14th Annual
Graduate Research Symposium

March 20-21, 2015

WILLIAM & MARY

CHARTERED 1693

Table of Contents

Schedule at a Glance

Friday, March 21, 2015 -- Sadler Center

8:00 am - 9:00 am	Registration *Second Floor Lobby*
9:00 am - 10:00 am	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, James Room, York Room and Colony Room*
10:15 am - 11:15 am	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, James Room, York Room and Colony Room*
11:30 am - 1:00 pm	Luncheon & Welcoming Remarks *Chesapeake A*
1:15 pm - 2:15 pm	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, James Room, York Room and Colony Room*
2:30 pm - 3:30 pm	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, James Room, York Room and Colony Room*
3:30 pm - 4:30 pm	Poster Presentations with Q&A *Chesapeake A*
3:30 pm - 6:00 pm	Networking Reception *Chesapeake A*

Saturday, March 21, 2015 -- Sadler Center

8:00 am - 8:30 am	Registration *Second Floor Lobby*
8:30 am - 9:30 am	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, James Room, York Room and Colony Room*
9:45 am - 10:45 am	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, York Room and Colony Room*
11:00 am - 12:00 pm	Concurrent Sessions *Tidewater A, Tidewater B, Chesapeake C, James Room, York Room and Colony Room*
12:00 pm - 1:30 pm	Luncheon & Awards Ceremony *Chesapeake A*

Dear Members of The College of William & Mary Community, Visiting Presenters, and Guests,

It is our pleasure to welcome you to the 14th Annual Graduate Research Symposium at the College of William and Mary! This is the largest Graduate Research Symposium to date with 158 presenters coming from 16 colleges and universities throughout the United States. With so many brilliant research presentations coming from across the disciplines in the arts and sciences, we again sought to encourage interdisciplinary discussion and bridge the divide between academic departments.

Accomplishing this required the creation of some interesting presentation sessions. Continuing our mission of emphasizing the '&' in Arts & Sciences, you will notice a number of sessions which include presentations from both the arts and sciences. Rather than grouping strictly by academic discipline, the committee sought to tease out the larger themes present in the various abstracts and group them accordingly. The committee also was tasked with coming up with creative and informative titles for each of the oral presentation sessions. We hope these titles will help to clear up any confusion regarding why certain presentations were grouped the way they were, will draw in more audience members from across the disciplines of the arts and sciences, and, in at least a few cases, will put a smile on your face.

In encouraging interdisciplinary discussion, this year's special event will be the merging of our poster session with the start of Friday evening's networking reception. By moving the poster session into Chesapeake A and B, we hope to encourage more in-depth and interdisciplinary discussion of the research presented in the various posters without the commotion and distraction of the Sadler Center Lobby. The new venue will also allow for better traffic flow in and around the displayed posters, so don't be shy about going up to a poster you are interested in and asking the presenter any questions you may have! Posters will then be left on display for the duration of the networking reception, so if you missed one during the session, you can still go back and view the research at a more leisurely pace.

Finally, we extend our heartfelt gratitude to all of the participants and volunteers at this year's Graduate Research Symposium. We would especially like to thank the William and Mary's graduate faculty, staff, administration, and the Graduate Studies Advisory Board for their commitment to graduate students and graduate research. Last, but certainly not least, thank you to the members of the Graduate Research Symposium committee for your dedication and long hours put in to making this year's symposium a success.

Best,

Brittany St.Jacques Dowd
Sciences Co-Chair, Graduate Research Symposium
MS Candidate, Biology Department

Jenna Carlson
Humanities Co-Chair, Graduate Research Symposium
PhD Candidate, Anthropology Department

CHARTERED 1693

THE COLLEGE OF WILLIAM AND MARY
OFFICE OF THE PRESIDENT
P.O. BOX 8795
WILLIAMSBURG, VIRGINIA 23187-8795

757/221-1693, Fax: 757/221-1259

Dear Students and Friends,

Welcome to the fourteenth annual Graduate Research Symposium at the College of William & Mary! It's grand to have you here.

The Symposium's theme – "Preparing Scholars, Presenting Excellence" – reflects William & Mary's mission in graduate education. Our students contribute seriously to human understanding on their way to advanced degrees. Then they continue to do so as teachers and scholars. The Symposium provides an opportunity for our graduate students and their peers from other schools to present their work, and for the William & Mary community to enjoy the presentations.

You have my best wishes for an enjoyable and rewarding time together.

Cordially,

W. Taylor Reveley, III
President

2015 Graduate Research Symposium

Program Chairs
Jenna K. Carlson, *Anthropology*
Brittany St.Jacques Dowd, *Biology*

Graduate Student Committee
Katrina Hoeger, *COR*
David Nguyen, *Computer Science*
Helis Sikk, *American Studies*
Emily Wavering, *Public Policy*

Office of Graduate Studies and Research
Dean Virginia Torczon, *Graduate Studies*
Chasity Roberts
Wanda Carter
Vicki Thompson Dopp

Sponsors
Graduate Studies Advisory Board
Market Access International, Inc.
Northrop Grumman Corporation

Special Thanks To:
Aroma's of Williamsburg
Sal's by Victor
Rachel Folis, Creative Services
Volunteers and Room Proctors
Session Chairs

Judging Panel
Graduate student poster and oral presenters were eligible to submit a paper for award consideration in the disciplinary category of their choosing. The names and institutions of the students and advisors were removed from the submissions prior to evaluation by the judging panel. Advisors whose students submitted papers recused themselves from ranking those papers. W&M Master's students were eligible for the Corporate Awards, the W&M Awards for Excellence, and the Carl J. Strikwerda Awards.

Humanities & Social Sciences
John Burton, *Graduate Studies Advisory Board*
Dr. Gerard Chouin, *History*
Dr. Jonathan Glasser, *Anthropology*
Dr. Arthur Knight, *American Studies*
Prof. Elaine McBeth, *Public Policy*
Dr. Ronald Schechter, *History*
Betsy Sigman, *Graduate Studies Advisory Board*
Dr. Todd Thrash, *Psychology*

Natural & Computational Sciences
Michael Bracken, *Graduate Studies Advisory Board*
David Hood, *Graduate Studies Advisory Board*
Dr. Oliver Kerscher, *Biology*
Dr. Rex Kincaid, *Computational Operations Research*
Peter Martin, *Graduate Studies Advisory Board*
Dr. Eugeniy Mikhailov, *Physics*
David Opie, *Graduate Studies Advisory Board*
Dr. Denys Poshyvanyk, *Computer Science*
Robert Saunders, *Graduate Studies Advisory Board*
Laura Terry, *Graduate Studies Advisory Board*

Mentoring Awards: Humanities & Social Sciences
Dr. Alan Braddock, *American Studies*
Dr. Pam Hunt, *Psychology*
Prof. Elaine McBeth, *Public Policy*
Dr. Neil Norman, *Anthropology*
Dr. Hannah Rosen, *History*

Mentoring Awards: Natural & Computational Sciences
Dr. Elizabeth Harbron, *Chemistry*
Dr. Pieter Peers, *Computer Science*
Dr. Patricia Vahle, *Physics*
Dr. Matthew Wawersik, *Biology*

The College of William & Mary
Award Recipients for Excellence in Scholarship

These awards acknowledge graduate students whose research presentation demonstrates original investigation and the integration of knowledge, and distinguished excellence in scholarship through potential contribution to the discipline and recognition by peers.

To be considered for an award, presenters had to submit a 5-6 page paper describing their research. The papers were judged blindly by an independent panel of William & Mary faculty and Graduate Studies Advisory Board members. The papers by the following students were selected to merit an award among the many outstanding submissions. The corporate sponsored awards listed below were open to students from the College of William & Mary.

MARKET ACCESS INTERNATIONAL, Inc. (www.marketaccessintl.com) is an international trade, investment and enterprise growth consulting firm. The company was founded by Arts & Sciences Graduate Studies Advisory Board member Diane Alleva Cáceres (W&M '87 BA Economics, '89 MA Government).

MARKET ACCESS INTERNATIONAL, Inc. Award for Excellence in Scholarship in the Humanities and Social Sciences

EVE BOURBEAU-ALLARD
The College of William and Mary, History, Advisor: Dr. Karin Wulf
"A Widow's Purview: A Microhistory of Gender and Family Relations in the 18th-Century Virginia Backcountry

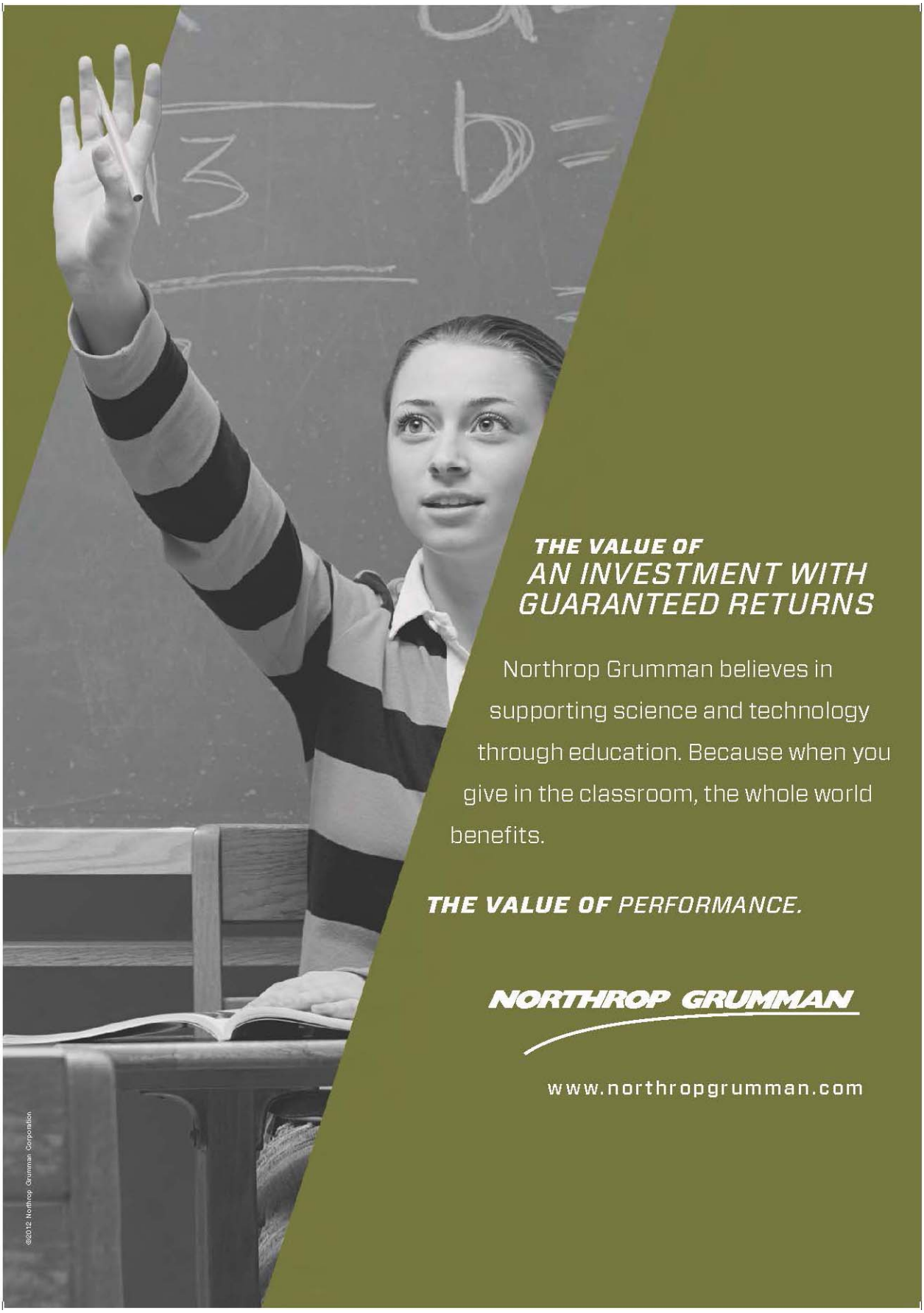
********Join Eve as she presents her research Friday, March 20, 2015 *******
from 2:30pm-3:30pm in Tidewater A

NORTHROP GRUMMAN CORPORATION (www.northropgrumman.com) Northrop Grumman Corporation is a leading global security company whose 120,000 employees provide innovative systems, products, and solutions in aerospace, electronics, information systems, shipbuilding and technical services to government and commercial customers worldwide.

NORTHROP GRUMMAN CORPORATION Award for Excellence in Scholarship in the Natural and Computational Sciences

VITEK JIRINEC
The College of William and Mary, Biology, Advisor: Dr. Matthias Leu
"Wood Thrush microhabitat associations: implications for species persistence in human-modified landscapes"

********Join Vitek as he presents his research Saturday, March 21, 2015*******
from 11:00am-12:00pm in Chesapeake C


THE VALUE OF
AN INVESTMENT WITH
GUARANTEED RETURNS
Northrop Grumman believes in supporting science and technology through education. Because when you give in the classroom, the whole world benefits.
THE VALUE OF PERFORMANCE.
NORTHROP GRUMMAN
www.northropgrumman.com
©2012 Northrop Grumman Corporation

The Arts & Sciences Graduate Studies Advisory Board at the College of William & Mary is a proud sponsor of the 2015 Graduate Research Symposium

The Graduate Studies Advisory Board is a group of educational, corporate, and community leaders with a commitment to enhancing the quality of graduate education in Arts & Sciences at William and Mary. We commend the attendees of the Graduate Research Symposium for their dedication to excellence in research.

The missions of the Graduate Studies Advisory Board are:

- Development/fundraising to increase graduate Arts & Sciences financial resources
- Assisting in the building of a graduate Arts & Sciences community
- Enhancing professional development opportunities for graduate students
- Advocating for graduate Arts & Sciences within the William and Mary community

Arts & Sciences graduate programs are critical to the mission of the College of William and Mary and to the College's status as a research university. Graduate programs strengthen the undergraduate program by providing research and mentoring opportunities, and are essential in retaining approximately a third of William and Mary's faculty members in Arts & Sciences.

By sponsoring the 2015 Graduate Research Symposium, initiating the Distinguished Thesis/ Dissertation Awards, the Carl J. Strikwerda Awards for Excellence and the S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring in Arts & Sciences, and providing recruitment fellowships to outstanding entering graduate students, the Graduate Studies Advisory Board is playing a vital role in advancing William and Mary's graduate programs in Arts & Sciences.

Members of the Graduate Studies Advisory Board, 2014-15

President: Diane Alleva Cáceres '87 BA Economics, '89 MA Government
Vice-President: Brian Morra '78 BA History
Past President: Cynthia Morton '77 BS Biology
Chair, Communications and Advocacy Committee: Robert Saunders '00 BS Physics
Chair, Development Committee: John Burton '89 MA History, '96 PhD History
Chair, Recruitment Committee: Debbie Allison '77 BS Chemistry
Chair, Student Professional Development Committee: Kathryn Caggiano '90 BS Mathematics

Michael Bracken '86 BS Mathematics
Jeffrey Deitrich '04 BA Political Science
Kurt Erskine '92 BA Public Policy
Mike Hoak '02 MA History
David Hood '90 BS Chemistry '92 MA Chemistry '96 PhD Applied Science
Peter Martin '71 MS Physics, '72 PhD Physics
George Miller '67 BS Physics, '69 MS Physics, '72 PhD Physics
David Opie '88 MS Physics '91 PhD Physics
Betsy Page Sigman '78 BA Government
Laura Terry '03 BS Biology
Bill Tropf '68 BS Physics
Jeffrey Voas '86 MS Computer Science, '90 PhD Computer Science
Edwin Watson II '68 BA History, '70 MA History
Gail W. Wertz '66 BS Biology

The College of William & Mary
Award Recipients for Excellence in Scholarship

William & Mary Award for Excellence in the Humanities and Social Sciences

JANINE BOLDT
American Studies, Advisor: Dr. Alan Braddock

William & Mary Honorable Mentions

JENNA CARLSON
Anthropology, Advisor: Dr. Neil Norman

ED HUNT
American Studies, Advisor: Dr. Charles McGovern

Visiting Scholar Award for Excellence in the Humanities and Social Sciences

JEEHEE HAN
Quantitative Methods, Columbia University, Advisor: Dr. Monica Prasad

Visiting Scholar Honorable Mention

BRE'AUNA BEASLEY
Public Policy, Virginia Commonwealth University, Advisor: Dr. Veronica Womack

The College of William & Mary
Award Recipients for Excellence in Scholarship

William & Mary Award for Excellence in the Natural & Computational Sciences

ELIZABETH RADUE
Physics, Advisor: Dr. Irina Novikova

William & Mary Honorable Mentions

ED NOVAK
Computer Science, Advisor: Dr. Qun Li

MELISSA BEEBE
Physics, Advisor: Dr. R. Ale Lukaszew

Visiting Scholar Award for Excellence in the Natural & Computational Sciences

MIRANDA KLEES
Biology, Clemson University, Advisor: Dr. Min Cao

Visiting Scholar Honorable Mention

ELIZABETH FALWELL
Biology, Clemson University, Advisor: Dr. Andrew Mount

The College of William & Mary
Carl J. Strikwerda Awards for Excellence

These awards recognize W&M Arts & Sciences graduate students for an outstanding written paper by a student who is engaged in thesis research/scholarship to earn an MA, MS, or MPP degree. In the spring of 2011, the Arts & Sciences Graduate Studies Advisory Board voted unanimously in support of the Board's concept for initiating these annual awards. To be considered for an award, Graduate Research Symposium presenters had to submit a 5-6 page paper describing their research. The papers were judged blindly by an independent panel of William & Mary faculty and Graduate Studies Advisory Board members. Awardees are listed in alphabetical order.

Awards for Excellence in the Humanities and Social Sciences

EMILY WILLROTH
Psychology Department, MA, Advisor: Dr. Matthew Hilimire

JEREMY ABRAMOWITZ
Public Policy Program, MPP, Advisor: Dr. Sarah Stafford

Award for Excellence in the Natural and Computational Sciences

STEPHANIE CHIN
Biology Department, MS, Advisor: Dr. Dan Cristol

The College of William & Mary
S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring

These awards recognize Arts & Sciences graduate students for outstanding undergraduate mentoring in scholarship and research outside of classroom teaching. Such mentoring includes graduate students who mentor undergraduates in the context of the undergraduate students' senior theses, honors theses, writing projects, term papers, or research in a laboratory, field site, museum, or archive. In the spring of 2009, the Arts & Sciences Graduate Studies Advisory Board and the Arts & Sciences Committee on Graduate Studies voted unanimously in support of the Board's concept for initiating and funding these annual awards.

Nominations consisted of supporting statements from current or past W&M undergraduate students and faculty members. A panel of W&M faculty and Graduate Studies Advisory Board members ranked the nominations. Awardees are listed in alphabetical order.

Awards for Excellence in Undergraduate Mentoring in the Humanities and Social Sciences

GANDALF NICOLAS
Psychology Department, MA

KRISTINA POZNAN
History Department, PhD

Award for Excellence in Undergraduate Mentoring in the Natural and Computational Sciences

CAITLIN CYRUS
Biology Department, MS

KRISTEN FRANO
Chemistry Department, MS

Friday, March 20, 2015

9:00 AM

York Room – **LANDSCAPE AND CONTESTED MEMORIES**

Wounded Knee and the Struggle to Memorialize a Massacre
Tyler Norris

Terra Sacra
Frank Fucile

"A Continuously Evolving Landscape of Memory": The National AIDS Memorial Grove and the Politics of Memorializing an Epidemic
Jan Huebenthal

James Room – **COLOR ME RAD: PAINTS, PIGMENTS, AND PROJECTILES**

Materializing William Byrd II's Transatlantic Social Network
Janine Boldt

Identification of Organic Pigments in Transatlantic 18th C. Oil Paintings Using Surface-Enhanced Raman Scattering (SERS) Spectroscopy
Kristen Frano

On the Origin of Ammunition: An Analysis of Cannonballs Found at Fort Stanwix
Elizabeth Scholz

Colony Room – **MINDFUL MATTERS**

Social Influence on Emotion Experience and Physiology
Emily Willroth

Implicit Learning of Context-Predictive Associations: A New Method for Studying Visual Illusions
Evan Jones

Individual Differences in Base Rate Neglect
Kunjoon Byun

Chesapeake C – **MOTHER KNOWS BEST**

The Predictive Validity of Compassionate Love, Parent Relationships Status, and Parent Relationship Quality on Coparenting Relationships
Regina Alexander

The Effect of Dietary Methylmercury on the Parental Care of an Avian Model Species
Stephanie Chin

Effects of Maternal Nutrient Restriction on Bovine Fetal Growth During Mid-Gestation
Regina Taylor

Effects of Prenatal Androgen Exposure on Reproduction in Captive Female Golden Lion Tamarins (*Leontopithecus rosalia*)
Brett Frye

9:00 AM

Tidewater A – **WHAT'S COOLER THAN BEING COOL? ~~ICE~~ ULTRACOLD**

Scattering of Ultracold Atoms from an Oscillating Barrier
Andrew Pyle
Progress on Using AC Zeeman Potentials for Manipulating Ultracold Atoms
Charles Fancher
7 Li and 93Nb Solid-State NMR Study in a Cation-Ordered Perovskite of High Permittivity Materials
Rony Kalfarisi
45 Sc NMR Studies of PSW
Jeremy Ellden

Tidewater B – **HOLD THE TRAFFIC! HOLD ALL CALLS!**

Simulating Parking Space
Katarina Hoeger
Traffic Flow State Detection and Dissemination
Ahmed Alhafdhi
Improving GUI-Based Testing of Android Apps
Mario Linares-Vasquez

10:15 AM

York Room – **SCHOOLS OF TODAY AND TOMORROW: REFORM AND DIVERSITY IN EDUCATION**

Alternative Education Programs in Virginia
Emily Wavering
Performance Based Funding in Higher Education: Refining a Promising Concept
Benjamin Plache
Study the Diversity of International Students in Different Graduate Programs in USA
Sevinj Iskandarova
Perceived Stress, Psychological Adjustment and Antisocial Behavior in African American College Students
Kourtney Bell

10:15 AM

James Room - **FROM LOCAL TO GLOBAL: HEALTHCARE POLICY HOME AND AWAY**

Medicaid Expansion and Access to Care Among Breast Cancer Survivors
Wafa Tarazi

Income Inequality in the US and Public Opposition to Governmental Health Care Provisions
Jeehee Han

Taking the Health Aid Debate to the Sub-National Level: Impact and Allocation of Foreign Health Aid in Malawi
Robert Marty

Rural Health: A Multivariate Analysis of the Incidence of Chlamydia in Rural Georgia and the Case for Local Governments
Bre'Auna Beasley

Colony Room – **RACE, (IN)EQUALITY, AND HEALING**

House-as-Archive in Toni Morrison's *Song of Solomon*
Mariaelena DiBenigno

White Fright, White Flight: William Christenberry and the Fine Art of Remembering the Ku Klux Klan
Kathryn Previti

Close Contact and Attitudes Towards Latinos
Jasmine Koech

Edward Dromgoole and the Shifting Spectrum of Evangelical Attitudes Toward Slavery in Virginia, 1780-1815
Christopher Jones

Chesapeake C – **MEDIATED HORIZONS**

Roving Mars: The Next Frontier of Space and Media
Giny Cheong

Influences on Science Fiction & Fantasy Fandom on Implicit and Explicit Bias
Melissa Gomez

Radiometric Transfer: Example-Based Radiometric Linearization of Photographs
Han Li

Measurement-Based Editing of Diffuse Albedo in Photographs with Consistent Interreflections
Bo Dong

Tidewater A – **I'VE GOT THE MUSIC IN ME**

Performance, Hip Hop, and Activism
Travis Harris

Are All Musicians Always Better than Non-Musicians on Music-Related Tasks?
Laura Getz

I Got Country Toots: Race, Identity and Black Country Singers in the 1970s
Matthew Anthony

Big Fun with the Prince of Darkness: Miles Davis and the Death of the American Dream
Brian Jones

10:15 AM

Tidewater B – **DOES THIS FILM MAKE ME LOOK FAT?**

Superconducting Properties of NbN and NbTiN Thin Films
Matthew Burton

On the Repeatability of Domain Formation and Growth During the Metal-Insulator Transition in Vanadium Dioxide Films
Tyler Huffman

Investigation of Optically Induced Metal-Insulator Transitions in VO2 Thin Films Grown on Al2O3 and TiO2
Elizabeth Radue

Surface Plasmon Resonance and Insulator-Metal Transition in Gold and Vanadium Dioxide Bilayer Films
Melissa Beebe

Surface Plasmon Resonance Enhancement via Oblique Thin Film Deposition on Gratings
Zhaozhu Li

1:15 PM

York Room – **WHAT'S LOVE GOT TO DO WITH IT? DRINKING, DOLLS, AND DECADENCE**

Playing with Dolls: Stigmatization and Performance of Reborn Dolls
Khanh Vo

"So Long, Saloon": Drinking, Gender, and Morality in *Farewell, My Lovely*
David Pratt

Morbid Love and American Decadence
Nicolette Gable

James Room – **SPREADING IDEAS AND ATTITUDES**

Non-Governmental Organization as Norm Diffuser Actors in Global Governance
Derya Buyuktanir

Environmental Protection or Economic Growth: Attitudinal Differences Among Chinese Population
Menuka Ban

"Every Child Should Have a Party": Sweet Commercial Cookbooks in the Great Depression
Sarah Adams

1:15 PM

Colony Room – **SOCIAL LANDSCAPES**

Virginian Loyalists and the Property that Defined Them: A Study of Status Reconstruction
Kasey Sease

Money as a Social Institution in Late Eighteenth Century Virginia
Amanda Gibson

Translating the Social Landscape: Hawaii's Ancient Land Divisions as Documented by the Hawaiian Government Survey
Summer Moore

Chesapeake C – **WHAT'S COOKIN', GOOD LOOKIN'?**

The Effects of Supplementing Ruminal Bypass Unsaturated Fatty Acids on Marbling in Early-Weaned Steers
Kayla Mangrum

Development and Implementation of the G.E.T.T. Cooking Curriculum: A Pilot Study
Elizabeth Ramirez

Bacterial Recovery, Transfer to Hands and Survival on Restaurant Menus
Ibtehal Alsallaiy

Food Odors, Dietary Restraint, and Attentional Bias to Food Cues
Winnie Zhuang

Tidewater A – **MAY THE MASS X ACCELERATION BE WITH YOU!**

Turbulence and Transport Suppression by Shear Flow in DIII-D H-Mode Plasmas
Xin Wang

High-Performance Outlier Detection Algorithm for Finding Blob-Filaments in Plasma
Lingfei Wu

Four-Wave Mixing Reduction for EIT-Based Stored Light
Gleb Romanov

New Probe of Electroweak Interference Effects in the Proton's Quark Structure
James Dowd

Tidewater B – **PERSONHOOD AND PRIVACY IN THE CYBERAGE**

Document Dumps in History: Learning from Cablegate and Its Notable Precedents
Edward Hunt

Model-Based Storage Tiering for Smooth System Operation
Ji Xue

Building Fast Privacy-Preserving Scheme for Applications on Smartphones
Shanhe Yi

SMOC: A Secure Mobile Cloud Computing Platform
Zijang Hao

2:30 PM

York Room – **I LIKE BIG DATA AND I CANNOT LIE**

GameMaps: Using Big Data to Understand Enjoyment
David Dobolyi

Multilingualism, a Linguistic and Cultural Treasure for the 21st Century
Nuria Ballesteros Soria

Judicial Revenge: The Mass Execution of Thirty-Eight Dakota Men
Ian Tonat

James Room – **EMOTIONAL FACES AND AUTISM**

Attention to Emotional Faces in Adults as a Function of Autism-Related Attention Switching Abilities
Catherine Mitchell

Neurometric Profiling of Autism Spectrum Disorders Using the Brief Neurometric Battery (BNB)
Leigh Gayle

Emotional Face Processing in Young Adults with Self Reported Autistic Behaviors
C. Teal Kozikowski

Colony Room – **ARE WE SOLID?**

Electrodynamics of Rare-Earth-Doped CaFe2As2
Zhen Xing

Chemoselective Glaser-Hay Coupling Using Solid-Support
Jessica Lampkowski

Exploring Interfacial Adhesion in Graphene Oxide Nanocomposites
Laura Dickinson

Chesapeake C – **FEELINGS OF (UN)BELONGING**

Popular and Unpopular Images of Queer Life in the South
Helis Sikk

Powerful Schemas: Feelings of Power Bias Social Categorization Towards Traditional and Majority Racial and Sexual Identities
Gandalf Nicolas

Constructing Normative Citizenship
Jessica Cowing

Tidewater A – **GENDER AND SEXUALITY IN THE PAST AND PRESENT**

"I'm Just So Sick of RHE": Rachel Held Evans, Sarah Bessey, and Making Religious Bodies Batter through New Media
Anna Rosenkranz

Investing in Daughters: A Quantitative Analysis of Marriage Settlements from South Carolina, 1750-1850
Lindsay Keiter

A Widow's Purview: A Microhistory of Gender and Family Relations in the 18th-Century Virginia Backcountry
Eve Bourbeau-Allard

2:30 PM

Tidewater B – **LET'S GET PHYSICAL**

Determination of the Dielectric Function of Materials with Scattering-Type Scanning Near Field Optical Microscopy
Peng Xu

Covert Channels over Physical Media on Smart Devices
Ed Novak

A Study of the Effect of Deep UV (172nm) Irradiation on Polyimide Surfaces
Lopamudra Das

Quantitative Estimation of the Performance Delay with Propagation Effects in Storage Power Savings
Feng Yan

3:45 PM

Chesapeake A & B – **POSTER SESSION**

The Archaeology Plantation Slavery at Good Hope Estate: Preliminary Findings
Hayden Bassett

Effect of In-Vitro Combination Treatment with Curcumin, Aspirin, and Sulforaphane on Idiopathic Pulmonary Fibrosis Fibroblasts
Sarah Bui

Oxen at Oxon Hill Manor: Identifying Draught Cattle from the Archaeological Record of Colonial Maryland
Jenna Carlson

The Psychometric Properties of the Assessment of Attitudes, Beliefs, and Behavioral Intentions Scale (AABBIS)
Stephen Casazza

Differences in Sockeye Salmon Antibody Composition: Testing the Immunological Imprinting Hypothesis
Maxwell Chappell

Avalanche PhotoDiodes for the NOvA Near Detector at Fermilab
Marco Colo

Potential Threats to Diamondback Terrapin Nesting Success Caused by the Invasive Reed Phragmites australis
Cassandra Cook

Evaluation of the Efficiency of Recovery Methods of Trace Evidence for Pollen Particles
Christie Cyktor

Emotion Recognition, Theory of Mind and Schizotypy
Docia Demmin

Mate Choice and Mercury: Do Environmental Contaminants Affect Sexual Selection?
Virginia Greene

Settlement Stability and Floodplain Dynamism in the Dan River Drainages
Madeleine Gunter

Benign Deterrence of Nonsongbirds Using Directional Sound
Nicole Ingrassia

Chesapeake A & B – **POSTER SESSION**

Depression, Obesity and Perceived Vulnerability to Disease in African American College Students
Jessica Roane
Political and Economic Development of US Agriculture Policy
Serena Saffarini
Effect of Noise on the Social Structure of European Starlings (Sturnus vulgaris)
Autumn Swan
Examining a Potential Labor Shortage in the Aviation Maintenance Industry
Emily Uselton
The Effects of BPA on Fertility in a Variable Population
Emily van den Blink
Perceptions of OCBs and CWBs in the Workplace: The Influence of Age and Gender Stereotypes
Boglarka Vizy
Assessing the Ototoxic Effects of Methylmercury Exposure in the Zebra Finch (Taeniopygia guttata)
Sarah Wolf
Spatial Structure of Quantum Noise in a Squeezed Vacuum Field
Mi Zhang

8:30 AM

York Room – **IS THIS REAL LIFE?**

Disability and Disaster: Linguistic Crossover and the Development of Material Reality
Jennifer Ross

Capitalist Architecture in a Posthumanist World
Lindsay Garcia

"Lumping" and "Splitting are Distinct Traits with Distinct Nomological Nets
Victoria Oleynick

Colony Room – **NEMATODES, SPIDERS, AND NUCLEAR IMPORT. OH, MY!**

The Silk of the Brown Recluse Spider: Structure to Function
Qijue Wang

X-Chromosome Loss as a Mechanism for Male Production in Self-Fertile Rhabditis sp. SB347 Nematodes
Maureen Farrell

Importins 4, 5, 8, 13 Knockdown Effects on Thyroid Hormone Receptor's Nuclear Import
Jibo Zhang

Investigating the Integration of Metabolic Signals with DNA Damage Response in Saccharomuces cerevisiae
Olatomiwa Bifarin

The Potential Role of Cv1MMP in Wound Healing and Shell Repair in the Eastern Oyster, Crassostrea virginica
Elizabeth Falwell

Chesapeake C – **JUST BREATHE**

Excessive Periodic Breathing in Preterm Infants with NEC
Mary Mohr

Morphometric Properties of Dbx1+ Neurons that Contribute to Respiratory Rhythm and Pattern Generation in Neonatal Mice
Victoria Akins

Modeling Piecewise Destruction of the Respiratory Pre-Bötzinger Complex: Implications for the Assembly of a Minimal Rhythm and Pattern-Generating Motor Circuit in Mammals
Hanbing Song

Synaptic Depression Influences Inspiratory Burst Termination in the Brainstem preBötzinger Complex
Andrew Kottick

Tidewater A – **PHYSICS AT THE PRECISION FRONTIER**

Physics Potential of Neutrino-Nucleus Deep Inelastic Scattering in the MINERvA Experiment
Anne Norrick

The First Measurement of the Al Beam-Normal Single-Spin Assymetry
Kurtis Bartlett

An Experimental Overview of Q-weak, and Removal of Target Contributions
Joshua Magee

Analysis of the Kinematics in the Qweak Experiment
Valerie Gray

Tidewater B – **INTERNATIONAL RELATIONS**

Redistribution and the Welfare State: An Econometric Approach to Public Social Expenditure and Inequality Reduction in OECD Countries from 1983 to 2009
Albert Strubler

The Gang Crisis in El Salvador
Kathleen Baugh

Modeling the Effects of Enforcement Spending on International Narcotics Policy Outcomes
Charles deAzagra

9:45 AM

York Room – **EARLY VISIONS OF RITUAL AND RELIGION**

The Brafferton Estate: Harvard, William and Mary, and Religion in the Early Modern English Atlantic World
Mark Mulligan

"With His Breath He Attracts and Cuts the Spirit of the People": Ritual and Authority of Southeastern Colonial Native Americans
Patrick Johnson

Fictions of Wholeness: Claiming the Land in Catharine Sedgwick's Hope Leslie
Amanda Stuckey

Chesapeake C – **IS IT GETTING HOT IN HERE? NAH, CHECK OUT MY SNOWBALL!**

Probing Crude Oil/Rock Interactions in the High Temperature High Pressure Regime Using Atomic Force Spectroscopy
William Dickinson

Numerical Simulations of Acoustics to Track Oil Under Ice Floes
Elizabeth Skinner

Measuring Social Vulnerability for Climate Change Adaptation for Hampton Roads, Virginia
Jeremy Abramowitz

Impact of the EPA Clean Power Plan on the U.S. Electricity Industry, Environment, and Individual Homeowners
Kevin Rasmussen

Tidewater A – **NO BRAINER: IDEAS THAT STICK!**

Dbx1-Derived Intermediate Reticular Formation Neurons Contribute to Respiratory Pattern Formation
Nikolas Vann

Mechanisms of Recovery from Notch Perturbation in Xenopus laevis
Catherine Bianchi

Adhesive Properties of Brown Recluse Spider Silk
Sean Koebley

EEG Correlates of Kinematic Properties of Hand Movements
Kenneth Osborne

Tidewater B – **PLANTS AND THEIR PLACE IN THE WORLD**

An Evaluation of Density Dependence in Asclepias syriaca, Common Milkweed
Mary Seward

The Comparison of Leaf and Anatomical Traits Between Temperate and Tropical Members of Rhododendron
Tatpong Tulyanon

Conserving the College Woods: Changes in Floristic Richness of the College Woods in the Last 4 and 2 Decades Under Increasing Herbivory by White-Tailed Deer (Odocoileus virginiana)
Caitlin Cyrus

Archaeobotany and Gendered Landscapes in Tidewater Algonquian Virginia
Jessica Herlich

11:00 AM

York Room – **SHOW ME THE MONEY: ECONOMY, IDENTITY, AND SUSTAINABILITY**

Mining the Land, Mining the Sea: Informal Drinking Economy and Drinking Spaces in Resource Extraction Communities at Highland City, Montana and the Isles of Shoals, Maine
Megan Victor

"A Land Not Exactly Flowing the Milk & Honey": Western Australia and the British Public, 1828-1831
Matthew Niendorf

A High Price for White Gold: the Dutch Salt Enterprise on La Tortuga Island, Venezuela, 1624-1638
Konrad Antczak

James Room – **INTERDEPENDENCE OF MEMORY, IDENTITY, AND LIFE ENVIRONMENT**

Evaluation of a Brief Neurometric Battery for the Detection of Changes in Brain Activity Associated with Cognitive Decline in Older Adults
Emily Cunningham

Examining Effects of Early-Life Environment on Life History Strategy, with a Focus on Priming Conditions
Humama Khan

Investigating Personal Identity in Reminiscence Research: Identity-Relevant Periods and Domains of Life
Brian Carle

Colony Room - **A LINEAR PATH TO GRADUATE MATH**

Density Matrices with Prescribed Partial Trace
Diane Pelejo

Estimating diag(f(A))
Jesse Laeuchli

Open Locating-Dominating Sets in Circulant Graphs
Robin Givens

Chesapeake C – **FLORA AND FAUNA**

Wood Thrush Microhabitat Associations: Implications for Species Persistence in Human-Modified Landscapes
Vitek Jirinec

How Resource Availability Influences Eastern Tiger Swallowtail (Papilio glaucus) Occupancy in the Birginia and Middle Peninsulas
Angela Zappalla

Identification and Functional Characterization of a Novel Protein Kinase Gene Family Involved in Stress Resistance
Ning Yuan

The Effect of Probiotics Supplementation on Health Using Caenorhabditis elegans as a Model System
Miranda Klees

Tidewater A – **THE KIDS ARE ALRIGHT: YOUTH AND GENDER IN THE 20TH CENTURY**

"Life Problems": Youth, Sex Education, and Medical Advice of the 1910s
Laura Ansley

Dear Mr. President Ike: Race, Gender, and Imagined Relationships in Children's Letters to Dwight D. Eisenhower
Cara Elliott

The Marys of Tyler Hall: Defining the William and Mary Student in the Early Twentieth Century
Caylin Carbonell

Tidewater B – **ARE YOU PART OF THE SOLUTION? OR THE PRECIPITATE?**

Calcium Homeostasis in a Local/Global Whole Cell Model of Permeabilized Ventricular Myocytes with a Langevin Description of Stochastic Calcium Relase
Xiao Wang

Polyamid Hydrolysis Accelerated by Small Weak Organic Acids
John-Andrew Hocker

Trace Chemical Analysis Latent Fingerprint Biomarkers with GC/MS
Jennifer Munson

Every Child Should Have a Party: Sweet Commercial Cookbooks in the Great Depression

Presenter: Sarah Adams
Advisor: Charles McGovern
College of William & Mary,
American Studies

Commercial cookbooks published by local and national manufacturers have proliferated in America for nearly 150 years. Simultaneously marketing tools and cultural texts, their format has changed little over the years, typically employing recipes and other culinary instruction to advertise their products. By the early 20th century, detailed color images featured in many such publications, lending rich aesthetic value to the inexpensive pamphlets. In the following decades, narrative and visual tone within the genre evolved to reflect and accommodate changing culinary and cultural trends while tirelessly promoting brands.

