

SYMPOSIUM 2017 ANNUAL UNDERGRADUATE



Monday, April 24

**La Maison Salon
and Hall**

9:00 - 10:30

11:00 - 12:30

1:30 - 3:00

Tuesday, April 25

Carriage House

8:30 - 10:00

Testa 106

5:00 - 6:30

**La Maison Salon
and Hall**

9:00 - 10:30

11:00 - 12:30

1:00 - 2:30

Poster Session

Tuesday, April 25

Testa Atrium

2:00 - 4:00

**Presentation
Sessions**

Monday & Tuesday

AM & PM



2017

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ASSUMPTION COLLEGE

Office of the Provost and Vice President for Academic Affairs

Welcome to the *23rd Annual Undergraduate Symposium*, highlighting the research and scholarly achievements of Assumption students working in collaboration with dedicated faculty mentors. These collaborations represent a model for integrating teaching, original research, and the beneficial effects of peer review in promoting intellectual development and professional growth. The *Symposium* provides the campus community with the opportunity to gain a greater appreciation of the individual and collective accomplishments of our faculty and students, as well as to applaud those achievements.

I hope that you enjoy and profit from viewing the posters, hearing the papers, and speaking with the authors of these impressive works.

Sincerely,

Louise Carroll Keeley
Provost and Vice President for Academic Affairs



Undergraduate Symposium Program Schedule

Monday, April 24, 2017

Time	Event	Location
9:00 AM—10:30 AM	Presentation Session 1A	La Maison Salon
9:00 AM—10:15 AM	Presentation Session 1B	La Maison Hall
11:00 AM—12:15 PM	Presentation Session 2	La Maison Salon
1:30 PM—2:45 PM	Presentation Session 3A	La Maison Salon
	Presentation Session 3B	La Maison Hall

Tuesday, April 25, 2017

Time	Event	Location
8:30 AM—10:00 AM	Presentation Session 4	Carriage House
9:00 AM—10:30 AM	Presentation Session 5	La Maison Salon
11:00 AM—12:30 PM	Presentation Session 6	La Maison Salon
1:00 PM—2:30 PM	Presentation Session 7A	La Maison Salon
1:00 PM—2:15 PM	Presentation Session 7B	La Maison Hall
2:00 PM—4:00 PM	Poster Session	Testa Atrium
5:00 PM—6:30 PM	Presentation Session 8	Testa 106

Presentation Session 1A
Monday, April 24
9:00 AM – 10:30 AM La Maison Salon

Time	Presenter(s)	Discipline	Title
9:00 AM	Samuel Birney	HIS	<i>The Emergence of International Aid and Relief: Comparing the Disaster Responses of Naples and Lisbon</i>
9:15 AM	Kathleen Nolan	HIS	<i>Eichmann in Jerusalem: A Report on the Criticism of Hannah Arendt</i>
9:30 AM	Jonathan Geromini	HIS	<i>The Changing of Writing Styles of German Exile Erich Maria Remarque</i>
9:45 AM	Sean Sullivan	HIS	<i>Wilhelm Reich and the Sexual Revolution</i>
10:00 AM	Matthew Miller	HIS	<i>Discordant Brilliance: The Life and Work of Arnold Schoenberg</i>
10:15 AM	Steven Foertsch	HIS	<i>Edward II's Trial of the Templars</i>

Presentation Session 1B
Monday, April 24
9:00 AM – 10:15 AM La Maison Hall

Time	Presenter(s)	Discipline	Title
9:00 AM	David Gazzola	NAS	<i>A Novel Approach to Delivering Cry5B Protein as an Anti-worm Medicine</i>
9:15 AM	Zachary Shepard	NAS	<i>Self-healing Coatings for Structural Steel</i>
9:30 AM	Rachel Avard	NAS	<i>Synthesis of Biaryl Macrocycles using Oxidative Phenol Coupling</i>
9:45 AM	Thanh Vu	NAS	<i>On the Physical Foundations of Self-organization: Energy, Entropy and Interaction</i>
10:00 AM	Mallory Monaco	MCS	<i>Identity Theft: A Look into Preventing Decades of Damages</i>

Presentation Session 2
Monday, April 24
11:00 AM – 12:15 PM La Maison Salon

Time	Presenter(s)	Discipline	Title
11:00 AM	Brigid Sandstrum	MCL	<i>Blind Faith in The Decameron: Giovanni Boccaccio's Satire of the Roman Catholic Church</i>
11:15 AM	Jessica Wisniewski	AMT	<i>Chopin and Nationalism</i>
11:30 AM	Sarah Leary	AMT	<i>Judith Leyster: Master of the Market</i>
11:45 AM	Kelse Merrill	AMT	<i>Sin and Virtue in The Battle Between Carnival and Lent</i>
12:00 PM	Christopher Cuzzupe	AMT	<i>The Function of Liturgical Music within the History of the Catholic Church</i>

Presentation Session 3A
Monday, April 24
1:30 PM—2:45 PM La Maison Salon

Time	Presenter(s)	Discipline	Title
1:30 PM	Amber Kelley	PHI	<i>My Encounter with Plato and the Greatest Human Evil</i>
1:45 PM	Nicole Dufresne	PHI	<i>Perception: A Moral Construct</i>
2:00 PM	Nicole Roy	POL	<i>Doctrines of Judicial Review in the State Constitutional Ratifying Conventions</i>
2:15 PM	Jennelle LeBeau	SCA	<i>Quality of Life: Molded by the Interactions within a Care Facility</i>
2:30 PM	Luis Perez	SCA	<i>Effects of Gender in Female Dominated Occupations: Case Study of a Rape Crisis Center</i>

Presentation Session 3B
Monday, April 24
1:30 PM—2:45 PM La Maison Hall

Time	Presenter(s)	Discipline	Title
1:30 PM	Shannon Campbell	PSY	<i>The Influence of Social Context on Communication and Restricted and</i>
1:45 PM	Lauren Price	PSY	<i>Does Mindful Meditation prevent the Misinformation Effect?</i>
2:00 PM	Casey Curran	HRS	<i>Assessing College Students' Knowledge of Noise Induced Hearing Loss</i>
2:15 PM	Anthony Manzi & Jacqueline Raftery	HRS	<i>The Academic and Social Experiences of Students With Anxiety on a Small College Campus</i>
2:30 PM	Thea Hickey & Olivia LeSaffre	HRS	<i>The Muslim Experience in the United States</i>

Presentation Session 4
Tuesday, April 25
8:30 AM—10:00 AM Carriage House

Time	Presenter(s)	Discipline	Title
8:30 AM	Evan Sutherland	HIS	<i>Studying Newspaper Advertisements from 250 Years Ago</i>
8:45 AM	Jonathan Bisceglia	HIS	<i>Transcribing the Past: Working on the Isaiah Thomas Broadside Ballads Project</i>
9:00 AM	Daniel McDermott	HIS	<i>Digital Humanities and the Era of the Revolution: Digitally Connecting the Public and Historians</i>
9:15 AM	Shannon Dewar	HIS	<i>Curating the Adverts 250 Project: Examining Everyday Life in Revolutionary America</i>
9:30 AM	Shannon Holleran	HIS	<i>Looking at History with a Modern Eye: Working on a Digital Humanities Project</i>
9:45 AM	Samuel Birney	HIS	<i>The Adverts 250 Project: Digital Humanities and Reaching Out to the General Public</i>

Presentation Session 5
Tuesday, April 25
9:00 AM—10:15 AM La Maison Salon

Time	Presenter(s)	Discipline	Title
9:00 AM	Veronica Beaupre	ENG	<i>A Case for Collaboration: Bringing the Collegiate Peer Tutoring Model to the High School Level</i>
9:15 AM	Kathryn Bauer	ENG	<i>A Return to The Authentic: The Changing Book Industry & Millennial Detachment</i>
9:30 AM	Jose Garcia	MCL	<i>Two Stories of a Rebellion, Yet One Reinvention</i>
9:45 AM	Franchesca McMenemy	MCL	<i>The Objectification of Women Through Patriarchal Language</i>
10:00 AM	Claudia Palencia	MCL	<i>The Hope of an Immigrant</i>

Presentation Session 6
Tuesday, April 25
11:00 AM—12:30 PM La Maison Salon

Time	Presenter(s)	Discipline	Title
11:00 AM	Jennelle LeBeau	NAS	<i>Thyroid Hormone Regulates Crabp1 in Mouse Mammary Gland Adipose Stromal Cells</i>
11:15 AM	Michael Doyle	NAS	<i>The Interaction Between Macrophages and ASC-Ls Increases Angiogenic and Proliferative Potential of Pregnancy Associated Breast Cancers</i>
11:30 AM	Fabiola De Varona	NAS	<i>Crabp1 regulation of FAS RNA in Mouse Mammary Gland ASCs</i>
11:45 AM	Emma Machado	NAS	<i>Holographic Scaling of Pure Gravity in the Near Horizon</i>
12:00 PM	Monika Rettler	NAS	<i>Examination of Synapse Development in C. elegans: Characterizing Novel Genes Using Behavioral Analysis</i>
12:15 PM	Elizabeth DiLoreto	NAS	<i>Ice Buckets to Proteins; Investigating the Role of matrin-3 in ALS</i>

Presentation Session 7A
Tuesday, April 25
1:00 PM—2:30 PM La Maison Salon

Time	Presenter(s)	Discipline	Title
1:00 PM	Kelsey Lewis & Danie Marseille	Women's Studies	<i>Nancy Johnson's Lifelong Commitment to Education: An Oral History Interview</i>
1:15 PM	Delaney Fenton, Natalia Kaczor, & Sydney Vu	Women's Studies	<i>Women's Body Image in the Media</i>
1:30 PM	Lindsay Hajjar, Thea Hickey, & Jenna Snyder	Women's Studies	<i>Worcester Women's Oral History Project: Marissa Pyatt</i>
1:45 PM	Franchesca McMenemy	Women's Studies	<i>Samuel Beckett, a Misogynist, Constructs Women as Vice Through the Objectification of Women as Sexual Beings</i>
2:00 PM	Ceara Morse	HIS	<i>The Slavery Adverts 250 Project: Examining Advertisements for Slaves Published during the Eve of the American Revolution</i>
2:15 PM	Megan Watts	HIS	<i>The Adverts 250 Project: Using Advertisements to Understand Early American Society</i>

Presentation Session 7B
Tuesday, April 25
1:00 PM—2:15 PM La Maison Hall

Time	Presenter(s)	Discipline	Title
1:00 PM	Kathleen Hurley	BUS	<i>Mastering Customer Loyalty</i>
1:15 PM	Stephen Picard	EGS	<i>Effect of Distance from NHL Affiliate on AHL Attendance</i>
1:30 PM	Toni Lambert	SCA	<i>"You Throw Like a Girl," and other Expectations of Masculinity</i>
1:45 PM	Steven Foertsch	SCA	<i>Chaplains, Prisoners, and COs - Oh My!</i>
2:00 PM	Jose Garcia	LAS	<i>The Chicano Movement in Chicano Schools Today</i>

