PEPPERDINE UNIVERSITY

Seaver College

UNDERGRADUATE RESEARCH AND SCHOLARLY ACHIEVEMENT SYMPOSIUM

An Annual Celebration of Research, Scholarship, and Creativity

Friday, March 21, 2014

Acknowledgements

We would like to extend special thanks to Provost Darryl Tippens, Dean Rick Marrs, the Seaver Dean's Office, the Seaver Research Council, and the W. M. Keck Foundation for their support of undergraduate research at Pepperdine.

March 21, 2014

Dear Friends and Colleagues,

Welcome to the Seaver College Undergraduate Research and Scholarly Achievement Symposium. This afternoon and evening we are pleased to highlight and celebrate the students and faculty mentors who have worked together over this past year on a wide variety of scholarly and creative projects. As you will see, almost all academic disciplines are represented in today's celebration. Increasingly, Seaver students are working side-by-side with faculty mentors to be co-creators of new knowledge, music, or art. Learning at Seaver no longer just occurs in the classroom but also in the laboratory, art studio, museum, library, on the stage, and at locations all around the world. Please join us in celebrating the accomplishments and creativity of over 115 Seaver students.

Sincerely,
Lee

Lee Kats
Vice Provost

"That truth, having nothing to fear from investigation, should be pursued relentlessly in every discipline"

Seaver College Undergraduate Research and
Scholarly Achievement Symposium
March 21, 2014

SCHEDULE OF EVENTS

2:00 - 3:00 p.m.	Poster Session	Waves Cafeteria
3:30 - 6:00 p.m.	Oral Presentation Sessions	Plaza Classrooms & Rockwell Academic Center
.	Performing Arts Sessions	Surfboard Room (Payson Library)
	Art Exhibition Session	Payson Library Art Gallery
6:30 - 8:30 p.m.	Celebration Banquet* (RSVP required)	Waves Cafeteria

*featuring "Up Against the Screen: New Music with Film," a performance by the Pickford Ensemble

Poster Session
Waves Cafeteria, Tyler Campus Center

1) **Hadley Burke** and **Hannah Joyner** (Dr. Tomas Martinez, Faculty Mentor) "Relationship Trends in Two Generations" pg. 12
2) **Elizabeth Cabadas** (Dr. Tomas Martinez, Faculty Mentor) "Developmental Assets and Ethnic Identity as Predictors of Thriving in Hispanic Adolescents" pg. 12
3) **Christopher Hunt** (Drs. Elizabeth Krumrei and Janet Trammell, Faculty Mentors) "The Interaction of Semantic-Relatedness and Emotion: An Immediate Free Recall Task" (POSC Honors Program) pg.12
4) **Brian Cheah**, **Terah Condrey**, **Josh Harvey**, **Christopher Hunt**, **Alessandra McDowell**, and **Angel Tseng** (Drs. Priscilla MacRae and Janet Trammell, Faculty Mentors) "Steps Walked is Positively Correlated with Reasoning and Memory in Older Adults" (DRG and Sports Medicine Enrichment Funds) pg.13
5) **Alessandra McDowell** (Dr. Janet Trammell, Faculty Mentor) "How Handedness Direction and Consistency Relate to Declarative Memory Task Performance" (AYURI) pg.14
6) **Jane Dominick** (Dr. Gary Cobb, Faculty Mentor) Transcribing Early Italian Madrigals with Sibelius Music Software (AYURI) pg.14
7) **Matthew Finley** (Dr. Julianne Smith, Faculty Mentor) "Troublesome Restorations: Editing Janauschek's *Bleak House* Adaptation" (AYURI) pg.14
8) **Steven Fleming** (Dr. Donna Nofziger Plank, Faculty Mentor) "The Regulatory effect of semaphorin 7A on proliferation and migration in human umbilical vein endothelial cells" (SURB) pg.15
9) **Arthur Garnica** and **Vincent Quach** (Dr. Lee Kats, Faculty Mentor) "A test of the effect of ultraviolet-B radiation on behavior in the poison dart frog, *Dendrobates tinctorius*, during the larval stages" pg.15
10) **Chelsea Gest** (Prof. Dana Zurzolo, Faculty Mentor) "*Number the Stars*, 20"x11" photo composite" pg.16
11) **Jacob Gonzalez** (Dr. Thomas Vandergon, Faculty Mentor) "Making Sense of Animal Genome Size Standards" (AYURI) pg.16
12) **Imani Goodman** (Dr. Rebecca Kim, Faculty Mentor) "Family Dynamics: Exploring the Relationship Between Facebook Usage Among Families and the Likelihood of Familial Strife" (Keck Scholars Program) pg.17
13) **Matthew Gribble** (Dr. Jane Ganske, Faculty Mentor) "Determination of Volatile Carbonyl Compounds in University Weight Room Air Using Passive Sampling" (URF, AYURI) pg.17
14) **Francesca Guglielmi** (Dr. Tomas Martinez, Faculty Mentor) "An Exploration of Gender Roles and Communication in Emerging Adulthood" pg. 17
15) **Alexis Carrington** (Dr. Matt Joyner, Faculty Mentor) "A seed germination inhibitor from *Araucaria columnaris* is absent in *Pinus edulis*" pg. 18
16) **Selyna Jacobs** (Prof. Chris Stivers, Faculty Mentor) "Television's Effects on the Tolerance of Homosexuality" (Keck Scholars Program) pg. 19

Poster Session cont.
Waves Cafeteria, Tyler Campus Center

17) **Christopher Krepich** (Dr. Dyron Daughrity, Faculty Mentor) "Different Approaches to the Role of the Bishop of Rome in the First Four Centuries" (SURP) pg.19
18) **Daniel Lander** (Dr. Timothy Lucas, Faculty Mentor) "Supervised STM Image Segmentation of Self-Assembled Molecule Layers" (SURP, URF) pg.19
19) **Amy Li** (Dr. David Green, Faculty Mentor) "Reduced sample size and improved extraction and recovery of tetrodotoxin from the California newt, *T. torosa*, with quantitation by HPLC-FLD" (SURP, URF, AYURI) pg.20
20) **Junyuan Lin** (Dr. Timothy Lucas, Faculty Mentor) "A Contagion Model of Emergency Airplane Evacuations" (AYURI) pg.20
21) **John MacBeth** (Dr. Donna Nofziger Plank, Faculty Mentor) "Lysophosphatidic Acid Stimulates Lymphangiogenesis in Human Lymphatic Endothelial Cells" (SURB, AYURI) pg.20
22) **Brianna Manes** (Dr. Jay Brewster, Faculty Mentor) "Nanoparticle exposure activates an inositol triphosphate receptor-dependent elevation of reactive oxygen species and apoptosis in human alveolar lung cells" (SURP, URF) pg.21
23) **Ashley Martin** (Dr. Jennifer Harriger, Faculty Mentor) "Conformity and How it Relates to Eating Patterns" (Keck Scholars Program) pg.21
24) **Maria Martinez** (Dr. Jennifer Harriger, Faculty Mentor) "Level of Psychological Stress in College Students with Relation to Academic Major" (Keck Scholars Program) pg.22
25) **Alexandria McCollum** (Dr. Joseph Fritsch, Faculty Mentor) "Investigating the effect of strategically placed atoms on the preparation of biodegradable plastic" (URF) pg. 22
26) **Jae Eun Min** (Dr. Matt Joyner, Faculty Mentor) "Isolation of Antibacterial Compounds from *Artemisia californica*" (URF) pg.23
27) **Kelly O'Connor** (Prof. Dana Zurzolo, Faculty Mentor) "*The Art Forger: A Novel*" pg. 23
28) **Samantha Olson** (Prof. Dana Zurzolo, Faculty Mentor) "Lonely" pg. 24
29) **Brandon Scheirman** (Prof. Dana Zurzolo, Faculty Mentor) "*Frankenstein*" pg.24
30) **Logan Schmitz** (Dr. Joseph Fritsch, Faculty Mentor) "Making biodegradable plastic with unusual aluminum ion pair complexes" (SURP, URF, AYURI) pg.25
31) **Rosemond Travis** (Dr. Cindy Miller-Perrin, Faculty Mentor) "The Association between Parent and Children's Knowledge and Attitudes Toward Mental Illness" (AYURI) pg. 25
32) **Agustin Vargas** (Dr. Jay Brewster, Faculty Mentor) "Assessment of cell viability of Bhk-21 cells at low and high concentrations of Tunicamycin after transfection of Bcl-2 ER localized proteins" (SURB) pg. 25
33) **Viviana Vasquez** (Drs. Jennifer Harriger and Elizabeth Krumrei, Faculty Mentors) "Volunteer Activities and Self-Esteem" (AYURI) pg. 26
34) **Natalie Viklund** (Prof. Dana Zurzolo, Faculty Mentor) "From Pen To Paper" pg. 26
35) **Yushuang Wu** (Prof. Dana Zurzolo, Faculty Mentor) "*Interpersonal Communication*" pg. 27
36) **David Kang** (Dr. Stephen Davis, Faculty Mentor) "Physiological Performance in Thinned vs. Non-thinned *Ceanothus spinosus*, *Ceanothus megacarpus*, and *Malosma laurina* of the Santa Monica Mountains" (Keck Scholars Program) pg. 27

Oral Presentation Schedule
Session A, Plaza Classroom 190
Moderator: Dr. Candice Ortbals

3:30 **Wil Fisher** (Dr. Joel Fetzer, Faculty Mentor) "Public Attitudes toward Bike Lanes in New York City" (POSC Honors Program) pg. 28

3:45 **Tiffany Bailey** (Dr. Megan Francis, Faculty Mentor) "Conservative Vigilantes and the Undoing of the Voting Rights Act of 1965" (POSC Honors Program) pg. 28

4:00 **Alexander Booker** (Drs. Brian Newman and Candice Ortbals, Faculty Mentors) "Finding a Frame that Fits Analyzing and Comparing Rival Framing of American Gun Control Policy in 2013" (POSC Honors Program) pg. 28

4:15 **Evan Shorter** (Dr. Dan Caldwell, Faculty Mentor) "The Benefits of Employing Unmanned Aerial Vehicles in Low Intensity and Irregular Conflict Scenarios (POSC Honors Program) pg. 29

4:30 **Caroline Roemer** (Dr. Steve Rouse, Faculty Mentor) "Effect of Facebook on Mood" (SURP) pg. 29

4:45 BREAK

5:00 **Rosemond Travis** (Dr. Elizabeth Krumrei, Faculty Mentor) "An Interdisciplinary Introduction to Prostitution: Psychological Correlates of Prostitution" (CDIUR) pg. 29

5:15 **Steven Zhou** (Dr. Ben Postlethwaite, Faculty Mentor) "An Interdisciplinary Introduction to Prostitution: Prostitution as a Business" (CDIUR) pg. 30

5:30 **Nancy Kannampuzha** (Dr. Dan Morrison, Faculty Mentor) "An Interdisciplinary Introduction to Prostitution: Framing Sex Work Activism: A Sociological View" (CDIUR) pg. 30

5:45 **Allora Dubay** (Dr. Candice Ortbals, Faculty Mentor) "An Interdisciplinary Introduction to Prostitution: The Multi-Layered Political Context of Prostitution" (CDIUR) pg. 30

Oral Presentation Schedule
Session B, Plaza Classroom 189
Moderator: Dr. Kelle Keating Marshall

3:30 **La'Nita Johnson** (Dr. Carolyn James, Faculty Mentor) "The Consequences of Somali Piracy on International Trade" (Global Tides) pg. 31

3:45 **Alexandra Roberts-Mendel** (Dr. Kelle Keating Marshall, Faculty Mentor) "Equality isn't all it's cracked up to be: The price of duality and bilingualism" (SURP) pg. 31

4:00 **Kylee Slee** (Dr. Patrizia Lissoni, Faculty Mentor) "A Look at the Musical and Poetical Language of Secular Vocal Music of Seicento through Selected Works by Barbara Strozzi" (SURP) pg. 32

4:15 **Emily Gibson** (Dr. Carolyn James, Faculty Mentor) "The Right to Choose: Women's Political Activity in Islamic States (AYURI) pg. 32

4:30 **Lindsay Gardner** (Dr. V. Seshan, Faculty Mentor) "The Acquisition of SM Energy as a Proposed Strategy of Growth for Chevron Corporation" (AYURI) pg. 33

4:45 BREAK

5:00 **Amanda Miller** (Dr. V. Seshan, Faculty Mentor) "Innovative Biotechnology Approach to Central Nervous System Diseases" (AYURI) pg. 34

5:15 Presented by: **Amanda Miller**; **Prithvi Kanneganti** and **Andrew Synn** (Dr. V. Seshan, Faculty Mentor) "A Strategic Pharmaceutical Acquisition Proposal for Novartis a Global Pharmaceutical Multinational Corporation" (AYURI) pg. 34

5:30 **Jessica Freitas** and **Miluska Mogrovejo** (Dr. V. Seshan, Faculty Mentor) "Merck: SURP 2013 – Industry Analysis, External Environment, and Technological Assessment for the Development of an Acquisition Strategy (Novavax)" (SURP) pg. 35

Oral Presentation Schedule
Session C, Plaza Classroom 188
Moderator: Dr. Michael Gose

3:30 **Laura De La Torre** (Dr. Kindalee De Long, Faculty Mentor) "A coin from Caesarea Philippi: Julia Domna" pg. 36

3:45 **Eric Kim** (Dr. Ronald Cox, Faculty Mentor) "Displaying Loyalty in the Midst of Rebellion: Jewish Loyalist Coins in the 1st Century" (SURP) pg. 36

4:00 **Anna Tiner** (Dr. Ronald Cox, Faculty Mentor) "A Period of Transition: Early Islamic and Umayyad Coinage" (AYURI) pg. 36

4:15 **Andrew Krawtz** (Dr. Dyron Daughrity, Faculty Mentor) "The History and the Legacy of the Patrick Henry and Thomas Jefferson Religious Debates" (AYURI and SURP) pg. 37

4:30 **Kristin Brisbois** (Dr. Kristen Chiem, Faculty Mentor) "Don't Touch! Examining the Roles of Hands-On Children's Programs in Museums" (Keck Scholars) pg. 37

4:45 BREAK

5:00 **Sarah Attar** (Professor Gretchen Batcheller, Faculty Mentor) "Person/Persona" (SURP) pg. 38

5:15 **Kai Woods Decker** (Professor Gretchen Batcheller, Faculty Mentor) "The Extimate Mind" (SURP) pg. 38

5:30 **Constantine Nicandos** (Drs. Cathy Thomas Grant, Melanie Emelio, Bill Szobody, and Michael Gose, Faculty Mentors) "Research, Scholarship, and *Les Mis*" (Pepperdine Theatre and Center for the Arts) pg. 39

Oral Presentation Schedule
Session D, Rockwell Academic Center 175
Moderator: Drs. Darlene Rivas and Tomás Bogardus

3:30 **Carolyn Dapper** (Dr. Lorie Goodman, Faculty Mentor) "Xenophobia, Whiteness, and Citizenship in the United States" (Global Tides) pg. 39

4:00 **Chad Marxen** (Dr. Tomás Bogardus, Faculty Mentor) "Yes, Safety is in Danger" (SURP) pg. 40

4:15 **Paige Massey** (Dr. Tomás Bogardus, Faculty Mentor) "Reviewing Epistemic Authority" (SURP) pg. 40

4:30 **Steven Lesky** (Dr. Stella Erbes, Faculty Mentor) "iPad and Pedagogy: Exploring the Impact of One-to-One iPad Classroom Integration on Perceived Educator Effectiveness" (Keck Scholars Program) pg. 40

4:45 BREAK

5:00 **Alexandria McCollum** (Dr. Constance Fulmer, Faculty Mentor) "The Art of Perception: An Analysis of How a Desired Public Image Affects One's Actions" (AYURI) pg. 41

5:15 **Aaron Elijah Sims** (Dr. Constance Fulmer, Faculty Mentor) "A New Heroine: Renovation of the Saint Theresa Archetype in George Eliot's *Middlemarch"* (SURP) pg. 41

5:30 **Sam Vaughn** (Dr. Joi Carr, Faculty Mentor) "Hemingway's Flapper Transcending Hollywood Norms: Brett Ashley and *The Sun Also Rises"* (AYURI) pg. 42

Oral Presentation Schedule
Session E, Rockwell Academic Center 178
Moderator: Dr. Stephen Davis

3:30 **Victoria Lekson** (Dr. Stephen Davis, Faculty Mentor) "Influence of Temperature on the Tensile Strength of Spider Silk (*Araneus gemmoides)*" (Keck Scholars Program) pg. 42

