

WELLESLEY COLLEGE

THE
RUHLMAN
RUHLMAN
RUHLMAN
CONFERENCE

A CELEBRATION OF
STUDENT ACHIEVEMENT

MAY 2, 2018



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BIOGRAPHY

BARBARA PETERSON RUHLMAN '54



Barbara Ann Peterson was born to Thomas and Ethel Peterson in 1932 in Worcester, Massachusetts, and lived there for her first nine years. The family moved to Shaker Heights, Ohio, where Barbara graduated from Laurel School before enrolling at Wellesley in the class of 1954. A psychology major, Barbara lived in Homestead and Severance before spending her junior and senior years in Claffin Hall.

Of her time at Wellesley, Barbara wrote in 2004, “Fifty-four years ago when I entered Wellesley, it was a dream come true...Four years at Wellesley were wonderful, rewarding, but not without their ups and downs, and much hard work, which helped me

become a stronger, more confident person.”

Barbara deployed her psychology degree as a hospital social worker before marrying former Air Force lieutenant Jon Ruhlman in 1955. Jon was a graduate of Purdue University with a graduate degree from the University of Colorado. Together, Jon and Barbara raised two sons, Robert and Randall, while Jon pursued a career in business. Barbara took on numerous volunteer leadership roles in the arts, education, health care, and more in her community. Barbara and Jon avidly pursued their loves of sailing, global travel, and spending time with their two grandchildren together. Sadly, Jon passed away in 2004.

To this day, Barbara remains closely connected to Wellesley College through her philanthropy, her volunteer service, and her participation in class reunions and mini-reunions, of which she has written, “I have enjoyed reconnecting with classmates I knew years ago and meeting some for the first time...I treasure my new friends, and those I have had for many years, as they provide a great source of strength and stability.”

THE RUHLMAN CONFERENCE 2018

It gives us great pleasure to welcome you to the 2018 Ruhlman Conference. Made possible by the Barbara Peterson Ruhlman Fund for Interdisciplinary Study, the Ruhlman Conference is intended to foster collaboration among students and faculty across the disciplines and to enhance the intellectual life of the College. The event provides an opportunity for students, faculty, staff, friends, family, and alumnae to come together in celebration of student achievement.

The Ruhlman Conference celebrates intellectual life by sponsoring a communal, public event where students have an opportunity to present their work to an unusually wide audience. By providing an opportunity for public presentation of what is often a private, isolated activity, the conference demonstrates that research can be part of the ongoing conversation in a community of scholars.

Attentive to the diversity of student interests and accomplishments, the Ruhlman Conference includes a variety of formats for the presentation of student work: papers, panels, posters, exhibitions, musical and theatrical performances, interactive teaching presentations, and readings of original work. Representing the work of nearly 350 Wellesley students, the Ruhlman Conference is organized around three major themes: Humanities, Science and Technology, and Social Sciences.

We invite you to celebrate the 22nd annual Ruhlman Conference by experiencing the scope and richness of student achievement at this year's conference. We wish to express our thanks and congratulations to all students and alumnae, near and far, for their participation in this special event.

The 2018 Ruhlman Conference Committee Members

Edilia Foster
Class of 2020

Charlene Galarneau
Women's and Gender Studies

Scott Gunther
French Department

Nadya Hajj
Peace and Justice Studies

Margaret Keane
Psychology Department

Katy Ma
Class of 2018

Jessica May
Office for Resources

Andy Mowbray
Art Department

Anthony Pires
Composers Conference Residential

Christina Pong
Communications & Public Affairs

Elizabeth Robichaud
Albright Institute for Global Affairs

Orit Shaer
Computer Science Department

Andrew Shennan
Office of the Provost

Yuichiro Suzuki
Biological Sciences Department

Kerry Wells
Class of 2020

A History of the Conference

By Lee Cuba and
Adele Wolfson

The first Ruhlman Conference was held on the afternoon of May 1, 1997. Looking back on that day, the 150 students who volunteered to participate in the inaugural conference—and the more than 50 faculty who served as their advisors—were creating a new Wellesley tradition. In the months preceding the conference, members of the program committee had worried that it might be difficult to recruit students to participate in this ambitious communal experiment. Indeed, that was the question on Barbara Ruhlman’s mind throughout much of the year. Once the day of the conference arrived, however, a new question came to occupy their minds: What if no one attended? The conference had been organized into concurrent sessions scheduled from 3 p.m. to 7 p.m. and, because no change to the class schedule was made that day, late-afternoon classes overlapped with the first block of conference presentations. At a place already overpopulated with lectures, performances, and other community events, who would be interested in attending yet another optional event?

Many were. The student, faculty, and staff turnout that afternoon was respectable, if not large, and faculty and staff outnumbered students in most sessions. Of greater significance, participants and attendees of the first conference left with the impression that they had participated in something special, urging those in charge of planning the conference to find ways to increase involvement among all constituencies of the College. The following year the conference was scheduled for a day on which no classes would be held, the number of blocks of concurrent sessions was increased, and a community-wide lunch was added. The number of students presenting at the conference rose to 250, and the number of faculty and staff advisors doubled (to 100), as did the number of sessions. In the years to follow, the conference would consistently attract between 250–300 student participants sponsored by well over 100 faculty and staff, representing virtually every academic department and program of the College.

Why was the Ruhlman Conference such a success? A student on the first program committee provided insight into the answer when she suggested that “Wellesley was a very academic place, but it wasn’t as intellectual as it might be.” By that, we believe she meant that Wellesley students set high academic standards for themselves and their peers, that they worked hard to achieve those standards—but that they spent more time talking about how hard they worked than about what they were working on. Although the Ruhlman Conference provided a venue to applaud and celebrate the hard work necessary to produce excellent projects, its focus was on the results of that hard work—the knowledge, understanding, and joy that comes through serious intellectual engagement.

As we celebrate the 22nd annual Ruhlman Conference, it is hard to imagine Wellesley without the Ruhlman Conference. It is built into our calendar and our consciousness. Students look forward to their presentations as they plan their research projects. Faculty mark the years by remembering which students participated in a Ruhlman panel or poster session. Deans describe the conference to candidates for faculty positions as one of the great selling points of the institution. Other colleges planning student research conferences look enviously at the structure we have built. Part of the joy of the day is the way in which traditional divisions are broken down. Science talks happen in Pendleton; poetry readings in the Science Center. Panels are created that cross disciplines and make new connections; their audiences are filled with staff, faculty, and students interacting with the presenters and with one another in new ways. And part of the joy comes from Barbara Ruhlman’s obvious delight in her creation. The gratitude that flows back and forth between her and the students adds to the special nature of the day and is a manifestation of the connections among generations of Wellesley alumnae. It is not difficult to see why the Ruhlman Conference has become such a valued Wellesley tradition.

Lee Cuba is Professor of Sociology and former Dean of the College. While Associate Dean, he worked with Barbara Ruhlman to develop the plan for the Ruhlman Conference and chaired the program committee from 1997–1999. Adele Wolfson is the Nan Walsh Schow '54 and Howard B. Schow Professor in the Physical and Natural Sciences. She was Associate Dean of the College from 2004–2010 and chaired the program committee.

Conference at a Glance

Themes	9:15–10:25am	10:45–11:55am
Humanities	<p>Medieval Pageant Wagons for a Modern Divine Comedy (Exhibition) GRH-136C</p> <p>Perspective: An Artistic Analysis (Exhibition) Jewett Sculpture Court</p> <p>Songs and Songwriting: A Performance (Long Performance) JAC-AUD</p> <p>Calderwood Seminars in Public Writing: Engaging Interviews (Preformed Panel Discussion) FND-120</p> <p>Look Again, Beyond What You See (Talk) FND-102</p> <p>Adapting to Changing Environments (Talk) FND-319</p>	<p>The Future of Futurism: From Noise Intoners to Noise Taction (On-location Presentation) JAC-AUD</p> <p>Present Conversations, Collective Pasts (Exhibition) Collins Cinema</p> <p>Gallery Talk: A Conversation with the Studio Art Thesis Students (Exhibition) JAC-200</p> <p>Sfanta: A Solo Performance (Short Performance) ALH-RNJ Theatre</p> <p>Urban Education: Power, Action, and Agency with Action Research (Interactive Teaching Presentation) FND-102</p> <p>The Enduring Art of Book Making (Interactive Teaching Presentation) Clapp-458 , Clapp Book Arts</p> <p>Finding Meaning in Juxtaposition (Talk) FND-126</p> <p>Carving Out Spaces for Communities (Talk) PNE-127</p>
Science and Technology	<p>Sex, Aging, Metabolism, and Behavior: Lessons from the Microscopic Worm <i>C. Elegans</i> (Preformed Panel Discussion) FND-307</p> <p>Don't Change the Channel: Investigating Transport Proteins Implicated in Human Health and Disease (Preformed Panel Discussion) FND-207</p> <p>Investigating Global Gas Environmental Chemistry Using Mass Spectrometry and Noble Gases (Preformed Panel Discussion) JAC-372</p> <p>From Menstrual Cramps to Conferences: Creating and Publishing a Menstrual-Tracking Wearable (Preformed Panel Discussion) PNE-127</p> <p>It's More Than Your Genes: From Epigenetics to Proteomics (Talk) PNE-239</p> <p>The Very Hungry Caterpillar (Talk) JAC-450</p> <p>Cultivating Cultures (Talk) PNE-216</p> <p>Physics Matters: Reflecting on the Past and Discovering an Otherworldly Future (Talk) Collins Cinema</p>	<p>Experimental and Computational Approaches to Understanding Histone-Derived Antimicrobial Peptide Structure-Function Relationships (Preformed Panel Discussion) GRH-130</p> <p>Exploring the Final Frontier: Astronomy and Planetary Science Research at Lowell Observatory (Preformed Panel Discussion) FND-207</p> <p>Supporting Web Literacy and Understanding Signals of Credibility on the Web (Preformed Panel Discussion) JAC-372</p> <p>Assessing the Tsunami Hazard of Northern Haiti—A Proposal for a Pilot Field Study (Preformed Panel Discussion) PNE-216</p> <p>Geohealth: Understanding Human and Natural System Interactions to Identify Sustainable Management Practices (Interactive Teaching Presentation) FND-120</p> <p>Getting to the Heart and Gland of the Matter (Talk) PNE-239</p> <p>Neuronal Basis of Seeing, Sleeping, and Peeping (Talk) PNE-139</p> <p>Neuroscience Takes Flight (Talk) FND-307</p>
Social Sciences	<p>Economic Analysis of Healthcare Policy (Preformed Panel Discussion) GRH-130</p> <p>African Diaspora Members Experiences Through the Lens of Black Psychology (Preformed Panel Discussion) FND-126</p> <p>Cooperation, Interaction, and Communication (Talk) GRH-330</p> <p>Intersection of Technology, Politics, and Culture (Talk) FND-317</p> <p>Exit West? Migrants, Refugees, and Resettlement (Talk) PNE-139</p>	<p>The Economics of Information, Competition, and Behavior (Preformed Panel Discussion) GRH-330</p> <p>Diasporic Perspectives: Hidden Stories of South and Southeast Asian Communities (Preformed Panel Discussion) JAC-450</p> <p>Living in a MAD World: US Foreign Policy in the Nuclear Age (Preformed Panel Discussion) FND-317</p> <p>Exploring the Selfie in Contemporary Culture (Preformed Panel Discussion) PNE-327</p> <p>Health and Wellness Social Policy (Talk) FND-319</p> <p>Affect and Imagination (Talk) GRH-428</p> <p>Modeling Economic Behavior (Talk) PNE-339</p>

Key: FND-Founders Hall
GRH-Green Hall
JAC-Jewett
PNE-Pendleton East

Lunch*	1:30–2:40pm	3:00–4:10pm
	<p>A Sense of Places (Performed Panel Discussion) Collins Cinema</p> <p>The Impact of the Selfie in American Life (Performed Panel Discussion) FND-126</p> <p>Flutes on Fire: Passion and Virtuosity in 20th-century Flute Quartets (Long Performance) JAC-AUD</p> <p>Sed Ministrare: Building the Ministrare Council from the Ground Up (Performed Panel Discussion) FND-102</p> <p>Exploring Community and Individual Identities Through Writing (Literary Reading) PNE-139</p> <p>Whose Land Is It? (Talk) PNE-127</p>	<p>Children of the Holocaust: Service-Learning in the Netherlands (Performed Panel Discussion) FND-207</p> <p>Archaeology at Wellesley: Sticks, Stones, and Bones (Performed Panel Discussion) PNE-127</p> <p>Somnium (Film Screening) Collins Cinema</p> <p>How Sounds Make Us Feel (Talk) JAC-450</p>
	<p>EcoLab: Investigating the Impacts of Nutrients and Soil Feedbacks on Plant Productivity and Diversity (Performed Panel Discussion) FND-120</p> <p>Exploring the Relationship Between the Innate Immune System and Adult Neurogenesis in the Crayfish (<i>Procambarus clarkii</i>) Brain (Performed Panel Discussion) FND-307</p> <p>Chasing Digital Traces and Digital Natives (Performed Panel Discussion) PNE-216</p> <p>Nanotechnology: From Biomedicine to Materials Chemistry (Performed Panel Discussion) GRH-136C</p> <p>The Water Challenge: Water Sustainability on Wellesley College Campus (Performed Panel Discussion) JAC-372</p> <p>Chemistry in Action: From Pharmaceuticals to the Galaxy (Talk) PNE-339</p> <p>The Environment and Our Health (Talk) FND-317</p>	<p>Inclusion in Computer Science: How Students Are Contributing to an Effort to Make the Department More Welcoming for Everyone (Performed Panel Discussion) GRH-136C</p> <p>Create to Engage: Exploring Mathematics Through Engineered Models (Interactive Teaching Presentation) FND-126</p> <p>Artificial Intelligence: From Fiction to Reality (Performed Panel Discussion) PNE-139</p> <p>Pulling, Shifting, and Deleting: Manipulating Biological Systems Through Biochemical Approaches (Performed Panel Discussion) PNE-327</p> <p>CRISPEE: A Tangible Gene-Editing Platform for Early Childhood (Performed Panel Discussion) FND-317</p> <p>We-cycle: A Systems Approach to Improving Recycling Practices at Wellesley College (Performed Panel Discussion) FND-120</p> <p>Interactivity: Connecting, Learning, and Augmenting Our World (Talk) PNE-216</p> <p>Computational Modeling and Machine Learning: Methods and Applications (Talk) FND-307</p>
	<p>Modern Sickness: Addressing Issues in American Healthcare (Performed Panel Discussion) PNE-327</p> <p>Girls' Generation? A Linguistic Analysis of Gender Representation in Modern South Korean Media (Performed Panel Discussion) JAC-450</p> <p>Linguistic Attitudes: Creole Language Education in Mauritius and Haiti (Exhibition) GRH-428</p> <p>Making Dreams into (Virtual) Realities: VR at Wellesley College (On Location Presentation) Knapp Fabrication Lab—1st Floor Clapp Library</p> <p>Mellon Mays Undergraduate Fellowship Research Imperatives I (Performed Panel Discussion) FND-319</p> <p>Finding One's Self (Talk) GRH-130</p> <p>Contemporary Debates in Politics (Talk) PNE-239</p>	<p>Science Education Equity Development Kit: Using Data to Drive Social Change (Performed Panel Discussion) FND-102</p> <p>Mellon Mays Undergraduate Fellowship Research Imperatives II (Performed Panel Discussion) FND-319</p> <p>Healthcare Resources: Practitioners and Consumers (Talk) GRH-330</p> <p>On Addressing Inequality: Sources, Consequences, and Culture (Talk) PNE-239</p>

* All members of the Wellesley College community are invited to enjoy lunch on the Wang Campus Center lawn. In the event of inclement weather, the lunch will remain in the same tented service location with the Campus Center and Alumnae Hall as indoor rain locations. Lunchtime entertainment will be provided by the Blue Notes, the Tupelos, and the Wellesley Widows, in the vicinity of the lunch tent.

**Key: FND-Founders Hall
GRH-Green Hall
JAC-Jewett
PNE-Pendleton East**

*The Ruhlman Poster Session will be held in LWC Tishman Commons from 1:00 -2:40 p.m.

Conference Schedule

8:45–9:15am Breakfast	<i>Refreshments served in the Pendleton Atrium</i>	
9:15–10:25am Humanities	Medieval Pageant Wagons for a Modern Divine Comedy (Exhibition) <i>Rosalynnd (Roz) Rea '19, English Medieval/Renaissance Studies</i>	GRH-136C
	Perspective: An Artistic Analysis (Exhibition) <i>Madison (Maddie) Miller '21, Undeclared</i>	JEWETT SCULPTURE COURT
	Songs and Songwriting: A Performance (Long Performance) <i>Charlotte Francis '19, Music; Isabella DeHerdt '21, Undeclared; Kristen Gasparini '20, Philosophy; Rosamond Herling '18, Russian Area Studies; Kimaya (Kimy) Lecamwasam '21, Undeclared; Lauren Luo '20, Computer Science; Karen Ni '18, Economics</i>	JAC-AUD
	Calderwood Seminars in Public Writing: Engaging Interviews (Preformed Panel Discussion) <i>Alexandra Beem '18, Biological Sciences; Molly Hoyer '18, Comparative Literature; Diva Sharma '18, Economics and Mathematics</i>	FND-120
	Look Again, Beyond What You See (Talk) The Crouching Venus in the Court of Louis XIV—Branding, Womanhood, Authenticity, and Spectatorship <i>Runchan (Jennifer) Zhang '18, Art History and French</i> Recontextualizing the Chinese Works of Art in the Davis Museum <i>Nikki Hua '18, Art History and Economics</i> The Confederacy Strikes Back <i>Maya Nandakumar '19, Classics and Political Science</i> Tell Me a Story Using Numbers and Pictures <i>Georgia Stylianides '18, Art History and Mathematics</i>	FND-102
	Adapting to Changing Environments (Talk) The Power of Art to Break Despair: The Impact of the Kohleausstieg on the German Imagination <i>Anne Schnitzer '18, German Studies</i> The Politicization of Sunni and Shi'a Under Saddam Hussein's Dictatorship in Iraq <i>Emily Bader '18, International Relations–History</i> The Artist Collective Ratgeb: The Art of Defending Public Space; Political Murals of West Berlin 1979-89 <i>Emily Moore '18, Art Studio and German Studies</i> From Tokyo to Boston, Brazil, Britain, and Beyond: How Japanese Religious Movement Soka Gakkai International Adapted to a 21st-Century World <i>Arianna Regalado '18, Religion</i>	FND-319
Science and Technology	Sex, Aging, Metabolism, and Behavior: Lessons from the Microscopic Worm <i>C. Elegans</i> (Preformed Panel Discussion) <i>Elizabeth Loxterkamp '18, French and Neuroscience; Sarah Yaser '19, Neuroscience; Janessa Sullivan '18, Psychology; Casey Smith '20, Neuroscience; Maya Muldowney '18, Neuroscience; Leila Mahdavi '21, Undeclared; Olivia Holbrook '20, Political Science; Hanjaaram (Jaaram) Cha '20, Undeclared</i>	FND-307

Don't Change the Channel: Investigating Transport Proteins Implicated in Human Health and Disease (Preformed Panel Discussion) **FND-207**

Stephanie Kim '18, Biological Sciences; Maura Sticco-Ivins '18, Biochemistry; Emily Whitehead '18, Biochemistry; Laurel Kinman '18, Biological Sciences and Mathematics

Investigating Global Gas Environmental Chemistry Using Mass Spectrometry and Noble Gases (Preformed Panel Discussion) **JAC-372**

Callan Krevanko '18, Chemistry; Lumi Kinjo '19, Chemistry; Brenda Ji '18, Biological Sciences; Helene Alt DS, Chemistry; Katherine Chan '18, Chemical Physics; Danielle Aldrett '21, Undeclared

From Menstrual Cramps to Conferences: Creating and Publishing a Menstrual-Tracking Wearable (Preformed Panel Discussion) **PNE-127**

Rachel Pak '18, English and Media Arts and Sciences; Shanzay Kazmi '18, Media Arts and Sciences; Margaret Flemings '18, Media Arts and Sciences

It's More Than Your Genes: From Epigenetics to Proteomics (Talk) **PNE-239**

A Cross-Comparison of the Extracellular Matrix Derived from Various Cell Types for Applications in Tissue Engineering and Regenerative Medicine

Emily Liao '19, Biological Sciences

Computational Prediction of miRNA Targets in a Brain-Specific Cluster

Hannah Jacobs '19, Biochemistry (Fowler Public Speaking Finalist)

The Role of Histone Modifiers in Segment Specification During Metamorphosis

Teresa Chen '18, Biological Sciences

Synthetic Biology: Developing a Biological Tool to Artificially Control Alternative Splicing

Vienna Thomas '20, Chemistry

The Very Hungry Caterpillar (Talk) **JAC-450**

Threshold Weight Determination in Manduca Sexta

Lorrie He '18, Biological Sciences

Comparison of Nutrient Dependency of Ecdysteroidogenesis Genes in Manduca and Drosophila Larvae

Lily Xu '19, Biological Sciences

Investigating the Genetic Basis of a Heat Shock Inducible Color Change in the Tobacco Hornworm, Manduca Sexta

Surisadai (Suri) Aquit '18, Biological Sciences

Understanding the Role of Juvenile Hormone in Ecdysone Biosynthesis and Metamorphic Onset in Manduca Sexta

Priyanka (Priya) Basak '18, Biological Sciences

Cultivating Cultures (Talk) **PNE-216**

Optimizing Amino Acids in Defined Media for Pichia Pastoris Recombinant Protein Expression

Angel Kuo '18, Chemistry

3D Cell Culture Studies of Anti-Pancreatic Cancer Agent DCM-MJ-I-21

Elisa Wang '18, Biological Sciences

Characterizing Microbial Growth on a 6th-Century Chinese Buddhist Votive Stele

Lisa Luka '18, Biochemistry

**Physics Matters: Reflecting on the Past and Discovering
an Otherworldly Future (Talk)**

Collins Cinema

**Application of Bayesian Inference to Analysis of Dynamic Light Scattering to Determine Size
Distribution of Polydisperse Solutions**

Caroline Martin '18, English and Physics

Planet Candidate Validation in K2 Crowded Fields

Rayna Rampalli '18, Astrophysics

**Perspectives on the Wellesley College Physics Department: Where We've Been and Where
We're Going**

Mehak Sarang '18, Physics; Rayna Rampalli '18, Astrophysics

Understanding Long-term Planetary Surface Conditions Through Impact Crater Modification

Carol Hundal '18, Astrophysics

Social Sciences

Economic Analysis of Healthcare Policy (Preformed Panel Discussion)

GRH-130

*Marissa Caldwell '18, Economics; Tanvee Varma '18, Economics; Margaret (Meg) Babikian '18, Economics;
Victoria Angelova '18, Economics*

**African Diaspora Members Experiences Through the Lens of Black Psychology
(Preformed Panel Discussion)**

FND-126

*Chinenyenwa Amaechi '20, Economics and Spanish; Keisha Jean-Charles '20, Africana Studies and Economics;
Paige Robinson '20, American Studies; Hailey den Elzen '19, Psychology*

Cooperation, Interaction, and Communication (Talk)

GRH-330

The Evolution of Cooperation in Humans: Was Shared Care of Infants the Catalyst?

Genae Matthews '19, Philosophy

**Let Me Tell You a Story: The Relationships Among Fiction, the Big Five Personality Traits,
and Compassion**

Ruixi Zhang '19, English and Psychology

Language, Race, and Integration: A Comparative Study on the Migrant Experience in Morocco

Madeline (Maddy) Davison '19, Cognitive and Linguistic Sciences

Studying the Effect of Iconicity in the Learnability of American Sign Language

Carla Adams '20, German Studies and Psychology; Natalia Reynoso '20, Undeclared

Intersection of Technology, Politics, and Culture (Talk)

FND-317

The Social Justice Implications of Blockchain

Madelena Collins '18, Peace and Justice Studies

Activating Social Media Activism

Esa Tilija '19, Economics

**Epidemiology: Understanding the Coordination and Control of
Online Campus-Specific Culture Sharing**

Esther Jaffee '19, Biological Sciences

**The Role of Internet Communication Technologies in Facilitating Strength and
Resilience in Refugee Communities**

Anne Schwartz '18, Computer Science

Immigration and the Model Minority: Effects on Chinese/Hong Kong/Taiwanese Immigrants' Children's Psychological Well-Being*Ashley Wang '20, Women's and Gender Studies***Serving Through Borders: An Intersectional Approach to Gender and Global Migration***Monica Naranjo DS, Peace and Justice Studies and Psychology***Where Political Science and Neuroscience Meet: Issues of Forced Migration***Basma Jaber '18, Neuroscience and Political Sciences***Hablamos Ambos (We Speak Both): The Effect of Bilingualism in Greater Boston Area Children***Veronica Valencia '19, Cognitive and Linguistic Sciences and Economics*

10:25–10:45am Break*Refreshments served in the Pendleton Atrium*

**10:45–11:55am
Humanities****The Future of Futurism: From Noise Intoners to Noise Taction (On-location Presentation)**

JAC-AUD

Diana Tosca '18, Computer Science and Music

Present Conversations, Collective Pasts (Exhibition)

Collins Cinema

Grace Ming '18, Media Arts and Sciences

Gallery Talk: A Conversation with the Studio Art Thesis Students (Exhibition)

JAC-200

Melina Mardueno '18, Art History and Art Studio; Juyon Lee '18, Art Studio; Isabella King '18, Art Studio and English and Creative Writing; Nadine Franklin '18, Art Studio and Japanese Language and Culture; Anjali Benjamin-Webb '18, Art Studio and Political Science; Breslin Bell '18, Art History and Art Studio

Sfanta: A Solo Performance (Short Performance)

ALH-RNJ Theatre

Diana Lobontiu '18, Psychology and Theatre Studies

Urban Education: Power, Action, and Agency with Action Research (Interactive Teaching Presentation)

FND-102

Karina Ithier '20, Spanish; Sydney Stewart '18, Peace and Justice Studies; Thalia Ramirez '18, Neuroscience; Azalea Troche '18, Economics; He-Yue (Sophie) Wang '19, Psychology; Kindred Obas '19, English; Christina Okezie '19, Political Science

The Enduring Art of Book Making (Interactive Teaching Presentation)

Clapp-458, Clapp Book Arts

Patricia Grahmann '18, Neuroscience; Robin Siddall '20, Mathematics

Finding Meaning in Juxtaposition (Talk)

FND-126

Get Free: Joni Mitchell, Lana del Rey, and the Language of Externalities*Matilda Berke '21, Undeclared***The Arthurian Legend in Times of War: *Le Morte D'Arthur* and *The Once and Future King* as Wartime Texts***Sebrina Stickney Morris '18, English and French***Terror in the Cul-de-sac: The Suburban Uncanny in Late 20th-Century Horror***Sarah Michelson '18, Art History and English***The Power of Resilience and Gender Identification: Does Resilience Moderate the Effects of Gendered Stereotype Threat on Undergraduate Wellesley College Students?***Dalila Stanfield '18, Psychology*

Carving Out Spaces for Communities (Talk)

PNE-127

LGBTQ+ Youth Experiences with Sex Education*Sarah Netherton '18, Women's and Gender Studies***The Architecture of Community: Investigating the Lulu Campus Center and Its Potential to Foster a Wellesley Community***Gwendolyn Sands '18, Architecture***"We're All Nerds in Costume": The Influence of Cosplay on Adolescent Gender Identity Development***Madison (Matthias) Remillard '18, Women's and Gender Studies***Activist in the Making: An Archival Tribute to Student Activism Past, Present, and Future***Gabriela (Gaby) Varela '20, Sociology; Paola Gonzalez '20, Women's and Gender Studies*

Science and Technology**Experimental and Computational Approaches to Understanding Histone-Derived Antimicrobial Peptide Structure-Function Relationships (Preformed Panel Discussion)**

GRH-130

*Carla Perez '18, Chemistry; Katrina Montales '18, Chemistry; Ju Young Kwag '19, Chemistry; Kerry Gao '20, Undeclared; Hannah Schmidt '18, Chemistry***Exploring the Final Frontier: Astronomy and Planetary Science Research at Lowell Observatory (Preformed Panel Discussion)**

FND-207

*Karisa Zdanky '20, Astrophysics; Jocelyn Reahl '19, Geosciences; Abigail (Abbie) Burrus '19, Astrophysics***Supporting Web Literacy and Understanding Signals of Credibility on the Web (Preformed Panel Discussion)**

JAC-372

*Ana Fernandez '20, Computer Science; Emily Wang '20, Computer Science***Assessing the Tsunami Hazard of Northern Haiti—A Proposal for a Pilot Field Study (Preformed Panel Discussion)**