Poster Session
Tuesday, April 25
2:00 PM—4:00 PM Testa Atrium

Time	Presenter(s)	Discipline	Title
2:00 PM - 4:00 PM	Caroline Bercier	AMT & POL	<i>The Marxist-Leninist Break with History Visualized: Contrasting Soviet and Mexican Artworks</i>
	Santina Marinelli	HSR	<i>A Child's World: How Technology Influences Children's Language Development, Physical Development, and Social-emotional Development</i>
	Emily Hill & Karina Torres	NAS	<i>Bactericidal Effects of Listerine</i>
	Colleen Morrissey & Emily Tomanelli	NAS	<i>Bottled vs Tap Water: Evidence of Bacterial Growth</i>
	Michael Doyon & Ryan Durand	NAS	<i>Determination of Microorganisms in Different Aquatic Environments</i>
	Rafael Hamawi & Christian Wesolowski	NAS	<i>Ultraviolet Light Resistance of High Altitude Halophilic Archaea</i>
	Rafet Amoor & Zachary Slepchuk	NAS	<i>Exploring Bacterial Contamination of Raw Chicken Breast</i>
	Emma Machado	NAS	<i>Holographic Scaling in Newtonian Gravity</i>
	Meagan Eccleston & Michaela Lievi	NAS	<i>Identification of Bacterial Samples Taken From Various Toothbrushes Using Rapid Identification Assays</i>
	Jessica Hernandez	NAS	<i>Identification of IKKα in Developing Chicken Cornea</i>
	Sarah Morley	NAS	<i>Investigating Chemical Reactions using Millifluidic Devices</i>
	Thao Nguyen & Emily Powers	NAS	<i>The Effectiveness of Antibacterial Soap Compared to that of Non-antibacterial Soap</i>
	Lauren O'Connor	NAS	<i>Vesicle-Membrane Tethering: The Interaction of Sec1 and Exocyst Subunit Sec6</i>
	Meredith Bercier	POL	<i>Everybody Loves a Rebel: Modern Politics and the Rise and Reign of Dystopian Fantasy</i>
	Anna doCurreal	PSY	<i>A Microgenetic Study of Parental Depression and Infant Development at 3 Months Postpartum</i>
	Lauren Bretanha	PSY	<i>Emerging Adults' Expectations of Longevity in Romantic Relationships</i>
Deanna Tortora	PSY	<i>The Role of Couples' Birth Experiences in Coparenting Dynamics During the Transition to Parenthood</i>	

Presentation Session 8
Tuesday, April 25
5:00 PM—6:30 PM Testa 106

Time	Presenter(s)	Discipline	Title
5:00 PM	Marisa Butler & Bridget Coakley	HIS	<i>Memories of a Woman Who Works for Social Justice</i>
5:15 PM	Abigail Cote & Aishea Henry	HIS	<i>God's Influences in the Life of Linda Raffaele-Moyen</i>
5:30 PM	Liam Bashista & Frank Mantero	HIS	<i>Lauren Grover, Self-Made Woman: An Oral History Interview</i>
5:45 PM	Elaine Cavaliere & Abbey Marsalisi	HIS	<i>Kellee Kosiorek, a Story of a Worcester Woman's Service to Citizens of the World</i>
6:00 PM	Haley Guenard, Kayelyn Kelley, & Erin Lavery	HIS	<i>Making a Difference in the Lives of Women: An Oral History Interview with Jasmine Jina Ortiz</i>
6:15 PM	Evan Maravelis & Timothy Wood	HIS	<i>The Story of a State Representative: An Oral History Interview with Kimberly Ferguson</i>

ABSTRACTS

Presentation Session 1A
Monday, April 24
9:00 AM - 10:30 AM La Maison Salon

***The Emergence of International Aid and Relief:
Comparing the Disaster Responses of Naples and Lisbon***

Samuel Birney '18

History

This paper focuses on the historical appearance of international aid and relief efforts in early or pre-modern Europe. I noticed that charity was common within cities and European countries from the Renaissance to the early Enlightenment. However, I wondered about international aid efforts, specifically the international communities' responses to natural disasters in early modern Europe. I researched several natural disasters during this period, especially the Eruption of Mt. Vesuvius in 1631 and the Lisbon Earthquake in 1755 to understand the context of historical disasters at the time. I found that the first real case of international relief and aid efforts occurred during the Lisbon Earthquake. My work reveals that the response to natural disasters progressed from local affairs, to matters of international discussion, and finally resulted in actual aid and intervention because of Europeans' developing communication and international relations.

Faculty Mentor: Dr. Lance Lazar

Eichmann in Jerusalem: A Report on the Criticism of Hannah Arendt

Kathleen Nolan '17

History

This project will examine some of the criticisms of Hannah Arendt's work *Eichmann in Jerusalem: A Report on the Banality of Evil*. The report, which appeared first as a series in the New Yorker and then in a book, will be examined closely. Criticism from soon after the report was published in both forms will be examined along with more modern commentary on the controversy. The two perspectives will be compared and contrasted in hopes of making sense of the larger controversy and its lasting impacts on Arendt's career and legacy.

Faculty Mentor: Dr. Thomas Wheatland

The Changing of Writing Styles of German Exile Erich Maria Remarque

Jonathan Geromini '18

History

At the beginning of World War Two, Erich Maria Remarque, author of one of the most famous war novels of all time, *All Quiet on the Western Front*, fled from his homeland of Germany to the United States. While in exile in America, Remarque fought back against the Nazis by writing his two emigre novels, *Flotsam* and *Arch of Triumph*. In these two novels, Remarque portrays the horrors of the Third Reich and their treatment of people including those who went into exile from Germany. This presentation will examine the different ways in which Remarque through his two emigre novels portrayed the ruthlessness and tyrannical actions of Nazi Germany. It will also examine the ways in which Remarque tried to inform those around the world of the ways that the Third Reich was destroying the lives of those who emigrated from Germany when Adolf Hitler came to power.

Faculty Mentor: Dr. Thomas Wheatland

Wilhelm Reich and the Sexual Revolution

Sean Sullivan '18

History

An enigmatic and controversial figure both in his own time and today, Wilhelm Reich is a figure who is hard to adequately define in any one set of terms. Once praised as a leading Freudian psychologist and a champion of sexual reform, he would end his life in ridicule, expelled from academia and brought to trial by the FDA. Reich's ideas regarding human sexuality, seemingly modern in their outlook, would appear to be highly influential on the Sexual Revolution of the 1960s and 1970s. To what extent can this man, mocked in his own time and coming from a different intellectual background than the college students of the Summer of Love have on a massive social change is doubtful. The differences between the ideas of Reich and the Sexual Revolution should be acknowledged. Reich's disciples, loyal both to his supposed scientific brilliance and views on sexuality, credit him as a genius and a prophet. The truth of Reich's legacy must be viewed in the light of the last half century of social developments and through the lens of scholarship not tainted by the worship of a pioneer long dead.

Faculty Mentor: Dr. Thomas Wheatland

Discordant Brilliance: The Life and Work of Arnold Schoenberg

Matthew Miller '17

History

To defy traditional expectations, especially in an established art form, is often a gamble. In the case of Music, there is no exception. Austrian composer Arnold Schoenberg was able to defy typical compositional expectations of music during the early twentieth century by use of the Twelve-Tone System and atonality. This study will focus on his life and early career to his exile in America and eventual later career efforts. Despite the conceptual brilliance of his music, there are some questions that arise. Did he become trapped by his own legacy and his own compositional ideas? Could he move beyond what he conceptualized or would he remain trapped by his own creation and never transition beyond? What inspired this idea of atonality and what factors urged him to compose this type of radical music?

Faculty Mentor: Dr. Thomas Wheatland

Edward II's Trial of the Templars

Steven Foertsch '17

History

Analyzing Edward II's actions in response to Philip's persecution of the Templars in France, one can see that Edward had many reasons to not persecute the Templars, and likely only did so for political reasons. By demonstrating these reasons, one can tell that Edward's trials were characterized by lukewarm policies and enforcement.

Faculty Mentor: Dr. Winston Black

Presentation Session 1B

Monday, April 24

9:00 AM - 10:15 AM La Maison Hall

A Novel Approach to Delivering Cry5B Protein as an Anti-worm Medicine

David Gazzola '17

Natural Sciences

Soil-transmitted helminths (STHs, also called intestinal parasitic worms) are parasitic nematodes that reside in the human intestinal tract after consumption of egg or larvae contaminated soil. Nearly 1.5 billion people worldwide (24% of the world population) are infected with at least one species of these parasites where both poor communities and pregnant women and children have an increased rate of infection. To combat these

diseases, the World Health Organization only recognizes four anthelmintic drugs, including the preferred drug albendazole, for mass drug administration. Prolonged use of these drugs has been shown to decrease their efficacy over time, partly due to resistant worm selection, making there an urgent need for novel and powerful anthelmintics. The Aroian lab at UMass Medical School has pioneered a technique using crystal protein, Cry5B, as the next generation of anthelmintics. This protein is harvested from the soil-dwelling bacterium *Bacillus thuringiensis* (Bt), which is well-documented as having natural insecticidal properties in agricultural applications. Efforts by the Aroian lab to produce and formulate a deployable version of Cry5B that is cheap, safe, scalable, and stable will be presented.

Faculty Mentor: Dr. Mary Pickering

Self-healing Coatings for Structural Steel

Zachary Shepard '18

Natural Sciences

Roads and bridges in the United States are in a state of disrepair due to the corrosion of concrete-reinforcing rebar. When rebar corrodes, it expands in volume, which leads to degradation of roadways. The goal of this project was to develop an epoxy and microcapsule-based self-healing coating that would utilize tung oil to prevent corrosion. SEM images demonstrated the effect of reaction conditions (pH, reaction time, amount of shell material, and amount of surfactant) on the formation of microcapsules with a poly(urea-formaldehyde) shell and a tung oil core. Steel rebar was coated in microcapsules, both optimized through the modification of reaction conditions and a baseline capsule (Brown et. al., 2003), suspended in epoxy. The experiment involved rebar samples that were uncoated, coated with unmodified epoxy, coated with epoxy and 1% wt. optimized microcapsules, coated with epoxy and 10% wt. optimized microcapsules, and coated with epoxy and 10% wt. baseline microcapsules. Half of all samples were impact damaged to assess the self-healing capabilities of the coating. Impact damaging ruptured the microcapsules in the epoxy coating and released the encapsulated tung oil. Accelerated corrosion testing was used to determine the coating's effect on the corrosion process. Pullout testing determined the effect of the coating on the bond between the rebar and concrete. The pullout testing concluded that the bond interface between the rebar and the concrete was not affected by the coating. Based on the current test results, a microcapsule based self-healing coating is a viable method for corrosion prevention.

Faculty Mentor: Dr. Elizabeth Colby Davie

Synthesis of Biaryl Macrocycles using Oxidative Phenol Coupling

Rachel Avard '17

Natural Sciences

Natural products are a class of molecules that are made by living organisms. Many of these products have innate healing abilities and therefore are of great interest to the scientific community. This research focused on a very specific subset of natural products known as biaryl macrocycles. Many medicines, such as antibiotics, are composed of biaryl macrocycles, yet they have proven to be extremely difficult to synthesize. Classically, transition metals have been used to catalyze the synthesis of biaryl macrocycles, yet these transition metals are toxic and difficult to use. Rather than using transition metal catalysts, this research investigated the use of peroxides to generate phenolic radicals in order to form biaryl macrocycles. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program. It also summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Elizabeth Colby Davie

On the Physical Foundations of Self-organization: Energy, Entropy and Interaction

Thanh Vu '18

Natural Sciences

The central idea of self-organization is the interaction between the agents, the particles, and the elements that constitute the system. In biological systems, swarm behavior has shown to regulate the agent-to-agent interactions that would lead to optimization of system efficiency. Other crucial factors include agent interactions with the environment that lead to its modifications, like the topology of the energy landscape. Since these

interactions are governed by energetic and entropic exchanges, the Principle of Least Action was considered to be the answer as it involves both time and energy into its formulation. As such, the Principle minimizes action and directs the system elements along least action trajectories on the energy landscape. The Principle was also expanded to mediate with the Second Law of Thermodynamics by describing the number of accessible microstates which would be less in an organized system. One of the approaches of the project was to simulate these systems, using a computer simulation, in which swarms of agents uniformly follow least action trajectories and simultaneously degrade their free-energies to maintain the organizational structure of the system in order to export more entropy along the least action paths to the outside environment. Another approach was to create a fluid (Benard) cell that would form convection cells as transport channels to reduce time for energy transmission. A third approach included other data in literature, from CPUs to space evolution, to demonstrate other factors of self-organization, such as size and density.