Sarah Adams is a Ph.D. candidate in the American Studies Program at the College of William & Mary. Her dissertation explores austerity and imagination in the cultural consumption of sweets during the Great Depression.

I Got Country Roots: Race, Identity and Black Country Singers in the 1970s

Presenter: Matthew Anthony
Advisor: Charles McGovern
College of William & Mary,
American Studies

In 1971, country singer Charley Pride was named "Entertainer of the Year" and "Male Vocalist of the Year" by the Country Music Association. On one level, Pride's honors were no surprise. 1971 was a very successful year for the singer who topped the country charts three times that year, giving him eight career #1 hits. However, Pride's recognition was an unprecedented event in country music because he was the first black artist ever to receive such an honor from the country music establishment. Many at the time saw Pride as country music's Jackie Robinson, and several other black country singers were semi-successful in the 1970s.

Matt Anthony is a Ph.D. student in American Studies at the College of William & Mary. He received an M.A. in American Studies from Penn State Harrisburg, and a B.A. in History and English from St. Mary's College of Maryland.

Materializing William Byrd II's Transatlantic Social Network

Presenter: Janine Boldt
Advisor: Alan Braddock
College of William & Mary,
American Studies

William Byrd II (1674-1744) assembled a collection of at least thirty paintings at Westover Plantation in Virginia. About half of these paintings featured distinguished English noblemen or women that he met while living in England during his youth. Upon his permanent return to Virginia in 1726, these paintings became tangible evidence of Byrd's transatlantic connections to influential politicians, military leaders, and natural philosophers. Maintaining his English social network while living in Virginia proved challenging for Byrd, but his portraits allowed him to connect and converse with his friends and acquaintances from a distance. The acts of exchanging, giving, and receiving portraits materialized social and political connections between Byrd and the sitters, which correspondence and personal favors reinforced. The fact that many of Byrd's portraits were copies emphasizes the importance of images as networking devices, while painted details reveal relationships among the sitters. By studying not only the Westover paintings, but also the social network (s) in which they functioned, I argue that eighteenth-century portraiture materialized connectivity throughout the British Atlantic World.

"Disordered Minds": Citizenship and Disability in Eastern State Hospital Cemetery

Presenter: Jessica Cowing
Advisor: Kara Thompson
College of William & Mary,
American Studies

The Eastern State Hospital (ESH) Cemetery on South Henry Street in Williamsburg, Virginia is located near the original site of ESH, which was the first psychiatric facility established in the United States in 1773. Unclaimed bodies in ESH Cemetery ask important questions about which bodies are worthy of citizenship and which are not. This paper considers how nineteenth century asylums reinforced normative citizenship. ESH Cemetery provides a narrative of how disability and citizenship is continually constructed through processes of inclusion and exclusion. I argue that ESH Cemetery reflects the historical devaluation of disabled, institutionalized lives through the presence of unmarked graves while also allowing for a space to reimagine disabled citizenship. Examining citizenship through the lens of dis/ability reveals how normative citizenship depends on the exclusion and confinement of bodies and minds perceived to be incompatible with the normative national body. The historical processes through which asylums managed, classified, and contained disabled bodies and minds continue to shape ongoing constructions of disability in opposition to normative citizenship. Uncovering the extent to which ability is a qualification for citizenship reveals how disabled bodies and minds define what a citizen is not. Twentieth century efforts to commemorate unclaimed bodies in ESH Cemetery ask important questions: What are the possibilities for reimagining disabled citizenship and how do we remember institutionalized, disabled people in death?

Jessica Cowing is a Ph.D. student in American Studies at the College of William & Mary. Jessica focuses on American literature and American cultural studies with interests in representations of dis/ability as well as constructions of disability, citizenship, and nationalism.

ARTS & SCIENCES

House-as-Archive in Toni Morrison's *Song of Solomon*

Presenter: Mariaelena DiBenigno
Advisor: Susan Donaldson
College of William & Mary,
American Studies

Throughout American literature, houses provide a setting for important narrative moments. They shelter, conceal, and remember. They can operate as sentient entities with specific stories to tell. Similar to Kathleen Brogan's concept of cultural haunting, the house serves as a reminder of specific historical moments; they reveal, in Brogan's words, "people's historical consciousness." Simply put, houses tell stories. In Toni Morrison's 1977 novel *Song of Solomon*, houses provide important historical records in a landscape haunted by race and class. Milkman, the novel's main character, moves from house to house in an attempt to recover his ancestry; this journey explores liminal spaces where orality and spectrality reveal important familial storylines. In Morrison's text, understanding one's past allows for a more fruitful future. By exploring domestic space, Milkman conducts necessary research about his past. Much like an archive provides information on public and private pasts, Milkman uses various houses in *Song of Solomon* to piece together -- and thus re-possess -- his heritage. When Milkman recognizes the house-as-archive, he also knows (and frees) himself via his family's history. In Morrison's *Song of Solomon*, the house provides a useful theoretical model to explore what it means to be haunted by history -- and who has access to ancestral archives.

Mariaelena DiBenigno is a Ph.D. student in the American Studies Program. After several years as a middle school teacher, she completed her English M.A. at the University of North Carolina Wilmington; her thesis concerned the relationship between folklore and tourism in the coastal Carolinas. Other research interests include intersections between memory and public history; popular American narratives about war; and death commemoration in the United States.

Terra Sacra

Presenter: Frank Fucile
Advisor: Alan Braddock
College of William & Mary,
American Studies

Expanding from Giorgio Agamben's concept of the Homo Sacer, the human being who can be killed without being murdered or sacrificed, my dissertation engages with the necropolitics of the battlefield environment. It is an inquiry into the processes by which landscapes have been designated as war zones and then commemorated as sacred ground afterward. Through an examination of the Gettysburg Address, General Orders 100, and Civil War photography, this essay will describe the battlefield ecology I call *terra sacra* as it emerged in the United States during the Civil War. My argument concludes that the most salient biopolitical characteristic of these battlefield environments is not the sacrifice of citizen soldiers to the cause of the republic, as claimed in the Gettysburg Address and American political rhetoric ever since, but rather the generalized wastage of life through industrial-scale destruction. This project draws from the fields of history, literary analysis, environmental studies, and visual studies. My analysis will potentially have implications for new materialist and post-humanist work on the kinship between humans and so-called â€œdeadâ€ matter as well as for the fields of cultural and military history. In the sub-field of environmental military history, the dissertation will present an origin narrative for the process of ecocide in modern warfare.

Frank Fucile is a Ph.D. student in the American Studies Program, and works in fields including ecocriticism, literature, film, visual studies, and military history.

Morbid Love and American Decadence

Presenter: Nicolette Gable
Advisor: Chandos Brown
College of William & Mary,
American Studies

At the end of the Nineteenth Century, some of the most privileged and culturally sophisticated Americans developed a desire for the base, the vulgar, the artificial and the diseased. Some of them adopted the label of Decadent. They wanted to associate themselves with the "Decadent" movement then flowering in Europe, which celebrated the culture and society of empires at the end of their lives. The writers, artists, and thinkers who aligned themselves with Decadence deliberately set themselves against the main American cultural currents and social norms, adopting a variety of affectations to identify themselves and shock others. One such characteristic was the decadent love of illness and suffering. This craving ranged from a morbid interest in descriptions of illness to a sexual fetish for disease. Commentators often found this the most threatening aspect of Decadence in America and noted its decidedly sexual overtones. Nosphilia, a name coined to mean love of disease, offers a starting point to help understand the ways that these ideas circulated. This paper investigates the cultural meanings and work done by the representations of this love of illness. The material for this paper comes from both popular and little magazines of the 1890s as well as popular sexology. Specifically I will focus on why these artists, largely from or aspiring to the upper classes, might crave disease and illness. What did they hope to accomplish with this identification? How and why was this so dramatically pathologized by authorities?

Nicolette Gable is a Ph.D. Candidate in the American Studies Program at W&M. She is working on her dissertation which is on the Decadent movement in America.

Capitalist Architecture in a Post-Humanist World

Presenter: Lindsay Garcia
Advisor: Alan Braddock
College of William & Mary,
American Studies

One doesn't have to travel to an urban center like Detroit to see the failure of capitalism as epitomized in Thomas Sugrue's *The Origins of the Urban Crisis* or Eminem's film *8 mile*. Examples of capitalist architectural ruin exist in suburban Williamsburg, Virginia: contrast Richmond Road's three abandoned motels with New Town's brand new but un-leaseable commercial spaces. Williamsburg overestimates its local consumer potential, tourism markets, and population growth; the resulting debris is accumulating. Humans claim dominion over the entire natural world; they received permission from the bible and other authorities, so they tend to maintain anthropocentric attitudes. Recent scholarship in posthumanism and political economy/ecology points to the complex and problematic relationships between humans, nonhuman animals, climate, nature, culture, and capitalism. To solve the world's greatest problems: hunger, climate change, abuse of animals, to name a few, society must adopt a new set of principles by which to live and unmask oppressive structures of state and cultural power.

Lindsay Garcia received her B.F.A. from Rhode Island School of Design in 2006, an M.A. in Contemporary Art from Sotheby Institute of Art in 2009, her M.F.A. from SUNY Purchase in 2014, and is currently pursuing her Masters and Ph.D. in American Studies at the College of William & Mary. Her research interests focus on the intersectional lines between art history, activism, feminism, animal studies, and environmental studies.

Performance, Hip Hop, and Activism

Presenter: Travis Harris
Advisor: Michael Blakey
College of William & Mary,
American Studies

Police officer Darren Wilson's killing of Michael Brown on August 9, 2014 is part of an endemic system of structural racism against Blacks in St. Louis, Missouri. Institutional racism has a long history of devaluing and dehumanizing Blacks in America. The impacts of this multi-faceted system have led to various responses by the people of St. Louis ranging from protests to victim blaming. Several modes of activism are necessary to fight the interconnected system of institutional racism. Hip Hop has responded in St. Louis and has provided illustrations for combating the evils of racism. This paper will focus on three Hip Hop emcees, Kareem Jackson (Tef Poe), Travis Tyler (Thisl) and Marcus Gray (Flame) who have been actively involved in improving St. Louis before August 9, 2014. I will provide a performance studies theoretical analysis on each of these emcees. I will analyze the repertoires of Tef Poe's and Flame's performances and the archive of Thisl's performance. These three emcees present three models of activism. Tef Poe protested on the front lines, and testified before the United Nations Committee Against Torture. Flame held Hope for Ferguson which was a "buycot" and included a live concert. Thisl created a music video for the song "Dream Team" (I Had a Dream) where he articulates the direct connection between his performances on stage with his work in St. Louis. They deserve attention because of their work in addressing institutional racism head on and providing hope to a city constantly dealing with antagonistic forces.

Travis Harris' research examines the intersection of race, religion and Hip Hop. In seminary, his Master's Thesis was entitled "Listen Up: Why the Church and Academia Should Study and Embrace Holy Hip Hop." Travis argues for the academic community to pay more attention to Christians within Hip Hop. He also articulates the church's need to go beyond its misconceptions of Hip Hop and realize the evangelical potential that embracing Hip Hop offers.

"A Continuously Evolving Landscape of Memory": The National AIDS Memorial Grove and the Politics of Memorializing an Epidemic

Presenter: Jan Huebenthal
Advisor: Leisa Meyer
College of William & Mary,
American Studies

In 1996, the National AIDS Memorial Grove, located on a lush plot of land in San Francisco's Golden Gate Park, was dedicated as the official American memorial to the global AIDS pandemic. By the early 2000s, many supporters of the Grove felt that the memorial lacked an architectural structure commensurate with the status of a national memorial. An international design competition wielded a winning design by two New York architects that proved controversial owing to its frank visualization of dying and regeneration. Ultimately, the design was not implemented and to this day the Grove remains a natural sanctuary. The ill-fated attempt to establish an architecturally designed AIDS Memorial at the Grove resonates with the contested and multifaceted politics of memorializing an epidemic. Memorializing the AIDS epidemic entails a dual temporal burden: honoring the memory of the dead, in the full knowledge that many more will die in the future. This paper argues that memorializing the AIDS epidemic has been a continuous process of collective meaning-making linked to broader historical currents and meanings attached to the HIV/AIDS crisis. Through comparative readings of reactions to Maya Lin's 1981 design of the Vietnam Veterans Memorial, this paper teases out some of the particularities of memorializing a cultural trauma with indeterminate meaning and situates the struggles over the AIDS Grove in the context of queer identity politics in relation to the HIV/AIDS crisis. The Vietnam Veterans Memorial on the National Mall likewise symbolizes, in Kristin Ann Hass's words, a "struggle over the representation of contested terrain" and it is through a comparison of the two memorial sites that this paper develops a tentative account of the relationship between contentious cultural memory and the U.S. nation state.

Jan Huebenthal is a second-year Ph.D. student in the American Studies Program. His research interests include gender studies, queer theory, cultural studies, 20th century American history, critical race studies, and sports studies.

Document Dumps in History: Learning from Cablegate and its Notable Precedents

Presenter: Edward Hunt
Advisor: Charles McGovern
College of William & Mary,
American Studies

When the dissident media organization WikiLeaks began publishing more than a quarter million diplomatic cables to its website in late November 2010, it provided a wealth of material to researchers. Although many critics in the mass media condemned "Cablegate" as a dangerous "document dump," WikiLeaks had in fact acted in the same way as a number of organizations in the federal government. Over the years, WikiLeaks, the National Archives, and every single administration since the time of Abraham Lincoln have all administered comparable dumps of the nation's diplomatic correspondence. Only when WikiLeaks conducted its release of government documents outside of official channels did a great mass of commentators emerge in the press to condemn the move as a dangerous document dump. Through a series of case studies, including the formative dump of the Lincoln administration in 1861, the publication of hundreds of thousands of cables by the National Archives in 2006, and the more recent incremental release of diplomatic cables by WikiLeaks from 2010 to 2011, my research suggests that researchers should be suspicious of the dominant narrative that emerged in the mass media about the WikiLeaks cables. More generally, my research suggests that researchers can find useful information in the WikiLeaks cables.

Edward Hunt is a Ph.D. candidate in the American Studies Program at the College of William & Mary. He has a B.A. in English from the College of William & Mary, a M.S. in Statistics from the University of Massachusetts at Amherst, and an M.A. in History from the University of Massachusetts at Boston. He is writing his dissertation about the role that U.S. diplomats play in managing the modern world-system.

Big Fun with the Prince of Darkness: Miles Davis and the Death of the American Dream

Presenter: Brian Jones
Advisor: Charles McGovern
College of William & Mary,
American Studies

On April 19, 1974, Miles Davis' *Big Fun* was released on Columbia Records. Culled from sessions spanning from 1969-1972, *Big Fun* represents a sly rethinking of the circumambient poly-histories inherent to the era. The complicated mixture of sonorities on *Big Fun* are at its core infectious, foreboding, and uproarious. *Big Fun*'s unique orchestration - fragmented funk drum breaks, Indian tabla and electric sitar, melodic/harmonic ambiguity, heightened abstraction, and soulful rhythmic phrase-ology - swirl together into a complex orgy of affect. Synthesized with Davis' legendary antisocial personality and sublime aurality, *Big Fun'*s enigmatic ambivalence is overshadowed by its sheer psychedelic beauty and good-time charm.

Brian Jones is a member of the music faculties at the University of Richmond and the College of William & Mary, as well as a Ph.D. student in the American Studies Program at the College of William & Mary. His research interests include Miles Davis' life and work during the Bitches Brew period, Sun Ra and Afrofuturism, and jazz during the Civil Rights era. As a drummer, Jones has worked with a wide array of artists including Mark Turner, John Abercrombie, Jason Mraz, Liz Phair, Steven Bernstein, and Jandek. In 1999, Jones started Slang Sanctuary Records as a limited edition record label focusing on creative music.

Wounded Knee and the Struggle to Memorialize a Massacre

Presenter: Tyler Norris
Advisor: Kara Thompson
College of William & Mary,
American Studies

This paper explores the history of the site of the Wounded Knee Massacre since 1890. The attempts at publicly memorializing the event have ranged from efforts to construct a physical memorial to claiming the site as a space for activism. The paper examines the monument at Wounded Knee, visitors' interactions with it, the American Indian Movement's occupation that reclaimed the site as a Native space in 1973, and the controversies surrounding the ownership of the land today. The struggle to achieve an adequate memorial for the tragedy of the Wounded Knee Massacre will be placed alongside a history of the relationship between the Lakota and the U.S. Federal Government. This juxtaposition will reveal the ways in which U.S. settler-colonialism have affected initiatives to publicly address the tragedy and atrocity of the Wounded Knee Massacre.

Tyler Norris is a third year Ph.D. student in the American Studies Program at William & Mary. Her studies focus on Native American Studies and explore issues of identity, sovereignty, belonging, and transnational representations of American Indian history and culture. She has a B.A. in History from Middlebury College and her Masters work at William & Mary explored early American education.

"So Long, Saloon": Drinking, Gender, and Morality in *Farewell, My Lovely*

Presenter: David Pratt
Advisor: Susan Donaldson
College of William & Mary,
American Studies

Though Prohibition is generally regarded as a failure, it did bring about the end of the all-male drinking place that the Anti-Saloon League had targeted as the key site of social reform, replacing the saloon with mixed-gender speakeasies and homebound cocktail culture. In hard-boiled detective fiction, a popular genre of literature that came of age during Prohibition, the near-impossibility of homosocial convivial drinking in this new social milieu becomes a persistent signifier of modern America's moral decay, against which the genre's masculine protagonists perform their work as enforcers of morality. While Dashiell Hammett established the conventions of the hard-boiled detective as a heavy-drinking masculine hero in the Prohibition era, Hammett's literary successor Raymond Chandler created the genres most influential detective, Philip Marlowe, in the succeeding years of the Great Depression. In his early novels, Chandler consistently juxtaposes Marlowes steady heavy drinking with the vampiric feminine greed of the morally corrupt characters he encounters through his detective work. In Farewell, My Lovely (1940), Marlowe's perceptions of every characters morality can be read through his observations of their drinking habits, which range from Moose Malloy's working-class gusto and Anne Riordan's abstinence at one extreme, to Helen Grayles intoxicated greed and Jessie Florians desperate alcoholic thirst at the other. That Marlowe regards no woman as a fit drinking companion speaks to Chandlers rampant misogyny, but also exemplifies a broader bitterness regarding the decline of male drinking prerogatives in American popular culture of the Great Depression.

David Pratt is a Ph.D. candidate in the American Studies Program at William & Mary. His research concerns alcohol in American literature and popular culture, with a particular historical focus on the mid-to-late twentieth century. David currently teaches in the English department, and recently had the unique opportunity to teach a course titled "American Drunkards" in the American Studies program.

White Fright, White Flight: William Christenberry and the Fine Art of Remembering the Ku Klux Klan

Presenter: Kathryn Previti
Advisor: Charlie McGovern
College of William & Mary,
American Studies

Mixed in its mediums and feelings toward his native Alabama, the work of Washington, D.C.-based artist William Christenberry reveals at once a beloved South of childhood summers spent in Hale County, the setting for his acclaimed photography, and a South haunted by regional and personal trauma of hate and human-inflicted terror embodied in his expansive Klan Tableau. Previous scholarship and critical commentary on Christenberry's art either skirts the Klan Tableau altogether or contends with his two seemingly conflicting strains of work separately. This paper, however, puts the Walker Evans-inspired Hale County landscapes in conversation with Christenberry's more controversial art centered on the Klan and suggests that he works not just from memory, but from a deeply personal interplay of memory and trauma. I argue that these two strains of Christenberry's work are not, as many suggest, in opposition to one another, but in fact bring together two alternative paths as a unified strategy for processing lived and inherited trauma: nostalgia and confrontation. Futher, drawing on recent conversations with Christenberry and visits to his home studio, I explore how his Klan - the work itself and one traumatic encounter with a Klansman - fills the silences of Christenberry's of Southern soil to offer a corrective, even a meta-memory, that disrupts and revises the nostalgic characterization of his Hale County photographs and popular paintings that incorporate regional signage and iconography from Coca Cola to catfish.

Kate Previti is a Ph.D. Candidate and Teaching Fellow in the American Studies Program at the College of William & Mary. She received a B.A. in American Studies and an M.A. in Communication, Culture and Technology, both from Georgetown University.

"I'm Just So Sick of RHE": Rachel Held Evans, Sarah Bessey, and Making Religious Bodies Matter through New Media

Presenter: Anna Rosenkranz
Advisor: Grey Gundaker
College of William & Mary,
American Studies

Two of media theorist Marshall McLuhan's most famous claims are, "The medium is the message," and "Media are extensions of Man." One his critiques of Western culture is its largely unselfconscious engagement with media and their effects. Yet, interestingly, popular discourse in new media on new media is often highly self-conscious, and often uneasy, with new mediums and their social and material effects. The question "What happens to the body in social media?" (S. Brent Plate's question in *Cross Current*'s June 2012 issue) assumes special salience when the bodies in question are already marginalized. The two evangelical women bloggers I study are twice marginalized, because of they are women and because they self-identify as "feminists" within a religious community in which "feminist" marks the enemy. Sarah Bessey's and Rachel Held Evan's relationship with new media is fraught, both opening up a space for their voices to be heard by their religious communities, and by operating in a space where bodies' "reality" or "unreality" are always rendered ambiguous. I pose the questions then of when, how, and why these bloggers call attention to the material, or in McLuhan's terms, the "prosthetic" quality of the medium they're using. Using the queer theory of Judith Butler in conversation with McLuhan's media theory, I will argue that by calling attention to both social media's materiality and their own bodies' materiality, these women participate in a "citational politics" that renders their bodies as ones that matter.

A Ph.D. student in the College of William & Mary's American Studies Program, Anna Rosenkranz is interested in the following questions: how religious identity is continually being constructed; how, why, when, and for whom that identity is or isn't malleable; how gender and sexuality inform religious dis/identification.

Disability and Disaster: Linguistic Crossover and the Development of Material Reality

Presenter: Jennifer Ross
Advisor: Kara Thompson
College of William & Mary,
American Studies

Disability and disaster share a unique relationship. Etymologically, the terms intertwine in a rich and inseparable linguistic history in which disability is constructed as a personal disaster. Disability's association with juridical disempowerment or disqualification combines with ideologically-induced fear of vulnerability, loss of bodily control, and stigmatization to drive a pressing need to identify, classify, observe, and control the threateningly different body. In controlling disabled bodies, discursive able-bodiedness powers very material results that marginalize disabled bodies and strip them of full citizenship in U.S. politics and society. As evidenced in the days during and after 9/11 and Hurricane Katrina, this visual and juridical repression results in tragic consequences in disaster situations. In many ways, disability and disaster cannot be divided; each informs the other, and, combined, both interact dialectically to influence our understandings of and approaches to topics as far-ranging as disability and able-bodiedness, disaster situations, social relationships, the build environment, and human rights.

Jennifer Ross is in her second semester in the American Studies Ph.D. program. Her research areas include contemporary U.S. literature, literature of disaster, race relations, cultural studies, and the political novel. She is currently thinking of completing her dissertation on how narrative techniques are used to put forth political critique in post-Hurricane Katrina and post-9/11 literature.

Popular and Unpopular Images of Queer Life in the South

Presenter: Helis Sikk
Advisor: Leisa Meyer
College of William & Mary,
American Studies

Queer culture has been theorized as having a special relationship with the urban space and the majority of writing on LGBTQ issues has focused on the city. John D'Emilio points out that queer identities emerged together with the historical development of urban capitalism, and rural to urban migration, which ultimately altered (heterosexual) family relations. The urban within this queer writing tradition has been more often than not very narrowly defined by bicoastal metropolitan giants: New York City and San Francisco. The South as the regional "other" has been frequently equated with the non-urban and rural. Whereas the realities of Southern queers have largely been ignored, the symbolic positioning of the South as a space of uncontrolled violence has been solidified by a few particular celebrity cases that are not Southern yet definitely decidedly "rural": Matthew Shepard and Brandon Teena.

Helis Sikk is a Ph.D. candidate at the College of William & Mary. She received her master's in American Studies from the University of Wyoming, and her bachelor's in English Language and Literature from the University of Tartu, Estonia. She prefers a feral interdisciplinary approach to the relationships between queerness, built environment, media and visual cultures. Currently she is working on her dissertation and exploring the affective economies of anti-LGBTQ violence in the United States. Helis is a returning member of the Graduate Research Symposium organizing committee.

Fictions of Wholeness: Claiming the Land in Catharine Sedgwick's *Hope Leslie*

Presenter: Amanda Stuckey
Advisor: Elizabeth Barnes
College of William & Mary,
American Studies

For several decades, critics have viewed the early to mid nineteenth century genre of U.S. historical fiction as part of a larger nationalist endeavor to project an image of Native American disappearance that legitimizes white appropriation, inheritance, and ownership of Native lands. This paper complicates the idea of Native "disappearance" by contextualizing the historical fiction genre within nineteenth century U.S. practices of collecting, studying, and displaying Native American bones. The discourse of this bone collecting supposedly foretold Native extinction not only because the bones signaled Native demise, but also because the bones were fragmented, incomplete pieces of a larger, ideal whole. Furthermore, in intimating Native disappearance from the land, such practices also suggested that Native bodies were unfit for inhabiting their land, and that white bodies possessed the integrity and ability to live on and improve this land.

Amanda Stuckey is a Ph.D. candidate in American Studies at William & Mary. Her work focuses on representations of the body in late eighteenth and early nineteenth century literature of the Americas.

Playing with Dolls: Stigmatization and Performance of Reborn Dolls

Presenter: Khanh Vo
Advisor: Charles McGovern
College of William & Mary,
American Studies

Reborn dolls, baby dolls refurbished to look and feel realistic, is a phenomenon of the last two decades and the fastest grown niche of the doll industry. The majority of consumers in this market are collectors, in much the same way we collect Cabbage Patch Kids or Beanie Babies, Others purchase reborn dolls as surrogates of loss or nonexistent children. Within both groups, however, reborn mothers, as they are called, often treat their dolls as real living beings. This behavior becomes classified as taboo or deviant. In this paper, I explore some of the reasons why it is so: mature women playing with dolls, the uncanny effect of the dolls' realism, and doll fetishism and pathology. I suggest that all these reasoning speak to society's need to categorize and its means to do so by attributing ordinary and natural behavior to each of its categories and stigmatize what we deem "unnatural behavior." It is the ambiguity of the reborn dolls that leads to the stigmatization. I also examine the interaction between reborn dolls and their owners as kind of performance because the dolls, despite their realistic characteristics, are neither deviant nor ambiguous. It is how people interact with them that create the ambiguity.

Khanh Vo is an M.A. student in the American Studies Program. Her research focuses on aspects of material culture and realism, specifically with realistic depictions of human characteristics in machines (automaton, androids, etc.) and dolls.

A High Price for White Gold: The Dutch Salt Enterprise on La Tortuga Island, Venezuela, 1624–1638

Presenter: Konrad Antczak
Advisor: Frederick Smith
College of William & Mary,
Anthropology

In the decades of the 1620s and 1630s the Dutch engaged in salt extraction on the island of La Tortuga, Venezuela, building a wooden fort, portable cannon emplacements, jetties, and semi-industrial solar saltpan production facilities. Although short-lived, the Dutch salt enterprise on the island was intensive, insistent and heavily contested by the Spanish from the mainland Province of Venezuela, who in 1638 managed to finally end Dutch incursion onto Spanish saltpans in the Southern Caribbean region. The Punta Salinas site on La Tortuga is a palimpsest in which a few years' individual events overlie the decades-long arc of Dutch mercantile projection into the world. This short time frame invited the researchers to engage the scale of daily rhythms, rather than the large scale of distant impersonalized forces and processes operating beyond the perception of the local social actors. The relative paucity of the archaeological record juxtaposed with the wealth of detailed documentary data and fieldwork experiences lead to the operationalization of the heuristic tool of '-scapes'. A critical construction of these socially alive portions of the island landscape and seascape demonstrates 1) how north-western European conceptions of the cultural control of nature were embodied in Dutch orderliness and industriousness; 2) how the strategy of maximization of extractive practices and minimization of risk was evidenced in the overall ephemerality of structures; and 3) how these structural imperatives were imbricated in the prose of human life and death that was unfolding from one small-scale event to another on this desolate island.

Konrad Antczak from Caracas, Venezuela, completed his M.A. at William & Mary in 2014, concerning the politics of punch drinking among New England seafarers visiting the island of La Tortuga in the 18th century. His current doctoral interests focus on the historical archaeology of 17th–19th-century salt exploitation on the offshore islands of Venezuela and aim to trace the salt's entanglements with the Atlantic World beyond.

The Archaeology Plantation Slavery at Good Hope Estate: Preliminary Findings

Presenter: Hayden Bassett
Advisor: Neil Norman
College of William & Mary,
Anthropology

On the large-scale sugar plantations of Jamaica, enslaved households formed, in aggregate, dense communities on a small urban scale. The "slave village," as it was known, had its own household relations, inequalities, and complex material worlds. In the British Caribbean, the village site was typically allotted by the plantation owner, though in many cases, enslaved households exercised a degree of control over the village's internal organization. This poster summarizes the findings from my recent archaeological fieldwork at one such "slave village," that of Good Hope estate, an 18th/early-19th-century sugar plantation in northern Jamaica. Home to 400 to 500 enslaved laborers at any one time between 1766 and 1838, the discovery and excavation of the village site provides insights into the internal composition and material lives of a large-scale enslaved community. Data from this shovel-test-pit survey suggests that the conditions of enslavement varied from household to household, as well as the means for negotiating one's position within the hierarchical organization of the enslaved community. Ultimately, my preliminary findings suggest that relative household location, differential access to material goods, and the physical modification of the landscape are three ways in which enslaved individuals negotiated internal socioeconomic divisions, while simultaneously seeking to moderate the conditions of chattel slavery.