3:45 **Jesse Aston** (Dr. Brian Fisher, Faculty Mentor) "What Makes a 'Good' Definition: Analyzing Students' Conceptions of Mathematical Definitions and the Pedagogy of Definitions in Math Education" (AYURI) pg. 43

4:00 **Tanner Heckle** (Dr. Jeffrey Jasperse, Faculty Mentor) "The effect of shear stress, potassium, and adenosine on α-1 adrenergic vasoconstriction of rat soleus feed arteries" (SURB and AYURI) pg. 43

4:15 **Gina Fitzgerald** and **Gabriella Smith** (Dr. Don Thompson, Faculty Mentor) "Cardiovascular Health Among US and Argentine University Students – A Comparative Study of Behaviors and Risk Factors" (AYURI) pg. 44

4:30 **Matthew Fleming** (Dr. Matt Joyner, Faculty Mentor) "Extracts of *Trichostema lanatum* inhibit the growth of gram-positive bacteria and an *Escherichia coli* ΔtolC mutant strain" (SURB) pg. 44

4:45 BREAK

5:00 **Ashley Broadwell** (Dr. Stan Warford, Faculty Mentor) "BACIBeans: A NetBeans Plugin to Concurrent Programs" (AYURI) pg. 45

Performing Arts Session
Surfboard Room, Payson Library
Moderator: Dr. Ryan Board

3:30 **Kevin Enstrom** (Guitar) (Professor Christopher Parkening, Faculty Mentor) Girl with the Flaxen Hair Claude Debussy (1862-1918) Koyunbaba Carlo Domeniconi (b. 1947) pg. 46

3:45 **Niki Fukada** (Violin), accompanied by Andrew Gladbach (Professor Alexander Treger, Faculty Mentor) Violin Concerto in E minor, Op. 64: Felix Mendelssohn (1809-1847)
1. Allegro Molto Appassionato pg. 46

4:00 Pickford String Quartet: **Christopher Hunt** (Violin), **Niki Fukada** (Violin), **Hannah Samson** (Viola), and **Edward Kang** (Cello) (Professor Lisa Dodlinger, Faculty Mentor) String Quartet No. 14 in D Minor, D 810 –"Death and the Maiden", II *Andante con moto*. Franz Schubert (1797-1828) pg. 47

4:15 **Andrew Gladbach** (Piano) (Professor Edward Francis, Faculty Mentor) Wildmung, S 566, arranged by Franz Liszt (1811-1886). Robert Schumann (1810-1856) pg. 48

4:30 Vocal Soloists:
Jane Dominick, accompanied by Andrew Gladbach (Professor Ida Nicolosi, Faculty Mentor) *Romance Silence Ineffable.* Claude Debussy (1862-1918);
Kylee Slee, accompanied by Andrew Gladbach (Dr. Louise Lofquist, Faculty Mentor) "Kaddish" (from *Deux melodies hébraïques*), Maurice Ravel (1875-1937);
Madison Leonard, accompanied by Andrew Gladbach (Dr. Henry Price, Faculty Mentor) *Morire*, Giacomo Puccini (1858-1924) pg. 49

Art Exhibition
Payson Art Gallery, Payson Library
Moderator: Professor Gretchen Batcheller

Sarah Attar (Professor Joseph Piasentin, Faculty Mentor) *Untitled,* 2014, watercolor on paper, 24x18 inches, pg. 51
Ahra Cho (Professor Gretchen Batcheller, Faculty Mentor) *Untitled,* 201e, graphite on paper, 24x24 inches, pg. 51
Ahra Cho (Professor Gretchen Batcheller, Faculty Mentor) *Blue and Orange Still Life*, 2014, oil on canvas, 12x16 inches pg. 52
Fidella Danica (Professor Joseph Piasentin, Faculty Mentor) *Shell*, 2014, watercolor on paper, 18x24 inches, pg.52
Louis Philip DeLaura III (Professor Joshua Dildine, Faculty Mentor) *Untitled*, 2014, mixed media on paper, 18x24 inches, pg. 53
Lydia Gerard (Professor Gretchen Batcheller, Faculty Mentor) *Environmental Factors,* 2014, Acrylic Paint, oil paint on canvas, 5 X 5 feet, pg. 53
Lydia Gerard (Professor Ty Pownall, Faculty Mentor) *Aquatics,* 2014, copper, wire, and rice paper, 12x6x6 inches / 5x4x4 inches, pg. 54
Sarah Gibson (Professor Gretchen Batcheller, Faulty Mentor) *Untitled,* 2014, mixed media on canvas, 36x36 inches, pg.54
Clayton Gustafson (Professor Joshua Dildine, Faculty Mentor) *Untitled*, 2014, mixed media on paper, 18x24 inches, pg. 55
Jay Hartmann (Professor Gretchen Batcheller, Faculty Mentor) *Triptych*, 2014, oil on canvas, 12x16 inches, pg.55
Hayley Presthus (Professor Gretchen Batcheller, Faculty Mentor) *Still Life*, 2014, oil on canvas, 17x11 inches, pg.56
Naomi Purnell (Professor Gretchen Batcheller, Faculty Mentor) *Dawn*, January 2014, mixed media on canvas, 48x36 inches, pg.56
Leanna Schroeder (Professor Ty Pownall, Faculty Mentor) *Untitled,* February 2014, copper wire and mixed media, 8x8x8 inches, pg.57
Leanna Schroeder (Professor Gretchen Batcheller, Faculty Mentor) *Figure vs. Fabric*, 2013, charcoal on paper, 24x18 inches, pg. 57
Sarah Jane Souther (Professor Ty Pownall, Faculty Mentor) *Untitled* , Spring 2014, 30(H)x18x18 inches (Hanging Sculpture- lightweight), copper and paper, pg.58
Sarah Jane Souther (Professor Joshua Dildine, Faculty Mentor) *Untitled*, 2014, acrylic and graphite on paper, 18x24 inches, pg. 58
Alexandra Springer (Professor Ty Pownall, Faculty Mentor) *Untitled,* Spring 2014, 12(H)x8x8 inches (Table Top Sculpture), pg.59
Alexandra Springer (Professor Joshua Dildine, Faculty Mentor) *Now I Understand,* 2014, graphite and oil pastel on paper, 18x24 inches, pg. 59
Kai Woods Decker (Professor Gretchen Batcheller, Faculty Mentor) *Camel*, 2013, oil on canvas, 24x36 inches, pg. 60
Laura Worden (Professor Ty Pownall, Faculty Mentor) *Tornado-esque,* January 2014, wood, 13x9x14 inches, pg. 60

Poster 1 **Poster Session 2:00-3:00**
Hadley Burke, Psychology **Waves Cafeteria**
Hannah Joyner, Psychology
Dr. Tomas Martinez, Faculty Mentor

Relationship Trends in Two Generations
The aim of the present study is to examine the relationship trends between two generations. Specifically, the relationship qualities of children with non-divorced parents versus the relationship qualities of children with divorced parents were observed. We believe by examining the relationship traits demonstrated by children with divorced parents that those traits are more negative than those relationship traits demonstrated by children with non-divorced children. Accordingly, we conducted an online survey using the Pepperdine University Sona System, collecting the responses of 100 participants. The 100 participants of this study were from a small, private Christian university in Southern California. In this study, participants were questioned about a variety of relationships, including parental, romantic, and friendship. We believe this information may be useful in determining how to strengthen interpersonal relationships, support family and marital therapy, and reinforce bonds between parent and child.

Poster 2
Elizabeth Cabadas, Psychology
Dr. Tomas Martinez, Faculty Mentor

Developmental Assets and Ethnic Identity as Predictors of Thriving in Hispanic Adolescents
This study will examine the relationship between ethnic identity, acculturation, stress, trauma, and individual-oriented, as well as social-oriented achievement motivation in youth. The purpose is to examine whether or not ethnic identity, acculturation, stress, and trauma affect individual-oriented and social-oriented achievement motivation. More specifically, researchers hope to gain a better understanding of whether or not those with higher ethnic identity and acculturation will have higher levels of individual-oriented and social-oriented achievement motivation; attributing individuals' higher success rate in life.

Poster 3
Christopher Hunt, Psychology
Drs. Elizabeth Krumrei and Janet Trammell, Faculty Mentors
Political Science Honors Program

The Interaction of Semantic-Relatedness and Emotion: An Immediate Free Recall Task
The purpose of this study was to examine what effect the combination of organization (e.g., semantic-relatedness) and emotion have on recall. We hypothesized that emotion-induced priority binding mechanisms (Mackay et al., 2004) could impair relational processing of gist traces (Brainerd & Reyna, 2002), thus leading to reduced recall of a semantically-related emotional list compared to a semantically-related neutral list. Seventy-two undergraduate participants viewed four 20-item pure word lists: a semantically-related neutral list, a semantically-related emotional list, an unrelated neutral list, and an unrelated emotional list. Recall was tested immediately after each presentation. An ANOVA revealed a significant interaction between emotion and semantic-relatedness, such that emotion impaired recall in semantically related but not unrelated lists. There was also a main effect of semantic-relatedness, such that semantically-related lists were recalled better than an unrelated lists, and a main effect of emotion such that neutral lists were overall recalled better than emotional lists. These findings indicate that emotion may impair memory for the overall meaning of a message, which

may be relevant to fields like education and advertising.

Poster 4
Brian Cheah, Sports Medicine
Terah Condrey, Sports Medicine
Josh Harvey, Sports Medicine
Christopher Hunt, Psychology
Alessandra McDowell, Psychology
Angel Tseng, Psychology
Drs. Priscilla MacRae and Janet Trammell, Faculty Mentors
Dean's Research Grant and Sports Medicine Program Enrichment Funds

Steps Walked is Positively Correlated with Reasoning and Memory in Older Adults

The graying of America is well-documented with the percentage of older adults increasing from 13% in 2010 to over 20% in 2050 (Vincent & Velkoff, 2010). A major challenge is the potential increase in healthcare demands due to age-related chronic diseases and disabilities. A potential solution to this impending predicament is regular physical activity, which reduces the risk of cardiovascular diseases, diabetes, and some cancers, as well as prevents falls and maintains independence in the later years of life. With aging there is also a nearly linear decline in measures of fluid intelligence and executive function beginning in the thirties, despite the fact that overall acquired knowledge (known as "crystalized intelligence") continues to improve through the first five decades of life (Salthouse, 2012). However, recent evidence suggests that regular physical activity is associated with cognitive benefits, and could slow or even reverse this mental decline, reducing the risk for dementia and improving cognitive function in older adults (Colcombe, 2003; Spirduso, Francis, & MacRae, 2005). The purpose of this study was to examine the relationship between daily physical activity, sleep and cognitive function in older adults. Participants were 65 years of age or older, living independently in the community with no diagnosed cardiovascular or neurological diseases. All participants passed a cognitive performance screen, i.e. scored >24/30 on the Mini Mental Status Examination (MMSE). Twenty participants (15 women, 5 men, Mage = 76.3, range 65-88 years of age) met the above criteria, completed a health, physical activity, and sleep questionnaire and were fitted with an activity monitor worn on their wrist (Fitbit Flex) during Session 1. Participants were instructed to wear the Fitbit Flex at all times for 24 hours, after which they returned to complete the cognitive assessments (Session 2). At the second session, the monitors were collected and physical activity (steps taken and active minutes) and sleep (minutes asleep, minutes awake, number of awakenings) data were downloaded. The participants also completed four assessments of cognitive function:

1. Reasoning (Raven's Matrices)
2. Short Term Memory (immediate recall of word lists)
3. Perceptual Speed (a pattern comparison test), and
4. Working Memory (assessed with a running memory letter task).

Despite a small sample size, significant positive correlations ($p < .05$) were found between steps taken and performance on both the matrix reasoning task ($r = 0.47$) and short term memory task ($r = 0.55$), such that those who took more steps demonstrated greater cognitive functioning. Similarly, very active minutes correlated with reasoning ($r = 0.43$, $p = .06$) and short term memory ($r = 0.55$; $p < .05$). Both steps taken and active minutes showed a positive, but non-significant, relationship with perceptual speed and working memory. Correlations between sleep and cognitive function were low and not significant. Future studies should include a larger sample and monitor physical activity and sleep across a longer time interval. In conclusion, higher levels of physical activity were correlated with better cognitive function in healthy community-dwelling older adults.

Poster 5
Alessandra McDowell, Psychology
Dr. Janet Trammell, Faculty Mentor
Academic Year Undergraduate Research Initiative

How Handedness Direction and Consistency Relate to Declarative Memory Task Performance
While previous research has demonstrated that significant episodic memory differences exist between left and right as well as consistent and inconsistent handers, these differences are contradictory from study to study (Lyle et al., 2012). Furthermore, little inquiry has been done regarding semantic memory ability among left-handers in comparison to their right-handed counterparts. In order to examine potential long-term memory performance differences between left and right-handers, as well as consistent and inconsistent handers, 106 college students completed a handedness inventory and episodic and semantic memory tasks. The results indicated that left-handers had significantly better semantic memory recall than right-handers, a new finding that suggests cerebral lateralization of memory performance and of handedness direction may be independent of one another.

Poster 6
Jane Dominick, Vocal Performance
Dr. Gary Cobb, Faculty Mentor
Academic Year Undergraduate Research Initiative

Transcribing Early Italian Madrigals with Sibelius Music Software
The purpose of this project was to transcribe Early Italian Madrigals by Paolo Quagliati into modern form. Thus, making it available to print, perform, and study by a modern audience. The transcriber of the music also gained and will include a historic understanding of early musical notation of the Early Italian Madrigal.

Poster 7
Matthew Finley, English Literature and Art History
Dr. Julianne Smith, Faculty Mentor
Academic Year Undergraduate Research Initiative

Troublesome Restorations: Editing Janauschek's *Bleak House* Adaptation
As a serial novel immediately popular upon its publication, Charles Dickens' *Bleak House* generated a range of contemporaneous responses. One of the ways that this reaction materialized was through a group of plays that were performed before the novel had been completely published. This project seeks to standardize the manuscript of one of these plays in order to prepare it for publication and analysis in a wider context. In performing this editorial task, the researcher encounters difficulties such as antiquated word use and omitted phrases and sentences. Ultimately, the editorial task is to determine how far one goes in altering the manuscript in order to make it useful to another researcher.

Poster 8
Steven Fleming, Biology
Dr. Donna Nofziger Plank, Faculty Mentor
Summer Undergraduate Research in Biology

The Regulatory effect of semaphorin 7A on proliferation and migration in human umbilical vein endothelial cells

Semaphorin 7A (SEMA 7A), a factor originally identified as regulating axon growth, has recently been implicated as a pro-angiogenic factor. The molecular mechanisms for this ability to stimulate angiogenesis have not been identified. This study examines if SEMA 7A can have a direct effect on vascular endothelial cells or whether it can indirectly induce angiogenesis through stimulation and recruitment of macrophages as has been suggested. Using human umbilical vein endothelial cells (HUVECs), the ability of SEMA 7A to affect proliferation and migration was examined. HUVECs were exposed to SEMA 7A directly or indirectly using conditioned media collected from macrophages exposed to SEMA 7A and a cell proliferation assay was performed. Additionally, the ability of the cells to migrate was also measured using a transwell assay. Direct exposure of HUVECs to plate-bound SEMA 7A resulted in a significant decrease in cell proliferation. Preliminary data also suggest that direct exposure results in a slight inhibitory effect on the migration of HUVECs. SEMA 7A treatment of macrophages did not result in the production of factors that stimulate HUVECs to proliferate. Additionally, our results suggest that macrophages exhibited migration stimulation in response to SEMA 7A.

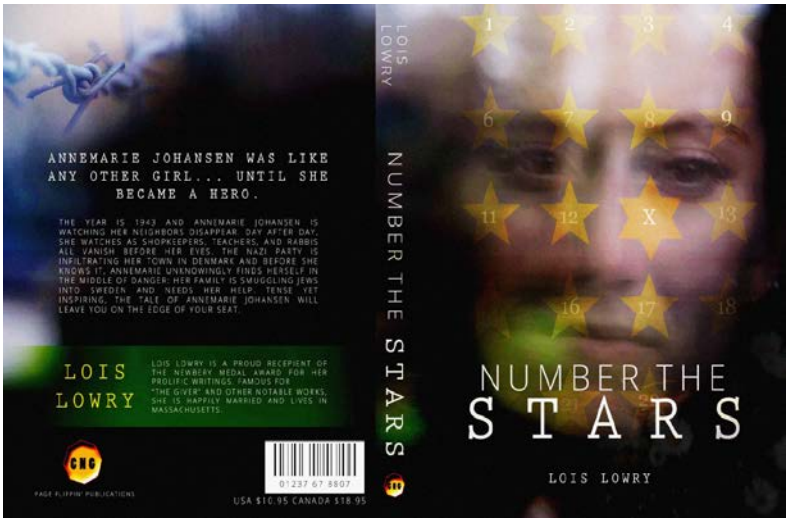
Poster 9
Arthur Garnica, Psychology
Vincent Quach, Biology
Dr. Lee Kats, Faculty Mentor

A test of the effect of ultraviolet-B radiation on behavior in the poison dart frog, *Dendrobates tinctorius*, during the larval stages

Exposure to ultraviolet-B radiation can harm and negatively affect amphibians and as a result many species of anurans, including dendrobatids, tend to avoid extended periods of exposure in their terrestrial stages. In this experiment, we observed the responses of larval *Dendrobates tinctorius to* ultraviolet-B radiation. We hypothesized that avoidance behavior would be present when a tadpole was exposed to direct ultraviolet-B radiation. Frog larvae were exposed to visible light, UV light and control conditions. We monitored the percent of time larvae spent in shelter. The duration the larvae were out of a shelter and in direct exposure was recorded. Our data suggest that dendrobatids in their larval stages of development do not tend to avoid ultraviolet radiation in a laboratory experiment. ($P > 0.05$). Dose of UV radiation may have been too small to elicit a response or water may have served as a UV filter. Future experiments will examine similar responses to UV in newly metamorphosed frogs.