Faculty Mentor: Dr. Georgi Georgiev

Identity Theft: A Look into Preventing Decades of Damages

Mallory Monaco '17

Mathematics and Computer Science

Each year identity theft victimizes more people, taking their time, money, and feeling of financial and physical security. Despite its ongoing presence in the news and media, this fraud is too often treated in a reactive manner. Due to the lack of prevention of identity theft, its negative consequences range from damaging one's credit score for decades to cases of medical identity theft incorrectly altering a patient's medical records and causing potentially life threatening complications. This presentation examines four major types of identity theft, including medical identity theft, credit card fraud, consumer data breaches, and the identity theft associated with tax returns. It explores what they entail, how perpetrators commit the fraud, and recommendations for prevention. With a look into what the theft is and how it is committed, we can be better informed and able to slow its prevalence in our society. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Joseph Alfano

Presentation Session 2

Monday, April 24

11:00 AM - 12:15 PM La Maison Salon

Blind Faith in The Decameron: Giovanni Boccaccio's Satire of the Roman Catholic Church

Brigid Sandstrum '17

Modern and Classical Languages and Cultures

Giovanni Boccaccio's *Decameron* is one of the earliest Italian literary works written in the vernacular, the language spoken by the people. The *Decameron* is a collection of one hundred tales told over the span of ten days by ten young Florentines as they escape the bubonic plague to the Tuscan countryside. The tales told in *Decameron* mirror the daily activities and events of fourteenth-century Italy in an exaggerated and satirical way. I have studied three tales which focus on different aspects of the Church within its teachings and practices including the practice of indulgences, the celebration of the Catholic Mass, the cult of saintly relics and the teachings on Purgatory. These tales present Boccaccio's critical insight into the beliefs of the medieval Church. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Richard Bonanno

Chopin and Nationalism

Jessica Wisniewski '17

Art, Music and Theatre

Ethnomusicologists support the concept that music is a key factor in expressing identity, along with language, material culture and many other contributors. The many European and American Nationalist composers of the nineteenth and twentieth centuries have provided us with extraordinary examples of this by creatively infusing folkloric rhythms, melodies, and even ethnic instruments into high art music.

This presentation will clarify some of the major elements associated with Polish music in particular, as uniquely demonstrated in the works of Frederic Chopin. Widely viewed as a Romantic composer of imaginative and idiomatic piano pieces, this presentation will reveal Chopin's lesser known nationalistic tendencies that reflect the roots of his full musical identity.

Faculty Mentor: Dr. Peter Clemente

Judith Leyster: Master of the Market

Sarah Leary '17

Art, Music and Theatre

Scholars and art historians alike celebrate Judith Leyster as one of the greatest female artists, and she is featured in many of the canonical works of feminist art history. The feminist perspective leads scholars to concentrate on a few specific works – for example *Man Offering Money to a Young Woman* (1631, Mauritshuis), *A Game of Tric Trac* (1630, Worcester Art Museum), or *Self-Portrait* (1630, National Gallery of Art) – and to overlook the majority of her oeuvre. This in its turn tends to obscure perhaps the most remarkable fact about Leyster's career: she established a career in the art world not just as a female, but as a single woman in her twenties without the support or connections of her family to help her. I argue that she built this career by incorporating art market trends popularized by other artists into her works. Leyster looked to the works of many Dutch artists who achieved success during the 1620s, including Frans Hals, Dirck Hals, and the Utrecht Caravaggisti. Scholars tend to be less willing to discuss the works of Leyster where she more openly draws on other artists as these works may seem imitative. Without looking at her entire oeuvre, it is difficult to understand the more remarkable aspects of how Judith Leyster was able to attain a career.

Faculty Mentor: Dr. Toby Norris

Sin and Virtue in The Battle Between Carnival and Lent

Kelse Merrill '17

Art, Music and Theatre

During the year 1559 Pieter Brueghel the Elder produced the painting *The Battle Between Carnival and Lent*. Traditionally this painting has been associated with his later peasant scenes. However, during the same time that *The Battle Between Carnival and Lent* was created, Brueghel also produced fourteen engravings. These engravings were based on both the seven deadly sins and the cardinal virtues. After careful visual analysis, there is an undeniable connection between the painting and the engravings. This conclusion would suggest that the *Battle Between Carnival and Lent* has less of a connection with peasant traditions and more of a connection with a religious message on morality and sin. Furthermore, the images in both the painting and engravings share a unique similarity to the figures found in many of Hieronymus Bosch's paintings. Bosch, who was active in the same century and same region as Brueghel, worked primarily with religious themes and narratives. The similarities between the figures and themes found in *Battle Between Carnival and Lent* and many of Hieronymus Bosch's works contributes to the religious significance of *Battle Between Carnival and Lent*. Using this evidence, my presentation will argue against the traditional interpretation of *Battle Between Carnival and Lent* as a representation of peasant traditions. Rather, I will attempt to show that the painting has a deeper and more spiritual statement on morality and sin.

Faculty Mentor: Dr. Toby Norris

The Function of Liturgical Music within the History of the Catholic Church

Christopher Cuzzupe '17

Art, Music and Theatre

Within the Catholic Church, there has always been a need and a strong presence for music. The need for music has changed from being simply something listened to by all and sung by a few to involving everyone to sing together and participate in liturgical celebrations. There is great richness to be gained from an increased awareness of music in the Church, and many important lessons can be learned from the historical progression of liturgical music. The effect music has had on the liturgy has directly affected the congregation based upon their needs. The central questions addressed within this presentation relate to why Christians sing at worship and why Christians worship with music. The answers to these questions will be provided by an analysis of the three main periods of history within the Church: The Church at the Beginning of the Middle Ages, The Reformation, and The Second Vatican Council. Through this presentation, one will realize that music is an enjoyable part of life, gaining a better understanding of what music can do within worship, and realizing the great impact music has had on the Catholic liturgy. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Father Donat Lamothe, AA

Presentation Session 3A

Monday, April 24

1:30 PM - 2:45 PM La Maison Salon

My Encounter With Plato and the Greatest Human Evil

Amber Kelley '17

Philosophy

I am a philosophy major because of Plato's *Phaedo*. Philosophy, however, is not a way of life that has come easily for me. I have experienced an extreme dislike of philosophical discussion until I read the *Phaedo*, a dialogue that made me consider that my hatred of argument might be one of the greatest evils that a human being can encounter.

In the *Phaedo*, Socrates' friends fall into a budding hatred of arguments. They doubt their own ability to know the truth and the attainability of truth itself. This despair is a terrifying moment in the dialogue because the activity of examining arguments in pursuit of truth is what makes life worthwhile, and Socrates' friends are ready to give up on this essential aspect of being human. Socrates tries to save both his friends and the life of the argument by explaining to his friends why their hatred of argument is such a horrific evil and how they can avoid falling into this evil. The lessons in Plato's dialogues matter for every individual who wants to live a truly human life.

Faculty Mentor: Dr. Marc LePain

Perception: A Moral Construct

Nicole Dufresne '18

Philosophy

Despite their central importance to a liberal arts education, core texts such as Mark Twain's *Adventures of Huckleberry Finn* risk being dismissed by students as a consequence of excessive exposure and use. Some students have exchanged their curiosity for a generalized understanding of the novel and end up regurgitating the opinions of others. Twain addresses this issue by showing how someone like Huckleberry Finn, with an inadequate education, can form independent thought. This essay will consider how our comprehension of reality is explained by a combination of social and biological forces and will demonstrate that the novel encourages its readers to consider how an understanding of what it means to be human shapes morality. In order to do this, I will analyze the novel's perspective on education, cultural morality, and puberty so as to yield explanations for the arguments, and explore how the incorporated Lockean ideas highlight the importance of perception to moral agency.

Doctrines of Judicial Review in the State Constitutional Ratifying Conventions

Nicole Roy '18

Political Science

The judiciary's role and power in government is heavily debated. The judiciary's decisions on constitutional matters tend to be seen with finality. In recent years, those who advocate for originalism have followed the Madisonian strain. This originalism is termed "public-meaning" originalism because it holds that the founders' original intent should only be determined by what was said in a public context. Following this logic, this presentation looks at the ratification debates in the state conventions. The most important state ratifying conventions were those in New York, Pennsylvania, and Virginia. In these, founders such as James Madison, Alexander Hamilton, and John Wilson played prominent roles. The ratifying conventions reached varying positions on the role of the judiciary. There seems to be no one specific public intent agreed upon by all of the founders. There was a general agreement that the judiciary would participate in constitutional review, but its role in the process as final arbiter was not necessarily supported by the state conventions. Overall, "public-meaning" originalism points towards a vision of the judiciary working among the other branches in the constitutional process. This presentation summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Gregory Weiner

Quality of Life: Molded by the Interactions within a Care Facility

Jennelle LeBeau '18

Sociology, Criminology and Anthropology

The purpose of this project was to gain insight into the social interactions that occur within an assisted living facility, and explore how such interactions influence the residents' quality of life. Since social experiences of residents differ within the facility, and a high quality of life (QOL) is crucial to the senior population's longevity, there is great importance in determining whether or not there is a connection between social interactions and QOL. Senior residential facilities are known for providing a variety of social activities for residents and staff to participate in. These activities serve as a great medium for socialization amongst residents and between staff. The continuation of positive interactions established at such activities and growing connections is even more important to sustain or even improve a senior's quality of life. The more actively engaged in the community, the more likely a senior is to have a positive outlook and therefore higher quality of life. Implications of this research will allow for a possible shift in the training of healthcare workers to emphasize the importance of human interaction.

Faculty Mentor: Dr. Francis Prior

Effects of Gender in Female Dominated Occupations: Case Study of a Rape Crisis Center

Luis Perez '17

Sociology, Criminology and Anthropology

Society at large has gender presumptions and stereotypes. Men are associated with power and aggressive traits; they are seen as independent and dominant. Conversely, women are perceived as submissive, passive, and dependent. For instance, during the Industrial Revolution nursing was a good fit for women because of its feminine characteristics. That is because the role of the nurses as helpers to the doctors was equivalent to the role of a wife to a husband. Today, the professional hierarchy is still in place; surgeons are predominantly men while primary care spheres are predominantly occupied by females because gender roles relegate women as caretakers. The purpose of conducting this research was to investigate how gender expectations and stereotypes affect individuals' perception of female-dominated occupations. Specifically, the project explored how gender matters at sexual assault agencies. The goal was to enhance the understanding of society's presumptions and stereotypes on gender-roles in gendered professions such as social service. Hence, service providers at a feminist sexual assault agency were asked a series of open-ended questions about their perspective, motivation, commitment, experience and whether they believe their gender-identity matters at a rape crises center.