Hayden Bassett is a Ph.D. candidate in Anthropology, focusing in historical archaeology. He is currently conducting his dissertation fieldwork at Good Hope plantation in northern Jamaica, where he serves as the Director and Principal Investigator of the Good Hope Archaeological Project. Hayden uses a landscape archaeological approach to study plantation slavery, issues of dwelling, and human-environment relations.

Oxen at Oxon Hill Manor: Identifying Draught Cattle from the Archaeological Record of Colonial Maryland

Presenter: Jenna Carlson
Advisor: Neil Norman
College of William & Mary, Anthropology

The methodologies for identifying and analyzing draught cattle from the archaeological record have been developed and refined over the past twenty years. However, little research has been done which applies these methodologies to faunal assemblages from the New World. This research identifies possible draught cattle from an eighteenth-century well and a possible smokehouse at Oxon Hill Manor in Prince George's County, Maryland, using pathological and osteometric analyses. Analysis of pathologies on metapodials and phalanges identifies which specimens most likely came from individuals used for draught labor. Osteometrics delineate the sex ratios of cattle in the archaeological record, thus providing a means for assessing the husbandry strategies in regions where draught cattle were used. As Oxon Hill Manor was home to an elite upper class planting family, the site provides a unique opportunity to explore the changing roles of draught oxen with the shift from tobacco to diversified agriculture in the last half of the eighteenth century. Additionally, the documentary record from Oxon Hill Manor provides a means to test the reliability of these methods for identifying draught cattle from British North American faunal assemblages.

Jenna Carlson is a fourth-year Ph.D. Student in Anthropology at the College of William & Mary. Jenna's dissertation research explores how laboring animals were incorporated into power negotiations amongst the residents of eighteenth-century plantations in the Chesapeake and the Lowcountry. Her other research interests include non-dietary roles of animals in past societies, French colonialism, eighteenth-century plantation life, and identity formation. Jenna is the co-chair of the 2015 Graduate Research Symposium.

Settlement Stability and Floodplain Dynamism in the Dan River Drainages

Presenter: Madeleine Gunter
Advisor: Martin Gallivan
College of William & Mary,
Anthropology

Sedimentalogical evidence from site 44Hr04, a re-occupied floodplain site located in Philpott, Virginia, speaks to the formational history of multi-component floodplain sites in Virginia's Dan River Piedmont. Invoking Schlanger's (1992) concept of "persistent places," this poster uses evidence from the Philpott site to examine the long-term settlement histories of Siouan-speaking Native communities across the Virginia Piedmont, asking: why did Piedmont communities reoccupy floodplain village sites in the Dan River drainage between AD 800—1600 despite ecological and occupational disadvantages?

Madeleine Gunter is a first year Anthropology Ph.D. student at the College. Her dissertation research examines Late Woodland (AD 1400-1600) settlement strategies in Virginia's southern Piedmont using geoarchaeological methods.

Archaeobotany and Gendered Landscapes in Tidewater Algonquian Virginia

Presenter: Jessica Herlich
Advisor: Martin Gallivan
College of William & Mary,
Anthropology

A landscape has many cultural and social meanings and can fulfill distinct roles for a community. Activities and labor are examples of how people shape a landscape and through which they ascribe connections to the organic and inorganic dimensions of a space (Ingold 2000; Moore and Thompson 2012). Gender is an important part of the human experience, and it plays a role in community activity and labor division. This paper looks at landscape and gender to discuss how coastal landscapes and shell midden sites in Tidewater Virginia both impacted social life and were shaped by Algonquian men, women, and children from ca 1000 BC-AD 1600. My research combines ethnographic texts and historical documents with archaeological and archaeobotanical remains to discuss these connections between people, space, and time. The archaeobotanical methods that I am applying include macrobotanical remains (carbonized seeds, wood, and nutshell) and microbotanical remains (phytoliths, or silica microfossils, and starch grains). Shellfishing has ethnographically been connected with women's work, and this paper looks at these coastal landscapes as filling a complexity of social and political roles.

Jessica Herlich is a Ph.D. candidate in the Anthropology department. She completed her M.A. degree in Anthropology at William & Mary in 2011, and her Master's Thesis was entitled "Shellfishing, Ceramics, and Gender: Shell Midden Ceramics from the Kiskiak Site." Her dissertation research is based on archaeobotanical analysis, or the study of ancient plant remains, at coastal archaeological sites, particularly shell midden sites, in Tidewater Virginia. Jessica is currently a Junior Fellow in Garden and Landscape Studies at Dumbarton Oaks in Washington, DC.

"With His Breath He Attracts and Cuts the Spirit of the People:" Ritual and Authority of Southeastern Colonial Native Americans

Presenter: Patrick Johnson
Advisor: Kathleen Bragdon
College of William & Mary,
Anthropology

Anthropologists since the nineteenth century have investigated art, songs, and other performances as well as the underlying rituals and beliefs of Native Americans. Archaeologists have used such research to interpret exchange, iconography, and politics of groups before European contact. Historians have also read between the lines of European documents, for the most part written in the context of trade or conflict, to understand Native American beliefs and charisma with regard to the construction of authority. This presentation connects previous archaeological, anthropological, and historical interpretations of ritual, war, and diplomacy using material written or dictated by colonial Native Americans themselves. More specifically, I connect the letter and tattoo of a 1740 Cherokee-Yamasee warrior titled Cesar Augustus to other 1740s and 1750s testimony about war and politics and a 1790 translator who described a ferocious animal that guarded both a silver mine and the nexus to another world. This synthesis demonstrates broad spiritual similarities between Southeastern groups across hundreds of years that allowed colonial Native American translators, warriors, and leaders to gain authority in ways specific to their circumstance.

Patrick Johnson is building on his Master's thesis research into the eighteenth-century Apalachee Indians of Florida to consider neighboring Yamasees and broader political and social networks. His presentation is part of his dissertation research into those networks.

Translating the Social Landscape: Hawaii's Ancient Land Divisions as Documented by the Hawaiian Government Survey

Presenter: Summer Moore
Advisor: Jennifer Kahn
College of William & Mary,
Anthropology

At the time of European contact, Hawaiian land tenure was based on a hierarchical tributary system. Each island's paramount leader controlled a series of large districts, themselves divided into a set of community-level divisions called ahupua'a. Archaeological research on the origins of the ahupua'a system, together with oral traditions, have argued that these land divisions emerged early in Hawaiian history as systematic developments tied to agricultural intensification. As understood today, the names and boundaries of the ahupua'a largely derive from a 19th-century government cadastral survey, during which boundaries of ancient land divisions were charted through a technique of meshing of traditional knowledge with landmarks such as trails and natural features. Archaeologists studying the development and elaboration of the ahupua'a system prior to European contact have tended to view ahupua'a as fixed, static entities, much as depicted on maps from this survey. This paper seeks to problematize this conception of ahupua'a as discrete, self-contained land units with clearly defined boundaries, based on an examination of how Hawaiian constructions of the social landscape were merged with Western cartographic principles during the 19th-century survey. Considering surveyor accounts as a process of "translation" rather than "recording," I propose that the land divisions recorded by surveyors were more fluid than typically understood by archaeologists, and that the early ahupua'a may have emerged in an ad hoc fashion, taking the form recognizable today relatively late in the pre-contact era.

Summer Moore is a second-year Ph.D. student in the Anthropology Department. She is currently working on a dissertation proposal that will address continuity and change in rural Hawaiian communities during the early post-contact period.

On the Origin of Ammunition: An Analysis of Cannonballs Found at Fort Stanwix

Presenter: Elizabeth Scholz
Co-Authors: A. Roache-Fedchenko, T. Jones, N. Goodale
Advisor: Neil Norman
College of William & Mary, Anthropology

British and American forces occupied Fort Stanwix during the fort's 23-year (1758-1781) military occupation. Some of the 35 cannonballs uncovered at Fort Stanwix National Monument have been found in association with the British occupation, others have been found within the American occupation, and some cannot be associated with either occupation. British and American cannonballs may have been produced using different sources of iron and by different casting techniques. This paper presents research that examines the spatial distribution, physical characteristics, and elemental composition, obtained by using portable X-ray fluorescence (pXRF), to identify the potential characteristics of cannonball manufacturers. Subsequently, this study seeks to identify the number of manufacturers that contributed to assemblage at Fort Stanwix. This research was completed in partnership with the National Park Service at Fort Stanwix National Monument in Rome, New York.

Elizabeth Scholz graduated from Hamilton College in 2009 with a degree in history and archaeology. After graduating, she was selected as the George Watson's Teaching Fellow and she spent the year teaching in Scotland. She is currently enrolled in the M.A. program in Historical Archaeology at the College of William & Mary and is particularly interested in historical archaeology, North American archaeology, conflict archaeology and portable X-ray fluorescence (pXRF) analysis.

Mining the Land, Mining the Sea: Informal Economy and Drinking in Resource Extraction Communities at Highland City, Montana and the Isles of Shoals, Maine

Presenter: Megan Victor
Advisor: Neil Norman
College of William & Mary, Anthropology

Frontiers spaces are zones of meeting, interaction, dynamism, and change. Current research has sought to fight the image of frontier spaces as locations needing westward-moving civilization. Instead, examining frontier locales comparatively has proved to be a more effective approach. My doctoral research intends to contribute to the comparative approach in frontier archaeology by examining the way that the actions of frontier inhabitants (including negotiation, conflict, and cohesion) combined with geographic and ecological factors within two specific locations: Smuttynose Island, Maine, and Highland City, Montana. To make the comparison across space and time between these two locations, I will analyze them through the framework of informal economy, trade and exchange networks and the negotiation of social capital through commensal politics in drinking spaces. I will address excavation data from the 2013 and 2014 field seasons at Highland City, Montana along with earlier excavation data from the Isles of Shoals, Maine.

Megan Victor is a doctoral candidate at the College of William & Mary. She defended her dissertation proposal in April of 2014 and is now in her fifth year at the College. Her research focuses on frontier theory and locations, as well as drinking spaces, the negotiation of social capital and power relations. She received her B.A. from the University of Michigan and her M.A. from the College of William & Mary.

Morphometric properties of Dbx1+ neurons that contribute to respiratory rhythm and pattern generation in neonatal mice

Presenter: Victoria Akins
Advisor: Christopher Del Negro
College of William & Mary,
Applied Science

Breathing is essential behavior for humans and all mammals, yet its underlying neural circuits are not completely understood. Inspiratory rhythm is generated within the preBötzinger complex (preBötC), a bilaterally distributed site in the ventral medulla, but the circuits that express inspiratory motor output and coordinate breathing with other orofacial behaviors are less well defined. Adjacent to preBötC is the intermediate reticular formation, which contains a mixed population that includes breathing-related hypoglossal (XII) premotor neurons, among other cell types. Putatively rhythmogenic neurons in the preBötC are derived from a single genetic line, whose precursors express homeodomain transcription factor Dbx1 (i.e., Dbx1 neurons). Interneurons whose precursors express Dbx1 can also be found in the intermediate reticular formation. A morphometric analysis of core rhythmogenic Dbx1+ neurons in the preBötC and Dbx1+ neurons in the reticular formation revealed that their dendritic trees are largely similar, yet they differ in their axon projections. Dbx1 neurons in the preBötC have commissural axon projections consistent with a role in rhythmogenesis and bilateral synchronization. Axon projections in the reticular formation were disparate, however. Some Dbx1+ reticular neurons projected to the XII nucleus, which is consistent with premotor functionality. Others exhibited commissural axons, which suggest a different behavioral role. These data suggest Dbx1+ neurons in the preBötC generate bilaterally synchronous inspiratory rhythm whereas Dbx1+ reticular neurons have mixed functionality including involvement with respiratory premotor behavior as well as bilateral coordination of orofacial behaviors such as whisking, sniffing, and licking.

Victoria Akins graduated from James Madison University with a B.S. and an M.S. in Integrated Science and Technology. She is now a Ph.D. Candidate at the College of William and Mary studying Systems Neuroscience.

Evaluation of the efficiency of recovery methods of trace evidence for pollen particles

Presenter: Christie Cyktor
Advisor: Patrick Buzzini
West Virginia University,
Forensic and Investigative Sciences

The goal of this research project will be to implement and compare multiple sampling techniques for pollen incorporated into a test dust on various substrates in an effort to establish which technique is most efficient at recovering the greatest amount of the pollen/dust mixture. Within the forensic science community, pollen as a form of trace evidence is extremely underutilized. In many instances, examiners are unfamiliar with how best to recover pollen from a piece of evidence. In this research, three different types of pollen, pine, ragweed, and goldenrod will be incorporated in to a "test dust" that will be applied to five different forensically relevant surfaces. These surfaces will be a cotton knit shirt, a cotton woven shirt, copy paper, a paint can, and a pair of shoes. These surfaces are relevant because they may be encountered at many crime scenes. There are several methods in trace evidence that will be implemented for the recovery of the test dust off of these selected materials; these methods are cotton swabbing, vacuum sweeping, electrostatic dust lifting, tape lifting, and sonication. While these methods are known to be beneficial with trace materials such as fibers, their efficiency with pollen has yet to be determined. Through this research project, trace evidence examiners will have a better understanding of how to recover pollen from different evidence types, and moreover which recovery method will be most appropriate to apply depending on what type of surface the pollen is deposited on.

Christie Cyktor is a second year graduate student at West Virginia University specializing in Trace Evidence Examination.

A Study of the Effect of Deep UV (172nm) Irradiation on Polyimide Surfaces

Presenter: Lopamudra Das
Advisor: Michael Kelley
College of William & Mary,
Applied Science

Polyimides have a wide range of industrial and scientific applications where changes in surface structure due to UV radiation are of significant interest. Particularly in its use in spacecraft, the effect of deep UV is important to predict photo-degradation of the material. We investigated the response of commercial samples of PMDA-ODA (PI) films to 172nm UV from a xenon excimer lamp in the absence of oxygen, using XPS, ToF/SIMS, and AFM.

Lopamudra Das is a Ph.D. student in Applied Science, working in the area of material characterization and surface modification of polymers using UV light.

Exploring Interfacial Adhesion in Graphene Oxide Nanocomposites

Presenter: Laura Dickinson
Co-Authors: D. Kranbuehl, J. Ye, S. Hocker
Advisor: Hannes Schniepp
College of William & Mary,
Applied Science

Nanocomposites promise to revolutionize structural materials by combining the strength of graphene with the low density of a polymer. In many cases, they could replace metal, a material well known for its versatility and strength. The current problem holding back this field is designing nanocomposites that exhibit strong enough adhesion between the nanoparticles and the polymer matrix surrounding them in order to take full advantage of the attributes of both materials. Our work focuses specifically on graphene oxide (GO), which has similar properties as graphene but is much easier to disperse into a liquid polymer solution during the manufacturing process. We combine GO with polymers that are currently used in paint and high temperature adhesive tape in order to improve the properties of these products. To study these interactions, we use a peeling test developed in our lab to look at the interfacial attraction between the GO flakes and various polymers. By testing which polymers effectively peel GO flakes from flat substrates, our results clearly show that some combinations are better than others in terms of filler/matrix bonding.

Laura Dickinson is fifth year doctoral student in Dr. Hannes Schniepp's Nanomaterials and Imaging Lab, in the Applied Science Department of the College of William & Mary, where she specializes in atomic force microscopy and surface interactions at a liquid/solid interface. She has a B.S. Physics from the University of Mary Washington.

Probing crude oil/rock interactions in the high temperature high pressure regime using atomic force spectroscopy

Presenter: William Dickinson
Co-Authors: S. Higgins, J. Sasidharan, J. Bracco
Advisor: Hannes Schniepp
College of William & Mary, Applied Science

Efficient oil recovery is very important due to the high impact of oil on the world economy. One of the challenges is that oil adheres to the porous rock layer in a reservoir, and thus, only a fraction of all oil is typically recovered. We systematically study oil/mineral adhesion with the goal of finding conditions under which this stickiness is reduced and thus recovery improved. In a first step, we designed a unique sensor based on atomic force microscopy (AFM) that has successfully characterized these interactions using real crude oil and real reservoir minerals with micrometer spatial and piconewton force resolutions. In a second step, we are making these experiments even more realistic by designing a specialized AFM that can operate at the extreme conditions found in a reservoir: temperatures of up to 100 Â°C (212 Â°F) and pressures of up to 100 atmospheres (1450 psi). Our first results show that in this high temperature/high pressure environment there is a significant change in the oil/mineral interaction. We will use our results to systematically minimize adhesion and thus enhance oil recovery.

Will Dickinson is a Ph.D. student working in the Nanomaterials and Imaging lab of Dr. Hannes Schniepp at the College of William and Mary for the past two years. His research focuses on studying interactions at a liquid/solid interface using an atomic force microscope.

Polyamide hydrolysis accelerated by small weak organic acids

Presenter: Samuel Hocker
Co-Authors: A. Rhudy, G. Ginsburg,
Advisor: David Kranbuehl
College of William & Mary, Applied Science

It is well known that acidity, pH, of a solution accelerates the hydrolysis of soluble amides. Here we describe the unexpected result that weak small organic acids at low concentrations hydrolyze a polyamide at rates approximately twice that of a water HCl solution of the same pH. The effect of three small organic acids in dilute solutions, acetic, propanoic, and butanoic was studied. It is observed that the effect on the hydrolysis rate increases as the organic acid gets weaker. Butanoic, the weakest acid, has the strongest effect on increasing the hydrolysis rate. Measurements on the concentration of these acids in the polyamide reveal that there is a selective desire for these weak organic acids to diffuse into the polyamide. The concentration of these acids in the polyamide is found to be several multiples of the concentration in the water environment. And the acid concentration is highest for butanoic. The hydrolysis rate is shown to be governed by solubility, not pH of the water environment. The longer hydrocarbon tail on the carboxylic group increases its compatibility with the polyamide's monomer structure. Results are reported on the hydrolysis of polyamide-11 polymerized from aminoundecanoic acid, both neat and a commercial plasticized composition, placed in water at 100 and 120 °C under anaerobic conditions in high pressure glass tubes.

Samuel Hocker is a Ph.D. candidate in Applied Science at The College of William and Mary.

Adhesive Properties of Brown Recluse Spider Silk

Presenter: Sean Koebley
Co-Author: F. Vollrath
Advisor: Hannes Schniepp
College of William & Mary,
Applied Science

Silk has long attracted attention as an engineering and biomedical material due to its impressive strength, unequaled toughness, and biocompatibility. Recent efforts to employ silk thin films in biomedical devices have yielded promising results, but artificial silks lag far behind their natural prototypes in mechanical properties, limiting their scope of impact. Recently, our lab investigated a promising model for a superior silk thin film: the silk of the brown recluse spider. With a thin ribbon-like morphology that contrasts the cylindrical morphology typified by other spider species, brown recluse silk was found to be just as strong as other spider silks-far stronger than the best artificial silk films. This thin silk ribbon therefore serves as a unique model whose structure and function have the potential to inspire the next generation of artificial silk devices. In this work, we investigated the adhesion of the brown recluse ribbon using atomic force microscopy, yielding a qualitative evaluation of the nature of adhesion and a quantitative determination of the force of adhesion per unit width. Our results allow us to compare the adhesion of brown recluse silk to that of other biological films like, for example, the spatulae that cover a gecko's foot and famously allow the animal to hang inverted from smooth glass. These findings enhance our understanding of brown recluse silk's functionality and how it or an artificial equivalent could be applied in a biomedical context.

Sean Koebley is a third-year Ph.D. student in the Applied Science Department at the College of William and Mary who studies spider and silkworm silk in Dr. Hannes Schniepp's Nanomaterials and Imaging lab.

Synaptic Depression Influences Inspiratory Burst Termination in the Brainstem preBötzinger Complex

Presenter: Andrew Kottick
Advisor: Christopher Del Negro
College of William & Mary,
Applied Science

The brainstem preBötzinger Complex generates the rhythm underlying inspiratory breathing movements. Recurrent synaptic excitation is required to initiate inspiratory bursts, but whether excitatory synaptic mechanisms also contribute to burst termination is unknown. We tested the hypothesis that synaptic depression influences inspiratory burst termination using a rhythmically active neonatal mouse brainstem slice preparation. Results obtained using whole-cell electrical recordings and optogenetic stimulation suggest that short-term presynaptic depression influences inspiratory burst termination and post-inspiratory dynamics.

Andrew Kottick is a Ph.D. student in the department of Applied Science and a member of the Del Negro lab. He utilizes optical microscopy and whole-cell electrical recordings of neurons to investigate the properties of biological motor pattern generation - specifically, how the mammalian breathing rhythm is produced.

Excessive Periodic Breathing in Preterm Infants with NEC

Presenter: Mary Mohr
Co-Authors: M. Patel, D. Lake, K. Fairchild
Advisor: John Delos
College of William & Mary,
Physics

Background: Periodic breathing (PB) is a normal developmental phenomenon in neonates, but excessive PB may be pathologic. We previously developed a method of detecting PB using wavelet analysis of chest impedance signal. Quantification of PB in all 1269 preterm infants (<35 weeks gestation) admitted to the University of Virginia Neonatal Intensive Care Unit (NICU) from 2009-2013 throughout their entire NICU stay gave us average levels of PB. Objective: We sought to determine if infants had excessive PB before diagnosis of necrotizing enterocolitis (NEC). Methods: The relationship between excessive PB and NEC in preterm infants was analyzed. For all preterm infants, average percentage of PB was calculated by gestational age and postmenstrual age. All cases of NEC were identified and percentage of PB in the hours leading up to diagnosis of NEC was compared both with previous percentages of PB in the same infant and with the average percentage of PB in other infants at the same gestational and postmenstrual ages.
Results: In 14 cases of NEC, PB was higher than the average at that age in 10 cases, and there was a significant increase above the individual infant's baseline level of PB in 11 of cases. Conclusions: Percent of time spent in PB may be a useful predictive monitoring metric for NEC.

Mary Mohr is a Ph.D. candidate in the physics department. Her research is in apnea and periodic breathing in preterm infants. She works with a group that includes both clinicians and quantitative scientists from the University of Virginia and The College of William and Mary and that seeks to use predictive monitoring to improve patient outcomes in the University of Virginia's Neonatal Intensive Care Unit.

Density Matrices with Prescribed Partial Trace

Presenter: Diane Pelejo
Advisor: Chi Kwong Li
College of William & Mary,
Applied Science

Let D_n be the set of all n-by-n positive semidefinite matrices with trace one. Elements of D_n are called density matrices. In quantum information theory, density matrices are used to represent the state of a quantum system or register X. We consider a multipartite system $X=(X_1,X_2,\ldots, X_k)$ with total quantum state ρ. For any subset I of $\{1,2, \ldots , k\}=[k]$, one can perform a partial trace operation on ρ with respect to subsystems $\{X_i\}_{i \in I}^c$ to obtain ρ^I, a density matrix of lower dimension. That is, $Tr_I^c(\rho)= \rho^I$ gives the reduced state of X on the subsystem $X^I=\{X_i\}_{i \in I}$.
In this study, we aim to find simple characterizations of the set $S_N(A_1,A_2,\ldots,A_s)=\{ \rho \in D_n \mid Tr_{Ji}(\rho)= A_i \text{ for all } i=1,2,\ldots,s \}$ of all possible states of a multipartite system having a set of reduced states $A_1,A_2, \ldots,A_s$. This problem is closely related to the theory of sums of Hermitian matrices. A numerical method called *alternating projection* is also employed to find an element of $S_N(A_1,A_2,\ldots,A_s)$.

Diane Pelejo is a Ph.D. student in the Department of Applied at the College of William and Mary. She received her B.S. and M.S degree in Mathematics from the University of the Philippines.

Development and Implementation of the G.E.T.T. Cooking Curriculum: A Pilot Study

Presenter: Elizabeth Ramirez
Advisor: Katherine Cason
Clemson University,
Food, Nutrition, and Packing Science

Contributing factors to the obesity epidemic in the US are great and complex but a leading factor is dietary behavior. Two-thirds of the adult and one-third of the child and adolescent population are either overweight or obese. Hectic schedules and increasing availability of highly processed foods, even in food desert areas, provide an appealing opportunity to feed a family quickly and at a cost-efficient manner. Numerous studies have demonstrated that frequent fast food consumption contributes to significant weight gain. Between the years of 2007 and 2010, Americans consumed an average of 11.3% of their total daily caloric intake from fast food eateries. In an effort to combat the appealing nature of fast food consumption, it is essential to arm adults and adolescents with the tools, skills, and knowledge necessary to provide themselves and their families with healthy home-prepared meals. The purpose of this pilot study was to test the 8-lesson curriculum, Generations Eating Together Through Cooking (G.E.T.T. Cooking), and determine its efficacy in a low-income audience. Pre, post, and follow up evaluations and interviews were conducted. The 2 participating families demonstrated an increase in food budgeting, food security, food safety practices, consumption of fresh fruits and vegetables, child involvement in cooking, and in-home meal consumption. A decrease in consumption of sugar-sweetened beverages, distractions during meals, food pickiness, food waste, and fast food consumption were also observed. Participation by children and adolescents was enthusiastic and exciting, and provided numerous learning opportunities for both the adult and children participants.

Elizabeth Ramirez is a Ph.D. student in Food Technology, with a concentration in Nutrition and cognate in Statistics, at Clemson University. Her research concentrates on community nutrition programs as well as biostatistics.

Numerical Simulations of Acoustics to Track Oil Under Ice Floes

Presenter: Elizabeth Skinner
Advisor: Mark Hinders
College of William & Mary,
Applied Science

The increased drilling for oil in the Arctic also increases the possibility for a large oil spill. A major issue for cleanup and recovery of oil in the Arctic is that the oil becomes trapped under ice floes. The traditional methods of tracking the oil are not well suited when this occurs. Not only it is difficult to determine where the oil is located from above, the oil also moves along with the ice. Radio waves will not transmit through ice so GPS cannot be used from under the ice. We instead will establish the location of the oil from under the ice, then track the ice floe from above. To do this we will transmit an acoustic signal from a device located at the bottom side of the ice. This device will generate Lamb waves in ice, which we will then detect that signal on top of the ice using a series of detectors to triangulate the location of the underwater device. Understanding the behavior of the sound signal we use in the ice and water is crucial to the design of these devices. Using a finite difference time domain technique we can accurately model the propagation of the sound waves. Once we have located the underwater device we can track the ice as it moves, allowing for recovery later.

Elizabeth Skinner is a Ph.D. Candidate in the Nondestructive Evaluation lab of the Applied Science Department. She is working on supercomputer simulations of acoustics.

Modeling Piecewise Destruction of the Respiratory pre-Bötzinger Complex

Presenter: Hanbing Song
Co-Author: M. Drew LaMar
Advisor: Christopher Del Negro
College of William & Mary,
Applied Science

The mammalian breathing rhythm originates from the pre-Bötzinger complex (preBötC) of the ventral medulla. The preBötC core consists of interneurons derived from progenitors that express transcription factor Dbx1 (i.e., Dbx1 neurons). The neural basis for breathing rhythms can be studied in reduced preparations in vitro, even in thin brain slices that retain the preBötC as well premotor and motor output circuitry. Using rhythmically active slices from newborn transgenic mice that label Dbx1 neurons with native fluorophores, experiments showed that cumulative deletion of Dbx1 preBötC neurons reduced the amplitude of respiratory motor output by half and eventually stopped respiratory rhythm after ~15% of the network was deleted. In previous studies we simulated these experiments to help explain rhythm cessation due to Dbx1 neuron ablations. The loss of respiratory rhythm would be largely attributed to the impairment of network excitability or the disturbance of the process of recurrent synaptic excitation. However, this prior branch of work could not explain the abrupt amplitude decrease most likely because the assembled model network model did not account for a premotor population. This project seeks to construct a network configuration consisting not only the rhythmogenic population but also the premotor part of the network, which provides with a more realistic framework to analyze the breakdown in respiratory rhythm and motor output studied in vitro. In this study we discovered a plausible connectome with preferential attachment between the two populations that, during constituent neuron deletion simulation, would produce a rapid respiratory amplitude decrease.

Hanbing Song is a third year graduate student currently working at Dr. Christopher Del Negro's lab, doing research on simulations and network modeling.

Dbx1-derived Intermediate Reticular formation Neurons Contribute to Respiratory Pattern Formation

Presenter: Nikolas Vann
Advisor: Christopher Del Negro
College of William & Mary,
Applied Science

Breathing is an essential behavior and its rhythm is generated in the preBötzinger Complex. We aim to understand the cellular underpinnings of the respiratory circuit from rhythm generation to motor output using a rhythmically active in vitro mouse model. Neurons whose precursors express the homeodomain transcription factor Dbx1 (i.e., Dbx1 neurons) comprise the core oscillator of the respiratory circuit and are candidates for other parts of the circuit as well. Specifically, Dbx1 neurons are found in the intermediate reticular formation an area known to have premotor neurons projecting to the hypoglossal motor nucleus. We hypothesized that the Dbx1 neurons in this region are part of the premotor circuit. This hypothesis predicts that Dbx1 reticular neurons should 1) be inspiratory modulated and 2) directly influence the amplitude of respiratory motor output in vitro. Whole-cell electrical recordings showed that Dbx1 reticular neurons are rhythmically active during the inspiratory phase of the respiratory cycle. We then used two-photon laser microscopy to detect and delete individual Dbx1 reticular neurons on a single side of the slice while monitoring motor function. We observed a significant decrease in XII output on the ablation side of the slice but there was no change in XII output on the opposite (unlesioned) side. These data suggest that both the premotor and rhythmogenic neurons are derived from a single genetic background, derived from Dbx1. This is the first example of a mammalian rhythmic motor behavior whose core oscillator and pattern-generating circuits are known to have the same genetic origin.

Nikolas Vann is a third year Ph.D. Candidate at the College of William and Mary in the Department of Applied Science. My interests focus on central pattern generators specifically the respiratory oscillator.

Calcium homeostasis in a local/global whole cell model of permeabilized ventricular myocytes with a Langevin description of stochastic calcium release

Presenter: Xiao Wang
Co-Authors: S. Weinberg, Y. Hao, E. Sobie
Advisor: Gregory Smith
College of William & Mary,
Applied Science

Population density approaches to modeling local control of Ca-induced Ca release in cardiac myocytes can be used to construct minimal whole cell models that accurately represent heterogeneous local Ca signals. Unfortunately, the computational complexity of such "local/global" whole cell models scales with the number of Ca release unit (CaRU) states, which is a rapidly increasing function of the number of ryanodine receptors (RyRs) per CaRU. Here we present an alternative approach based on a Langevin description of the collective gating of RyRs coupled by local Ca concentration. The computational efficiency of this approach no longer depends on the number of RyRs per CaRU. When the RyR model is minimal, Langevin equations may be replaced by a single Fokker-Planck equation, yielding an extremely compact and efficient local/global whole cell model that reproduces and helps interpret recent experiments that investigate Ca homeostasis in permeabilized ventricular myocytes. Our calculations show that elevated myoplasmic Ca concentration promotes elevated network SR Ca concentration via SERCA-mediated Ca uptake. However, elevated myoplasmic Ca concentration may also activate RyRs and promote stochastic SR Ca release, which can in turn decrease SR Ca concentration. Increasing myoplasmic Ca concentration results in an exponential increase in spark-mediated release and a linear increase in non-spark-mediated release, consistent with recent experiments. The model exhibits two steady-state release fluxes for the same network SR Ca concentration depending on whether myoplasmic Ca concentration is low or high. In the later case, spontaneous release decreases SR Ca concentration in a manner that maintains robust Ca sparks.

Xiao Wang began her graduate studies of mathematical biology in the department of applied science at the College of William and Mary from 2010. Her research interest is stochastic modeling of calcium signaling in cardiac myocytes.

The silk of the brown recluse spider: structure to function

Presenter: Qijue Wang
Co-Authors: S. Koebley, F. Vollrath
Advisor: Hannes Schniepp
College of William & Mary,
Applied Science

Spider silk is a remarkable material possessing strength, biocompatibility and other outstanding properties. It also has many practical applications. In the realm of biomaterials, the silk of the brown recluse spider is unique. Unlike other species, the brown recluse spider spins a ribbon instead of a cylindrical strand. This thin film morphology is interesting because (a) it provides us with an easier path to research surface properties, and (b) thin film morphology is widely studied in biomedical applications. In our research, we investigated the unique structure of brown recluse silk and showed how the structure influences its function. Using atomic force microscopy, we were able to comprehensively acquire the 3D morphology of brown recluse silk and analyze its mechanical properties. We have been studying various kinds of properties of the silk to assess its function.

Qijue Wang is currently a first year graduate student in the Dr. Hannes Schniepp's Nanomaterials and Imaging Lab, department of Applied Science. He mainly focuses on the project of brown recluse spider silk. He received his Bachelor of Science in Physics in 2014 from Zhejiang University, Hangzhou China.

Bacterial Recovery, Transfer to Hands and Survival on Restaurant Menus

Presenter: Ibtehal Alsallaiy
Advisor: Paul Dawson
Clemson University,
Food, Nutrition, and Packaging Science

Some non-food contact surfaces such as restaurant menus are not routinely cleaned or evaluated for microbial contamination and thus may be a potential contamination risk. The main objectives of this study were to detect bacteria on restaurant menus, test the rate of bacteria transfer from menus to consumers and determine the survival rate of bacteria on the menu surface. Evaluation of samples can find that menus harbored detectable levels of Total Plate count and Staphylococcus spp. The average mean of Total Plate count (TPC) was 28 CFU/15cmÂ² sampling area on a menu during busy periods and 15 CFU/15cmÂ² sampling area on a menu during less busy periods. The Staphylococcus count had an average mean of 6 CFU/15cmÂ² sampling area on a menu during busy periods and 2 CFU/15cmÂ² sampling area on a menu during less busy periods. The interaction between the restaurant and traffic periods in regards with Staphylococcus spp. was significantly different (P= 0.0212) at a P-value of <0.05. The interaction between the restaurant and traffic periods in regards with TPC was significantly different (P< 0.0001) at a P-value of <0.05. The average transfer rate was 11.17%, with a high variability between subjects (10.45% standard deviation). Survival rate of bacteria was 1.40% after 24 hours and 1.34% after 48 hours, respectively. Results indicate that bacteria can transfer from a menu to the consumer' hands and bacteria can survive on menus even after 48 hrs. This study will inform the public and restaurant personnel about the importance of menu hygiene.

Ibtehal Alsallaiy is a culinary sciences graduate assistant at Clemson University. She was born in Libya and raised there and in the UK. She studied two years of dental school in Libya. She left Libya in 2008 and came to the USA with her husband and earned her B.S in Biology (2011) and M.S. in Food, Nutrition and Culinary Sciences (2012) from Clemson University. She has two sons, one is 6 years old and the other almost a year. She has been in the Food Technology Ph.D. program a year now.