Poster 10
Chelsea Gest, Advertising
Professor Dana Zurzolo, Faculty Mentor

***Number the Stars*, 20"x11" photo composite**



Poster 11
Jacob Gonzales, Biology
Dr. Thomas Vandergon, Faculty Mentor
Academic Year Undergraduate Research Initiative

Making Sense of Animal Genome Size Standards

Genome size is defined as the DNA content in one set of chromosomes reported as the C-value in pictograms (pg). Genome size analysis can provide critical information for comparing evolutionary, species, and population relationships. Currently, animal C-values ranging from 0.02 to 132.83pg are available for approximately 5000 species, but a majority of animal C-values remain unmeasured. C-value variation may reflect environmental influence, evolutionary history, ploidy level, and cell or body size. Currently C-value variation does not correlate reliably to most of these hypothesized factors. This may be due to scarce data, however, a confounding problem is that different genome size studies often report different results even for the same species! Why would that be? Two sources of variation or error are probable; 1) the technique used, and 2) the dependence upon a "known" standard animal C-value to determine an unknown C-value. Currently, about a dozen animals are used as standards for genome size analysis. Unfortunately, for the common technique known as Flow Cytometry (FCM), the genome sizes of these "standards" do not correlate, meaning that C-values based on different standards are not the same. It is difficult to rely on reported data when standard values are not reproducible. The goal of this study is to identify a small set of common, reliable animals to use for genome size standard correlation using FCM. For FCM we isolate nuclei from blood or tissue in Kreb's Ringers containing 0.1% Triton X-100, stain with Propidium Iodide and then measure fluorescence on a Quanta SC-MPL system. We measured nuclei from chicken, cow, *Drosophila*, goldfish, horse, yellow mealworm, and

zebra fish. Of these, only three matched reported C-values: Cow, 3.908pg, Drosophila, 0.165pg and Horse, 3.322pg. We continue work toward finding additional animal standards that cross correlate to chicken and Drosophila, thus forming a globally useful standard C-value set.

Poster 12
Imani Goodman, 3/2 Engineering
Dr. Rebecca Kim, Faculty Mentor
Keck Scholars Program

Family Dynamics: Exploring the Relationship Between Facebook Usage Among Families and the Likelihood of Familial Strife
The purpose of this study was to determine whether or not there is a correlation between perceived familial strife and Facebook friend status between Pepperdine teens and their parents. To determine this correlation I collected data on two groups (one friends with their parents on Facebook, and the other not), that marginalized their familial dynamic based on specific attributes. The 4 attributes I used were transparency, trust, healthy communication, and comfort. With the data I found that there are correlations between perceived familial strife depending on the status of friendship on Facebook. For the Pepperdine teens that are friends with their parents on Facebook they showed high incidents of trust, comfort, and transparency, and low incidence of non-healthy communication. For the Pepperdine teens that are not friends with their parents they had low incidents of trust, comfort, and transparency, and high incidents of conflict. So yes amongst Pepperdine teens there is a positive correlation between familial strife and lack of Facebook friendship within a family, and there is a negative correlation for familial strife and having Facebook friendship within a family.

Poster 13
Matthew Gribble, Chemistry
Dr. Jane Ganske, Faculty Mentor
Undergraduate Research Fellowship and Academic Year Undergraduate Research Initiative

Determination of Volatile Carbonyl Compounds in University Weight Room Air Using Passive Sampling
Volatile organic compounds in indoor environments may adversely impact human health. Airborne carbonyl compounds in a university weight room were identified and quantified using passive sampling by conventional 2,4-dinitrophenylhydrazine (DNPH) derivatization followed by separation using high performance liquid chromatography (HPLC) with UV visible detection. Noteworthy aldehydes include formaldehyde, acetaldehyde, valeraldehyde, hexenal, and hexanal measured at concentrations ranging from 10.7-21.9 mg/m3, 1.6-2.0 mg/m3, 4.4-6.6 mg/m3, 7.6-18.1 mg/m3 and 4.2-9.7 mg/m3, respectively. Other C4-C10 aldehydes and ketones were identified in the weight room air but not quantified.

Poster 14
Francesca Guglielmi, Psychology
Dr. Tomas Martinez, Faculty Mentor

An Exploration of Gender Roles and Communication in Emerging Adulthood
What did you say? A common expression uttered by males and females reflects a potential lack of understanding between the sexes. Gender and communication is not a new area, but it is an under

researched area within emerging adulthood. Traditionally, development progressed from adolescence to young adulthood, but changes in today's modern society have altered the typical pattern of "growing up". High school graduates are no longer forced into adult roles—careers and marriage—but are able to spend their late teens through mid-twenties exploring a variety of opportunities (Arnett, 2007). As a relatively new developmental stage, emerging adulthood has not been studied as in depth as adolescence and adulthood. Communication differences abound in these two groups, so it is reasonable to hypothesize that similar differences persist throughout` emerging adulthood. Some research claims these differences arise because male and female are two different cultures (Tannen, 1990), while others propose that socialization is the basis for this male-female miscommunication (Kunkel & Burleson, 1999). A result of socialization, masculinity and femininity develop through reinforcement of gender appropriate behavior (Maccoby, 2000). It is therefore important to consider how gender roles might affect male-female communication. An online survey was administered to students from Pepperdine University. The survey consisted of the Bem Sex Role Inventory (1974), demographic questions, and six visual stimuli. Participants were asked to subjectively interpret the images by creating a short vignette detailing their perceptions of the images. It was expected that men and women would interpret the images differently. In addition to biological gender, gender roles were assessed to see if any correlation exists between level of masculinity, femininity, and/or androgyny and interpretations of the visual stimuli. This research did not have the means to explore this topic more in depth, but it would be beneficial to further explore gender and communication in emerging adulthood from multiple perspectives, including ethnicity, relationship status, birth order, sexual orientation, religion, etc. Continued research could potentially result in "decoding" or translating these male and female languages that seem to so often be misunderstood.

Poster 15
Alexis Carrington, Biology
Dr. Matt Joyner, Faculty Mentor

A seed germination inhibitor from *Araucaria columnaris* is absent in *Pinus edulis*

Due to plant's immobile nature, they have evolved efficient chemical methods to defend themselves from predators and to enable communication with other organisms. A previous experiment has isolated 4',4' ',7,7' '-tetra-O-methylcupressuflavone, a biflavonoid from the *Araucaria columnaris* (Cook pine), and confirmed its inhibitory activity against seed germination. These findings supported the hypothesis that TMCF contributed to reduced plant growth in the area surrounding an *A. columnaris* tree. We also observed reduced plant growth under a *Pinus edulis* (Colorado pine) on campus of Pepperdine University. This observation led us to hypothesize that TMCF might also be contributing to reduced plant growth in *P. edulis* tree. To test this hypothesis, we extracted the compounds from *P. edulis* needles and analyzed them using Liquid Chromatography-mass spectrometry (LCMS) in order to detect the presence of absence of TMCF. The LCMS analysis indicated that TMCF was not present in the needles of *P. edulis*. This result led us to reject our hypothesis that TMCF is contributing to the observed reduced plant growth under the *P. edulis* tree. Our findings show that even though we observed a similar reduction in plant growth beneath *A. columnaris* and *P. edulis* trees, they probably use different mechanisms to achieve this effect.

Poster 16
Selyna Jacobs, Biology
Professor Chris Stivers, Faculty Mentor
Keck Scholars Program

Television's Effects on the Tolerance of Homosexuality
The purpose of this study was to investigate whether or not television can influence viewers' opinions of homosexuality. My research question was, "Does watching television containing homosexual characters influence tolerance of homosexuality among Pepperdine University Seaver Undergraduate College students?" Tolerance was defined as a fair, objective, and permissive attitude towards a group who's different from one's own. I was looking for a positive correlation between the number of television shows watched with a LGBT character and positive attitudes towards homosexuals. I was also looking for a correlation between perceived positive or negative behaviors of the LGBT character from the television shows and attitudes towards homosexuals.

Poster 17
Christopher Krepich, Religion
Dr. Dyron Daughrity, Faculty Mentor
Summer Undergraduate Research Program

Different Approaches to the Role of the Bishop of Rome in the First Four Centuries
The most divisive issue in the modern Christian world stems from each particular church's stance on the role and authority of the Bishop of Rome. Catholic, Orthodox, and Protestant scholars all explain the phenomenon of the Roman Pope in their own distinct way. I seek to discover and engage arguments and explanations written by prominent Catholic, Orthodox, Evangelical, and Anglican writers. Ultimately, I concluded that the Roman Catholic view is most likely to be true.

Poster 18
Daniel Lander, Mathematics
Dr. Timothy Lucas, Faculty Mentor
Summer Undergraduate Research Program and Undergraduate Research Fellowship

Supervised STM Image Segmentation of Self-Assembled Molecule Layers
Self-Assembled monolayers (SAMs) of cage molecules are useful in the construction of nanostructures and nanodevices. For the purposes of nanofabrication, it is useful to monitor the formation of defects in these SAMs and differences in molecular lattice orientation. Through autonomous and supervised image processing, this project aims to segment STM images of SAMs of cage molecules into domains of similar lattice orientation. Due to the translation invariance of the power spectra of the Fourier domain, it is possible to obtain a measure of the similarity or difference between the lattice orientations in two regions in an image and implement traditional clustering methods such as K mean and spectral clustering or more advanced methods such as Markov random fields. The results from the application of these methodologies are promising and could possibly replace manual segmentation as the industry standard.

Poster 19
Amy Li, Chemistry
Dr. David Green, Faculty Mentor
Summer Undergraduate Research Program, Academic Year Undergraduate Research Initiative, and Undergraduate Research Fellowship

Reduced sample size and improved extraction and recovery of tetrodotoxin from the California newt, T. *torosa*, with quantitation by HPLC-FLD
Tetrodotoxin (TTX) is a well-known potent neurotoxin and is the principle toxin of puffer fish poisoning. TTX is also found in a number of other organisms, including the California newt, *Taricha torosa*. The identification and quantitation of TTX and its analogs are important for understanding its biosynthesis for defense and other environmental cues. We have developed a method for sampling which minimizes disturbances to newt populations and obviates the need to 1) collect and remove from natural stream pools, 2) disrupt breeding, 3) sacrifice animals, and 4) inflict a large wound. In addition, we have optimized the extraction and recovery of TTX from the animal tissue over published methods. The reduced sample size capitalizes on the improved HPLC-FLD method developed in this laboratory in 2011. We present results of the determination of TTX isolated from 2 mm skin punch samples of *T. torosa* sampled in the wild from streams in southern California.

Poster 20
Junyuan Lin, Mathematics
Dr. Timothy Lucas, Faculty Mentor
Summer Undergraduate Research Program, Academic Year Undergraduate Research Initiative, and Undergraduate Research Fellowship

A Contagion Model of Emergency Airplane Evacuations
Motivated by the Asiana Flight 214 crash in San Francisco this summer, this project focuses on modeling an emergency airplane evacuation. Our models are based on the Particle Swarm Optimization (PSO) algorithm, where each agent's position is compared to a fitness function that describes the current environment. Each agent moves according to its knowledge of its own previous best position and the group's current best position. The static environment is modeled by a potential function that describes the layout of the airplane that includes the exits and physical barriers such as the seats. We model the interactions within the swarm by an attraction-repulsion force. Finally, we chose to incorporate the spread of an emotion such as fear or panic that influences the behavior of agents within the swarm. Our project includes an analysis of how the parameters and scaling of different parts of the model affect the swarm behavior. We also compared simulations with and without fear to study the impact of emotion on individual behavior as well as the ability of the entire group to safely exit the aircraft. We hope that this will lead to increased understanding of how panicked crowds behave in evacuation situations and that this will lead to better, safer evacuation designs.

Poster 21
John MacBeth, Biology
Dr. Donna Nofziger Plank, Faculty Mentor
Summer Undergraduate Research Program and Academic Year Undergraduate Research Initiative

Lysophosphatidic Acid Stimulates Lymphangiogenesis in Human Lymphatic Endothelial Cells
Lymphangiogenesis is the process by which new lymphatic vessels sprout and grow from existing vessels whether under developmental, immunological, or cancerous conditions. Proper lymphatic vessel

formation is important in working alongside normal angiogenesis in order to help regulate the body's tissue fluid as well as aid in immunosurveillance. Various factors regulate lymphangiogenesis such as members of the vascular endothelial growth factor family (VEGF). Another factor that has recently been identified to play a role in lymphangiogenesis is the bioreactive phospholipid lysophosphatidic acid (LPA) however the molecular mechanism by which LPA regulates lymphangiogenesis has not been well characterized. In this study, human lymphatic endothelial cells (HLECs) were treated with LPA in the presence or absence of VEGF and the late stage effects of lymphangiogenesis were examined. Preliminary evidence suggests that VEGF and LPA induces proliferation in HLECs, however there is no increase in this stimulation when both factors are added together. A Matrigel tube formation assay revealed that LPA induces an increase in cellular extensions as well as in tubule length as compared to the control.

Poster 22
Brianna Manes, Biology
Dr. Jay Brewster, Faculty Mentor
Summer Undergraduate Research Program and Undergraduate Research Fellowship

Nanoparticle exposure activates an inositol triphosphate receptor-dependent elevation of reactive oxygen species and apoptosis in human alveolar lung cells
The signaling of cell stress in response to organelle dysfunction, toxin exposure, and mutation is complex; generating responses that can include adaptation, or in severe cases, cellular apoptosis. Nanoparticles (20-100 nm diameter) have been shown to induce cell stress in lung cells, potentially identifying a cause of lung disease in areas with high levels of particulate-based air pollution. This study examines the effect of carbon black (CB) and titanium dioxide (TiO2) nanoparticles on stress signaling and apoptosis in cultured A549 human alveolar epithelial cells. CB and TiO2 powders were dispersed throughout a buffered solution containing bovine serum albumin using probe sonication. Particle size analysis was performed, revealing stable nanoparticle complexes ranging from 75 nm for CB and from 172 nm for TiO2. A range of nanoparticle doses between 5 and 100 µg/mL were evaluated for toxicity using a visual inspection for DAPI-stained apoptotic nuclei. This assay revealed a peak of cell death activation at 75 µg/mL for CB and 100 µg/mL for TiO2 though the CB was more effective at inducing apoptosis than TiO2. A live/dead-cell fluorescent protease assay confirmed CB to significantly decrease cell viability. Further studies revealed acute CB exposure, but not TiO2 exposure, to induce reactive oxygen species (ROS). Interestingly, inhibition of nanoparticle-induced calcium release by the inositol triphosphate receptor (ITPR) inhibited ROS production, suggesting a role for ER Ca2+ stores in activating ROS production. Further research is underway to determine which stress/apoptotic signaling pathways are induced downstream of nanoparticle exposure.

Poster 23
Ashley Martin, Psychology
Dr. Jennifer Harriger, Faculty Mentor
Keck Scholars Program

Conformity and How it Relates to Eating Patterns
This study examines how the eating habits and behaviors of individuals are influenced by another person's presence. Prior research has shown that participants are more likely to conform to eating patterns and behaviors of others in a large group; however this particular study focuses on the influence of just one other person. Twenty-nine females, aged 18-22, from Pepperdine University participated in a study designed to assess whether participants were more likely to conform to a

confederate's healthy eating patterns. It was hypothesized that participants, when presented with a variety of foods (both healthy and unhealthy), would be more likely to conform to the healthy eating patterns of the confederate in the room. Participants were divided into two different groups: a control group where a confederate was not present to influence a participant's eating habits, and an experimental group where a confederate engaged in "fat talk" and ate only healthy food options. Results indicated that participants in the experimental condition were more likely to conform to the confederate's healthy eating, while participants in the control group were less likely to eat the healthy food choices. It is important to continue research in this topic in order to further examine the relationship between social conformity and eating patterns.