Presentation Session 3B
Monday, April 24
1:30 PM - 3:00 PM La Maison Hall

***The Influence of Social Context on Communication
and Restricted and Repetitive Behaviors in Children with Autism***

Shannon Campbell '17

Psychology

Two of the most salient features of autism spectrum disorder (ASD) are impairments in communication and engagement in restricted and repetitive behaviors (RRBs). The goal of this study was to identify the effects of social context on both the occurrence of RRBs and social language performance in children with ASD. In this study, we defined the social context of a situation based on the primary focus (object or conversation) and the initiator of the interaction (child or experimenter). We performed a frequency count of RRBs as well as a mean length of utterance (MLU) analysis for play tasks with variations in focus and initiator. These measurements indicated that RRBs were lower in object-focused and child-initiated tasks; however, these situations also revealed a lower MLU. MLUs were higher for child-initiated tasks than experimenter-initiated tasks and for conversation tasks than object-focused tasks. These results imply that the type of tasks that are effective in lowering RRBs may not lend themselves to the further development of interpersonal communication skills. In order to develop more effective therapy options, it is important to understand the purpose of RRBs to find effective ways to reduce them while also increasing communication skills. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program. It also summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Paula Fitzpatrick

Does Mindful Meditation Prevent the Misinformation Effect?

Lauren Price '17

Psychology

Engaging in a brief mindful meditation task prior to witnessing an event may enhance event encoding and reduce susceptibility to post-event misinformation. Participants completed either a three-minute mindful meditation exercise or an unrelated filler task before watching a video depicting a crime. After viewing the video, they listened to a narrative that introduced misleading information about the video. Finally, they took a memory test on the video. Despite data indicating that the mindful meditation task was effective, there was no difference between the two groups on memory performance. However, for participants who engaged in the meditation task, greater states of mindfulness were associated with fewer reports of misinformation and a decrease in recollection of discrepancies between the video and narrative. These findings have interesting implications for the relationship between mindfulness and memory. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Leamarie Gordon

Assessing College Students' Knowledge of Noise Induced Hearing Loss

Casey Curran '17

Human Services and Rehabilitation Studies

Noise Induced Hearing Loss (NIHL) is an irreversible condition in which the cells of the inner ear are destroyed by strong sound signals and are no longer capable of relaying said signals to the brain for comprehension. Previous studies found that college students are most at risk for NIHL. Several organizations have created Hearing Conservation Programs to reduce this risk; however, their efforts to change students' behaviors have proven unsuccessful as noted by several research studies. These studies explain that Hearing

Conservation Programs and initiatives have not worked because college students do not believe they are susceptible to NIHL. The purpose of this study was to assess the knowledge that the average college student has regarding Noise Induced Hearing Loss in order to design a custom Hearing Conservation Program that can be created to meet college students' needs. To assess college students' knowledge of NIHL, an online quiz was administered to current college students via social media. Fifteen quantitative questions were asked. Data suggest that average college students know very little about the prevalence of Noise Induced Hearing Loss and its implications. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentors: Dr. Cinzia Pica-Smith & Dr. Alison Myette

The Academic and Social Experiences of Students with Anxiety on a Small College Campus

Anthony Manzi '17 & Jacqueline Raftery '17

Human Services and Rehabilitation Studies

With the number of college students with anxiety on the rise, this project focused on the effects and challenges of, and solutions to, living with anxiety in a college environment. In the form of a movie, this project sought to raise awareness of mental illness and silent disabilities, and to make the community aware of potential solutions for those with anxiety. Through a literature review as well as discussions with faculty and staff, this movie outlined anxiety and how it manifests itself into the lives of students during their college careers.

Faculty Mentor: Dr. Cinzia Pica-Smith

The Muslim Experience in the United States

Thea Hickey '18 & Olivia LeSaffre '18

Human Services and Rehabilitation Studies

This video presentation focuses on what it is like to be a young Muslim person growing up in the United States post-9/11, as well as the stereotypes and biases non-Muslim Americans possess. The video also touches upon how the negative discourse spread throughout the media has detrimental impacts on the lives of Muslim Americans today.

Faculty Mentor: Dr. Cinzia Pica-Smith

Presentation Session 4

Tuesday, April 24

8:30 AM - 10:00 AM Carriage House

Studying Newspaper Advertisements from 250 Years Ago

Evan Sutherland '20

History

This semester I completed a project that focused on seven advertisements that were published 250 years ago. My work was published on Prof. Keyes's daily research blog, the *Adverts 250 Project*. The advertisements selected came from newspapers in the collections of the American Antiquarian Society, including the *Boston-Gazette*, as well as newspapers available in various databases, including the *Virginia Gazette* (via the Colonial Williamsburg digital library) and the *South Carolina Gazette* (via Accessible Archives). I selected advertisements that promoted consumer items such as tea, coffee, cloth, and even slaves. After selecting the advertisements, I conducted research on specific aspects of each one, examining how they contributed to the daily life during the era of the American Revolution. Through the research, I learned new ways of viewing the causes of the American Revolution. It also allowed me to learn more about everyday life in the eighteenth century.

Faculty Mentor: Dr. Carl Robert Keyes

Transcribing the Past: Working on the Isaiah Thomas Broadside Ballads Project

Jonathan Bisceglia '19

History

My presentation features my experiences working on the *Isaiah Thomas Broadside Ballads Project* for the American Antiquarian Society. This project is designed for students who are interested in digital humanities. Each student involved in the project transcribes one broadside ballad (or, song printed on a poster) published during the War of 1812. However, the project goes far beyond this. As historians we analyze each document and insert XML tags in addition to the transcriptions. This is a form of coding used by databases to make keyword searches easier for scholars and other readers. This makes the project interesting for us as historians because it delves deep into what it means to be working towards preserving history for public consumption. This interdisciplinary project not only provides an excellent outlet for creativity but also gives real world insight into what it is actually like to work as an historian.

Faculty Mentor: Dr. Carl Robert Keyes

Digital Humanities and the Era of the Revolution: Digitally Connecting the Public and Historians

Daniel McDermott '19

History

This presentation summarizes my contributions to the *Adverts 250 Project*, a digital humanities project I was guest curated from March 12-18, 2017. The project focuses on Revolutionary-era newspaper advertisements published exactly 250 years ago, relating them to other primary and secondary sources. I was responsible for finding the advertisements, researching a topic or theme that interested me in each advertisement, and writing commentary and an interpretation of the advertisements and the other sources. By completing this process, I was “doing” history. The interpreting and commentary related to each advertisement was published via an online blog; therefore, it is considered a digital humanities project. This blog is open for anyone to read. This platform allows historians and the public to interact. Utilizing the internet and social media sites, like Twitter, historians can transform their research findings and scholarship into a digital humanities project accessible by the public. This promotes learning, intellectual curiosity, and educational ideas that can be related to current events and everyday life.

Faculty Mentor: Dr. Carl Robert Keyes

Curating the Adverts 250 Project: Examining Everyday Life in Revolutionary America

Shannon Dewar '18

History

This semester I worked as a guest curator on the *Adverts 250 Project*, a daily research blog founded by Prof. Keyes. This gave me the opportunity to work with several newspapers that were printed in the American colonies exactly 250 years ago. Each day of my week as guest curator, I chose one advertisement to examine in detail. This allowed me to explore how commerce and the sale of goods and other commodities were advertised in the colonies. I was able to further my knowledge of advertisements from the era of the Revolution, as well as see the diversity and desires of American society at that time. In addition, it allowed me to glimpse an aspect of American history that I have not spent much time studying, the role of advertising. Aside from finding the advertisements and looking at their significance, I completed my first digital humanities project. This was a unique experience that allowed me to view many eighteenth-century newspapers that have been digitized and present my own research and analysis of them.

Faculty Mentor: Dr. Carl Robert Keyes

Looking at History with a Modern Eye: Working on a Digital Humanities Project

Shannon Holleran '19

History

The *Adverts 250 Project* is a digital humanities project that explores advertisements posted in eighteenth-century newspapers exactly 250 years ago. The *Adverts 250* website is a historical blog that provides analysis of many early American advertisements. I was the guest curator of this website for the week of February 19-25, 2017. This project required me to visit several online databases to access the digitized newspapers. In addition to finding information online, I also visited the American Antiquarian Society. The advertisements I selected in these eighteenth-century newspapers announced the sale of various goods, foods, and slaves. The advertisements provided insight into what social and economic life was like in colonial and Revolutionary America. This project also included a social media component. Each day, I had to send out a tweet summarizing the main ideas of my analysis for each advertisement. This expanded my research and the work I had done to friends, historians, and other professionals. My presentation examines how American history is taught and received in modern ways in the twenty-first century.

Faculty Mentor: Dr. Carl Robert Keyes

The Adverts 250 Project: Digital Humanities and Reaching Out to the General Public

Samuel Birney '18

History

I will be showcasing my work with the *Adverts 250 Project*, a cooperative research project between Professor Keyes and undergraduates. The *Adverts 250 Project* is a research blog composed of newspaper advertisement from 250 years ago, featuring one each day of the week. I worked as guest curator of the project was from February 26 to March 4, 2017. I utilized the *Early American Newspapers* database, as well as the *Virginia Gazette* on the Colonial Williamsburg website and *Accessible Archives* via the American Antiquarian Society's digital resources, to choose from a wide variety of newspapers and pick one advertisement to research for each day of the week. For each, I examined one aspect of life in the Revolutionary era that the advertisement addressed. This project allowed me to discover aspects about everyday life in colonial and Revolutionary America. I also presented my own views and impressions regarding life in the colonies.

Faculty Mentor: Dr. Carl Robert Keyes

Presentation Session 5

Tuesday, April 25

9:00 AM - 10:30 AM La Maison Salon

A Case for Collaboration: Bringing the Collegiate Peer Tutoring Model to the High School Level

Veronica Beaupre '17

English

Colleges across the United States have peer tutoring centers designed to support diverse student bodies in their efforts to learn. At the surface level, peer tutoring provides tailored one-on-one instruction that meets the varied learning needs of a large learning community. In addition, peer tutoring has been shown to benefit not only the tutees coming to the center for assistance, but also increase the performance of tutors and change the learning culture of the rest of the learning community. As a powerful resource, the collegiate peer tutoring center model would greatly benefit high schools across the United States, who also must meet the diverse learning needs of their populations. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. James Lang

A Return to the Authentic: The Changing Book Industry & Millennial Detachment

Kathryn Bauer '17

English

Similar to many other industries in the twenty-first century, the book industry is beginning to turn in the technological direction. The emergence of eBooks, among other factors, has started to change the face of the industry as we know it. However, these changes may be a result of something bigger: the lifestyle choices of the trailblazing millennial generation. Millennial lifestyles differ significantly from those of past generations, especially in terms of social and emotional detachment. How do these seemingly different, yet defining, aspects of today's world relate? And is it possible to use ideas from thinkers of the past such as Plato and Baudrillard to remedy this millennial drift from an authentic lifestyle? This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Paul Shields

Two Stories of a Rebellion, Yet One Reinvention

Jose Garcia '19

Modern and Classical Languages and Cultures

The 1960s were known for Civil Rights in the United States. In 1968, Mexico faced its own Civil Rights Movement before the start of the 1968 Summer Olympics. The movement began after students protesting rising tuition hikes at Mexico's top university. Before the start of the Olympics, the Mexican Government committed a huge mistake by murdering between forty-three and three hundred citizens. Protests against the government increased in Mexico due to attempts to suppress all criticisms of it. When people are oppressed, they rebel. Mexico experiences another student movement in 1999, but it failed to attract to the attention that the 1968 movement brought because there was no government oppression in 1999. In order for a rebellion to happen among the citizens there must be government oppression. In 1968, the censorship of the government on its citizens caused an entire generation of Mexicans to rebel against the set norm of the government.