Mechanisms of Recovery from Notch Perturbation in Xenopus laevis

Presenter: Catherine Bianchi
Co-Author: B. Rabe
Advisor: Margaret Saha
College of William & Mary,
Biology

Plasticity and cellular re-programming in early development remains a fundamental and clinically relevant problem in modern biology. Early embryos are capable of responding to and often compensating for environmental challenges in order to develop normally, but the mechanisms of recovery from a disturbance during development are poorly understood. My research focuses on the specific instance of cell type recovery following a disturbance in the Notch signaling pathway in the developing nervous system of the African clawed frog, Xenopus laevis. Notch is a highly conserved signaling pathway activated by direct contact between adjacent cells. In nervous system development the pathway functions to control the populations of neural precursor cells and neurons. When Notch signaling is over- or under-expressed, the proportion of differentiated neurons to neural stem cells significantly decreases or increases, respectively. Over time, however, the embryos initiate a compensatory response and begin to regain an appropriate balance of cell types despite the continued disturbance. The work presented here attempts to uncover the mechanism of this compensatory response by investigating apoptosis and cell cycle regulation genes suspected to play a role in the response process. Expression patterns in normal and perturbed embryos over the course of primary neural development are examined using in situ hybridization. Of the expression profiles completed within the apoptosis group, candidate gene perp shows evidence of differential expression between perturbed and control conditions, while several other genes show no such pattern. Complete analysis of candidate genes will determine what role, if any, these pathways have in the process of responding to and possibly regaining normal cell type distribution in the developing Xenopus nervous system.

Catherine Bianchi is a second year graduate student in the Saha developmental biology research lab.

Investigating the Integration of Metabolic Signals with DNA Damage Response in Saccharomyces cerevisiae

Presenter: Olatomiwa Bifarin
Co-Author: M. Alharbi
Advisor: John Choy
Catholic University of America,
Biology

In cancer, it is well-established that the microenvironment supplying nutrients to tumor cells tend to be glucose and oxygen limited. Indeed, metabolic reprogramming has been observed in cancer cells and thought to accommodate the energy and biomass requirements necessary for proliferation. Moreover, it has been proposed that the microenvironment contributes to genomic instability and tumorigenesis. However, the integration of metabolic signals with the DNA damage response (DDR) is not well understood. We hypothesize that nutrient availability results in genetic reprogramming that can alter DDR activities. Toward testing this hypothesis, we used the budding yeast, Saccharomyces cerevisiae as a model organism because the DDR and metabolic pathways are highly conserved with humans. We performed a genome-scale screen of temperature sensitive alleles â€“ representing ~40% of all essential yeast genes â€“ for mutants that were sensitive or resistant to phelomycin (PHL) -induced DNA damage under high or low glucose conditions. We identified ~160 mutants that displayed a fitness defect that reduced growth by ~80% or more and ~20 mutants that displayed improved fitness with an increase in growth of 50% or higher, compared to wild-type cells. Importantly, we identified a large number of mutants that are sensitized to PHL only when glucose is high (2%) or low (0.2%). These results suggest that glucose availability influences DDR. This sets the foundation to elucidate the mechanism(s) of how metabolic changes are integrated with DDR. We will discuss current experiments toward elucidating the potential mechanism of how coenzyme A biosynthesis integrates metabolic signals with DDR.

Olatomiwa Bifarin is a Master's student in the Biotechnology program at The Catholic University of America, (CUA) in Washington D.C. He has a B.S. degree in Microbiology from Obafemi Awolwo University, Nigeria. He had his undergraduate research

Effect of in-vitro combination Treatment with Curcumin, Aspirin, and Sulforaphane on Idiopathic Pulmonary Fibrosis fibroblasts

Presenter: Sarah Bui
Co-Authors: M.K. Chhina, S. Khandhar, H. Mani, S.D. Nathan
Advisor: Geraldine Grant
George Mason University,
Biology

Rationale: Curcumin has shown good potential as an anti-fibrotic agent, however it suffers from poor bioavailability. To potentiate its effect, we investigated a combination therapy which includes curcumin (CUR), aspirin (ASA), and sulforaphane (SFN) (CAS) in vitro. Method: Nonlethal doses of ASP, CUR, and SFN were determined using primary fibroblasts cell lines derived from normal (n=2) and IPF patient lungs IPF-F (n=3) and a lung alveolar epithelial cell line (A549). Cells were exposed for 24 -48 hours to low (3mM ASA, 20ÂµM CUR, 40ÂµM SFN) and a high (5mM ASA, 20ÂµM CUR, 40ÂµM SFN) combination of drugs that individually were nonlethal. Fibroblast cell survival was determined by cell titre gloâ„¢ assay. Results: Exposure to CAS combination therapy at low and high doses resulted in a dose-dependent reduction in cell survival in vitro. Exposure to low-CAS dropped cell survival from 100% to 53.28Â± 17.32% (p=0.0181*) for IPF-F and a 68.34Â±5.53% (p=0.0021*) for low-CAS treatment after 48 hours. Normal fibroblast survival decreased to 26.03Â±31.31% (p=0.0474*) with high -CAS treatment and 23.01Â±14.29% (p=0.0072*) with low-CAS treatment after 48hours. Exposure of A549 cells to CAS for 48 hours also resulted in a reduction in cell survival to 66.79Â±8.24% (p=0.0232) with a low dose and 34.82Â± 3.06% (p=0.0093*) with a high dosage. Conclusion: The synergistic effect of CAS is seen at both low and high combined concentrations. The apoptotic mechanism and synergy between these agents remains to be determined. Our data supports the use of CAS as a novel combinatorial treatment potentially suitable for IPF patients.

Sarah Bui graduated with honors from VCU with her B.S. in Biology and minor in Chemistry. Currently, she is working on her M.S. in Biology with a concentration in Microbiology and Infectious Diseases at George Mason University. She is also EMT and PCA certified and has worked in hospitals around the Northern Virginia area and Richmond City.

Differences in Sockeye Salmon Antibody Composition: Testing the Immunological Imprinting Hypothesis

Presenter: Maxwell Chappell
Co-Authors: T. Clister, J. Schouten
Advisor: Patty Zwollo
College of William & Mary,
Biology

Anadromous fish such as sockeye salmon return to their natal streams to spawn, during which they undergo significant physiological changes including the release of cortisol, a known immunosuppressive hormone. Our lab has proposed the Immunological Imprinting Hypothesis, which suggests that juvenile anadromous fish respond to pathogens specific to their natal site by producing protective long lived plasma cells (LLPCs) that constitutively produce antibodies against those pathogens. These LLPCs are among the few immune cell types resistant to downregulation associated with cortisol. Thus, fish returning to their natal streams have protection from pathogens found at that specific location.

Maxwell Chappell attended William and Mary for his undergraduate studies, majoring in Biology and minoring in Biochemistry. He is currently a Biology Master's Student at William and Mary working in Dr. Zwollo's immunology lab.

The Effect of Dietary Methylmercury on the Parental Care of an Avian Model Species

Presenter: Stephanie Chin
Advisor: Daniel Cristol
College of William & Mary,
Biology

Mercury (Hg) is a heavy metal contaminant of major ecological concern. As a prevalent contaminant in aquatic ecosystems, effects of Hg on aquatic birds are well studied. Mercury has been documented to impair reproduction of avian species, specifically by reducing hatching success and fledging success. The mechanisms for how Hg impacts reproductive processes or behaviors are not well understood. We propose that Hg may be impairing reproduction by negatively affecting the parental care that is essential for producing viable offspring. The objective of this study is to determine how dietary methylmercury exposure influences avian parental care and resulting reproductive success, using zebra finches (*Taeniopygia guttata*) as a model species. Specifically, nest building, incubation behavior, incubation temperature, and provisioning behavior of parents will be examined, as well as reproductive success and offspring growth. Exposed parents will be dosed with 1.2ppm Hg via feed. We expect to see reduced parental care ability in pairs exposed to Hg in comparison to control parents receiving 0.0ppm Hg, and that lower parental care measures correlate with decreased hatching and/or fledging success. This study will provide novel insight into how Hg affects avian reproductive behavior. In addition, this study has implications for songbirds breeding in contaminated areas, since little information exists for the effects of Hg on terrestrial birds, despite recent evidence that Hg can move into terrestrial food chains.

Stephanie is a 2nd-year Master's student in the Institute for Integrative Bird Behavior Studies run by Drs. Daniel Cristol and John Swaddle. She is broadly interested in the effects of anthropogenic contaminants on wildlife, but her current research is lab-based.

Potential Threats to Diamondback Terrapin Nesting Success Caused by the Invasive Reed *Phragmites australis*

Presenter: Cassandra Cook
Advisor: Randy Chambers
College of William & Mary,
Biology

The goal of my project is to determine how shoreline growth of the invasive reed *Phragmites australis* influences diamondback terrapin nesting success. I will address three research objectives: 1. Determine what areas of available terrapin nesting habitat are being reduced due to *Phragmites* colonization; 2. Determine if predation of terrapin nests is increasing due to habitat structure change caused by *Phragmites*, and; 3. Determine if terrapin nests are directly impacted by *Phragmites*, specifically through invasion of nests by roots. My study will take place on the Eastern Shore of Virginia, which has a high density of terrapin nesting. I will compare current and past maps of *Phragmites* coverage to determine its expansion over the last 10 years. I will couple experimental design with observational data to determine if presence of *Phragmites* is impacting predator (raccoon) behavior and changing rates of predation on terrapin nests. Experiments will include tracking raccoon and terrapin movement, and determining zones of highest predation rates. Observations of predated nests will also be recorded. I will also use casual observation to determine if *Phragmites* root invasion is the cause of any nest mortality. I anticipate that *Phragmites* coverage will have increased in the last 10 years and that its presence increases predation on nests as well as destruction of nests by root invasion. These findings will aid in informing local land managers on how to increase conservation efficacy and will be applicable to many nesting shorebirds and other species that experience similar threats to nesting success.

Cassie Cook is a first year M.S. student in the Biology Department working in the lab of Randy Chambers. She did her undergraduate work at the University of Michigan, and has spent the last few years working for a variety of agencies and performing field work in some very diverse ecosystems. She is interested in conservation ecology and herpetology, and is extremely excited at the chance to study diamondback terrapins on the coast of Virginia.

Conserving the College Woods: Changes in floristic richness of the College Woods in the last 4 and 2 decades under increasing herbivory by white-tailed deer (*Odocoileus virginiana*)

Presenter: Caitlin Cyrus
Advisor: Martha Case
College of William & Mary,
Biology

The College Woods, located in Williamsburg, Virginia, is a valuable resource that supports an unusually high local diversity of plant species, making it a conservation concern at the state level. Understanding which plant species are present in the Woods and the possible factors threatening extirpation of those species are needed in order to inform future conservation policy. The flora of the College Woods has been threatened in the past 25 years by the exponential increase of the white-tailed deer population (*Odocoileus virginiana)*. White-tailed deer are known to quickly shift herbaceous layers of mature forests towards low-diversity, homogenized communities by selectively foraging on certain plant species. The goal of the present study is to examine how the diversity and abundance of vascular plant species in the College Woods compares to comparable floristic studies performed 44 and 25 years ago, respectively. Changes in the composition and abundance of the College Woods' flora are tested for consistency with key predictions regarding the effects of heavy deer browse. In addition, life history traits of each plant species are analyzed in declining versus non-declining species to better predict which plant characteristics put species at the greatest risk.

Caitlin Cyrus is a second year master's student at William & Mary studying Botany. She was the recipient of the Garden Club of America's field botany summer scholarship and named the Planters Scholar during summer 2013. Prior to coming to William & Mary, Caitlin raised butterflies at Lewis Ginter Botanical Garden and graduated from St. Mary's College of Maryland with a B.A. in Biology in 2012.

The potential role of Cv1MMP in wound healing and shell repair in the eastern oyster, *Crassostrea virginica*

Presenter: Elizabeth Falwell
Co-Author: M. Gomez-Chiarri
Advisor: Andrew Mount
Clemson University,
Biology

In adult oysters, hemocytes (blood cells) mediate immune responses including wound healing and shell repair. This is accomplished when hemocytes migrate to the site of injury and/or infection and lay down intracellularly-produced calcium carbonate crystals, fully encapsulating the organism from harm. We are investigating how matrix metalloproteinases (MMPs), specifically Cv1MMP, participates in the oyster wound healing response as MMPs classically have roles in cellular diapedesis (migration) and tissue remodeling in human wound healing. To achieve this aim, we examined Cv1MMP expression in hemocytes using polymerase chain reaction (PCR), a technique that amplifies specific segments of target DNA only. Specific primers were validated for our target gene, Cv1MMP, beta actin, a constituent of the cellular cytoskeleton, and the housekeeping gene 18s ribosomal RNA. We found that both Actin and Cv1MMP expression were elevated in stimulated hemocytes in comparison with unstimulated cells, indicating that hemocytes may utilize Cv1MMP and actin in migration to the wound site. To that aim we tested the proteolytic activity of hemocytes, as MMPs classically degrade Type I collagen during tissue remodeling in cellular migration. We found that live hemocytes migrated through a matrix of type I fluorescent DQ collagen and had significant collagenase activity. These data collectively reveal that Cv1MMP is expressed in hemocytes and likely has a role in diapedesis and collagen-dependent extracellular matrix remodeling to the mineralization front. This is one of the first proposed intracellular mechanisms for wound healing in bivalves and indicates that MMPs may have conserved functions across many phyla.

Elizabeth Falwell is a Ph.D. candidate at Clemson University in Clemson, SC. Elizabeth is a native of Bedford, VA and attended Virginia Tech for her undergraduate and master's degrees, focusing on mammalian immunology.

X-chromosome loss as a mechanism for male production in self-fertile Rhabditis sp. SB347 nematodes

Presenter: Maureen Farrell
Co-Authors: P. Sadler, X. Lin
Advisor: Diane Shakes
College of William & Mary,
Biology

Although the *Caenorhabditis elegans* germline is a well-characterized model for studying cell biology, recent work in Shakes' lab suggests that other nematode species can provide invaluable contributions to our understanding of the meiotic program. In particular, Rhabditis sp. SB347 is an excellent model for understanding sex chromosome drive and the cellular mechanisms underlying them. Interestingly, R. sp. SB347 features two forms of skewed sex ratios. In one sex skew, XO males sire >95% XX feminines rather than the expected 50% because essential motility proteins are segregated exclusively to X-bearing sperm (Shakes, et al 2011). In the other sex skew, XX hermaphrodite selfing unexpectedly produces 10% XO male progeny, with the highest proportion of males in the early brood (Felix, 2004). The cellular mechanism by which selfing XX hermaphrodites produce XO male offspring remains unknown. We hypothesized that nullo-X gametes must be produced during meiosis I or meiosis II in either oogenesis or spermatogenesis. Our data strongly suggests that nullo-X gametes are formed during oogenesis and that X-chromosome loss occurs during anaphase of meiosis I. Currently, we are studying whether there is a correlation between the timing of male production within the brood and formation of X-bearing oocytes. This two-tiered approach should critically test our hypothesis that nullo-X oocytes give rise to XO males in R. sp. SB347 self-broods.

Maureen Farrell is a second year Master's student at William and Mary. She received her undergraduate degree in Biology from Virginia Tech in 2012. Her research project focuses on the mechanism for a skewed sex ratio in a small roundworm.

Effects of Prenatal Androgen Exposure on Reproduction in Captive Female Golden Lion Tamarins (*Leontopithecus rosalia*)

Presenter: Brett Frye
Co-Authors: J. French, J. Cavanaugh, J. Mickelberg
Advisor: Lisa Rapaport
Clemson University
Biology

In mammals that gestate male and female fetuses concomitantly, females may experience a variable hormonal environment in utero depending on the sex of their littermates. Marmosets and tamarins are excellent models to study the effects of prenatal environments on reproduction due to their propensity towards fraternal twinning. I examined international studbook data on golden lion tamarins (*Leontopithecus rosalia*) born in zoos from 1988-2012 to deduce the possible downstream effects of prenatal androgen exposure on reproduction. Three parameters I used to investigate this phenomenon were: females' latencies to first parturition, average numbers of offspring produced over a lifetime, and offspring survivorships. I initially found that females gestated with female co-twins experienced significantly shorter latencies to their first parturition than did females that were gestated with a male co-twin (Welch's Two Sample t test, t = -2.1384, p=0.01716). Secondly, the sex-composition of the mother's gestational environment did not impact the number of fetuses that females produced per reproductive event. That is, the vast majority of births were twins, regardless of the sex of the mother's co-twin. Lastly, during the first 730 days of life, offspring that were born to multiparous mothers that gestated with males experienced significantly higher likelihoods of survival than those born to mothers gestated with females (Cox Proportional Hazards Model, p = 0.05). These results are instrumental in elucidating physiological mechanisms shaping inter-individual variation in life-history parameters in this species. Ultimately, this research can offer insight into analogous systems in other species that give birth to multiples, including humans.

Brett Frye is a graduate student currently pursuing a Ph.D. in Biological Sciences at Clemson University. She is interested in studying behavioral ecology as a means to facilitate the conservation of endangered primates.

Mate Choice and Mercury: Do Environmental Contaminants Affect Sexual Selection?

Presenter: Virginia Greene
Co-Author: M. McGeehan
Advisor: Dan Cristol
College of William & Mary,
Biology

The reproductive process is inherent to maximizing fitness across all taxa, and successful reproduction requires complex behavioral and physiological processes to act in concert. Studies have shown that environmental contaminants, such as mercury, are linked to reduced reproductive success in birds such as the zebra finch (*Taeniopygia guttata*). However, there have been few studies on the effects of mercury on the earliest stage of reproduction mate selection by females. Many factors contribute to male attractiveness in studies of zebra finches; intensity of bill coloration, high rate of song, and body symmetry have all been shown to be attractive characteristics to females. If a male is disadvantaged in some way by mercury exposure, for example by duller plumage or erratic song, then his desirability to females may be affected and his breeding success may be reduced. This study will investigate the effects of dietary mercury exposure on males' desirability to females, using zebra finches as the model species. Females will be given a choice between one of two males (dosed vs. control). I predict that the females will spend more time in the company of control males, as past studies in this lab and others have demonstrated several detrimental behavioral and physiological changes in birds affected by mercury. These changes may lead to decreased desirability and associated loss in reproductive performance. Quantifying the potential ways contaminants could reduce overall fitness at this stage of reproduction is key to understanding the mechanisms by which mercury disrupts fitness in the natural environment.

Virginia Greene is interested in animal cognition, behavior, and physiology, and the interactions between all three. Her past research involvement includes developmental embryology and avian endocrinology, and she is currently working as part of iibbs on the effects of environmental contaminants on mate-choice behavior in zebra finches.

Benign deterrence of nonsongbirds using directional sound

Presenter: Nicole Ingrassia
Co-Author: M. Hinders
Advisor: John Swaddle
College of William & Mary,
Biology

Nuisance species of nonsongbirds pose risks to human health. Mitigation of these risks is an expense to businesses, government and individuals and may come with a cost of life for the birds. I am interested in exploring nonlethal solutions to the problem of deterring pest birds from areas of concern. My research will investigate the use of directional sound, known as the sonic net, on the behavior and spatial distribution of nonsongbirds. My primary objectives are to answer the following questions: does the sonic net deter nonsongbirds? For how long does it deter them? And, how does it deter them? Research methods will involve a control group with dummy speakers and an experimental group with speakers, using a wild population of birds. I will analyze the behavioral responses of the birds, as well as their vocal communications. The expected result is that the sonic net will deter the birds, and it may do this by interrupting their vocal communication. My findings may introduce a new method of benign deterrence for nuisance nonsongbirds. This could have an array of benefits to human health and wildlife management, as well as to landowners, businesses, and public land recreationists.

Nicole Ingrassia is a Master's student in John Swaddle's lab. Our lab is a behavioral ecology lab and my research interests include studying animal behavior in search for solutions to applied ecology questions and wildlife management issues. She is originally from New Jersey and did her B.S. in Zoology at Oregon State University.

Wood Thrush microhabitat associations: implications for species persistence in human-modified landscapes

Presenter: Vitek Jirinec
Advisor: Matthias Leu
College of William & Mary,
Biology

Following the trend in many populations of migratory songbirds, the charismatic Wood Thrush has experienced long-term range-wide declines over the last few decades. A number of studies indicate that the species is area-sensitive: nest success and probability of occurrence decline with decreasing forest patch size. Contemporary forest lost due to anthropogenic landscape transformation could therefore explain these declines. However, our five-year bird census in suburban and rural areas in coastal Virginia provides little evidence for decreased probability of occurrence in smaller forest fragments. Perhaps then, housing development per se is not necessarily detrimental to Wood Thrush, as long as certain habitat requirements are met. Although the species has been extensively researched, there is little information on why birds use a particular area. We hypothesize that microhabitat features explain the space-use pattern in the species, and predict that high-use areas within home ranges will have: a) a specific set of structural vegetation characteristics not found in low-use areas, and b) a higher invertebrate prey abundance than low-use areas. To track habitat use, we captured and radio-tracked 40 birds over two breeding seasons (2013, 2014) in tandem with vegetation and food abundance sampling. Analyses of the 2013 data indicate that high-use areas have more downed woody debris, maple and American Holly saplings, and contain higher dry mass of worm and beetle-like leaf litter invertebrates than low-use areas. This knowledge provides land managers with parameters of optimal Wood Thrush habitat, thus helping to ensure this quickly-declining bird will continue to be heard.

Vitek Jirinec is currently a graduate research assistant at the College of William & Mary's Biology Department, where he works on his master's thesis on bird movements in human-altered coastal Virginia using radio telemetry.

The Effect of Probiotics Supplementation on Health Using *Caenorhabditis elegans* as a Model System

Presenter: Miranda Klees
Co-Authors: D. Pederson, Y. Dong
Advisor: Min Cao
Clemson University,
Biology

The "Western Diet," prominent among developed nations, often refers to a diet rich in meat proteins and refined sugars. With an increasing glycemic index observed in Western society, it comes to no surprise that obesity, diabetes, and heart disease are on the rise. The Centers for Disease Control and Prevention describes obesity as an epidemic, affecting more than 35% of U.S. citizens. Shortened lifespan and increased susceptibility to pathogens are associated with these diseases and linked to increased consumption of foods high in sugar. In order to reverse these observed effects, the healthful benefits probiotics have on immune system stimulation, restoration of shortened lifespan induced by a high glucose diet, and the beneficial effects of probiotics in combination of cranberry extracts in the model system *Caenorhabditis elegans* were investigated. An exciting benefit of implementing *C. elegans* in such studies is the innate immunological response and aging pathways homology in humans. By targeting these pathways, *C. elegans* provides an economical model system with application in humans. Here, we investigated the effects probiotics have on high glucose diet in *C. elegans*. Consistent with previous studies, when *C. elegans* was supplemented with each probiotic strain, lifespan extension was observed. Interestingly, the reversal of glucose induced shortened lifespan and the extension of lifespan in combination of cranberry extracts was strain dependent. The impact that probiotics have on the reversal of detrimental effects associated with a high glucose diet, including protection against known pathogens and immunological response pathways targeted by probiotics, is currently under investigation.

Miranda Klees has a profound interest in food microbiology and nutrition. She completed her B.A. at Coker College with an emphasis in Biology in May 2010, where her research interest in this area was ignited under Dr. Joseph Flaherty.

The effects of supplementing ruminal bypass unsaturated fatty acids on marbling in early-weaned steers

Presenter: Kayla Mangrum
Co-Authors: G. Tuttle, S. K. Duckett, G. Sell, C. R. Krehbiel
Advisor: Nathan Long
Clemson University,
Biology

The objective of this study was to determine if supplementation with Megalac-R, ruminal bypass unsaturated fatty acids (FA), improved marbling in early-weaned steers. All steers (n=47) were weaned at 150 Â± 5 d of age. Steers were blocked by BW and breed, then assigned to either control (CON; 1.5 kg of corn gluten feed (CGF), n=23) or isocaloric supplementation containing 200 mg of Megalac-R in 1.06 kg of CGF (EFA, n=24) for 110 d (fed 5 d/wk). Steers had ad libitum access to pastures throughout treatment. Steer BW and blood samples were collected at 0, 55, and 110 d of supplementation, and real-time ultrasound measurements were collected at 110 d. Following treatment, steers were transported to OSU for finishing and subsequent harvesting at a commercial plant. The 110 d ultrasound data showed that EFA steers tended (P=0.08) to have more intramuscular fat. Serum FA concentration showed a treatment Ã—day interaction (P<0.02) for 16:0, 18:0, 18:1c-9, 18:2, 20:4 and total FA. Serum triglyceride and cholesterol concentrations were increased (P<0.01) on d 55 and 110 in EFA vs. CON steers. Serum leptin concentration in EFA steers was greater (P<0.01) at d 110. After harvest, EFA marbling scores tended (P=0.09) to be higher than CON. The percentage of total lipids tended to increase (P=0.09) for EFA, along with the greater percentage of 20-30 Î¼m adipocytes (P=0.06) in the intramuscular depot vs. CON. The results of this study indicate that supplementation of unsaturated FA could positively impact marbling deposition in early-weaned steers.

Kayla Mangrum earned her B.S. at the University of Georgia in 2012, majoring in Animal Science. She is currently a Master's candidate majoring in Animal Science at Clemson University with an emphasis in Animal Nutrition. She plans to graduate in May of 2015.

An evaluation of density dependence in Asclepias syriaca, common milkweed

Presenter: Mary Seward
Advisor: Harmony Dalgleish
College of William & Mary,
Biology

Density dependence is found in populations of organisms where density drives growth and death rates. While density usually causes negative growth rates in plants, in clonal plants the effects may the opposite of this norm because clones are often integrated, meaning that seemingly independent plants are actually physically connected. Through this connection, they are able to share resources. Asclepias syriaca, the common milkweed, is a clonal plant of particular interest because of its relationship with the IUCN near threatened Monarch butterfly. Understanding the effects of density on common milkweed will allow researchers to better understand how to maintain healthy milkweed patches that will be capable of supporting the threatened butterfly.

Mary Seward is a first year graduate student in the Biology Department at William and Mary. She is studying milkweed in the Plant Ecology Lab with Dr. Harmony Dalgleish. She graduated from Christopher Newport University in 2014 with a Bachelor's degree in Biology with a concentration in Environmental Science. While there, she participated in research on the reproduction of two serpentine desert plants, Phlox hirsuta and Clarkia gracilis with Dr. Lauren Ruane.

Effect of Noise on the Social Structure of European Starlings (*Sturnus vulgaris*)

Presenter: Autumn Swan
Advisor: John Swaddle
College of William & Mary,
Biology

Birds that live in groups can benefit from having an organized social structure. The formation of a stable social structure depends upon individuals' abilities to effectively communicate with one another. Noise can mask a bird's vocal communication if it overlaps with the frequency range of vocalizations. Birds might respond to blocking of their vocal channel by relying on other forms of communication, such as visual signals. If birds are unable to effectively compensate for loss of vocal communication, their ability to form stable social structures may be compromised. My research investigates whether noise exposure affects the formation of social structures in groups of European Starlings, (*Sturnus vulargis*). Individual birds were placed in groups of four for one hour, with treatment groups exposed to noise and control groups not exposed to noise. I analyzed the social interactions between individuals and quantified the occurrence of aggression. I found that the outcomes of agonistic interactions among individuals were less consistent in groups exposed to noise relative to control groups. This suggests less stability in social structure in the noise treatment groups, as a result of loss of vocal communication. This research provides insight into the role of vocal communication in the establishment of stable social structures in groups of birds.

Autumn Swan is a M.S. in the Department of Biology at William and Mary. She is interested in animal behavior, particularly of birds. Her current research is focused on the effects of noise on social behavior in European Starlings (Sturnus vulgaris).

Effects of maternal nutrient restriction on bovine fetal growth during mid-gestation

Presenter: Regina Taylor
Co-Authors: R. Taylor, K. Mangrum, C. LeMaster
Advisor: Nathan Long
Clemson University,
Biology

Fetal programming refers to the phenomenon that environmental stressors to the dam during gestation can cause fetal adaptations leading to lasting post-natal consequences. Primiparous Angus-cross cows (n = 22) were synchronized using a Co-Synch+CIDR protocol and inseminated with sexed semen from a single Angus sire. Animals were fed at 1.3 x (Control [CON]) or 0.55 x (Nutrient Restricted [NR]) of maintenance energy and protein requirements based on BW (NRC 1996). Animals were blocked into groups and fed CON (n = 8) d 30-190; NR (n = 7) d 30-110 followed by CON d 110-190; or CON (n = 7) d 30-110 followed by NR d 110 -190. Cows were slaughtered on d 190 of gestation, when fetal measurements and samples were taken for analysis. Fetal weights (P = 0.07), empty fetal weights (P = 0.03), abdominal circumference (P = 0.01) and thoracic circumference (P = 0.03) were reduced in NR/CON and CON/NR vs. CON/CON cattle. Brain weight (P < 0.001) and fetal perirenal adipose weight (P = 0.003) as a percent of empty fetal weight was increased in NR/CON and CON/NR vs. CON/CON cattle. Fetal pancreas weight as a percent of empty fetal weight was reduced (P = 0.04) in CON/NR vs. CON/CON while NR/CON values were intermediate. The data show that maternal nutrient restriction during early or mid gestation causes asymmetrical fetal growth restriction, regardless if the restriction is preceded or followed by a period of non-restriction.

The comparison of leaf and anatomical traits between temperate and tropical members of Rhododendron

Presenter: Tatpong Tulyanon
Advisor: Erik Nilsen
Virginia Polytechnic Institute & State University,
Biology

There have been several attempts to legitimately describe differences between leaf anatomical structures of plants adapted to temperate or tropical habitats. Many studies utilized plant models from different phylogenetic groups, which conflicts phylogenetic relationship and habitat type. Thus, there is a need to control phylogenetic relationship when testing the relationship of leaf traits to habitat condition. Within each subgenus of Rhododendron there are species adapted to tropical and temperate conditions. In particular, species from section Schistanthe in subgenus Rhododendron is one tropically adapted group. Other, closely related species are adapted to temperate climates. The focus of this study is a comparison of leaf anatomical traits in Rhododendron species from section Schistanthe compared with that of temperate species in subgenus Rhododendron. Rhododendron leaves from species with tropical and temperate native ranges were collected from the Rhododendron Species Foundation and a common garden in Hawaii. Leaves were preserved, sectioned, photographed, and analyzed using ImageJ software. Measured traits included leaf area, thickness, palisade mesophyll thickness, idioblast expression, leaf scale identification, and stomata size. ANOVA was used to compare the traits using plant as the experimental unit. We discovered significant differences between leaf thickness while the ratio of palisade cell layer thickness to spongy mesophyll thickness remained unchanged. Average leaf size increased for tropical species. Idioblast cells are nonexistent in the temperate group. In further studies, our data will be mapped on a known phylogeny to clarify how these Rhododendron leaf traits evolved from temperate into tropical habitats.

Tatpong Tulvanon is currently a Ph.D. student in Biological Science program at Virginia Tech. and received a bachelor degree in Plant Science before coming to the US for doctoral degree supported by Royal Thai Government Scholarship.

The Effects of BPA on Fertility in a Variable Population

Presenter: Emily van den Blink
Advisor: Paul Heideman
College of William & Mary,
Biology

Endocrine disruptors, such as Bisphenol-A (BPA), are a pervasive threat to the health of both human and wildlife populations. This study is looking at heritable variation within in a population in regards to the effects of BPA on fertility. To test this, a wild-source population of mice, Peromyscus leucopus, will be treated with either a high or low dose of BPA. The effects of BPA on treated males will be measured using luteinizing hormone, testis and seminal vesicel size, and comparative counts of GnRH neurons. Pilot data suggests that BPA decreases fertility more in one selection line than the other. The varying impact of endocrine disruptors on the reproductive health of both human and wildlife populations will continue to be a topic of increasing importance.

Emily van den Blink is a 2011 Cornell University graduate with a B.S. in Animal Science. After working as a zookeeper at Disney's Animal Kingdom, she has developed a passion for wildlife conservation and education. Her master's degree is focused on environmental toxicology and reproductive epigenetics.

Assessing the ototoxic effects of methylmercury exposure in the zebra finch (*Taeniopygia guttata*)

Presenter: Sarah Wolf
Advisor: Dan Cristol
College of William & Mary,
Biology

Songbird communication greatly impacts bird fitness and evolution by influencing individual survival - it provides individuals with information that leads to critical resources, threat perception, and reproductive cues. Unfortunately, ubiquitous heavy metals like methylmercury (MeHg) have been shown to impact songbird song performance by decreasing both the song complexity and frequency of male songs in many species. Because the mechanism of song degradation is currently unknown, this presents a unique opportunity to investigate whether methylmercury exposure in songbirds is causing hearing impairment, which would directly impact their hearing-dependent vocal learning and likewise, song production in males. Our research aims to investigate whether dietary MeHg exposure in zebra finches results in hearing impairment and whether methylmercury targets specific song developmental periods. We will test hearing ability in zebra finches using three methods: anesthetized and aware-state auditory brainstem response tests (ABR) as well as operant conditioning. Each method estimates the minimum sound level required at a specific frequency for the bird to hear that pitch, and measures this auditory threshold over a range of frequencies and decibels of sound. Overall, we predict that MeHg exposed zebra finches will exhibit higher auditory thresholds than control finches due to hearing impairment. In addition to investigating how mercury impacts fitness qualities of wild populations of songbirds via song degradation, this research could also be applied to exploring human hearing and speech impediments resulting from mercury poisoning.

Sarah Wolf is a first-year biology Master's student from Ohio and recently graduated from Centre College in Danville, KY in 2014. In the past, she has researched muscle growth mechanisms in cannibalistic tadpoles and population dynamics of the invasive Asian Tiger mosquito at Centre College and the University of Kentucky, respectively.

Identification and Functional Characterization of a Novel Protein Kinase Gene Family Involved in Stress Resistance

Presenter: Ning Yuan
Advisor: Hong Luo
Clemson University,
Genetics and Biochemistry

The utilization of the transgenic techniques in agriculture to improve the biotic or abiotic stress tolerance of crops is a routine work now. In our lab, we are focusing on identification of novel genes playing crucial functions in stress-resistance pathways, and introduce those genes into crops to improve their stress resistance. In our previous work, we have identified a root specific gene named LRPK1 responding to salt and drought stresses strongly in Arabidopsis. Later we found that LRPK1 belongs to a novel protein kinase gene family AtLRPK comprised of four family members. The sequences of the four genes are highly identical, and the protein-GFP (Green Fluorescent Protein) fusion reporter system indicated that they are all localized on plasma membrane, indicating they may have similar function. The promoter/GUS reporter system indicated the four genes exhibit different expression patterns in plant, indicating each gene performs its function temporally and spatially. We knocked out two AtLRPK family members simultaneously in one Arabidopsis line by using RNA interference technique, and this RNAi line exhibits a significantly enhanced abiotic-stress tolerance, while overexpression of AtLRPK1 in Arabidopsis increases its pathogen resistance. These results indicated that this gene family is involved in both abiotic and biotic stress triggered signaling pathways. In the future, to better understand this gene family, the four genes will be over-expressed in Arabidopsis respectively. Yeast two hybrid will be performed to investigate whether the four proteins work as dimers or not, and try to identify ligands or co-regulators of LRPK proteins.