Poster 24
Maria Martinez, Mathematics
Dr. Jennifer Harriger, Faculty Mentor
Keck Scholars Program

Level of Psychological Stress in College Students with Relation to Academic Major
Psychological stress is experienced when an individual feels incapable of coping with environmental demands or the impression that these demands tax and surpass his or her adaptive capacity (Sheldon, Kessler, & Gordon, 1995). Stress can manifest itself in a variety of ways, including emotional instability and physical symptoms. College students live under demanding conditions on account of the pressure they have to compete and achieve. This can contribute to stress and also lead to unhealthy behaviors. This study intended to create a comprehensive ranking of majors based on three types of psychological stress (environmental, psychological and biological) exerted on students. Applying theory and using validated measures, a ranking of majors is proposed on the grounds that it is an approximation of the actual levels of stress experienced by students. Results indicate that the three majors with the highest levels of stress are biology, communication, and theatre; and those with the lowest are psychology, mathematics, and music.

Poster 25
Alexandria McCollum, Chemistry and English
Dr. Joseph Fritsch, Faculty Mentor
Undergraduate Research Fellowship

Investigating the effect of strategically placed atoms on the preparation of biodegradable plastic
Varying the electronic properties of a supporting ligand is a common approach for optimizing catalytic behavior in many systems. In this research, strategically placed fluorine and chlorine atoms were introduced into ketoimines to assess their effect on the preparation of biodegradable plastic. Through the reaction of 1,3-diketones and amines, two new ketoimines were prepared and characterized with techniques at Pepperdine and collaborating institutions. The compounds were used to prepare ion pair aluminum complexes which were successful in preparing a biodegradable plastic, poly-lactic acid. The isolated polymeric materials had high molecular weights with moderate poly-dispersity index values.

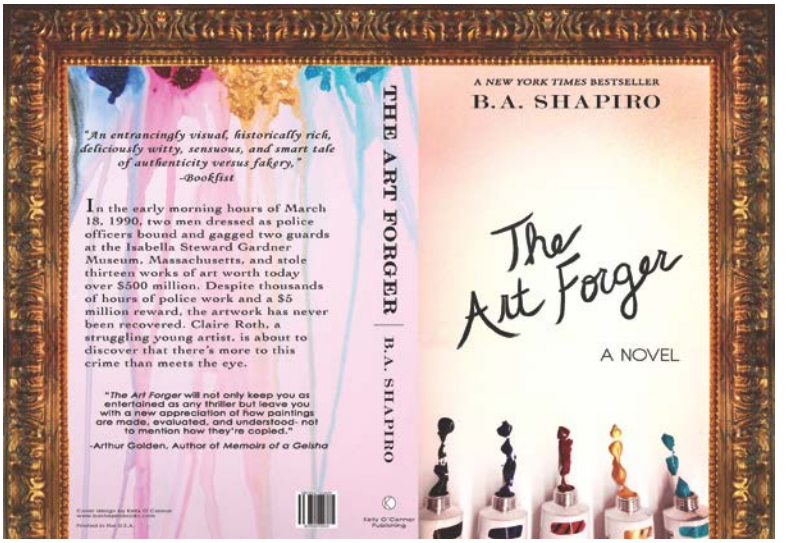
Poster 26
Jae Eun Min, Chemistry and Nutritional Science
Dr. Matt Joyner, Faculty Mentor
Undergraduate Research Fellowship

Isolation of Antibacterial Compounds from *Artemisia californica*

The Chumash Native Americans of Southern California have well-documented traditions of using plants for medicinal purposes. If a specific plant has traditionally been used by Chumash for the treatment of cuts, wounds and infections, it may contain chemicals with anti-bacterial properties. One plant that fits these criteria is *Artemisia californica* (coastal sage). Because of the widespread use of antibiotics over the past sixty years bacteria are evolving greater resistance to known antibiotics, but unfortunately the rate of antibiotic discovery has diminished during the past twenty years. Therefore, novel and effective antibiotics are essential for the continued treatment of bacterial infections. A target-specific anti-bacterial assay was used to identify compounds from *A. californica* that inhibited bacterial growth by inhibiting the FabI enzyme. Compounds which demonstrate decreased potency against a bacterial strain over-expressing FabI compared to a control strain have been isolated and characterized. The decreased activity in the over-expressing FabI strain suggests that the mode of action of this flavonoid is FabI inhibition.

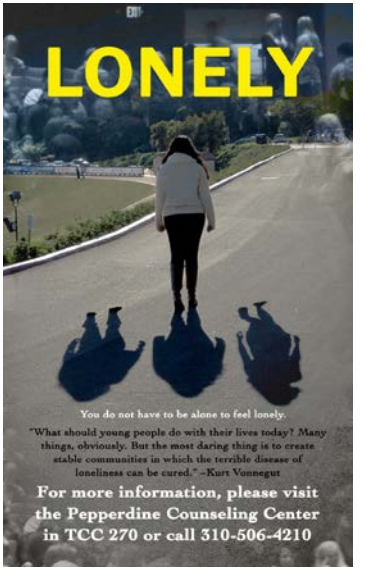
Poster 27
Kelly O'Connor, Intercultural Communications and Multimedia Design
Professor Dana Zurzolo, Faculty Mentor

The Art Forger: A Novel



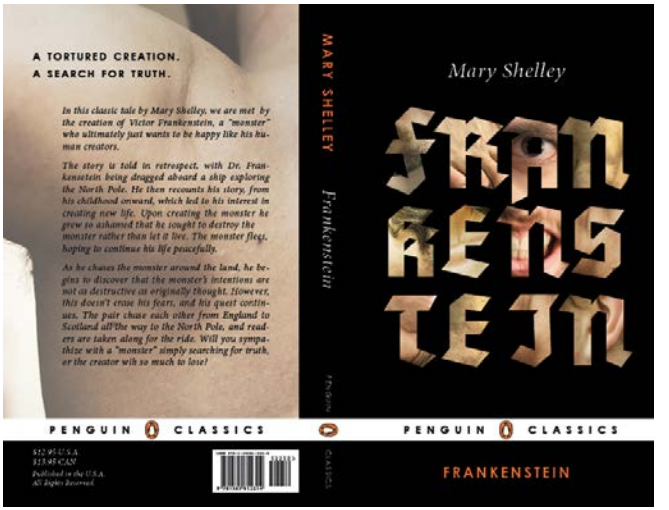
Poster 28
Samantha Olson, Computer Science and Mathematics
Professor Dana Zurzolo, Faculty Mentor

Lonely



Poster 29
Brandon Scheirman, Interpersonal Communication
Professor Dana Zurzolo, Faculty Mentor

Frankenstein



Poster 30
Logan Schmitz, Chemistry
Dr. Joseph Fritsch, Faculty Mentor
Summer Undergraduate Research Program, Academic Year Undergraduate Research Initiative, and Undergraduate Research Fellowship

Making biodegradable plastic with unusual aluminum ion pair complexes
A series of aluminum ion pair complexes were prepared through reaction of Schiff base ketoimines with aluminum triphenoxide. The aluminum ion pair complexes were characterized with techniques at Pepperdine and collaborating institutions. These aluminum complexes were unusual because they included a bis-ligated aluminum cation in distorted octahedral coordination geometry and a tetraphenoxide aluminate anion with tetrahedral coordination. The ion pair complexes were effective in preparing a biodegradable plastic, poly-lactic acid, through the polymerization of L-lactide and racemic-lactide at 100 °C for 18 hours. The isolated polymeric materials had high molecular weights with moderate poly-dispersity index values.

Poster 31
Rosemond Travis, Psychology
Dr. Cindy Miller-Perrin, Faculty Mentor
Academic Year Undergraduate Research Initiative

The Association between Parent and Children's Knowledge and Attitudes Toward Mental Illness
This study examined the influence that parents have on their children's knowledge and attitudes toward mental illness. Previous studies suggest that children may not have a complete knowledge of mental illness and may perceive it negatively. Researchers hypothesized that parents and children would have similar perceptions of mental illness and that parents may have an influence in socializing children to have certain views about mental illness. Data was gathered from 24 pairs of students and parents from a middle school and high school. Both parent and child participants completed both a knowledge and attitude assessment and responses of parents were compared to responses of children. The results showed that children tend to have incomplete knowledge of mental illness and that there is a significant difference in the knowledge and attitudes that children and parents have toward mental illness, but that parental attitudes may influence some children. The results indicate that a larger, more diverse sample should be gathered to examine additional age and gender differences.

Poster 32
Agustin Vargas, Biology
Dr. Jay Brewster, Faculty Mentor
Summer Undergraduate Research in Biology

Assessment of cell viability of Bhk-21 cells at low and high concentrations of Tunicamycin after transfection of Bcl-2 ER localized proteins
It is known that the B-cell lymphoma (Bcl-2) family of proteins has the ability to signal for apoptosis under stressful conditions to the cell, as well as to arrest apoptosis. The ability for Bcl-2 proteins to do this is due to their homology and their interaction with proteins such as the inositol 1,4,5-triphosphate (IP3) receptor, a calcium channel in the endoplasmic reticulum (ER). Blocking the IP3 receptor with 2-Aminoethoxydiphenyl borate (2-APB) has proven to be sufficient to block apoptosis at low levels of ER stress. In this study, Bcl-2 was used in an attempt to block apoptosis at low levels of ER stress. ER localized Bcl-2 (ER-Bcl-2-GFP) plasmid constructs were used to transfect Baby Hamster Kidney

(BHK21) cells then exposed t plow and high levels of ER stress in an attempt to replicate the rescue 2-APB had on the temperature sensitive hamster firbroblasts (tsBN7). It was shown that the over expression of ER-Bcl-2 was able to sufficiently rescue tsBN7 cells from apoptosis under low levels of ER stress through temperature shifts. Also, it was proven that BHK21 cells were sufficiently rescued by 2-APB (50μM) under low levels (30nM) of Tunicamycin induced ER stress. Though, after transfections, and 36 hour exposure to low (20nM-30nM) and high (200nM) levels of Tunicamycin induced apoptosis, ER-Bcl-2 was not able to significantly rescue BHK21 cells. Albiet, there was a trend in some of the trials, but no replicates allow for significance

Poster 33
Viviana Vasquez, Psychology
Dr. Jennifer Harriger, Faculty Mentor
Academic Year Undergraduate Research Initiative

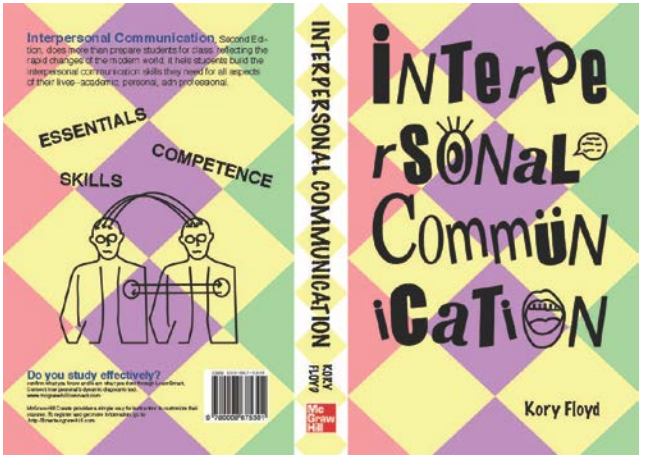
Volunteer Activities and Self-Esteem
While prior studies have found a relationship between volunteerism and self-esteem, results are inconclusive for college students. The current study examined students attending a small, private, Christian liberal arts college to determine whether students who engage in volunteer activities with direct contact with the individuals they are serving would report higher levels of self-esteem. Results indicated that there was no significant difference between the amount of direct contact a participant engaged in at his/her volunteer site and his/her self-esteem. However, results demonstrated that females report higher levels of direct contact at their volunteer sites and are more likely to report that their volunteer experience was rewarding compared to males.

Poster 34
Natalie Viklund, Advertising
Professor Dana Zurzolo, Faculty Mentor

From Pen To Paper

Poster 35
Yushuang Wu, Interpersonal Communication
Professor Dana Zurzolo, Faculty Mentor

Interpersonal Communication



Poster 36
David Kang, Sports Medicine
Co-authors: Hannah Choe and Melinda Marchiano
Professor Stephen Davis, Faculty Mentor
Keck Scholars Program

Physiological Performance in Thinned vs. Non-thinned *Ceanothus spinosus*, *Ceanothus megacarpus*, and *Malosma laurina* of the Santa Monica Mountains

In fire prone environments, such as Southern California, native vegetation is often artificially thinned around structures in order to reduce fuel load and protect buildings from fire damage. We tested the hypothesis that thinning of chaparral shrubs increased their physiological performance in comparison to neighboring un-thinned plants. As experimental subjects, we chose three dominate chaparral species in coastal exposures of the Santa Monica Mountains: green bark ceanothus (*Ceanothus spinosus*), big pod ceanothus (*Ceanothus megacarpus*) and laurel sumac (*Malosma laurina*). We compared thinned to un-thinned water status (pre-dawn and mid-day water potential using a Scholander-Hammel pressure chamber), water use rates (stomatal conductance to water vapor diffusion using a field portable gas-exchange system), and photosynthetic rates (also using a gas-exchange system). We also compared the mechanical strength of stems and leaves using a mechanical testing device (Instron 5544A). There was no difference in mechanical strength between treatments of either leaves or stems; however, we found that thinned plants had significantly higher photosynthetic rates (ranging between 5 to 8 µmol CO2 /m2 s), higher stomatal conductance rates (ranging between 43 to 149 mmol H2O / m2 s) , and elevated water potentials (ranging between 1.2 to 2.1 MPa). These significant differences illustrated that the thinned chaparral were in fact performing better than the non-thinned chaparral species; therefore, the effect of thinning chaparral directly correlates with improving the thinned chaparral's performance, presumably because there is less competition for water.

Oral Presentation Session A
Plaza Classroom 190

Wil Fisher, Political Science and International Studies **Session A 3:30**
Dr. Joel Fetzer, Faculty Mentor
Political Science Honors Program

Public Attitudes toward Bike Lanes in New York City
As bicycles gradually become an established form of transportation in the United States, planners and policymakers need new evidence to determine how best to expand bicycle infrastructure. Using logistic regression analysis of 2012 public opinion data from New York City, this article explores the demographics behind support of bicycle lanes. Due to an absence of literature on public opinion of bike lanes, it examines a breadth of variables in order to provide a basis for future research, answering the question: What personal characteristics are important in one's support for bike lanes? This study also demonstrates the distinction between demographics of bicycle ridership and demographics of supporters of bicycle infrastructure.

Tiffany Bailey, Political Science **Session A 3:45**
Dr. Megan Francis, Faculty Mentor
Political Science Honors Program

Conservative Vigilantes and the Undoing of the Voting Rights Act of 1965
The Voting Rights Act of 1965 forced state and local governments to abide by the Fifteenth Amendment and secured to African Americans the right to the ballot. However, with a recent Supreme Court decision in Shelby v. Holder (2013), the constitutional architecture of federal voting rights law is on unstable ground. But why is this the case even after a huge bi-partisan majority in Congress reauthorized it? My research question is what legal mobilization tactics did conservative legal groups adopt that led to their eventual success in Shelby v. Holder? My paper stands in stark contrast to the majority of legal mobilization research that focuses on a support structure of funding, well-placed political elites, and mass mobilizing of supporters on the ground. Instead, I show how one person and lots of money were able to change a landmark piece of civil rights law. My paper provides an analysis of the conservative legal movement and details the tactics litigators should employ if they want to be successful in the courts.

Alexander Booker, Political Science and Sociology **Session A 4:00**
Drs. Brian Newman and Candice Ortbals, Faculty Mentors
Political Science Honors Program

Finding a Frame that Fits: Analyzing and Comparing Rival Framing of American Gun Control Policy in 2013
This paper uses and expands upon the theoretical framework of political framing theory to analyze the messages that came out of different gun lobby groups during the early 2013 debate on gun control legislation that was being discussed within the United States Congress. My research question is what are the elements of a political action frame for a piece of legislation that can lead to positive or negative public opinion of it? To conduct my research I use a mixed-methods research approach to analyze recent political framing in regards to American gun control policy. For the qualitative part of the paper, I conduct a content analysis of both pro and anti-gun control messaging that came from the major gun lobby groups during the earlier part of 2013. For the quantitative part, I conduct a questionnaire

experiment in which individuals are randomly assigned one of three potential frames, and I analyze the reception that each frame receives from participants.