Faculty Mentor: Dr. Esteban Loustaunau

The Objectification of Women Through Patriarchal Language

Franchesca McMenemy '17

Modern and Classical Languages and Cultures

The readings, novels, music videos, and movies of this class have shown how women are portrayed sexually in Spanish literature. The stories of Cartucho by Nellie Campobello, the novel of Los de Abajo, and finally the corrido/song of "La Reina del Sur" of Los Tigres del Norte, show how women in each story are not taken seriously due to the fact that they are sexualized by men and society. The women in each story are seen as bodies of pleasure among those who have an ideal body. Even when women show strength and try to be at the same level as men, they cannot be on the same level because they are not the same, and they are degraded to sexual objects by the media and society. I use the theory of Simone De Beauvoir and Joy Go-Mah's article, "The Objectification of Women - It Goes Much Further than Sexy Pictures," to understand how the media and works of literature portray women as sexual objects. At the same time, the theories help one understand why the "contra-historia" (the against stories, or rather, real stories) do not surpass the fake story, in which women are made to look as weak bodies.

Faculty Mentor: Dr. Esteban Loustaunau

The Hope of an Immigrant

Claudia Palencia '17

Modern and Classical Languages and Cultures

Everyday immigrants decide to leave their homes in search for a better future. These immigrants have different motivations; for example, many enter the United States hoping for a new world of opportunities, while others are refugees searching for protection. However, all immigrants have had the courage to set aside their fears, anxieties and uncertainties in order to begin this journey that may in fact lead to dangerous and life

threatening situations. Once an immigrant has arrived to the United States they are a seed of hope for their current and futures families.

Faculty Mentor: Dr. Esteban Loustaunau

Presentation Session 6
Tuesday, April 25
11:00 AM - 12:30 PM La Maison Salon

Thyroid Hormone Regulates Crabp1 in Mouse Mammary Gland Adipose Stromal Cells

Jennelle LeBeau '18

Natural Sciences

The prognosis of breast cancer is strongly influenced by the developmental stage of the breast when the tumor is diagnosed. Pregnancy-associated breast cancers, cancers diagnosed during pregnancy, lactation, or in the first postpartum year, are typically found at an advanced stage, are more aggressive, and have a poorer prognosis. Adipose stromal cell (ASC) remodeling is responsible for these cancers. The amount of the mammary gland occupied by adipose tissue fluctuates during pregnancy and lactation such that the lactating gland has the least amount of adipose. Crabp1 is present during lactation and functions to prevent lipid accumulation. We have also shown that crabp1 can promote pregnancy associated breast cancer. However, the upstream regulators of crabp1 in the normal and diseased mammary gland remain unknown. This study aimed to determine if thyroid hormone regulates crabp1 gene expression by culturing ASCs from each stage of development in the presence or absence of thyroid hormone. Both qPCR and Western blotting were performed to determine the levels of crabp1 in each stage. As the results showed cells of certain stages increasing their crabp1 and others not in response to the treatment, thyroid hormone may be a key regulator of crabp1 expression in the mammary adipose stroma. The promoter contains a thyroid hormone response element and thyroid hormone levels increase at parturition. In fact, it is required for lactation. Thus, it may be the signal in the mammary gland to increase crabp1 levels to remodel the adipose tissue at lactation.

Faculty Mentor: Dr. Jessica McCready

The Interaction Between Macrophages and ASC-Ls Increases Angiogenic and Proliferative Potential of Pregnancy Associated Breast Cancers

Michael Doyle '17

Natural Sciences

Pregnancy associated breast cancers (PABCs) typically exhibit increased aggressiveness and overall poorer survival. During pregnancy and lactation drastic changes take place in breast tissue that lead to increased macrophage recruitment and alterations of adipose stromal cells (ASC-Ls). The interaction of these cell types, seen in PABCs, could play a novel role in the increased aggressiveness of these cancers. We created an *in vitro* co-culture model to recreate the unique interactions of ASC-Ls and macrophages *in vivo*. We performed qPCR and a cytokine array to quantify these changes. Additionally, functional assays were performed using the media collected from our co-culture model to further elicit how these changes effect tumorigenesis *in vivo*. The co-culture of ASC-Ls and macrophages alters both mRNA expression and cytokine secretion in a tumor promoting manner. Additionally, conditioned media from the co-culture increased tumor cell proliferation and angiogenic potential. In part, these pathways were shown to work through the cyclooxygenase-2 (COX-2) pathway. These findings indicate that the unique changes seen in PABC plays a role in the increased tumorigenesis of PABCs. The changes seen by the interaction of ASC-Ls and macrophages result in the secretion of cytokines that could potentially contribute to increased aggressiveness due to increased proliferative and angiogenic potential. Additionally, since these changes partly act through the COX-2 pathway, inhibition of this pathway could potentially act to remit the poor prognosis of PABCs. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program. It also summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Jessica McCready

Crabp1 Regulation of FAS RNA in Mouse Mammary Gland ASCs

Fabiola De Varona '17

Natural Sciences

The cellular retinoic acid binding protein 1 (crabp1) gene promotes tumor growth and is expressed in adipocyte stromal cells (ASCs-L) present during lactation. One known function of crabp1 is the binding and retention of retinoic acid (RA) in the cytoplasm. This can prevent RA regulated transcription of other genes. Research has shown that crabp1 is also responsible for the inability of ASC-Ls to retain lipid. This study hoped to connect these two functions of crabp1 and hypothesized that crabp1 limits lipid accumulation through fatty acid synthase (FAS) transcriptional regulation. FAS is an example of a gene that is regulated by RA. Luciferase assays, RT-qPCR, and Oil Red O assays were performed to study FAS promoter activity, mRNA levels, and lipid accumulation, respectively. ASCs at different stages of mammary gland development were studied to determine the relationship between crabp1, FAS, and lipid accumulation upon RA treatment. Our results suggest that RA treatment leads to a decrease in FAS promoter activity as well as FAS and crabp1 mRNA levels in ASC-Nulliparous. Furthermore, higher crabp1 mRNA levels in ASC-Ls did not correlate with a decrease in FAS mRNA. ASC-Ls also showed low lipid accumulation in the presence of adipocyte differentiation media, suggesting that crabp1 regulates lipid accumulation, but not through the regulation of FAS. The mechanisms of crabp1 in lipid regulation of ASCs remains to be determined. Our data show that crabp1 does not regulate FAS though RA retention in ASC-Ls. However, our results are consistent with the literature in that ASC-Ls have high levels of crabp1, but low lipid accumulation. Through understanding how crabp1 is acting on the adipocytes in the mammary gland it can be better understood what its tumor promoting function is in PABCs. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program. It also summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Jessica McCready

Holographic Scaling of Pure Gravity in the Near Horizon

Emma Machado '17

Natural Sciences

Many high school and college students are required to take physics, but few actually learn to discover the mysteries of the field, because they are too busy trying to memorize equations and solve "plug and chug" style problems. Looking into the calculations and equations of physics, a holography can be seen within the subject. By studying the duality that exists between electricity and gravity, a holography can be discovered and made accessible to general physics students. The concept of holography allows physicists to break down complex problems into manageable systems. This research demonstrates how holography can transfer information from 4D General Relativity to 2D Dilaton Gravity. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Leo Rodriguez

Examination of Synapse Development in C. elegans: Characterizing Novel Genes Using Behavioral Analysis

Monika Rettler '18

Natural Sciences

Neurons are specialized cells that are responsible for sending signals throughout the body. However, the molecular mechanisms that drive neuronal development are not well understood. To shed light on this important event, we have chosen to study sites of neuronal communication, known as synapses, in the model organism, *Caenorhabditis elegans*. The Francis Lab at UMMS has an ongoing project that aims to identify novel genes that regulate synapse formation. The *C. elegans* research model offers numerous advantages, including the ability to view synapses of a single neuron *in vivo*. The goal of my project will be to analyze the behavior of worms known to have anatomically abnormal synapses due to a genetic mutation. I will examine *C. elegans*' behavior at UMMS using a system called Wormtracker and by performing thrashing, aldicarb-sensitivity, and levamisole-sensitivity assays. These methods could provide insight as to what genes impact synaptic function at the level of locomotor

behavior.

Faculty Mentor: Dr. Michele Lemons

Ice Buckets to Proteins; Investigating the Role of matrin-3 in ALS

Elizabeth DiLoreto '17

Natural Sciences

Amyotrophic lateral sclerosis (ALS) is a dysfunction of motor neurons in the spinal column that prevents muscle movements. Currently, there is no known cure, and the progressive nature of the disease leads to fatality, typically within 2 to 5 years of diagnosis. My work has helped me and the larger community understand the cellular mechanisms and effects of this neurological disease. I began this journey with an internship at the University of Massachusetts Medical School under Dr. Jill Zitzewitz in 2014. My research primarily consisted of experiments to study the biophysics of protein folding, in order to better explain the misfolding of ALS linked proteins. Based upon this work with Dr. Zitzewitz, I am currently writing my honors thesis in Biology examining RNA-binding proteins associated with ALS (e.g. TDP-43 and matrin-3). Under the guidance of my on campus mentor Professor Michele Lemons, I am discussing the role of matrin-3 in this disease; specifically, how it can misfold and no longer perform its required function. From the Ice Bucket challenge, funds and awareness were raised for this disease and through my project I continue this investigation and hope to perpetuate this knowledge to the community. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Michele Lemons

Presentation Session 7A

Tuesday, April 25

1:00 PM - 2:30 PM La Maison Salon

Nancy Johnson's Lifelong Commitment to Education: An Oral History Interview

Kelsey Lewis '17 & Danie Marseille '18

Women's Studies

This presentation is based on an oral history conducted with Nancy Johnson. Johnson was born in Worcester, Massachusetts, at Hahnemann hospital in 1932. She attended Clark University with a major in Romance Languages. Her career began as an interpreter for the United Nations. From there, she decided to continue her studies and become a teacher. In this interview, Johnson discusses her struggles and accomplishments as a woman in education. Johnson began her career by teaching children foreign languages in elementary schools in various towns. Johnson reiterated the fulfillment she got from teaching students and hearing the impact she had on them. She expressed how her interest in children and the way they think has led her down the path of a lifelong commitment to education.

Faculty Mentors: Dr. Carl Keyes & Dr. Arlene Vadum Rankin

Women's Body Image in the Media

Delaney Fenton '20, Natalia Kaczor '20, & Sydney Vu '19

Women's Studies

How women are depicted in the media presents a dilemma. The advertising business and other forms of media could faithfully represent women of various body types – and some do. However, many companies still continue to market one type of body image, thus misrepresenting and underrepresenting the majority of women. This presentation focuses on women's body image portrayed in the media in recent years and how some women have responded. It sheds light on the statistics and severity of how the media can affect women's self-esteem. Additionally, this presentation highlights the rise of body inclusive and body positive movements challenging the stereotypes around body image. From controversial advertisements to potential censorship, this presentation seeks to provide clarity on the problematic issues surrounding society's expectations and perceptions of women

and their bodies.