Ning Yuan received a Bachelor's degree in biotechnology and Master's degree in molecular biology and biochemistry at Southwest Jiaotong University in China., and is a Ph.D. candidate in the department of Genetics and Biochemistry at Clemson University. .

How resource availability influences eastern tiger swallowtail (*Papilio glaucus*) occupancy in the Virginia and Middle Peninsulas

Presenter: Angela Zappalla
Advisor: Matthias Leu
College of William & Mary,
Biology

Mixed eastern deciduous woodlands are by nature heterogeneous and provide a number of different ecological resources. These patches of resources are valuable for their ability to maintain populations of plants and animals on a large scale by driving habitat selection based on specific resource needs. My research will focus on the habitat use of the eastern tiger swallowtail (*Papilio glaucus*). The objective of this research is to model how populations of *P. glaucus* interact with local habitats patterns and how the quality of these habitats affects occupancy at the landscape scale. Preliminary analyses show a significant increase in occupancy from 2012 to 2013, which provides insights into how habitat quality and resources, such as host plant distribution, nectar availability, and mineral availability define habitat quality for this species. I collected data on butterfly occupancy, host plant density, as well as nectar and mineral availability on 69 500-m transects randomly placed throughout the Virginia and Middle Peninsulas. Based on the transect data, I will define habitat as either preferred, intermediate, or unsuitable for *P. glaucus*. I predict that high-quality habitat will contain a higher number of nectar plants in association with host plants, while intermediate habitat will have less nectar plants and possibly no host plants. I predict that poor sites will have neither host nor nectar plants. My research will provide novel and crucially needed information to define habitat quality for this butterfly and will inform management of butterflies in landscapes fragmented by humans.

Angela Zappalla is a second year graduate student in the Biology department working with the Applied Conservation and Ecological Research Lab run by Dr. Matthias Leu. Before attending William and Mary, she was an undergraduate at the University of Delaware where she majored in Wildlife Conservation with a minor in Entomology.

Importins 4, 5, 8, 13 Knockdown Effects on Thyroid Hormone Receptor's Nuclear Import

Presenter: Jibo Zhang
Advisor: Elizabeth Allison
College of William & Mary,
Biology

Thyroid hormone (TH) has important effects on maintaining homeostasis and regulating genes responsible for metabolism, growth, and development. Over activity of TH could cause many diseases such as hyperthyroidism, cardiac, or thyroid diseases. Thyroid hormone is lipid soluble and can pass through the plasma membrane of a cell and can freely diffuse through the nuclear pore complex into the nucleus. In order to activate or repress transcription of target genes, however, it needs to bind to the thyroid hormone receptor (TR). Thyroid hormone receptor needs to be transported into nucleus by transport factors called Î² importins because of its relatively large size. Research suggests that there are at least 13 Î² importins in human cells. In our project, we will be testing Î² importins 4,5,8,13 activity on importing thyroid hormone receptor by performing importin knockdown. We also would like to know if the knockdown was effective and which nuclear localization signal (NLS) motifs of TR bind with importins 4, 5, 8, 13 by using Western Blot and HIS pull-down assay.

Jibo Zhang is an international student from China, and is a second year graduate student working in Dr. Allison's lab.

Identification of Organic Pigments in Transatlantic 18th C. Oil Paintings Using Surface-Enhanced Raman Scattering (SERS) Spectroscopy

Presenter: Kristen Frano
Advisor: Kristin Wustholz
College of William & Mary, Chemistry

The identification of organic colorants is an important area of art conservation science. The tendency for natural, organic pigments to fade has necessitated a method for their unambiguous identification in works of art so that conservators can plan an appropriate treatment plan to prevent further photodamage to the painting. In recent years, surface-enhanced Raman scattering (SERS) spectroscopy has allowed for the unequivocal identification of various organic pigments and dyes in historic artworks. We have used several SERS-based methods for the identification of red and blue organic pigments (e.g. carmine lake and indigo) in both paint cross-section and dispersed samples from oil paintings from the Colonial Williamsburg Foundation. This collection encompasses artists, techniques, and materials from both Britain and North America during the 18th century. Our results have confirmed the presence of organic pigments not only in quantity-rich areas of painting, but also in challenging, less concentrated areas of color such as flesh tones and small yet significant stylistic details. The positive identification of these pigments not only aids conservators in their treatment processes, but often enables digital reconstruction of paintings so that both art historians and museum visitors can appreciate the intended vision of the artist.

Kristen Frano is a second year Master's student in the chemistry department. A Massachusetts native, she received her Bachelors of Arts in chemistry from Saint Anselm College in Manchester, NH in 2012, where she performed research on the characterization of metal contents in ancient Roman bronze coins recovered from archeological digs in Italy. Her research at William and Mary with Dr. Kristin Wustholz involves the application of laser spectroscopies to problems in art conservation science, partially in collaboration with the museum conservation department of the Colonial Williamsburg Foundation.

Chemoselective Glaser-Hay Coupling Using Solid-Support

Presenter: Jessica Lampkowski
Advisor: Douglas Young
College of William & Mary
Chemistry

Polyynes exhibit numerous biological activities including antibacterial, antifungal, anti-HIV, and anticancer properties. Therefore, efficient syntheses toward these core structures is necessary. The Glaser-Hay reaction is a useful mechanism to couple terminal alkynes yielding conjugated polyynes. However, chemoselectivity often poses a significant problem in these couplings. Typically this reaction yields a mixture of products from both homo- and heterodimerizations. Utilizing a solid support, a novel methodology for the construction of conjugated asymmetrical polyynes has been developed in a chemoselective fashion. This methodology was then employed to a diverse array of terminal alkynes in order to produce a small library of polyynes. Furthermore, to investigate the unique optical properties exhibited by these structures, the synthesized polyynes have been characterized via fluorescence spectroscopy.

Jessica Lampkowski earned her B.A. in Chemistry from Siena Heights University in Adrian, Michigan, and is now a second year M.S. student in the Chemistry Department at the College of William and Mary. She hopes to work in research and development upon graduation.

Trace Chemical Analysis of Latent Fingerprint Biomarkers with GC/MS

Presenter: Jennifer Munson
Advisor: Katherine Pettigrew
George Mason University,
Chemistry

The purpose of the research is to develop a method for analyzing latent fingermarks that possess little evidentiary value. Fingermark composition is of much interest due to the frequency of detection during forensic investigations. The potential of fingermarks to provide investigative leads, not just identifications, based on residue composition is vast. We have determined that the environment in which the mark was deposited may influence the accuracy of profile development. Identifying rates of degradation of major components to aid in accuracy of profile development is a goal of the project. Squalene is the most ubiquitous molecule in highest abundance between all fingermarks. Characterization of its degradation rate, may lead to further understanding of the mechanism of degradation. In our work, we control environmental factors, light, temperature, and humidity, of each deposited fingermark residue. Performing single residue extraction and analysis by GC/MS allows us to assess multiple components at once, not just abundant molecules. Through various donor samples a database has been initiated for comparison of all the marks. From this research we aim to create a large enough database with multiple components from which rates of degradation may be extrapolated to assess additional molecules, such as fatty acids, prescription medications, and nicotine.

Jennifer Munson is currently a graduate student at George Mason University pursing an M.S. in Forensic Science. She is researching applied analytical chemistry and biochemistry techniques in respect to fingermark characterization. Her research interests include basic and applied research in forensic biology and forensic chemistry, as well as translation medicine.

Traffic Flow State Detection and Dissemination

Presenter: Ahmed Alhafdhi
Advisor: Stephen Olariu
Old Dominion University,
Computer Science

The main contribution of this work is to integrate traffic flow information collected by roadside Traffic Monitoring Units (TMUs) deployed at regular intervals (e.g. every kilometer) from passing vehicles to provide automated detection of traffic –related events on highways. A number of major challenges addressed in this work including preserving the privacy of participated vehicles, maintaining secure communications, and detecting traffic-related events. Based on a careful analysis of application requirements, we allow anonymous data collection while preventing impersonation attacks. Moreover, the collected data is used by the system's inference engine to detect traffic trends by implementing data mining support vector machine algorithm for classification. The relevant traffic flow-related information is then disseminated to the driving public along the highway. The traffic flow-related information is continuously updated using Bayesian inference. Conducted simulation results confirm our theoretical prediction.

Ahmed Alhafdhi earned his B.S. in Computer and Information Science from King Faisal University, Saudi Arabia in 2002, and M.S. in Computer Science from George Washington University in 2010. In Fall 2010, he joined the Computer Science Department of Old Dominion University and started my PhD. He is working under the supervision of Dr. Olariu and his research interests include Wireless Networks (Vehicular Networks, Sensor Networks), data Mining, and distributed systems.

Measurement-based Editing of Diffuse Albedo in Photographs with Consistent Interreflections

Presenter: Bo Dong
Advisor: Pieter Peers
College of William & Mary,
Computer Science

The selection of colors for furniture, mats or wall color are common design activities. Selecting the correct color of an object is a subjective process that cannot be taken in isolation without taking the visual impact on and from the environment into account. One common strategy for selecting a color is to take a picture of a scene and change the color of the desired region (e.g., part of wall, the top surface of a table) to preview the new color changes. However, the observed pixel colors are the result of complex interactions between the lighting and materials in the scene, as light emitted from a light source will be reflected off of the scene's surfaces one or more times before it reaching the camera. These interreflections are missing when directly changing pixel values, yet its effect is visually important and often difficult to predict. We propose a novel measurement-based approach using an efficient camera-projector coaxial system for recoloring desired regions of a scene without any knowledge of geometry and lighting of the scene while maintaining physically accurate interreflections. We describe a thorough analysis on interreflections of a scene and propose an novel and efficient solution.

Bo (Hover) Dong is a sixth year Ph.D. candidate in Computer Science department of The College of William and Mary. Now, he is doing super exciting research in the computer graphics with Dr. Pieter Peers. He got his M.S. in Computer Science department of Texas A&M University-Corpus Christi in 2009. During that period, he did significantly interesting research on underwater sensor networks with Dr. Ahmed Mahdy.

Open Locating-Dominating Sets in Circulant Graphs

Presenter: Robin Givens
Co-Author: G. Yu
Advisor: Rex Kincaid
College of William & Mary,
Computer Science

A common problem in computer science is detecting faults in parallel networks and microprocessors. These parallel structures can be modeled as graphs, and sensors placed strategically at a subset of vertices can detect the location of errors when they occur. An open locating-dominating set (OLD-set) is a subset of vertices in a graph in which every vertex in the graph has a non-empty and unique set of neighbors in the subset. Sensors placed at OLD-set vertices can then uniquely detect fault locations, however sensors can be expensive, so minimizing the size of the OLD-set is of particular interest.

Robin received her B.S. in Mathematics and Computer Science from the University of Richmond in 2006. She completed her M.S. in Computer Science at W&M in 2014 and is currently working towards the Ph.D. Her research interests include graph theory and optimization.

SMOC: A Secure Mobile Cloud Computing Platform

Presenter: Zijiang Hao
Co-Authors: Y. Tang, Y. Zhang, E. Novak, N. Carter
Advisor: Qun Li
College of William & Mary,
Computer Science

Mobile devices are ubiquitous in modern world. Nevertheless, they are subject to several constraints such as limited energy budget, limited computational power, and low security level. Combining cloud computing with mobile devices is good way to break these constraints. To this end, we propose a platform that spans across a mobile device and a cloud. To make this platform more practical, we introduce two techniques. First, the platform provides an environment through which a user can run her program on either side of the platform and change the running side freely to make a balance between program performance and user-perceived latency. Second, a separate design of the platform on the mobile device side makes it possible to isolate the user's input from the mobile device's operating system when the program is running on the cloud, such that a compromised mobile device's operating system cannot make any attack on the user's input and thus higher security level is provided. We implement a prototype system by using off-the-shelf hardware, and evaluation results demonstrate that our platform is efficient, easy to use, and secure.

Zijiang is a Ph.D. candidate in Computer Science Department. His advisor is Professor Qun Li. His research interests include pervasive computing, mobile computing, security and cloud computing.

Simulating Parking Space

Presenter: Katarina Hoeger
Co-Author: S. King
Advisor: Lawrence Leemis
College of William & Mary,
Computer Science

The city of Williamsburg wishes to expand upon the number of trains passing through the station and increase traveler flow through Williamsburg. Therefore, given the Williamsburg Transportation Center's fixed number of long term traveler's parking spaces currently, it is necessary to determine how much of a demand in parking additional trains would create. Through simulation, we model the effect of adding additional trains on parking space availability in the long term parking lot.

After graduating from Harvey Mudd College in 2013 with a B.S. in Mathematics, Katarina entered the College of William and Mary's Computer Science Program in pursuit of a Masters degree, with a specialization in Computational Operations Research. Once she completes her degree, she plans on using the mathematical modelling skills cultivated here and during her undergraduate years to assist in the understanding and overcoming of challenging situations. When not exploring optimization and simulation, Katarina enjoys learning, social dancing, playing the flute, and connecting with people. Someday, she hopes to find a way to mix her love of optimization with her less academic pursuits. Katarina is a returning member of the Graduate Research Symposium organizing committee.

Estimating diag(f(A))

Presenter: Jesse Laeuchli
Advisor: Andreas Stathopoulos
College of William & Mary,
Computer Science

For large matrices, computing diag(f(A)) can be computationally prohibitive. For example, obtaining diag(A^{-1}) and diag(exp(A)) often cannot be done directly. However, many applications require the computation of these functions, and resort to expensive Monte Carlo methods to estimate them. Unfortunately, these methods converge slowly, since they do not take into account knowledge of the structure of A. One method for dealing with this shortcoming is probing. In probing, some polynomial of the matrix A, p_n(A), is chosen, and used to estimate the structure of f(A). This structure is then colored. The elements of the matrix are reordered so that nodes that share a color are adjacent to each other. Since they have no connections (otherwise they would not share a color), a block diagional zero structure appears, allowing for the recovery of the diagonal elements. Unfortunately in many cases p_n(A) will not converge fast enough to f(A) to give a good estimate of its structure. We propose a new approach, which we term inverse probing. We combine several different methods for directly estimating the structure of f(A). First, several columns of f(A) are obtained, by computing x=f(a)e_i. We can then form an approximation to the structure of f(A) by computing x*x^T. Additionally, while we are computing these columns, some portion of the spectrum of f(A) will be available as a byproduct. We also use these columns to obtain statistical information about the off-diagonals of f(A). Combining all this information together, we obtain significant improvements over probing.

Jesse Laeuchli is a 4th year Ph.D. student in the department of computer science, studying numerical linear algebra, under the direction of Andreas Stathopoulos.

Radiometric Transfer: Example-based Radiometric Linearization of Photographs

Presenter: Han Li
Advisor: Pieter Peers
College of William & Mary,
Computer Science

We present an example-based approach for radiometrically linearizing photographs that takes as input a radiometrically linear exemplar image, and a target regular uncalibrated image of the same scene, possibly from a different viewpoint and/or under different lighting. The output of our method is a radiometrically linearized version of the target image. Modeling the change in the appearance of a small image patch seen from a different viewpoint and/or under different lighting as a linear 1D subspace, allows us to recast radiometric transfer in a similar form as classical radiometric calibration from exposure stacks. The resulting radiometric transfer method is lightweight and easy to implement. We demonstrate the accuracy and validity of our method on a variety of scenes.

Hani Li is a fourth-year Ph.D. student in the Computer Science Program.

Improving GUI-Based Testing of Android Apps

Presenter: Mario Linares-Vasquez
Co-Author: M. White, C. Bernal-Cardenas, K. Moran
Advisor: Denys Poshyvanyk
College of William & Mary,
Computer Science

Existing approaches and tools for automated GUI-based testing of Android apps are aimed at different goals and exhibit some pros and cons that should be carefully considered by developers and testers. For instance, mobile app testing is still done mostly manually, because writing/collecting test scripts required for some of those approaches is expensive, and the scripts become quickly outdated when significant changes are made to the GUI. In addition, the problem of generating representative and effective test cases reflecting natural user interaction with touch-screen devices received little attention. State-of-the art approaches such as random testing (RT) or systematic exploration-based testing (SEBT) provide a high ratio of infeasible inputs or execute events on the GUI just following a coverage criteria respectively; however test cases generated with RT and SEBT are not representative of natural (i.e., real) application usage scenarios. We address limitations of existing tools for GUI-based testing of Android apps in our novel hybrid approach, coined as MONKEYLAB. Our approach is based on the novel Record>Analyze>Generate>Validate framework, which is aimed at generating automatically actionable test cases for (un)natural app usage scenarios using statistical models. The framework also enables GUI-based testing without expensive test scripts collection. We evaluated MONKEYLAB in a case study on several medium-to-large Android apps and the results demonstrate that MONKEYLAB is able to generate actionable and effective test cases. The case study also helped us to document several challenges for GUI-based testing, not documented before, such as the impact of encapsulated components, clean/dirty launches, and inter-arrival time for events.

Mario Linares-Vasquez is a Ph.D. candidate at the College of William and Mary advised by Dr. Denys Poshyvanyk, and co-founder of liminal ltda. He received his B.S. in Systems Engineering and M.S. in Systems Engineering and Computing from Universidad Nacional de Colombia.

Covert Channels over Physical Media on Smart Devices

Presenter: Ed Novak
Advisor: Qun Li
College of William & Mary,
Computer Science

In recent years mobile smart devices such as tablets and smartphones have become increasingly popular. In the future, these devices will likely move to the developing world as well. This will lead to a world of ubiquitous smart devices that people rely on daily and carry everywhere. Users will increasingly place sensitive information on these devices like contact information, GPS location traces, financial information, and personal attributes like sexual orientation and political views. Because of this, security of these devices is of the utmost importance. In this paper, we demonstrate an attack, utilizing covert channels over physical "real-world" media, such as sound and light. These physical medium covert channels are apt for smart devices because they carry a wide array of sensors. These covert channels also present an attack vector that is difficult to differentiate from benign use, because physical world sensors (such as the speaker and microphone) are commonly used together in many benign scenarios. We implement five such covert channels and show how they can be used to circumvent taint propagation analysis, and enable a variety of attacks including privilege escalation and confused deputy attacks. We also present a defense mechanism for these new covert channels, which balances security with usability. The goal of our defense scheme is to allow applications to use sensors benignly, while stopping or severely limiting the bit-rate of covert channels that use the same sensors.

Ed Novak was born and raised in Schaumburg, IL, a suburb of Chicago. He attended Schaumburg High School and he began studying computer science as an undergraduate at Monmouth College in Monmouth, IL.

High-Performance Outlier Detection Algorithm for Finding Blob-Filaments in Plasma

Presenter: Lingfei Wu
Co-Authors: K. Wu, A. Sim, M. Churchill, J. Choi
Advisor: Andreas Stathopoulos
College of William & Mary
Computer Science

Magnetic fusion could provide an inexhaustible, clean, and safe solution to the global energy needs. The success of magnetically-confined fusion reactors demands steady-state plasma confinement which is challenged by the edge turbulence such as the blob-filaments. Real-time analysis can be used to monitor the progress of fusion experiments and prevent catastrophic events. We present a real-time outlier detection algorithm to efficiently find blobs in fusion experiments and numerical simulations. We have implemented this algorithm with hybrid MPI/OpenMP and demonstrated the accuracy and efficiency with a set of data from the XGC1 fusion simulation code. Our tests show that we can complete blob detection in two or three milliseconds using Edison, a Cray XC30 system at NERSC and achieve linear time speedup. We plan to apply the detection algorithm to experimental measurement data from operating fusion devices. We also plan to develop a blob tracking algorithm based on the proposed method.

Lingfei Wu is a 5th year Ph.D. candidate in the computer science department at the College of William and Mary, advised by Dr. Andreas Stathopoulos. Before coming to College of William and Mary, he received his M.S. degree in Automation from University of Science and Technology of China (USTC), following his B.E. degree in Electrical Engineering from Auhui University, both in Hefei, China.

Model-Based Storage Tiering for Smooth System Operation

Presenter: Ji Xue
Co-Authors: F. Yan, A. Riska
Advisor: Evgenia Smirni
College of William & Mary,
Computer Science

Storage systems are often deployed in a tiered form to enable high performance and availability. These tiers utilize all possible volatile and non-volatile storage technologies, including DRAM, SSD, and HDD. The trade-offs among their cost, features, and capabilities can make their effective integration into a single storage entity complex. Here, we propose an autonomic technique that learns user traffic patterns in a storage system over long time-scales to optimize user performance but also volume of completed system work. Our purpose is to multiplex as well as possible user workload with storage system features (e.g., voluminous internal system work) such that the latter is not starved but rather completed with minimal impact on user performance. %, which remains unscathed by the scheduling of additional work. Key to achieving the above is to use an autonomic learning engine to predict when the user workload intensity increases/decreases and then proactively stop/start bulky internal system work. Being proactive allows the system to effectively bring into the fast tier the active user working set just-in-time and right before it is needed most, i.e., when user traffic suddenly peaks.

Ji Xue is a third-year Ph.D. candidate in computer science. His research interests include system performance modeling, storage system, machine learning, and cloud computing.

Quantitative Estimation of the Performance Delay with Propagation Effects in Storage Power Savings

Presenter: Feng Yan
Co-Author: A. Riska
Advisor: Evgenia Smirni
College of William & Mary,
Computer Science

The biggest power consumer in data centers is the storage system. Coupled with the fact that disk drives are lowly utilized, disks offer great opportunities for power savings, but any power saving action should be transparent to user traffic. Estimating correctly the performance impact of power saving becomes crucial for the effectiveness of power saving. In this work, we develop a methodology that quantitatively estimates the performance impact due to power savings. By taking into consideration the propagation delay effects. Experiments driven by production server traces verify the correctness and efficiency of the proposed analytical methodology.

Feng Yan is currently a Ph.D. student in Computer Science department of College of William and Mary. His advisor is Dr. Evgenia Smirni. His current research interest includes distributed systems, performance tools, MapReduce, priority scheduling, cloud computing, deep learning and storage systems. He has done research internships in HP Labs and Microsoft Research during this Ph.D. study.

Building fast privacy-preserving scheme for applications on smartphones

Presenter: Shanhe Yi
Advisor: Qun Li
College of William & Mary,
Computer Science

The proliferation of smartphones has seen a plethora of context-sensitive applications on mobile social network, activity tracking, health care, biometric authentication, and payment system. Data such as locations, activities, contacts, health profiles, or even genome segments, are either sensitive or can be used to extract sensitive information. In most cases , those data will be implicitly or explicitly uploaded to the application servers to be computed for in-depth analysis or advanced functionalities, for example, health monitor apps constantly gather and upload sensor data to generate health analysis; social apps need permission of uploading your contact lists to help you find more friends in social network; physicians would like to pull your medical record for more accurate diagnose, or even your genome segments for personalized medicine. Currently, users are using all those applications at the risks of private information leakage. One way to solve this problem is to provide protocol for secure computation, which enables the computation on sensitive information while preserving the data privacy. Privacy-preserving solutions based on garbled circuits and homomorphic encryption have already been proposed. Garbled circuits is not efficient enough since it is too computationally intensive. Homomorphic encryption can not scale well in some scenarios. In this paper, we are seeking a better solution to combine homomorphic encryption and oblivious transfer. Our scheme supports common secure computation operations for computing distance measurements and we also propose a framework for secure dynamic programming. Our implementation involves the best practices for oblivious transfer and its proper extensions by leveraging android native codes for crypto primitives and building our protocol and primitives upon elliptic curves. We evaluate our implementation on smartphone in terms of computation cost and communication cost.

Shanhe Yi is a 2nd-year Ph.D. student at the Department of Computer Science, College of William and Mary.

"Life Problems": Youth, Sex Education, and Medical Advice of the 1910s

Presenter: Laura Ansley
Advisor: Leisa Meyer
College of William & Mary,
History

One of the major topics that has been widely addressed by historians of sexuality is sexual education, including both what children learned and how information was conveyed to them. Many projects on sexual education have focused on a more formalized system of education that was found in public schools starting as early as the 1930s. However, this paper looks to an earlier period to interrogate how youths learned about sexuality, their bodies, and what society expected of them. In the early decades of the twentieth century, a conversation arose among physicians, teachers, parents, and others about children's education on the matters of health and sexuality, which is reflected in an outpouring of publications addressed to young men and women on a variety of topics, from reproductive anatomy to "proper" relations between the sexes to prevention of venereal disease. Parents could be assured that, by handing them book or pamphlet, a child would receive the information needed to guide them through adolescence.

Laura M. Ansley is a Ph.D. candidate in history. She received a B.A. in history and American Studies from Case Western Reserve University in 2010 and an M.A. in history from the College of William and Mary in 2012. She is writing a dissertation on sex education in the United States from 1890-1930.

A Widow's Purview: A Microhistory of Gender and Family Relations in the 18th-Century Virginia Backcountry

Presenter: Eve Bourbeau-Allard
Advisor: Karin Wulf
College of William & Mary,
History

This research project seeks to deepen our understanding of gender relations and family history in the decades following the American Revolution by reconstructing the experience of one widow, Susanna Smith Preston (1740-1823). Susanna belonged to an elite plantation household in the Virginia backcountry, rendering her case particularly valuable to explore the workings of gender in tandem with race relations, geographic location, and socio-economic status. After the death of her husband William Preston in 1783, Susanna contended with new legal rights and responsibilities. Using a wide array of sources, from family letters to tax records, interpreted through a microhistorical approach, I focus on the management of her household, the education of her children, and her interactions with her community and her adult sons, who served as the executors of the estate, as windows into the gendered power dynamics that operated within the Preston family following the death of its headman. This research contributes to a broader historical question: what place did widows occupy in the Early American family system, most specifically in backcountry slaveholding households, and what does that tell us about gendered expectations in late eighteenth-century America? This project expands the framework of female agency in relation to male authority by highlighting the interdependence and complexities that defined relationships among members of a household. It argues that widows, while operating in a world where male actors may have limited their autonomy, assumed a wide range of responsibilities to advance their family's socio-economic situation.

Born in Montreal, Canada, Eve Bourbeau-Allard graduated in 2013 from McGill University with a First Class Honours B.A. in history and a minor in political science. Among other academic awards, she received in 2011 the Governor General of Canada's Collegiate Bronze Academic Medal.

The Marys of Tyler Hall: Defining the William and Mary Student in the Early Twentieth Century

Presenter: Caylin Carbonell
Advisor: Karin Wulf
College of William & Mary,
History

For an institution that boasts many "firsts," coeducation came fairly late at the College of William and Mary, which remained an "old boy's club" for over two centuries. The first women at the College constituted a small minority of the student body, and were largely segregated from the men, forcing them to create their own student government and YWCA. While coeducation at William and Mary has previously been described as a fairly accommodating process, and while men did not actively resist the move toward coeducation, representations of women at the College suggest anxieties about the changing definition of "student" at William and Mary. Men increasingly defined "student" as a masculine status, extolling their academic, athletic, and "moral" accomplishments. Women were instead "Co-eds," "the Marys," or "the girls." Women sometimes participated in self-segregation, but they also resisted these caricatures, pushing into male spaces and oftentimes consciously advocating for their right to belong. Women challenged assumptions of what it meant to be a student at William and Mary, leading to lasting changes at the school. At a time in the early twentieth century when conversations about the nature and roles of women were ubiquitous in American culture, female students at William and Mary worked to establish their place at the College. Drawing mostly from student publications, surveys, oral histories, and scrapbooks, this paper looks at how both male and female students produced and defined the image of "the Co-ed" during the early years of coeducation at William and Mary.

Caylin Carbonell is currently a Ph.D. student in the history department at the College of William and Mary. In 2012, she graduated from Bates College with a degree in history and a minor in French. Her current research focuses on the social history of early America, particularly gender and families.

Roving Mars: The Next Frontier of Space and Media

Presenter: Giny Cheong
Advisor: Paula Petrik
George Mason University,
History

Mars has inspired dreamers and space enthusiasts as the next logical step after going to the moon. In 1998, the Mars Pathfinder mission captured public attention by demonstrating the first beloved rover (Sojourner) to travel the surface, leading to the later Mars Exploration Rover program (Spirit and Opportunity that landed in 2004). While Mars Pathfinder made a groundbreaking transition into digital media, becoming a record setting web event with more than half a million hits surrounding its landing, the Mars Exploration Rovers would further engage the public though more sophisticated websites and social media. The rover news coverage showed how science communication evolved from traditional media to digital media, redefining how the public learns about outer space. Public outcry can directly impact unpopular decisions in some instances, such as reversing the four million dollar funding cut to the Mars Exploration program that required the Jet Propulsion Laboratory to turn off Spirit and limit the functionality of Opportunity in 2008. This paper will examine the mass media coverage surrounding the Mars Exploration Rovers that made them so popular with the public and how the cancellation story plays out, especially through social media sources.

Giny Cheong is a Ph.D. candidate in the Department of History and Art History at George Mason University.

Dear Mr. President Ike: Race, Gender, and Imagined Relationships in Children's Letters to Dwight D. Eisenhower

Presenter: Cara Elliott
Advisor: Leisa Meyer
College of William & Mary,
History

Historians often write about the role the United States government played in attempting to regulate and control the lives of American children. But children themselves, rather than simply being passive observers, actively participated in this relationship. By analyzing letters written from children to President Dwight D. Eisenhower during the 1950s, my paper considers the ways in which children reflected upon and sought to determine the nature of their relationship with the federal government. For these children, Eisenhower embodied an abstract concept of leadership and expertise, a crucial comfort during the tumultuous years of the early Cold War. As such, American children felt they had a claim on the president. They attempted to establish relationships of mutual familiarity and trust in their letters, inviting the president to dinner, intimately detailing their illnesses, or asking him to attend their bar mitzvahs. Moreover, when Eisenhower or his administration made choices that were controversial, children weighed in. Beginning in 1954, integration became a front-and-center issue for American children, many of whom wrote Eisenhower passionate letters of praise or opprobrium. They saw Eisenhower as the architect of integration, and they communicated to him that these actions either fulfilled or betrayed their "friendship." The arguments children presented for or against integration in their letters were explicitly gendered, racialized, and filled with Cold War rhetoric. I argue that the content and language of these letters demonstrate the diverse ways in which children envisioned their relationship both with the federal government and American society during the 1950s.

Cara Elliott is a Ph.D. candidate at the College of William and Mary in the History department. She received her B.A. from Gettysburg College in History and French, with a minor study in Economics. Cara received her M.A. in History from William and Mary in the spring of 2013.

Money as a Social Institution in Late Eighteenth Century Virginia

Presenter: Amanda Gibson
Advisor: Scott Nelson
College of William & Mary,
History

In this project I define money, in opposition to the standard definition, as the system of credit and payments that allowed trade to occur. The credit system of late eighteenth century Virginia functioned through relationships between merchants and planters. Because credit was built on honor and social standing, perceptions of money, which cleared these honor-based credit exchanges, were bound up in honor and social standing. The purpose of this project is to show that money in late eighteenth century Virginia was a social institution. Perceptions of money relating to credit and honor matter because the men who held these views set economic policies, which would become the foundation of the American economy.

Amanda Gibson holds an undergraduate degree in economics and history from James Madison University and a graduate degree in economics and entrepreneurship for educators from the University of Delaware. She spent a decade at the Federal Reserve Bank of Richmond where she worked in economic education and community development. Ms. Gibson's research interests include economic history and the Early Republic.

Edward Dromgoole and the Shifting Spectrum of Evangelical Attitudes Toward Slavery in Virginia, 1780-1815

Presenter: Christopher Jones
Advisor: Chris Grasso
College of William & Mary,
History

Edward Dromgoole migrated to the Chesapeake from Ireland in 1770; he quickly came under the influence of Methodist missionaries in the region and by 1772 was traveling as an itinerant preacher. After marrying Rebecca Walton in 1777, Dromgoole continued as a preacher for the remainder of the Revolutionary War, before abruptly retiring from the itinerant ministry and settling down in Brunswick County, Virginia to pursue a career as a small planter and merchant. From Rebecca's father, the Dromgooles inherited eleven slaves a point that did not sit well with church leaders who, inspired by Quaker activists and the emerging abolitionist movement, attempted to impose rules on all Methodists that forbade the ownership of slaves.

Christopher Jones is a Ph.D. candidate in the department of history at the College of William and Mary. He is currently finishing a dissertation on the growth and development of Methodism in North America and the Caribbean during the late eighteenth and early nineteenth centuries.

Investing in Daughters: A Quantitative Analysis of Marriage Settlements from South Carolina, 1750-1850

Presenter: Lindsay Keiter
Advisor: Karin Wulf
College of William & Mary,
History

Historians of marriage and the family in early America have often ignored economics, and economic historians generally overlook the family. This is a critical oversight when marriages prompted the largest distributions of property between generations except for the settlement of estates upon death. This paper explores the types and quantities of wealth that parents bestowed upon marrying daughters or that remarrying widows brought in South Carolina to uncover the financial concerns of marriage. Marriage settlements are useful for exploring these concerns because they frequently offer detailed schedules of the property being transferred by a bride to her groom and because they dictate the amount of control each partner had over said property. In this paper, I present a summary of several of my findings about the relationships between kinds and quantities of wealth, women's control of property, and time. My analysis is based on a database of a random sample of marriage settlements that I created. I argue that marriage settlements reflect South Carolinians' broader engagement with the developing economy, but not necessarily progressive attitudes about women's economic power.

Lindsay Keiter is a Ph.D. Candidate, writing a dissertation on the economic functions of marriage in Early America. By examining how families planned financially and how marriage functioned as a conduit for various types of property, she connects the experiences of families and individuals to the wider forces of early America's volatile, growing market economy. More broadly, she is interested in the intersections of the histories of gender, domestic violence, medicine, the law, and capitalism. Starting December 2014, she will be the Associate Historian for the Colonial Williamsburg Foundation's Digital History Center.

The Brafferton Estate: Harvard, William and Mary, and Religion in the Early Modern English Atlantic World

Presenter: Mark Mulligan
Advisor: Paul Mapp
College of William and Mary, History

Natural philosopher Robert Boyle is perhaps best known for his contributions to modern science, but his connections within the seventeenth-century English Atlantic world made possible another significant legacy: the funding of both the "Indian College" at Harvard and the Brafferton School for Native Americans at the College of William and Mary. In his will, Boyle requested funds be allocated to "charitable purposes," especially converting Native Americans to Christianity. After his death, his executors used the funds to purchase the Brafferton Estate in Yorkshire. Of the rents generated by this estate, the New England Company and Harvard received a fixed amount, and the remaining rents were allocated to William and Mary. While this is a familiar story, scholars have left certain questions about this Estate unanswered. Given the intense religious conflicts of seventeenth-century Britain, that an Anglican institution in Virginia and a staunchly Puritan institution in Massachusetts drew funding from the same source demands an explanation that scholars have not yet provided. What forces in the English Atlantic world were capable of bringing Anglicans and Puritans into the same orbit? By examining the records, correspondence, and account books in the Brafferton Estate Papers, I demonstrate that overlapping financial interests, connections amongst the English colonial elite, and shared attitudes about racial and religious "others" made this connection between seventeenth-century William and Mary and Harvard possible.