PNE-216

*Danielle Black '18, Geosciences; Clara Cogswell '18, Classical Civilization and Geosciences; Elizabeth Engel '18, English; Emma Jackman '19, Geosciences; Alexandra (Alex) Klufas '18, Mathematics; Marissa Menzel '18, Geosciences; Lauren Santo Domingo '19, Geosciences and Spanish; Sarah Wong '20, Undeclared; Kendall You Mak '20, Geosciences***Geohealth: Understanding Human and Natural System Interactions to Identify Sustainable Management Practices (Interactive Teaching Presentation)**

FND-120

*Lucy Wanzer '19, Geosciences; Brianna Love '19, Architecture; Melanie (Mel) Passaretti '18, English and Geosciences; Amanda Hernandez '18, Environmental Studies and Geosciences; Shivani Dayal '18, Neuroscience; Jennifer (Jenn) Harris '19, Biological Sciences; Zubyn D'Costa '20, Political Science; Madeline Cabillane '18, Cinema and Media Studies***Getting to the Heart and Gland of the Matter (Talk)**

PNE-239

Getting at the Heart of Inherited Arrhythmia: A New Approach to the Treatment of CPVT (catecholaminergic polymorphic ventricular tachycardia)*Danielle Heims-Waldron '18, Biological Sciences (Fowler Public Speaking Finalist)***High Blood Pressure: Unravelling the Hormone Behind It***Eleanor Zagoren '18, Biological Sciences***The Role of Vvl in Endocrine Gland Formation in *Tribolium Castaneum****Sara Shin '19, Biological Sciences***Neuronal Basis of Seeing, Sleeping, and Peeping (Talk)**

PNE-139

Alterations in the Balance Between Excitation and Inhibition as a Result of Song Learning*Rachel Woo '18, Neuroscience*

What Makes a Good Learner? The Contribution of Inhibitory Neurons to Zebra Finch Song Learning
Alexa Pagliaro '18, Neuroscience and Spanish

Roles of the Mediodorsal and Pulvinar Nuclei in Sleep Onset
Kanupriya Gupta '18, Neuroscience

Neural Mechanisms Underlying Recovery from Visual Impairment
Julia Deere '18, Neuroscience

Neuroscience Takes Flight (Talk)

FND-307

Neuronal Networks—The Role of Interneurons in Spatial Memory Formation
Helena Yan '18, Neuroscience

Integration of Visual and Thermal Stimuli by *Drosophila* in Flight
Isabel D'Alessandro '18, Neuroscience

From the Fingertip to the Brain: Quantifying Learning with the Senses
Maggie Mittleman '18, Neuroscience

A Look into the Methods of Systems Neuroscience
Moging (Molly) Quan '19, Neuroscience

Social Sciences

The Economics of Information, Competition, and Behavior (Preformed Panel Discussion) **GRH-330**
Karen Ni '18, Economics; Mary Chen '18, Economics; Lauren Mostrom '18, Classics and Economics; Lingjun (Lotus) Xia '18, Economics and Psychology

Diasporic Perspectives: Hidden Stories of South and Southeast Asian Communities (Preformed Panel Discussion) **JAC-450**
Kethural (Kethu) Manokaran '18, Neuroscience; Helena (Astrid) Mobley '18, Sociology; Ilina Mitra '18, Economics; Mathangi Ganesh '18, Computer Science; Keertana Anandraj '18, Economics and Mathematics; Phung Ninh '20, Sociology

Living in a MAD World: US Foreign Policy in the Nuclear Age (Preformed Panel Discussion) **FND-317**
Colleen Larkin '18, Mathematics and Political Science; Sabrina Leung '18, International Relations—Political Science; Heng (Amber) Qin '18, Political Science

Exploring the Selfie in Contemporary Culture (Preformed Panel Discussion) **PNE-327**
Tatiana Moise '21, Undeclared; Chuyue (Arielle) Xiao '21, Undeclared; Lane Arkangel '21, Undeclared; Sophia Ashbeir '21, Undeclared

Health and Wellness Social Policy (Talk)

FND-319

Governors and State-Level Policy Responses to the Opioid Addiction Epidemic in New England
Annalee Beaulieu '18, Political Science and Spanish

Eating Disorders, Epistemology, and the Intersectional Female Body
Alexa Riobueno-Naylor '18, Psychology and Sociology

Eating Behaviors at Wellesley College
Abigail (Abby) Donoghue '19, Chemistry and Psychology; Jacquelyn Floyd '19, Psychology

Data-Driven Wellness: Using Student Health Data to Inform Programming and Practice at Wellesley College
Jessica (Jess) Abramson '19, Computer Science and Psychology

Recreating the Future: Examining Impaired Future Thinking in PTSD

Lydia Guo '20, Neuroscience

Impaired Executive Function May Underlie Decreased Ability to Imagine the Future in PTSD

Rose Horowitz '20, Psychology

Malevolent Creativity: A Cross-Cultural Study

Zichun (Michelle) Wang '18, Psychology

Did Scrooge's Grumpy Mood Amplify His Miserliness? The Effect of Mood on Social Perception and Cooperation

Gauri Salil Gadkari '18, Neuroscience; Rachel Wulff '18, Neuroscience

Modeling Economic Behavior (Talk)

Growing the Future: Women in Farm Education for Children

Alejandra Narvaez '19, Environmental Studies

The Oceans Between Us: Exploring the Role of the United States in International Fishing Policy

Frances Dingivan '20, Environmental Studies

Development and Growth Without Property Rights in China's Transition Economy

Linda Zhou '18, East Asian Studies and Political Science

Models of Kidnaps for Ransom Insurance

Suzanne Wang '18, Economics

**12:00–1:30pm
Lunch**

(Served on Alumnae Hall Lawn)

1:00–2:40pm

Poster Session in LWC Tishman Commons

**1:30–2:40pm
Humanities**

A Sense of Places (Preformed Panel Discussion, Paulson Initiative Presentation) Collins Cinema
Zixia (Linda) Liu '19, English; Josephine (Josey) Murray '19, English and Creative Writing; Veronica (Ronnie) Alvarez-Alfani '20, Undeclared; Haruka Ueda '20, English

The Impact of the Selfie in American Life (Preformed Panel Discussion) FND-126
Abigail (Abby) Schleichkorn '21, Undeclared; Tara Hemant Luthra '21, Undeclared; Jacqueline Brinkhaus '21, Undeclared; Alicia Lee '21, Undeclared; Emily Katz '21, Undeclared; Rosalinda Xiong '21, Undeclared

Flutes on Fire: Passion and Virtuosity in 20th-Century Flute Quartets (Long Performance) JAC-AUD
Ruanqianqian (Lisa) Huang '20, Cognitive and Linguistic Sciences and Computer Science; Taylor Gunderson '18, English and Creative Writing and History; Hannah Kernen '20, Biological Sciences; Colleen Larkin '18, Mathematics and Political Science

Sed Ministrare: Building the Ministrare Council from the Ground Up (Preformed Panel Discussion) FND-102
Cecelia Tsui '18, Computer Science and Mathematics; Mehak Sarang '18, Physics; Leilani Stacy '18, Economics and Political Science; Magdalena Sowder '18, Media Arts and Sciences; Emily Moss '19, Economics

Exploring Community and Individual Identities Through Writing (Literary Reading) PNE-139

Far Cry

Padya Paramita '18, English and Creative Writing and Women's and Gender Studies

Strangers in San-Something: An Original Short Story Collection

Olivia Lafferty '18, Classical Civilization and English and Creative Writing

Let Us Not Bother with Them: Understanding the Suppression of Freedom in Myanmar Through Short Fiction

Rebecca (Becky) Finkelstein '21, Undeclared

Tongues of Eve: The Politics of Language in Postcolonial Algerian Literature

Molly Hoyer '18, Comparative Literature

Whose Land Is It? (Talk) PNE-127

Gold Diggers: The Social History of the Klondike Gold Rush

Samantha (Sam) Lanevi '18, Classical Civilization and History

The Ethics of Refugee Migration

Selma Khalil '18, Neuroscience and Philosophy

"We are Lonesome for Our Land": The Settler Colonialist Use of Exodus in the Diné Long Walk

Emma Brewer-Wallin '18, Peace and Justice Studies and Religion

Land, Labor, and Belonging: Japanese-Americans' and African-Americans' Struggle for Citizenship During World War II

Sofie Werthan '18, Individual-Ethnic Studies

Science and Technology

EcoLab: Investigating the Impacts of Nutrients and Soil Feedbacks on Plant Productivity and Diversity (Preformed Panel Discussion) FND-120

Emma Conrad-Rooney '20, Biological Sciences; Andrea Sama '19, Biochemistry; Emily Neel '18, Environmental Studies; Lyba Khan '20, Biological Sciences; Lara Jones '18, Biological Sciences; Abigail Conte '20, Biological Sciences; Erica Huang '20, Biological Sciences; Irina Chen '18, Biological Sciences; Sulaiikha Buuh '20, Biological Sciences

Exploring the Relationship Between the Innate Immune System and Adult Neurogenesis in the Crayfish (*Procambarus Clarkii*) Brain (Preformed Panel Discussion) FND-307

Anushree Dugar '18, Neuroscience; Vanessa Kelley '18, Biological Sciences; Yuriko Fukumura '19, Neuroscience; Sannidhi Ranjeet Joshipura '19, Neuroscience

Chasing Digital Traces and Digital Natives (Preformed Panel Discussion) PNE-216

Annabel Rothschild '20, Computer Science; Sophia (Sophie) Rosas-Smith '20, Computer Science; Meha Ahluwalia '20, Computer Science; Lauren Tso '20, Biological Sciences and Computer Science

Nanotechnology: From Biomedicine to Materials Chemistry (Preformed Panel Discussion) GRH-136C

Bang Nhan '20, Chemistry; Alejandra (Ally) Uchitelle '20, Biochemistry; Maria Phan '20, Undeclared; Amanda Code '20, Chemistry; Nasreen Al-Qadi '18, Biological Sciences; Camille Banson '19, Chemistry

The Water Challenge: Water Sustainability on Wellesley College Campus (Preformed Panel Discussion) JAC-372

Maria Gonzalez '19, Physics; Nicole Zhao '20, Cinema and Media Studies; Akilah Chatman '20, Physics

Chemistry in Action: From Pharmaceuticals to the Galaxy (Talk) PNE-339

First Surface Chemistry Application of a Newly Patented Ion Trap Mass Filter

Jean Huang '18, Chemistry and Japanese Language and Culture

Low Energy Photon Reactions with Condensed Methanol

Hope Schneider '18, Chemistry

Regioselective Synthesis of N1 Pyrazole Derivatives Using Disubstituted Benzyl Electrophiles

Natalie Norman '18, Chemistry

Pharmaceutical Formulation Development and Process Optimization

Michelle Duan '18, Chemistry

The Environment and Our Health (Talk) FND-197

Analysis of the Nutrient Composition, Efficacy, and Sustainability of Bokashi Fertilizer

Nisreen Abo-Sido '18, Environmental Studies

Walk a Life Cycle in These Shoes: Impact Assessment of Footwear

Leila-Anne Brusseau DS, Environmental Studies

From Field to Shelf: Framing the Transport of Herbicides Through Various Systems as an Issue of Women's Health

Amanda Hernandez '18, Environmental Studies and Geosciences

Social Sciences

Modern Sickness: Addressing Issues in American Healthcare (Preformed Panel Discussion) PNE-327

Gabriella (Gabi) L. Vesey '18, Political Science and Psychology; Nicole Zhu '20, Economics; Samantha (Sami) Habel '20, Political Science; Zoe Matticks '18, Neuroscience; Annalee Beaulieu '18, Political Science and Spanish

Girls' Generation? A Linguistic Analysis of Gender Representation in Modern South Korean Media (Preformed Panel Discussion) JAC-450

Paige Robinson '20, American Studies; Keiko Hilmo '20, Cognitive and Linguistic Sciences; Daniela Gomez '20, Cognitive and Linguistic Sciences; Audrey Seo '20, Mathematics

Linguistic Attitudes: Creole Language Education in Mauritius and Haiti (Exhibition) GRH-428

Rachael Schwartz '18, Cognitive and Linguistic Sciences; Karen Moorthi '18, Cognitive and Linguistic Sciences; Sofia Buitrago '19, Cognitive and Linguistic Sciences

**Making Dreams into (Virtual) Realities: VR at Wellesley College
(On Location Presentation)** **Knapp Fabrication Lab—1st Floor Clapp Library**

Kamile Lukosiute '19, Physics; Havannah Tran '19, Computer Science and English; Aubrey Simonson '19, Media Arts and Sciences and Political Science; Michelle Lu '18, Media Arts and Sciences; Kaylie (Shane) Cox '18, Classics; Valeria Yang '21, Undeclared

**Mellon Mays Undergraduate Fellowship Research Imperatives I
(Preformed Panel Discussion)** **FND-319**

Budnampet (Pet) Ramanudom '18, Computer Science and Women's and Gender Studies; Serenity Hughes '18, Africana Studies, Maleah Maxie '18, Cognitive and Linguistic Sciences and Music, Jordan Mayfield '18, Art History, Victoria (Tory) Roth '18, American Studies

Finding One's Self (Talk) **GRH-130**

Origin Stories—Personal Genomics Testing and Narratives of Identity in Chinese Adoptees

Margaretta (Kit) Mitchell '18, Anthropology

Performance Identity and Fictive Kinship: An Examination of Fraternity Life

Anna Ehrlich '18, Anthropology and English

Moral Dualism: Communities of Action vs. Inaction

Jasmine Kaduthodil '18, Neuroscience

Self-Esteem and the Twice Exceptional: Interactions Between Attention Deficit Hyperactivity Disorder and Intellectual Giftedness

Audrey Ellis '18, Psychology

Contemporary Debates in Politics (Talk) **PNE-239**

The Marginalization of Abortion in Medicine

Sarah Hudson DS, Political Science

Practice vs. Paper: An Analysis of Freedom of Speech Restrictions in Illiberal Democracies

Ishwari (Isha) Gupta '21, Undeclared; Grace Wong '21, Undeclared

The Sweet Life of American Muslims: Resilience and Community Building Through Muslim Student Associations (MSAs)

Maryam Khan '18, Economics and Political Science (Fowler Public Speaking Finalist)

2:40–3:00pm Break

Refreshments served in the Pendleton Atrium

**3:00–4:10pm
Humanities**

**Children of the Holocaust: Service-Learning in the Netherlands
(Preformed Panel Discussion)** **FND-207**

Sandra Amponsah Ohemeng '20, Economics; Anastacia Markoe '20, Political Science; Goretty Chavez '20, Psychology; Arianna Regalado '18, Religion

Archaeology at Wellesley: Sticks, Stones, and Bones (Preformed Panel Discussion) **PNE-127**

Paola Favela '19, Anthropology and Religion; Ruqing (Rachael) Tao '19, Psychology; Georgia Oppenheim '20, Anthropology

Somnium (Film Screening) **Collins Cinema**

Elena (Lanie) L. Najjab '18, Cinema and Media Studies; Ilana Meeker '18, Cinema and Media Studies

How Sounds Make Us Feel (Talk) **JAC-450**

Whispers from Half a World Away: ASMR and Distant Intimacy

Emily Precht '20, Peace and Justice Studies

Sound Healing and Complementary and Alternative Medicine: Issues of Access

Rachel Frazer '20, Music

My Neck, My Back: How Commerce and Music Shape Hook-up Culture and Erotic Capital at Wellesley College

Holland Rhodd-Lee '19, Music and Neuroscience

Science and Technology

Inclusion in Computer Science: How Students Are Contributing to an Effort to Make the Department More Welcoming for Everyone (Preformed Panel Discussion) **GRH-136C**

Mathangi Ganesh '18, Computer Science; Jessica (Jess) Abramson '19, Computer Science and Psychology; Breana Dupree-Jones '20, Computer Science; Caitlin Pham '21, Undeclared

Create to Engage: Exploring Mathematics Through Engineered Models (Interactive Teaching Presentation) **FND-126**

Aliza Camacho '20, Computer Science

Artificial Intelligence: From Fiction to Reality (Preformed Panel Discussion) **PNE-139**

Michelle Lu '18, Media Arts and Sciences; Olivia Strobl '19, Neuroscience; Grace Owen '19, Media Arts and Sciences; Ruanqianqian (Lisa) Huang '20, Cognitive and Linguistic Sciences and Computer Science; Catherine Chen '19, Computer Science and French; Dagmawit Libanos Assefa '20, Physics

Pulling, Shifting, and Deleting: Manipulating Biological Systems Through Biochemical Approaches (Preformed Panel Discussion) **PNE-327**

Sarah Plachinski '18, Biochemistry; Maahum Mehdi '18, Biochemistry; Suhaily Penix DS, Biological Sciences; Tatyana (Any) Johnson '18, Biological Sciences

CRISPEE: A Tangible Gene-Editing Platform for Early Childhood (Preformed Panel Discussion) **FND-317**

Jennifer Otiono '18, Biological Sciences; Parul Koul '19, Computer Science

We-cycle: A Systems Approach to Improving Recycling Practices at Wellesley College (Preformed Panel Discussion) **FND-120**

Amaya Allen '18, Environmental Studies; Lea Davis '18, Environmental Studies; Ariana Carter '18, Environmental Studies; Olivia Joslin '18, Environmental Studies; Margaret Mead '18, Art History and Environmental Studies; Fabiana (Fabi) Vivacqua '18, Economics and Environmental Studies; Sonia Hupalo DS, Environmental Studies; Alison Draikiwicz '18, American Studies and Environmental Studies; Caroline George '19, Environmental Studies and Music; Aynsley Kretschmar '18, Biological Sciences and Environmental Studies; Catherine (Katie) Livingston '19, Environmental Studies; Alexandra Bueno '18, Chinese Language and Environmental Studies; Emily Neel '18, Environmental Studies; Lorrie He '18, Biological Studies; Alejandra Narvaez '18, Environmental Studies; Amanda Hernandez '18, Environmental Studies and Geosciences; Nisreen Abo-Sido '18, Environmental Studies

Interactivity: Connecting, Learning, and Augmenting Our World (Talk) **PNE-216**

Snap 'n' Go: Trajectory Aware Task Allocation

Chloe Blazey '19, Mathematics; Hannah Murphy '19, Computer Science

ARtLens: Augmenting the Museum Experience

Lauren Futami '18, Media Arts and Sciences; Isabella (Bella) Virgilio '20, Media Arts and Sciences; Dana Hsiao '18, Computer Science

Pocket Politics: A Mobile Revolution for Political Engagement

Marissa Okoli '18, Media Arts and Sciences

Computational Modeling and Machine Learning: Methods and Applications (Talk) **FND-307**

Multilabel Classification and Its Applications

Yujue (Victoria) Wu '18, Economics and Mathematics

adVantage—Seeing the Universe: An Immersive, Laboratory-like Virtual Reality Environment Modeling a Star-Planet-Satellite System for Undergraduate Astronomy Students

Eliza McNair '18, Computer Science

Evaluation of Dynamic Binary Instrumentation Approaches: Dynamic Binary Translation vs. Dynamic Probe Injection

Valerie Zhao '18, Computer Science and Neuroscience

A Crowd-Sourced Blocks Suggestion System to Improve the Beginner Experience in App Inventor

Maja Susanna Svanberg '18, Computer Science

Social Sciences

Science Education Equity Development Kit: Using Data to Drive Social Change

(Preformed Panel Discussion)

FND-102

Sophia Samir Abdelrahman '20, Economics; Isabel D'Alessandro '18, Neuroscience; Katherine Schauer '18, French and International Relations–Economics; Undeclared; Denise Chai Sy Qing '21, Undeclared

Mellon Mays Undergraduate Fellowship Research Imperatives II

(Preformed Panel Discussion)

FND-319

Kindred Obas '19, English; Aya Ross '19, American Studies and East Asian Studies; Morinade (Jayla) Stevenson '19, Philosophy

Healthcare Resources: Practitioners and Consumers (Talk)

GRH-330

Family Needs Screening Program

Hanna May '19, Biological Sciences and Sociology

The Community Health Worker: An Analysis

Elinor Higgins '18, Biological Sciences and Women's and Gender Studies

Healthcare Without Walls: Providing Quality Care to Boston's Vulnerable

Karen Moorthi '18, Cognitive and Linguistic Sciences; Michelle Duan '18, Chemistry

On Addressing Inequality: Sources, Consequences, and Culture (Talk)

PNE-239

Achieving Gender Equality in India

Tarushi Sinha '20, Economics

Ethics of Student Volunteerism: The Challenges of and Best Practices for Training Student Volunteers

Alondra Navarro '18, Sociology

A Map of Exquisite Meanings: Urban Transportation as a Language of Spatial Equity and Layered History

Hans Han '18, Economics (Fowler Public Speaking Finalist)

Poverty's Paradoxes: Conceptions of Failed Parenting in the Neoliberal State

Alberta Born-Weiss '20, Economics

Jacqueline Loewe Fowler '47 Prize in Public Speaking

This year's Ruhlman Conference will host the Maurer Public Speaking Program's annual **Jacqueline Loewe Fowler '47 Prize in Public Speaking** competition. The prize honors Mrs. Fowler's support of public speaking at Wellesley through her substantial contributions to the public speaking program established by Ann E. Maurer '51 and her husband, Gilbert, in 2012.

The finalists, listed below, will be presenting throughout the day in PNE-239, and their talks can be viewed online at www.wellesley.edu/live.

Finalists (in schedule order)

9:15–10:25am Hannah Jacobs '19

Biochemistry

ADVISOR: *Adam Matthews, Biological Sciences*

"Computational Prediction of miRNA Targets in a Brain Specific Cluster"

10:45–11:55am Danielle Heims-Waldron '18

Biological Sciences

ADVISOR: *Louise Darling, Knafel Assistant Professor of Natural Sciences and Assistant Professor of Biological Sciences*

"Getting at the Heart of Inherited Arrhythmia: A New Approach to the Treatment of CPVT (catecholaminergic polymorphic ventricular tachycardia)"

1:30–2:40pm Maryam Khan '18

Economics

ADVISOR: *Nadya Hajj, Assistant Professor of Peace and Justice Studies*

"The Sweet Life of American Muslims: Resilience and Community Building Through Muslim Student Associations (MSAs)"

3:00–4:10pm Hans Han '18

Economics

ADVISOR: *Justin Armstrong, Lecturer in Writing and Anthropology*

"A Map of Exquisite Meanings: Urban Transportation as a Language of Spatial Equity and Layered History"

The Wellesley College Guild of Carillonneurs

The Wellesley College Guild of Carillonneurs is a student-run organization whose members provide the trademark music of chiming bells on campus. Active members of the Guild receive weekly lessons and perform regularly on the carillon during the school year. The Guild also hosts open tower events and concerts open to the entire Wellesley community. Housing 32 bells, the Wellesley carillon was installed in Galen Stone Tower above Green Hall in 1931. The tower is 182 feet tall from the ground to its highest finial. Aside from a few years during World War II, Wellesley students have performed on the carillon since its installation.

FEATURED CARILLONNEURS PLAYING DURING TODAY'S RUHLMAN CONFERENCE:

8:50am

Lara Prebble '19

Belmont Suite—Prelude, Slow Jig, Final Flourish; JOHN KNOX

Morning from Peer Gynt; EDVARD GRIEG

Do You Like Rhythm from the Wellesley Studies, assisted by Sarah Gonzalez; GEERT D'HOLLANDER

What a Wonderful World; LOUIS ARMSTRONG, ARRANGED BY LARA PREBBLE

10:25am

Hope Anderson '20

Suite Archaïque—Rigaudon, Pavane, Menuet; GEO CLÉMENT

Poor Wayfaring Stranger; LEEN 'T HART

Liz on Top of the World; DARIO MARIANELLI, ARRANGED BY HOPE ANDERSON

The Search, from the Wellesley Studies; GEERT D'HOLLANDER

12:10pm

Sarah Gonzalez '20

Do You Hear the People Sing?; CLAUDE MICHEL SCHONBERG, ARRANGED BY REBECCA WEITZEL

All I Ask of You; ANDREW LLOYD WEBBER, ARRANGED BY SARAH GONZALEZ

Gavotte and Double; WILLEM DEFESCH

Into the West; HOWARD SHORE

Pedal Aria; JOHN GOUWENS

Alma Mater; ARRANGED BY SALLY SLADE WARNER

1:10pm

Jasmine Li '21

Fantasia; JUAN NARVAEZ

Preludio V; MATTHIAS VAN DEN GHEYN

So Ben; ORAZIO VECCHI, ARR. RONALD BARNES

Waltz in c minor; DMITRI SHOSTAKOVICH, ARRANGED BY JASMINE LI

2:40pm

Ivy Chen '21

Etude; GARY WHITE

Sarabande; RONALD BARNES

Musical Clock Pieces—Andante, Allegretto, Menuetto; FRANZ JOSEF HAYDN

Flemish Prelude from ivy-Covered Walls; JOHN GOUWENS

4:10pm

Alison Draikiwicz '18

Prelude Op. 3 #2; SERGEI RACHMANINOFF

Memory from Cats; ANDREW LLOYD WEBBER, ARRANGED SALLY SLADE WARNER

Andante from Four Easy Pieces; ANTONIO DIABELLI, ARR. RONALD BARNES

Chorale Partita V; JOHN KNOX

Frequent Sources of Support for Student/Faculty Research

Brachman Hoffman Fund

Elizabeth Davis Cook Student Research Fund

Pamela Daniels '59 Fellowship

Educational Research and Development Committee

Virginia Fiske Fund

Howard Hughes Medical Institute

IBM Research Fund

Amabel Boyce James Fund for Summer Research in the Sciences

Keck Northeast Astronomy Consortium Grant

Sara Langer Fund for Research in Geosciences

John and Elizabeth Alden Little Science Fund

Janina A. Longtine Fund for Summer Research in the Natural Sciences

Massachusetts Space Grant Consortium

Georgeanne Miller Mulhern Fund for Faculty/Student Research in the Sciences

National Buchet Fellowship

National Institutes of Health

National Science Foundation

Office of the Provost and Dean of the College

Barbara Peterson Ruhlman

Jerome A. Schiff Fellowships

Joan and Herbert Schilder Student Research and Travel Fund

Staley Fund for Cancer-Related Research

Robert and Karl Staley Fund

Fund for Summer Research in the Social Sciences

Conference Planner

	Presentation 1	Presentation 2	Presentation 3	Presentation 4
9:15–10:25am	Topic:	Topic:	Topic:	Topic:
	Presenter(s):	Presenter(s):	Presenter(s):	Presenter(s):
	Location:	Location:	Location:	Location:
10:25–10:45am	BREAK			
10:45–11:55am	Topic:	Topic:	Topic:	Topic:
	Presenter(s):	Presenter(s):	Presenter(s):	Presenter(s):
	Location:	Location:	Location:	Location:
12:00–1:30pm	LUNCH			
1:30–2:40pm	Topic:	Topic:	Topic:	Topic:
	Presenter(s):	Presenter(s):	Presenter(s):	Presenter(s):
	Location:	Location:	Location:	Location:
2:40–3:00pm	BREAK			
3:00–4:10pm	Topic:	Topic:	Topic:	Topic:
	Presenter(s):	Presenter(s):	Presenter(s):	Presenter(s):
	Location:	Location:	Location:	Location:

Please note that people will be leaving or entering the rooms between or even during presentations.

Humanities

Medieval Pageant Wagons for a Modern Divine Comedy

GRH-136C (Exhibition)

Rosalind (Roz) Rea '19, English Medieval/Renaissance Studies

ADVISOR: *David Towlun, Theatre Production Manager*

Join Roz Rea for an exploration of the medieval pageant wagon in contemporary theatrical design practices through a modern representation of Dante's *Divine Comedy*. The exhibition includes mixed-media pieces designed to represent an emotive response to the comedy, scenic construction drafting, theatrical scene-by-scenes for the nine circles of Hell and the nine terraces of Purgatory (including Ante-Purgatory and the Earthly Paradise), half-inch scale renderings of two complete wagons, and a small section on presentation of the production to a theoretical audience as to how the chain of wagons would snake through the city of Florence.

Perspective: An Artistic Analysis

JEWETT SCULPTURE COURT (Exhibition)

Madison (Maddie) Miller '21, Undeclared

ADVISOR: *Daniela Rivera, Associate Professor of Art*

This portfolio of artwork explores the methods by which one can convey a range of viewpoints. From illustrations to surrealism, *Perspective: An Artistic Analysis* seeks out new lenses to capture concepts of self and emotionality and also to raise awareness for several 'lost' perspectives. There is a clear indication of experimentation, as the style develops dramatically over the course of the series. An illustration turns into realistic portraiture which becomes a set of surrealist paintings. Throughout this evolution, however, the substance of the artwork remains constant. Every piece approaches the question: "Who are we?" Who are we as individuals and as a society? When people get lost, what do they become to the rest of us? To what extent do our emotions play into our identity? In asking this, we can begin to see and understand our own perspective as well as to empathize with the outlook of others.