Evan Shorter, Political Science **Session A 4:15**
Dr. Dan Caldwell, Faculty Mentor
Political Science Honors Program

The Benefits of Employing Unmanned Aerial Vehicles in Low Intensity and Irregular Conflict Scenarios
The purpose of this research is to explore whether UAVs provide a more effective and affordable alternative to supporting troops on the ground in low intensity and asymetrical conflict scenarios than manned aircraft. This was done through a comparative analysis of the costs and capabilities of manned and unmanned aircraft using USAF budget data, performance details, and operational reports. Upon examination of UAVs and manned aircraft employed in low intensity conflict areas like Afghanistan, it becomes clear that the USAF could benefit greatly by increasing the size of its UAV fleet, while reserving its manned fleet for high intensity conflict that demand their enhanced performance characteristics.

Caroline Roemer, Psychology **Session A 4:30**
Dr. Steve Rouse, Faculty Mentor
Summer Undergraduate Research Program

Effect of Facebook on Mood
This study investigated the effect of exposure to Facebook relationships on mood through passive encounters with three different Facebook profiles. Undergraduate students were administered a Positive and Negative Affect Scale and then completed three conditions in a random order: looking at their own Facebook profile, the Facebook profile of a close friend, and the Facebook profile of a distant acquaintance. They took a PANAS mood scale after each condition to find the influence of each relationship on mood. Personality trait scores (as measured by the International Personality Item Pool) were examined in relationship to changes in mood.

Break: 4:45-5:00

Rosemond Travis, Psychology **Session A 5:00**
Dr. Elizabeth Krumrei, Faculty Mentor
Cross-Disciplinary/Interdisciplinary Undergraduate Research

Psychological Correlates of Prostitution
This presentation is based on a book project providing an interdisciplinary introduction to the topic of prostitution. Rose Travis will discuss literature that quantitatively addresses the psychological correlates of engaging in prostitution. First, the challenges of researching this population will be considered, followed by examining possible motivations associated with pursuing prostitution. Themes include economic motivation, drug addiction motivation, finding stability in prostitution, personal empowerment, social motivation, and escaping personal hardships. Next, research on psychological characteristics common among women engaged in prostitution will be described, including childhood abuse, adulthood abuse, drug use, posttraumatic stress disorder, anxiety, depression, dissociation, and

somatization. The literature presents a complex picture of the relationships between psychological variables among women engaged in prostitution that leaves open the question of causation, due to the correlational nature of the research.

Steven Zhou, Psychology and Religion **Session A 5:15**
Dr. Ben Postlethwaite, Faculty Mentor
Cross-Disciplinary/Interdisciplinary Undergraduate Research

Prostitution as a Business
This presentation is based on a book project providing an interdisciplinary introduction to the topic of prostitution. Steven Zhou will present on prostitution as a business enterprise, describing the social stigmatization of sex work as well as how prostitution functions as an industry involving entrepreneurial risks and rewards, stakeholders, a market structure, and occupational hazards.

Nancy Kannampuzha, Sociology **Session A 5:30**
Dr. Dan Morrison, Faculty Mentor
Cross-Disciplinary/Interdisciplinary Undergraduate Research

Framing Sex Work Activism: A Sociological View
This presentation is based on a book project providing an interdisciplinary introduction to the topic of prostitution. Nancy Kannampuzha will review the sociological literature at the intersection of social movements and prostitution. She will report on ethnographic and interview data to reveal the most commonly used rhetorical frames pro- and anti-sex work activists use when recruiting and retaining members. She will describe the assumptions and taken-for-granted moral and ethical aspects of these claims. The literature suggests that pro- and anti-sex work activists draw upon strikingly similar notions of body ownership and empowerment.

Allora Dubay, Political Science **Session A 5:45**
Dr. Candice Ortbals, Faculty Mentor
Cross-Disciplinary/Interdisciplinary Undergraduate Research

The Multi-Layered Political Context of Prostitution
This presentation is based on a book project providing an interdisciplinary introduction to the topic of prostitution. Allora Dubay will present on the political context in which prostitution takes place. She will discuss prominent feminist theories regarding prostitution and how those theories influence public policy in the United States and Europe. In doing so, she will explain how policies vary between national governments and among subnational governments.

Oral Presentation Session B
Plaza Classroom 189

La'Nita Johnson, Hispanic Studies and International Studies **Session B 3:30**
Dr. Carolyn James, Faculty Mentor
Global Tides

The Consequences of Somali Piracy on International Trade
In the last decade, piracy in the African waters, especially surrounding Somalia, has vastly increased. Due to a previous civil war, absence central government in the country and lack of natural resources, Somalia is presently one of the most underdeveloped countries in the world—which many say is a large stimulus in the rise and expansion of piracy. Although these attacks frequently go unnoticed, they have a large-scale effect on the global economy and international trade. This paper will first briefly observe the history of piracy, then go on to introduce the recent prevalence of Somali pirates off of the Horn of Africa. The rest of the paper will aim to examine the rise of piracy in Somalia, discuss the international and domestic implications of the attacks, and conclude by addressing Somali piracy as a whole, and survey proposed resolutions.

Alexandra Roberts-Mendel, English Literature **Session B 3:45**
Dr. Kelle Keating Marshall, Faculty Mentor
Summer Undergraduate Research Program

Equality isn't all it's cracked up to be: The price of duality and bilingualism
In the province of New Brunswick, English and French have shared co-official status since 1969, with the approval of the *Official Languages Act*. Francophones (French-speakers) make up a little over 31% of the population, and Anglophones (English-speakers) are the majority at 69% of the population. Even with equal linguistic rights, the Francophone minority often struggles to receive equal treatment in areas such as health care and education. From May-July 2013, I worked with Professor Keating Marshall on a SURP project, collecting 17 months' worth of op-ed articles and letters to the editor from two of Southeastern New Brunswick's Anglophone newspapers, *The Telegraph Journal* and *The Times and Transcript*. We used the following search terms: language, bilingualism, duality, etc. in order to find Conversations (Gee, 2010) related to language use, linguistic rights, and the province's official bilingualism. I then conducted a discourse analysis on the data from February 2012- April 2013 in order to discover the Conversations regarding language rights and legislation, and the linguistic ideologies manifest in the discourse of Anglophone and bilingual Francophone contributors. I uncovered nine conversations for the two months I analyzed in depth. Some of the topics that were prevalent in the research I conducted included health care, education, government officials and revisions to the *Official Languages Act*. For this presentation I will be focusing on the issues related to bilingualism in the health care system as its leaders strive to make it being cost effective and timely, providing the best health care to all citizens, while at the same time fulfilling the mandate to hire equal numbers of employees from each official language and to serve people in their language of their choice.

Kylee Slee, Vocal Performance **Session B 4:00**
Dr. Patrizia Lissoni, Faculty Mentor
Summer Undergraduate Research Program

A Look at the Musical and Poetical Language of Secular Vocal Music of the Seicento through Selected Works by Barbara Strozzi

In this study, I seek to explore the poetical and musical language of the "cantata" genre of Baroque secular vocal music. The focus is on Italian poetry and music of the Seicento (1600s) with a particular focus on the works of Barbara Strozzi, who was a prominent female composer of the time. I will examine the poetry that Strozzi used in her compositions from a socio-historical standpoint, which will enable a better understanding of how the poetry was written and why the poetry was written in that manner. I will also examine Strozzi's personal compositional style through the way she set the poetry.

Emily Gibson, International Studies and French **Session B 4:15**
Dr. Carolyn James, Faculty Mentor
Global Tides

The Right to Choose: Women's Political Activity in Islamic States

The past fifteen to twenty years have seen a significant shift in focus to the Middle East-North Africa (MENA) region as well as other primarily Islamic regions and countries, including Indonesia. Much of Western foreign policy has been allocated to tracking and stopping trans-national Islamic terrorist networks such as Al-Qaeda and Al-Shabaab, and working with the governments of the countries throughout which these groups operate. Despite what popular culture may portray, those who study Islam and its adherents have come to recognize that these terrorist groups represent a severe minority of what is often a thoughtful and peaceful faith. However, the study of Islam by Western thinkers is still far from complete. While Islamic politics and traditions have been studied for decades, there is one major component that has been severely limited and all too often ignored: the study of women and their role in Islamic culture. This paper will focus on examining the role Muslim women play in politics. A literature review of the material already compiled in Western academia will determine the degree to which most Muslim women are politically active and whether or not that degree is established by each woman's own choice or by oppression from her male-dominated society. This paper categorizes political activity into three types, from least active to most active: 1. political discourse and community-affiliated activities such as meetings, 2. political protests and demonstrations, and 3. holding public office. The focus is primarily on women in the MENA region. The examination is mainly from 1970 to the present with some references to Islamic history and tradition. The working research question for this study is as follows: Are Muslim women relatively inactive (compared to Western expectations) in politics due to oppression by their male-dominated society or by personal choice? This paper will survey what Muslim women are doing for themselves to become more involved in politics and whether or not they want to be politically active in the ways that the West thinks that they should. It seems that the Islamic community in MENA is tolerant of women's participation in politics to a certain extent. When determining whether or not Muslim women are relatively inactive in politics due to oppression by their male-dominated society or by personal choice, this framework helps identify patterns and trends that can be used both in the development of policy and a better understanding of this population's political desires and empowerment. The information collected in this paper leads to the conclusion that women who are minimally or mildly politically active are so by choice, not because they are pressured to be any more or less active. Second, women who are highly politically active, or wish to be, do indeed face oppression and obstacles in their progress and development as leaders. It appears to be socially

acceptable for a woman to hold a position of leadership within a particular community, but there must still be a man of higher rank that can counter any of her decisions.

Lindsay Gardner, International Studies **Session B 4:30**
Dr. V. Seshan, Faculty Mentor
Academic Year Undergraduate Research Initiative

The Acquisition of SM Energy as a Proposed Strategy of Growth for Chevron Corporation
The Energy Industry is worth $7.5 Trillion. As traditional sources of energy production become more costly to obtain due to scarcity of natural resources and a volatile international political climate, it is imperative that the United States be able to self-sufficiently produce sustainable energy. Chevron Corp. is a global company in the Energy Industry with Net Sales of $230.09 B and a market share of 3.60% in 2012. Extensive analysis of the External Industry Environment and a Company Assessment lead to the formation of the acquisition of SM Energy as a proposed strategy for Chevron Corp. growth. The acquisition would increase Chevron Corp.'s Exploration and Production Market Segment with domestic production of natural gas, allowing Chevron Corp. to recapture lost market share, while maintaining its commitment to "finding newer, cleaner ways to power the world" (Chevron, 2013).

Chevron Corp. is ranked as the eighth producer of Energy in the world, facing competition from Royal Dutch Shell, ExxonMobil, British Petroleum, PetroChina, Eni S.P.A, Conocco Phillips, Occidental Petroleum, and others. The Industry as a whole is experiencing increasing demand for energy as populations and standards of living rise in developing countries. Access to the oil supply is becoming increasingly difficult, so employing competitive technology is vital for success in maintaining and sustaining market share. The threat of Global Warming drives innovative technologies as sustainability becomes central to solving not only the environmental problems, but also to meet increasing demand. Chevron Corp.'s largest market segment is Exploration and Production, and it has been increasing revenue for the last ten years. Chevron Corp.'s net sales for 2012 were $230.09 billion. Chevron Corp. expects global energy demand to increase 53% between 2008 and 2035.

The price of Natural Gas has experienced a 5.6% growth from 2013 to 2014, while Natural Gas Exports have increased by 5.9%. Due to increased domestic production and low prices relative to markets outside of the United States, projected exports have increased by 140% between the Annual Energy Report of 2013 and 2014. SM Energy is an independently competitive company that operates in four regions of the United States and is engaged in the Exploration and Production of crude oil, natural gas, and natural gas liquids in onshore North America. It operates in the Mid-Continent, Rocky Mountain, Permian, and South Texas & Gulf Coast regions. The acquisition of SM Energy, with domestic natural gas resources, is a way for Chevron Corp. to maintain and increase its market share.

This Undergraduate Research project examined the External Environment, Industry Analysis, and Company Assessment using Strategic Management Methodologies. Then applied these findings to real strategies for our case subject, Chevron Corporation, in order to maintain competitive market advantage and increase or maintain market share.

Break: 4:45-5:00

Amanda Miller, International Business **Session B 5:00**
Dr. V. Seshan, Faculty Mentor
Academic Year Undergraduate Research Initiative

Innovative Biotechnology Approach to Treating Central Nervous System Diseases
The Biotechnology Industry is a relatively young industry that saw revenues of $400B in 2012. While the industry is beginning to reach maturity and has seen decelerating growth rates in recent years, the industry is certainly not in decline. Despite slowing down, the industry growth rates have remained relatively stable over the last ten years with 13% growth in 2003 and only decreasing to 9% in 2012. The Biotechnology Industry works in conjunction with the trillion dollar Pharmaceutical Industry to develop drugs to supplement human needs. Instead of focusing on chemical processes, Biotechnology utilizes living organisms and modifies their molecular and cellular structures to develop new products. The industry develops products in the areas of crop production and agriculture, industrial, and environmental. However, more than half of its products are designed for the human health technologies sector, which focuses on products to strengthen the human body against disease

Amgen is currently a leader in the Biotechnology Industry with a 4.32% market share and $17.27 B in Revenues in 2012. Despite being a leader, Amgen faces patent expirations on four out of its five top selling drugs in 2015. This means that Amgen needs to implement a new strategy in order to maintain its position as an industry leader; the Central Nervous System (CNS) Market Segment offers an opportunity to do just that. The CNS Market is one of the fastest growing segments in the industry with a growth rate of approximately 5% making this segment an attractive area to invest large amounts of R&D. The CNS Market deals primarily with diseases affecting a person's brain, spinal cord, and neurons. Growth in this segment, much like the other market segments, relies heavily on the development and advancement of new technologies.

A recent study at UCLA found a way to detect hyperphosphorylated tau proteins that cause Chronic Traumatic Encephalopathy (CTE), a disease resulting from multiple concussions that causes neurological degeneration targeted at the memory and the learning functions of the brain. With this new technology to detect CTE pre-mortem, there is an opportunity for Amgen to develop a treatment aimed at the treating this disease caused by repeated concussions. Approximately, 3.8 MM concussions are reported every year and an estimated 50% of concussions go unreported every year with most being sustained by athletes and military personnel. With an increased awareness of repeated Traumatic Brain Injuries in recent years paired with the new technology to detect
CTE, Amgen has the opportunity to be the first develop a treatment aimed at this innovative area of CNS and capture a market that has high profit potential.

Presented by: **Amanda Miller, International Business** **Session B 5:15**
Authors: **Prithvi Kanneganti, Business Administration**
Andrew Synn, Finance
Dr. V. Seshan, Faculty Mentor
Academic Year Undergraduate Research Initiative

A Strategic Pharmaceutical Acquisition Proposal for Novartis a Global Pharmaceutical Multinational Corporation
Novartis is one of the top ten global pharmaceutical companies with Net Sales reaching $58.57 Billion in 2011, a growth of 16% from 2010.iIn addition, Novartis had 6% Market Share in the United States while Novartis' Global Pharmaceutical Market Share was at 4.5% in 2011.ii Its main competitors are

Johnson & Johnson, Pfizer, Merck & Co., Sanofi, GlaxoSmithKline, and AstraZeneca. These companies alone made up 31.9% Market Share in United States according to its Net Sales (3.8%, 7.8%, 6.0%, 3.7%, 4.4%, and 6.2% respectively) and 30.93% (6.44%, 7.05%, 5.03%, 4.5%, 4.4%, and 3.51% respectively) in Global Pharmaceutical Market Share in 2011.iii Although the majority of Novartis' competitors focus solely on the branded pharmaceutical segment, Novartis derives its strength from diversified and complementary operations that reduce overall volatility and create cross-segment synergies. Further, Novartis is very well positioned for growth with a successful track record of acquisitions and an industry-leading pipeline of potential block-buster drugs. However, like its peers, Novartis is faced with the limiting factors for its growth in developed markets coupled with recent economic constraints and expiration of patents such as Valsartan in 2012.iv Novartis is responding to these challenges by executing strategies that benefit from industry trends. For example it has 15 major regulatory approvals in 2011, a complete acquisition of Alcon in early 2011 that will greatly boost its position in fast growing eye-care market and its purchase of 85% holding in Zhejiang Tianyuan Bio-Pharmaceutical Co., China's largest privately held vaccine company, which will substantially increase its footprint in the vaccines division.