Mark Mulligan is a graduate student in the Lyon G. Tyler Department of History at the College of William and Mary. He received his B.A. in History with a Concentration in Research Methods and minors in Education and Women's Studies from Assumption College in 2012. His research interests include the early modern English Atlantic world, religious history, and Native American history.

"A Land Not Exactly Flowing With Milk & Honey": Western Australia and the British Public, 1828-1831

Presenter: Matthew Niendorf
Advisor: Kathrin Levitan
College of William & Mary, History

Despite two centuries of overwhelmingly negative appraisals of Western Australia by Dutch, French, English, and American mariners, the British Colonial Office in 1828 approved a scheme by private investors to send 10,000 free British migrants and 1,000 head of cattle to Swan River, Western Australia within four years. This dramatic shift with its concurrent "Swan River Mania" within the British public can partly be explained by the growing demand within Great Britain for emigration and the relative ease with which wealth and prosperity seemed assured through this settlement scheme. This project seeks to look at the critical months that fomented this mania, analyzing why British citizens from the lowers classes (both urban and rural) to the upper echelons of society (both landed gentry and industrialists) were so attracted to the idea of settling halfway around the world to a place never before settled by Europeans. By looking at advertisements, emigration guides, editorials, personal letters of migrants, and other writings of the time, we can better grasp why emigration to a relatively unknown part of Australia seemed so compelling to many Britons in 1829. This work will contribute to a better understanding of the acceleration British diaspora during this period and will link often separate local Western Australian and British imperial and social histories.

Matt Niendorf received his B.A. in History from the University of Notre Dame in 2014. He is currently working on his Master's thesis, which looks at the founding of the Swan River Colony in Western Australia in 1829. Matt hopes to emphasize Western Australia's place in the British Empire as it has generally been either undervalued or completely ignored.

Virginian Loyalists and the Property that Defined Them: A Study of Status Reconstruction

Presenter: Kasey Sease
Advisor: Christopher Grasso
College of William & Mary,
History

The term "loyalist" has been attributed to individuals residing in the British colonies on the Atlantic Coast of North America that did not support the separation of the thirteen colonies from Great Britain during the American Revolution. Due to the political trajectory of the Revolution, and the eventual independence achieved by the colonists, loyalists were alienated from their communities politically, socially, or physically—often all three. These communities were the places where inhabitants built, exhibited, and maintained their social status, resulting in the grouping of people into particular social stations. By analyzing the damage claims made by loyalists to the Loyalist Claims Commission during and after the Revolution, I hope to gain a better understanding of whether or not loyalists attempted to maintain the status they forged in Virginia following their physical, political, or social displacement. In doing so, I will analyze the connection between the material goods of loyalists and the maintenance of status during and after the American Revolution. I have found a correlation between the kinds of goods an individual made claims for and their social station before the Revolution as defined by themselves and the community around them. Ultimately, status in colonial Virginia was the result of a process that was continuously asserted, reinforced, and maintained—a process that persisted even after loyalists were forced to leave the colony they called home.

Kasey Sease is a first year M.A. student in the M.A./Ph.D. program for early American history. Primarily, her interests are in political and intellectual history of 18th and early 19th century Virginia. She currently serves as an editorial apprentice at the Omohundro Institute of Early American History and Culture. She received her B.A. in History and Government from the University of Virginia in 2014.

Judicial Revenge: The Mass Execution of Thirty-Eight Dakota Men

Presenter: Ian Tonat
Advisor: Brett Rushforth
College of William & Mary,
History

On December 26, 1862 the US government hanged thirty-eight Dakota men in Mankato, Minnesota in the largest mass execution in US history. They had been convicted of alleged crimes related to the Dakota War of 1862. Three-hundred and three Dakota men had initially been sentenced to death by a military commission in trials that sometimes lasted less than five minutes per person and in which the criteria for guilt included providing ammunition to someone who had fired a gun in battle, though President Abraham Lincoln commuted all but 39 of these sentences and one was later pardoned. After the execution, a crowd of doctors, including William Worall Mayo, whose sons would found the Mayo clinic, exhumed the bodies of the executed men for medical dissection and trophies. This study will examine the mass execution of thirty-eight Dakota men in Mankato on December 26, 1862. In this examination, the contexts of local concerns and the broader American Civil War emerge as important factors in explaining how and why the hanging took place, while examination of the hanging itself, and its aftermath, illuminate how white Minnesotans viewed their relationships with their Native neighbors. The trial, execution, and exhumation of these thirty-eight Dakota men helps to demonstrate conflicting ideas about the place of Native people in the United States, as well as how conceptions of race influenced these ideas.

Ian Tonat received his B.A. from Carleton College in 2011 and his M.A. from the College of William and Mary in 2014. His master's thesis examines the judicial beheading of Native American men in seventeenth-century New England and how performative violence structured relationships between colonists and Native people. His research interests include North American colonial history, Native American history, intercultural violence, and the early American west.

The First Measurement of the Al Beam-Normal Single-Spin Asymmetry

Presenter: Kurtis Bartlett
Advisor: Wouter Deconinck
College of William & Mary, Physics

Qweak is an experiment that will determine the weak charge of the proton via a measurement of the parity-violating electron-proton asymmetry by scattering electrons with longitudinally polarized spin from a liquid hydrogen target. During the running of the experiment additional data was recorded from a 27Al target for the purpose of determining background contributions. A small subsection of this aluminum data were taken with electrons with spin polarized in the plane normal to the incoming beam direction, which is often referred to as being transversely polarized. The purpose of this data is for determining any small fraction of transversely polarized electrons that could contribute to the parity-violating measurement. This transverse aluminum data could lead to the first determination of the beam-normal single-spin asymmetry (BNSSA) on 27Al, which could help give an understanding for an observed anomaly of a near zero BNSSA for 208Pb by the PREX experiment. Theory currently predicts that the BNSSA should decrease as atomic number increases, thus the 208Pb BNSSA was expected to have a large negative value. I will present the status of my effort toward extracting the BNSSA from Qweak's 27Al data and the possible impact it will have on resolving this mystery from the result for 208Pb.

Kurtis Bartlett is originally from New Hampshire where he was born and raised. During his time in high school he started to gain an interest in physics from excellent science teachers. Once graduated from high school he moved on to pursuing a B.S. degree in Physics at the University of New Hampshire (UNH). During his time at UNH he was doing research in experimental nuclear physics for Thomas Jefferson National Accelerator Facility in Newport News, VA. In 2012, he graduated from UNH and started his Ph.D. at the College of William and Mary. He is currently working with the Qweak collaboration.

Surface Plasmon Resonance and Insulator-Metal Transition in Gold and Vanadium Dioxide Bilayer Films

Presenter: Melissa Beebe
Co-Authors: L. Wang, S.E. Madaras, J.M. Klopf, S. Wolf
Advisor: R. Ale Lukaszew
College of William & Mary, Physics

Under certain conditions, thin films of noble metals such as gold and silver exhibit intense surface plasmon polaritons (SPP), in what is called surface plasmon resonance (SPR). These are charge oscillations along the air/film interface resulting from the interactions between an illuminating wave and the free electrons at the conductor's surface. There are many possible applications of the SPR, including new plasmonic optoelectronic devices, biological sensors, and new imaging methods [1,2]. We now present correlated experimental studies and simulations on the modulation of the SPP in Au/VO2 bilayers by the metal insulator transition (MIT) of VO2, opening up new possible applications. The modification of the SPP wave vector by the thermally-induced MIT in VO2 was investigated by measuring the optical reflectivity of the sample when SPP's were excited via gratings patterned on the Au surface and also in Kretchmann configuration in Au/VO2 bilayers.

[1] Wang, L.; Yang, K.; Clavero, C.; Nelson, A. J.; Carroll, K. J.; Carpenter, E. E.; Lukaszew, R. A. J. Appl. Phys. 2010, 107 (9), No. 09B303
[2] Huang, X. H.; El-Sayed, I. H.; Qian, W.; El-Sayed, M. A. J. Am. Chem. Soc. 2006, 128 (6), 2115-2120.

Melissa Beebe was born and raised in Virginia. She attended Old Dominion University in Norfolk, VA, where she received a B.A. in Spanish Language and Literature and a B.S. in Physics with a minor in Mathematics in 2012. She began attending William & Mary in 2012 and now works with Dr. Ale Lukaszew's group studying thin films.

Superconducting Properties of NbN and NbTiN Thin Film

Presenter: Matthew Burton
Co-Authors: K. Yang, M. Beebe, A. Valente-Feliciano
Advisor: R. Ale Lukaszew
College of William & Mary, Physics

Particle accelerators, like those used at the Thomas Jefferson National Ignition Facility and the LHC, have unlocked a wide array of basic research previously forbidden to scientists. From exploring the energy frontier, studying the fundamental structure of matter, and even practical medicine, particle accelerators are at the forefront of mankind's push for advancement. Recently, the particle accelerator community has reached a fundamental material dependent upper limit in the energy the facilities are able to achieve when using SRF linear accelerators (linacs). Also, economic conditions have put pressure to create smaller and more energy efficient linacs to cut down development and operating costs. In response to these outside motivations, the community has begun to exploit the characteristics of superconducting materials with extremely low RF surface impedance, higher thermal conductivity than current materials and capable of sustaining larger field gradients. Superconducting thin films and multilayers hold promise for achieving these goals by offering the ability to coat the interior surfaces of superconducting radio frequency (SRF) cavities, thereby modifying the active surface. This could lead to control over the slope of the quality factor, cavities that are capable of sustaining higher accelerating gradients, increasing the maximum energy, and the possibility of creating coated cavities from castable metals, such as copper, leading to drastically reduced manufacturing and operating costs. Here we will present studies done on the thickness dependence of superconducting properties of NbN & NbTiN thin films and multilayers as well as preliminary studies of film deposition on Cu and Nb surfaces as a preliminary step toward actual cavity deposition.

Matthew Burton is a local of the Hampton Roads area, and he graduated from high school in Chesapeake Virginia in 2008. He received his B.S. in physics fundamental studies with a minor in math from James Madison University.

Avalanche PhotoDIodes for the NOvA Near Detector at Fermilab

Presenter: Marco Colo
Advisor: Jeffrey Nelson
College of William & Mary, Physics

NO½A (the NuMI off-axis neutrino experiment) is a new project that intends to use the Fermilab NuMI neutrino/antineutrino beam (used in the past by other experiments such as MINOS, and recently upgraded) to measure important physical parameters such as neutrino mixing angles and neutrino CP (Charge-Parity) violation. The experiment has two detectors, a smaller near detector at Fermilab and a larger far detector at Ash River, MN, which are similar in every aspect except for size. Commissioning of the former was completed in August 2014; commissioning of the latter was completed in November 2014.

Marco Colo is a 3rd year graduate student pursuing a Ph.D. in Physics at the College of William and Mary. He graduated cum laude from University of Pisa with a major in Physics, working on Silicon detectors, and has since been collaborating with the NOvA neutrino experiment at Fermilab.

New Probe of Electroweak Interference Effects in the Proton's Quark Structure

Presenter: James Dowd
Advisor: David Armstrong
College of William & Mary,
Physics

The recently completed Qweak Experiment at Jefferson Lab made the first direct measurement of the weak charge of the proton, Q_W^p, via a measurement of the parity-violating asymmetry in elastic electron-proton scattering with low four-momentum transfer. To reach the ultimate precision goal, energy-dependent radiative corrections in the parity-violating asymmetry must be accounted for. The most significant of these is the process wherein both a photon (γ) and the neutral carrier of the weak interaction (Z boson) are simultaneously exchanged between the incident electron and the proton; this is known as the γZ box diagram. The asymmetry arising from this diagram depends on the γZ interference structure functions, $F_{1,3}^{\gamma Z}$ for which there is almost no experimental data. Using the Qweak apparatus, with modifications, an ancillary measurement was taken at a higher beam energy of 3.35 GeV. The chosen kinematics allows access to inelastic scattering, where the asymmetry depends on these structure functions, allowing tests of their theoretical description. The addition of a 10 cm thick lead wall in front of one of the eight Cerenkov detectors isolates the pion background in the asymmetry measurement. Pion contamination is the largest uncertainty for this measurement. Analysis of these data will provide additional validation of the theoretical models used to predict the γZ box contribution to the proton's weak charge.

James Dowd earned a B.S. degree in Physics from Virginia Tech in 2009. He is currently pursuing a Ph.D. at the College of William & Mary in experimental nuclear physics under Dr. David Armstrong. His continued research on the Qweak experiment while at William & Mary is the topic of his dissertation. After graduating, he plans to pursue a career in the aerospace industry.

^{45}Sc NMR Studies of PSW

Presenter: Jeremy Ellden
Co-Author: R. Vold
Advisor: Gina Hoatson
College of William & Mary,
Physics

The study of ^{45}Sc NMR studies of $Pb(Sc_{2/3}W_{1/3})O_3$ (PSW) reveal three well resolved peaks from the central transition and a wide manifold of spinning sidebands from the satellite transitions. This allows us to estimate the quadrupole coupling, C_Q, using the quadrupole product, P_Q. We also look the the nuclear dynamics of each site, using relaxation experiments. These results show different trends for each peak as a function of temperature, which differ from the C_Q values predicted by density functional theory (DFT). The quadrupole couplings of the Sc sites are directly measure using 3QMAS.

Progress on using AC Zeeman Potentials for manipulating ultracold atoms

Presenter: Charles Fancher
Co-Authors: A. Ziltz, A. Pyle
Advisor: Seth Aubin
College of William & Mary,
Physics

We present progress towards an experiment using microwave and radio frequency AC Zeeman potentials produced from an atom chip to trap and manipulate ultracold atoms. These traps have the ability to operate with DC Feshbach resonances to tune atom-atom interactions, can be used in conjunction with a second field to perform forced evaporation, and can dynamically target qualitatively different potentials to different spin states. The first two qualities are widely used in the field of ultracold atoms but have been previously exclusive – DC magnetic traps have the ability to perform forced RF evaporation whereas optical dipole traps can be used with a DC Feshbach resonance however neither can do both. As of yet, no trapping scheme has been able to selectively target qualitatively different trapping potentials to different spin states. These new capabilities open the door for many applications in quantum computing, many-body physics, and spin-dependent atom interferometry. A spin-dependent atom interferometer formed by AC Zeeman potentials could have applications as an acceleration and rotation sensor.

Charles Fancher is originally from Saginaw, MI. He attended Worcester Polytechnic Institute in Worcester, M.A. for his undergraduate education in physics. He is currently a 5th year graduate student in the physics Ph.D. program at the College of William and Mary.

Analysis of the Kinematics in the Q_{weak} Experiment

Presenter: Valerie Gray
Advisor: Wouter Deconinck
College of William & Mary,
Physics

The Q_{weak} experiment at Jefferson Lab aims to determine the weak charge of the proton to a precision of 4% by parity-violating elastic electron scattering on protons in a liquid hydrogen target. After two years of data-taking, the experiment is in its analysis phase and the first results from the experiment's commissioning period have been published recently. The weak charge of the proton is directly related to the measured asymmetry, which is proportional to the squared four-momentum transfer Q^2 from the incoming electron to the struck proton. The uncertainty in Q^2 contributes directly to the precision of the measurement of the weak charge. We used two independent sets of drift chambers to reconstruct the electron trajectory through the experiment. Horizontal drift chambers are located just after the target while vertical drift chambers are located after a magnetic field just before the final Cerenkov detectors. Using the tracks measured in both of these sets of drift chambers the momentum transfer can be determined. Monte Carlo simulation is required to deduce the scattering vertex kinematics from the observed scattered energy and momentum. A Geant4 Monte Carlo simulation of the Q_{weak} experiment was used to determine the momentum transfer and its uncertainty. I will present the work on determining the Q^2 of the Q_{weak} experiment from data and using the Geant4 simulation. I will discuss the sources that contribute to the uncertainty in the value of the momentum transfer, and the progress towards our goal of a 0.5% precision on Q^2.

Valerie Gray is a 4th year graduate student in Physics at the College of William and Mary. She received her B.S. in Physics and Math at St. Norbert College in DePere, Wisconsin. Her graduate studies are in experimental nuclear physics, working mainly at Jefferson Lab in Newport News. Along with research she is active as chair of the American Physical Society's Forum of Graduate Student Affair, and she volunteers at many science outreach events.

On the Repeatability of Domain Formation and Growth During the Metal-Insulator Transition in Vanadium Dioxide Films

Presenter: Tyler Huffman
Co-Authors: P. Xu, B. Kim, H. Kim
Advisor: Mumtaz Qazilbash
College of William & Mary,
Physics

Nanoscale phase coexistence between insulating and metallic domains has been observed in films of vanadium dioxide (VO2) using scattering-type scanning near-field infrared microscopy (s-SNIM). When insulating VO2 transitions to the metallic phase, small regions of the metallic phase first nucleate, and then grow as the metal-insulator transition (MIT) progresses. It is an open question if the patterns of insulating and metallic VO2 in a given scan area are reproducible upon repeated thermal cycling across the MIT. To investigate this matter, we image the same area of a VO2 film with s-SNIM over multiple thermal cycles through the MIT. In this way, we uncover the relative contributions of deterministic and random events occurring at the nanoscale during the progress of the MIT. Our experiments reveal the nature of phase coexistence in VO2 films and the real-space dynamics of the MIT.

Tyler Huffman received his B.S. in Physics from Muhlenberg College in 2010. He is currently a 5th year Ph.D. student at the College of William and Mary. His research interests include photon spectroscopy and phase transitions in the strongly correlated systems, specifically the metal-insulator transition in vanadium dioxide.

7Li and 93Nb Solid-State NMR Study in a Cation-Ordered Perovskite of High Permittivity Materials

Presenter: Rony Kalfarisi
Advisor: Gina Hoatson
College of William & Mary,
Physics

Experimental 7Li and 93Nb NMR parameters for high permittivity cation-ordered Perovskite materials have been determined by analysis of NMR spectra. From these spectra, It was found that there was only one crystallographic site for 7Li ions and multiple sites for 93Nb ions. In resolving these multiple sites, multiple quantum magic angle spinning (MQMAS) was employed. The temperature dependence of spin-lattice relaxation rates were also investigated. Measurements were made at two different magnetic field strengths over the temperature range 220-370 K. Nuclear spin-lattice relaxation rates of the samples were measured by saturation recovery technique with magic angle spinning to increase resolution and sensitivity. The relaxation rates of all samples were observed to increase linearly with increasing temperature. Data obtained at two different magnetic field suggested that the dominant relaxation mechanism is due to paramagnetic impurities where the nuclear energy is transported via nuclear spin diffusion.

Rony Kalfarisi is a Physics graduate student at the College of William and Mary. He was admitted in 2010 and joined NMR spectroscopy group in 2012. He has been working intensively with high dielectric materials using NMR spectroscopy techniques, such as Magic Angle Spinning and Multiple Quantum Magic Angle Spinning.

Surface Plasmon Resonance enhancement via oblique thin film deposition on gratings

Presenter: Zhaozhu Li
Co-Authors: M. Klopf, G. Schwartz, M. Heimburger, L. Wang
Advisor: R. Ale Lukaszew
College of William & Mary
Physics

Surface Plasmon Resonance (SPR) has received much attention recently because of its capability to locally enhance electric fields significantly with respect to the incident light. Using a coupler such as a prism or a grating to satisfy the dispersion relationship, SPR can be excited when the light shines into the dielectric-metallic interface at the resonance angle for a specific material. It has been reported that the aspect ratio of the grooves affects the SPR performance distinctively when using grating couplers. By tailoring the grating amplitude within certain grating aspect ratios, it is expected that SPR performance can be optimized and therefore further enhancement of the local electric field intensity could be achieved. Here, we have applied oblique shadow thin film deposition (OSD) to deposit metallic layers onto commercial grating substrates to tailor the grating amplitude and have measured the resulting SPR performance of such structures and compared the SPR performance with that from a normally deposited film onto the same kind of commercial grating. Our results demonstrate that it is possible to tune SPR for greater benefit thus further enhancing the local electric field as expected, opening up a venue for applications of SPR such as photo-emission.

Zhaozhu Li is a graduate student at department of Physics pursuing a Ph.D. She got her bachelor degree at the University of Science and Technology of China in 2009 and her master's degree of philosophy at College of William and Mary in 2011. Her research of interest is in improving the silver-based photocathode performance by application of grating -excited surface plasmon resonance on dielectric-metallic thin film interface to significantly enhance the localized electric field intensity in the metal material.

An Experimental Overview of Q-weak, and Removal of Target Contributions

Presenter: Joshua Magee
Advisor: David Armstrong
College of William & Mary,
Physics

The Q-weak experiment recently completed data taking at Jefferson Laboratory with the aim of making the first experimental determination of the proton's weak charge. The weak charge is analogous to the more familiar electromagnetic charge. The experiment measured the small parity-violating asymmetry in elastic longitudinally-polarized electron-proton scattering, which allowed the first direct extraction of the proton's weak charge, Qwp. Although the scattering target was pure liquid hydrogen, the target cell was made of an aluminum alloy. Scattering from the thin aluminum cell walls contributes about 30% of the measured asymmetry and must be corrected for. This talk will provide a general overview of the experiment, with specific discussion on the treatment of this large experimental background. This talk will be suitable for a general audience.

Josh Magee came to William and Mary after a short career as a mechanical engineer. He joined the physics department in 2008, and studies fundamental symmetries in nature under Professor David Armstrong. His thesis experiment, Q-weak, studied the weak charge of the proton, and was conducted at Jefferson Lab. In this talk he will outline the experiment, and discuss his thesis work with removal the largest experimental background contributions.

Physics Potential of Neutrino-Nucleus Deep Inelastic Scattering in the MINERvA Experiment

Presenter: Anne Norrick
Advisor: Jeffrey Nelson
College of William & Mary,
Physics

Charged lepton-nucleus scattering experiments have been used to probe the structure of the nucleus at labs like Jefferson Lab for many years. These are useful for understanding parts of the structure of the nucleus, but not all parts are accessible through charged lepton-nucleus scattering, leading us down the murky path of neutrino-nucleus scattering. The potential for studying the structure of the nucleus using neutrino-nucleus scattering in the MINERvA detector using the NuMI beam line at Fermilab will be explored in this talk.

Anne Norrick was born in Minnesota, and started working in neutrino physics as an undergraduate at Barnard College in 2008. After a year working at Los Alamos National Laboratory, she started graduate school at William and Mary in 2011, and she has been working on MINERvA ever since.

Scattering of Ultracold Atoms from an Oscillating Barrier

Presenter: Andrew Pyle
Co-Authors: M, Ivory, K. Das, T. Byrd,
Advisor: Seth Aubin
College of William & Mary,
Physics

We present progress on an experiment to study 1D quantum mechanical scattering by an amplitude-modulated barrier. The oscillating barrier imparts or subtracts kinetic energy in discrete amounts from the scattered atoms. In this manner, the energy spectrum of the scattered atoms resembles a comb with a tooth spacing of that is directly proportional to the oscillation frequency of the barrier. Numerical simulations of the scattering process confirm this basic scattering picture. We present an atom chip-based experimental system to study the scattering dynamics with Bose-Einstein condensates (BEC) of 87Rb. The proposed experiment would be performed by using gravity to accelerate a BEC towards a tightly focused, 532 nm laser beam that serves as an oscillating barrier. Before interaction, gravity would be canceled by a linear potential gradient provided by a magnetic field to ensure constant atomic velocity during interaction with the barrier. Detection will be carried out with time a time of flight technique used to resolve discrete atomic packets. Dark-ground imaging will be used to detect small atom numbers, which will have the benefit of weaker interactions. This experiment represents a first step toward implementing a quantum pump for ultracold atoms based on two such barriers modulated out of phase with one another. Quantum pumping was originally proposed in the context of electron transport in nanowires, but has proven difficult to implement. The ultracold atom approach represents a possible route around the current experimental bottleneck.

AJ Pyle is a fourth year graduate student physics Ph.D. program at the College of William & Mary. He graduated from Kutztown University of Pennsylvania in 2011 with a B.S. in Physics and Chemistry.

Investigation of optically induced metal-insulator transitions in VO_2 thin films grown on Al_2O_3 and TiO_2

Presenter: Elizabeth Radue
Co-Authors: L. Wang, S.A. Wolf, E. Rossi, R.A. Lukaszew
Advisor: Irina Novikova
College of William & Mary, Physics

VO_2 is a paradigm of a highly correlated material that undergoes a phase transition, changing from an insulator phase to a metallic one upon increasing its temperature while its lattice structure changes dramatically. VO_2 has drawn interest because the insulator-metal transition (MIT) occurs just above room temperature at 154°F (68°C) enabling technological applications. It has been shown that VO_2 thin films can also undergo such phase transition when stimulated by an ultrafast optical pulse, leading to interesting applications, such as ultrafast optical switches and novel electronic devices. Thin films often exhibit different properties than bulk materials due to microstructure defects, strain, etc. Thus, we have been studying the metal insulator transition of VO_2 thin films grown on different substrates using a strong 100 fs pulse to induce the transition, while changing the arrival time of a weaker pulse to probe the changes of the film over time. Specifically, we have looked at two different VO_2 thin film samples, one grown on TiO_2 and one grown on Al_2O_3, in a pump-probe configuration, and found that the strain and differences in microstructure resulted in substantial difference the fluence threshold needed to induce MIT, as well in the relaxation times. By mounting the films in a cryostat, we also found that the fluence needed to achieve full MIT for the film on TiO_2 substrate did not depend on the sample temperature, implying that different mechanisms may be playing a stronger role in one film rather than the other for an optically induced transition.

Originally from Mt. Airy MD, Elizabeth Radue attended undergrad at Mount Holyoke College in Massachusetts graduating in the class of 2009 with a B.A. in Physics. She started at William and Mary in 2010 in the department of Physics and is working toward her doctorate. She has been involved with the Physics Association of Graduate Students and the OSA student chapter.

Four-Wave Mixing reduction for EIT-based stored light

Presenter: Gleb Romanov
Advisor: Irina Novikova
College of William & Mary, Physics

This project reports on the progress of the stored light experiment. We used Rubidium vapor to slow down and store pulses of resonant light. In the experiment, a strong control laser created Electromagnetically Induced Transparency (EIT) conditions for a weak probe laser. Under these conditions, it is possible to observe slow and stored light, and in principle single photon quantum memory. However, EIT conditions also introduced Four-Wave Mixing (FWM) that led to signal gain during the readout. This gain acts as a noise source in quantum memory experiments. I will describe our efforts to reduce the FWM and the associated gain.

Turbulence and Transport Suppression by Shear Flow in DIII-D H-mode Plasmas

Presenter: Xin Wang
Co-Authors: S. Mordijck, O. Meneghini
Advisor: Saskia Mordijck
College of William & Mary,
Physics

Understanding particle transport is always essential to predict density profiles for future tokamak devices. In high confinement tokamak plasmas, turbulence transport could cause large heat and particle loss. One of the mechanisms to suppress this turbulence transport is by localized stable flow shear. It could successfully reduce or even eliminate outward particle loss caused by different types of plasma instabilities. On DIII-D, recent experiments are designed to see the role of shearing flow on the changes in particle transport. We vary the input torque from co- to counter- direction through neutral beams. And the ExB shearing rates of these discharges are calculated. We compare the shearing rates with the linear instability growth-rates of the most unstable mode (calculated by TGLF[1] code), it shows that, for co and counter beam discharges, the ExB shearing rate becomes comparable or even larger than the growth-rate in the plasma edge. This gives good turbulence transport suppression and better density confinement. However, under balanced beam injections, the growth-rate is always larger than the shearing rate, so that particle transport will not be effectively suppressed, and thus the density profile would be lower.

Xin Wang is a Ph.D. candidate in the Department of Physics. He received his bachelor degree in University of Science and Technology of China, and his master's degree at William and Mary. His research specific is in plasma physics. He is currently focus on analyzing particle and momentum transport in H-mode high temperature tokamak plasma.

Electrodynamics of rare-earth-doped $CaFe_2As_2$

Presenter: Zhen Xing
Co-Authors: T.J. Huffman, P. Xu, A.J. Hollingshad, D.J. Brooker
Advisor: Mumtaz Qazilbash
College of William & Mary,
Physics

Rare-earth substitution at alkaline-earth sites leads to the suppression of the spin density wave phase transition in $CaFe_2As_2$ without the emergence of bulk superconductivity. In this work, we perform cryogenic infrared reflectance spectroscopy and spectroscopic ellipsometry on Pr-doped and La-doped $CaFe_2As_2$ single crystals. In both $Ca_{0.8}La_{0.2}Fe_2As_2$ and $Ca_{0.85}Pr_{0.15}Fe_2As_2$ samples, the spin density wave transition is completely suppressed. The temperature dependence of the ab-plane optical conductivity of the La-doped $CaFe_2As_2$ crystal exhibits conventional metallic behavior consistent with the absence of any structural, magnetic, or superconducting instabilities. On the other hand, the Pr-doped $CaFe_2As_2$ crystal undergoes a structural transition about 70 K from a tetragonal lattice to a collapsed tetragonal lattice with the same symmetry but reduced volume. In the Pr-doped $CaFe_2As_2$ crystal, the ab-plane optical conductivity reveals subtle but distinct spectral changes upon cooling through the structural transition. We provide results on the influence of the structural collapse on the charge dynamics, correlation effects and the electronic configuration.

Zhen Xing is a fourth year Ph.D. student in the Department of Physics and has been working in the photon spectroscopy lab with Prof. Qazilbash for more than two years.

Determination of the dielectric function of materials with scattering-type scanning near field optical microscopy

Presenter: Peng Xu
Co-Authors: T.J. Huffman, I. Kwak, A. Biswas
Advisor: Mumtaz Qazilbash
College of William & Mary, Physics

Apertureless scattering-type near field optical and infrared microscopy has been widely employed for imaging a variety of systems at the nanoscale including semiconductor nanostructures, organic biosystems, and phase coexistence during metal-insulator transitions. In apertureless, scattering-type near field infrared microscopy, one can measure both the near field amplitude and phase. To obtain the complex dielectric function of the material at nanometer length scales from the measured amplitude and phase, the inverse problem of near field interaction needs to be solved. We employed the lightning rod model [1] to analyze the near field interaction and obtain the dielectric function numerically. We present results for near-field infrared measurements on transition metal oxides including those that exhibit optical contrast due to coexisting phases. [1] A. S. McLeod et al. , Phys. Rev. B 90, 085136 (2014)

Peng Xu is a graduate student in the Department of Physics at the College of William and Mary.

Spatial structure of quantum noise in a squeezed vacuum field

Presenter: Mi Zhang
Co-Authors: R.N. Lanning, Z. Xaio, J.P. Dowling, I. Novikova
Advisor: Eugeniy Mikhailov
College of William & Mary, Physics

We use interaction of laser light with dense vapor of Rb atoms to modify quantum statistics of the optical field and to produce a so-caller "squeezed" vacuum field of light, in which amplitude and phase noise is altered compare to a regular laser field (known as a "coherent" optical field). We achieved a 2dB (33%) reduction in the measured quantum noise compared to the shot noise limit, which is the fundamental limit of measurement accuracy when a coherent optical field is used. When a spatial mask was applied to the beam after its interaction with atoms, we observed that the detected quantum noise suppression strongly depended on the shape of the mask.

Mi Zhang is a fourth year graduate in the department of physics. She works in the quantum optics group since the summer of 2012. Her work focuses on the squeezed vacuum field of light generated from interactions between light and atoms.

The Predictive Validity of Compassionate Love, Parent Relationship Status, and Parent Relationship Quality on Coparenting Relationships

Presenter: Regina Alexander
Advisor: Katrina Walker
Virginia State University,
Psychology

Coparenting has become more popular due to declining marriage and rising divorce rates. The coparenting relationship has become extremely important in efficiently raising children. The current study examined the effects of compassionate love, parent relationship status, and parent relationship quality on coparenting relationships which include parenting alliance and maternal gatekeeping. Research questions include: What is the relationship between compassionate love and parent relationship quality with coparenting relationship?; and, What is the predictive validity of compassionate love and parent relationship quality on coparenting relationships? It was hypothesized that compassionate love, parent relationship status, and parent relationship quality would have a significant relationship with parenting alliance. It was hypothesized that compassionate love, parent relationship status and parent relationship quality would have a significant relationship with maternal gatekeeping. It was also hypothesized that compassionate love, parent relationship status and parent relationship quality would predict parenting alliance and maternal gatekeeping. One hundred and thirty-one single, unmarried women ages 19-55 were recruited to participate in the current study. Along with demographic variables, the participants were given questionnaires to access compassionate love, parent relationship quality, parenting alliance and maternal gatekeeping. Results will be presented at the conference. It should be understood that compassionate love, parent relationship status, and parent relationship quality may play an important role in the relationship between coparents.

Regina Alexander is a second year Clinical Psychology Master's student at Virginia State University. Her research interests include romantic relationships, coparenting relationships and the relatively new concept compassionate love.

Multilingualism, a Linguistic and Cultural Treasure for the 21st Century

Presenter: Nuria Ballesteros Soria
Co-Authors: S. Gómez Martinez
Advisor: Sandra Stjepanovic
West Virginia University,
World Languages, Literatures & Linguistics

The goal of this talk is to present "Multilingual Families," a very innovative education project funded by the European Union which is targeted at preserving the linguistic and cultural diversity of the 47.3 million immigrants living in the European Union, since they represent a very valuable treasure. The project aims to support and inform immigrant or multilingual parents as to how and why to raise their children multilingually in an informal setting. This project will answer the following questions: Why should we support children's learning and continuing use of the family language?, what can we do to support them? and how do we implement real language support so that they learn the family language and retain it? The logical steps of the project build on each other and include research on immigration and language acquisition and needs analysis, development of materials for teachers, community stakeholders, parents and children, technical design of resources and multi-translation, piloting of the materials and recommendation and implementation resource pack. There has been piloting that will allow schools to have fully autonomous use of the resources produced after the end of funding. With institutions from 6 different countries involved, this project has created so far highly practical resources for teachers, parents, children, educators, social workers, etc. in 17 languages and in different formats (text, audio, video). Those materials have already been piloted in 6 countries in Europe, are extremely easy to implement and available for free on the project website http://www.multilingual-families.eu.