Songs and Songwriting: A Performance

JAC-AUD (Long Performance)

Charlotte Francis '19, Music; Isabella DeHerdt '21, Undeclared; Kristen Gasparini '20, Philosophy; Rosamond Herling '18, Russian Area Studies; Kimaya (Kimy) Lecamwasam '21, Undeclared; Lauren Luo '20, Computer Science; Karen Ni '18, Economics

ADVISOR: *Martin Brody, Catherine Mills Davis Professor of Music*

The Song and Songwriting class inspired performers, poets, composers, and music enthusiasts to create works of art through the classic combination of lyric and melody. Throughout the semester, students received feedback from each other on pieces they were creating, and at the end of the semester students presented their final pieces to each other. In this session, we will present a sampling of this work.

Calderwood Seminars in Public Writing: Engaging Interviews

FND-120 (Preformed Panel Discussion)

Alexandra Beem '18, Biological Sciences; Molly Hoyer '18, Comparative Literature; Diva Sharma '18, Economics and Mathematics
ADVISOR: *David Lindauer, Stanford Calderwood Professor of Economics*

Alexandra Beem: People with HIV are living longer than ever before, thanks to rapid advancements in antiretroviral therapy (ART), a drug cocktail that prevents HIV-positive people from developing AIDS. However, as patients on the leading edge of the HIV epidemic reach their 60s and 70s, we are beginning to see the effects of long-term HIV treatment. I interviewed Dr. Jennifer Snyder-Cappione, an immunologist at the Boston University Medical Center, who explained that emerging research shows that HIV-positive people on ART appear to be aging faster than their HIV-negative peers. We talked about her research into how the immune system deals with both aging and HIV infection, as she tries to figure out why ART isn't working as well as the medical community hoped it would.

Molly Hoyer: My Calderwood Seminar, *Advocating for Other Cultures*, asks students to write about their experience of a different culture. Somy Kim, associate teaching professor in Northeastern University's Writing Program, is an expert in engaging with cultures other than her

own. In addition to her own research on Iranian cinema, she guides undergraduates from a wide variety of disciplines as they navigate and analyze film and literature from other cultures. Our conversation about both her academic training and her experience in the Middle East, including living in Cairo during the start of the Iraq War, emphasized the critical perspective that any cultural product or experience is one narrative, not a one-to-one relationship.

Diva Sharma: Professor Moon Duchin of Tufts University is doing something outside of the mathematical box—finding a real-life application for pure mathematics. Professor Duchin's research interests range from geometric group theory and geometric topology to gerrymandering—the practice of manipulating electoral boundaries to benefit a certain group. Her work has not gone unnoticed. Pennsylvania governor Tom Wolf enlisted Professor Duchin to testify before the Pennsylvania Supreme Court this past September. Her expertise and unique mathematical argument illuminated the existence of extreme gerrymandering in Pennsylvania's Seventh District. In late January '18, the Supreme Court ruled 5-2 in favor of redistricting the gerrymandered district. Duchin's research lies at the intersection of politics and mathematics, and has never been more important than it is in today's polarizing climate.

Look Again, Beyond What You See

FND-102 (Talk)

The Crouching Venus in the Court of Louis XIV-Branding, Womanhood, Authenticity, and Spectatorship

Runchan (Jennifer) Zhang '18, Art History and French

ADVISOR: *Kimberly Cassibry, Assistant Professor of Art*

The Crouching Venus is a celebrated Hellenistic archetype which shows Venus taking her ritual bath. Even though the original statue did not survive, the Crouching Venus type was frequently copied, altered, and appropriated not only by the Romans, but also by Renaissance and Baroque artists. My project, which produced a seminar paper for ARTH 373 *Antiquities Today Replication*, analyzes the replication and appropriation of the Crouching Venus type in the context of the 17th-century French court of Louis XIV. The study

pays special attention to the marble copy of the Hellenistic statue and its bronze cast by Antoine Coysevox (1640-1720), respectively finished in 1686 and 1688. My research is divided into five sections: “A False Signature, a Brilliant Marketing Strategy: Coysevox as the Successor of Phidias,” “A 17th-Century Venus de Milo: The Appropriation of Aphrodite Ourania,” “A Portrait of a New Queen or a Representation of Ideal Beauty?,” “Two Venuses, Two Images of Womanhood,” and “Venus on Display: A Goddess or an Object?”; the five parts serve to answer five central questions: Historically, the Crouching Venus archetype was closely tied to Doidalsas (ca. mid-3rd century BC), an artist whom art historians know very little about. Interestingly, Coysevox signed his work with “Phidias,” the name of the famous Athenian sculptor who was the artistic director of the construction of the Parthenon. How can one explain Coysevox’s behavior? And more importantly, how does Coysevox’s signature reflect on his patron, Louis XIV? Did Coysevox pick one of Louis XIV’s mistresses as the model of his Crouching Venus? If so, how did the artist express the taste and character of this mistress through the guise of the goddess of love and beauty? And most importantly, what message was the mistress or patron trying to express through the addition of a tortoise, a symbol of female chastity appropriated from the Aphrodite Ourania prototype? After making his Crouching Venus in marble, Coysevox later produced the same statue in bronze. Considering that Doidalsas probably made the first Crouching Venus in bronze, how does the shift of medium from bronze into marble and back into bronze reflect 17th century perception of the Antiquities?

Recontextualizing the Chinese Works of Art in the Davis Museum

Nikki Hwa '18, Art History and Economics
 ADVISOR: *Kimberly Cassibry, Assistant Professor of Art*

The Chinese collection in the Davis Museum can not only be used as it is now, as a showcase of ancient Chinese history, but also as a marker of modern history, through its acquisition. Political upheaval and changes have greatly influenced the art market and thus, the acquisition of different Chinese works in museums and private collections alike. The years after the fall of the Qing dynasty saw a spike in collecting;

the following years, 1937-1976 (when Mao died), had a smaller market. However, as the economy of mainland China continued to improve during the 1980s, more Chinese artifacts and works were found and sold. The 1990s and 2000s signify the start of antiquities returning to China and more serious art-buying by the Chinese. Due to the significant changes China has gone through in the 20th century, the Davis should emphasize its modern history in addition to its ancient past.

The Confederacy Strikes Back

Maya Nandakumar '19, Classics and Political Science
 ADVISOR: *Kimberly Cassibry, Assistant Professor of Art*

As the centerpiece of Tennessee’s Centennial Park, the Nashville Parthenon has represented the transforming values of Southern identity. Constructed in 1897 for a celebration of the region’s statehood, the monument served as a testament to a sense of newfound metropolitanism. However, critical research reveals sinister intentions: namely, the Nashville Parthenon, while ostensibly a display of democratic values, also served as a subtle tribute to the city’s Confederate and colonial past. An evaluation of the Nashville Parthenon’s initial installation, restoration, and modern usage illustrates the ways in which the building has defined the Tennessean ethos over the years.

Tell Me a Story Using Numbers and Pictures

Georgia Stylianides '18, Art History and Mathematics
 ADVISOR: *Corrine Taylor, Senior Lecturer in the Quantitative Reasoning Program*

Art tells stories, as does statistics. What stories can statistics tell us about art? Over the last two semesters, I have used statistical analysis to investigate what narratives can be told and insight can be gained by approaching an art context with an analytical objective. This work has culminated in a hedonic pricing model, a strictly statistical tool, which I will use to tell a story about auction prices. I will offer my insights into the myriad of influences that affect artistic value: how important are the narratives that we associate with a certain piece in determining its monetary worth? Is there a premium for art that was

looted during WWII, and then recovered, repatriated, and restituted?

Adapting to Changing Environments

FND-319 (Talk)

The Power of Art to Break Despair: The Impact of the *Kohleausstieg* on the German Imagination

Anne Schnitzer '18, German Studies
 ADVISOR: *Anjeana Hans, Associate Professor of German Studies*

My thesis research examines the cultural impact of the *Kohleausstieg*, a national policy of phasing out dependence on coal in former East Germany. This transformation represented more than a loss of economic livelihood, which was traumatic in and of itself; it also meant the disappearance from peoples’ lives of much that was familiar and secure. I explore artistic production as a way of coping with this dramatic transition. I analyze works from a range of media and by artists from differing backgrounds in order to consider how the region as a whole engaged with and represented its experience through cultural expression.

The Politicization of Sunni and Shi’a Under Saddam Hussein’s Dictatorship in Iraq

Emily Bader '18, International Relations–History
 ADVISOR: *Lidwien Kapteijns, Elizabeth Kimball Kendall and Elisabeth Hodder Professor of History*

My thesis research focuses on the history of Sunni and Shi’ite Arabs from the establishment of the British mandate in Iraq through Saddam Hussein’s seizure of power as head of the Ba’th Party in 1979. It explores the changing politicization of these two religious communities under Hussein’s dictatorship and how this politicization took the form of increasing communal violence following his capture in 2003. I will argue that that the Iran-Iraq War from 1980 to 1988, the invasion of Kuwait in 1990, and subsequent Shi’a uprisings in 1991 lay the basis for the collective violence that became commonplace after the invasion of Iraq by the U.S.-led coalition in 2003. An important focus in this is the ways that religious group leaders, in particular those of the powerful Shi’ite Sadr family—to which the infamous Mahdi militia leader Muqtada al-Sadr belongs—contributed to these developments by instigating such violence.

The Artist Collective Ratgeb: The Art of Defending Public Space; Political Murals of West Berlin 1979-89

Emily Moore '18, *Art Studio and German Studies*

ADVISOR: Anjeana Hans, *Associate Professor of German*

My research follows the work of the artist group Ratgeb, a collective of five West German artists from the generation of Germans who grew up in the immediate aftermath of the Second World War. During the eight years that the group was active, the Ratgeb Collective worked with squatters, schoolchildren, teenage runaways, immigrant minorities, juvenile delinquents, and even a biker gang to create more than a dozen large-scale murals within Berlin. Eleven of these murals can still be seen today, nearly four decades after their creation. My thesis focuses on both Ratgeb's commissioned and illegal mural projects, all of which comment on the housing crisis that arose in the 1980s following the retail speculation government officials had organized with foreign investors. The namesake of the group, and honorary sixth member, Jörg Ratgeb, was an altar and fresco painter who regularly infused his religious paintings with messages of political dissent, and was later executed due to his leadership role in the farmers' uprising. In honor of this early fellow German artist and activist, the Collective Ratgeb adopted not only his name but his revolutionary drive to use murals as a means of communicating the wants and needs of those civilians who had been overlooked and neglected by government officials and the social elite of West Berlin.

From Tokyo to Boston, Brazil, Britain, and Beyond: How Japanese Religious Movement Soka Gakkai International Adapted to a 21st-Century World

Arianna Regalado '18, *Religion*

ADVISOR: T. James Kadera, *Professor of Religion*

Founded in 1930, Soka Gakkai is a Japanese Buddhist religious organization based on Nichiren Buddhism, which was formed by Japanese Buddhist monk Nichiren Shonin in the 13th century. My thesis examines the formation of Soka Gakkai International by analyzing the strategies they used to expand from a few dozen teachers to a global membership in the tens of millions of followers in over 100 countries worldwide. Soka Gakkai International is the largest religious group to promote and spread

Nichiren Buddhism in the 21st century and is the largest of the new religions of Japan. What did they have to sacrifice in order to achieve this size and influence? How did strategies like chanting, using shakubuku as a tactic to convert others, taking advantage of emigration from Japan in order to spread overseas, setting up universities and other centers of education in order to spread their message, and altering Nichiren Buddhism to make Nichiren's teachings more palpable for different communities around the world lead to their success as the largest of the new religions of Japan? How did Soka Gakkai appeal to places as different as Brazil, Britain, and Boston? How does the organization resolve the tensions between the original teachings of Nichiren Buddhism and their current status, primarily the tension between preaching a religion of renunciation while being one of the largest and most powerful political and economic forces in contemporary Japan, with a net worth in the billions of dollars and with ties to one of the most powerful Japanese political parties, the Komeito Party, which they founded in 1964?

Science and Technology

Sex, Aging, Metabolism, and Behavior: Lessons from the Microscopic Worm *C. Elegans*

FND-307 (Preformed Panel Discussion)

Elizabeth Loxterkamp '18, *French and Neuroscience*; Sarah Yaser '19, *Neuroscience*; Janessa Sullivan '18, *Psychology*; Casey Smith '20, *Neuroscience*; Maya Muldowney '18, *Neuroscience*; Leila Mahdavi '21, *Undeclared*; Olivia Holbrook '20, *Political Science*; Hanjaaram (Jaaram) Cha '20, *Undeclared*
ADVISOR: Deborah Bauer, *Lecturer in Neuroscience*

Caenorhabditis elegans (*C. elegans*) is a microscopic nematode that is an ideal model organism due to its simplicity, allowing researchers to study the basic molecular processes of biology and neuroscience. Our lab will present two projects investigating neurobiology in these worms.

Project 1: Behavioral sex differences. Most *C. elegans* are hermaphrodites, which have two X chromosomes and are able to reproduce asexually, but approximately 0.1% are males, who arise due to a mutation where one X chromosome is missing. *C.*

elegans hermaphrodites and males differ neurologically—hermaphrodites possess 302 neurons, while males have 385. Despite these differences, variations in general behavior between the sexes has not been well documented. In order to evaluate behavioral sex differences in *C. elegans*, we compared spontaneous movement, sensitivity to mechanosensation, and sensitivity to chemosensation between males and hermaphrodites that were fed or starved. Males reversed to mechanical stimulation significantly less often than hermaphrodites.

Project 2: Lifespan and metabolism in glutamate transporter knockout animals. Glutamate is a neurotransmitter that mediates many important signals in the nervous system. Glutamate transporters (GLTs) reset the synapse by removing extrasynaptic glutamate. GLT knockouts are lethal in mammals but not in *C. elegans*. Therefore, we use *C. elegans* as a model organism to investigate the role of GLTs on metabolism and aging. In order to investigate the role of glutamate transporters in aging, we measure longevity in *C. elegans* GLT-knockouts (*glt-1/glt-3*, *glt-4*, and *glt-5*) using two techniques: a standard method used in the worm community, and a novel assay that we are developing with reduced chemical hazards. Lastly, we are using Liquid Chromatography-Mass Spectrometry (LC-MS) and metabolite-specific assays to measure glutamate, glutamine, and alpha-ketoglutarate in each of our wormstrains. Preliminary results from our aging experiments indicate that glutamate transporter expression does influence lifespan. If successful, our new lifespan assay would provide the worm community with a safer, cheaper, and easier method of measuring *C. elegans*' longevity.

Conclusions: Our findings suggest that studies in *C. elegans* can provide insight into the influence of sex and protein expression on behavior and lifespan.

Don't Change the Channel: Investigating Transport Proteins Implicated in Human Health and Disease

FND-207 (Preformed Panel Discussion)

Stephanie Kim '18, *Biological Sciences*; Maura Sticco-Ivins '18, *Biochemistry*; Emily Whitehead '18, *Biochemistry*;

Laurel Kinman '18, Biological Sciences and Mathematics
 ADVISOR: *Louise Darling, Knafel Assistant Professor of Natural Sciences*

Transport proteins are a subclass of transmembrane protein responsible for the transport of ions and other molecules across the cell membrane. This movement of materials facilitates the uptake of nutrients, drugs, and other important compounds into the cell, and functions in maintaining an electrochemical gradient across the cell membrane. The Darling lab investigates specific transport proteins, with the goal of characterizing both their function and their interactions with other proteins in the cell. Specifically, the Darling lab focuses on three types of transport proteins: cardiac voltage-gated potassium channels, cardiac ATP-sensitive potassium channels, and the transport protein reduced folate carrier. Voltage-gated potassium channels are critical in mediating the repolarization of the heart, and dysfunctions in these channels are associated with cardiac arrhythmias and long QT syndrome. Currently, Laurel Kinman and Maura Sticco-Ivins are working to characterize the effects of cAMP-mediated protein-protein interactions on plasma membrane localization of two such channels. Meanwhile, ATP-sensitive potassium channels play a protective role in the heart when it is undergoing low-oxygen conditions. Emily Whitehead has been working to develop a model heterologous cell line through which we can characterize and study these channels. Finally, reduced folate carriers are responsible for the transport of both necessary nutrients and the chemotherapeutic agent methotrexate into the cell. Stephanie Kim is currently working to understand how these transporters contribute to drug resistance, particularly in adipose-derived stem cells. Together, the Darling laboratory seeks to investigate the biochemical properties of these transport proteins and their impact on human health and disease.

Investigating Global Gas Environmental Chemistry Using Mass Spectrometry and Noble Gases

JAC-372 (Preformed Panel Discussion)

Callan Krevanko '18, Chemistry; Lumi Kinjo '19, Chemistry; Brenda Ji '18, Biological Sciences; Helene Alt DS, Chemistry; Katherine

Chan '18, Chemical Physics; Danielle Aldrett '21, Undeclared
 ADVISOR: *Rachel Stanley, Assistant Professor of Chemistry*

Understanding how gases move between air and bodies of water, i.e. air-sea gas exchange, helps scientists' better model important processes such as biogeochemical cycles and climate change. Air-sea gas exchange occurs through interactions at the surface of the water and through bubbles, which inject gas into the water. Once in the water, certain gases are biologically active and their concentrations are further mediated by biological reactions. Through various projects, our lab group studies air-sea gas exchange, biological production, and the effects of these processes on global climate cycles using mass spectrometry and noble gas tracers. The goal of our research is to improve understanding of gas behavior in the upper ocean and eventually to lead to better predictions of how the ocean is affecting and being affected by climate change.

From Menstrual Cramps to Conferences: Creating and Publishing a Menstrual-Tracking Wearable

PNE-127 (Preformed Panel Discussion)

Rachel Pak '18, English and Media Arts and Sciences; Shanzay Kazmi '18, Media Arts and Sciences; Margaret Flemings '18, Media Arts and Sciences

ADVISOR: *Orit Shaer, Class of 1966 Associate Professor of Computer Science*

In our fall 2017 course, CS 320 Tangible User Interfaces, we conceptualized a tangible user interface (TUI) in order to provide all people who menstruate a novel way of keeping track of their periods. What started as a simple desire to engineer a better alternative to available period tracker apps turned into a published scientific paper and a demonstration at an international conference. Our project, Crimson Wave, is a personal TUI that generates and displays information about its user's menstrual cycle based on changes in body temperature. It tracks the data through a wearable armband and then displays it visually on a separate augmented mirror. The goal of the project is to seamlessly provide more accurate information to the user. In our panel, we will walk the audience through the entire process of developing, building, testing,

and publishing our TUI and presenting Crimson Wave at the TEI Conference in Stockholm, Sweden.

It's More Than Your Genes: From Epigenetics to Proteomics PNE-239 (Talk)

A Cross-Comparison of the Extracellular Matrix Derived from Various Cell Types for Applications in Tissue Engineering and Regenerative Medicine

Emily Liao '19, Biological Sciences
 ADVISOR: *Sun-Hee Lee, Associate Professor of Korean*

The extracellular matrix (ECM) is a support system located between cells that is synthesized, secreted, and remodeled in response to environmental cues. Its components include proteins like collagen and elastin that determine tissue properties such as tensile strength and elasticity. Consequently, it plays an important role in tissue engineering and regenerative medicine. However, while ECM derived from different cell types may lead to the different physical properties of various tissues, few previous studies have directly compared them. To better understand compositional and functional differences in ECM, we studied the protein composition of four different cell-derived matrices (CDM). As hypothesized, we found that different cell types not only produced CDM with different arrangement patterns, but also different protein levels. While preliminary, these results may hold the key to producing technology that better mimics our bodies on a microscopic as well as a macroscopic level.

Computational Prediction of miRNA Targets in a Brain-Specific Cluster

Hannah Jacobs '19, Biochemistry (Fowler Public Speaking Finalist)

ADVISOR: *Adam Matthews, Lecturer in Biological Sciences*

miRNAs are noncoding RNAs that regulate gene expression by binding the 3'untranslated region (3'UTR) of mRNA transcripts, signaling them for degradation. One of the largest clusters of miRNAs is called miR379-410, which contains 39 miRNAs that are coexpressed in the Meg3 gene on the genome. miR379-410 has been shown to be upregulated in the brain. Previous research has elucidated specific miRNAs in the cluster affecting neuronal pathways. However, there is still a large

need to understand why these miRNAs are clustered together, whether they coregulate transcripts, and if so, which neuronal pathways are affected. In order to answer these questions, I have used computational modeling to predict possible miRNA targets of this cluster by processing a dataset in TargetScan (a miRNA target-predicting software). With my high-confidence target predictions, I will create reporter constructs that contain 3'UTRs of predicted genes to confirm whether miRNA loss changes the expression of these genes of interest.

The Role of Histone Modifiers in Segment Specification During Metamorphosis

Teresa Chen '18, Biological Sciences
 ADVISOR: *Yuichiro Suzuki, Associate Professor of Biological Sciences*

The spectacular transformation of the body morphology during metamorphosis often involves major tissue remodeling, rearrangements, and repatterning. The roles of epigenetic regulators in this process remain poorly understood. Polycomb group (PcG) proteins have been identified as regulators of Hox gene expression and maintenance in *Drosophila*. In this study, Polycomb (Pc) and Enhancer of zeste (E(z)), members of the major histone-modifying Polycomb repressive complex 1 and Polycomb repressive complex 2, respectively, were silenced through RNA interference in *Tribolium castaneum* to examine their roles during metamorphosis. When Pc was silenced, the adults exhibited disruption in eye development, transformation of head appendages into leg-like morphology, and homeotic transformation of midwing into hindwing. These results demonstrate that Pc serves to specify appendage identity. When E(z) was silenced, all appendages lost their segmentation. The legs resembled each other in size and length, with clear signs of homeotic transformation. The wings also exhibited homeotic transformation, although the nature of transformation was not clear. Our findings demonstrate that epigenetic regulators assume critical but evolutionarily divergent roles during metamorphosis to direct tissue repatterning and proper segmental identities in different insect species.

Synthetic Biology: Developing a Biological Tool to Artificially Control Alternative Splicing

Vienna Thomas '20, Chemistry
 ADVISOR: *Megan Núñez, Professor of Chemistry*

Alternative splicing is a process that takes an mRNA transcript and modifies it in various ways to create a final mature mRNA molecule for translation. Some sequences known as introns are removed; other sequences known as exons remain to be translated. With such a process, a single gene can result in many types of protein transcript. Our MIT iGEM team aimed to control alternative splicing of RNA, specifically exon skipping and inclusion, using a deactivated CRISPR protein called Cas13a. Being able to control alternative splicing is relevant and useful due to its many applications in the creation of genetic circuits as well as within the therapeutic field.

The Very Hungry Caterpillar JAC-450 (Talk)

Threshold Weight Determination in *Manduca sexta*

Lorrie He '18, Biological Sciences
 ADVISOR: *Yuichiro Suzuki, Associate Professor of Biological Sciences*

The final body size of an organism has important consequences on its fitness. Additionally, the timing of key postembryonic developmental events, such as puberty in humans and metamorphosis in insects, often depends on the attainment of a particular body-size checkpoint. However, little is known about how organisms sense their body size to know when they are ready to initiate these developmental events. In the tobacco hornworm, *Manduca sexta*, the attainment of threshold weight (TW), first described by Nijhout in 1975, marks the decision to start metamorphosis; increasing the threshold weight leads to delayed onset of metamorphosis, which in turn leads to a larger final body size as the caterpillar has more time to feed and grow. Previous work has found that TW can be shifted to different weights by raising *Manduca* larvae under different environmental conditions. In this study, to determine the processes regulating TW and body-size detection in *Manduca*, the effects of varying environmental conditions on threshold weight, cell size, and gene expression levels were examined further. Our work suggests

that a nutrient-dependent pathway may be involved in regulating the TW, and that a systemic factor may allow *Manduca* to assess its size during development.

Comparison of Nutrient Dependency of Ecdysteroidogenesis Genes in *Manduca* and *Drosophila* Larvae

Lily Xu '19, Biological Sciences
 ADVISOR: *Yuichiro Suzuki, Associate Professor of Biological Sciences*

Body size is an important life history characteristic that determines fitness. The final body size is determined in part by the timing of attainment of two key body-size checkpoints, the critical weight (CW) and the minimum viable weight (MVW). In *Drosophila melanogaster*, these two checkpoints are indistinguishable and refer to the minimum weight necessary to metamorphose on time. Manipulating the prothoracic gland (PG) in *Drosophila* has indicated that the MVW/CW is also the point at which ecdysteroidogenesis in the PG become nutrient independent. In contrast, in *Manduca sexta* the CW and MVW are distinct checkpoints. In this study, *Manduca* PG gene expression was examined during the final larval instar to compare the mechanism of metamorphosis to that in *Drosophila*. The expression of two P450 enzymes involved in ecdysone biosynthesis, phantom (phm) and disembodied (dib), along with a juvenile hormone response gene, *kruppel* homolog (*kr-h1*), were analyzed at different larval weights. Our data suggest that unlike in *Drosophila*, ecdysteroidogenesis in *Manduca* is nutrient dependent throughout much of larval development, including post MVW/CW. Our findings indicate that the physiological regulation of growth is highly adapted to the feeding ecology of insect species.

Investigating the Genetic Basis of a Heat Shock Inducible Color Change in the Tobacco Hornworm, *Manduca sexta*

Surisadai (Suri) Aquit '18, Biological Sciences
 ADVISOR: *Yuichiro Suzuki, Associate Professor of Biological Sciences*

The phenomenon of phenotypic plasticity, common in insects, occurs when one genotype generates different phenotypes due to environmental changes. When the environmentally induced phenotype becomes genetically encoded over time due to processes such as natural selection,

the initial sensitivity to the environmental cue is lost or amplified, and genetic accommodation occurs. While the process of genetic accommodation has been demonstrated through artificial selection experiments, the genetic basis underlying this process remains unclear. Previous studies have shown that polyphenisms might evolve through genetic accommodation. In this project, black *Manduca sexta* mutant larvae subjected to heat shock produced a range of epidermal colorations which were then selected upon. Polyphenic and monophenic strains were evolved through selection for either greener or blacker epidermal color following heat shock. The expression of hormonal biosynthesis and response genes, specifically in the ecdysteroid and juvenile hormone (JH) signaling pathways, was analyzed in heat-shocked selected animals and compared to the effects of heat shock on unselected control animals. Our initial findings suggest that JH levels, and not ecdysone levels, are modulated by heat shock in unselected larvae. After selection, JH levels evolved to be more or less sensitive to temperature in the sb polyphenic and monophenic strains, respectively. These studies will begin to help us better understand the process of genetic accommodation at the molecular level and ultimately allow us to determine whether genetic accommodation occurs in nature.

Understanding the Role of Juvenile Hormone in Ecdysone Biosynthesis and Metamorphic Onset in *Manduca sexta*

Priyanka (Priya) Basak '18, Biological Sciences
 ADVISOR: *Yuichiro Suzuki, Associate Professor of Biological Sciences*

How organisms sense their own size and determine the final body size is poorly understood. The tobacco hornworm, *Manduca sexta*, is a model system used to examine the mechanisms of body size regulation. *Manduca* larvae have five instars, and their development is marked by two important weight checkpoints called the minimum viable weight (MVW) and the critical weight (CW). The MVW is the lowest weight at which a starved larva can continue to develop and eventually metamorphose. However, the caterpillar will have a delayed metamorphosis if it is starved at or above the MVW and below the CW. In this study, the effect of juvenile hormone (JH) on MVW was explored.

By performing starvation experiments on JH- and acetone-treated mutant larvae with low JH titers, the MVW was determined. In addition, the effects of neck-ligation—which eliminated the source of JH—on ecdysteroid production was assessed by examining the growth of ecdysteroidogenic glands. Our study provides insights into the mechanism underlying the attainment of MVW and why some insects are large whereas others are small.

Cultivating Cultures PNE-216 (Talk)

Optimizing Amino Acids in Defined Media for *Pichia Pastoris* Recombinant Protein Expression

Angel Kuo '18, Chemistry
 ADVISOR: *Nolan Flynn, Associate Professor of Chemistry*

Pichia pastoris is yeast commonly used to express recombinant proteins, with great potential to be used for biopharmaceutical production. In the biopharmaceutical industry, culture media for host organisms have been optimized with nutrients like amino acids to maximize recombinant protein production. Amino acids serve as the building blocks of proteins, as well as intermediates in various metabolic pathways, so they are posited to relieve much of the metabolic burden experienced by organisms producing heterologous proteins. Because few systematic studies of amino-acid supplementation have been reported for *Pichia pastoris*, my thesis work aims to study the impact of adding specific amino acids to a defined medium on recombinant protein expression in *Pichia pastoris*. Commercially available defined media often lack nutrients, including specific amino acids found in complex media. However, defined media has the potential to simplify downstream protein purification and quality control, and is therefore of great interest. To uncover a general formulation, three *Pichia pastoris* strains were studied, each expressing a different heterologous protein. Across all three strains, some amino acids increased protein production, while some amino acids decreased protein production relative to controls lacking amino acids. Given its ability to uncover metabolic pathways associated with a particular phenotypic state, RNA sequencing was performed on a subset of the media conditions to further understand the biological benefits of adding amino acids to the media.