Recommendations for Corporate Strategy were developed through an in-depth Industry Analysis and Company Assessment. Seven evaluative measures were used to determine the most profitable and successful strategy. Eight recommendations were proposed out of which the Acquisition of an Indian Pharmaceutical Company Dr. Reddy's Laboratories Ltd. (Dr. Reddy's) was selected as a strategy for accelerated growth. Acquiring Dr. Reddy's is a strategic fit for Novartis due to its extensive knowledge and experience of the rapidly growing emerging markets, its highly technical but Low-Cost Manufacturing facilities, and an evolving R&D for its proprietary drugs . Through this acquisition, Novartis will expand in emerging markets, establish operational synergies for cost effective drug development and drive its productivity.

Jessica Freitas, Political Science and International Management **Session B 5:30**
Miluska Mogrovejo, International Business
Dr. V. Seshan, Faculty Mentor
Summer Undergraduate Research Program

Merck: SURP 2013 - Industry Analysis, External Environment, and Technological Assessment for the Development of an Acquisition Strategy (Novavax)

At the end of 2012, Merck's Net Sales totaled $47.27 B. The company's Total Global Pharmaceutical Industry's Share of Market (SOM) is about 4.3%, making it the seventh largest in the industry as of 2012. Merck's biggest competitors include, Johnson & Johnson, Pfizer Inc., Novartis AG, Bayer AG, Roche Holding Ltd, and Sanofi. In order for Merck to maintain its U.S. and Global Market Share, sustain competitive advantage against its competitors, and maximize its Shareholder Wealth, it must assess its Environmental Threats and Opportunities. Merck greatest Threats are Competition, especially from generic products that devalue Merck's brand drugs that lose patent protection, and Politics, as Merck's success depends on whether its drugs are governmentally approved or not. Merck biggest opportunities are Technology, as technological advancements allow it to develop innovative drugs, and Social, as there is an increasing aging population that will raise the demand for Merck's products. Merck's Gap Analysis suggests that it must minimize three gaps: Product-Line, Distribution, and Competitive Gap. By taking advantage of its opportunities, assessing it threats, and developing strategies that take the Environmental Scan in consideration, it will be able to minimize those gaps to maintain or increase its market share. The background analysis of the Industry, Environmental Scan, and Technology Check served to develop and recommend a strategy to counteract infectious diseases:

the acquisition of Novavax, a Biotechnology company that focuses on the development of Influenza vaccines.

Acquisition of Novavax allows Merck to tap the growing Respiratory/Anti-Infectives Market Segment for pandemic and seasonal vaccines, as seasonal flu vaccines alone constitute a market worth $2.9B. Utilizing Novavax's proprietary Virus-Like Particle technology in vaccine production is the Technological Opportunity Merck needs to revitalize its current products in the Respiratory/Anti-Infectives Market Segment.

Oral Presentation Session C
Plaza Classroom 188

Laura De La Torre, Psychology **Session C 3:30**
Dr. Kindalee De Long, Faculty Mentor

A Coin from Caesarea Philippi: Julia Domna
The year is 193 A.D., and the Severan Dynasty has begun. For the first time in Roman history, the emperor, Septimius Severus, is from Leptis Magna (present day Libya). His wife, Julia Domna, is also a foreigner, from Emersa, Syria. Through extensive travel, the two were able to create a unified Roman Empire. One of their early trips brought them to Caesarea Philippi, in what is today northern Israel; the coin under study commemorated this trip (199 A.D.). This coin reveals the relationship between Caesarea Philippi and Rome in the beginning of the Severan dynasty, and it demonstrates the transformation of Julia Domna, especially with regard to her hairstyle. Another captivating aspect of the coin is the unique depiction of the goddess Tyche in Caesarea Philippi.

Eric Kim, Religion **Session C 3:45**
Dr. Ronald Cox, Faculty Mentor
Summer Undergraduate Research Program

Displaying Loyalty in the Midst of Rebellion: Jewish Loyalist Coins in the 1st Century
The First Jewish Revolt was a decisive event for the Jewish people which had ripple effects for Judaism all the way into modernity. However, the revolt was not as homogenous as it is often portrayed to be. Although Jerusalem, the focal point of the revolt, was rife with civil war and revolt against the Romans, other Jewish cities did not all share these sentiments. Notably, the city of Sepphoris is representative of a Jewish city that was loyal to their Roman overseers. This study focused on a bronze coin minted in Sepphoris during the Revolt and what the symbols and historical context illuminate about the city. Furthermore, this coin from Sepphoris was contrasted with a coin minted in Jerusalem by Jewish rebels to highlight the different messages each group aimed to relay.

Anna Tiner, Art History **Session C 4:00**
Dr. Ronald Cox, Faculty Mentor
Academic Year Undergraduate Research Initiative

A Period of Transition: Early Islamic and Umayyad Coinage
John Wilson, dean emeritus and professor of religion at Pepperdine University, has accumulated a collection of over 1200 coins from the Holy Land dating from the Persian Period (c. 5th century) to the

time of the Crusaders (c. 14th century). Wilson's interest in these coins has given many Pepperdine undergraduate students the opportunity to study and research the coins' significance in historical, religious and artistic context. From Wilson's generosity, I, a senior art history major at Pepperdine, have been given the opportunity to analyze four coins from his collection dating from 620 AD to 680 AD. These four coins provides a meager yet insightful glimpse into the coinage minted by Islamic rulers during their conquest over the Holy Land and the transition of rule from the Byzantine Empire to the Islamic Caliphate. With the help of an innovative technology called Reflective Transference Image (RTI), on loan from USC, I will be able to view the coins in high-resolution images that can be adjusted with respect to light and reflectivity. Creating RTI images of the coins administers a deeper alternate perspective giving light to aspects of the coin that cannot be seen by the naked eye. Using the RTI technology alongside research of the coins' historical context verifies that the coins not only serve an economical purpose but also have a strategic political, social and religious agenda.

Andrew Krawtz, Economics and Religion **Session C 4:15**
Dr. Dyron Daughrity, Faculty Mentor
Academic Year Undergraduate Research Initiative and Summer Undergraduate Research Program

The History and Legacy of the Patrick Henry and Thomas Jefferson Religious Debates
The debates between Thomas Jefferson and Patrick Henry concerning religious liberty had a major impact on what the newly formed United States thought about the public role of religion and its impact on civil virtue. This presentation will analyze these debates and trace the ideas therein historically, focusing on their religious and Enlightenment influences. Second, the relevancy of these debates in regards to current polarizing issues, such as increasing religious pluralism and secularism, will be discussed.

Kristin Brisbois, Art History and French **Session C 4:30**
Dr. Kristen Chiem, Faculty Mentor
Keck Scholars Program

Don't Touch! Examining the Role of Hands-On Children's Programs in Museums
Until the 20th century, museums were designed mainly for scholars to conduct research on rare and endangered objects. In the past few decades, museums have broadened their outreach to the general public to include people of all ages and demographics. Many museums now offer children's programs that include hands-on activities as a way to stimulate a love for learning in a more relaxed and independent fashion. At two institutions targeting the same demographic, the Los Angeles Zoo and the Los Angeles County Museum of Art [LACMA], children are able to learn about endangered animals and rare works of art through hands-on activities. Although the LA Zoo and LACMA are challenged by exhibiting subjects that cannot be touched, they have succeeded in bringing children closer to both animals and art through the construction of children's spaces, interactive children's programming and supplemental materials. Through a comparative analysis of the Los Angeles Zoo's Critters n' Kids Program and LACMA's NexGen program, this paper investigates the role of hands-on activities in museum children's program as a way to bridge learning for a younger demographic. My analysis of the recent development of the interpretive media, programs, and spaces at the LA Zoo and LACMA provides a basis for redefining the role of the public museum in society. This will highlight the idea of the importance of using interpretative media as a way for museums to serve as a perpetrator of education for society.

Break: 4:45-5:00

Sarah Attar, Art **Session C 5:00**
Professor Gretchen Batcheller, Faculty Mentor
Summer Undergraduate Research Program

Person/Persona
In the summer of 2012, I made history as one of the first female athletes to compete for Saudi Arabia in the Olympics. This experience greatly impacted my life, leading me to pursue a body of creative work exploring the nuanced public and private perceptions of my newfound role as a "trailblazer" for women in Saudi Arabia. Based heavily upon research gleaned from the sociopolitical implications of my experience, my project deals with first-hand reflections and meditations surrounding my participation in the Olympics, as well as subsequent time spent in Saudi Arabia this past summer. I employ the use of photo documentation, various methods of portraiture, and installation to visually express my story. By utilizing a variety of mediums, I am able to explore the conversation between public and private identity. The ongoing process of visual documentation has enabled me to discover, first-hand, the deeply personal side of such a high profile, public event. I have come to realize that this struggle with identity is not uncommon; mine just came about in a very public manner. This tension between public and private is not meant to silence, but to empower and inspire a generation.

Kai Woods Decker, Art **Session C 5:15**
Professor Gretchen Batcheller, Faculty Mentor
Summer Undergraduate Research Program

The Extimate Mind
We all experience the same world, yet this experience manifests itself differently within each individual. Innumerable works of art, pieces of literature, musical compositions or creations can occur at any time within the private mind of an individual, but would never happen unless outwardly expressed. In this oral presentation I will address my artistic body of work, entitled "The Extimate Mind." In this series of digital illustrations —specifically portraiture—I explore the inner workings of the mind as it is revealed through exterior gesture. The compositions within each portrait are characterized by diagonal shapes with isolated figures in stark backgrounds, highlighting the gesture of the figures. The vague backgrounds and settings put emphasis on the gesture of the isolated forms, rather than the environment surrounding the forms. In this way, the viewer is able to focus solely on the feelings or emotions emanating from the figure. Similarly, I use an achromatic color scheme to convey aspects of humanity that remain atemporal: the spirit and legacy of human experience. This black and white color palette creates a sense of immutability which parallels the timelessness of humanity. There is a certain unexpectedness in truly perceiving the emotions broadcast in an expression or action. Encountering this "otherness" entreats an exploration wherein the viewer can simultaneously feel connected yet separate from the individual. In so candidly portraying the figure to the viewer, my work can possibly expand the inner world to the outer, in what Lacanian theory would define as "extimacy." Extimacy, the spliced neologism of externality and intimacy, enables the viewer to grasp the movement of emotion between the "self" and the "other." Therein the viewer can find an intricate truth shared between themselves and humanity.

Constantine Nicandos, Theatre Arts **Session C 5:30**
Drs. Cathy Thomas Grant, Melanie Emelio, Bill Szobody, and Michael Gose, Faculty Mentors
Pepperdine Theatre and Center for the Arts

Research, Scholarship, and *Les Mis*
Performing the role of Jean Valjean in the Pepperdine Fall production of *Les Mis* required copious amounts of research and scholarship. Research included study of the original novel by Victor Hugo, past performances, and literature pertaining to 19th Century France. That the term "scholarship" originally meant study with a master, it included detailed and exhaustive study including work with Cathy Thomas Grant, Melanie Emilio, Bill Szobody.

Oral Presentation Session D
Rockwell Academic Center 175

Carolyn Dapper, Writing and Rhetoric and Political Science **Session D 3:30**
Dr. Lorie Goodman, Faculty Mentor
Global Tides

Xenophobia, Whiteness, and Citizenship in the United States
In January 2014, the Republican Party released new "principles of immigration" which among many reforms, made space for the possibility of a pathway toward "legal status" for certain groups of undocumented immigrants in the United States. This paper investigates the rhetorical difference between "citizenship" and "legal status" and claims how these principles reflect the GOP's motives to ease their conservative constituents' anxieties surrounding the protection of a traditional, euroamerican definition of American citizenship. This paper analyzes the relationship between whiteness and citizenship, a class which extends beyond ethnicity and involves education, income level, and values associated with WASP America.

Chad Marxen, Philosophy **Session D 4:00**
Dr. Tomás Bogardus, Faculty Mentor
Summer Undergraduate Research Program

Yes, Safety is in Danger
In an essay recently published in this journal ("Is Safety in Danger?"), Fernando Broncano Berrocal defends the safety condition on knowledge from a counterexample proposed by Tomas Bogardus (2012). In this paper, we will define the safety condition, briefly explain the proposed counterexample, and outline Broncano-Berrocal's defense of the safety condition. We will then raise four objections to Broncano-Berrocal's defense, four implausible implications of his central claim. In the end, we conclude that Broncano-Berrocal's defense of the safety condition is unsuccessful, and that the safety condition on knowledge should be rejected.

Paige Massey, Philosophy **Session D 4:15**
Tomás Bogardus, Faculty Mentor
Summer Undergraduate Research Program

Reviewing Epistemic Authority
Given the relationship between personal autonomy and our various commitments across ideological communities, it is important to understand how to navigate peer disagreement and on which bases we may rationally accept a community leader as an authority in the formation of our beliefs. In her most recent book, Epistemic Authority, Linda Zagzebski develops a theory of rational trust to provide a framework for understanding this complex relationship between autonomy and authority. In my project with Professor Bogardus, we set out to coauthor a scholarly review of Zagzebski's book in light of current epistemological research, with the additional aim to provide me with a basis for crafting an original graduate school writing sample on a related topic within epistemology. We intend our review to appear in this summer's publication of American Catholic Philosophical Quarterly.

Steven Lesky, Economics **Session D 4:30**
Dr. Stella Erbes, Faculty Mentor
Keck Scholars Program

iPad and Pedagogy: Exploring the Impact of One-to-One iPad Classroom Integration on Perceived Educator Effectiveness
This qualitative study explored how one high school history teacher and one middle school English teacher from an independent school in southern California prepared to integrate a class set of iPads into their instruction, and investigated how the instructors perceived that iPad integration affected their pedagogies and effectiveness as educators. One-to-one programs and "BYOD" (bring your own device) policies are currently being considered by schools, and are more easily adoptable in private,

highly affluent institutions. Studies related to educational technology are plentiful, but empirical research addressing the role of the instructor in adopting such innovations is remarkably scarce and will be valuable to the educational community.

In May 2012, iPads were borrowed from a local university and given to study participants for use with their classrooms for one school cycle, or six school days. The instructors used the devices in all sections of the single subject they taught. Throughout the school cycle, instructors rotated iPads so that each section had several experiences learning with or without the device during classroom instruction.

Investigation was conducted through participant observation and a series of three formal interviews with each instructor: a pre-interview assessing technological preconceptions, interviews discussing experiences while teaching with the iPads, and a follow-up interview regarding the return to non-iPad-based instruction. Interviews were roughly transcribed and coded to organize the data systematically so that patterns could be noted. Results found that each instructor commented about their instructional philosophy, instructional objectives, tech support, teacher efficacy, and classroom management during the course of the study. Interestingly, the participants in this study were most concerned with teacher efficacy, their ability to be effective in teaching their curriculum with the iPad and being successful in preparing instruction that included iPads.

Break: 4:45-5:00

Alexandria McCollum, Chemistry and English **Session D 5:00**
Dr. Constance Fulmer, Faculty Mentor
Summer Undergraduate Research Program

The Art of Perception: An Analysis of How a Desired Public Image Affects One's Actions
Written in 1859, *Adam Bede* was George Eliot's first novel and marked the beginning of her fascination with class distinction and social perception. The main characters of her novel, Adam Bede and Hetty Sorrel, find themselves engaged in efforts in maintain their respective images, fulfill societal expectations, and transcend class distinctions. Initially, Adam is painted by Eliot as a devoted, hardworking, hypercritical man while Hetty is depicted as childlike and innocent. As each character struggles to maintain her/his public image and find their place in the class system, they encounter challenges that call for reevaluation of the importance of image. George Eliot suggests that resisting conformity and shying away from societal expectations is a trait to be desired as Adam is saved by relinquishing his concern with public image and Hetty's obsession with it is her condemnation. Throughout *Adam Bede*, Eliot beautifully shapes characters who struggle with the art of perception in order to provide a cautionary tale for Victorian society on the hazards of centering one's life around conforming to societal expectations and attempting to maintain an image.

Aaron Elijah Sims, Economics **Session D 5:15**
Dr. Constance Fulmer, Faculty Mentor
Summer Undergraduate Research Program

A New Heroine: Renovation of the Saint Theresa Archetype in George Eliot's *Middlemarch*
Dorothea Brooke is a passionate, capable woman in George Eliot's *Middlemarch*, but she is tragically portrayed as an updated version of Saint Theresa of Avila from Catholic Mythology. The novel opens, "Here and there is born a Saint Theresa, foundress of nothing, whose loving heartbeats and sobs after an unattained goodness tremble off and are dispersed among hindrances, instead of centering in some

long-recognizable deed" (Eliot 2). There is nothing dishonorable in being a woman of loving heartbeats who sobs for unattained goodness; however, the inconvenient reality is that sobbing will not achieve any practical good, and passionate, able women such as Dorothea can easily be stuck in a social structure that prohibits women's freedom to act. But Dorothea refuses to be passively female. Eliot's use of Gian Bologna Bernini's marble statue The Ecstasy of St. Theresa as a motif within the novel suggests that many Victorian women are "frozen" like marble in a world controlled by patriarchal institutions. But by acting outside of the bounds of Victorian England's expectations of women, Dorothea breaks out of these statuesque molds of domesticity and femininity and becomes a new, self-reliant heroine.