Nuria graduated with a B.A. degree in Translation and Interpreting from the University of Valladolid in Spain, and is currently a second semester student in the M.A. program in TESOL and Linguistics at West Virginia University. She has been involved in several national and internationals research and innovation projects related to second language

Perceived Stress, Psychological Adjustment and Antisocial Behavior in African American College Students

Presenter: Kourtney Bell
Advisor: Katrina Walker
Virginia State University,
Natural and Health Sciences

Over the past few decades, many research studies have examined antisocial behavior and how it develops in childhood and adolescence and follows into adulthood. The purpose of this study is to examine the relationship between perceived stress and psychological adjustment with antisocial behavior in African American college students. Four hypotheses were tested: 1) Participants who have high levels of perceived stress will report high levels of antisocial behavior; 2) Participants who have high levels of psychological adjustment will report lower levels of antisocial behavior; 3) Participants who have high levels of perceived stress and low levels of psychological adjustment will report highest levels of antisocial behavior and 4) Stress and psychological adjustment will predict antisocial behavior. Participants were 200 student volunteers between the ages of 18-26 enrolled in psychology courses at a Historically Black University. Stress levels were measured using the Perceived Stress Scale (PSS). Participants were given the Mental Health Inventory (MHI-5) to assess psychological adjustment and antisocial behavior was measured using the Young Adult Antisocial Behavior Scale. All questionnaires were completed using Qualtrics Online Survey Software. Data was analyzed using correlation analysis, analysis of variance (ANOVA), and a multiple regression.

Kourtney Bell is a third year doctoral student in the Clinical Health Psychology Program at Virginia State University. Her pre-doctoral educational training was at George Mason University where she earned her Bachelors of Science degree in Psychology and a minor in Dance Appreciation. Kourtney will receive her Masters of Science degree in Clinical Psychology from Virginia State University this May. Kourtney's primary research interests are stress, coping, and control. In the future, she would like to work in an outpatient mental health facility conducting assessments/evaluations within groups to encourage healthy behaviors and promote healthy behavioral change.

Individual Differences in Base Rate Neglect

Presenter: Kunjoon Byun
Advisor: Christopher Ball
College of William & Mary,
Psychology

When making evidence based judgments regarding the predicted likelihood of an event, normative formulae incorporate new evidence in mathematically appropriate ways. However, when people make these decisions without access to these normative tools, they rarely follow these normative steps. For example, some people simply ignore the early evidence and rely solely on the latest evidence for making their judgments, while others rely solely on the early evidence and ignore any new evidence that arises. Past research has focused primarily on ways to move judgments from non-normative responses to normative solutions. For the most part, these approaches have been somewhat successful, but usually more than half of the participants in these studies still fail and continue making non-normative judgments. The goal of the present research is to determine if individuals are consistent in the way they approach these judgment problems, and whether these individual differences can be measured in some way. This would allow us to predict non-normative patterns of judgments before the judgments were actually made. Participants provided multiple responses to real-life decision scenarios that can be best solved using Bayes Theorem. Individual differences in response patterns were revealed, and then related to participants' responses to questionnaires that measured their basic probability understanding and their attitudes to the use of probability-based data for making decisions. The implications of these findings for assisting probabilistic reasoning in real world applications are discussed.

Kunjoon Byun is a first year graduate student in the Psychology department at College of William and Mary. He is from South Korea and finished his undergraduate at University of Wisconsin - Madison. He is interested in judgment and decision making and social psychology research.

Investigating personal identity in reminiscence research: Identity-relevant periods and domains of life

Presenter: Brian Carle
Advisor: Thomas Pierce
Radford University,
Psychology

Reminiscence, rather than passive recall of life experiences, may be considered as a process which informs individuals' sense of identity, throughout life (Webster, 1999). Based upon the well-established "reminiscence bump" phenomenon, in which events from the young adult period are remembered with relatively high frequency, experiences from young adulthood, in particular, may be closely integrated into self-concept (Rubin, 1998). The current study investigates how individuals build their life narrative and sense of self based on their lifetime of experiences. We employ the "lifeline" measure of autobiographical memory, in which older adults physically draw the course of their life from birth to present, with peaks and troughs representing positive and negative experiences (literally, "ups and downs") (Schroots, 2003). Importantly, the lifeline measure does not impose an objective chronological scale, and of primary interest in the current study is whether the young adult period (ages 14-29) may take up a disproportionately large share of the lifeline's space, as well as contain a relatively large portion of life events (Pierce & Schroots, 2012). Ongoing data collection via lifeline-based interviews is also exploring the underpinnings of the reminiscence bump in different domains of life (i.e., Family, Work, Social). Our theoretical view is that the expansion of the young adult period on the lifeline would point to how the young adult period may form a major basis for personal identity, and lifeline/ life event data is presented to address this subject.

Brian Anderson Carle is a second-year graduate student in the Experimental Psychology (M.A.) program at Radford University and a graduate in Psychology (B.A.) from the University of Virginia. His research has focused on aspects of personality and identity, incorporating perspectives ranging from behavioral genetics, personality testing, and autobiographical memory. He hopes to pursue a Ph.D. in psychology beginning next Fall, towards a career in social science research and academia.

The Psychometric Properties of the Assessment of Attitudes, Beliefs, and Behavioral Intentions Scale (AABBIS)

Presenter: Stephen Casazza
Co-Authors: L. Barbir, E. Ludwig, A. Vandevender
Advisor: Jay Caughron
Radford University,

Sexual and gender minorities continue to face social stigma, heterosexism, discrimination, and violence (APA, 2012). The purpose of the current study is to create a scale that measures heterosexist and homopositive attitudes and behavioral intentions as they relate to each of three sexual minority groups: gay, lesbian, and bisexual. Additionally, the instrument assesses for both positive and negative attitudes and behavioral intentions toward transgender individuals. Research (e.g., Worthen, 2012; Norton & Herek, 2012) has pointed out the need to further separate and examine these subpopulations; not only do heterosexuals show differing attitudes towards each of the subpopulations, but the nature of the stigma experienced by each group is also different. Furthermore, there has been research that supports self-reported attitudes may differ significantly from one's intentions in certain situations (Fishbein & Ajzen, 2005). Therefore, this measure intends to assess incongruences between attitudes and behavioral intentions in each of the groups identified. A survey was developed and distributed to 342 college students at a mid-sized public university in Southwest Virginia. Exploratory factor analysis was conducted using a varimax rotation technique to determine appropriate factors associated with attitudes and behavioral intentions toward lesbian, gay, bisexual, and transgender groups independently. It was expected four factors would emerge from the analysis: homopositive attitudes, heterosexist attitudes, homopositive intentions, and heterosexist intentions. Development of a psychometrically sound instrument to examine differing attitudes and behaviors towards each of the groups has important implications for addressing discrimination and experiences of respective group members on college campuses.

Stephen Casazza is a first year student enrolled in the Psy.D. program of Counseling Psychology at Radford University.

Evaluation of a brief neurometric battery for the detection of changes in brain activity associated with cognitive decline in older adults

Presenter: Emily Cunningham
Advisor: Paul Kieffaber
College of William & Mary,
Psychology

Although the early detection of cognitive decline associated with Alzheimer's disease may be a critical to successful treatment and prevention, the detection process is complicated by the fact that overt behavioral changes often do not manifest until years after the onset of neurodegeneration. As a cost-effective, flexible, and noninvasive means of assessing changes in brain activity, electroencephalography (EEG) holds promise in this area, and the purpose of this study was to evaluate the sensitivity and clinical practicality of a brief battery of EEG-based neurometrics for the detection of subtle changes in sensory and perceptual function associated with mild to moderate levels of cognitive impairment. The goals of this study were (a) to evaluate the capacity of older adults with mild to moderate levels of cognitive impairment to successfully complete this battery, (b) to determine whether this paradigm could be used to detect subtle differences in brain activity associated with different levels of cognitive function, (c) to evaluate this design in relation to existing neuropsychological and neuroimaging assessment techniques. Responses were obtained from 30 older adult participants recruited from a local memory clinic. The task was well-tolerated in this sample, and multidimensional profiles of electrophysiological activity were successfully created for these participants. Preliminary results suggest that these electrophysiological profiles may be used to meaningfully differentiate between individuals at different levels of cognitive impairment, and analyses of these profiles in conjunction with neuropsychological and volumetric data support the potential utility of this procedure in clinical settings.

Emily Cunningham is currently in her second year of the M.A. program in Experimental Psychology at the College of William and Mary, where she works in the Cognitive Psychophysiology lab under the direction of Paul Kieffaber.

Emotion Recognition, Theory of Mind and Schizotypy

Presenter: Docia Demmin
Advisor: Glenn Shean
College of William & Mary,
Psychology

Schizophrenia is associated with deficits in social cognition including: emotion perception, social perception, theory of mind and social knowledge. Schizotypal traits are also associated with similar but less severe deficits in social cognition, including emotion recognition and social competence. This study was designed to compare the performance of groups of schizophrenic patients and students who scored at or slightly below an average level on a widely used schizotypal personality questionnaire on a series of tasks involving emotion recognition and various levels of social awareness.

Docia Demmin is a 2nd year graduate student in the M.A. in Experimental Psychology program. The goal of her research is to examine the mechanisms underlying cognitive deficits in schizophrenia and spectrum disorders. Her current research interests lie in social cognition, specifically impairments in emotion processing and theory of mind. She has particular interests in the developmental patterns of these deficits, and the factors that contribute to a reduced functioning.

GameMaps: Using Big Data to Understand Enjoyment

Presenter: David Dobolyi
Advisor: Michael Kubovy
University of Virginia,
Cognitive Psychology

Psychologists have long been interested in measuring and predicting how people evaluate the episodes of their lives. One of the few theories to attempt this is Kahneman's peak-end rule, which suggests that people base their evaluations on two factors: (a) the intensity of its emotional or sensory peak and (b) the upward or downward trend of this intensity at the end of the episode (Kahneman et al., 1993). While this rule has proven to work well for simple events, it often fails to predict evaluations of complex episodes. "Big data" offers a novel approach for modeling evaluations of these complex episodes. Specifically, we have been investigating NBA basketball games, which offer rich, structured episodes to which fans respond by posting to Twitter. To this end, we have collected: (a) game statistics for the entire 2013-2014 NBA season and (b) Twitter data for these games. By combining these two data sources, we have begun exploring which features of games dictate people's enjoyment in terms of engagement. We also describe a variety of techniques—including cluster analysis, temporal causal modeling, and sentiment analysis—to evaluate how different types of games or features of games predict tweeting by fans. Ultimately, we hope to show that "big data" offers a unique way to model how people evaluate the episodes of their lives. We also present recommendations for best practices when applying "big data" methods to social science research based on what we have learned.

David Dobolyi is a Ph.D. candidate in cognitive psychology at the University of Virginia, and a student of Chad Dodson and Michael Kubovy. He possesses a strong background in computer programming and software development, and his research focuses on using the best statistical modeling techniques to answer a variety of theoretical and applied questions. Domains of interest include eyewitness confidence, Parkinson's disease, and the evaluation of life episodes.

Neurometric Profiling of Autism Spectrum Disorders Using the Brief Neurometric Battery (BNB)

Presenter: Leigh Gayle
Advisor: Paul Kieffaber
College of William & Mary,
Psychology

Autism Spectrum Disorder (ASD) is a group of pervasive developmental disorders, often appearing in a child by age two, characterized by atypical development of social and communication skills. The CDC has recently estimated that 1 in 68 children have been diagnosed with ASD; which is an increase of 30% from the previous estimate of 1 in 88. Considering the dramatic increase in prevalence of this disorder, a major theme in current autism research is early identification. One of the current "Areas of High Priority for Research" at the NIMH is identifying biometrics that have the potential to be utilized for detecting vulnerability, diagnosis or treatment efficacy, and/or severity of mental disorders. The current research aims to identify neural biometric (aka neurometrics) markers of ASD-like personality traits in students at the College of William and Mary (ages 18-24). Using a novel EEG-based methodological approach, called the Brief Neurometric Battery (BNB), we will measure 9 different neurometric indices of brain function in a concise 20 -minute task. It is expected that a neurometric profile of ASD can be created for this population through the identification of clusters of abnormal ERP components and oscillatory activity. Future directions for research include the use of the BNB to determine if a similar electrophysiological profile (s) can used in a clinical population of children diagnosed ASD.

Leigh Gayle is a first-year Master's student in the Psychology department. She works in the Cognitive Psychophysiology Lab with Dr. Paul Kieffaber as her advisor. Her research interests include the neural correlates of autism spectrum disorder. After completing her Master's degree, she plans on attending a Ph.D. program in Cognitive Psychology or Behavioral Neuroscience to continue her research.

Are All Musicians Always Better than Non-Musicians on Music-Related Tasks?

Presenter: Laura Getz
Advisor: Michael Kubovy
University of Virginia,
Cognitive Psychology

In this study, we were interested in whether musicians always have an advantage over non-musicians on music-related tasks; in other words, we wanted to know if musicians' perceptual advantages shown in previous literature (e.g. Rauscher & Hinton, 2003) extend across genre boundaries. To answer this question, we investigated rhythm expertise using Latin salsa music as a case study. Each Latin salsa music style is associated with a characteristic clave pattern that constitutes essential structure for performers. We asked what types of expertise are needed to detect the correct clave--salsa pairing. Using two clave patterns (the 3--2 and 2--3 *son* clave) and three manipulated alternatives, we asked listeners to choose the correct clave pattern for a variety of bomba, calypso, mambo, and merengue excerpts. The results show that listeners unfamiliar with salsa were unable to detect the correct salsa--clave pairing. Listeners who had some music training or were familiar with salsa detected the need for rhythmic irregularity but not the specific pairing. Only musicians well-acquainted with salsa correctly detected the salsa--clave pairing. We conclude that the distinction between the 2-3 and 3-2 clave patterns is not inherent in the music itself, but rather is a convention to be learned through exposure and training. Therefore, we show that training in one musical genre may not generalize to other genres. We thus demonstrate a specificity of expertise that is genre-specific rather than domain-specific, challenging the unitary nature of music expertise.

Laura Getz is a cognitive psychology Ph.D. graduate student at the University of Virginia working with Dr. Michael Kubovy. She is broadly interested in auditory perception, with specific interests in the processing of complex rhythms and the overlap between music and language processing. Laura has been recognized for her research, most notably with an NSF Graduate Research Fellowship, and for her teaching.

Influences of Science Fiction & Fantasy Fandom on Implicit and Explicit Bias

Presenter: Melissa Gomez
Co-Authors: E. Cunningham, S. Jugo, T. Powell, C. Dickter
Advisor: Jen Stevens
College of William & Mary,
Psychology

As science fiction and fantasy become more prevalent in the media, the need to study self-identified sci-fi and fantasy fans in the psychological context increases. The current talk discusses two studies concerning the relationship between sci-fi and fantasy fandom and bias. In study 1, three hundred participants (225 fans) recruited from Amazon's Mechanical Turk completed the Gender-Science Implicit Associations Test as well as four measures of explicit sexism. Among self-identified fans, greater enjoyment of sci-fi and fantasy predicted less implicit bias against women in science. Furthermore, among male fans, enjoyment predicted less explicit fandom. Study 2 sought to extend these findings to explicit bias against Blacks, Hispanics, Lesbians and Gays. It was hypothesized that fans would demonstrate less bias than non-fans. Six hundred-ten participants (315 fans), recruited from an undergraduate institution in Southeast Virginia, completed measures explicit bias toward Blacks, Hispanics, Lesbians, and Gays, as well as measures of warmth toward various groups (e.g. Republicans, Christians, and Habitat for Humanity). As predicted, fans scored significantly lower on measures of racism against Blacks. Interestingly, fans were less internally motivated to not appear prejudiced (but not more externally motivated). Fans were also significantly less warm toward Christians and Caucasians, implying bias. There were no differences between fans and non-fans on measures of bias toward Hispanics, Lesbians, or Gays. These findings suggest that fandom is related to bias. Future research should elaborate on this relationship even further

Melissa Gomez is a second year Master's student in the Experimental Psychology program at William & Mary. She studies influences of implicit attitudes on stereotyping, prejudice and behavior.

Study the Diversity of International Students in Different Graduate Programs in USA

Presenter: Sevinj Iskandarova
Advisor: Oris Griffin
James Madison University,
Psychology

Each year more and more students become interested in studying abroad in the United States of America. Based on Open Doors Data of Institute of International Education (IEE), 819,644 students enrolled in American colleges and universities in 2012- 20131; moreover, currently the number of student enrolled in 2013-2014 is 886,0522. Given the popularity and the value of studying abroad, developing countries appreciate such programs, and are looking for methods to increase exchange programs aboard. However, international students seek programs abroad that are well-know and often overlooking other universities, colleges and with similar programs or prestigious. This paper explores strategies that assist with students' awareness of similar programs at other institutions, increasing the number of graduate programs within the USA and to increase the number of international students enrolled in other programs. Based on statistical reports, there is a huge gap in the number of international students enrolled in various graduate programs within the US. This study will also explore the USA's performance in the world markets for international education and its international students.

Sevinj Iskandarova is from Baku, Azerbaijan, and is a master's student in JMU. She received her bachelor's degree in 2011 from Khazar University, School of Humanities and Social Sciences in Baku, Azerbaijan, During her university years as a teacher, she participated in numerous projects, seminars and programs. She was also a trainer, an education advisor, and a Human Resources specialist.

Implicit Learning of Context-Predictive Associations: A New Method for Studying Visual Illusions

Presenter: Evan Jones
Advisor: Peter Vishton
College of William & Mary,
Psychology

Previous research has shown that the visual context we experience helps to guide and deploy our attention, increasing our ability to discern relevant visual information from complex environments quickly and accurately. Moreover, this visual learning from context often occurs unconsciously and automatically. One recently studied example of this is "contextual cuing", in which participants don't consciously recognize a repeated image within a sequence, but process the image faster. We were interested in whether this phenomenon extends to context-predictive associations, whereby the context cue is presented prior to the search display. To test this, we used an eye tracker to investigate whether subjects would implicitly learn the predictive relationship between an object's size (a small vs. large disk in the middle of a blank screen) and the location (left vs. right visual field, respectively) of a target (a "T" amongst numerous distractor "L's"). Preliminary results indicate that there is a reliable relationship between disk size and search strategy between the predicted right and left visual field, and that this effect occurs without participants' explicit awareness. We further extended this by surrounding the central disk with smaller or larger peripheral disks, creating an Ebbinghaus illusion. We expect this contextual manipulation to modulate the effect of disk size on differential looking times, depending on whether the illusion was used to perceptually enlarge or dwarf the predictive cue. We feel that this novel approach to studying people's unconscious perception of visual illusions will provide useful evidence for assessing current theories of visual processing.

Evan Jones is a first year M.A. student from Eugene, OR. I have degrees in philosophy and psychology and hope to use new research methods from psychology to answer old philosophical questions. In particular, I'm interested in the relationship between perception, action, and the environment.

Examining effects of early-life environment on life history strategy, with a focus on priming conditions

Presenter: Humama Khan
Co-Authors: M. Emanuel, H. Keil, M. Ancona
Advisor: Michael Frederick
University of Baltimore,
Applied Psychology

Growing evidence indicates that the early-life environment can have an enduring influence on an individual's metabolism, neurochemistry, and behavior. Life history theory suggests many of these long-term effects may represent expressions of a "fast" or "slow" life history strategy. Urban research programs are particularly useful for assessing the influence of the early-life environment because of the large amount of archival data available. Previous research examining the impact of priming conditions on the expression of life history strategies has produced inconsistent results. Earlier research reported that when individuals were exposed to a news article that indicated high levels of violence and mortality in the environment, those who grew up in low-status environments, and consequently had faster life history strategies, reacted to the prime by becoming more impulsive on a delay discounting measure. Some research has failed to replicate this study; it needs to be examined further to identify and refine the priming conditions that are most useful. Participants from the University of Baltimore, who are primarily lifelong city residents, will provide their childhood address blocks and complete a variety of behavioral surveys. We hypothesize that individuals who were born small or developed in low status environments will demonstrate faster life histories, diminished inhibitory control, and an increased propensity towards short-term gains. We also hypothesize individuals who developed in environments high in resource scarcity will display faster life history strategies and will become progressively more focused on short-term goals after exposure to a mortality prime, specifically writing about their own death.

Humama Khan is pursuing her Master's Degree in Applied Psychology at the University of Baltimore. She graduated with a Bachelor's Degree in Experimental Psychology from the University of South Carolina in 2013.

Close Contact and Attitudes Towards Latinos

Presenter: Jasmine Koech
Advisor: Cheryl Dickter
College of William & Mary,
Psychology

Latinos are the largest minority group in the U.S. (Gandara, 2010). This is important when considering the limited literature regarding Latino and non-Latino interactions and acknowledging possible barriers that could prevent peaceful communication between groups. It is well documented that higher levels of prejudice can increase conflict between groups. The contact hypothesis (Allport, 1954; Amir, 1976; Pettigrew, 1997; Williams, 1947), a well-tested theory, has demonstrated that constructively increasing intergroup contact can help to reduce prejudice towards outgroup members, thereby reducing this conflict (Pettigrew & Tropp, 2006). Research has begun to illuminate the role that contact between Latinos and non-Latinos can play in reducing prejudice. For example, Brannan and Waltan (2013) found that implicit bias can be reduced by structurally increasing contact between Latinos and White or Asian participants. Other work has argued that more friendships with Latinos was predictive of a rejection of negative attitudes towards Latinos while other forms of contact (i.e., high school diversity or Spanish fluency) did not mirror these effects for White and Black participants (Ellison, Shin, & Leal, 2011). While this study noted the important role of close contact, it failed to directly measure either explicit or implicit prejudice. The current research expands on previous work by including measures of contact that focus on close, personal interactions and attempts to interpret the role it plays on predicting implicit and explicit prejudice on multiple measures. It is hypothesized that more close contact with Latinos will be predictive of lower implicit and explicit prejudice towards Latinos.

Jasmine Koech is currently a first-year master's student in the psychology department. Her research focuses on intergroup contact and prejudice.

Emotional face processing in young adults with self reported autistic behaviors

Presenter: C. Teal Kozikowski
Co-Authors: J. Burk, C. Dickter, J. Zeman
Advisor: Joshua Burk
College of William & Mary,
Psychology

Autism spectrum disorders (ASD) are characterized by difficulty with social responses which may contribute to trouble forming social relationships. These challenges may be due to differences in interpreting facial emotions. The goal of this study was to understand the relationship between autistic behaviors and the ability to attend to and correctly identify a target emotional face amongst other faces expressing the same or different emotions. Participants were 70 undergraduate students who completed the Autism Quotient (AQ; Baron-Cohen et al., 2001). Participants' task was to identify the target face emotion amongst distractor faces. Reaction times for accurate trials were compared between those students with total AQ scores in the top third with those in the bottom third as well as for the five AQ subscales. A mixed-model ANOVA yielded a significant target x flanker x Social Skill AQ subscale group interaction and a significant target x flanker x Communication AQ subscale group interaction. Further investigation of the results revealed that those in the top third and those in the bottom third of these AQ subscales were differentially affected when the flanker stimuli displayed an angry emotion. Adults undiagnosed with ASD who report higher levels of social characteristics associated with ASD do not differentially attend to target emotions whereas those who report lower levels of these characteristics do exhibit reaction time differences when the target face is surrounded by angry emotional faces.

Teal Kozikowski graduated from Wake Forest University in 2013 and is currently in her second year of the Master in experimental psychology program at William and Mary. Under the advisement of Dr. Joshua Burk, her research interests at William and Mary include cholinergic influences on attention and cognitive flexibility and attentional differences in those who report autistic like behaviors.

Attention to emotional faces in adults as a function of autism-related attention switching abilities

Presenter: Catherine Mitchell
Co-Authors: J. Burke, S. Taylor, J. Zeman
Advisor: Cheryl Dickter
College of William & Mary
Psychology

Research examining autism spectrum disorders (ASD) has demonstrated that autistic individuals experience attentional and emotion identification impairments (Gross, 2004; Keehn, Mueller, & Townsend, 2013). The goal of this research was to test whether adults with varying levels of self-reported autistic behaviors would perform differently on a task that combined attentional processing and emotional identification. Participants were 167 college students, who completed the Autism Quotient (AQ), a self-report measure of autistic-like behaviors. Participants completed a modified visual search task, which assessed their reaction time and accuracy for identifying a unique emotional face among 8 or 16 discrepant emotional faces. Additionally, the face stimuli displayed either basic emotions (i.e. happiness or sadness) or complex emotions (i.e. surprise or fear). Participants whose AQ score indicated stronger attention-switching ability responded faster to basic emotion targets, or targets surrounded by discrepant basic emotions. Participants with poor attention-switching ability also responded faster to basic emotion targets and targets surrounded by discrepant basic emotion stimuli, but they also responded significantly more slowly when both the target and discrepant stimuli displayed complex emotions. These results indicate that undergraduates with poorer attention-switching abilities have a difficult time identifying discrepant emotions when all faces display complex emotions. Individuals with more autistic behaviors specific to attentional control may have difficulty detecting emotional face content in situations involving multiple complex emotions. These findings may help shed light on core differences underlying the social processing challenges associated with ASD.

Catherine received her B.S. in Psychology from William & Mary in 2014. She is now a first year Experimental Psychology master's student at William & Mary. Her research interests focus on neural and psychological differences in autism spectrum disorders.

Powerful Schemas: Feelings of Power Bias Social Categorization towards Traditional and Majority Racial and Sexual Identities

Presenter: Gandalf Nicholas
Co-Author: N. Alt
Advisor: Cheryl Dickter
College of William & Mary
Psychology

Interpersonal power has been linked to several biased cognitive processing strategies, including over-reliance on previous information and confirmatory information-seeking. However, the way such cognitions reflect on the ubiquitous process of social categorization is unclear. The current studies aimed to explore how feelings of power bias the labeling of racially and sexually ambiguous targets. Specifically, we presented participants with mixed-race faces to be categorized as Black, White, or Multiracial (Study 1), and faces of individuals of different sexual orientations to be categorized as Straight or Gay (Study 2). As an experimental manipulation in study 1, participants either wrote about a time they felt powerful (i.e., had influence over someone else) or a time they felt powerless. In study 2, power was manipulated by having participants hold up a fist during the experiment (vs. a non-powerful hand gesture). We hypothesized that participants primed with power would rely more heavily on existing social schemas and base rate information about race and sexual orientation. Specifically, participants would categorize racially ambiguous targets using traditional Black or White labels, and targets of unknown sexuality using the heteronormative Straight label. Our findings confirmed this hypothesis, with both Multiracial and Gay categorizations being less common when participants felt powerful. These findings expand current theories of power by linking the cognitive biases that result from assymetrical resources control to the automatic process of social categorization. Furthermore, our results suggest that those in power, who hold the most social influence, can significantly hinder the acceptance of non-traditional and minority identities.

Gandalf Nicolas is a Masters student at the College of William & Mary. He studies neural and behavioral processes associated with social categorization, especially in the context of categorical ambiguity.

"Lumping" and "Splitting" are Distinct Traits with Distinct Nomological Nets

Presenter: Victoria Oleynick
Advisor: Todd Thrash
College of William & Mary,
Psychology

We examined individual differences in cognitive integration ("lumping") and differentiation ("splitting"). Lumping refers to seeing connections, analogies, and similarities between objects, ideas, and people, and it thus results in a tendency to mentally group things together in broad categories. Splitting, on the other hand, refers to seeing distinctions, contrasts, and differences between objects, ideas, and people, and it thus results in a tendency to mentally split things into smaller categories. Traditionally, lumping and splitting have been treated as categorical and mutually exclusive (meaning a person is considered to be either a lumper or a splitter, but not both), or as opposite ends of a single continuum. We tested this view scientifically, also considering the possibility that lumping and splitting may be independent or positively related dimensions. We developed the Lumping-Splitting Questionnaire (LSQ), which measures individuals' trait levels of both lumping and splitting. Results from a confirmatory factor analysis indicate that lumping and splitting are distinct (i.e., they form two factors) and are positively correlated at the between-person level. We also examined the constructs' nomological nets; While both lumping and splitting related positively to the Big 5 trait of openness, lumping was uniquely related to agreeableness and approach temperament, and splitting was uniquely related conscientiousness and avoidance temperament. Implications for theory will be discussed.

Victoria Oleynick is an M.A. student in the Psychology department at the College of William and Mary, working with Dr. Todd Thrash. Her core research interests are motivation, emotion, and personality.

EEG Correlates of Kinematic Properties of Hand Movements

Presenter: Kenneth Juston Osborne
Advisor: Paul Kieffaber
College of William & Mary,
Psychology

Movement is arguably the most important function of our nervous system. Recent research has shown that everything from how our brains perceive other's emotions to how we plan and execute goal-directed behaviors is in part dependent on our motor system (Niedenthal, 2007; Gallese, Fadiga, Fogassi, & Rizzolatti, 1996). Given the important role our motor system plays in understanding and interacting with the world around us, it is surprising that the majority of psychophysiological neuroscience research has focused primarily on sensation and perception irrespective of its relationship(s) to the execution of movement. Our current project addresses this limitation in the field. Utilizing novel methods, we have developed a procedure able to track the kinematics of human movement during EEG. We aim to determine if patterns of brain activity are able to predict subsequent kinematic movements in healthy young and older adults. Building a profile of brain activity during movement could potentially give us a neurometric that could be used to differentiate between healthy older adults and older adults suffering from the cognitive decline associated with mild cognitive impairment (MCI). Having a neurometric capable of discriminating between cognitive decline and healthy aging would aid in the early diagnosis of MCI, which would be useful in implementing preventive treatment before more severe decline occurs.

Juston Osborne is currently a first year Master's student in the Psychology Department at the College of William and Mary. He works in the Cognitive Psychophysiology Lab and is supervised by Dr. Paul Kieffaber. He is broadly interested in studying the predictors and biomarkers of cognitive decline in neurodegenerative disorders.

Depression, Obesity and Perceived Vulnerability to Disease in African American College Students

Presenter: Jessica Roane
Advisor: Katrina Walker
Virginia State University,
Clinical Health Psychology

Research has grown on how one perceives their vulnerability and how it is related to promoting positive health behaviors. Both depression and obesity have been linked to increased risk for developing disease. The purpose of this study will be to examine the relationship between depression, obesity and perceived vulnerability to disease in African American college students. Four hypotheses will be tested: 1) Individuals who report a higher body mass index (BMI) and report a higher rating of depression will score higher in perceived vulnerability to disease, 2) Individuals who report a higher body mass index (BMI) will score higher on depression scales, 3) Individuals who report higher ratings of depression will score lower in perceived vulnerability to disease and 4) Individuals who report higher body mass index (BMI) will score higher in perceived vulnerability to disease. Participants will be 100 college student volunteers between the ages of 18-26 enrolled in psychology courses at a historically black university. Ratings of depression will be measured using the Center for Epidemiologic Studies Depression Scale (CES-D). Participants will be given a demographics questionnaire asking height and weight to calculate body mass index (BMI). Participants' perceived vulnerability to disease will be measured using the Perceived Vulnerability to Disease Scale. All questionnaires will be completed using Qualtrics Online Survey Software. Data will be analyzed using a multiple regression, correlational analysis and analysis of variance (ANOVA).

Jessica E. Roane is a Ph.D. student in the clinical health psychology program at Virginia State University in Petersburg, Virginia. She received her undergraduate degree in psychology from North Carolina Agricultural and Technical State University in Greensboro, North Carolina. At a young age she realized with her talkative behaviors, that she had a gift, which was useful to all those around her. She decided to pursue this gift and chose the field of psychology.

Perceptions of OCBs and CWBs in the workplace: The influence of age and gender stereotypes

Presenter: Boglarka Vizy
Advisor: Jenessa Steele
Radford University,
Psychology

Previous research has shown that gender stereotyping occurs in the workforce. Findings on gender stereotypes clearly paint a picture of a male-dominated workforce, with common stereotypes focusing on male strength and assertiveness, while women are portrayed as more nurturing and less capable. Stereotyping based on age can also be detrimental to employees in the workforce; their chances of excelling are severely limited. Many individuals may be denied a job based on the idea that older workers are less flexible, reliable, and productive. The goal of this research is to examine age and gender stereotypes in the workplace and how it affects student ratings of target employees based on measures of performance evaluation, competence, reward recommendation, and punishment severity by implementing a 2 (age: 25/60) x 2 (gender: male/female) x 2 (workplace behavior: Organizational Citizenship Behavior/ Counterproductive Work Behavior) between and within-subjects experimental study. Only age and gender are manipulated across vignette conditions except for control groups that have no age or gender identifying information. Data collection is ongoing, but we anticipate data analysis to reveal significant main effects for age and gender for all four DV's (and a significant interaction on reward recommendation and punishment severity) when performing OCBs and CWBs. Additionally, we expect experimental group means to be significantly different than control group means. Our study has the potential to alert organizations of the negative effects of existing stereotypes in the workplace, prompting them to implement action of a discrimination-free employee selection and review process.

Boglarka Vizy is currently a second year student at Radford University in the Experimental Psychology Program. She received her B.S. in Psychology from Virginia Commonwealth University.

Social Influence on Emotion Experience and Physiology

Presenter: Emily Willroth
Advisor: Matthew Hilimire
College of William & Mary, Psychology

Social information can profoundly influence behavior, but its effect on emotion experience is unclear. In two experiments, I will investigate whether others' emotion ratings affect self-reported and physiological indices (skin conductance response, skin temperature, and the late-positive potential component of the event-related potential) of emotion in response to emotional stimuli. In Experiment 1, pleasant and unpleasant pictures will be preceded by non-reinforced social information indicating low or high emotion ratings from previous participants. Trial-by-trial emotion intensity expectancies will be collected and are expected to mediate the relationship between social information and emotion experience. In Experiment 2, picture stimuli will be presented first, followed by the social information. Emotion response will be measured upon a second presentation of the picture. If a relationship between social information and emotional response is found in Experiment 2, it would suggest the social information is instigating a cognitive change emotion regulation strategy. Experiment 1 is expected to demonstrate social information's strong influence on both emotion experience and physiological emotional response via expectancy modulation. Results from Experiment 2 are expected to reveal another means by which social information can influence emotion experience and physiology in the absence of expectancy changes. Taken together, these studies will provide a basis for further exploration of social information's effect on emotion experience, and its utility as an emotion regulation tool.

Emily Willroth is an M.A. student in Experimental Psychology at the College of William and Mary. With her adviser Dr. Matthew Hilimire, she studies contextual influences on emotion regulation, as well as the relationship between emotion and visual attention.

Food Odors, Dietary Restraint, and Attentional Bias to Food Cues

Presenter: Winnie Zhuang
Co-Author: T. Schroeder
Advisor: Catherine Forestell
College of William & Mary, Psychology

Odor plays a very influential role in sense and perception, particularly in the process of food choice. The present study examined the effects of a high fat odor on attentional bias for high calorie foods in restrained (i.e., those who restrict their food intake) and unrestrained eaters. Participants were exposed to either a high fat or neutral odor, and then performed a flanker task involving high and low calorie food images. These food images were presented on the computer as either a target in the center of the screen or as distractors flanking the central target, and participants were asked to categorize the target image while ignoring the distractors. We hypothesize that restrained eaters exposed to a high fat odor will show significantly longer reaction times in trials with high calorie food distractors relative to restrained eaters who were exposed to a neutral odor. No such difference was predicted for unrestrained eaters. Results from this study will shed light on the influence of food odors on attentional bias to food cues in restrained eaters.