Faculty Mentors: Dr. Carl Robert Keyes & Dr. Arlene Vadum Rankin

Worcester Women's Oral History Project: Marissa Pyatt

Lindsay Hajjar '18, Thea Hickey '18, & Jenna Snyder '18

Women's Studies

This presentation is based on an oral history conducted with Marissa Pyatt in collaboration with the Worcester Women's Oral History Project for the introductory Women's Studies course. Pyatt was born in Arlington, Virginia, in 1986. In 2016, she found herself in Worcester for the first time, taking on the role as Director of Supportive Services at Abby's House. Abby's House is an emergency shelter for women, founded in 1976 at the beginning of the battered women's movement. When she was a young girl, Pyatt's father murdered her mother; her maternal grandparents raised her. With the support of her extended family, she attended Virginia State University. She then went on to get her master's degree in clinical mental health counseling. In her interview, Pyatt talks about social equality and the importance of understanding how you can help others. She says, "I think people don't understand their privilege, and we as a group, not just Worcester, not just women, but as citizens, as humans, need to be able to understand our privilege and how it intersects with oppression." Pyatt also discusses her childhood, the struggles of being a mother in the twenty-first century, and the importance of social justice and political action.

Faculty Mentors: Dr. Carl Keyes & Dr. Arlene Vadum Rankin

***Samuel Beckett, a Misogynist, Constructs Women as Vice
through the Objectification of Women as Sexual Beings***

Franchesca McMenemy '17

Women's Studies

This essay explicates Samuel Beckett's works "First Love" and *Happy Days* using the analyses and theories of Simone De Beauvoir's *Second Sex* and Ayn Rand's *The Virtue of Selfishness*. De Beauvoir's feminist approach focuses on the power of patriarchal language, and its relation to women giving meaning to "otherness." Similarly, when applying the theories of Ayn Rand, the essay explains how man in the world has a higher purpose because he is the "mind," while woman on the other hand is represented as the "body." Rand claims that a man is always rational; this rationality allows man to follow his interests and not let anything get in the way. Rand examines sexual conflict that allows man to dispose his desires as he wishes. These two philosophers set the stage to show that Beckett used language to degrade women. In "First Love" and *Happy Days*, Beckett regards women as body but never mind; he does not step in the shoes of a woman, and fails to explain her to the audience. He fails to take the woman's perspective with her state of mind. As of a consequence, he degrades women as sexual beings who act as servers for pleasure, reproduction, and nurture while the man is always the receiver of these gifts.

Faculty Mentor: Dr. Christine Keating

***The Slavery Adverts 250 Project: Examining Advertisements for Slaves
Published during the Eve of the American Revolution***

Ceara Morse '19

History

The *Slavery Adverts 250 Project* is a collaborative project pursued by students and Prof. Keyes. I worked as curator for the week of April 2-8, 2017. I read through all the newspapers published 250 years ago that week, consulting sources at the American Antiquarian Society as well as various online databases. In these newspapers, I found every advertisement that mentioned or had something to do with slavery. Each day of the week I also tweeted each advertisement published 250 years ago that day via the project's Twitter account. This presentation shows the different kinds of advertisements: selling of slaves, seeking slaves, runaway slaves, and captured slaves. I will explain what is important about each of these types of advertisements. I will also show where the general public can go to see more advertisements, demonstrating that the *Slavery Adverts 250 Project* broadens who gets access to historical sources. This is important because it shows how slaves were just as popular as other commodities being bought and sold in the eighteenth century.

Faculty Mentor: Dr. Carl Robert Keyes

The Adverts 250 Project: Using Advertisements to Understand Early American Society

Megan Watts '19

History

This presentation features a digital humanities project, the *Adverts 250 Project*, which I have guest curated for two weeks. *Adverts 250* is a collaborative project conducted by undergraduate history students and Prof. Keyes. They produce a daily research blog that features one advertisement published exactly 250 years ago in an American newspaper accompanied by analysis on what that advertisement reveals about life in eighteenth-century America. By taking one advertisement and placing it into context, the readers (and writers) of this project glean a deeper understanding of the complex world of colonial and Revolutionary America. This project is invaluable because it helps history students to expand their view of the past and offers others beyond the Assumption community, both scholars and general audiences, a chance to learn about this era.

Faculty Mentor: Dr. Carl Robert Keyes

Presentation Session 7B

Tuesday, April 25

1:00 PM - 2:15 PM La Maison Hall

Mastering Customer Loyalty

Kathleen Hurley '17

Business Studies

Customer loyalty can be described as “the result of consistently positive emotional experience, physical attribute-based satisfaction and perceived value of an experience, which includes the product or services” (Shaw & Hamilton 2015). Since 1896, loyalty programs have developed from a simple stamp redemption system to an intricate in-store and digital model. This system has become so successful because it properly engages the customer, both inside and outside the store, to build a mutually beneficial relationship between the business and the customer. Understanding customer loyalty is essential in creating a program that will provide the customer with incentives to reward their patronage while also building a personal relationship with the brand. By analyzing the various desires and interests of each generation, companies can modify their loyalty programs to their target audience and engage customers appropriately and effectively. Even Starbucks, a company that considered to be a leader in capturing customer loyalty, has areas for improvement and can make subtle changes to their program to interact more effectively with their consumer base. These programs can be implemented by any business whose goal is to generate a loyal base of customers and improve business-consumer relationships. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Cary LeBlanc

Effect of Distance from NHL Affiliate on AHL Attendance

Stephen Picard '17

Economics and Global Studies

This paper examines the effect of American Hockey League (AHL) teams locating closer to their National Hockey League (NHL) affiliates. With several AHL teams closing the distance (geographically) between their NHL affiliates for logistical purposes, I studied whether or not they will experience higher levels of fan support. I used data from all AHL teams between 2007 and 2017. I found a statistically insignificant negative relationship between proximity to NHL affiliate and average attendance in the AHL for all the teams. However, less popular AHL teams do experience higher levels of fan attendance when located closer to their NHL affiliate. Popular AHL teams often experience higher fan attendance figures regardless of their affiliation. While controlling other variables, I find that fans are drawn to AHL teams that have an older NHL affiliate. Also, NHL and AHL games

appear to be substitute goods as AHL fan attendance increased by nearly 8 percent during the NHL lockout in 2012-2013. Finally, my results indicate that less popular AHL teams should relocate closer to their NHL affiliates in order to increase ticket sales. This presentation summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Brian Volz

“You Throw Like a Girl,” and other Expectations of Masculinity

Toni Lambert '17

Sociology, Criminology and Anthropology

Gendered phrases are part of our everyday interactions. When they are being said, little thought goes into them; however, when being received, they can have an unexpected lifelong impact. Specifically looking at the phrase “like a girl,” Assumption College students were interviewed regarding their personal interactions with the phrase. This study was not conducted to justify the use of the phrase “like a girl,” but to investigate the function the phrase serves. The goal of the study was to discover what is meant by the everyday use of the phrase “like a girl”, and how use of the phrase impacts men, women, and society as whole. Quite clearly, this is just one of the many phrases used to police the boundaries of masculinities.

Faculty Mentor: Dr. Steven Farough

Chaplains, Prisoners, and COs - Oh My!

Steven Foertsch '17

Sociology, Criminology and Anthropology

Qualitative interviews with chaplains not only reveal their personal interpretations of what they are doing, but also their impact on prisoners and their issues interacting with corrections officers.

Faculty Mentor: Dr. Steven Farough

The Chicano Movement in Chicano Schools Today

Jose Garcia '19

Latin American Studies

As the fiftieth anniversary of the Chicano Movement approaches, the Chicano Man is often forgotten. The Chicano man or woman is someone who associates himself or herself with the term Chicano; there is no set criteria other than being of Mexican decent. During the Chicano Movement, Chicanos received attention from people like Robert F. Kennedy. While the Chicano Man has made achievements over those last fifty years, there have been failures as well. Chicanos still struggle in key social and economic aspects. Chicano schools have not greatly improved, with many still considered below average. During the height of the Chicano Movement in the 1960s and 1970s, Chicanos had a dream. Chicanos achieved the dream to form a new identity: neither simply American nor simply Mexican. People outside the Chicano community now view that identity ambiguously. The Chicano Movement was a major factor during the 1960s’ Civil Rights Movement yet it is a movement not talked much about or known outside the Chicano Community. The contribution Chicanos made during the Civil Rights Movement is largely forgotten. The Chicanos Movement failed to continue the progression that was achieved during the 1960s causing the Chicanos to be forgotten.

Faculty Mentor: Dr. Esteban Loustaunau

Poster Session
Tuesday, April 25
2:00 PM - 4:00 PM Testa Atrium
(in order of discipline)

The Marxist-Leninist Break with History Visualized: Contrasting Soviet and Mexican Artworks

Caroline Bercier '17

Art, Music and Theatre and Political Science

The ideology of the Soviet Union following the 1917 revolution had a massive impact on the features of the artworks created during that time. Exploration reveals that many of these features directly contrast Mexican artworks, specifically muralism, which were not produced under such an ideological state. Contrasting the two provides insight on one of the defining features of the Marxist-Leninist ideology - the lofty aim of breaking with history to usher in a new age, and eventually a stateless utopia, at any cost. This is a linear conception of history. Lacking such an ideology, Mexican political culture allowed for a more cyclical, universal conception of history, which does not require such drastic means and enables recognition of the universality of the human condition. These contrasting views are embodied in the role of the artist, the subject matter, and the style of the artworks produced in the two states following their revolutions. An original artistic component is included to display these findings visually, using the various styles of the forms of artworks unique to each state. It takes the form of an installation. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Prof. Lynn Simmons, M.F.A.

A Child's World: How Technology Influences Children's Language Development, Physical Development, and Social-emotional Development

Santina Marinelli '17

Human Services and Rehabilitation Studies

In the twenty-first century, technology has become a vital part of our day-to-day lives, including the lives of growing children. Children are spending close to seven hours per day on electronics (American Academy of Pediatrics, 2015). Recent research shows that playing with electronics reduces the interaction between a child and parent, and can compromise the child's play experience (Wooldridge & Shapka, 2012). Other research has investigated the relationship between screen time and physical activity as a risk factor for being overweight. For example, Maher et al. (2012) found that the likelihood of being overweight was increased by the amount of screen time use. Another study investigated how computers impacted the social behavior of preschoolers and concluded there were mixed positive and negative results. For example, technology can be used to enhance children's social-emotional development when used appropriately (Heft & Swaminathan, 2002). This study surveyed parents about technology use and three areas of their children's development: language, physical, and social-emotional. The findings of this study may assist parents, future parents, and others who plan to work with children, to better understand the role technology plays in children's development. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Susan Scully-Hill

Bactericidal Effects of Listerine

Emily Hill '17 & Karina Torres '17

Natural Sciences

Saliva microbiota contains hundreds of differing species of microorganisms and a low pH in order to control the amount of bacteria that we are exposed to orally. However, the accumulation of pathogenic bacteria in the oral cavity can result in illnesses like oral cancer and gums disease. Therefore, good oral hygiene is very important in order to prevent and reduce health risks. Brushing teeth with regular toothpaste at least twice a day is a normal regimen many people do. However, individuals should pair that with an antiseptic agent such as

Listerine, a common brand mouthwash known to reduce microbial colonies present in the oral cavity. In this experiment, the bactericidal effects of Listerine were measured by inoculating samples of saliva before and after subject #1 brushed teeth with regular toothpaste and before and after subject #2 brushed and rinsed with Listerine. A cfu count of all four samples indicated that subject #1 had 12 bacterial colonies before brushing and 2 after while subject #2 had 19 colonies before brushing and rinsing with Listerine and just 1 after. In addition, a gram stain of all four samples revealed more gram negative bacteria present in the saliva of both subjects before the procedure and more gram positive bacteria after. Overall, it is supported that Listerine effectively reduces bacterial colonies and pathogenic bacteria in the mouth after rinsing, resulting in reduction of the risks of plaque buildup and development of gums disease.