Sam Vaughn, English Literature **Session D 5:30**
Dr. Joi Carr, Faculty Mentor
Summer Undergraduate Research Program

Hemingway's Flapper Transcending Hollywood Norms: Brett Ashley and *The Sun Also Rises*

Hemingway's portrayal of the "new woman" of the 1920s, namely Brett Ashley in *The Sun Also Rises*, is more strikingly complex than those portrayals in popular films of the time. In Brett, Hemingway develops a complexity and depth of the "new woman" portrayal by utilizing Brett's tumultuous past, which is in stark contrast to her filmic counterparts. Her conflicted characterization sets her apart from the typical flat representation of the woman of her time in film. Hemmingway provides a glimpse into a "real new women's" complex way of being in the new 1920's metropolitan world.

Oral Presentation Session E
Rockwell Academic Center 178

Victoria Lekson, Biology and Music **Session E 3:30**
Drs. Stephen Davis, Faculty Mentor
Keck Scholars Program

Influence of Temperature on the Tensile Strength of Spider Silk *(Araneus gemmoides)*

Temperature ranges between day and night in southern California can be as great as 30°C and may influence vital functioning of ectothermic organisms. Arachnids produce silks from a pair of spinnerets in their abdomen and rely on variance in protein composition to make different types of silks. Temperature may influence tensile strength of filaments. We tested the effects of temperature on tensile strength of dragline silk of five specimens of *Araneus gemmoides* (orb-weaver) which were collected from Malibu Creek State Park in the Santa Monica Mountains of southern California, under five temperature conditions. Each specimen was placed in a 0.0283 m3 mesh enclosure and allowed 24-hours to acclimate to a temperature increase of 5°C. Photoperiods were set at 12-hour intervals for light and dark to simulate natural conditions. We then removed a single thread of dragline silk and measured tensile strength using an mechanical testing device (Instron 5544-A). We found that dragline silk is typically composed of two monofilaments wrapped together at points and thus quantified transverse area of both monofilaments. This structure may explain the reason why variability around mean values was similar for the plot of stress at break versus temperature. After running a one way ANOVA statistical analysis for repeated measures, we found that at 10°C both the Young's Modulus and stress at break were significantly greater ($P<0.05$) than values obtained at 15°C. Additionally, mass of spider seems to correlate with greater tensile strength ($R2=0.52$) suggesting that larger spiders produce stronger silk. Currently, biomaterial engineers are attempting to exploit the incredible properties of silk for production of fiber materials. Therefore, understanding how *Araneus gemmoides*

is influenced by temperature offers insight into the optimal temperature for harvesting silk.

Jesse Aston, English Literature and Mathematics **Session E 3:45**
Dr. Brian Fisher, Faculty Mentor
Academic Year Undergraduate Research Initiative

What Makes A 'Good' Definition: Analyzing Students' Conceptions of Mathematical Definitions and the Pedagogy of Definitions In Math Education
What are the key differences between how students view mathematical definitions and how their professors think they do? In this study we follow students during a guided reconstruction exercise in which they create a definition for, in this case, the convergence of a sequence and we record the process on film. Several theoretical frameworks including RME are then used to analyze student responses and behavior throughout the process and determine the difference in perceptions between student and teacher; these differences inform the best method to present definitions to students.

Tanner Heckle, Sports Medicine **Session E 4:00**
Dr. Jeffrey Jasperse, Faculty Mentor
Summer Undergraduate Research in Biology and Academic Year Undergraduate Research Initiative

The effect of shear stress, potassium, and adenosine on α-1 adrenergic vasoconstriction of rat soleus feed arteries
During exercise, sympathetic nerve activity increases, augmenting the release of the neurotransmitter norepinephrine (NE) at the arterial wall and into the blood. NE binds to arterial adrenergic receptors to cause vasoconstriction, yet arteries in contracting skeletal muscle dilate during exercise. Previous evidence from Ives *et al.* suggests that heat and acidosis may partially inhibit constriction resulting from α-1 adrenergic receptors (termed sympatholysis). Our lab has previously demonstrated that rat soleus feed arteries respond to sympathetic signaling solely by α-1 adrenoceptors. We hypothesized that increased levels of arterial wall shear stress, potassium, or adenosine also contribute to sympatholysis, thereby reducing sympathetic vasoconstriction. This study measured the constriction response to phenylephrine (PE; an α-1 agonist) in the presence of varying levels of shear stress, potassium, and adenosine. Soleus feed arteries were isolated from male Sprague-Dawley rats and cannulated on two glass micropipettes for in vitro video microscopy. PE dose-response curves (10^{-9} M to 10^{-4} M, 0.5 log increments) were evaluated for shear stress (0 dy/cm^2, 25 dy/cm^2, and 135 dy/cm^2), potassium (5 mM, 7.5 mM, and 10 mM), and adenosine (0 µM, 0.8 µM, and 1.6 µM). We found that the three proposed sympatholytic agents did not reduce vasoconstriction to phenylephrine (n = 12 rats per group). There was no significant difference between the constriction for each level of shear stress (maximum constriction 71.8 %, 71.6 %, 69.4 %), potassium (maximum constriction 67.8 %, 62.8 %, 68.5 %), and adenosine (maximum constriction 59.8 %, 60.2 %, 57.2 %), respectively. We conclude that the predominantly slow twitch soleus muscle may not be capable of fighting sympathetic vasoconstriction, and we are pursuing these same studies in the mixed fiber type rat gastrocnemius.

Gina Fitzgerald, Biology **Session E 4:15**
Gabriella Smith, Hispanic Studies
Dr. Don Thompson, Faculty Mentor
Academic Year Undergraduate Research Initiative

Cardiovascular Health Among US and Argentine University Students- A Comparative Study of Behaviors and Risk Factors

Cardiovascular disease for some time has been the leading cause of death in the Western world. Primary prevention is the only way to halt the onset of cardiovascular disease, yet there is little information on the prevalence of risk factors for cardiovascular disease in young adults. This study seeks to evaluate students from the Catholic University of Argentina and Pepperdine University of America for the prevalence of CVD risk factors, as well as knowledge of CVD and daily habits that contribute to heart health. Thus we compared two cultures with very different lifestyles and prevalence of risk factors. We hypothesized that students with low prevalence of CVD risk factors are more likely to maintain a normal range of blood pressure and heart rate, and those with high prevalence of CVD risk factors are more likely to have heart rate and blood pressure outside an acceptable range. A web-based survey assessed 500 students from Buenos Aires, and 500 students from Malibu in the areas of current medical information, personal health history, family health history, personal habits, and knowledge of cardiovascular health. Additionally, blood pressure, heart rate, and demographic information were recorded. We aimed our focus on the relationship of the risk factor and behaviors in these two populations, keeping socioeconomic status, age, and nationality constant. We then hypothesized that this relationship between risk factors and behaviors is constant in both countries. Our research supports our hypothesis that students with worse behaviors displayed increased cardiovascular risk factors.

Matthew Fleming, Biology **Session E 4:30**
Dr. Matt Joyner, Faculty Mentor
Summer Undergraduate Research in Biology

Extracts of *Trichostema lanatum* inhibit the growth of gram-positive bacteria and an *Escherichia coli* ΔtolC mutant strain

The Chumash Native Americans of Southern California have well-documented traditions of using plants for medicinal purposes. If a specific plant has traditionally been used for the treatment of cuts, wounds and infections, it may contain chemicals with anti-bacterial properties. One plant that fits these criteria is *Trichostema lanatum* (woolly blue curls). We tested extracts of *T. lanatum* for their ability to inhibit the growth of a variety of bacteria. Because of the widespread use of antibiotics over the past sixty years bacteria are evolving greater resistance to known antibiotics, but unfortunately the rate of antibiotic discovery has diminished during the past twenty years. Therefore, novel and effective antibiotics are essential for the continued treatment of bacterial infections. A panel of bacteria representing both gram-negative and gram-positive species as well as organisms from a variety of ecological niches was used to evaluate the anti-bacterial properties of methanolic extracts of *T. lanatum*. An *Escherichia coli* ΔtolC mutant was also used to test whether or not drug-efflux activity in the bacteria reduces the inhibitory activity of the plant extracts. The inhibition of bacterial growth was measured using a Kirby-Bauer disc diffusion assay. The diameter of the zone of growth inhibition surrounding discs treated with plant extracts was used as the measure of the anti-bacterial activity of the extracts against each bacterial species. Our results showed that 1.25 mg of *T. lanatum* extract inhibits the growth of gram-positive bacteria but not gram-negative bacteria. However, growth of the E. coli ΔtolC mutant was inhibited by 1.25 mg of *T. lanatum* extract, suggesting that the resistance of

gram-negative bacteria to the anti-bacterial activity of *T. lanatum* may be due the drug-efflux ability of some of these bacterial species.

Break: 4:45-5:00

Ashley Broadwell, Mathematics and Computer Science **Session E 5:00**
Dr. Stan Warford, Faculty Mentor
Academic Year Undergraduate Research Initiative

BACIBeans: A NetBeans Plugin for Concurrent Programs
C-- is a programming language developed by M. Ben-Ari to teach principles of concurrent and distributed programming. It is a small subset of the C language but with the added features of concurrency, semaphores, and monitors. BACI is an acronym for Ben-Ari Concurrency Interpreter. JavaBACI is an open-source command line concurrency simulator used by students to compile and run C-- programs. NetBeans is an integrated development environment (IDE) that many students use in our courses to develop Java and C++ programs. This talk describes the development of a NetBeans plug-in we call BACIBeans that integrates JavaBACI into NetBeans, combining the familiarity and ease of use of NetBeans with the concurrency interpreter. The plugin allows students to write, compile, and run C-- programs within the familiar NetBeans IDE.

Performance Arts Session
Surfboard Room

Kevin Enstrom, Music Performance **3:30**
Professor Christopher Parkening, Faculty Mentor

Solo Guitar Performance
Kevin Enstrom is a senior at Pepperdine University studying Classical Guitar. Originally from Ontario, Canada, Kevin began playing guitar at the age of six. Starting with acoustic guitar, he gained a love and appreciation for many kinds of music, such as Jazz, Blues and Rock. However, It wasn't until the age of 13, when he heard the true beauty of the classical guitar, that he decided that this was his calling. In 2010 Kevin had the opportunity to move to California in order to study under the world-renowned guitarist, Christopher Parkening. After four years in the city of Malibu, Kevin has been given opportunities to record with various artists in Los Angeles, as well begin work on his solo classical album to be released in the coming years. Kevin will be playing three contrasting pieces showing the great versatility of the Classical Guitar.
Girl with the Flaxen Hair Claude Debussy (1862-1918)
This piece was originally written for piano, but later transcribed for the guitar by Jack Marshall. Written by Debussy in 1882, the piece was dedicated to an auburn-haired singer for whom the much younger Debussy wished to create a piece inspired by her voice. This work shows the shimmering beauty the guitar can create, bringing the listener through a dream like journey produced by the bell like tones of the guitar.
Koyunbaba Carlo Domeniconi (b. 1947)
Literally translated as "shepherd," Koyunbaba is by far one of his most famous pieces for solo guitar. Among other things, Koyunbaba is also the name of a region in southwest Turkey--dry, desolate, and open to Mother Nature's wrath. This afternoon's program will feature the I and IV movements of Koyunbaba, depicting the wild and furious storms of the barren landscape.

Niki Fukada, Film Studies and Music **3:45**
Professor Alexander Treger, Faculty Mentor

Solo Violin Performance
Niki Fukada is a freshman at Pepperdine University studying Violin Performance and Film who is among a select group of students who are members of the Pickford Ensemble and part of the Mary Pickford Foundation Music Project at Pepperdine University. Niki Fukada first began playing the violin at seven years of age and received her first musical instruction from Miriam Kammen. At the age of ten, she enrolled in the Crowden Music School in Berkeley, CA, which provided vigorous musical and academic training. She began studying with Heghine Boloyan in 2005 and competed in the Junior Bach Festival every year through which she won four competitions. After graduating from Crowden, she pursued her musical career in violin at the San Domenico High School with the Orchestra da Camera. During her Junior year at high school, she began her studies with Wei He where he taught her strict musical discipline and musicality. Since the summer of 2011, she has attended the Hawaii Performing Arts Festival at the Big Island of Hawaii where she explores her musical interest in teaching younger children. During her senior year, Eugene Chukhlov became her private teacher until she graduated from high school. Currently, she is studying with Alexander Treger who is a noted violinist, gifted conductor and educator, and Musical Director of the American Youth Symphony. Ms. Fukada hopes to pursue a career as an orchestral violinist, specifically for film scores, and will continue her role as a music teacher.

Violin Concerto in E minor, Op. 64: Felix Mendelssohn (1809-1847)
1. *Allegro Molto Appassionato*
Andrew Gladbach, Accompanist (Pickford Musician and Composer)
Felix Mendelssohn, born in February of 1809, was a German Romantic composer. In his time, Mendelssohn was recognized as one of Europe's greatest musical prodigies. The Mendelssohn Violin Concerto was one of his last large orchestral compositions. This particular concerto consists of three movements, Allegro, Molto Appasionato Andante, and Allegretto Non Troppo, which follows the traditional fast-slow-fast structure of most concerto compositions. When the concerto was first performed, it was well received and remains a popular concerto choice for many musicians today.

Pickford String Quartet: **4:00**
Christopher Hunt, Psychology
Niki Fukada, Film Studies and Music
Hannah Samson, Music
Edward Kang, Music
Professor Lisa Dodlinger, Faculty Mentor

The Pickford String Quartet consists of members of the Pickford Ensemble and is part of the Mary Pickford Foundation Music Project at Pepperdine University. Each member of The Pickford Ensemble is selected by audition, awarded a scholarship, and has the honor of being known as a "Pickford Musician" for the academic year. During the spring semester, the Pickford Ensemble will perform new music scored for silent film by Pepperdine student composers selected as "Pickford Composers". The project, funded in part by the Mary Pickford Foundation, creates a unique music-art genre by combining live original modern chamber music with the visual art of silent film.

Christopher Hunt is a senior Psychology major and Violinist at Pepperdine University. Originally from Whittier, CA, Chris began playing violin at the age of seven. He developed a deep passion for the violin in his teen years – competing in various chamber music competitions, serving as the concertmaster of his high school orchestra, and being selected to play in the Pasadena POPS professional orchestra as part of the organization's side-by-side program. Although he decided to pursue studies in pre-medicine and psychology at Pepperdine, Chris remained extremely involved in the school's music program as a non-major – performing at various Pepperdine fundraisers as a soloist and chamber musician, serving as the Pepperdine symphony orchestra's concertmaster the past 4 years, and winning the Thomas M. Osborn Concerto Competition his freshman year in 2011. In his senior year, Christopher was selected to be a Pickford Musician.

Niki Fukada is a freshman at Pepperdine studying Violin Performance and Film. Niki is from El Sobrante, California and first began playing the violin at the age of seven. At the age of ten, she began competing annually in the Junior Bach Festival and won four competitions. She pursued her musical career in violin at the San Domenico High School with the *Orchestra da Camera*. Since the summer of 2011, she has attended the Hawaii Performing Arts Festival at the Big Island of Hawaii where she explores her musical pursuit and interest in teaching younger children. Currently, she is studying with Alexander Treger who is a noted violinist, a gifted conductor and educator, and Musical Director of the American Youth Symphony. Niki hopes to pursue a future as an orchestral violinist, specifically film scores, and teacher.

Hannah Samson is a junior at Pepperdine studying Viola Performance. Hannah is originally from Bucks County Pennsylvania and started playing the violin in 4th grade in the school string program. She switched to the viola, in 11th grade and it has been a love affair ever since. Hannah has had the

opportunity to play in many great orchestras including the Philadelphia Sinfonia, the Marrowstone Orchestra, and YMF of Los Angeles. She currently studies under Alma Fernandez, and has worked with great musicians like Christopher Parkening, Kim Fisher, Alexander Treger, and Helen Callus. Being a part of the Pickford Quartet has been a very challenging but rewarding experience for her.

Edward Kang, currently a freshman at Pepperdine University, started playing the Cello at the age of six. He has studied with Richard Andaya, Leo Gravin, Irene Sharp, and is now studying with world-renowned cellist Lynn Harrell and Quattro Quartet cellist Giovanna Clayton. He has served as Principal Cellist in the Sacramento Youth Orchestra and is now the Pepperdine Symphony Orchestra's principal cellist. Last semester he performed with the Pickford Quartet for the Mary Pickford Foundation. On April 12, he will perform with the Pickford Ensemble at the Pepperdine Amphitheater for a silent film screening. Mr. Kang appreciates that Pepperdine has given him the opportunity to express music not only as a career, but also as a calling.