3D Cell Culture Studies of Anti-Pancreatic Cancer Agent DCM-MJ-I-21

Elisa Wang '18, Biological Sciences
 ADVISOR: *Dora Carrico-Moniz, Associate Professor of Chemistry*

In the United States, 40 percent of men and women will be diagnosed with cancer at some point in their lives. Of the possible diagnoses, pancreatic ductal adenocarcinoma (PDAC) is one of the most devastating. Currently, the five-year survival rate of PDAC is below 10 percent, one of the lowest for common carcinomas in the U.S. The Carrico-Moniz lab has developed isoprenylated coumarin derivatives as novel chemotherapies for PDAC. Several structure-activity relationship (SAR) studies led to our current lead compound, DCM-MJ-I-21. Studies with our lead compound in 2D cytotoxicity assays show that DCM-MJ-I-21 is selectively cytotoxic against PANC-1 cells under nutrient-deprived conditions. However, 2D assays are not an accurate model for in vivo tumors, as flat monolayers do not reflect the complexity of 3D tumors. Our current studies aim to 1) further evaluate DCM-MJ-I-21 cytotoxicity in 3D in vitro PANC-1 cell cultures and 2) evaluate DCM-MJ-I-21 cytotoxicity in 3D in vitro assays of other PDAC cell lines, such as BxPC-3 and Capan-2.

Characterizing Microbial Growth on a 6th-Century Chinese Buddhist Votive Stele

Lisa Luka '18, Biochemistry
 ADVISOR: *Vanja Klepac-Ceraj, Assistant Professor of Biological Sciences*

Microorganisms cause biodeterioration of stone sculptures and monuments by producing organic and inorganic acids as well as by physically penetrating into the stone. The goal of my project was to identify and characterize the microorganisms contributing to the weathering of a 576 A.D. Chinese Buddhist votive stele that was kept in an outdoor garden in coastal Maine for almost a century during which its surface became colonized by microbiological organisms, decolorized, and weathered. The stele was recently recovered by the Museum of Fine Arts (MFA) and is undergoing restoration. To identify the microorganisms growing on the stele, we used a combination of sequencing approaches and culturing. We sequenced the bacterial and fungal DNA directly from samples and from lab cultures

by targeting specific genes used as universal markers to identify bacterial and fungal species. We identified diverse communities of microorganisms growing on the stèle such as photosynthetic Cyanobacteria, various halophilic, or salt-loving, microorganisms, and acid-producing Acidobacteria. We also identified lichens such as *Athallia holocarpa* and *Trapelia placodioid*, commonly found on low-nutrient surfaces like rocks. We are currently examining if specific bacteria are associated with different lichens and assessing the stone weathering potentials of isolated microorganisms by glucose production tests and CaCO₃ solubilizing plate assays. Our findings would further the understanding of interactions of microbial communities on sandstone and provide information that would help guide efforts to restore and conserve sandstone sculptures.

Physics Matters: Reflecting on the Past and Discovering an Otherworldly Future

Collins Cinema (Talk)

Application of Bayesian Inference to Analysis of Dynamic Light Scattering to Determine Size Distribution of Polydisperse Solutions

Caroline Martin '18, English and Physics
ADVISOR: *Jerome Fung, Lecturer in Physics*

By observing the dynamics of particles within biological systems, we can investigate processes of self-assembly, describe complex particle interactions, and probe the stability against aggregation of particles over time. As such, dynamic light scattering is a widespread technique in soft-matter physics. This technique can determine the size distribution of particles suspended in a fluid, freely moving in Brownian motion through random collisions with the molecules of the fluid. When an incident laser is shone on the suspension, each particle scatters the light, creating a complex interference pattern that randomly fluctuates in time as the particles move. Over long periods of time we can use the measured intensity of light to determine the composition of the sample. Because of the random Brownian motion of these particles, however, there is an inherent probabilistic nature to the data. My thesis seeks to apply a Bayesian inference approach to this data analysis. The Bayesian approach to statistics further constrains the models using prior information to inform fit, which is highly applicable to model fitting in which

several possible models exist. My thesis seeks to develop an open-source algorithm in Python that can efficiently and accurately describe the size distribution of particles in a polydisperse suspension. By incorporating a Bayesian framework into dynamic light-scattering analysis, I hope to develop a more accurate inference of size distribution of a sample within a limited data set.

Planet Candidate Validation in K2 Crowded Fields

Rayna Rampalli '18, Astrophysics
ADVISOR: *Wesley Watters, Diana Chapman Walsh Assistant Professor of Astronomy*

The discovery of planets outside of our own solar system has captured the imagination of scientists and the public alike. In just the past decade, more than 2,000 planets have been discovered with the groundbreaking NASA telescope missions Kepler and its successor K2. In just three years, the K2 mission has yielded some remarkable results, with the discovery of over 100 confirmed planets and 500 reported planet candidates to be validated. The K2 mission detects planets by recording any periodic dimming in stars; this dimming often indicates that a planet is in orbit around the star. A major challenge with the analysis of these data is to identify planets in star-crowded regions, where individual camera pixels overlap multiple stars. In this study, we develop and test a validation process for ruling out false-positive detections of planets in K2 observations of star-crowded regions. One part of the process involves seeing-limited on/off imaging, which is used to rule out false positives due to nearby transiting binary star systems. Later, using Markov chain Monte Carlo analysis, we can fit a model to obtain the orbit parameters for each candidate planetary system. These results are then evaluated using a software program called validation of exoplanet signals using a probabilistic algorithm (VESPA) to estimate the probability of a false-positive detection. These techniques and results are important tools for conducting candidate validation and follow-up observations for space-based missions, including the upcoming transiting exoplanet survey satellite (TESS) mission, since TESS's large camera pixels resemble K2 star-crowded fields.

Perspectives on the Wellesley College Physics Department: Where We've Been and Where We're Going

Mehak Sarang '18, Physics; Rayna Rampalli '18, Astrophysics
ADVISOR: *Tracy McAskill, Visiting Lecturer in Physics*

As the second undergraduate physics laboratory ever established in the United States, the Wellesley College physics department has been home to a strong lineage of female physicists since its inception. Today, the department remains strong, with Wellesley physics students making up about 1 percent of the females who graduate with a bachelor's degree in physics. However, a lot has changed since Wellesley first opened in 1870. Just as the field of physics itself has transformed, so have the curriculum, faculty, and students since Sarah Frances Whiting, the first physics professor, led an all-female faculty to establish the department. With the physics faculty now in flux and renovations being made to the science center, the department is at a crucial turning point. Using archival material, interviews with students and faculty, and data on the department, we present a historiographical survey of the department. We hope to illuminate the evolution of the department and examine and offer suggestions for implementations of timely changes. We will present a history of the department's curriculum and discuss the relevance of the current coursework in equipping students to address 21st century problems in implementation of rapidly evolving technologies. This project hopes to serve current and future faculty in their existing efforts to modernize the curriculum and to continue building a strong legacy of physicists.

Understanding Long-term Planetary Surface Conditions Through Impact Crater Modification

Carol Hundal '18, Astrophysics
ADVISOR: *Wesley Watters, Diana Chapman Walsh Assistant Professor of Astronomy*

The study of impact craters on the planets of our solar system has been vital for addressing some of the most important problems in the field. Studying the morphology comparison, shape of the rims, and interiors of craters lends insight to not only the formation of craters, but also the complex conditions and processes that modify them thereafter. This work contributes to an ongoing investigation

of the morphometric (quantitative measure of shape) of lunar and Martian craters in diverse settings using high-resolution topographic data. We analyze approximately 20,000 craters in a wide range of modification states on Mars and the moon to compare with the predictions of computer models of landscape evolution.

Social Science

Economic Analysis of Healthcare Policy

GRH-130 (Preformed Panel Discussion)

Marissa Caldwell '18, Economics; Tanvee Varma '18, Economics; Margaret (Meg) Babikian '18, Economics; Victoria Angelova '18, Economics
 ADVISOR: *Eric Hilt, Professor of Economics*

Senior thesis students in the economics department use econometric tools to study how domestic and international health policies and guidelines affect social outcomes. Victoria Angelova studies the economics of abortion policies, and seeks to answer whether changes in the legal status of abortion that occurred in Eastern Europe in the 1990s resulted in improved educational outcomes of adolescents. Meg Babikian investigates the impact of the Affordable Care Act on hospitals that serve a large proportion of low-income individuals and families. Marissa Caldwell explores whether arbitrary obesity categories affect medical decision-making both from the patients' perspectives, in their utilization of healthcare, and from the physicians' perspectives, in the types of treatments their patients receive. Tanvee Varma investigates the effect of the Affordable Care Act, and more specifically Medicaid expansion, on reducing racial and ethnic disparities in health access and outcomes in the United States.

African Diaspora Members Experiences Through the Lens of Black Psychology

FND-126 (Preformed Panel Discussion)

Chinenyenwa Amaechi '20, Economics and Spanish; Keisha Jean-Charles '20, Africana Studies and Economics;

Paige Robinson '20, American Studies; Hailey den Elzen '19, Psychology
 ADVISOR: *Ophera Davis, Lecturer in Africana Studies*

This panel of students will discuss one aspect of their research projects from the Africana studies black psychology course which is cross listed with the psychology department. Each panelist's topic uses cultural methodology and sheds light on several topics such as identity, education, science, and music. Our presentations will bring light to the African-American experience through the lens of black psychology.

Cooperation, Interaction, and Communication

GRH-330 (Talk)

The Evolution of Cooperation in Humans: Was Shared Care of Infants the Catalyst?

Genae Matthews '19, Philosophy
 ADVISOR: *Alison McIntyre, Virginia Onderdonk '29 Professor of Philosophy*

The ability to cooperate is a trait that we take to be distinctly human. This cooperation can take several different forms. We can cooperatively divide resources, raise young, or store information. Philosopher Kim Sterelny argues that these kinds of human cooperative networks must have coevolved, with each facilitating the other. In this sense, he looks at cooperation around resources, infants, and information as a three-legged stool. However, anthropologist Sarah Hardy argues that a specific form of reproductive cooperation (alloparenting practices) led to the basis, in early hominins, for the evolution of the distinctive psychological traits that characterize human sociability. In this presentation, I will argue that Sterelny fails to counter evidence that reproductive cooperation preceded other forms of cooperation in early hominins and persisted. I define this idea as the persistence hypothesis and argue that it undermines the notion that cooperation is distinctive to humankind.

Let Me Tell You a Story: The Relationships Among Fiction, the Big Five Personality Traits, and Compassion

Ruixi Zhang '19, English and Psychology
 ADVISOR: *Angela Bahns, Assistant Professor of Psychology*

This study aimed to provide empirical support for the philosophical theory that

reading literary fiction would cultivate compassion. Meanwhile, the study sought to investigate the relationship between the big five personality traits (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience) and compassion. Participants (N=44) first completed questionnaires that assessed their big five personality traits, fantasy proneness, and long-term exposure to fiction. They were then randomly assigned to read either a short story or a science article. Afterwards, three domains of compassion (i.e., theory of mind, empathy, and prosocial behavior) were measured. Results indicated that short-term exposure to fiction had no impact on compassion. However, the preference for fiction/fantasy in the long run was positively related to theory of mind and empathy. Moreover, higher neuroticism was associated with greater empathy. Findings of the study partially supported the philosophical theory and shed new light on the relationship between the big five traits and compassion.

Language, Race, and Integration: A Comparative Study on the Migrant Experience in Morocco

Madeline (Maddy) Davison '19, Cognitive and Linguistic Sciences
 ADVISOR: *Maria Del Mar Bassa Vanrell, Visiting Lecturer in the Cognitive and Linguistic Sciences Program*

This study project, conducted in Rabat, Morocco, examines the divide between local and migrant populations in the Moroccan context. This divide is primarily influenced by “feelings of otherness” and is triggered first and foremost by differences in physical appearance—easily identifiable differences upon first impression. Though inspired by a nearly instantaneous arrangement, this divide is fueled further by an inconsistency of language usage between groups. Because there is a wide variety of migrant experiences in this context, it is important to identify some of the differences between these lived experiences. Upon observation, the question, “What are the fundamental differences between migrants' lived experiences?” can help answer “What mechanisms are facilitating the divide between sub-Saharan migrants and local Moroccans?”

Studying the Effect of Iconicity in the Learnability of American Sign Language

Carla Adams '20, *German Studies and Psychology*; Natalia Reynoso '20, *Undeclared*
ADVISOR: Jennie Pyers, *Associate Professor of Psychology*

Previous research has indicated that sound-symbolism serves an important role in how we learn new words. The correlate for sound-symbolism for sign languages is visual iconicity, where the form of a sign directly represents an aspect of its meaning. Our research explores whether nonsigners learn iconic signs better than noniconic signs. We taught 48 nonsigners 32 highly iconic signs and 32 low-iconic signs. Half of the signs were paired with their actual meaning and half were paired with their opposite meaning. We hypothesized that participants would remember the highly iconic signs that were paired with their actual meaning better than those paired with their opposite meaning, but there would be no effect for low-iconic signs.

Intersection of Technology, Politics, and Culture

FND-317 (Talk)

The Social Justice Implications of Blockchain

Madelena Collins '18, *Peace and Justice Studies*
ADVISOR: Catia Confortini, *Associate Professor of Peace and Justice Studies*

Blockchain, the underlying technology that powers bitcoin, is one of the buzzwords of the past year. Practically everyone is talking about blockchain, and for good reason. Distributed ledgers, the term of art for blockchain's underlying technology, offer an exciting new way to transact business without a central authority. Blockchain enthusiasts have discussed plans for the “social good” application of the technology, in particular how it could be used in the global south for “development.” In an independent study this spring, I have researched the potential social justice implications of using this technology “for good.” This talk will cover the details of what the blockchain is, why it is important, and the social concerns of its future use.

Activating Social Media Activism

Esa Tilija '19, *Economics*
ADVISOR: Linda Williams, *Senior Research Scientist with the Wellesley Centers for Women*

How can social media be utilized as a tool for social change? Can social media activity translate to substantial social justice progress, or is social media activism synonymous with slacktivism? Throughout my Linda Coyne Lloyd research internship at the Wellesley Centers for Women under the mentorship of Dr. Williams, I have helped plan, implement, and evaluate how to strengthen the Justice and Gender Based Violence Research Initiative's (JGBVR) social media presence. By running semiweekly controlled postings that are designed to examine how time of day and type of post engage the greatest audience, I have identified effective ways for social-change-oriented individuals and research-and-action institutes to improve their social media presence. Through surveying social media account's followers, Wellesley College students, and the public, I have also been able to gauge the extent to which social media translates to real-world activism.

Epidemiology: Understanding the Coordination and Control of Online Campus-Specific Culture Sharing

Esther Jaffee '19, *Biological Sciences*
ADVISOR: Nicholas Knouf, *Assistant Professor of Cinema and Media Studies*

How does an image evolve from a set of pixels to something recognizable as a meme? The question that keeps social media managers awake at night doesn't have a single answer, but the pathways by which images assume memetic properties are put on stark display by niche online communities that have emerged from college campuses throughout the world. Through the creation, identification, and analysis of memes in the sandbox of independently run college campus Facebook pages, my research categorizes and attempts to explain the longitudinal success—or lack thereof—of memes based on situational specificity, lapse between inciting events and posting time, content-specific sharing patterns, and repeat-creator recognition. Simultaneously, comparison between campuses yields striking differences in content between geographically similar institutional entities. Through both an analytical and a media theory perspective, this project provides

insight into “viral” properties of online content and the startling nuances of Wellesley's homegrown meme culture.

The Role of Internet Communication Technologies in Facilitating Strength and Resilience in Refugee Communities

Anne Schwartz '18, *Computer Science*
ADVISORS: Nadya Hajj, *Assistant Professor of Peace and Justice Studies*; Eniana Mustafaraj, *Assistant Professor of Computer Science*

We are currently in the midst of a refugee crisis, with over 65 million people around the world displaced from their homelands. Refugees face serious challenges in securing work, learning new languages, and burying and commemorating their dead. Internet communication technologies (ICTs) like Facebook pages or WhatsApp messaging services are one of the main ways that groups of formerly united people, like diasporic refugee communities, connect with their family members and friends. I have been working for the past several months with Professor Nadya Hajj to collect and analyze data from the Facebook page for the Nahr al Bared Palestinian refugee camp in Lebanon, in order to investigate the role of ICTs within the communities of Palestinian refugees and other displaced people around the world. During this presentation, I will share data visualizations I have created, expand on the implications of the data I have collected, as well as discuss the difficulties of collecting data from social media platforms that set up barriers even to data collection for research purposes, in order to keep their competitive advantage.

Exit West? Migrants, Refugees, and Resettlement

PNE-139 (Talk)

Immigration and the Model Minority: Effects on Chinese/Hong Kong/Taiwanese Immigrants' Children's Psychological Well-Being

Ashley Wang '20, *Women's and Gender Studies*
ADVISOR: Nancy Marshall, *Adjunct Associate Professor in Women's and Gender Studies & Senior Research Scientist at Wellesley Centers for Women*

Expanding on my upbringing as a Chinese-American child of immigrants, I have used a literature review, survey, and student interviews to research how the model minority myth as well as labor and immigrant experiences of first-generation

immigrants from China/Taiwan/Hong Kong affect their second-generation children's psychological wellbeing. The hardships of the immigration experience alongside the work ethic culture and values of East Asians create an environment that narrowly defines success for first-generation immigrants. This environment, combined with the model minority myth, has thus been both absorbed into U.S. racial culture and internalized by members of the Asian-Americans and Pacific Islanders (AAPI) community, resulting in both external and internal pressures for second-generation children. My research explores these pressures among Wellesley College students.

Serving Through Borders: An Intersectional Approach to Gender and Global Migration

Monica Naranjo DS, Peace and Justice Studies and Psychology

ADVISOR: *Nancy Marshall, Adjunct Associate Professor in Women's and Gender Studies & Senior Research Scientist at Wellesley Centers for Women*

We all love going to restaurants, having a delicious meal, and not having to worry about cooking and cleaning, but have you wondered who is preparing your meal, who is serving it, and who is picking up after you? While jobs in the food-service industry are among the lowest paid in the United States, gender and race shape the decisions of millions of immigrants to ultimately work in these types of jobs. Through an intersectional lens, I will present the findings of interviews with seven immigrant women, discussing their complex experiences and exploring their connections to their home communities. (Research supported by the Shirley R. Sherr Student Research Fellowship.)

Where Political Science and Neuroscience Meet: Issues of Forced Migration

Basma Jaber '18, Neuroscience and Political Science

ADVISOR: *Laura Grattan, Associate Professor of Political Science*

The issue of forced migration has received a lot of attention in terms of political policy and discussion, but in this presentation, I will consider ways in which neuroscience can be used to inform better policies with regards to this issue. How do the lived experiences of stress, trauma, displacement, loss, and grief, as explained

by neuroscientific research, impact the lives of individuals being forcibly displaced, and how can this research help create policies that would make these experiences more bearable for these individuals?

Hablamos Ambos (We Speak Both): The Effect of Bilingualism in Greater Boston Area Children

Veronica Valencia '19, Cognitive and Linguistic Sciences and Economics

ADVISOR: *Kyung-Hong Park, Assistant Professor of Economics*

Research supports the correlation of quantity and quality of children's language ability. Data collected from bilingual children aged four to six years old in the greater Boston area can be examined further and used to determine if socioeconomic background, gender, and level of bilingualism can be correlated to the quality of a child's language ability. Data collected includes 30-minute taped video interactions quantified in CLAN, fMRI brain scans, and a language assessment performed in English. CLAN data is examined for mean length of utterance, conversational turns, and bilingualism percentage. Bilingual families are divided into three groups: primarily English, primarily Spanish, and primarily bilingual. Within groups correlations are performed to determine if gender and bilingualism level correlate with language assessment performance and quality of language interaction found in scripted CLAN data.

“During the first session in the library about the history of Wellesley, I was fascinated by the presentation, which was excellent ...”

—Barbara Peterson Ruhlman '54

Humanities

The Future of Futurism: From Noise Intoners to Noise Taction

JAC-AUD (On-location Presentation)

Diana Tosca '18, Computer Science and Music
ADVISOR: *Jenny Johnson, Associate Professor of Music*

In the early 20th century, Italian futurists became interested in expanding the definition of music to include sounds previously considered non-musical—sounds often described as “noise.” The intonarumori (noise intoners) was a family of instruments created by the futurist artist Luigi Russolo, which allows for the player to control the pitch and sound of these noises. This presentation describes and showcases a recreation of the intonarumori, dubbed the tattorumori (noise tactions), using new interactive surface technology unavailable to Russolo. The significance of this instrument with regards to both the futurist movement and music history is that it challenges the established idea of what music is and embodies the ideas of modernity; the intonarumori bridges the gap between sound and music. The reimagining of the instrument explores the vision of futurism in the context of the present, using Russolo's instrument as a blueprint with the technology of a century later.

Present Conversations, Collective Pasts

Collins-Cinema (Exhibition)

Grace Ming '18, Media Arts and Sciences

ADVISOR: *David Olsen, Associate Professor of Art*

This multimedia installation explores the echoes of history, heritage, and collective pasts in the contents of everyday conversations through audiovisual documentation. The work reflects the artist's own personal journey of learning about the history of Asian- and Chinese-Americans and noticing the influences of these histories present in current discussions about anything from everyday trivialities to broader social issues.

Gallery Talk: A Conversation with the Studio Art Thesis Students

JAC-200 (Exhibition)

Melina Mardueno '18, Art History and Art Studio; Juyon Lee '18, Art Studio; Isabella King '18, Art Studio and English and Creative

Writing; Nadine Franklin '18, Art Studio and Japanese Language and Culture; Anjali Benjamin-Webb '18, Art Studio and Political Science; Breslin Bell '18, Art History and Art Studio

ADVISOR: *Andrew Mowbray, Lecturer in Art*

In conjunction with the studio art department, the class of '18 studio thesis students invite you to preview their newest artwork. This gallery talk presents a unique occasion for all six students to share their yearlong work with the broader community before the highly anticipated senior thesis show. This is a first look at the honors thesis students' work, which touches upon varying and interweaving themes including portraiture, collective history, the senses, and the self. Though each art student explores individual subjects, as well as mediums—oil painting, drawing, installation, printmaking, performance, film, and photography—the threads that organically rest between each body of research are noteworthy. Moreover, this reflects the positive impact of six thesis students sharing a collective working space.

Sfanta: A Solo Performance

ALH-RNJ Theatre (Short Performance)

Diana Lobontiu '18, Psychology and Theatre Studies

ADVISOR: *Marta Rainer, Lecturer in Theatre Studies*

I will be performing an excerpt from the one-woman show I am writing and performing for my thesis project. I am exploring themes of religion, recognition, and queerness by presenting one girl's efforts to become a saint in the Russian Orthodox Church. Set in a 17th-century monastery in Varzaresti, a Romanian village, the show follows Teodora, who is more concerned with being the best at something than with holiness, and sees saintliness as her big break. Her path is blocked by her journey of self-discovery, which includes grappling with her pettiness, murder, and a budding romance with a fellow novice.

Urban Education: Power, Action, and Agency with Action Research

FND-102 (Interactive Teaching Presentation)

Karina Ithier '20, Spanish; Sydney Stewart '18, Peace and Justice Studies; Thalia Ramirez '18, Neuroscience; Azalea Troche '18, Economics; He-Yue (Sophie) Wang '19, Psychology; Kindred

Obas '19, English; Christina Okezie '19, Political Science

ADVISOR: *Soo Hong, Associate Professor of Education*

We bring an interest and passion for reimagining the day-to-day and lived educational experiences of youth of color. As part of an urban education seminar at Wellesley College, we engaged with youth in Boston, Framingham, and Cambridge through the MIT-Wellesley Upward Bound Program, the Mission Hill After School Program (MHASP), St. Stephen's After School Youth Program, Boston Arts Academy, and Latinas En Acción. As we developed relationships with the youth in these programs, we crafted individual action research projects that were rooted in reimagining the existing program structure. We each had the privilege of interacting with students through the lens of a researcher, but also as women of color who are passionate about education and urban youth empowerment. In our session, we aim to encourage educators and researchers to reframe their own notions of research as well as the role of the researcher by sharing our own experiences teaching students in Boston, Cambridge, and Framingham Public Schools. We hope participants will leave with an expanded understanding of action research as a tool for centering the voices of youth living at society's margins in addition to understanding and improving the educational environment. Through active reflection and open discussion, we invite participants to consider how research has the potential to not only impact the communities it touches, but also to transform the researcher. This bidirectional relationship can serve as a powerful method through which both students and researchers can explore and embrace their intersectional identities and backgrounds.

The Enduring Art of Book Making

Clapp-458, Clapp Book Arts (Interactive Teaching Presentation)

Patricia Grahmann '18, Neuroscience; Robin Siddall '20, Mathematics

ADVISOR: *Katherine Ruffin, Book Arts Program Director*

In anticipation of the 75th anniversary of Wellesley College's Book Arts Laboratory and its Annis Press imprint in '19, we invite you to join us in the Book Arts Lab

for a tour of the space, a popup exhibition of student work samples produced over the years, and hands-on demonstrations. Participants will work alongside student instructors to experience a sample of processes and concepts students have explored this spring in ARTS 222 Intro Print Methods: Typography/Book Arts. They will also take home their own books and prints after engaging in hands-on letterpress printing and binding simple book structures. This session will give visitors an opportunity to participate in the long tradition of making books by hand in the Wellesley College Library, and we hope that visitors will consider typography, printmaking, and book arts in a new way after attending this session.

Finding Meaning in Juxtaposition

FND-126 (Talk)

Get Free: Joni Mitchell, Lana del Rey, and the Language of Externalities

Matilda Berke '21, Undeclared

ADVISOR: *Sarah Wall-Randell, Associate Professor of English*

Interpretations of Joni Mitchell's work are largely steeped in the vocabulary of biography, since most critics subscribe to the conflation of author and speaker commonly embedded in discussions of female artistry. Lana del Rey, the indie pop songstress best known for her hit ballad "Video Games," seems to have inherited these gendered elements of Mitchell's public reception as well as her sly, often undiscussed dance between truth and fiction. In my research, I explore how both musicians control their vulnerabilities, make space for confession, and ultimately validate their narratives by creating artistic personae through which they use the external to legitimize the internal. I focus on three shared techniques in my analysis of lyrics, albums, musical soundscapes, and music videos—the use and subversion of conventional structures, the juxtaposition of anachronisms, and the reclamation of American icons. By writing in the language of externalities, Mitchell and del Rey blend creative liberties with selective self-exposure in order to demand the critical analysis automatically bestowed upon male singer-songwriters' work.

The Arthurian Legend in Times of War: *Le Morte D'Arthur* and *The Once and Future King* as Wartime Texts

Sebrina Stickney Morris '18, English and French
ADVISOR: *Sarah Wall-Randell, Associate Professor of English*

My research focuses on the sociopolitical influences on the Arthurian legend, specifically comparing two texts, Sir Thomas Malory's *Le Morte D'Arthur* and T. H. White's *The Once and Future King*. Though the texts share their plot, the contemporary influences on these texts make the retellings of the Arthurian legend radically different. While Malory's text focuses on themes of succession and unity due to the influences of the Wars of the Roses, White's text focuses on themes of passivity and power as a form of government due to the influences of the two World Wars.

Terror in the Cul-de-sac: The Suburban Uncanny in Late 20th-Century Horror

Sarah Michelson '18, Art History and English
ADVISOR: *Vernon Shetley, Professor of English*

Horror as a genre dates back to the Gothic of the 18th century, but like all genres, does not remain static. Horror seeks to explore, explain, and exploit what scares us and why, and as such, is a fascinating mirror to society. This year, I have been working on a thesis to explore what is behind the curtain of American late 20th-century horror, and specifically, a common theme that I refer to as the suburban uncanny. In my presentation, I will explore the question that I explore in my thesis: in the shadow of mass suburbanization and consumerism that marks being a 20th-century American, how does the safe, the secure, and the familiar suddenly become a nightmare? This thesis is multidisciplinary, and includes authors like Stephen King, directors like David Lynch, and artists like Gregory Crewdson.

The Power of Resilience and Gender Identification: Does Resilience Moderate the Effects of Gendered Stereotype Threat on Undergraduate Wellesley College Students?

Dalila Stanfield '18, Psychology
ADVISOR: *Angela Bahns, Assistant Professor of Psychology*

The examination of resilience in connection to stereotype threat is not well studied within the field of psychology. Previous research on measures of resilience makes it clear that resilience plays a role in

moderating the negative effects that stressful environments can induce in an individual. Research has also shown the negative effects of gendered stereotype threat on women's performance. This study was designed to examine the relationship between one's levels of resilience, gender, and racial identification and how they influence one's susceptibility to gendered stereotype threat when completing a spatial/rotational task. Participants were 40 undergraduate students attending a psychology course at Wellesley College, a historically all-women's college. We found that individual levels of resilience and gender identification did not correlate with performance in either stereotype threat or control condition. There was also no relationship between race, condition, and task performance. Although the predicted effects were not supported, the study reveals some interesting relationships between gender/racial identity, resilience, and performance for Wellesley College students.