Faculty Mentor: Dr. Soraya Betancourt-Calle

Bottled vs Tap Water; Evidence of Bacterial Growth

Colleen Morrissey '18 & Emily Tomanelli '18

Natural Sciences

Life cannot exist without water and living in an affluent country, we conveniently have immediate access to both running tap water and bottled water. Tap water is often stereotyped especially in cities as less clean than bottled water although both sources undergo extensive sterilization before consumption. Some sterilization techniques include distillation, nanofiltration, UV radiation, and reverse osmosis. Chlorine is added to municipal sources as an extra precaution. On average, there were more bacteria cultured from the tap water than bottled water samples. Most samples cultured Gram negative *streptobacillus* and Gram positive *staphylococcus*, indicative of bacteria that are part of normal flora found on human skin. The most interesting discovery was the high number of bacteria cultured from the Britta filtered water. This common and easy method of filtration often used to purify tap water may remove chemicals (like chlorine) that keep the water bacteria free over extended periods of storage. Water that is Britta filtered and not immediately refrigerated may have accelerated bacterial growth. Overall, bottled and tap water sources are equally safe since contamination likely comes from external sources such as human skin, faucets, and the filtration devices used (Britta) rather than the water itself.

Faculty Mentor: Dr. Soraya Betancourt-Calle

Determination of Microorganisms in Different Aquatic Environments

Michael Doyon '17 & Ryan Durand '17

Natural Sciences

Bacteria can be found in a variety of conditions. In this laboratory experiment, a variety of microorganisms were identified and quantified in a water sample from the pond on Assumption College's campus and a water sample from the stream that empties into the pond. Samples were taken from each of the two environments and aseptically transferred onto nutrient agar and incubated for 48 hours at 37°C. Once the bacteria was incubated, the cultures were quantified. Gram stains were then conducted for each of the different colonies on each agar plate. Once the incubation period elapsed, a water sample from the pond and from the stream was aseptically transferred onto Entomophthora Complete Medium (ECM) and Mannitol Salt Agar (MSA) yielding four new plates that were incubated for 48 hours at 37°C. The only dish that yielded bacterial growth after the incubation period elapsed was ECM in which pond water was placed on. This provided concrete evidence that gram negative bacteria was in the pond water. By analyzing the gram stain and shape of the bacteria, it was concluded that *E. coli* was present in the pond water along with a variety of other bacteria.

Faculty Mentor: Dr. Soraya Betancourt-Calle

Ultraviolet Light Resistance of High Altitude Halophilic Archaea

Rafael Hamawi '19 & Christian Wesolowski '18

Natural Sciences

Halophilic archaea thrive in the shallow waters of natural and man-made salt ponds and flats where they can be exposed to high levels of solar irradiation. Species of halophilic archaea found in salt flats at high altitude, where the atmosphere is of a lesser density than at sea level, experience an increased intensity of UV. We hypothesize that strains of the genus *Halobacterium* recently isolated from the Salar de Uyuni in the Andes

Mountains will be more UV resistant than halophilic archaea that were isolated near sea level, such as *Halobacterium sp. NRC-1*. We first characterized growth rates of the recently isolated strains and then commenced with UV sensitivity assays. In these experiments, cells from different growth phases are irradiated with increasing UV doses, then the cultures are diluted, plated on solid media and incubated so surviving cells can form macroscopic colonies. If our prediction is supported by the results, future experiments will explore specific mechanisms involved in promoting enhanced UV resistance, such as DNA protective and repair mechanisms. The findings in our study will further the scope of astrobiology.

Faculty Mentor: Dr. David Crowley

Exploring Bacterial Contamination of Raw Chicken Breast

Rafet Amoor (Worcester State University) & Zachary Slepchuk '17

Natural Sciences

The purpose of this experiment was to determine how much bacteria is present in raw chicken breast meat obtained from Price Chopper. Five agar plates were swabbed with bacteria from the raw chicken. The results showed that the plate swabbed with unwashed chicken meat had 90 colonies formed compared to 30 colonies that had formed on a plate swabbed with washed chicken. Of the three dilutions of washed chicken swabs, the 1:10 dilution was the only reliable plate that had more than 25 visible colonies and yielded 550 colony-forming units per ml (cfu/ml). Simply eating 1 gram of uncooked chicken can cause serious illness.

Faculty Mentor: Dr. Soraya Betancourt-Calle

Holographic Scaling in Newtonian Gravity

Emma Machado '17

Natural Sciences

Many high school and college students are required to take physics, but few actually learn to discover the mysteries of the field, because they are too busy trying to memorize equations and solve “plug and chug” style problems. Looking into the calculations and equations of physics, a holography can be seen within the subject. By studying the duality that exists between electricity and gravity, this holography can be discovered and made accessible to general physics students. Furthermore, the concept of mass in physics (ADM-mass) can be calculated, within this holography, for various black holes along with the orbits of massive and massless particles. The concept of holography allows physicists to break down complex problems into manageable systems. This research demonstrates how holography can bring you from 4D General Relativity to 2D Dilaton Gravity. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Leo Rodriguez

Identification of Bacterial Samples Taken From Various Toothbrushes Using Rapid Identification Assays

Meagan Eccleston '17 & Michaela Lievi '18

Natural Sciences

Microorganisms, specifically bacteria, vary in their characteristics and mechanisms of survival based upon their optimal conditions and environments. Microorganisms specialize their functions, such as metabolism, cell structure, and resistance, etc. in an attempt to survive any conditions they may encounter. These unique characteristics allow them to be more easily identified and differentiated from one another. The goal of this project was to encounter various types of bacteria and classify them based on characteristics indicated by a wide array of testing. In this experiment, swabs were used to obtain bacterial samples from several toothbrushes. These samples were then plated on nutrient agar plates and cultured for 24 hours at 37°C. Then, a variety of metabolic and characteristic tests were run in order to assist in the identification and classification of the bacteria sampled from the toothbrushes. These assays included catalase, oxidase, gram and negative stains, as well as a more comprehensive enterotube assay. All but the yellow colony of toothbrush 6 proved to be gram negative, which meant they could undergo further testing via enterotube. Based on the numerical codes that correspond to the results of the bacterial tests, the control bacteria was *Proteus vulargis*, the bacteria from toothbrush 2 was *Proteus penneri*, toothbrush 8 contained *Proteus vulgaris*, and the brown colony from toothbrush 6 was

Enterobacter cloacae, while the cream colony's identity was also *Enterobacter cloacae*.

Faculty Mentor: Dr. Soraya Betancourt-Calle

Identification of IKK α in Developing Chicken Cornea

Jessica Hernandez '17

Natural Sciences/Biology/Building Diversity in Biomedical Sciences Program at
Tufts Sackler School of Graduate Biomedical Sciences

Development of the eye involves mechanisms of cell differentiation that are not entirely understood. Previous experiments have shown that the NF- κ B pathway is involved in development and, specifically, IKK α , which is a component of this pathway, has proven to be essential for the development and formation of the cornea. The objective of this study was to test if IKK α is present in the cornea of developing chickens and, if so, to determine at what stage of development IKK α is expressed at the strongest levels. Based on information from previous literature, we hypothesize that IKK α will be present in the developing chicken corneas during critical points of development. Fluorescent immunohistochemistry was used in order to observe levels of IKK α in the chicken corneas at different stages of development. The experiment showed that IKK α is expressed in the developing chicken corneas and begins to appear strongest in the apical corneal epithelial cells at E14. The colocalization of IKK α and class III beta tubulin, which was also found in these apical cells, could point to a relationship between the two but further investigation would be needed to confirm this.

Faculty Mentor: Dr. Jessica McCready

Investigating Chemical Reactions using Millifluidic Devices

Sarah Morley '18

Natural Sciences

Understanding the interaction between a chemical species and the solvent is important for controlling chemical reactions. This research focused on designing and building a reaction vessel that enables spectroscopic study of the species in a progressing chemical reaction. Millifluidic reaction vessels were 3-D printed using PLA plastic and glass panels to allow for spectroscopic measurements of a constantly flowing reaction mixture, yielding time resolved spectra of reaction progress. The developed technique was used to probe a common iodine clock reaction, in which a solution of potassium iodate was mixed with a solution containing soluble starch, sodium metabisulfite and sulfuric acid to produce a delayed, visible color change. The reaction was conducted in water and varying concentrations of methanol, ethanol and 1-propanol to observe the effect of the solvent on the product of the reaction. It was observed that increasing the length of the carbon chain in the solvent caused a decrease in the wavelength of maximum absorbance in the product.

Faculty Mentor: Dr. Benjamin Knurr

The Effectiveness of Antibacterial Soap Compared to that of Non-antibacterial Soap

Thao Nguyen '19 & Emily Powers '18

Natural Sciences

Antibacterial soaps are commonly used to prevent one from getting sick. The antibacterial activity of antibacterial soaps is enhanced by adding chemicals like sodium benzoate or benzethonium chloride. The objective of this experiment was to determine whether antibacterial hand soaps were more effective at inhibiting bacterial growth compared to that of regular soaps. The antibacterial soaps were hypothesized to be able to inhibit the growth of bacteria better than plain soaps. In this experiment the efficacy of antibacterial soaps versus non-antibacterial soaps from Dial and Softsoap was first tested by using the disk-diffusion method with two bacterial cultures: *Staphylococcus aureus* and *Escherichia coli*. Then, growth curves were generated by measuring the absorbance of the culture of bacteria in antibacterial soaps. The results showed that *E. coli* was more resistant to all types of soap, including the antibacterial soaps, from both brands than *S. aureus* was. Interestingly, the zone of inhibition exhibited from the antibacterial soap was close to that of regular soap for *S. aureus*. Additionally, the growth curves suggested that antibacterial soaps did limit the growth of bacteria. In short, there were no major differences between culture of bacteria treated with antibacterial and non-antibacterial soaps. Consequently, using plain soaps appears to have a similar effect as antibacterial soaps.