String Quartet No.14 in D Minor, D.810 -"Death and the Maiden" Franz Schubert (1797-1828)
II. *Andante con moto*

The String Quartet No. 14 in D minor, known as *Death and the Maiden*, by Franz Schubert, is one of the pillars of the chamber music repertoire. Composed in 1824, after the composer suffered through a serious illness and realized that he was dying, it is Schubert's testament to death. The quartet takes its name from the lied "*Der Tod und das Mädchen*" ("Death and the Maiden, D.531), a setting of a poem of the same name by Matthias Claudius which Schubert wrote in 1817. The theme of the song forms the basis of the second movement of the quartet. The quartet was first played in 1826 in a private home, and was not published until 1831, three years after Schubert's death. Yet, passed over in his lifetime, the quartet has become a staple of the quartet repertoire. The second movement is a theme and five variations, based on the theme from the Schubert Lied. The theme is like a death march in G minor, ending on a G major chord. Throughout the movement, Schubert does not deviate from the basic harmonic and sentence structure of the 24-measure theme. But each variation expresses a profoundly different emotion.

Theme of the second movement

In the first variation, a lilting violin descant floats above the theme, played in pulsing triplets in the second violin and viola that recall the triplets of the first movement. In the second variation, the cello carries the theme, with the first violin playing the pulsating role – this time in sixteenth notes. After two relaxed variations, the third variation returns to the *Sturm und Drang* (Storm and Stress) character of the overall piece: a galloping *fortissimo* figure breaks off suddenly into piano; the violin plays a variant of the theme in a high register, while the inner voices continue the gallop. The fourth variation is again lyrical, with the viola carrying the melody under a long violin line in triplets. This is the only variation in a major key – G major. In the fifth variation, the second violin takes up the theme, while the first violin plays a sixteenth-note arpeggiated motif, with the cello playing the triplets in the bass. The variation grows from pianissimo to fortissimo, then again fades and slows in pace, finally returning to a restatement of the theme – this time in G major.

Andrew Gladbach, Piano Performance and Composition **4:15**
Professor Edward Francis, Faculty Mentor

Solo Piano Performance

Andrew Gladbach is among a select group of students who are members of the Pickford Ensemble and part of the Mary Pickford Foundation Music Project at Pepperdine University. He is a junior majoring in piano performance and composition at Pepperdine. An experienced vocal and instrumental accompanist, he served as rehearsal pianist for Pepperdine productions of *Oklahoma*!, *Les Miserables*,

L'Elisir d'Amore, and, most recently, *Cosi fan tutte*, in which he also played the harpsichord onstage dressed as Mozart. Additionally, he was music director for the U.S. premiere of Pepperdine's award-winning commissioned theatre piece, "Why Do You Stand There in the Rain?" He is the winner of the 2014 Thomas Osborn concerto Competition and will be performing *Rhapsody in Blue* with the Pepperdine University Orchestra on April 10 for the Orchestra and Choir Masterworks Concert, and his score to Mary Pickford's silent short film "The School Teacher and the Waif" will be premiered along with the scores of two other Pepperdine student composers at the "Up Against the Screen" event on April 12.

Widmung, S. 566 Robert Schumann (1810-1856) arranged by Franz Liszt (1811-1886)
Franz Liszt transcribed and arranged many works by other composers for solo piano, and one of his most popular arrangements is that of the Schumann song titled *Widmung*. Though it begins very much in the style of the original piece, it transforms into a passionate, virtuosic arrangement with many arpeggios (figures meant to imitate a harp) and octaves (doubling a note in a lower register to reinforce the sound) that make full use of the entire range of the piano.

Vocal Soloists **4:30**

Jane Dominick, Vocal Performance
Professor Ida Nicolosi, Faculty Mentor

A senior at Pepperdine University, Jane Dominick has participated in many of the Universities' opera, musical theatre, and choral productions, in addition to master classes during her vocal studies at Pepperdine. She has performed the role of Nella in Puccini's Gianni Schicchi, as well as roles in opera scenes such as Zdenka in Arabella, Frasquita in Carmen, and Amor in L'egisto with the Bay Area Summer Opera Theatre Institute in San Francisco. Most recently, Jane was a young artist at the CoOPERAtive program at Westminster Choir College in Princeton, NJ where she focused on the interpretation and performance of art song repertoire.

Romance: Silence Inneffable Claude Debussy (1862-1918)
Andrew Gladbach, Accompanist (Pickford Musician and Composer)
Romance: silence inneffable, follows impressionistic styles of music with its simple piano accompaniment. This accompaniment plays a series of repeating chords and poly harmonies throughout the piece, often using non retrogradable rhythms. Furthermore, the accompaniment does not typically support the vocal line, save one or two notes among the chords. This allows the vocal line to float independently above the accompaniment thus establishing a story through a leaping melody that gives an impression of the feelings the poem speaks of. The poem gives a picture of two hearts or lovers that in a silent moment give themselves completely to each other becoming one, thus creating a moment of silent music.

Kylee Slee, Vocal Performance
Professor Louise Lofquist, Faculty Mentor

Las Vegas native Kylee Slee is a senior at Pepperdine University, where she is both a Regent's Scholarship and a Music Department Scholarship recipient, pursuing a major in Vocal Performance. She has performed with Pepperdine's Flora Thornton Opera Program in the chorus of Die Fledermaus and of L'Elisir d'Amore, and has been a featured soloist in Pepperdine's Collegium Musicum ensemble. In the summer of 2011, Kylee studied abroad in Heidelberg, Germany with Pepperdine's music department, where she sang the roles of Carmen, Dorabella, and Marcellina in an opera scenes concert.

Kylee performed in the chorus of Mozart's Requiem and Bernstein's Chichester Psalms in Smetana Hall under the batons of Dr. Anton Armstrong and Dr. André Thomas as part of the Prague Choral Festival. In fall, 2012, Kylee sang the role of the First Lay Sister in Puccini's Suor Angelica with Center Stage Opera. In summer 2013, she sang the role of Pallade in Monteverdi's L'incoronazione di Poppea with Opera NEO.

"Kaddish" (from *Deux mélodies hébraïques*) Maurice Ravel (1875-1937)
Andrew Gladbach, Accompanist (Pickford Composer and Musician)
Ravel's "Kaddish" was written in 1914, commissioned by Madame Alvina Alvi who was a soprano with the St. Petersburg Opera. The premiere was sung by Mme Alvina Alvi, with Ravel himself at the piano. The "Kaddish" is a liturgical chant from the Jewish synagogue service, and its text is a mixture of Hebrew and Aramaic. The text itself is a glorification and exaltation of God. The tonality of the piece is intentionally middle-eastern-sounding to reflect the origins of the text, but the piece still maintains a little of Ravel's Spanish-influenced compositional style. Ravel wrote a very sparse accompaniment, with only resounding octave G's in the beginning, through which the singer weaves beautiful melodic lines in an improvisatory manner: similar to what may be heard by a Jewish cantor.

Madison Leonard, Applied Music
Professor Henry Price, Faculty Mentor

Madison Leonard is a soprano from Hayden Lake, Idaho who will be graduating with her B.A. in Applied Music from Pepperdine next month. As America's Distinguished Young Woman of 2010, Madison won over $50,000 in academic scholarship and performed around the country, utilizing her background in musical theater and jazz. Madison has continued performing musical theater at Seaver College, with leading roles as Fantine in the Fall 2013 production of Les Miserables and Kira/Clio in the 2011 production of Xanadu, but has focused primarily on her classical study under Dr. Henry Price. Last year, she was excited to sing her first operatic role as Adina in L'elisir d'amore and was honored again this spring to sing Despina in the opera Cosi fan tutte. Madison has also completed the International Baccalaureate Diploma, has a minor in Hispanic studies, is featured on the Seaver College Dean's List and "Who's Who Among American College Students," and is a member of the Pi Kappa Lambda, Phi Eta Sigma, Sigma Delta Pi and Golden Key International Honor Societies. She hopes to attend graduate school in pursuit of a Masters of Music degree in the fall.

***Morire* Giacomo Puccini (1858-1924)**
Andrew Gladbach, Accompanist (Pickford Composer and Musician)
Giacomo Puccini is regarded by many as one of the greatest composers of Italian opera — following Verdi. Famous for writing many of the most recognizable and beloved operas of the 19th century, including La Boheme, Madama Butterfly, and Turandot, Puccini only contributed a small amount to the world of song literature. This song is from one of those rare collections of songs called Per la croce rossa italiana, using text by the Italian poet Giuseppe Adami. The poem contests the ever-pending question: what is the meaning of life? Despite it being a relatively short, simple song, one can still hear the characteristic Italianate sound, legato lines and dramatic intervals in the melody that are fundamental to Puccini's magnificent operatic style.

Art Exhibition
Payson Art Gallery
3:30-6:00 p.m.

Sarah Attar, Art
Professor Joseph Piasentin, Faculty Mentor

***Untitled*, 2014, watercolor on paper, 24x18 inches**

Ahra Cho, Art and Film Studies
Professor Gretchen Batcheller, Faculty Mentor

***Untitled,* 201e, graphite on paper, 24x24 inches**

Ahra Cho, Art and Film Studies
Professor Gretchen Batcheller, Faculty Mentor

***Blue and Orange Still Life*, 2014, oil on canvas, 12x16 inches**

Fidella Danica, Psychology
Professor Joseph Piasentin, Faculty Mentor

***Shell*, 2014, watercolor on paper, 18x24 inches**

Louis Philip DeLaura III, Art
Professor Joshua Dildine, Faculty Mentor

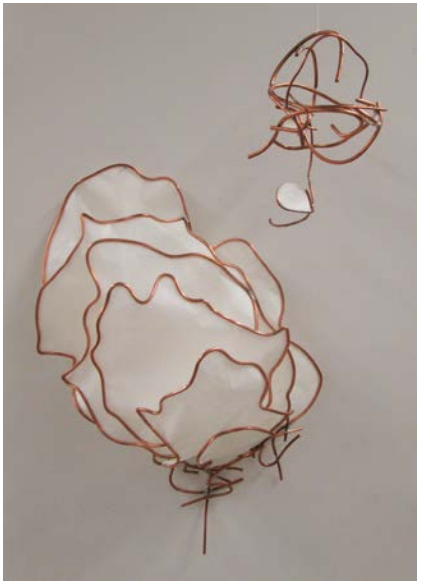
***Untitled*, 2014, mixed media on paper, 18x24 inches**

Lydia Gerard, Studio Arts
Professor Gretchen Batcheller, Faculty Mentor

***Environmental Factors,* 2014, Acrylic Paint, oil paint on canvas, 5x5 feet**

Lydia Gerard, Studio Arts
Professor Ty Pownall, Faculty Mentor

***Aquatics,* 2014, copper wire and rice paper, 12x6x6 inches / 5x4x4 inches**



Sarah Gibson, International Studies
Professor Gretchen Batcheller, Faculty Mentor

***Untitled,* 2014, mixed media on canvas, 36x36 inches**

Clayton Gustafson, Art
Professor Joshua Dildine, Faculty Mentor

***Untitled*, 2014, mixed media on paper, 18x24 inches**

Jay Hartmann, Creative Writing and Art
Professor Gretchen Batcheller, Faculty Mentor

***Triptych*, 2014, oil on canvas, 12x16 inches**

Hayley Presthus, Biology
Professor Gretchen Batcheller, Faculty Mentor

***Still Life*, 2014, oil on canvas, 17x11 inches**

Naomi Purnell, Art
Professor Gretchen Batcheller, Faculty Mentor

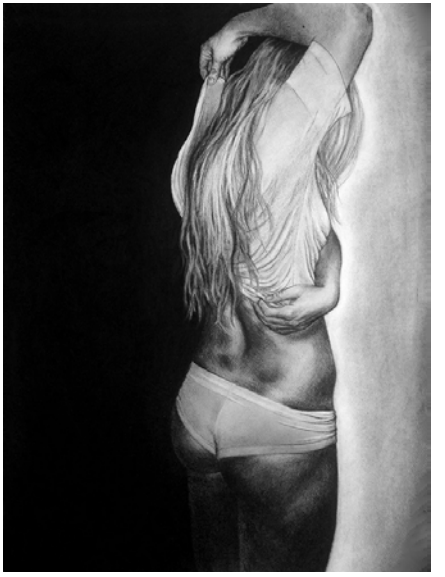
***Dawn*, January 2014, mixed media on canvas, 48x36 inches**

Leanna Schroeder, Art
Professor Ty Pownall, Faculty Mentor

***Untitled,* February 2014, Copper wire and mixed media, 8x8x8 inches**

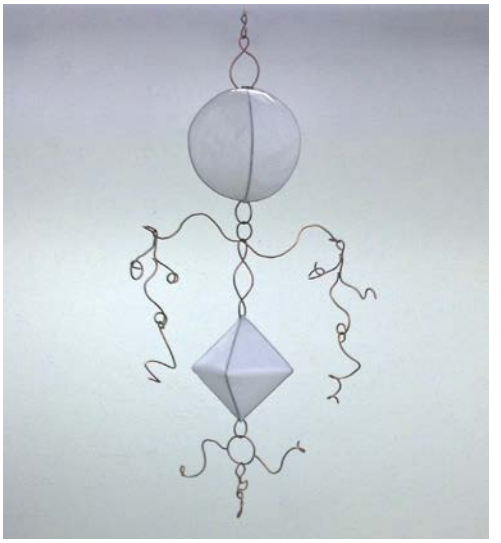
Leanna Schroeder, Art
Professor Gretchen Batcheller, Faculty Mentor

***Figure vs. Fabric*, 2013, charcoal on paper, 24x18 inches**



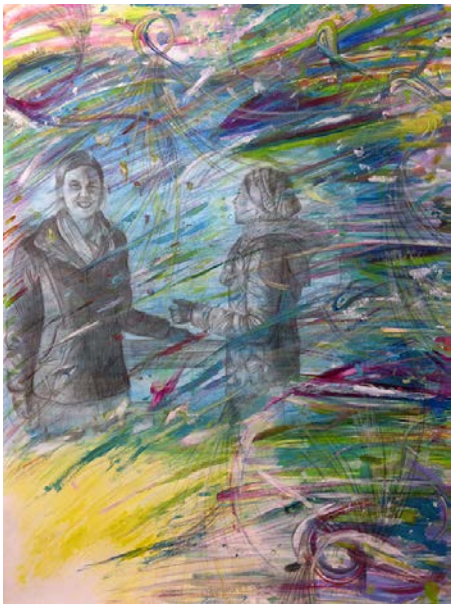
Sarah Jane Souther, Art
Professor Ty Pownall, Faculty Mentor

Untitled **, Spring 2014, 30(H) x18 x18 inches (hanging Sculpture- lightweight), copper and paper**



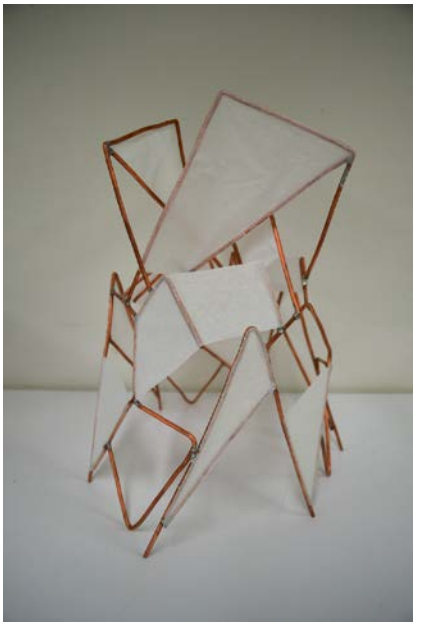
Sarah Jane Souther, Art
Professor Joshua Dildine, Faculty Mentor

Untitled, **2014, acrylic and graphite on paper, 18x24 inches**



Alexandra Springer, Art
Professor Ty Pownall, Faculty Mentor

***Untitled,* Spring 2014, 12 (H)x8x8 inches (table Top Sculpture)**



Alexandra Springer, Art
Professor Joshua Dildine, Faculty Mentor

***Now I Understand,* 2014, graphite and oil pastel on paper, 18x24 inches**

Kai Woods Decker, Art
Professor Gretchen Batcheller, Faculty Mentor

***Camel*, 2013, oil on canvas, 24x36 inches**

Laura Worden, Art History
Professor Ty Pownall, Faculty Mentor

***Tornado-esque,* January 2014, wood, 13x9 x14 inches**