Carving Out Spaces for Communities

PNE-127 (Talk)

LGBTQ+ Youth Experiences with Sex Education

Sarah Netherton '18, Women's and Gender Studies
ADVISOR: *Wendy Robeson, Senior Research Scientist with Wellesley Centers for Women*

Across the United States, sex education programs have come under increased scrutiny and pressure for reform. But even among these limited efforts, LGBTQ+ youth are left behind by sex education that consistently fails to provide the information and affirmation they need. In this study, approximately 400 young adults were surveyed and asked to reflect on their experiences with sex education in relation to LGBTQ+ inclusion. Their responses revealed themes of erasure and exclusion, hostile classroom environments, limited representation, and much more.

The Architecture of Community: Investigating the Lulu Campus Center and Its Potential to Foster a Wellesley Community

Gwendolyn Sands '18, Architecture
ADVISOR: *Martha McNamara, Director of New England Arts & Architecture Program*

The spaces we live in can affect our relationships with the people around us; they can foster community or result in a

sense of isolation. Wellesley's Lulu Chow Wang Campus Center was designed to be a welcoming community space, but changes in the program at Lulu have left some spaces overcrowded while others are underutilized. According to a survey I conducted last fall, Wellesley's students, faculty, and staff feel that the Lulu does not reach its full potential for fostering community. Both the form and function of the space play a role in the successful creation of a sense of community. Because making changes to the form of the building is prohibitively expensive, I am using my research on the building's design and use to enhance the building's "community fostering" function. I will reflect on the event I hosted in Lulu that worked to activate the underused spaces, and provide opportunities for community connection. This day was meant to show the community the possibilities that Lulu offers and change the way people think about and use the building. I will discuss if this worked, and what more needs to be done to help Lulu reach its full community potential.

"We're All Nerds in Costume": The Influence of Cosplay on Adolescent Gender Identity Development

Madison (Matthias) Remillard '18, Women's and Gender Studies
ADVISOR: *Nancy Marshall, Adjunct Associate Professor in Women's and Gender Studies & Senior Research Scientist at Wellesley Centers for Women*

The cosplay community and its spaces, found primarily online and at pop culture conventions across the country, present an open and welcoming environment that allows transgender/gender nonconforming youth to feel safe exploring their genders. Cosplay is a distinct subculture that creates a judgment-free space given that everyone present in the space is a "nerd in costume." The experience of dressing up as a character and being received positively by others can confirm an adolescent's gender identity or allow them to "try on" a gender other than their own, leading to a deeper understanding of their gender identity.

Activist in the Making: An Archival Tribute to Student Activism Past, Present, and Future

Gabriela (Gaby) Varela '20, Sociology; Paola Gonzalez '20, Women's and Gender Studies
 ADVISOR: *Irene Mata, Barbara Morris Caspersen*
Associate Professor of Humanities

When institutions of higher learning admit their students, they make a commitment to ensuring their students thrive, not just survive. However, historically, students of color have been responsible for initiating change at Wellesley College. Through extensive archival research in the Wellesley College Archives and in-person interviews with Wellesley alumnae, students, and faculty, our independent study took steps towards establishing an institutional memory of student-led movements at Wellesley College to honor and credit the free emotional and physical labor students of color have put into identifying and fixing problems. In addition, we aimed to make this information centralized and accessible for both current and future students to learn of an untold history of Wellesley College and to establish a resource for students to come. From Ethos in the 1960s to WAAM-SLAM parts I and II, we aim to retell and reclaim the history of Wellesley College. We believe that it is only through the establishment of institutional memory that the students of Wellesley College can actively initiate institutional change.

Science and Technology

Experimental and Computational Approaches to Understanding Histone-Derived Antimicrobial Peptide Structure-Function Relationships

GRH-130 (Preformed Panel Discussion)

Carla Perez '18, Chemistry; Katrina Montales '18, Chemistry; Ju Young Kwag '19, Chemistry; Kerry Gao '20, Undeclared; Hannah Schmidt '18, Chemistry
 ADVISOR: *Donald Elmore, Professor of Chemistry*

Antimicrobial peptides (AMPs) are small, positively charged peptides that are part of the innate immunity of a variety of organisms. Their activity against a broad range of microorganisms makes them ideal candidates as novel antimicrobial agents to combat bacterial resistance. To this end,

the Elmore Lab is working towards further characterizing AMPs to ultimately design more cost-effective, potent peptides. AMPs can be quite expensive to synthesize. Thus, one area of exploration centers around truncation of these peptides to determine if shorter, less expensive versions are active and maintain the same mechanism. To better understand the effectiveness of AMPs, another area of study focuses on characterizing the activity and mechanism of AMPs against different bacterial strains instead of against a single model strain, as is commonly done. To quantify AMPs, substitution of an alanine residue for a tryptophan residue is often made. One study focused on the effect of the position of this mutation in one AMP, parasin, to investigate if A12W and A14W mutated forms of parasin have different activity or mechanisms. This understanding will help in the design of hybrid peptides. Most assays performed on AMPs focus on the activity of peptides under dilute buffer conditions, but this focus does not accurately represent the intracellular and extracellular environments, which are crowded with macromolecules. Better knowledge of how crowding affects the ability of AMPs to target extracellular and intracellular components may be quite important in designing peptides with greater antimicrobial activities. Therefore, another area of study modifies experimental and computational studies to investigate activity, structure, and mechanism using macromolecular crowding to more accurately model physiological conditions.

Exploring the Final Frontier: Astronomy and Planetary Science Research at Lowell Observatory

FND-207 (Preformed Panel Discussion)

Karisa Zdanky '20, Astrophysics; Jocelyn Reahl '19, Geosciences; Abigail (Abbie) Burrus '19, Astrophysics
 ADVISOR: *Kim McLeod, Professor of Astronomy*

The goal of the MIT-Wellesley astronomy field camp is to give students in different areas of study a chance to perform research with professional astronomers at Lowell Observatory and gain an understanding of what it is like to work in the field. During our time at Lowell, we explored a variety of topics related to modern astronomy and planetary science, including solar variability, asteroid photometry, and

planetary surface simulation. Each of us will elaborate on the purposes and outcomes of our individual projects, as well as discuss the various research techniques used. We will also comment on field camp activities beyond our research, such as attending weekly science discussions, learning how to do astrophotography, and exploring the Discovery Channel telescope.

Supporting Web Literacy and Understanding Signals of Credibility on the Web

JAC-372 (Preformed Panel Discussion)

Ana Fernandez '20, Computer Science; Emily Wang '20, Computer Science
 ADVISOR: *Eniana Mustafaraj, Assistant Professor of Computer Science*

With the rise of fake news and deliberate misinformation spread through the internet, web literacy skills have become increasingly important. What signals do we as consumers use to evaluate if a website is credible? Users often trust Google search engine result pages (SERPs) as unbiased sources, when in reality the results can be manipulated by those seeking to advance their ideology. Our research focuses on supporting users as they evaluate information presented by SERP and other online sources, as well as building tools to help users improve their web literacy skills. First, we seek to understand how people evaluate the credibility of web sources through user surveys conducted on Amazon Mechanical Turk. Next, we aim to build a web platform that augments SERP pages with known credibility signals to assist users in evaluating the credibility of sources. As it is becoming increasingly clear, with an unregulated internet the need to solve this problem is urgent. We hope to bring awareness to the importance of web literacy, as vulnerable communities are often the most impacted by misinformation on the web.

Assessing the Tsunami Hazard of Northern Haiti—A Proposal for a Pilot Field Study

PNE-216 (Preformed Panel Discussion)

Danielle Black '18, Geosciences; Clara Cogswell '18, Classical Civilization and Geosciences; Elizabeth Engel '18, English; Emma Jackman '19, Geosciences; Alexandra (Alex) Klufas '18, Mathematics; Marissa Menzel '18, Geosciences; Lauren Santo Domingo '19,

Geosciences and Spanish; Sarah Wong '20, Undeclared; Kendall You Mak '20 Geosciences
 ADVISOR: *Katrin Monecke, Assistant Professor of Geosciences*

The northern coastline of Haiti experienced a magnitude 8.1 earthquake and devastating tsunami in 1842, causing the loss of more than 5,000 lives. GeoHazards International (GHI), a nonprofit organization dedicated to mitigating the risk of natural hazards in the poorest countries around the world, is working in Haiti to improve earthquake and tsunami safety. This work can only be successful if the size and recurrence of such events is known. In collaboration with GHI and within the course GEOS 316-Paleoseismology, we are developing a proposal for a pilot field study to reconstruct the geologic record of tsunamis along the northern coast of Haiti. We will present our scientific approach and seek feedback from the audience on how to best assess the tsunami hazard and prepare threatened communities along the northern Haitian shorelines.

Geohealth: Understanding Human and Natural System Interactions to Identify Sustainable Management Practices

FND-120 (Interactive Teaching Presentation)

Lucy Wanzer '19, Geosciences; Brianna Love '19, Architecture; Melanie (Mel) Passaretti '18, English and Geosciences; Amanda Hernandez '18, Environmental Studies and Geosciences; Shivani Dayal '18, Neuroscience; Jennifer (Jenn) Harris '19, Biological Sciences; Zubyn D'Costa '20, Political Science; Madeline Cabillane '18, Cinema and Media Studies
 ADVISOR: *Daniel Brabander, Frost Professor in Environmental Science*

Geohealth is an emerging discipline at the boundary between natural sciences, public policy, and stakeholders, recognizing that research is often applied and can inform local decision-making. We are a transdisciplinary research group with students from a variety of majors exploring biogeochemical systems through the lens of stakeholders. In particular, we investigate biogeochemical cycles to examine ecosystem and community and public health implications. The range of current projects includes: remediation of contaminated urban soils by amending with compost, understanding the connections between

herbicides and human health through studies focused on detecting herbicides in commercial tampons, sustainable management of complex landscape systems, exploring the intersection of environmental and social factors related to zinc deficiency in India, case studies examining lead exposure with recycling lead acid batteries, and finding novel indicators of seasonal water chemistry. Our different disciplinary and research backgrounds strengthen our ability to approach complex geochemical systems. In this dynamic and interactive session, we will share our research group approach and work to draw connections between our projects and the communities they are set in, with a focus on the transferability of this process to other complex, interdisciplinary systems.

Getting to the Heart and Gland of the Matter

PNE-239 (Talk)

Getting at the Heart of Inherited Arrhythmia: A New Approach to the Treatment of CPVT (catecholaminergic polymorphic ventricular tachycardia)

Danielle Heims-Waldron '18, Biological Sciences (Fowler Public Speaking Finalist)

ADVISOR: *Louise Darling, Knafel Assistant Professor of Natural Science*

As one of Boston's many skyscrapers, the John Enders Research Building can be easy to pass by. However, its 13 floors house researchers of all disciplines who work alongside clinicians at Boston Children's Hospital to combat disease with scientific understanding and ingenuity. The 12th floor is home to Dr. William Pu's department of cardiology research lab, where I have interned since the end of my first year at Wellesley. Recently, I have focused my research on catecholaminergic polymorphic ventricular tachycardia (CPVT): an inherited arrhythmia that arises from a point mutation in the gene encoding the cardiac-specific ryanodine receptor protein (RYR2). RYR2 is a main component of calcium channels on the sarcoplasmic reticulum, and thus regulates calcium release into the cytosol. This regulation is critical, as the contraction of a heart is an electrical event highly sensitive to and dependent on the presence of these ions. While a small genetic change in the protein could seem insignificant, its impact can be profound: irregular calcium release can cause electrical instability in heart cells,

resulting in abnormally fast heartbeats that can cause syncope (blackouts) and, in more serious cases, cardiac arrest. In fact, the mortality rate of patients with CPVT is 30 to 50 percent by age 30 if they go untreated. Though medications are available, studies have shown they have variable effects on patients, with some patients experiencing markedly more control over their CPVT than others. The causes of these variable responses across patient populations remain unknown, however, limiting the ability of clinicians to predict which patients will experience better outcomes. Recognizing that the currently available medications are neither true treatments of the genetic condition nor consistently effective, our lab investigates the molecular mechanisms driving the condition. We hope to design new therapies and test our treatment with animal models, and eventually bring the new option to human patients with CPVT. In my presentation, I will introduce the disease CPVT, share promising results from my research group, and also discuss some smaller studies I recently designed and executed.

High Blood Pressure: Unravelling the Hormone Behind It

Eleanor Zagoren '18, Biological Sciences

ADVISOR: *Adam Matthews, Lecturer in Biological Sciences*

Cardiovascular and metabolic diseases remain the leading cause of death both globally and in the United States. This project, performed in the hormonal mechanisms of cardiovascular injury lab at Brigham and Women's Hospital, focuses on one of the physiological factors contributing to development of cardiovascular diseases: namely blood pressure, and its subsequent dysregulation to become high blood pressure, or hypertension. One of the reasons why blood pressure control is so difficult to achieve through medication is because both the primary causes of hypertension and the mechanism for blood pressure control are not entirely clear. In a simplistic form, blood pressure is the product of blood volume times resistance. Here, we investigate how a major regulator of blood volume homeostasis, the hormone aldosterone, regulates its own production. Specifically, we will determine the site of regulation for a novel, ultra-short feedback loop within the biosynthetic pathway of aldosterone

production, as either the early or late pathway of steroid synthesis.

The Role of Vvl in Endocrine Gland Formation in *Tribolium Castaneum*

Sara Shin '19, Biological Sciences

ADVISOR: *Yuichiro Suzuki, Associate Professor of Biological Sciences*

Both invertebrates and vertebrates undergo key developmental stages that are marked by significant morphological and physiological changes. Such changes are often accompanied by the release of developmental hormones, which in the case of insect species are comprised primarily of ecdysteroids and juvenile hormone. Ecdysteroids, a group of steroid hormones, initiate molting in insects and are secreted by the prothoracic gland. However, studies in the 1970s demonstrated that ecdysteroid may be produced in the oenocytes, which are abdominal glands essential for lipid processing and detoxification. In this project, we explored whether the oenocytes are ecdysteroidogenic by examining the expression of ecdysone biosynthesis genes *spook* and *phantom* with in situ hybridization. In addition, Ventral veins lacking (Vvl), a POU domain transcription factor, was previously reported to regulate ecdysteroidogenesis and prothoracic gland development. To determine whether oenocytes might be serial homologs of prothoracic glands, the role of Vvl in oenocyte development in *T. castaneum* was explored.

Neuronal Basis of Seeing, Sleeping, and Peeping

PNE-139 (Talk)

Alterations in the Balance Between Excitation and Inhibition as a Result of Song Learning

Rachel Woo '18, Neuroscience

ADVISOR: *Sharon Gobes, Assistant Professor of Neuroscience*

Similar to how human babies acquire speech from their parents, male zebra finches (*Taeniopygia guttata*) learn their songs from adult males—typically their biological fathers. Song learning involves changes in the brain, referred to as memory formation. Such alterations in the brain have been observed in the balance of connections that either increase (excitatory) or decrease (inhibitory) the probability of electrical signals (action potentials) being passed on from one neuron to the next. This balance is not constant, but changes over

the course of development. In collaboration with Richard Hahnloser's lab in Zurich, previous data has revealed differences in the balance between excitatory and inhibitory connections in birds that received tutoring, compared to those that received no tutoring in HVC, a brain region associated with song production. To confirm these alterations with song learning, we investigated the abundance of proteins that are specific to excitatory post synaptic density protein 95 (PSD-95) or inhibitory (gephyrin) synapses and hypothesized that inhibition increases with song learning while excitation remains consistent. We used three groups of male juvenile zebra finches: birds that received no tutoring, one day of tutoring, or 24 days of tutoring. We labeled for PSD-95 and gephyrin with fluorescent tags and obtained images of the brain to measure the intensity of fluorescence as a proxy for the relative levels of excitation and inhibition in HVC. Preliminary results show that the relative level of excitation remains constant while that of inhibition decreases with song learning. This finding indicates that connections necessary for song learning may strengthen while the others weaken and disappear, a phenomenon called synaptic pruning. There was significant learning in the birds, as measured by comparing the bird's song with that of their tutor or a novel bird. The birds tutored for 24 days learned significantly more than the birds tutored for one day (two-sample $t(10) = 2.40, p = 0.04$). These data suggest that relative levels of excitation and inhibition change with song learning.

What Makes a Good Learner? The Contribution of Inhibitory Neurons to Zebra Finch Song Learning

Alexa Pagliaro '18, Neuroscience and Spanish

ADVISOR: *Sharon Gobes, Assistant Professor of Neuroscience*

What makes a good learner? Young zebra finch songbirds learn to sing from their father (tutor) by memorizing their tutor's song, which they attempt to match as they develop their own. Some birds imitate their tutor's song with great success (good learners) whereas others fail to copy key components of the model song (poor learners). An auditory region in the bird brain is thought to contain (part of) the memory for tutor song. It has been shown that a significant portion of cells in this brain region are inhibitory—they

impede rather than promote cell activity. Furthermore, inhibition has been shown to play a critical role in song learning in brain areas involved in producing the song. Given the importance of inhibition in the song learning process, the current study investigates whether individual differences in learning outcomes can be explained by the distribution of inhibitory cells within the auditory region that contains (part of) the tutor song memory.

Roles of the Mediodorsal and Pulvinar Nuclei in Sleep Onset

Kanupriya Gupta '18, Neuroscience

ADVISOR: *Laura Lewis '85, Albright Ambassador*

Humans spend a third of their lives sleeping, and sleep is essential for learning and memory, but how sleep affects the brain and cognition is still heavily debated. Although the thalamus is known to play a major role in sleep, it is currently unknown what the roles of the different thalamic nuclei are during sleep and how they contribute to certain oscillations that occur during sleep. Therefore, I am specifically studying the roles of the pulvinar and mediodorsal thalamic nuclei in sleep onset in humans using simultaneous EEG-fMRI data. By integrating advanced brain imaging techniques—simultaneous EEG and functional magnetic resonance imaging (fMRI)—we can both measure sleep oscillations (in EEG) while also measuring activity in the thalamus (using fMRI).

Neural Mechanisms Underlying Recovery from Visual Impairment

Julia Deere '18, Neuroscience

ADVISOR: *Ming-fai Fong, Visiting Lecturer in Neuroscience*

Amblyopia, or “lazy eye,” is a common source of visual disability in children. It is caused by a significant difference in the quality of vision between the two eyes during early postnatal life. This difference leads to a decline in the brain's capacity to respond to vision through the weaker eye. Amblyopia can be recapitulated in laboratory mice using monocular deprivation (MD), or temporarily closing one eye soon after birth, which drives neural plasticity that reduces cortical responsiveness to vision through the previously deprived eye. We recently discovered that silencing action potential firing in the retinas can restore cortical sensitivity to visual input through the deprived eye in the mouse model. However,

the precise mechanisms that translate retinal silencing into recovery are unclear. We have observed that retinal silencing promotes highly correlated firing of action potentials in the thalamic relay between the retina and primary visual cortex. I am currently testing the hypothesis that this correlated thalamic activity underlies the visual recovery that follows retinal silencing. In this presentation, I will review my past and current research encompassing the neural mechanisms underlying amblyopia and the recovery of normal visual function.

Neuroscience Takes Flight FND-307 (Talk)

Neuronal Networks—The Role of Interneurons in Spatial Memory Formation

Helena Yan '18, Neuroscience

ADVISOR: *Sara Wasserman, Assistant Professor of Neuroscience*

Whether you're going to the kitchen in the dark to sneak a few cookies, or trying to navigate a corn maze on Halloween, you're creating and using a map of the space around you as you walk around. These maps are formed in the hippocampus, a part of your brain that is integral to memory formation and can be modified based on experiences. The Wilson lab at MIT investigates the cellular mechanisms that underlie spatial map formation, and my thesis focuses on the role of a specific cell type, the interneuron, within the network of cells that are involved in spatial maps. Starting with an introduction to spatial memory, I will give an overview of my contribution to the development and application of research methods, including calcium imaging and optogenetics, used to investigate the effects of perturbing interneuron activity to affect spatial maps, and I will report on my thesis experience.

Integration of Visual and Thermal Stimuli by *Drosophila* in Flight

Isabel D'Alessandro '18, Neuroscience

ADVISOR: *Sara Wasserman, Assistant Professor of Neuroscience*

The fruit fly *Drosophila melanogaster* must navigate a complex natural environment in flight, integrating stimuli from multiple sensory modalities, and using this information to drive contextually appropriate behavior. One sensory modality which has received little exploration in *Drosophila* is thermo sensation (heat

sensation), an important cue which the fly uses to maintain its body temperature and localize food. This talk will describe experiments conducted to investigate how *Drosophila* integrates visual and thermal stimuli to modulate in-flight behavior. We can investigate these questions in the lab using a "virtual reality flight simulator" in which the fly can steer freely in response to controlled combinations of sensory stimuli, while behavior is tracked quantitatively. Such experiments allow an investigation of the neural computations underlying the sensorimotor response to temperature changes, as well as the ways in which this response may be modulated by other internal and external cues. More broadly, this work aims to provide insight into the conserved mechanisms which enable neural circuits to integrate sensory information in response to dynamically changing environments.

From the Fingertip to the Brain: Quantifying Learning with the Senses

Maggie Mittleman '18, Neuroscience

ADVISOR: *Sara Wasserman, Assistant Professor of Neuroscience*

Noninvasive, simple approaches to assess basic brain mechanisms of learning in humans could be of great value in epidemiological studies. Of interest in this study is the spread of task-based learning, which can be assessed by using a novel approach to test discriminatory sensitivity to frequency and pressure stimuli. The brain's sensory cortex is organized such that areas in close proximity in the body are mapped next to each other on the cortex. This topographic layout can be used to assess the spread of learning. In this preliminary study, we created tasks in which participants were trained on one finger to discriminate between two very similar pressures and frequency vibrations. After training, the same discrimination tests were administered to the participants' neighboring fingers to examine if the learning had spread to topographically proximal areas. This procedure could become a useful, noninvasive, and inexpensive tool to quantify learning in future studies.

A Look into the Methods of Systems Neuroscience

Moging (Molly) Quan '19, Neuroscience

ADVISOR: *Michael Wiest, Associate Professor of Neuroscience*

Systems neuroscience helps us understand how neurons in the central nervous system interact with one another, while preserving the original state of the animal. Involving neuroscientists, biologists, programmers, electrical engineers, and physicists, this interdisciplinary field allows us to study the circuitry and brain regions involved in various behavioral states. At the Wilson Lab at MIT, we analyze the electrical activity of neurons to answer questions involving how we learn and remember, targeting hippocampal regions. From animal to computational models, and from tetrode twisting to spike sorting, I aim to provide a chronological overview of the standard methods behind electrophysiology research.

Social Science

The Economics of Information, Competition, and Behavior

GRH-330 (Preformed Panel Discussion)

Karen Ni '18, Economics; Mary Chen '18,

Economics; Lauren Mostrom '18, Classics and Economics; Lingjun (Lotus) Xia '18, Economics and Psychology

ADVISOR: *Eric Hilt, Professor of Economics*

Four economics thesis students present their projects analyzing behavioral responses to various competitive environments. Mary Chen explores the impact of improved highway infrastructure in India on manufacturing firms' product scope. Lauren Mostrom studies the role of information asymmetries in capital acquisition and firm performance by studying the composition of boards of directors of companies in the late 19th and early 20th centuries. Karen Ni investigates how gender of professors affects the choice of female students to major in STEM fields, using a panel of Wellesley College student-level data gathered between 2004 and 2017. Lotus Xia uses a behavioral experiment to examine asymmetric gender-specific response to negative and positive feedback and its consequence in entry of competition.

Diasporic Perspectives: Hidden Stories of South and Southeast Asian Communities

JAC-450 (Preformed Panel Discussion)

Kethural (Kethu) Manokaran '18, Neuroscience; Helena (Astrid) Mobley '18, Sociology; Ilina Mitra '18, Economics; Mathangi Ganesh '18, Computer Science; Keertana Anandraj '18, Economics and Mathematics; Phung Ninh '20, Sociology

ADVISOR: *Smitha Radhakrishnan, Luella LaMer Associate Professor of Women's Studies and Associate Professor of Sociology*

This semester, six Wellesley undergraduates worked on independent study projects that highlight hidden stories of the South and Southeast Asian diasporas. Informed by social scientific research on gender, culture, class, and religion in migration, we each conducted multiple oral history interviews with diasporic individuals around the world, exposing processes of assimilation, racialization, and group identity formation in diverse migrant communities. The narratives we studied spanned many continents and generations. In our presentations, we share our research findings on youth culture and community-building among contemporary Indonesian-American youth (Mobley), youth culture in Tamil diasporas in the United Kingdom (Mitra), gender and religion across generations of South Asian-American women (Anandraj), identity formation among South Asian women working in corporate America (Ganesh), the effects of migration history and memory on gender and labor in Vietnamese-American communities (Ninh), and class divisions in Sri Lankan Tamil diasporas (Manokaran).

Living in a MAD World: US Foreign Policy in the Nuclear Age

FND-317 (Preformed Panel Discussion)

Colleen Larkin '18, Mathematics and Political Science; Sabrina Leung '18, International Relations–Political Science; Heng (Amber) Qin '18, Political Science

ADVISOR: *Stacie Goddard, Jane Bishop '51 Associate Professor of Political Science*

Our senior honors thesis research addresses some of today's most pressing topics in international security, including the rise of Chinese and Russian naval power, competing goals of U.S. arms control and nuclear weapons modernization

programs, and the tensions between alliance politics and nuclear proliferation. Amber Qin examines U.S. domestic actors' perceptions of China and Russia's recent naval modernization programs. What arms policies can be counted as credible signals, and do U.S. policymakers and analysts care about the right signals? Colleen Larkin conducts a case study of the domestic and rhetorical factors that influenced the evolution of President Jimmy Carter's nuclear strategy. Why did Carter commit to significant arms control measures while embracing a military strategy necessitating nuclear superiority over the Soviet Union? Sabrina Leung explores the Nixon administration's secret nuclear assistance program to France. Why did Nixon decide to reverse previous policies of opposition to aiding France? How did U.S. policymakers attempt to balance the Soviet threat and alliance relations while upholding the nuclear nonproliferation regime?

Exploring the Selfie in Contemporary Culture

PNE-327 (Preformed Panel Discussion)

Tatiana Moise '21, Undeclared; Chuyue (Ariele) Xiao '21, Undeclared; Lane Arkangel '21, Undeclared; Sophia Ashebir '21, Undeclared
ADVISOR: *Heather Bryant, Visiting Lecturer in the Writing Program*

This year, Professor Heather Bryant is teaching two sections of the first-year writing course, "WRIT 155: A Selfie in the American Life." A few students in the second section of this course will share their findings. The students will present many pros and cons of selfography, and explore the role that it has in contemporary American society.

Health and Wellness Social Policy

FND-319 (Talk)

Governors and State-Level Policy Responses to the Opioid Addiction Epidemic in New England

Annalee Beaulieu '18, Political Science and Spanish
ADVISOR: *Nancy Scherer, Associate Professor of Political Science*

I will be presenting on my political science thesis, which examines the state-level politics of the opioid addiction epidemic in New England. While the order of magnitude of the epidemic is similar across the region,

and the states share similar features of their economies, demographics, and a regional identity and history, different policy responses to this devastating public health crisis have emerged. I am studying why and how these differences have emerged, specifically what role governors play in shaping the level of policy response in each state. I'll begin with a brief introduction to the science behind how and why opioids are so addictive, discuss the history of how the opioid addiction epidemic began and then grew, and then discuss my empirical analysis of the influence of governors in opioid policy.

Eating Disorders, Epistemology, and the Intersectional Female Body

Alexa Riobueno-Naylor '18, Psychology and Sociology

ADVISOR: *Markella Rutherford, Associate Professor of Sociology*

Eating disorders affect over 30 million people in the United States every day, and have some of the highest mortality rates among psychiatric diseases. Individuals from all demographic groups are affected by eating disorders; however, eating disorders are largely understood as affecting a homogenous population of elite young white women. Eating disorders are also thought to be linked to a drive for thinness and conformity to Western female body ideals. However, eating disorders serve as coping mechanisms for individuals who have experienced various forms of trauma, and represent one of the ways that marginalized individuals cope with racism, historical trauma, misogyny, violence, colonialism, and acculturation. By comparing the experiences of black and Latina women with eating disorders to the experiences of white women as well as incorporating perspectives from clinicians, this project investigates how the diagnosis and treatment of eating disorders is reflective of white supremacist epistemological frameworks. A more intersectional understanding of eating disorders as they exist within the bodies of Latina and black women is proposed, in order to challenge how eating disorders are currently understood within the institution of psychology, as well as within the context of the medical-industrial complex.