Vesicle-Membrane Tethering: The Interaction of Sec1 and Exocyst Subunit Sec6

Lauren O'Connor '17

Natural Sciences

The exocyst complex is a multi-subunit tethering complex that is used in the process of exocytosis. It is an eight subunit complex, and these subunits interact with each other as well as other proteins to facilitate membrane fusion. Prior research has shown that exocyst subunit Sec6 and Sec1 from the Sec1/Munc18 (SM) family, a known regulator of membrane fusion, interact with each other. In this experiment, the goal was to crosslink the two proteins and in turn work to identify the interacting amino acid residues that are responsible for the proteins' interaction. To do this, Sec1 and Sec6 were purified individually. Binding assays were performed on the purified proteins to confirm that they had folded properly and were able to interact. Crosslinking experiments were performed, using BS3, and resulted in the appearance of new bands on the gel indicating that crosslinking had occurred. The proteins present in these bands will be analyzed by mass spectrometry to determine the interacting residues of the two protein subunits. This research is important in furthering our understanding of the exocyst complex, how its subunits are organized, and how it interacts with other proteins to facilitate the complex process of exocytosis. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program. It also summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Laura Marcotte

Everybody Loves a Rebel: Modern Politics and the Rise and Reign of Dystopian Fantasy

Meredith Bercier '17

Political Science

Noting that the genre of dystopian literature tends to experience increased popularity at times when a place's political or social climate is one of danger or uncertainty, the thesis analyzes why that is the case. Finding that the recurring reason for it is that people experience feelings of fear at such times, and seek to communicate them through their works, the thesis explores whether the fears communicated through a few particular dystopian works are justified or paranoia, considering their historical situations. The works analyzed are separated into two categories: classic dystopias and modern dystopias. The classics include Yevgeny Zamyatin's *We* and Huxley's *Brave New World*, and the moderns include J.K. Rowling's Harry Potter series, Suzanne Collins' *The Hunger Games*, and Veronica Roth's *Divergent*. The findings suggest that while classic dystopias communicate justified fears about both the political and social circumstances in which they were written, the modern works tend to communicate justifiable social fears, but political ones that are factually more akin to paranoia or conspiracy. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Daniel Mahoney

A Microgenetic Study of Parental Depression and Infant Development at 3 Months Postpartum

Anna doCurral '17

Psychology

Approximately 15% of mothers and 3-5% of fathers experience postpartum depression (DelRosario, 2013). Current literature suggests a negative association between maternal depression and infant development, but little is known about paternal contributions. Maternal anxiety but not depression was associated with an increase in odds of having an infant with difficult temperament at four and six months (Austin et al., 2004). Field (2010) found that mothers with depressive symptoms at four and eight weeks postpartum reported frequent infant nighttime awakenings and less sleep during the night. Depressed mothers also reported more eating difficulties and lower infant weight gain than non-depressed mothers did (Gress-Smith, 2012). Moreover, infants of depressed mothers expected maternal unavailability and made less effort to engage the mother during the still face experiment (Field, 2002). In this microgenetic study we examined both maternal and paternal depression, and their associations with temperament and multiple indices of development, from the last trimester to three

months postpartum. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program. It also summarizes collaborative research conducted with a faculty member made possible by an Honors Summer Fellowship.

Faculty Mentor: Dr. Maria Kalpidou

Emerging Adults' Expectations of Longevity in Romantic Relationships

Lauren Bretanha '17

Psychology

This study investigated the reasons underlying emerging adults' optimistic beliefs about the longevity of their own romantic relationships compared to more realistic beliefs held about the longevity of others' romantic relationships. Undergraduate student participants completed questionnaires measuring their romantic relationship longevity beliefs, attachment orientation, passionate love, commitment, perceived control beliefs, and dispositional optimism. Findings indicated that emerging adults demonstrated a significant *optimism bias*, meaning they predicted significantly lower estimates of future divorce for themselves than they did for others. In addition, emerging adults currently romantically involved with a partner or who came from intact families showed greater optimism bias compared to adults who were not currently romantically involved or came from divorced families. Partial correlations controlling for parental and own relationship statuses indicated that emerging adults' greater optimism bias was associated with more secure attachment orientation and greater commitment, passionate love, and perceived control beliefs. Dispositional optimism was not associated with romantic longevity beliefs or optimism bias. The current findings extend the literature on emerging adults' expectations of romantic relationships by suggesting that by projecting pessimistic prospects onto the relationships of others, emerging adults may preserve their optimism about the future of their own romantic relationships despite grim divorce statistics. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Regina Kuersten-Hogan

The Role of Couples' Birth Experiences in Coparenting Dynamics During the Transition to Parenthood

Deanna Tortora '17

Psychology

The purpose of this study was to explore the impact of birth narratives on early coparenting during the transition to parenthood. Fifty-five couples were observed in the PLTP and LTP tasks, and given an interview to co-construct the story of their child's birth and early postpartum experiences. Findings indicated that more emotionally expressive couples and couples who told more coherent birth narratives displayed more supportive coparenting dynamics in the PLTP task and during the postpartum period. This poster summarizes an original capstone project that fulfills the final requirement of the Honors Program.

Faculty Mentor: Dr. Regina Kuersten-Hogan

Presentation Session 8

Tuesday, April 25

5:00 PM - 6:30 PM Testa 106

Memories of a Woman Who Works for Social Justice

Marisa Butler '20 & Bridget Coakley '20

History

This project, sponsored by the Worcester Women's Oral History Project, examines the life of Isabelle Amy Jenkins. She was born on June 1, 1988. She grew up in both Gill, Massachusetts, and New Milford, Connecticut. Her childhood was slightly different from others, since her neighborhood was the boarding school where her mother worked. In her predominately white, middle class town, the boarding school brought diversity to New Milford. She attended the College of Holy Cross for her undergraduate degree and Harvard's Divinity School for her

graduate degree to become a chaplain. It was not until an internship at United Way during her junior year that she realized she loved service work. Jenkins currently works at the College of the Holy Cross as the Associate Director of Community Based Learning. This program engages students in hands-on work to deepen their understanding of what they are learning in the classroom. Her passions lie with making students encounter difference in the community of Worcester. Each day, she deals with various social justice issues and tries to fix as many as she can. She believes that women should never stop trying to advance and believes each should “Surround yourself with your people because being a woman is really hard and you’re going to need people to let you persist.”

Faculty Mentor: Dr. Carl Robert Keyes

God’s Influences in the Life of Linda Raffaele-Moyen

Abigail Cote '19 & Aishea Henry '18

History

As part of our American history class, we interviewed Linda Raffaele-Moyen in collaboration with the Worcester Women’s Oral History Project. Raffaele-Moyen was born in Leominster, Massachusetts, on September 12, 1957. She attended Leominster High School and went on to study at Fitchburg State, married her high school sweetheart, and had three children. She later divorced and never remarried. Although her education led her to become a teacher, she ended up opening her own business in order to better support her family. However, when she gave it up she ventured back into teaching about nutrition and continues to work in the field today. In the interview Raffaele-Moyen shared some of the struggles and setbacks that she faced. She stated that she managed to overcome them with the help of God’s messages: “whenever I would feel like throwing down the towel, I would see a rainbow, and I use to see rainbows, and I still do today.” Raffaele-Moyen shared the stories of her journey in faith and how she rediscovered her understanding of God in the support group Al-Anon. Even though she has never lived in Worcester, Raffaele-Moyen has done work to improve the city especially during her time working at Women, Infants, and Children (WIC). She shed light on the importance of family, faith, and believing in your own abilities to live a fulfilling life.

Faculty Mentor: Dr. Carl Robert Keyes

Lauren Grover, Self-Made Woman: An Oral History Interview

Liam Bashista '20 & Frank Mantero '20

History

Lauren Grover participated in an oral history interview sponsored by our American History class and the Worcester Women’s Oral History Project. Grover was born on October 19, 1984, in Worcester, but grew up in Holden, Massachusetts. At the time of the interview, she had been married for five years and had two children. In 2003 she attended Assumption College to pursue a major in Psychology and a minor in Social Rehabilitation Services. During her time at Assumption she volunteered at the Reach Out Center, which helped her to choose which career path she wanted to pursue. Lauren also did internships during the summer, which allowed her to learn important lessons that she could apply to her career. These internships also led to a job right out of college in one of the agencies where she had interned. After attending Assumption she went to Boston College and earned her Master of Social Work. Grover currently owns her own practice in Worcester. Every day she helps people solve difficult situations in their lives, giving them the ability to be their own therapists so they can solve their life problems on their own, without needing her services. Because she is her own boss, she is able to be flexible with her working hours to make time to be a mother and a wife while having a successful career that she enjoys.

Faculty Mentor: Dr. Carl Robert Keyes

Kellee Kosiorek, a Story of a Worcester Woman’s Service to Citizens of the World

Elaine Cavalieri '20 & Abbey Marsalisi '19

History

This presentation examines the experiences of Kellee Kosiorek, based on an interview conducted via the Worcester Women’s Oral History Project. Kosiorek was raised in a small town in New Hampshire. She double majored in Cultural Psychology and International Business and then earned a master’s degree in Non-Profit

Management from Clark University. Although she had primarily been exposed to her conservative, white family and neighbors while growing up, attending Clark opened her eyes to a variety of different cultural backgrounds. Since then she has fallen in love with exploring other cultures. Her dream is to join the Peace Corps but for now she works at the Seven Hills Foundation in Worcester. Kosiorek works on multicultural and ethnic projects at the foundation. Seven Hills global outreach programs include countries such as Haiti, Jamaica, Ghana, Liberia, and Guatemala. She also works with the International Center of Worcester, which keeps her constantly busy. Kosiorek is only 25 years old, but she realizes how blessed and lucky she is to have the life and job opportunities she enjoys so much.

Faculty Mentor: Dr. Carl Robert Keyes

Making a Difference in the Lives of Women: An Oral History Interview with Jasmine Jina Ortiz

Haley Guenard '20, Kayelyn Kelley '20, & Erin Laverty '19

History

The Worcester Women’s Oral History Project sponsored this project. Jasmine Jina Ortiz was born on May 1, 1979, and raised in New York City. She comes from both a Latino and an African American background; her parents are both from the Dominican Republic. She moved to Worcester to attend Clark University as an undergraduate. Since then, Ortiz has taught at Quinsigamond Community College and Becker College. She also works for Keller Williams Realty as a real estate agent. Through her work at Keller Williams, Ortiz has been able to increase the number of Latinos buying homes and commercial property in Worcester by a significant amount. She has also done a lot of volunteer work throughout the city over the years, especially work supporting the rights of women. Ortiz addresses the role of women in the Worcester community in her interview: “I don’t know if I can speak for all women generally, but I can speak for myself. ... For industries where women can actually do very well financially, we’re still not as represented as I would like.” Through her teaching, real estate agency, and volunteer work, Jasmine Ortiz is pushing to make a difference in the lives of women, especially women in Worcester.

Faculty Mentor: Dr. Carl Robert Keyes

The Story of a State Representative: An Oral History Interview with Kimberly Ferguson

Evan Maravelis '20 & Timothy Wood '17

History

We conducted an interview with Representative Kimberly Ferguson on behalf of the Worcester Women’s Oral History Project. Ferguson was born in Worcester, Massachusetts, on December 21, 1966. She was an only child and was raised by her parents in a small neighborhood, West Tatnuck, on the outskirts of Worcester. She graduated from Saint Peter Marian High School in Worcester. Ferguson then attended Worcester State University for her undergraduate degree in Special Education. Afterwards, she went to Fitchburg State University for her master’s degree in Speech and Language Pathology as well as her Certificate of Advanced Graduate Study in Education Leadership and Management. Ferguson is a single mother who has a fifteen-year-old son who is attending Saint John's High School in Shrewsbury, Massachusetts. Prior to being elected a representative in the state government, Ferguson worked as an adjunct professor at Framingham State University as well as a speech pathologist. Ferguson’s work in the fields of Special Education and speech pathology have given her a different perspective on the legislation that is written for the people that live in her district. This, in combination with the extensive knowledge Ferguson has of Worcester and its surrounding towns, helps her to serve and to connect with the people who live in her town to the best of her ability.

Faculty Mentor: Dr. Carl Robert Keyes

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**Next year's Symposium will be held on
Monday, April 23 & Tuesday, April 24**

Please mark your calendars!

Program artwork by Michael Tortora '19

“DISCOVERY

is **SEEING** what
EVERYBODY ELSE

has **SEEN,**

and **THINKING**
what **NOBODY ELSE**

has

Albert
Szent-
Gyorgyi

THOUGHT”