Winnie Zhuang is an M.A. student in the Psychology Department at the College of William and Mary. She completed her B.A. degree in biopsychology at Tufts University in Boston last May. Her senior honors research examined attentional bias to foods in restrained and unrestrained eaters.

Measuring Social Vulnerability for Climate Change Adaptation for Hampton Roads, Virginia

Presenter: Jeremy Abramowitz
Advisor: Sarah Stafford
College of William & Mary,
Public Policy

Climate change is among the most complex public policy challenges facing humanity, presenting a multitude of ecological, political and social dimensions in the development of responses for both mitigation and adaptation. Eastern Virginia, and the Hampton Roads metropolitan area in particular, is among the most vulnerable regions of the United States to the effects of climate change and faces escalating problems with sea level rise, extreme weather, and recurrent coastal flooding that threaten significant population displacement and economic and environmental disruption. In order to help local governments and the state of Virginia more effectively respond to these changes, the Virginia Coastal Policy Clinic at the College of William & Mary has formed an Environmental Enquiry Group to study climate change effects and adaptation strategies in Hampton Roads. This section of the study focuses on identifying socially vulnerable populations to help allocate state and local resources toward adaptation efforts that will yield the greatest social benefit. In order to approach this problem quantitatively, the study builds on the Social Vulnerability Index initially developed by Susan Cutter et al. in 2003, using principal component analysis of U.S. census data to create a numerical index that can guide governments in identifying populations most in need of assistance. An analysis of different indices of social vulnerability generated across multiple sets of variables and geographic regions is used to build a more refined, robust and reliable measure that can be used to identify target populations in eastern Virginia as well as in other regions facing similar threats from climate change.

Jeremy Abramowitz is a first-year candidate for a master's degree in the Thomas Jefferson Program in Public Policy at William & Mary. He received his undergraduate degree from Dartmouth College in 2007 with a major in Geography, focusing in human -environment relations. He has worked in the political journalism and environmental nonprofit fields in Washington, D.C. for the last seven years.

Environmental Protection or Economic Growth: Attitudinal Differences Among the Chinese Populations

Presenter: Menuka Ban
Advisor: Tun Jen Cheng
College of William & Mary,
Public Policy

The "Environmental Kuznets Curve" hypothesis states that environmental degradation follows an inverted U-shape trend as the country progresses towards economic advancement. At the early stage of economic growth, pollution increases due to adverse economic activities and industrialization. Once a society reaches some level of economic affluence, people will develop environmental consciousness and start giving more value to the environment. This leads to stronger national regulations and a willingness to limit pollution. In the past couples of decades, China has achieved an impressive level of economic growth. However, the prosperity has also had a detrimental effect to the environment. Nonetheless, recent studies suggest that the level of concern towards environmental issues is growing in China. The question still arises about whether this increasing attention is adequate enough to change the trend of environmental degradation and to allow progress towards a sustainable growth. This paper will examine how much people in China value the environment over economic growth, based on their individual traits: education level, income level, employment status, location, marital status, age, and gender. It will also examine peoples' perceptions of freedom of choice, post-material attitude, and satisfaction with their life/ financial situation and their effects on opinion towards environmental protection. The method of research utilized is a statistical analysis using four waves of World Value Surveys data comprising over 6,000 total observations. The study is conducted by employing the Probit Maximum Likelihood Estimation (MLE) regression model.

Menuka Ban is pursuing a Master of Public Policy (M.P.P.) and M.S. in Computational Operations Research at the College of William and Mary. She received her B.A. in political science and mathematics from Mississippi University for Women.

The Gang Crisis in El Salvador

Presenter: Kathleen Baugh
Advisor: Elaine McBeth
College of William & Mary,
Public Policy

After the civil war that engulfed El Salvador from 1979-1992, many Salvadorans fled the country out of fear for their personal safety. Many of these migrants fled to the United States without documentation and ended up in cities like Los Angeles. In response to threats from other ethnic groups, many young Salvadorans developed Los Angeles-style street gangs that eventually evolved into the two most dangerous Central American gangs: Mara Salvatrucha and 18th Street. Once the civil war came to an end with the 1992 Chapultepec Peace Accords, some of these dangerous young gangsters were deported back to El Salvador and they brought their gangs with them to an already fragile country. This paper will explore the transnational relationships between gangs in the United States and El Salvador and how each country has responded to the threat of gang violence. The paper ends with a brief analysis of the current truce between gang leaders and politicians in El Salvador and whether this truce is a model for other Central American countries to follow.

Katie Baugh is a first year graduate student in the Thomas Jefferson Program in Public Policy. She hopes to focus on issues in education policy, immigration policy or foreign policy once she graduates in 2016.

Rural Health: A Multivariate Analysis of the Incidence of Chlamydia in Rural Georgia and the Case for Local Governments

Presenter: Bre'Auna Beasley
Advisor: Veronica Womack
Virginia Commonwealth University,
Public Policy

Chlamydia is one of the most commonly contracted sexually transmitted diseases. In 2013, the Centers for Disease Control and Prevention noted that the incidence rate of Chlamydia in the United States was 456 newly reported cases per 100,000 of the population. Among the states, Georgia ranked 8th, in terms of Chlamydia incidence rates with a rate of 534 reported cases per 100,000 of the population. Within the state of Georgia the incidence of Chlamydia is significantly more pronounced in rural Georgia counties. The primary objectives of this analysis are to: 1.) systematically examine the relative impact of selected social, health, and human capital variables on the incidence rate of Chlamydia in rural Georgia counties through the use of multiple regression analysis; 2.) isolate the factors with the greatest influence; 3.) suggest practical policies rural local governments may implement to address these factors, as a means of reducing the contraction and transmission of Chlamydia. The most influential variables were the percent of each county's population identifying as African American (.57) and the percent of each county's population between 15 and 24 years of age (.72). The results were significant beyond the .05 level. Based upon these results, policy and program suggestions included: increasing representative bureaucracy within local government and public healthcare centers and the implementation of comprehensive sexuality education programs.

Bre'Auna Beasley is a second year Public Policy and Administration doctoral student at Virginia Commonwealth University. Her primary research interest is examining the role of health policy on the contraction and transmission of sexually transmitted diseases in rural and marginalized communities.

From Local to Global: Non-Governmental Organizations as Norm Diffusers in Global Governance

Presenter: Derya Buyuktanir
Advisor: Sam Eusebio Mujal-Leon
Georgetown University,
Government

As a result of increasing debates over global governance in the aftermath of 1980s, the role played by civil society organizations throughout the world has increased in importance. Issues such as national, international, and cultural identity, norms, and ethics; as well as power, the use of power, security, and state centricity; have been galvanized. During this process, non-governmental organizations (NGOs), as an increasingly important segment of civil society, have gained recognition as one of the most important actors disseminating norms. Especially after the beginning of 2000s, the effects of NGOs on inter-governmental organizations regarding transparency and accountability have increased, and they have become more active in disseminating the international norms at the local and international levels. Moreover, NGOs have supported the internalization of global norms within the societies so that these norms can become a part of the identity of these societies, and, as a result, affect the determination of interests. In this respect, NGOs can be seen as effective norm diffusers since they have the power to transform both their members and other people in society. They can even influence governments to make amendments to or re-establish their policies, especially on issues such as human rights, environment, and democracy.

Derya Buyuktanir is an Assist. Prof. Dr. at Abdullah Gül University in Turkey. She is also a visiting researcher at Georgetown University. She works on civil society, the European Union, and global governance

Modeling the Effects of Enforcement Spending on International Narcotics Policy Outcomes

Presenter: Charles de Azagra
Advisor: William Hausman
College of William & Mary,
Public Policy

This project examines the question of a link between spending and drug policy outcomes in different nations of the world through two linear and four ordered logistical statistical regression models, which are mathematical estimations of true relationships between those phenomena. The dependent variable across all six models is an ordered categorical variable that ranks nations based on the strictness of their drug laws. The main hypothesized explanatory variable is counter-narcotics grants to foreign law enforcement from the State Department's Bureau of International Narcotics and Law Enforcement Affairs. The models make use of additional data from the World Bank, UN Human Development Report, and other academic databanks to help control for the enforcement grants' effect on a nation's drug policy outcome including health, education, and military spending by foreign governments. Following regression analysis, this paper argues that there exists a marginal positive relationship between enforcement grants and more liberal narcotics policies around the world, holding all other respective variables constant. These results were surprising as they appear to suggest that the financial fuel used toward continuing the prohibition of psychotropic substances in other nations may in fact be accelerating policy shifts in the opposite direction and toward more liberalized models of control. Though more research is needed, the project lends insight into the shifting nature of narcotics control policy around the world as well as the relationship between American and foreign interests regarding the continued international prohibition of illicit narcotics.

Charles de Azagra is concurrently seeking both his Bachelor's and Master's in Public Policy. In his free time, Charles enjoys teaching and learning fencing and has been a member of the W&M team during all four of his undergraduate years.

Income Inequality in the US and Public Opposition to Governmental Healthcare Provisions

Presenter: Jeehee Han
Advisor: Monica Prasad
Columbia University,
Quantitative Methods

Many scholars have studied the relationship between public opinion on redistributive policies and the level of income inequality in the United States. A debate between two contrasting views appears in previous literature on how the public reacts to rising income inequality. This study empirically tests where health care policies, a timely and politically important issue in the U.S., reside in this debate. Using the General Social Survey, I examine how the actual level of income inequality and perceptions of income inequality both impact respondents' opinions about governmental health care provisions. I include other factors as control variables, which previous literature has found to be relevant predictors of public opinion. Running ordered logistic regressions, I find a positive relationship between the actual level of income inequality and public opposition to health care policies. In contrast, there exists a negative relationship between the perception of income inequality and respondents' opposition to health care policies. Based on previous literature and a correlation between the two independent variables, I gather from these outcomes that a rise in income inequality, along with less concern for inequality, makes people less supportive of health care provisions. This interpretation suggests that the social fragmentation theory holds in the case of health care policies; growing inequality causes more fragmentation between the insured and the uninsured. I further discuss how future studies using qualitative methods can provide more comprehensive interpretations of these numerical outcomes.

Jeehee Han is currently a first-year M.A. student at Columbia University studying Quantitative Methods in the Social Sciences with a Data Science Focus. Her research focus is on public policy with particular interests in policy evaluation methodologies for education, health and immigration.

Taking the Health Aid Debate to the Sub-National Level: Impact and Allocation of Foreign Health Aid in Malawi

Presenter: Robert Marty
Co-Authors: C. Dolan, D. Runfola
Advisor: Matthias Leu
College of William & Mary,
Public Policy

Empirical literature examining the impact of health aid primarily comes from the cross-national level, where existing findings support both positive and no aid impacts. The emergence of geographically referenced foreign aid data allows for a new analytical approach, one of examining how aid is targeted within countries and aid impacts in these targeted areas. We examine the impact and allocation of foreign health aid in Malawi, drawing from sub-national data from AidData, Malawi's third integrated household survey, the Malawi Ministry of Health, 2008 census data, and the Malawi Electoral Commission. We use maximum likelihood spatial error models to examine how aid is allocated according to health, environmental health, socio-economic, and political variables in four time periods (2007 and before, 2008, 2009, and 2010). In addition, we use entropy balancing methods to examine the impact of health aid on reducing overall disease prevalence and malaria prevalence specifically in these same time periods, controlling for variables in allocation models. Findings indicate that annual health aid is associated with reducing disease prevalence by 1% to 3.3%, implying reductions of at least 100,000 to 200,000 cases of disease in a given year. In years with malaria-specific aid projects, health aid exhibits a more statistically significant and larger impact on reducing malaria prevalence than on reducing disease prevalence as a whole. Allocation results show that weak health infrastructure is an important driver of health aid allocation; however, aid may not have reached the most destitute and ethnic preferencing may have occurred after the 2009 election.

Robert Marty is a joint-degree masters student in the Thomas Jefferson Program in Public Policy at the College of William & Mary studying Public Policy and Operations Research. He is interested in how foreign aid can be better targeted to improve development outcomes and how tools such as GIS can improve decisions related to foreign aid.

Performance Based Funding in Higher Education: Refining a Promising Concept

Presenter: Benjamin Plache
Advisor: Richard Huff
Virginia Commonwealth University,
Public Policy

Over the last twenty-five years American higher education—long a hallmark of the United States' highly touted educational system—has faced new and mounting challenges. During a time when tuition costs have risen dramatically and state support for public institutions have slumped, universities have been forced to confront rising enrollment and increased demand for an affordable, quality education that provides students with employable skills. In response to this complicated and challenging environment, which has neither easy answers nor obvious solutions, several states have begun to reassess the way in which their public higher education system has been funded, shifting away from traditional funding models, which predicated fund support on a combination of enrollment, degree offerings and institutional expectations, to a model that emphasizes graduation rate, the number of students who are able to successfully complete a degree within six-years of their enrollment.

Ben Plache is a first year Ph.D. student in Virginia Commonwealth University's Wilder School of Government and Public Affairs Public Policy and Administration Ph.D. program. My areas of interest include higher education policy, higher education funding and mechanisms to increase university retention and graduation rates. He also currently works as a Pre-Health Advisor at Virginia Commonwealth University, where he teaches several courses about succeeding in college.

Impact of the EPA Clean Power Plan on the U.S. Electricity Industry, Environment, and Individual Homeowners

Presenter: Kevin Rasmussen
Advisor: Hector Guerrero
College of William & Mary,
Public Policy

The 2007 Energy Independence and Security Act and the Clean Power Plan proposed by the U.S. Environmental Protection Agency require carbon emissions to be reduced by 30-percent by 2030 from levels emitted in the year 2012. Requirements are further tailored to fit each U.S. state's unique situation. The study uses open source data from the U.S. Department of Energy, Energy Information Agency, numerous independent research agencies, and data from the energy industry to develop a quantitative model representing the alternatives. The U.S. electrical industry is also studying the alternatives and beginning to put them into practice. Coal burning electrical plants emit approximately 200 pounds of carbon per ton of coal into the atmosphere; natural gas emits only half this amount; but renewable wind, solar, and geothermal emit no carbon at all. The U.S. electrical grid requires a certain steady state of continuous power and can accommodate up to approximately 30-percent renewable power. However, the renewables vary greatly over time with fluctuations of wind speed and sun exposure. Future digital control of the electric system using SmartGrid technology and dynamic power scheduling also promise improved efficiency and reduced carbon emissions. What are the comparative economic costs and carbon reduction levels for the various alternatives? Can the 2030 target year reductions be reached? The alternatives examined by the study, monte-carlo simulations, risk and sensitivity analysis will be presented.

Kevin Rasmussen is an M.P.P. graduate student in Public Policy Program at the College of William and Mary. He served as a Veterans Scholar for the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, and the General Services Administration during the summer of 2014.

Political and Economic Development of US Agriculture Policy

Presenter: Serena Saffarini
Advisor: C. Lawrence Evans
College of William & Mary,
Public Policy

This project examines the development of agriculture policy in the United States beginning in the early 1930s. We weave together historical factors to explore the intent behind Agricultural legislation, including price supports, subsidies, and production incentives. Congressional decision data are broken down by district to examine trends in the economic and political environment of with regard to Congressional boundaries and the rural-urban divide. Further, we consider structural changes in relevant executive departments over time with an eye toward procedural maneuvering and coalition building at the legislative level.

Originally from Amman, Jordan Serena received her B.B.A. in Accounting from William & Mary in 2014, and is pursuing a Master of Public Policy at the College. She is particularly interested in understanding the political and economic roots behind legislative decisions. Upon graduating, Serena will begin working at Ernst and Young's tax practice based out of the McLean, VA office.

Redistribution and the Welfare State: An Econometric Approach to Public Social Expenditure and Inequality

Presenter: Albert Daniel Strubler
Advisor: Peter McHenry
College of William & Mary,
Public Policy

The amount of redistribution and the level and composition of redistributive social spending vary greatly among members of the OECD. As a result, the purpose of the current study is to examine the extent to which differences in the level and composition of public social expenditure matter in determining the amount of redistribution that countries are able to achieve. In order to overcome many of the limitations of previous research, this study uses data that distinguish between market and disposable income inequality in order to measure the effects of market income inequality on redistribution.

Daniel Strubler recently graduated from the University of Virginia, where he majored in Foreign Affairs and Economics. While at UVA, he received the Emmerich-Wright Prize for the most outstanding Distinguished Major Thesis in Politics. Currently, he is pursuing a Master of Public Policy at William and Mary. He serves as a Graduate Research Assistant at the Schroeder Center for Health Policy and as an Associate Editor for the William and Mary Policy Review. His research interests include the effect of public social and health programs on economic inequality and the impact of rising inequality on the political process.

Medicaid expansion and access to care among breast cancer survivors

Presenter: Wafa Tarazi
Co-Author: C. Bradley
Advisor: Lindsay Sabik
Virginia Commonwealth University,
Healthcare Policy and Research

Breast cancer survival is improving due to early detection of the disease and advances in treatment. To receive effective treatment, breast cancer survivors need to follow a treatment plan prescribed by their physicians. However, access to healthcare services remains a barrier to completing needed treatment. Medicaid expansion under the Affordable Care Act improves access to care among vulnerable populations, but almost half of the states opted out of the expansion. We shed light on the potential effect of Medicaid expansion on access to care among breast cancer survivors by assessing inability to see a doctor due to cost before Medicaid expansion in non-expansion states versus expansion states. We use a logistic model and control for demographics, insurance status, and general health. We use data from the Behavioral Risk Factor Surveillance System (BRFSS) for the years 2009, 2010, and 2012. The BRFSS is a nationally representative survey that collects information on self-reported preventive health practices and risk behaviors. Preliminary results suggest that breast cancer survivors in non-expansion states had significantly higher odds of being unable to see a doctor due to cost (OR = 1.5, 95% CI =1.01, 2.25). Living in a state that expands Medicaid will be an advantage for breast cancer survivors because it will improve their access to healthcare services. Existing disparities in access to care are likely to widen between breast cancer survivors in non-expansion states and expansion states. Non-expansion states could potentially leave many breast cancer survivors with no affordable insurance coverage.

Wafa Tarazi is a Ph.D. candidate in the Department of Healthcare Policy and Research at Virginia Commonwealth University. Her research interests focus on cancer prevention and control. In particular, she is working on delays in diagnosis and treatment of breast cancer among low-income women, who lost their Medicaid coverage due to policy changes.

Examining a Potential Labor Shortage in the Aviation Maintenance Industry

Presenter: Emily Uselton
Co-Authors: M. Ban, C. Jones
Advisor: Peter McHenry
College of William & Mary,
Public Policy

The aviation maintenance industry, like many other industries, requires advanced technical skills for their workforce. Nationally, the Bureau of Labor Statistics predicts employment growth of 2.4 percent by 2022. Moreover, employers and trade associations are feeling evidence of a labor shortage "on the ground." The Government Accountability Office conducted a national study of the issue and found inconclusive evidence. This research paper uses the same data sources to conduct a quantitative regional analysis. Technical workforce development has received growing national attention but is truly a state and local policy issue. The research examines regional changes and variation in employment, wages, FAA certification, public funding, and post-secondary degrees and certificates for aviation maintenance programs. Due to data limitations, such as starting wage information, a labor shortage was not found in any region. Nonetheless, results show significant variation among employment, earnings and certification by region. Furthermore, there is evidence of increasing student completion for aviation maintenance programs between 2011 and 2013. The results can be used to further examine industry competition for human capital in the technical workforce sector, as well as migration between states for education and employment opportunity.

Emily Uselton is an M.P.P. student in the Jefferson Program in Public Policy at the College of William and Mary. She received her undergraduate degree from Xavier University in 2008, majoring in Accounting and Finance. Her research interests include higher education policy, particularly issues regarding finance, access, and workforce development. During her graduate studies she has served as a Research Assistant for the Schroeder Center for Health Policy and Professor Paul Manna, who focuses on K-12 education policy research. In her free time she enjoys anything outdoors, especially kayaking and hiking.

Alternative Education Programs in Virginia

Presenter: Emily Wavering
Advisor: Sarah Stafford
College of William & Mary,
Public Policy

Broadly defined, alternative education programs (AEPs) are educational activities that fall outside the mainstream school system. This research project focuses on AEPs in Virginia that serve students who have been long-term suspended or expelled from traditional schools, with the goal of returning these students to a traditional setting. In 2006, the Virginia General Assembly commissioned a survey on regional and local AEPs, and from that survey came a comprehensive report on the structure and services of AEPs in the Commonwealth. The 2006 survey and report found a number of weaknesses with AEPs in Virginia, including gaps in the services provided, limited information on alternative education options, no central point of contact for AEPs, and a lack of student tracking. The final report provided several recommendations to improve the provision of support services in Virginia public schools, and through 2009 there were annual reports filed to track regional AEPs in Virginia. However, the emphasis on comprehensive data gathering and record keeping for AEPs has faded in recent years, and there is currently no inventory of local or regional AEPs serving Virginia students. In a related project, I helped update and expand the 2006 survey for redistribution to Virginia school superintendents, and once data from the updated survey is collected, I will use the it to explore the following questions for this project: What demographic characteristics put students at a higher risk of being placed in an AEP? What combination of resources and services provided serves students in the most cost-effective way?

Emily Wavering is a second year Master of Public Policy candidate at the College of William & Mary, Emily graduated summa cum laude from St. Mary's College of Maryland in 2013 with a B.A. in economics, and she spent this past summer interning for the United Nations Economic Commission for Europe in Geneva, Switzerland. Emily is also the Editor-in-Chief of the William & Mary Policy Review, and serves on the GRS planning committee. Emily is a returning member of the Graduate Research Symposium organizing committee.

Notes

ARTS & SCIENCES

Index of Presenters

ARTS & SCIENCES

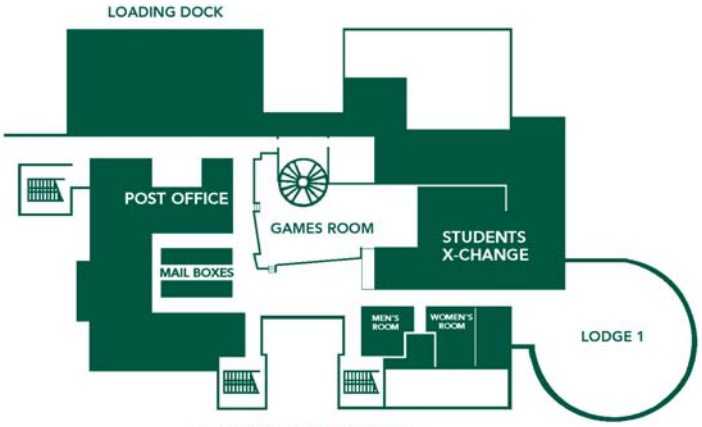
Index of Presenters

WM ARTS & SCIENCES

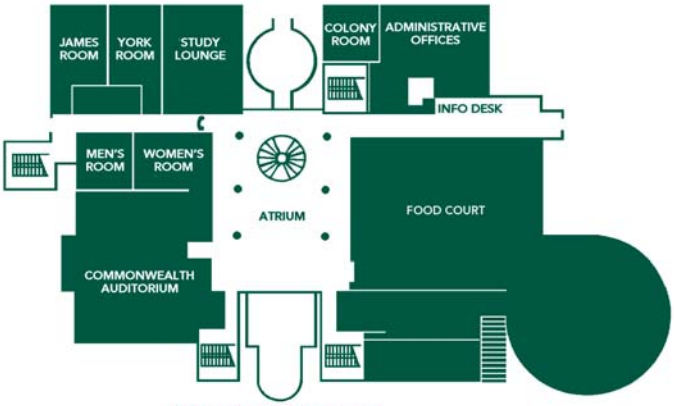
Index of Presenters

ARTS & SCIENCES

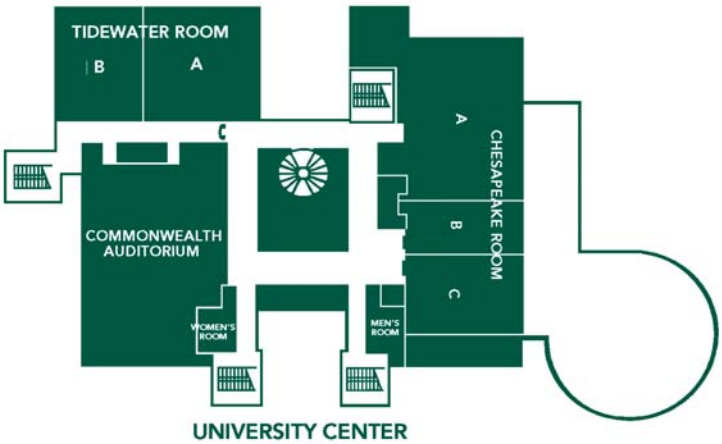
Meeting Space at the Sadler Center



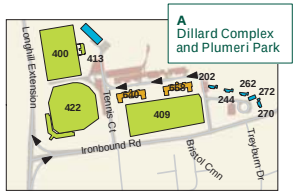
UNIVERSITY CENTER
1ST LEVEL

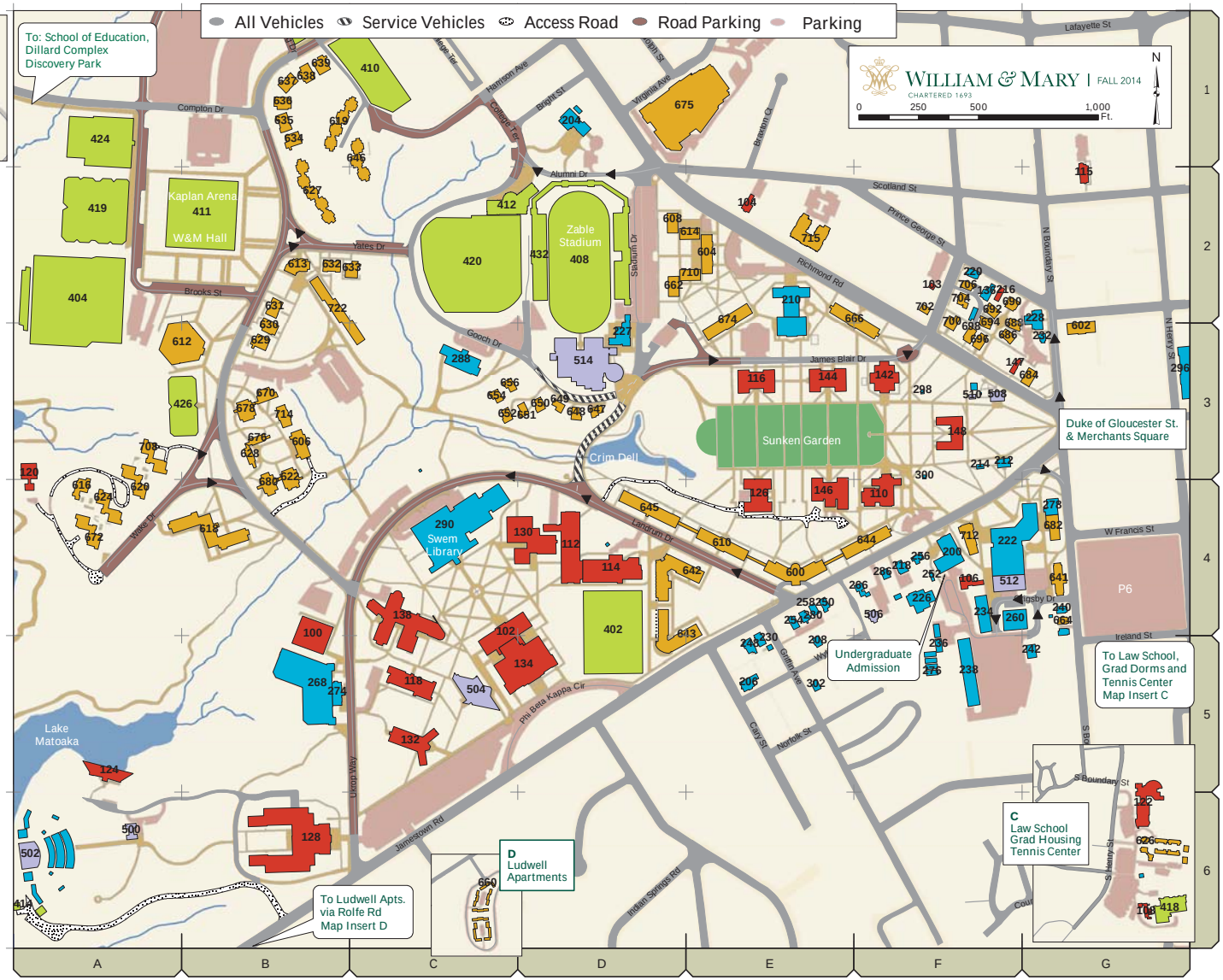


UNIVERSITY CENTER
2nd LEVEL



UNIVERSITY CENTER
3rd LEVEL





MAP#	BUILDING	GRID
	ACADEMIC	
100	Adair Hall	B4
102	Andrews Hall	C5
103	Bozarth Garage	F2
104	Ctr. for Archaeological Res.	E2
106	Ceramics Studio	F4
108	Endocrinology (Pop) Lab	Ins C
110	Ewell Hall	F4
112	ISC I	D4
114	ISC II	D4
115	ITPIR	G2
116	James Blair Hall	E3
118	Jones Hall	C5
120	Keck Env. Field Lab	A5
122	Law School	E4
124	Matoaka Art Studio	A5
126	McGlothlin-Street Hall	E4
128	Miller Hall	B6
130	Millington Hall	C4
132	Morton Hall	C5
134	Phi Beta Kappa Mem. Hall	D5
136	Prince George House	F2
138	Small Hall	C4
140	School of Education	Ins B
142	Tucker Hall	F3
144	Tyler Hall	E3
146	Washington Hall	E4
147	Western Union Building	F3
148	Wren Building	F3
	ADMIN & SUPPORT SERVICES	
200	Admission (undergraduate)	F4
202	Alexander Galt	Ins A
204	Alumni House	D1
206	Bell Hall	E5
208	Blank House	E5
210	Blow Memorial Hall	E2
212	Brafferton	F3
214	Brafferton Kitchen	F3
216	Braxton House	F2
218	Bridges House	F4
220	Bull House	F2
222	Campus Center	F4
226	Child Care Center	F4
227	Cohen Career Center	D3
228	College Apartments	G2
230	Corner House	E5
232	Davis House	G3
234	Facilities Mgmt. Admin.	F4
236	Facilities Management Annex	F5
238	Facilities Management Shops	F5
240	Facilities Safety	G5
242	Facilities Supervisors	G5
244	Gabriel Galt	Ins A
248	Griggs House	E5
250	Holmes House	E4
252	Hoke House Annex	F4
254	Hornsby House	E4
256	Hoke House	F4
258	Lambert House	E4
260	Main Power Plant	F4
262	Minson Galt	Ins A
264	Mount Vernon Complex	Ins B
266	Murray House	F4
268	Parking Deck	B5
270	Patrick Galt	Ins A
272	Patrick Galt Annex	Ins A
274	Police and Parking Services	B5
276	Quonset Huts	F5
278	Reves Center	G4
280	Rowe House	E4
282	Savage House	D1
286	Stetson House	F4
288	Student Health Center	C3
290	Swem Library	C4
296	W&M Bookstore	G3
298	Wren Outbuilding North	F3
300	Wren Outbuilding South	F3
302	Young House	E5

MAP#	BUILDING	GRID
	ATHLETICS & ATHLETIC EVENTS	
400	Albert-Daly Field	Ins A
402	Barksdale Field	D4
404	Busch Field	A2
408	Cary Field	D2
409	Dillard Practice Fields	Ins A
410	Intramural Fields	C1
411	Kaplan Arena at W&M Hall	B2
412	Laycock Football Center	C2
413	Martin Family Stadium	Ins A
414	Matoaka Boat House	A6
418	Millie West Tennis Facility	A2
420	Montgomery Field	C2
422	Plumeri Park	Ins A
424	Student Recreation Center	A1
426	Tennis Courts	B3
432	Zable Stadium	D2
	ARTS & EVENTS	
500	Amphitheatre Ticket Office	A6
502	Lake Matoaka Amphitheatre	A6
504	Muscarelle Museum of Art	C5
506	Plumeri House	F4
508	President's House	F3
510	President's Guest House	F3
512	Trinkle Hall	F4
514	Sadler Center	D3
	STUDENT HOUSING & SERVICES	
600	Barrett	E4
602	Brown	E2
604	Bryan	E2
606	Cabell	B3
608	Camm	D2
610	Chandler	E4
612	Commons Dining Hall	A3
613	Community Building	B2
614	Dawson	E2
616	Dinwiddie	A4
618	DuPont	B4
619	Eagle (Green & Gold Village)	B2
620	Fauquier	A4
622	Giles	B4
624	Gooch	A4
626	Graduate Housing	Ins C
627	Griffin (Green & Gold Village)	B2
628	Harrison	B3
629	House 620	B3
630	House 630	B3
631	House 640	B3
632	House 660	B2
633	House 670	B2
634	House 710	B1
635	House 720	B1
636	House 730	B1
637	House 740	B1
638	House 750	B1
639	House 760	B1
640	Hughes	Ins A
641	Hunt	G4
642	Jamestown North	D4
643	Jamestown South	D4
644	Jefferson	F4
645	Landrum	D4
646	Lion (Green & Gold Village)	B1
647	Lodge 2 (Daily Grind)	D3
648	Lodge 4	D3
649	Lodge 6	D3
650	Lodge 8	D3
651	Lodge 10	D3
652	Lodge 12	C3
654	Lodge 14	C3
656	Lodge 16	C3
660	Ludwell Apts. (100-700)	Ins D
662	Madison	D2
664	Meridian Coffee House	G4
666	Monroe	E3
668	Munford	Ins A
670	Nicholas	B3

MAP#	BUILDING	GRID
672	Nicholson	A4
674	Old Dominion	E3
675	One Tribe Place	D1
676	Page	B3
678	Pleasants	B3
680	Preston	B4
682	Reves	G4

MAP#	BUILDING	GRID
684	House 1	G3
686	House 2	F3
688	House 3	F3
690	House 4	F3
692	House 5	F2
694	House 6	F3
696	House 7	F3

MAP#	BUILDING	GRID
698	House 8	F3
700	House 9	F3
702	House 10	F2
704	House 11	F2
706	House 12	F2
708	Spotswood	A3
710	Stith	E2

MAP#	BUILDING	GRID
712	Taliaferro	F4
714	Tazewell	B3
715	Tribe Square	E2
722	Yates	B2