Eating Behaviors at Wellesley College

Abigail (Abby) Donoghue '19, Chemistry and Psychology; Jacquelyn Floyd '19, Psychology
 ADVISOR: *Sally Theran, Associate Professor of Psychology*

Eating disorders are a nationwide problem, and Wellesley is not exempt. While we do not know the rates of eating disorders at Wellesley, we did not set out to find these rates. We were looking to find eating patterns in the student populations in relation to other variables. We looked at different levels of support, such as friends and family, that can affect healthy and disordered eating. Finally, we sought to find any correlations between perfectionism and types of eating behaviors.

Data-Driven Wellness: Using Student Health Data to Inform Programming and Practice at Wellesley College

Jessica (Jess) Abramson '19, Computer Science and Psychology

ADVISOR: *Claudia Trevor-Wright, Assistant Director of Health Education and Wellness*

Every two years, Wellesley College students are invited to take the National College Health Assessment, a comprehensive health questionnaire. Hundreds of students fill out the extensive survey, but for the data to inform programming, interventions, and allocation of resources, the Wellesley community needs to be informed about the survey results. As the health communication student aide, I work to encourage student, faculty, and staff engagement with the health data. From weekly graphics, to subgroup analysis, to a faculty game show, I'll be discussing the various projects we've undergone to promote engagement, recognize health disparities, and inform stakeholders in student health. I will also discuss some of the data-driven programming and initiatives that have come about as a result.

Affect and Imagination

GRH-428 (Talk)

Recreating the Future: Examining Impaired Future Thinking in PTSD

Lydia Guo '20, Neuroscience

ADVISOR: *Margaret Keane, Professor of Psychology*

Our memories of the past are essential to our ability to envision the future. "Future thinking" is essential to our social problem-

solving and ability to organize long-term goals. Impaired future thinking has been found in amnesic individuals who also have impaired episodic (autobiographical) memory resulting from damage to the brain's medial temporal lobe (MTL). Therefore, the MTL is believed to play a crucial role in constructing the future from our past episodic memories. Individuals with post-traumatic stress disorder (PTSD) also have impaired future thinking and autobiographical memory disturbances. I am involved in a study that explores future thinking in people with PTSD through an examination of their narratives about the future. Their narratives are expected to be over-general (with fewer episodic details) and have a negative content bias. By better understanding the nature of future thinking in PTSD, we hope to build towards more effective clinical interventions.

Impaired Executive Function May Underlie Decreased Ability to Imagine the Future in PTSD

Rose Horowitz '20, Psychology

ADVISOR: *Margaret Keane, Professor of Psychology*

Individuals with post-traumatic stress disorder (PTSD) have shown a decreased ability to envision the future. The current project investigates the possibility that deficits in "executive function" (the ability to self-regulate, inhibit responses, filter, etc.) might underlie the deficits in future thinking ability expressed with PTSD. The Stroop test—in which participants must inhibit the immediate tendency to read a word and instead say the color it is written in—was used to measure executive function. The words presented included color names and emotional war-related words. Individuals with impaired executive function have a harder time inhibiting the immediate tendency to read a word, and therefore take longer to say the color it is written in instead. Accordingly, if impaired executive function underlies impaired future thinking, we expect longer response times in individuals with PTSD than in healthy individuals. My experience was made possible by the sophomore early research program (SERP).

Malevolent Creativity: A Cross-Cultural Study

Zichun (Michelle) Wang '18, Psychology

ADVISOR: *Beth Hennessey, Professor of Psychology*

Creativity is most often perceived to be a highly desirable and exclusively positive attribute, yet both history and a growing body of research remind us that creativity is not always benevolent. When creativity is deliberately used to cause harm, it is known as "malevolent creativity." An extreme example of malevolent creativity is the development of the atomic bomb. To better understand the mechanisms underlying the production of malevolently creative products and problem solutions, this study investigated the degree to which demonstrations of benevolent creativity (commonly referred to simply as creativity), creative self-efficacy (a personal judgment of one's own creative ability), and psychological entitlement (feelings that one is "better"/ more deserving than others) influence demonstrations of malevolent creativity among college students. Additionally, the potential role played by culture in the manifestation of malevolent creativity is explored by recruiting participants from the U.S. (n = 60) and China (n = 60).

Did Scrooge's Grumpy Mood Amplify His Miserliness? The Effect of Mood on Social Perception and Cooperation

Gauri Salil Gadkari '18, Neuroscience; Rachel

Wulff '18, Neuroscience

ADVISOR: *Margaret Keane, Professor of Psychology*

Does being in a good mood make one more helpful and willing to give others the benefit of the doubt? Often, the judgments we make about others and our willingness to cooperate with them are not as rational as we would like them to be. Our study explored whether mood and social value orientation (i.e., willingness to share) influence the cognitive mechanism that supports social decisions. Participants played a resource-sharing game with a fake partner, in which rigged feedback made them think that, as a rule, people either generally share or do not share. Inducing participants to feel either positively or negatively, we assessed their perception of characters in ambiguous social situations, and their willingness to cooperate. We found that a positive mood did lead participants to be cooperative, but

interestingly did not influence how they thought of others. So, maybe the cure to Scrooge's miserly ways was a few good jokes!

Modeling Economic Behavior PNE-339 (Talk)

Growing the Future: Women in Farm Education for Children

Alejandra Narvaez '19, Environmental Studies
ADVISOR: *Wendy Robeson, Senior Research Scientist with the Wellesley Centers for Women*

This presentation focuses on a descriptive study that explores women in the field of farm education for children. The purpose of this study was to investigate female farm educators' views on gendered child behavior, the benefits of the program, the challenges of the career path, and motivation for engagement with such educational programs. The research methods used throughout this study were in-person qualitative interviews with the female agricultural educators and online qualitative surveys. Each of these methods was designed to explore two of the previously mentioned categories of educators' views. The in-person interviews were conducted in sustainably managed farms with educational programs for children under age 13. These were located in the greater Boston area, the greater Atlanta area, and Providence, RI. The study indicated a correlation between age, group dynamics, and gendered behavior in children within farm education programs. For the respondents, there was found to be economic, social, gender-based, and educational consistency within the perceived challenges of the career path. Finally, all respondents were found to cite motivations and goals for their education program that could be categorized into four main ideas: environment, social and health, visible effect, and exemplary behavior. The study served its purpose in its exploration of female authority within a traditionally male-dominated field. The findings are consistent with previous research on the importance of the female viewpoint in global agriculture, for the sake of sustainable food production in developed and developing nations.

The Oceans Between Us: Exploring the Role of the United States in International Fishing Policy

Frances Dingivan '20, Environmental Studies
ADVISOR: *Elizabeth DeSombre, Camilla Chandler Frost Professor of Environmental Studies*

Fisheries are a common-pool resource, meaning they are open to all for use, but one actor's use diminishes the quality of the resource for others. To prevent the depletion of international fisheries, various states have organized themselves into regional fisheries management organizations (RFMOs) to regulate the use of these precious resources. Given its status as a major global power, the United States, as a member of these organizations, has the potential to exercise significant political and economic influence on regulations and enforcement. The purpose of this research was to discern the role of the United States in forming, implementing, and enforcing international fishing policy as a member of various RFMOs. My research focused primarily on the North Atlantic Fisheries Organization (NAFO). As part of this research, I compared the total allowable catch quotas set by NAFO with the United States' actual reported catches. I also analyzed the official statements of the United States at annual meetings of NAFO's general session to discern the United States' position on NAFO regulations. Through this research, I was able to discern that while the United States generally adheres to NAFO's regulations, it used its economic investment in NAFO to shape policies and regulations, such as catch limits, in its favor. This research is ongoing, and there is a possibility that different trends will appear as I continue to explore the United States' involvement in other organizations as well.

Development and Growth Without Property Rights in China's Transition Economy

Linda Zhou '18, East Asian Studies and Political Science
ADVISOR: *C. Pat Giersch, Professor of History*

Strong property rights are usually seen in development literature as a necessary condition for development. My research takes a closer look at China's transitional period right after the start of reform and opening up to explore China's economic growth despite not meeting any of the development prerequisites. Using a case

study comparison of the Aijian Corporation and China International Trust and Investment Corporation (CITIC), I show how Chinese businesspeople used business connections as a substitute for property rights, with relationship-based lending and business-government relations playing large roles in a firm's establishment and growth. The Aijian Corporation and CITIC are two of the earliest firms in post-reform China, making them among the longest continuously operating corporations in China today. The Aijian Corporation is widely recognized as the first private corporation in post-reform China, yet this is the first formal study of the corporation in English. Business in China cannot exist in a vacuum, so this study also explores the interconnections between disciplines and shows how sociology, political science, and economics need to intertwine to explain China's anomalies.

Models of Kidnaps for Ransom Insurance

Suzanne Wang '18, Economics
ADVISOR: *Casey Rothschild, Norma Wilentz Hess Associate Professor of Economics*

Criminal kidnapping for ransom is a large market, with annual recorded ransom payments totaling over \$1.5 billion globally. Common in many developing countries, insuring against kidnaps is seen now as a necessary cost of doing business in high-risk areas. Poorly managed negotiations result in high ransoms, which encourage more kidnappers to enter the market with high payout expectations. However, criminal kidnap ransoms are surprisingly low and stable. Research suggests that this outcome is a result of a central governing body—not the government, but private insurance firms competing under Lloyd's of London. This presentation will explore the unique structure of the criminal kidnap market and the private governance model that regulates it. Using the tools of game theory, I will show how Lloyd's succeeds in areas where governments fail, and improves both the welfare of its consumers and society as a whole.

Lunch

12:00–1:30pm
Served on
Alumnae Hall Lawn

Poster Session

1:00–2:40pm
LWC Tishman
Commons

“*The Ruhlman is truly a magical, inspirational day that is hard to describe, but is better experienced in person.*”

—Barbara Peterson Ruhlman '54

1:30–2:40pm

Humanities

A Sense of Places

Collins Cinema (Preformed Panel Discussion)

(Paulson Initiative Presentation, Sustainability Year)

Zixia (Linda) Liu '19, English; Josephine (Josey) Murray '19, English and Creative Writing; Veronica (Ronnie) Alvarez-Alfani '20, Undeclared; Haruka Ueda '20, English
ADVISOR: *Marilyn Sides, Senior Lecturer in English*

It's a well-known cliché that travel writing is writing about places. Last semester, we took ENG206, a travel-writing workshop, to share stories we didn't know we had until we were forced to pick up our pens—or keyboards. Through our time together, the essays we brought to the table chronicled our journey from the shallow “I” to the deep “I.” By the end of the semester, our understanding of travel writing was transformed. Exploring stories both personal and adventurous, we've learned that the travel-writing genre extends beyond guidebook vacation spots and trips to five-star resorts. Travel writing connects us to a range of destinations and experiences that are deeply personal to the individual. Through selected excerpts of each of our own travel essays, we will explore how the experiences obtained through travel, both the hilarious and the sentimental, reveal the deep “I.”

The Impact of the Selfie in American Life

FND-126 (Preformed Panel Discussion)

Abigail (Abby) Schleichkorn '21, Undeclared; Tara Hemant Luthra '21, Undeclared; Jacqueline Brinkhaus '21, Undeclared; Alicia Lee '21, Undeclared; Emily Katz '21, Undeclared; Rosalinda Xiong '21, Undeclared
ADVISOR: *Heather Bryant, Visiting Lecturer in the Writing Program*

This panel serves to explore the conventional use and impact of the selfie across multiple disciplines, such as art, politics, sports, medicine, and entertainment. From Kim Kardashian's book *Selfish* to the use of selfies in political campaigns, the influence that selfies have on our everyday lives continues to evolve and shape our modern culture. As we delve deeper into an age of technology where we have the ability to capture a moment in time with just the click of a button, the implications of the selfie have

revolutionized how we view ourselves and the world around us.

Flutes on Fire: Passion and Virtuosity in 20th-Century Flute Quartets

JAC-AUD (Long Performance)

Ruanqianqian (Lisa) Huang '20, Cognitive and Linguistic Sciences and Computer Science; Taylor Gunderson '18, English and Creative Writing and History; Hannah Kernen '20, Biological Sciences; Colleen Larkin '18, Mathematics and Political Science

ADVISOR: *Suzanne Stumpf, Senior Music Performance Faculty in Flute, Baroque Flute, and Chamber Music*

Throughout the 20th century, interest in composing for the modern “Boehm” system flute as inspired by the French pedagogues Taffanel and Gaubert continued to spread throughout the world, creating what some scholars have dubbed a Golden Age of the flute. Two French composers, Pierre Max Dubois (1930-1995) and Eugène Bozza (1905-1991), contributed to the growing list of rich flute repertoire by penning outstanding flute quartets. Dubois resisted the impressionistic and romantic tendencies of the era and incorporated his characteristic lighthearted elements into many of his works, such as *Quatuor*, a flute quartet with four movements. Bozza's piece, *Jour d'été à la montagne*, evokes the imagery of a summer journey up a mountain and the subsequent descent down a rushing, writhing river. Our presentation features a discussion of the history and compositional aspects of *Quatuor* and *Jour d'été à la montagne*, followed by a full performance of each piece.

Sed Ministrare: Building the Ministrare Council from the Ground Up

FND-102 (Preformed Panel Discussion)

Cecellia Tsui '18, Computer Science and Mathematics; Mehak Sarang '18, Physics; Leilani Stacy '18, Economics and Political Science; Magdalena Sowder '18, Media Arts and Sciences; Emily Moss '19, Economics
ADVISOR: *Erin Konkle, Program Director, Community Engagement*

The Ministrare Council was a new initiative created this year with the Office of Civic Engagement to build a student-led network of service opportunities. Five teams address different angles through which students can participate in service: Youth partnerships, community partnerships,

Wellesley partnerships, alternative breaks, and logistics and communications. We hope to share with the Wellesley community our experiences leveraging different resources to build this initiative from the ground up. Our presentation will engage audience members in an act of service and reflection, both key components in our approach to civic engagement. Bringing Wellesley's motto to life, the Ministrare Council and this presentation will reflect the spirit of Non Ministrari, Sed Ministrare.

Exploring Community and Individual Identities Through Writing

PNE-139 (Literary Reading)

Far Cry

Padya Paramita '18, English and Creative Writing and Women's and Gender Studies
ADVISOR: Marilyn Sides, Senior Lecturer in English

The essays in my creative nonfiction collection *Far Cry* reflect important, memorable, and meaningful moments and events in the lives of myself and my family members. The intersection of my identities as a Bangladeshi Muslim queer individual and an international student has played an integral part in every aspect of my life. This project has helped me process and understand several instances of growth, change, and trauma around the communities where I grew up. The stories parallel how the Bangladesh Liberation War of 1971 shaped my family as well as the creation of a national identity, and how it affects me today. In writing these essays, I have set on a terrifying but exciting journey into self-discovery by exploring more of my family's and my nation's stories of birth, trauma, and reformation, and delving into how it shapes my past, present, and future, with a special focus on different aspects of my racial, gender, and religious identity. I grew up reading a great deal of Western literature that I loved—both fiction, such as *Middlesex* by Jeffrey Eugenides, and nonfiction, like *Fun Home* by Alison Bechdel—that drew on familial history and memory. Stories of the South Asian diaspora are also evolving, through stories by my role models, Jhumpa Lahiri and Arundhati Roy. Existing South Asian literature in English however, has overlooked the unique Bangladeshi identity and has made South Asia seem monolithic. The Bangladeshi identity is often

overshadowed by Indocentric South Asian literature, film, television, and public figures. While there are many works in Bangla on the war, there is little literature—especially autobiographical work—that looks at the impact of the war on the subsequent generation and their construction of identity. I hope to add to the slowly growing work about the post-war Bangladeshi experience at home and abroad. I want to pay tribute to my family members—their struggles and sacrifices, as well as their triumphs and achievements—through my work. Hence some of the most important themes in my essays surround home, identity, family, and sacrifice. Time and intergenerational difference play a big role in these essays. I have shown these differences through material objects such as advanced technology—going from letters to text messages—to more abstract changes such as acceptance of queerness or challenging religious rigidity. This project has strongly aided my journey of self-discovery as a student, writer, and a member of both my family and homeland. I hope I have brought even a little bit of light to the stories yet untold and hope to do my family and nation justice by putting some of their words on paper.

Strangers in San-Something: An Original Short Story Collection

Olivia Lafferty '18, Classical Civilization and English and Creative Writing
ADVISOR: Margaret Cezair-Thompson, Senior Lecturer in English

Strangers in San-Something is a collection of interconnected short stories about three generations of a Filipina-American family. Drawing from family history and a scholarly and creative interest in coming-of-age trauma narratives, the project works to give voice to a marginalized population. From San Pedro to San Diego, the stories follow the women of the Reyes family as each confronts an ever-shifting, fragmented identity, in the context of mango trees, milkfish, and purple yam desserts. (Research supported by the Schiff Fellowship)

Let Us Not Bother with Them: Understanding the Suppression of Freedom in Myanmar Through Short Fiction

Rebecca (Becky) Finkelstein '21, Undeclared
ADVISOR: Erin Battat, Visiting Lecturer in the Writing Program

After Myanmar became independent in 1948, violent attempts to overthrow the government ensued. Aung San Suu Kyi emerged as the voice for peaceful change. She eventually became the face of the pro-democracy movement in Burma, now renamed Myanmar. During this time, the violence against the Rohingya (which has always existed in Myanmar) escalated into an attempted ethnic cleansing, with Aung San Suu Kyi and her followers defending violence against the Rohingya minority. Burmese writers, who have long been a central part of Myanmar culture, do nothing to challenge the violence. Rather, they tell stories to uphold the status quo of Burmese society. My project investigates how those in Myanmar, while still thinking of their actions as peaceful and just, failed to act. In my project, I have analyzed representations of equality and freedom in groups of “outsiders” in Burmese literature to gain some understanding of how those in Myanmar can justify stripping away the freedom of the Rohingya, or how they might not even acknowledge the violence they are doing. Much research has already been done about the literary canon of Burmese literature and the cultural oppression of the Rohingya people, but little scholarship focuses on the intersection of those two topics. My project would bridge these two subjects in hopes to reveal something bigger: the influence of literature on societal expression of freedom. To do so, I have looked specifically at modern Burmese short stories, written since Myanmar's independence in 1948. I have traced the presence and representation of justice and freedom. Throughout the Burmese short fiction available in English, the fundamental rights of humans are seen as a concept only understood by the educated few, and therefore unimportant to the rest of Myanmar society. The disregard for universal rights has helped Myanmar citizens justify stripping away the rights of certain groups. Because of the desensitizing literature, the majority in Myanmar don't even think of unlawful practices as a violation of human rights. This is how the Myanmar society

can create a culture in which the systematic killing of the Rohingya does not even need to be justified.

Tongues of Eve: The Politics of Language in Postcolonial Algerian Literature

Molly Hoyer '18, Comparative Literature
ADVISOR: *Rachid Aadnani, Senior Lecturer in Middle Eastern Studies*

Conflict in North Africa is often represented through a binary opposition between French and Arabic. Over the course of the almost 200 years since French colonization began in the region, these two languages have come to signify countless, contradictory elements of Algerian identity, history, and culture. This presentation will explore these language dynamics within the context of late 20th-century Algeria by analyzing two novels: *So Vast the Prison* by Assia Djebar and *Memory of the Flesh* by Ahlam Mosteghanemi. While each author wrote in a different language—Djebar in French and Mosteghanemi in Arabic—both manipulate narrative structure and style to explore representations of history, gender, national identity, and language in a postcolonial and feminist critique.

Whose Land Is It?

PNE-127 (Talk)

Gold Diggers: The Social History of the Klondike Gold Rush

Samantha (Sam) Lanevi '18, Classical Civilization and History
ADVISOR: *Ryan Quintana, Associate Professor of History*

The Klondike gold rush evokes images of a frozen, unforgiving landscape dotted by virile white men seeking to strike it rich. However, this imagery obfuscates the truth of the Klondike. The allure of gold was universal and attracted more than the stereotypical white, male gold miner; both women and various minority groups heeded the call of easy riches and exercised their freedom in the Klondike. While gold rush literature portrays stereotypical miners striking it rich, there was much more at stake. The Klondike gold rush is a prime example of how American mythology clouds the realities and people who made this gold rush possible.

The Ethics of Refugee Migration

Selma Khalil '18, Neuroscience and Philosophy
ADVISOR: *Helena de Bres, Associate Professor of Philosophy*

This thesis explores the nature and foundation of our moral responsibility towards refugees. To do so, I answer six broad questions central to the debate: (1) what are our duties towards helping the vulnerable, (2) how should we define refugeehood, (3) can a state justifiably deny entry of migrants, (4) how should we outline the resettlement process of those with official refugee status, (5) what is the duty of countries hosting refugee populations, and (6) is prioritizing right of asylum or resettlement as a solution for the refugee crisis ethical?

“We are Lonesome for Our Land”: The Settler Colonialist Use of Exodus in the Diné Long Walk

Emma Brewer-Wallin '18, Peace and Justice Studies and Religion
ADVISOR: *Edward Silver, Assistant Professor of Religion*

Euro-American scholarship of the Diné Long Walk often concludes that the end of this traumatic experience “birthed” the Navajo Nation. This narrative parallels that of the biblical Exodus, in which the people endured a grueling period in the desert, resulting in them reaching the “promised land” as a united people. The imposition of this narrative, however, serves as a tool of the ongoing project of settler colonialism. My thesis attempts to address this presumption, in part through the use of Diné-recorded oral histories and native scholarship, as well as consideration of possibilities for the coexistence of multiple narratives.

Land, Labor, and Belonging: Japanese-Americans' and African-Americans' Struggle for Citizenship During World War II

Sofie Werthan '18, Individual-Ethnic Studies
ADVISOR: *Brenna Greer, Knafel Assistant Professor of Social Science*

During World War II, the U.S. government displaced nearly 120,000 Japanese-Americans from the West Coast and interned them in concentration camps. At the same time, over 150,000 African-Americans moved from the American South to the West Coast in search of wartime employment, oftentimes building communities in the same neighborhoods

from which Japanese-Americans had been forcibly removed. The war thrust Japanese-Americans and African-Americans into close proximity with one another, both physically and ideologically. My senior honors thesis explores the ways that World War II impacted Japanese-Americans and African-Americans' sense of national belonging, focusing on the linkages between the two groups' wartime experiences of state-sanctioned spatial segregation and labor exploitation. By using a comparative framework, I aim to highlight the complex ways in which the government's treatment of racially marginalized people shifted in response to the war, particularly given the increased emphasis on upholding the ideals of freedom, democracy, equality, and citizenship during this period. By putting these two experiences into conversation with one another, I hope to underscore the flexibility and endurance of the overarching structures of racial hierarchy and racism in the United States. In this presentation, I will discuss both my project's findings and the methods I used to research and write an interdisciplinary ethnic studies thesis.

Science and Technology

EcoLab: Investigating the Impacts of Nutrients and Soil Feedbacks on Plant Productivity and Diversity

FND-120 (Preformed Panel Discussion)

Emma Conrad-Rooney '20, Biological Sciences; Andrea Sama '19, Biochemistry; Emily Neel '18, Environmental Studies; Lyba Khan '20, Biological Sciences; Lara Jones '18, Biological Sciences; Abigail Conte '20, Biological Sciences; Erica Huang '20, Biological Sciences; Irina Chen '18, Biological Sciences; Sulaikha Buuh '20, Biological Sciences
ADVISOR: *Jaclyn Matthes, Assistant Professor of Biological Sciences*

Title #1: Neighboring Nutrients: Investigating Sustainable Mulching Alternatives to Inorganic Fertilizers. Sulaikha Buuh, Lyba Khan, Emily Neel. Abstract #1: Inorganic fertilizer in agricultural systems creates significant greenhouse gas emissions, produces pollution through nitrogen runoff, and represents a large monetary expense for small-scale farmers. Alternatives to inorganic fertilizers, such as mulch, could potentially enhance plant productivity while minimizing

environmental impacts. This research investigates whether adding legume mulch will increase the productivity of spinach and lettuce and alter soil carbon and nitrogen fluxes. Crown vetch, a legume, is widely considered to be an invasive species, so harvesting this plant for mulch could also produce cobenefits for local invasive species control efforts. The aim of this experiment is to help gardeners and small-scale agricultural managers understand the connections between agroecosystem carbon and nitrogen cycling and the potential for using legume mulch to enhance plant productivity.

Title #2: The Difference that Dirt Makes: Exploring the Impact of Soil Origin on Forest Diversity. Irina Chen, Abigail Conte, Andrea Sama. Abstract #2: Biodiversity is essential to the health of any forest. Our project investigates the relationships between trees, soil origin, and soil pathogens and their contribution to forest diversity. By using soil samples and acorns collected from the Harvard Forest, we analyzed the biomass of red oak seedlings grown in their native soil versus soil from underneath different tree species. Soils under each tree species hold unique microbial and fungal communities, including a diverse range of soil pathogens. Through analyzing the biomass of red oak seedlings grown in different soils and measuring their carbon and nitrogen levels, we can start to uncover how soil pathogens may contribute to the biodiversity and resilience of forests.

Title #3: Searching Below the Surface: Impacts of Forest Landscape Structure and Belowground Mechanisms on Trees and their Symbiotic Fungi. Emma Conrad-Rooney, Erica Huang, Lara Jones. Abstract #3: Belowground processes and characteristics, such as nutrient cycling and soil texture, play a significant role in structuring ecosystems from the bottom up. One essential component of soil systems is mycorrhizal fungi, which associate mutualistically with tree roots. At the Hubbard Brook Experimental Forest in New Hampshire, each tree species only associates with either arbuscular or ectomycorrhizal fungi. For both mycorrhizal types, trees exchange carbon for nutrients, but the different types of mycorrhizae provide nutrients in different ways. At the landscape scale, we hypothesize that having both mycorrhizal types in the same plot would

enhance productivity and diversity, since their strategies are complementary. At the scale of an individual tree, we examined how physical soil characteristics impact root length for roots associated with either arbuscular or ectomycorrhizae. The mechanisms behind these interactions are not well studied and are important for understanding the resilience of forests in the face of environmental change.

Exploring the Relationship Between the Innate Immune System and Adult Neurogenesis in the Crayfish (*Procambarus clarkii*) Brain

FND-307 (Preformed Panel Discussion)

Anushree Dugar '18, Neuroscience; Vanessa Kelley '18, Biological Sciences; Yuriko Fukumura '19, Neuroscience; Sannidhi Ranjeet Josphipura '19, Neuroscience
 ADVISOR: *Barbara Beltz, Allene Lummis Russell Professor of Neuroscience*

Adult neurogenesis, the production of new neurons in the adult brain, is a lifelong process that occurs in both vertebrate and invertebrate species. It is thought that neurogenesis in mammalian species is regulated by self-renewing neural precursor cells; however, findings in crayfish demonstrate that neural precursor cells are not self-renewing and are being replenished by an extrinsic source. Recent studies reveal that these neural precursors are blood cells derived from the innate immune system. In order to better characterize the relationship between adult neurogenesis and the immune system, our aims include (1) identifying the immune tissue that generates neural precursor cells and the factors that bias these cells towards a neural fate, (2) establishing whether neural precursor cells express molecules that characterize neural differentiation during embryonic development, and (3) exploring serotonin as a mediator between the immune system and the nervous system.

Chasing Digital Traces and Digital Natives

PNE-216 (Preformed Panel Discussion)

Annabel Rothschild '20, Computer Science; Sophia (Sophie) Rosas-Smith '20, Computer Science; Meha Ahluwalia '20, Computer

Science; Lauren Tso '20, Biological Sciences and Computer Science
 ADVISOR: *Eniana Mustafaraj, Assistant Professor of Computer Science*

In our fall 2017 course, CS234 Data, Analytics, and Visualizations, we learned how to employ data science to study the many data traces we, along with our peers, create as digital natives. These traces are content or interactions captured by any digital device ranging from Wikipedia editing to our own text messages. Furthermore, they are an integral component of digital natives, a generation that grew up with technology. From here, we learned how the data science cycle works, beginning with asking interesting questions about processes or habits we observed and then collecting and analyzing the relevant data. Using computational approaches, we sought to answer our questions so we could communicate our findings to our larger community through visualizations. Now, we each review our first experiences in data science. We hope to reveal what insight this analysis has brought and how we are furthering new experiences in a variety of interests.

Nanotechnology: From Biomedicine to Materials Chemistry

GRH-136C (Preformed Panel Discussion)

Bang Nhan '20, Chemistry; Alejandra (Ally) Uchitelle '20, Biochemistry; Maria Phan '20, Undeclared; Amanda Code '20, Chemistry; Nasreen Al-Qadi '18, Biological Sciences; Camille Banson '19, Chemistry
 ADVISOR: *Nolan Flynn, Associate Professor of Chemistry*

Materials with nanometer-scale dimensions have been a topic of interest for many scientists in the last few decades because of their possible applications in biomedicine, energy, and technology. More specifically, gold nanoparticles (AuNPs) have been the focus because gold is relatively inert yet easily modified on the surface, making them attractive for settings such as environmental remediation and chemotherapeutic treatment. AuNPs can be used as a nanovehicle for cancer treatment by attaching molecules on their surface to target cancer cells. Despite some research on AuNPs, there is still little known about how it behaves in the human body. We investigate these complicated interactions

in fluids that model the body, helping us understand treatment efficacy. Additionally, gold nanoparticles can be used as a template to produce a variety of materials such as hollow nanospheres. Traditionally, these hollow nanospheres begin with a metal colloidal core and are coated with alternating polycationic and anionic layers. We explore an alternative synthesis by incorporating inorganic anionic material because of its unique properties of maintaining its structural integrity in acidic conditions.

The Water Challenge: Water Sustainability on Wellesley College Campus

JAC-372 (Preformed Panel Discussion)

Maria Gonzalez '19, Physics; Nicole Zhao '20, Cinema and Media Studies; Akilah Chatman '20, Physics
 ADVISOR: James Battat, Assistant Professor of Physics

In the fall 2017 semester, we began designing a sensor system that will ultimately be used in real-world applications. The sensor system uses a Raspberry Pi computer, a tentacle board, and sensors. The coding within the Raspberry Pi takes the values retrieved from the sensors on a continuous basis and logs these values to a structured database. Before the presentation we plan to build plant beds containing different rain garden designs that incorporate plant species. A flow system simulating rainwater will be positioned above the plant beds. We will create the inflowing water by adding chemicals to fresh water so that we can manipulate different factors. The quality of water will be continuously monitored by the sensor system and displayed in a graphical format. We intend to use this work to ultimately create rain gardens by the Gray Lot to capture rainwater runoff from the impermeable surface of the parking lot.

Chemistry in Action: From Pharmaceuticals to the Galaxy PNE-339 (Talk)

First Surface Chemistry Application of a Newly Patented Ion Trap Mass Filter

Jean Huang '18, Chemistry and Japanese Language and Culture
 ADVISOR: Christopher Arumainayagam, Professor of Chemistry

Mass spectrometry is an analytical technique used to identify components of a sample by mass-to-charge ratio after ionization. The

most common type of mass spectrometer for detecting small molecules separates ions using a quadrupole mass filter. Our lab has been using a quadrupole mass spectrometer to study surface and radiation chemistry in an ultrahigh vacuum chamber using a technique called temperature-programmed desorption (TPD). TPD can identify reaction intermediates and products by mass spectrometrically monitoring gas desorption off a surface as a function of surface temperature. A recently commercialized ion trap mass spectrometer claims higher sensitivity, greater resolution power, and faster response time than a typical quadrupole mass spectrometer—ours is the first application of this mass filter for TPD experiments. Results of our initial experiments suggest we can easily detect nanomolar quantities of a substance adsorbed on a surface.

Low Energy Photon Reactions with Condensed Methanol

Hope Schneider '18, Chemistry
 ADVISOR: Christopher Arumainayagam, Professor of Chemistry

In the interstellar medium, UV photolysis of condensed methanol (CH₃OH), contained in ice mantles surrounding dust grains, is thought to be the mechanism that drives the formation of “complex” molecules, such as methyl formate (HCOOCH₃), dimethyl ether (CH₃OCH₃), acetic acid (CH₃COOH), and glycolaldehyde (HOCH₂CHO). Methoxyethanol (CH₃OCH₂OH), another “complex” molecule, was first detected in the interstellar medium in 2017. Methoxymethanol was first identified in 1995 as an electron-induced radiolysis product of condensed methanol. Because no previous studies identified methoxyethanol as a photolysis product of condensed methanol, methoxyethanol was suggested as a possible tracer molecule for electron-initiated reactions in interstellar ices. We report the first identification of methoxyethanol (CH₃OCH₂OH) as a photolysis product of condensed methanol based on temperature-programmed desorption studies conducted following irradiation with photons of energies below the ionization threshold (9.8 eV) of methanol.

Regioselective Synthesis of N1 Pyrazole Derivatives Using Disubstituted Benzyl Electrophiles

Natalie Norman '18, Chemistry
 ADVISOR: Adrian Huang, Instructor in Chemistry Laboratory

Pyrazoles are five-membered heterocycles with two adjacent nitrogen atoms that are a major motif in medicinal and pesticide chemistry. Pyrazole derivatives are distributed as anti-pyretic, -diabetic, -depressant, and -inflammatory agents, yet very little is known about them. Celecoxib, an anti-inflammatory, acts through the selective inhibition of the cyclooxygenase-2 (COX-2) isozyme, unlike most NSAIDs, which target both COX-1 and COX-2. COX-1 is constitutional and promotes the production of the natural mucus lining that protects the inner stomach, contributing to reduced acid secretion as well as platelet aggregation. Chronic use of NSAIDs such as aspirin for pain management can lead to an increased risk of gastrointestinal bleeding and thrombocytopenia. Unfortunately, synthesis of Celecoxib results in a mixture of two regioisomers, the desired N1-pyrazole and a byproduct (N-2 pyrazole) which is not biologically active. The two adjacent nitrogens on the pyrazole ring are chemically similar, so the electrophile adds to both. The two regioisomers then have to be separated, in a costly and time-consuming process. Another issue with Celecoxib is that there is an increased risk of cardiac events, thus slight structural changes that may increase Celecoxib's therapeutic activity are highly sought after. Recently, our team had conducted a systematic study of the N-substitution reactions of pyrazoles under basic conditions. N-substitution reactions using mono-substituted benzyl electrophiles occurred at room temperature to yield N1 regioisomers as the major products. This study has led to a simple, robust, and regioselective reaction protocol that functionalizes the pyrazole rings at the N1 position in good to excellent yields. In this study, nine di-substituted benzyl electrophiles with a range of functional groups, different steric factors, and electronic properties were used to further knowledge of pyrazole chemistry and try to further improve upon the regioselectivity as well as therapeutic activity and yield. In addition to varying the electrophiles, two additional pyrazole rings, as well as that found in Celecoxib, were used to observe

how functional groups on the nucleophile with different electronic properties would direct the electrophiles to the nitrogens on the ring. Ring A has a nitro group on C3 as opposed to a trifluoromethyl group (ring H) and was used because not only is it cheaper, it is an extremely versatile intermediate for further substitution on the ring. Ring E, while having the same tetrahedral geometry with a methyl group on C3 as the trifluoromethyl, is electron-donating. We ran 27 reactions with each nucleophile and electrophile pairing. Confirmation of the correct regioisomers are verified with ¹H and ¹³CNMR, 2-D NMR, and X-ray crystallography.

Pharmaceutical Formulation Development and Process Optimization

Michelle Duan '18, Chemistry
 ADVISOR: *Adrian Huang, Instructor in Chemistry Laboratory*

All pharmaceutical products are formulated to specific dosage forms so drugs can be effectively delivered to patients. Common forms include oral tablets, capsules, solutions, suspensions, topical ointments, gels, solutions, and injections. Different forms of dosage need different technologies and present technical challenges for formulation development. Because of these challenges that formulation scientists encounter, it is necessary to have an effective methodology. Design of experiments (DOE) and statistical analysis, and more recently, an emphasis on data modeling, have been applied widely in process optimization and validation for formulation development. In oral tablets, wetting and solubilization are two factors that affect both manufacturing packaging and delivery to the gastrointestinal tract. My summer research addresses modeling of wetting characteristics to predict dissolution and disintegration performance of tablets. Using a variety of mechanical testing and modeling/fitting with MATLAB video and image analysis, I was able to determine that trends are observed between wetting properties and disintegration times and that a predictive model for disintegration time could be established. The applications of this to formulation development would be to eliminate risky formulations early on and reduce labor and material waste in the formulation process.

The Environment and Our Health

FND-317 (Talk)

Analysis of the Nutrient Composition, Efficacy, and Sustainability of Bokashi Fertilizer

Nisreen Abo-Sido '18, Environmental Studies
 ADVISOR: *Alden Griffith, Assistant Professor of Environmental Studies*

Much of the world's food is produced on increasingly smaller fractions of land by smallholders utilizing a variety of resource-conserving agricultural techniques. Bokashi, a traditional agroecological fertilizer of fermented manure and other waste products, is an example of such a technique. The nutrient-rich amendment utilizes agricultural byproducts, costs nearly nothing to make, and repurposes waste streams. I analyzed the nutrient and microbial composition of bokashi that I made from variable starting ingredients, as well as the effects of the different types of bokashi on plant growth. By exploring the biogeochemical transformation and efficacy of bokashi, I aim to feed into a scientific paradigm that bridges the disconnect between knowledge systems: local or native knowledge and scientific knowledge generated by controlled research.

Walk a Life Cycle in These Shoes: Impact Assessment of Footwear

Leila-Anne Brusseau DS, Environmental Studies
 ADVISOR: *Monica Higgins, Lecturer in Environmental Studies*

You may be familiar with your carbon footprint, but have you ever considered the environmental impact of your shoes? In this project, I will conduct a life-cycle assessment (LCA) to compare natural and synthetic shoes. LCA is a tool used to assess the environmental impacts of products. The modeling choices that are made to carry out an LCA can influence the results. When the results run contrary to popular thought, the rationale behind these choices becomes increasingly important. I will investigate the effect of modeling choices, including coproduct allocation rules and shoe lifetime, on the comparison result. My objective is to create a transparent LCA model to generate LCA results that could help manufacturers make improvements and help consumers make more informed decisions.

From Field to Shelf: Framing the Transport of Herbicides Through Various Systems as an Issue of Women's Health

Amanda Hernandez '18, Environmental Studies and Geosciences

ADVISOR: *Daniel Brabander, Frost Professor in Environmental Science*

Glyphosate, an active ingredient in the herbicide Roundup, is one of the most ubiquitous herbicides in modern agriculture because of its high efficiency, low residence time, and low mobility. This herbicide has also been associated with numerous negative health outcomes including kidney failure and cancer. However, there is little research on the potential presence of glyphosate in commercially produced cotton products such as tampons, which have the potential to negatively impact women's health. This study began as a research project on the intersections between women's health and the environment and has maintained this focus while evolving to study a variety of biogeochemical processes in the multiple stages of tampon production. This presentation will highlight the use of a multiyear interdisciplinary approach to a complex system that spans a wide range of conditions, from the field to the factory and finally to the shelf.

Social Science

Modern Sickness: Addressing Issues in American Healthcare

PNE-327 (Preformed Panel Discussion)

Gabriella (Gabi) L. Vesey '18, Political Science and Psychology; Nicole Zhu '20, Economics; Samantha (Sami) Habel '20, Political Science; Zoe Matticks '18, Neuroscience; Annalee Beaulieu '18, Political Science and Spanish
 ADVISOR: *Tom Burke, Professor of Political Science*

Why doesn't the United States have paid family leave? Why is dentistry treated almost completely separately from the rest of medicine when it comes to health insurance? Does the media frame the opioid epidemic differently from previous drug crises? Is "Medicaid buy-in" the path towards universal health coverage in the U.S.? How are states trying to control healthcare costs? In this panel, we will discuss our individual research in an attempt to answer these questions and to better understand the past, present, and future of the fragmented American healthcare system.

Girls' Generation? A Linguistic Analysis of Gender Representation in Modern South Korean Media

JAC-450 (Preformed Panel Discussion)

Paige Robinson '20, American Studies; Keiko Hilmo '20, Cognitive and Linguistic Sciences; Daniela Gomez '20, Cognitive and Linguistic Sciences; Audrey Seo '20, Mathematics
 ADVISOR: Sun-Hee Lee, Associate Professor of Korean

All of our panel topics originate from our final research projects for the course KOR 256: Gender and Language in Modern Korean Culture. In spite of rapid socioeconomic progress, South Korea experiences various gender inequality issues. This panel centers around the use of language in both South Korean and American media and its effect on the representation of gender and women. The topics presented will include a discourse analysis of Korean fanworks pertaining to online LGBTQ representation and gender performance through a self-compiled corpora, an examination of the language used by Korean-American-owned e-commerce sites to advertise Korean skincare products to American consumers, an exploration of linguistic gender bias on female athletes in news media, and findings on how Korean culture influences meaning representation in Korean search results.

Linguistic Attitudes: Creole Language Education in Mauritius and Haiti

GRH-428 (Exhibition)

Rachael Schwartz '18, Cognitive and Linguistic Sciences; Karen Moorthi '18, Cognitive and Linguistic Sciences; Sofia Buitrago '19, Cognitive and Linguistic Sciences
 ADVISOR: Angela Carpenter, Associate Professor of Cognitive and Linguistic Sciences

Linguistic attitudes are opinions, ideas, or prejudices that speakers hold towards a language. In many postcolonial countries, linguistic attitudes created and maintained during colonialism continue to hold power. As an example, negative attitudes towards native Creole languages exclude them from education spheres in countries such as Mauritius and Haiti, in favor of European languages. A significant body of research exists delineating the deleterious cognitive and educational outcomes of being educated in nonnative languages. Thus, linguistic

attitudes have serious implications for the socioeconomic and political development of nations. This semester-long study examines linguistic attitudes of native Creole speakers towards Creole language education in Mauritius and Haiti, countries where pilot bilingual education initiatives involving the Creole language are established. In particular, the study examined the role these bilingual programs play on perception of language, self, and others in Creole-speaking communities across the world. Data was collected via Qualtrics and analyzed using Statistical Package for the Social Sciences (SPSS).

Making Dreams into (Virtual) Realities: VR at Wellesley College

Knapp Fabrication Lab-1st Floor Clapp Library (On Location Presentation)

Kamile Lukosiute '19, Physics; Havannah Tran '19, Computer Science and English; Aubrey Simonson '19, Media Arts and Sciences and Political Science; Michelle Lu '18, Media Arts and Sciences; Kaylie (Shane) Cox '18, Classics; Valeria Yang '21, Undeclared
 ADVISOR: Jordan Tynes, Manager, Scholarly Innovations

The Knapp Center interns utilize cutting-edge technology for academic and creative purposes; lately, many of our projects are incorporating virtual reality (VR). The following VR projects will be showcased during this session: a reconstruction of the train car featured in Tolstoy's *Anna Karenina*, corroborated by historical documents; a learning environment and laboratory designed for study of bones and fossils; and a recreation of an archaeological dig site in Greece. Attendees will be able to experience these virtual places and will be left with new ideas for their own VR projects.

Mellon Mays Undergraduate Fellowship Research Imperatives I

FND-319 (Preformed Panel Discussion)

Budnampet (Pet) Ramanudom '18, Computer Science and Women's and Gender Studies; Serenity Hughes '18, Africana Studies, Maleah Maxie '18, Cognitive and Linguistic Sciences and

Music, Jordan Mayfield '18, Art History; Victoria (Tory) Roth '18, American Studies
 ADVISOR: Tracey Cameron, Director of Harambee House and Assistant Dean of Intercultural Education

Budnampet Ramanudom. Title: Cognitive Dissonance at the Intersection of Tech and Social Good. Advisor: Irene Mata, Women's and Gender Studies. If we measure the success of for-profit companies through dollars, then should we measure the social good of nonprofits by... goodness? If so, then what does "goodness" look like here? Who benefits? Is tech for social good even possible? Utilizing ethnographic methodology, I aim to highlight the experiences of those who seek/have sought opportunities in the nonprofit tech sector, specifically those that aim to "empower" women and girls, and analyze these organization's metrics of efficacy through a transnational feminist framework.

Serenity Hughes. Title: From Drillinois to Chiraq: The Rise of Drill Music on the South and West Sides of Chicago and Beyond. Advisor: Michael Jeffries, American Studies. Since the early 2010s, drill music has been in the spotlight. Drill music, and drill subculture, has been characterized as a genre of gangsta rap that is "dark, grim, and lyrically violent." My research focuses on the impact drill music and drill subculture have on teenagers living on the south and west sides of Chicago. Through the lens of drill artists, I examine the oppressive social, political, and economical institutions that influence the lives of black youth in Chicago. This presentation will focus on the Chicago Housing Authority and the role it has played in violence in Chicago.

Maleah Maxie. Title: "Rollin' Along": Jerome Kern and Oscar Hammerstein II's *Show Boat* (1927) and the Social Implications of a Multiracial Cast on Broadway. Advisor: Larry Rosenwald, English. Throughout the years, critics have speculated about whether the *Show Boat*'s writers, Jerome Kern and Oscar Hammerstein II, included race in the plot of the show and featured a mixed race cast in an attempt to satirize or bring attention to the plight of African-Americans in the United States. Many lyrics depict black people in a negative light, and the resolution of a prominent character's story seems to warn African-Americans to "stay in their

place.” Yet, the first show’s creative team made a concerted effort to cast the first multiracial cast on Broadway, a decision that contributed to breaking a large barrier between races on stage. My research will explore the evidence for Kern and Hammerstein either attempting to promote tolerance of black and white performers on the same stage, or creating a caricature of black life to appease white audiences.

Jordan Mayfield. Title: Embodying the Orishas: Yemayá and Oshun in the Art of María Magdalena Campos-Pons. Advisor: Professor Nikki A. Greene, Art. In Embodying the Orishas, Jordan Mayfield analyzes the visual embodiment of orishas Yemayá and Oshun in the works of Afro-Cuban artist María Magdalena Campos-Pons. In her photographic series *When I Am Not Here/Estoy Allá* and installation *Spoken Softly with Mama*, Campos-Pons invokes the presence of these orishas from Cuban Santería, a syncretized religion of Yoruba beliefs and Catholicism. In Santería, Yemayá is the Great Mother of water, and Oshun is a river goddess of love and sensuality. Campos-Pons’s photographs and installation are “secular altars” that celebrate black womanhood through the employment of the black female form in the evocation of the two Orishas. In this presentation, Jordan Mayfield will investigate the visual culture surrounding Yemayá and Oshun in Santería and Cuban art history, and connect these visual conventions to the evocation of the orishas in *When I Am Not Here/Estoy Allá* and *Spoken Softly with Mama*.

Tory Roth. Title: The Silent Minority: Examining Anti-Blackness in Non-Black Communities of Color at Wellesley College. Advisor: Tracey Cameron, Mellon Mays Undergraduate Fellowship. During the fall of 2017, Wellesley’s student body voted to cap the amount of money spent by student organizations on executive board retreats. Members of some cultural organizations criticized the move for disproportionately affecting communities of color. However, not all communities of color were equally impacted by the measure. Examining the financial records of the SOFC reveals that cultural organizations representing black and Latinx students often struggle to fund major events. This trend in funding discrepancies often gets explained away by

apparent failures to follow all SOFC rules. Upon closer inspection, that explanation mirrors similar tactics employed by neoliberal thinkers and governments to (1) blame groups for their “failure” to succeed and (2) obscure a system that advantages certain groups at the expense of others. Ultimately, we need to ask ourselves: how does the dominant American culture of white supremacy and anti-black sentiment function within Wellesley’s student body?

Finding One’s Self

GRH-130 (Talk)

Origin Stories-Personal Genomics Testing and Narratives of Identity in Chinese Adoptees

Margaretta (Kit) Mitchell ’18, *Anthropology*
ADVISOR: Adam Van Arsdale, Associate Professor of Anthropology

Personal genomics testing companies advertise ancestry testing and disease risk assessment based on a body of research emerging from the Human Genome Project. My research explores how Chinese adoptees in the U.S. have incorporated personal genomics testing into their searches for medical information, birth family in China, and sense of national identity. Through semistructured interviews and immersion in online communities devoted to adoption, genomics, and genealogy, I discovered that adoptees and adoptive parents often have different motivations for pursuing testing. Adoptive parents are interested in using personal genomics testing to gain medical and ancestral information about their children. Parents’ emphasis on the empirical validity of consumer genomics tests opposes the conclusions made in academic literature, which suggests that population genomics cannot reliably assess ancestry at the individual level. In contrast, adoptees frequently use testing to find cousins through family linkage in the company’s user databases. However, rather than completely eclipsing more laborious “traditional” methods of search for birth family, personal genomics has become an additional avenue to reach birth relatives or a way to confirm biological kinship. As personal genomics testing gains a larger foothold in popular culture, this work seeks to examine how the results of genomic tests change the nature of kinship structures, national identity, and sense of cultural belonging.

Performance Identity and Fictive Kinship: An Examination of Fraternity Life

Anna Ehrlich ’18, *Anthropology English*
ADVISOR: Justin Armstrong, Lecturer of Writing and Anthropology

This study includes the findings of one year of ethnographic fieldwork in one fraternity at a large university in the Boston area. The fieldwork focuses on how members of this fraternity construct their individual and group identities, and how the group identity informs the construction of the individual identity. This exploration of identity highlights constructions of masculinity and connotations of brotherhood or other familial relations in this particular fraternity’s community.

Moral Dualism: Communities of Action vs. Inaction

Jasmine Kaduthodil ’18, *Neuroscience*
ADVISOR: Jeremy Wilmer, Associate Professor of Psychology

When presented with a situation in which you choose one action or another, how do you decide? Do you consult your emotions, or do you consult your logic? Do you choose to make no decision at all? Current findings in neuroscience and philosophy discriminate between two logical thought processes: emotion-based morality (a Humean perspective) and reason-based morality (a Kantian perspective). Here we look at two classic moral dilemmas: the trolley and the footbridge. By manipulating these circumstances slightly, we can determine the tendency towards reason-based or emotion-based moral decision making, as well as the tendency towards refusing to decide. We have examined the responses of over 200 participants, from both a Wellesley population and a population derived from Amazon Mechanical Turk. Placing morality into a strict binary of right and wrong places the subjective in an objective lens, which is impossible as morality is defined by each individual and institution. We can instead study morality by looking at the basis for moral decision making, and how the communities and cultures that surround us impact both the ways in which we make our decisions and whether we make decisions at all.

Self-Esteem and the Twice Exceptional: Interactions Between Attention Deficit Hyperactivity Disorder and Intellectual Giftedness

Audrey Ellis '18, Psychology

ADVISOR: Jeremy Wilmer, Associate Professor of Psychology

Intellectually gifted individuals with attention deficit hyperactivity disorder (ADHD), also known as twice-exceptional individuals, face unique academic and social challenges that have not been properly researched. The purpose of this study was to examine the self-esteem of twice-exceptional adults and how they compare to populations with/without intellectual giftedness or with/without ADHD symptoms. Data were gathered from 275 adults, aged 18 to 73, to identify them as gifted (CMT of CVT score above 84th percentile) or nongifted, along with having subclinical ADHD (WURS score of 46 or higher) or not having subclinical ADHD. All subjects took a self-report self-esteem measure. Despite previous studies suggesting that giftedness would protect against the negative impact ADHD has on an individual's self-esteem, twice exceptional students did not have any statistically significant change in self-esteem. Among general self-esteem and all subscales, attention grouping (ADHD/non-ADHD) had a significant main effect on self-esteem, with the ADHD group having the lower reported scores. More research is needed to draw any larger conclusions, especially considering the limited sample of the study, using this study as a basis for a larger investigation into twice-exceptionality.

Contemporary Debates in Politics

PNE-239 (Talk)

The Marginalization of Abortion in Medicine

Sarah Hudson DS, Political Science

ADVISOR: Tom Burke, Professor of Political Science

Prior to the nationwide legalization of abortion in 1973, there was consensus among medical professionals that the procedure should be legal and incorporated into standard obstetric-gynecological care. However, in the intervening years, abortion has been marginalized in the medical community, resulting in a dwindling number of providers and facilities willing to perform abortions. This project examines

how abortion became marginalized in the medical profession.

Practice vs. Paper: An Analysis of Freedom of Speech Restrictions in Illiberal Democracies

Ishwari (Isha) Gupta '21, Undeclared; Grace Wong '21, Undeclared

ADVISOR: Thomas Cushman, Deffenbaugh de Hoyos Carlson Professor in the Social Sciences

The seemingly democratic republics of Turkey and Sri Lanka both have exhibited a pattern of infringing upon citizens' rights to freedom of speech and specifically targeting the Kurdish and Tamil minority groups. Turkey and Sri Lanka have both used their "state of emergency" status to justify limiting antigovernment speech. When the government uses economic and political means to limit antigovernment speech acts, citizens are forced to either speak positively about the government or to take the risk of speaking out against the government. In Turkey and Sri Lanka, citizens have responded to infringements on their freedoms of speech in three primary ways: outright antigovernment speech, creating and sharing political satire, and, in extreme cases, terrorism towards the government. In our research we aim to examine the phenomenon of the rights to freedom of speech in the democracies of Turkey and Sri Lanka; the limitations of freedom of speech by the Turkish and Sri Lankan governments; and lastly, the response by Turkish and Sri Lankan citizens to these limitations.

The Sweet Life of American Muslims: Resilience and Community Building Through Muslim Student Associations (MSAs)

Maryam Khan '18, Economics and Political Science (Fowler Public Speaking Finalist)

ADVISOR: Nadya Hajj, Assistant Professor of Peace and Justice Studies

Nabra. Deah, Yusor, and Razan. Ben. These names all have something in common—their deaths in some way were associated with Islamophobic motivations. In the United States' context, there is something about identifying as Muslim that is particularly jeopardizing. Yet in a time where American Muslims have every rational reason to attempt to assimilate to escape the physical violence and discrimination due to religious persecution, Muslim Student Association (MSA) membership has only increased in the last two decades across the United States. My research seeks to

explain why this paradox is occurring. What do MSAs offer that encourage students to join despite the threat of ostracization and violence? Through a mixed-methods approach, incorporating quantitative and qualitative data, as well as anecdotal experiences, I gain and present the value of MSAs, especially in today's world, which provides interesting context to understand what is takes to feel welcome, empowered, and a sense of belonging in a free society.

“From all reports, this year's Ruhlman was the best! I've had letters from classmates, alumnae, faculty, and others about how outstanding the girls' work is and how excellently presented. It has been very heartwarming for me.”

—Barbara Peterson Ruhlman '54

Humanities

Children of the Holocaust: Service-Learning in the Netherlands

FND-207 (Preformed Panel Discussion)

Sandra Amponsah Ohemeng '20, Economics; Anastacia Markoe '20, Political Science; Goretty Chavez '20, Psychology; Arianna Regalado '18, Religion

ADVISOR: *T. James Kodera, Professor of Religion*

Three Wellesley students embarked on a service trip to the Netherlands to engage in memory work to remember the forgotten voices of children, Dutch resistors, and Jewish communities in the Holocaust. They spent time researching Jewish life in Amsterdam before and after the war, learning the experiences of Jewish children in the Holocaust and confronting the painful heritage of the Netherlands. In addition to memory work, they visited the Anne Frank House, Joods Historisch Museum, Portuguese Synagogue, Hollandsche Schouwburg, Dutch Resistance Museum, and the Westerbork Transit Camp, and met with child Holocaust survivors. Through this presentation, these students will delve into the lessons they learned about the importance of bringing children's voices out of the dark to recognize them as part of the greater narrative of the Holocaust, explore the role of the Protestant and Catholic churches in rescuing Jewish lives, examine the conditions of the Jewish population in the Netherlands before and during the war, and explain why in a country that enjoyed a reputation for religious tolerance prior to the war, a larger percentage of Jews were killed than in any country besides Poland—the site of the death camps—itsself.

Archaeology at Wellesley: Sticks, Stones, and Bones

PNE-127 (Preformed Panel Discussion)

Paola Favela '19, Anthropology and Religion; Ruqing (Rachael) Tao '19, Psychology; Georgia Oppenheim '20, Anthropology

ADVISOR: *Elizabeth Minor, Mellon Postdoctoral Fellow in Anthropology*

Over the past year, we have explored several archaeological sites around Wellesley and Boston. Intentional and accidental preservation give us different types of information about the lives and deaths

of the people surrounding us in the past. Some teams recorded the decorations and biographical information on gravestones in the Old Burial Ground in Cambridge, tracking the changes from skulls to willows and names and occupations. On campus, we excavated the area where College Hall burnt down in 1914. Fragments of objects from daily life teach us more about how students lived before us, highlighting the ways the Wellesley community has changed over a century.

Somnium

Collins Cinema (Film Screening)

Elena (Lanie) L. Najjab '18, Cinema and Media Studies; Ilana Meecker '18, Cinema and Media Studies

ADVISOR: *David Olsen, Associate Professor of Art*

In this project, we explore how all stories can be a window into understanding another reality. In order to examine how ideologies impact reality, our film traverses different categories of culture. Moving from big picture, external, to small picture, internal, aspects of culture, we are investigating the impacts of ethereal culture, physical culture, and individual culture in a series of animated and live-action vignettes. To present our research and theory in a comprehensible way and to connect these different styles of vignettes, we have incorporated the same protagonist in each vignette. Much like Lewis Carroll's Alice, this character experiences these strange realities alongside the audience. Additionally, our film has a frame outside of the theoretical vignettes to introduce our protagonist as well as to give the piece more of a narrative structure.

How Sounds Make Us Feel

JAC-450 (Talk)

Whispers from Half a World Away: ASMR and Distant Intimacy

Emily Precht '20, Peace and Justice Studies;

ADVISOR: *Deborah Matzner, Assistant Professor of Anthropology*

What do you know about that electric tingling on your skin when you hear a paper bag crinkling and crunching, a nail scratching against leather, or a whisper in your ear? The mysterious online community that has formed around the autonomous sensory meridian response (ASMR)—otherwise known as the whisper community—has piqued anthropological

interest in recent years. This phenomenon has challenged us to redefine what we think of as intimacy: no longer a term reserved for physical proximity. As an intersection of visual and sonic arts that elicits a very specific physical reaction, ASMR is in a unique position in time; scientists and anthropologists alike wonder what implications this facet of the Internet will have on the human psyche. The research conducted over the past year has gifted us with unique insights on how human relationships are evolving in the information age.

Sound Healing and Complementary and Alternative Medicine: Issues of Access

Rachel Frazer '20, Music

ADVISOR: *Kariann Goldschmitt, Assistant Professor of Music*

Upon investigating sound healing both through literature on medical ethnomusicology, internet research, participating in a sound-healing circle, and in-person as well as over-the-phone interviews, I've noticed that there is a trend in the demographic that tends to seek out this type of alternative healing and potentially other types of complementary and alternative medicine (CAM) practices in the United States. In general, participants are more likely to be middle-class, middle-aged white women rather than people of color or people from a less affluent socioeconomic class. In this presentation, I will discuss the possible reasons for this demographic breakdown and the ways in which it can be problematic because of the origins of these practices as well as because of the ways sound healers themselves navigate this problem. I will also investigate the stigma behind CAM and sound healing and propose potential ways in which we can demystify this stigma. The overall goal of this presentation is to investigate why minority groups and people of lower income are less likely to seek out this type of healing in the United States. My findings connect to the larger conversation in medical ethnomusicology about the efficacy of alternative and complementary practices that I believe should be accessible to every person regardless of race, class, gender, or any other label that one chooses to perform/identify with.

My Neck, My Back: How Commerce and Music Shape Hook-up Culture and Erotic Capital at Wellesley College

Holland Rhodd-Lee '19, Music and Neuroscience;

ADVISOR: *Kariann Goldschmitt, Assistant Professor of Music*

Ethnomusicologists have devoted their time to studying the relationship between people and music, but often overlook the influence music has on social and retail environments. Tia DeNora and Sophie Belcher suggest that music functions as a social ordering device in their study of music in retail spaces in London. This ethnography builds off DeNora and Belcher's work to explore the relationship between the music in retail spaces and how they shape sexual fields in queer college spaces. Wellesley College's student bar, Punch's Alley, is a student run co-op and bar that functions as a queer nightclub on Thursday nights, known as "pub nights." In this presentation, I will examine how the music played on Thursday nights creates and organizes desire and sexual fields. Using Thomas Turino's work on how music influences identity and participation, and Pierre Bourdieu's ideas of habitus, omnivorous tastes, cultural capital, and the new petite bourgeoisie to help shape my argument, and drawing on the public playlists, interviews, and pub nights I attended, I aim to explore how the entrepreneurial component of Punch's Alley constructs a social scene on campus that revolves around hook-up culture, shared erotic appetites, and who is accepted in this space.

Science and Technology

Inclusion in Computer Science: How Students Are Contributing to an Effort to Make the Department More Welcoming for Everyone

GRH-136C (Preformed Panel Discussion)

Mathangi Ganesh '18, Computer Science; Jessica (Jess) Abramson '19, Computer Science and Psychology; Breana Dupree-Jones '20, Computer Science; Caitlin Pham '21, Undeclared
ADVISOR: *Brian Tjaden, Professor of Computer Science*

In the past few semesters, the computer science department has been engaged in conversation and initiative planning on

diversity and inclusion. Students have been central to both the discussions and implementation of interventions. We'll provide an overview of how this conversation got started, what initiatives we've developed so far, and what we've learned. Jess Abramson will be discussing the implementation and results of a questionnaire designed to provide a snapshot of student experience in the department and insight into disparities in a sense of belonging. Mathangi Ganesh, peer mentor coordinator, will tell you about the peer mentor program, a program design to build community and reinforce course content in CS240 and CS111. Breana Dupree-Jones and Caitlin Pham, student advocates, will be sharing findings from the student advocate initiative, an intervention designed to reduce barriers and facilitate access to existing resources in CS111.

Create to Engage: Exploring Mathematics Through Engineered Models

FND-126 (Interactive Teaching Presentation)

Aliza Camacho '20, Computer Science

ADVISOR: *Ann Trenk, Professor of Mathematics; Amy Banzaert, Lecturer in Engineering*

In my interdisciplinary project in the sophomore early research program (SERP), I use rapid prototyping tools and engineering design processes to help build models for learning mathematics. In this talk I will describe the stages of creating our mathematical models, including how I work through the design process and use computer software to control machinery such as a laser cutter. I will also talk about the mathematical context for the puzzles themselves and how students have used them so far. Audience members will be encouraged to try out the models.

Artificial Intelligence: From Fiction to Reality

PNE-139 (Preformed Panel Discussion)

Michelle Lu '18, Media Arts and Sciences; Olivia Strobl '19, Neuroscience; Grace Owen '19, Media Arts and Sciences; Ruanqianqian (Lisa) Huang '20, Cognitive and Linguistic Sciences and Computer Science; Catherine Chen '19,

Computer Science and French; Dagmawit Libanos Assefa '20, Physics

ADVISOR: *Eniana Mustafaraj, Assistant Professor of Computer Science*

In our spring '18 course, CS 232 Artificial Intelligence, we are directing our critical gaze at the depiction of artificial intelligence (AI) in fiction, with a series of interconnected goals and from different disciplinary perspectives. We start by looking at how AI in fiction inspired and influenced our current technologies, explaining how these technologies work and exploring their possible impact on the future world. We contemplate what it means to have thinking machines with the possibility of consciousness. Using the technology and stories presented in the TV show *Black Mirror*, we consider the ethics of using (and abusing) AI as well as its reflection on our society. We also present a video piece on how we gender, racialize, and sexualize AI in real life and media. In an age where technology has such a huge impact on our lives, we must ask ourselves, who is in control?

Pulling, Shifting, and Deleting: Manipulating Biological Systems Through Biochemical Approaches

PNE-327 (Preformed Panel Discussion)

Sarah Plachinski '18, Biochemistry; Maahum Mehdi '18, Biochemistry; Subaily Penix DS, Biological Sciences; Tatyana (Any) Johnson '18, Biological Sciences

ADVISORS: *Megan Núñez, Professor of Chemistry; John Goss, Assistant Professor of Biological Sciences; T. Kaye Peterman, Susan M. Hollowell and Ruby Frances Howe Farwell Professor of Biological Sciences*

Life is complicated. Biology—the study of life—is underpinned by chemical and physical properties, and so, by manipulating naturally occurring systems via biophysical and biochemical approaches, we can begin to unravel how nature operates. These research approaches often rely on disrupting, altering, or otherwise “unnaturally” examining a system. The Peterman Lab uses the power of CRISPR to edit the genome of *Physcomitrella patens* to gain a deeper understanding of key molecular players involved in a developmental process. The Núñez Lab uses optical tweezers to capture a single molecule of HIV-1 RNA and probe its stability parameters. The Goss Lab is designing an optogenetic tool

to understand the function of key proteins that drive the final stages of cytokinesis during cell division in the fission yeast *Schizosaccharomyces pombe*. Though these approaches are inherently different in their methodologies, their implications contribute to the better understanding of complex systems, ranging from HIV-1 and cancer to developing organisms.

CRISPEE: A Tangible Gene-Editing Platform for Early Childhood

FND-317 (Preformed Panel Discussion)

Jennifer Otiono '18, Biological Sciences; Parul Koul '19, Computer Science
 ADVISOR: *Orit Shaer, Class of 1966 Associate Professor of Computer Science*

We present CRISPEE, a novel tangible user interface designed to engage young elementary school children in bioengineering concepts. Using CRISPEE, children assume the role of a bioengineer to create a genetic program that codes for a firefly's bioluminescent light. This is accomplished through sequencing tangible representations of BioBricks, which code for the primary colors of light (red, green, and blue) to be turned on or off. The interface and curricular supplement expose children in early elementary school to concepts traditionally taught much later in school curricula through playful interaction and exploration. We discuss CRISPEE's concept and design and share findings from its preliminary evaluation with children and adults.

We-cycle: A Systems Approach to Improving Recycling Practices at Wellesley College

FND-120 (Preformed Panel Discussion)

Amaya Allen '18, Environmental Studies; Lea Davis '18, Environmental Studies; Ariana Carter '18, Environmental Studies; Olivia Joslin '18, Environmental Studies; Margaret Mead '18, Art History and Environmental Studies; Fabiana (Fabi) Vivacqua '18, Economics and Environmental Studies; Sonia Hupalo DS, Environmental Studies; Alison Draikiwicz '18, American Studies and Environmental Studies; Caroline George '19, Environmental Studies and Music; Aynsley Kretschmar '18, Biological Sciences and Environmental Studies; Catherine (Katie) Livingston '19, Environmental Studies; Alexandra Bueno '18, Chinese Language and Environmental Studies; Emily Neel '18, Environmental Studies; Lorrie He '18, Biological Studies; Alejandra Narvaez '18, Environmental

Studies; Amanda Hernandez '18, Environmental Studies and Geosciences; Nisreen Abo-Sido '18, Environmental Studies
 ADVISOR: *Elizabeth DeSombre, Camilla Chandler Frost Professor of Environmental Studies*

In response to China's waste import ban, the cost of recycling has increased and Wellesley College faces the challenge of restructuring its recycling program to maximize institutional efficiency and promote participation. This year's environmental studies capstone class (ES300) was charged with providing recommendations to improve recycling rates across campus. Through research examining the life cycles of recycled items at Wellesley and observations of recycling behavior as influenced by ease and accessibility of recycling on campus, we identified areas of priority and potential growth within our recycling processes. In our analysis, we considered our current system through the lenses of sustainability, practicality, and fiscal feasibility to present recommendations for individual, communal, and institutional changes to recycling on campus.

Interactivity: Connecting, Learning, and Augmenting Our World

PNE-216 (Talk)

Snap 'n' Go: Trajectory Aware Task Allocation

Chloe Blazey '19, Mathematics; Hannah Murphy '19, Computer Science
 ADVISOR: *Christine Bassem, Lecturer in Computer Science*

Our project focuses on the study of crowd sensing, a method of data collection that utilizes the capabilities of a crowd equipped with smart mobile devices, such as the student body of Wellesley College. In a typical crowd-sensing application, a user chooses or is assigned to "tasks" that they can fulfill by collecting requested data about their location on their mobile device, such as a photo of their surroundings. The specific data that is to be collected is requested by an interested party, such as a researcher, because they would like to use that information for their own project. For example, an environmental science researcher might want to collect daily photos of vegetation in a particular location. When a user fulfills a task, such as taking a picture of that vegetation, they receive an incentive for their efforts, often a small amount of money. This

data is then sent to a central database where the researcher can use the collected data. A problem within this field is the method of allocating tasks to users. Which tasks should be given to which users to yield the best and most consistent results? Our research team is developing and will run experiments using our own crowd-sensing application, called Snap 'N' Go, to target this key problem in the field of crowd sensing. We will use our results to examine user behavior in reaction to different types of task allocation. We are specifically interested in testing route-coordination algorithms that match a user's projected routes with tasks they can fulfill along their way. This work is supported by the collaborative research experience for undergraduates (CREU) program provided by the Computing Research Association, which provides an opportunity for undergraduate students to work on a funded, year-long research project.

ARtLens: Augmenting the Museum Experience

Lauren Futami '18, Media Arts and Sciences; Isabella (Bella) Virgilio '20, Media Arts and Sciences; Dana Hsiao '18, Computer Science
 ADVISOR: *Orit Shaer, Class of 1966 Associate Professor of Computer Science*

We present ARtLens, an AR application for the Microsoft HoloLens headset, which allows museum visitors to actively interact with and learn about artifacts on display. We designed ARtLens to enhance learning and engagement with museum collections while keeping the focus on the original artifact. ARtLens provides context for an artifact by supplying audio and visual information, and guides visitors in exploring the original artifact. It also allows users to directly manipulate, using gesture-based interactions, holographic representations of related artifacts alongside authentic artifacts in the gallery. We intend to study the impact of ARtLens on object-based learning and engagement of college-level museum visitors in an African Art gallery.

Pocket Politics: A Mobile Revolution for Political Engagement

Marissa Okoli '18, Media Arts and Sciences
 ADVISOR: *Catherine Delcourt, Assistant Professor of Computer Science*

Lack of political engagement is a problem that plagues our society and threatens the underpinnings of our democracy. Worse still, fake news, political punditry, and

boldfaced misconstructions continue to sow divisiveness and occlude individuals' understanding. We need a new way of thinking about how we approach political involvement. Pocket Politics is a mobile app designed to promote participation, engage community, and foster understanding as they relate to politics. Through a social media platform geared towards open dialogue, unearthing commonalities, and other forms of gamification and edification, Pocket Politics serves to make political awareness and activity fun, accessible, and most significantly, universal. In this talk, we will explore the needs of the Wellesley College student community, how those needs informed the design implementation of Pocket Politics, and ultimately, what its usability outcomes were. Fundamentally, it is this sort of rigorous understanding and user-centered design that can help us make positive change.

Computational Modeling and Machine Learning: Methods and Applications

FND-307 (Talk)

Multilabel Classification and Its Applications

Yujue (Victoria) Wu '18, Economics and Mathematics

ADVISOR: *Qing (Wendy) Wang, Assistant Professor of Mathematics*

Nowadays, with the ease and convenience of collecting and storing big data, one is often overwhelmed by the amount of information available. As such, classification is becoming an increasingly important topic in machine learning, where researchers explore ways that the machine can correctly categorize data without human administration. Most traditional classification methods focus on single-label classification, where each object is only allowed to be assigned into one category. However, many real-life problems require methods that label information with multiple categories: in publication, a book may fall into several genres; in sentiment analysis, a person may feel multiple emotions at the same time; in bioinformatics, a gene may have a series of purposes. As a result, in recent years, multilabel classification has become a new and crucial research area. In this talk, we will introduce the methods of multilabel classification as well as its applications in the real world.

adVantage-Seeing the Universe: An Immersive, Laboratory-like Virtual Reality Environment Modeling a Star-Planet-Satellite System for Undergraduate Astronomy Students

Eliza McNair '18, Computer Science

ADVISOR: *Scott Anderson, Lecturer in Computer Science*

This poster introduces the “adVantage-Seeing the Universe” system, a learning environment designed to augment introductory undergraduate astronomy education. The goal of the adVantage project is to show how an immersive virtual reality (VR) environment can be used effectively to model the relative sizes and distances between objects in space. To this end, adVantage leverages the benefits of three-dimensional models by letting users observe and interact with astronomical phenomena from multiple perspectives. The system uses preset vantage points to structure students' progress through a variety of “missions” designed to improve their understanding of scale. The adVantage system departs from two-dimensional, textbook illustrations by adding navigable depths to a star-planet-satellite system, and distinguishes itself from existing pedagogical 3D space-simulation environments (that we know of) by establishing a laboratory for student investigation. Students exploring in adVantage will be able to adjust parameters, like radius and orbital distance, of the subjects of the system: e.g., the exoplanet WASP-12b, its sun-like star, WASP-12, and imagined satellites constructed to resemble the earth and its moon. This combination of astronomical bodies will engage students by introducing the new star-exoplanet system and provide context by incorporating familiar elements. We have already implemented a JavaScript prototype of the adVantage system and are currently developing the VR system using the game engine Unity. Students will interact with adVantage using a head-mounted display (HMD) and hand controllers. We will carry out preliminary investigations of student response to the system once the VR version of adVantage is complete.

Evaluation of Dynamic Binary Instrumentation Approaches: Dynamic Binary Translation vs. Dynamic Probe Injection

Valerie Zhao '18, Computer Science and Neuroscience

ADVISOR: *Benjamin Wood, Anchor Point Assistant Professor in Computer Science*

From web browsing to bank transactions, to data analysis and robot automation, just about any task necessitates or benefits from the use of software. Ensuring that a piece of software is effective requires profiling the program's behavior to evaluate its performance, debugging the program to fix incorrect behaviors, and examining the program to detect security flaws. These tasks are made possible by instrumentation—the method of inserting code into a program to collect data about its behavior. Dynamic binary instrumentation (DBI) enables programmers to understand and reason about program behavior by inserting code into a binary during run time to collect relevant data, and is more flexible than static or source-code instrumentation, but incurs run-time overhead. In this presentation, I will give a brief overview of the relevant ideas, and discuss my project for extending the preexisting characterization of the tradeoffs between dynamic binary translation (DBT) and dynamic probe injection (DPI), two popular DBI approaches. This project aims to acquire helpful insight for optimizing DBI.

A Crowd-Sourced Blocks Suggestion System to Improve the Beginner Experience in App Inventor

Maja Susanna Svanberg '18, Computer Science
ADVISOR: *Franklyn Turbak, Associate Professor of Computer Science*

MIT App Inventor is a beginner programming environment, where users build Android applications by connecting blocks together. As its main audience is beginner programmers, it is important that the users are given the proper guidance and instruction to successfully become creators. To provide this help, App Inventor provides text-based tutorials that describe the workflow of example programs to users. However, studies have shown that out-of-context help such as tutorials has little to no effect on learning, and when given the choice, users prefer in-context hints and suggestions. For users to overcome some of the barriers with self-training, we need

to provide them with relevant information and in-context suggestions. Therefore, I am introducing suggested blocks, a data-driven model that leverages machine-learning to provide users with relevant suggestions of which blocks to include in their programs. Since the scope of the project is limited due to the nature of a thesis, this project will focus on developing the neural networks to power the system. Based on the current state of a user project, the network will draw from a large database of projects made by experienced users to determine a collection of blocks to suggest. I experiment with different vector representations of projects, tree-traversals, feature selections, and architectures, to try to find a viable algorithm for the problem at hand. A viable algorithm would not only be accurate, but would provide suggestions that are sensible, relevant, and most importantly, educational. To test this, I will be using not only statistical measures, but human evaluation, including manual inspection of a subset of the test data, as well as suggestions given by App Inventor experts. If successful, the results of the study could be implemented and launched to the over 6 million App Inventor users.

Social Science

Science Education Equity Development Kit: Using Data to Drive Social Change

FND-102 (Preformed Panel Discussion)

Sophia Samir Abdelrahman '20, Economics; Isabel D'Alessandro '18, Neuroscience; Katherine Schauer '18, French and International Relations—Economics; Denise Chai Sy Qing '21, Undeclared
 ADVISOR: *Wendy Robeson, Senior Research Scientist with the Wellesley Centers for Women*

As members of StemKit's data analysis team here on campus, we spent the semester interpreting questionnaire data collected in three schools in the suburbs of Accra, Ghana over the summer. The StemKit is a low-cost lab in a box used to teach hands-on science experiments in low-resource schools. StemKit works with a Boston based nongovernmental organization, the Exploratory, which runs afterschool science club programs for girls in Ghana. By establishing relationships with students and science teachers, we continue to learn how we can further adapt the StemKit to match

their needs. We prepared questionnaires and assessments for students in Ghana before the summer, and employed statistical methods and tools to analyze the results back on campus to determine the efficacy of our project. We will provide insights into our findings and their implications, our successes and shortcomings, and what our results mean for the future of StemKit.

Mellon Mays Undergraduate Fellowship Research Imperatives II

FND-319 (Preformed Panel Discussion)

Kindred Obas '19, English; Aya Ross '19, American Studies and East Asian Studies; Morinade (Jayla) Stevenson '19, Philosophy
 ADVISOR: *Tracey Cameron, Director of Harambee House and Assistant Dean of Intercultural Education*

Mellon Mays Research Imperatives II

Kindred Obas. Title: Oh Where Are the Books about Black Kids: An Exploration of Diversity in Children's Literature. Advisor: Soo Hong, Education. Representation is more than important—especially in children's literature. As of 2015, 73.3 percent of children's books were written about white children, 7.6 percent were written about African/African-American children, 3.3 percent about Asian or Pacific/Asian-American or Pacific-American children, 2.4 percent about LatinX children, and 0.9 percent about American Indians (Hyuck). The second most popular group for main characters is inanimate objects such as animals and trucks, with 12.5 percent of children's books written about them. This means, in theory, that a Korean-American child is more likely to pick up a book about a rabbit than they are about someone who resembles their color, language, or culture. The Cooperative Children's Book Center (CCBC) at the University of Wisconsin-Madison found that “among the 3,000 or so titles they received, only 6 percent had significant African or African-American content. While 20 percent of the country's students are Latino, only about two percent of all books reviewed by CCBC had significant Latino content.” (Perkins) This is a problem for multiple reasons, including the fact that United States public schools are becoming majority children of color. Yet, their bookshelves are not mirroring their classroom demographics. In this presentation

I will seek to dive deeper into diversity in children's literature and propose creative ways to diversify classroom libraries.

Aya Ross. Title: Call Me Two: Representations of the Mixed Race Asian in Science Fiction Television. Advisor: Michael Jeffries, American Studies. A genre that is invested in imagining realities and futures different from our own, science fiction (SF) frequently employs metaphor and allegory to explore real-world issues without directly addressing them. A common example is the employment of the dichotomy of human vs. other as a stand-in for interracial issues, wherein humanity frequently represents whiteness against a racialized figure, as the interracial becomes interspecies. Drawing from existing techno-Orientalist scholarship, this research focuses on science fictional representations of the Asian/Asian-American as nonhuman other. More specifically, looking at examples in contemporary North American SF television, I examine figures including the alien/human hybrid and robotic/organic cyborg as representations of mixed Asian/white individuals. I consider how anxieties of miscegenation, different racializations (ex: narratives of passing), and dreams of postracial future play out through and onto these individuals by both themselves and others.

Jayla Stevenson. Title: A Philosophical Investigation into Self. Advisor: Selwyn Cudjoe. *In The Souls of Black Folk* (SBF), W.E.B. Du Bois describes “double consciousness” as a peculiar feeling of “looking at one's self through the eyes of others” in a world that denies him a true self-consciousness. This presentation will further complicate how we think of double-consciousness by examining Toni Morrison's *The Bluest Eye*. Through a philosophical investigation into the nature of consciousness using Morrison's novel, I seek to explore the meaning of black existence, specifically for someone like protagonist Pecola Breedlove. By casting Morrison's work in an existential light, this research further challenges the conventional nature and methods prevalent in philosophy.

Healthcare Resources: Practitioners and Consumers

GRH-330 (Talk)

Family Needs Screening Program

Hanna May '19, Biological Sciences and Sociology

ADVISOR: *Omolara Uwemedimo Pediatrics and Occupational Medicine, Epidemiology*

Children of immigrant families (CIF) are more likely to experience adverse social determinants of health (SDoH). Few studies have explored the successful utilization of resources in SDoH screening programs that include assisted navigation and follow-up support—particularly among CIF or children of parents with limited English proficiency. My study describes referral utilization patterns by immigrant-related factors in a practice-integrated, SDoH screening program. In my study, children living in households with non-US citizen or LEP caregivers are (1) more likely to engage in SDoH programs offering navigation and follow-up support, but (2) are the most at risk for difficulty in maintaining contact for follow-up support. The findings from this study indicate the need for larger comparative effectiveness studies to determine if programs providing assisted navigation and follow-up have significant benefit over those providing screening and referral only, specifically for CIF.

The Community Health Worker: An Analysis

Elinor Higgins '18, Biological Sciences and Women's and Gender Studies

ADVISOR: *Nancy Marshall, Adjunct Associate Professor in Women's and Gender Studies & Senior Research Scientist at Wellesley Centers for Women*

Community health workers are increasingly recognized as vital to carrying out healthcare and public health initiatives in the United States, particularly in underserved communities. We will take a closer look at who community health workers are, the conditions of their jobs, and how those conditions could potentially be improved.

Healthcare Without Walls: Providing Quality Care to Boston's Vulnerable

Karen Moorthi '18, Cognitive and Linguistic Sciences; Michelle Duan '18, Chemistry

ADVISOR: *Tobie Weiner, MIT Professor of Political Science*

Healthcare is a universal right to which many vulnerable populations do not have

access. Healthcare Without Walls (Wellesley, MA) is a nonprofit that aims to bridge the gap between disadvantaged women and children in the greater Boston area and quality healthcare. The organization recruits volunteer healthcare practitioners to serve in women's and children's centers across Boston, while shouldering administrative burdens to allow practitioners to perform the duties for which they are most needed unencumbered. This semester-long project involved conducting interviews with previous beneficiaries of HCWW, administrative teams at HCWW-identified shelters, and healthcare volunteers, and axial coding of results to generate an impact report of HCWW services. The report will be examined to create a map of basic framework of relationships between perceptions and outcomes of services provided and used to guide future program development.

On Addressing Inequality: Sources, Consequences, and Culture

PNE-239 (Talk)

Achieving Gender Equality in India

Tarushi Sinha '20, Economics

ADVISOR: *Akila Weerapana, Associate Professor of Economics*

Gender inequality is still a pertinent issue in India at all levels of society. According to a gender equality index published in the November 2017 *Gender Gap Report* issued by the World Economic Forum, India is ranked 108 out of 144 countries. The index measures equality based on four criteria: economic participation and opportunity, educational attainment, health and survival as well as political empowerment. My presentation will examine three countries at the top of the gender equality index and examine the methods they have used in the past to identify ideas that can be implemented to achieve similar outcomes in India. I will discuss how the ongoing implementation of the United Nations' sustainable development goals is helping these countries come closer to achieving gender parity. I will also include primary sources from representatives of the United Nations in the relevant countries. This research is part of an internship I did with the United Nations Global Compact Network in India, as they begin preparation

for New Delhi's first ever Gender Equality Summit.

Ethics of Student Volunteerism: The Challenges of and Best Practices for Training Student Volunteers

Alondra Navarro '18, Sociology

ADVISOR: *Peggy Levitt, Luella LaMer Slaner Professor in Latin American Studies & Professor of Sociology*

Across the country, colleges and universities are working diligently to ensure that their students are well-rounded citizens who can take what they've learned in the classroom and apply it critically to the world around them. To achieve this, many schools actively encourage their students to volunteer in communities that are quite different from their own. That frequently produces a great social distance between the benefactors and the beneficiaries. My study looks at how different groups prepare students to rise to these ethical challenges by comparing two nonprofit organizations, one that involves volunteers working within the United States and a second that deploys volunteers to work outside the nation.

A Map of Exquisite Meanings: Urban Transportation as a Language of Spatial Equity and Layered History

Hans Han '18, Economics (Fowler Public Speaking Finalist)

ADVISOR: *Justin Armstrong, Lecturer in Writing and Anthropology*

Map out people's patterns of movement across a cityscape and the image which forms over time is the face of humanity in frenetic motion—intelligent individuals focused on their miniature odysseys formed amidst late trains and sidewalks and blurred stoplights. Despite its broader implications, urban transit is a subject that only comes to our collective attention when it's failing or absent, otherwise fading into quiet bureaucracy. Traditional city planning actors have long acknowledged how transportation is not merely the presence of a city's transit infrastructure, but also how the nuances of its location, quality, and timing can affect individuals' potential for action-filled lives. My project with the Pamela Daniels '59 Fellowship reads Boston's urban transportation lines as a charged social text and a physical manifestation of inequitable service for different communities, and how this narrative is slowly shifting for the future.

Poverty's Paradoxes: Conceptions of Failed Parenting in the Neoliberal State

Alberta Born-Weiss '20, Economics

ADVISOR: *Markella Rutherford, Associate Professor of Sociology*

While a fair amount of research has been conducted on poor children's consumption of media, there is a striking dearth of literature on the media's constructions of American children living within poverty. The few articles that do examine this phenomenon were conducted in the context of the American welfare reform of the 1990s. New developments in media usage and family policy warrant a fresh investigation. The news and social media are important pieces of the equation due to their agenda-setting (Kunkel et al., 2006) powers in the social and political arenas. News outlets' use of episodic rather than thematic framing (Iyengar, 1990) emphasizes symptoms of poverty rather than structural causes, and implies individual responsibility, a position supported by neoliberal family policies in Canada and the United States. Children provide a nuanced perspective on constructions of poverty because of their status as members of the "deserving poor," as opposed to their oft-vilified parents (e.g. "welfare queens"). So-called color- and gender-blind neoliberal policies utilize a risk discourse to apply normative child welfare and child support policies that apply similar attributions of responsibility on parents' shoulders, simultaneously encouraging often poor single mothers to participate in the workforce while vilifying their lack of childcare. Both political and media-produced discourses on children in poverty generate a multitude of paradoxes with which poor parents must grapple.

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