

Creative COLLABORATIONS

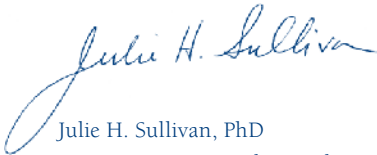
WELCOME TO THE 6TH ANNUAL CREATIVE COLLABORATIONS CONFERENCE!

Today we celebrate undergraduate student faculty collaborative works from disciplines across the campus: physical sciences, humanities, social sciences, fine arts, engineering, business and education. The broad range of research, internship, and artwork presentations represent an impressive collection of the creative inquiry undertaken in our classrooms, labs, libraries, studios, and within the San Diego and international communities beyond our borders.

The conference has expanded again this year with the addition of students' oral presentations of their research and creative works. Please locate the oral presentations schedule on poster boards throughout the University Center and attend presentations that pique your curiosity. When listening to oral presentations and viewing the poster sessions, you will experience firsthand the commitment of students and faculty to the core mission and values of the university; which include the pursuit of academic excellence, the intellectual development of students, and the commitment to community collaborations.

Many of USD's students who present their projects at Creative Collaborations also publish their outcomes in peer-reviewed journals and present at national and international conferences, and the high quality of their work contributes to awards for fellowships and scholarships. In addition, these students have the opportunity to work in close collaboration with USD's faculty of scholars and artists.

We would like to thank our faculty who mentor, teach, and model scholarly excellence for our students and thus make Creative Collaborations possible. We also extend hearty congratulations to our student presenters for their extraordinary commitment to their education and pursuit of intellectual inquiry. Finally, we are grateful to Dr. Debbie Tahmassebi, Peggy Agerton, Annie O'Brien, Allen Wynar, and the Creative Collaborations Organizing Committee for their fine work organizing and managing this event.



Julie H. Sullivan, PhD
Executive Vice President and Provost



Mary K. Boyd, PhD
Dean, College of Arts and Sciences

PRESENTATIONS

Students who are presenting at Creative Collaborations could sign up to give one of four types of presentations. Poster boards by the registration table indicate each student's assigned presentation time and location.

POSTER PRESENTATION

Students will be standing by their posters during their assigned hour to explain their research or creative work and to answer questions. Please feel free to wander through the poster presentations and ask questions of the students.

ORAL PRESENTATION

Students have been assigned a 15-minute time slot and will be located in one of two rooms on the lower floor of the University Center (UC104 and UC128). Students have been instructed to prepare a 10-minute oral presentation about their research or creative activity, leaving three minutes for questions from the audience and two minutes to prepare for the next student's presentation.

VISUAL ARTS PRESENTATION

Students' work is displayed in the University Center Forums. Students will be standing by their work during their assigned hour to explain their research or creative work and to answer questions.

TIME-BASED MEDIA ART

Students' work will be displayed in the University Center Forums. Students will be standing by their work during their assigned hour to explain their creative work and to answer questions.



art

A FACE IS WORTH 1,000 WORDS

KELSEY ANDERSON

FACULTY ADVISOR: JOHN HALAKA, ART

The title of this project is “A Face is Worth 1,000 Words.” The concept behind it is examining what makes a person who they are. I have conducted a series of intimate interviews with personal questions that allow me to see my subject on a deeper level. The questions ask about everything from dreams to failures, past and future, and celebrations and tragedies. I am using the combination of photo realistic drawings and words from these interviews to bring the inside out.

ANIMAL HEART PROJECT

AMANDA HOLLAND

FACULTY ADVISOR: SABA OSKOU, ART

People should want to look at something promoting animal rights, not turn away in fear. My work is a reaction to the harsh, graphic approach that is currently being used by animal rights activists. Most animal advocacy groups, such as PETA or ASPCA, rely on depressing and sometimes horrifying methods to garner people's attention and sympathy. In my reaction to this, I created a series of graphic design products including t-shirts, plates, cups, key chains, bumper stickers, window decals, and traditional stickers targeted to young people. By using good design principles, my hope is to attract attention due to the artistic quality of my work, not by scary images or extremely heart-wrenching stories, and thus promote animal rights.

SAN DIEGO MARINE BIRDS

ALEXIA ROSENBERG

FACULTY ADVISOR: SABA OSKOU, ART

My main concern when designing this art piece was to blend my hand drawn illustrations with artwork generated on the computer. I chose to redesign a bird identification book that combines the classic water-colored Audubon birds with a modern, graphic style. I combined photography, illustrations, patterns, and typography to create a visually stimulating and informative book. I photographed the environment of the birds, and placed the watercolor illustrations over the photographs using Photoshop. I used the Audubon Society website as a source for the information on each bird. I printed the text and maps on clear film so the viewer could choose to see the background images free of text. I hope to take this book further by experimenting with printing the bird images on the clear film, as well as experimenting with different binding options.

“ROSENCRANTZ AND GUILDENSTERN ARE DEAD” CRAFT CONSTRUCTION

LINDSEY ROTH, DANIELLE SATHER, FELICIA BALDWIN, SYDNEY BOLTON, JOSHUA BELLFY, ALYSSA RAY CROW, LEAH WICKMAN

FACULTY ADVISOR: JEANNIE GALIOTO, THEATRE ARTS

Members of the Costume Construction class collaborated with actors, Costume Designer Jeannie Galioto and Director George Ye to create crafts for the school production of “Rosencrantz and Guildenstern Are Dead.” These crafts included two masks, four crowns and one pair of size eighteen boots. Each student sketched ideas for his or her craft based on the Elizabethan time period of the show, the artistic vision for the show and what would be functional for actors to use. Upon hearing feedback from the director and the designer, students modified their sketches and created mock-ups of their designs. George Ye and Jeannie Galioto made suggestions regarding each of the mock-ups. The students then applied those suggestions and constructed the actual crafts. Any final adjustments were then made to the crafts based on feedback from the director, the designer, and the actors who would use the crafts.

WOMAN AND LANDSCAPE

ANN MARIE SATTERFIELD

FACULTY ADVISOR: JOHN HALAKA, ART

The inspiration for my artwork draws on the beauty and honesty of the natural landscape and human’s relationship to it. Most people are very disconnected from nature, and trapped within the chaos of modern society. These paintings seek to reunite the human body to its origins within the natural landscape. They deal specifically with the naked female body, which within nature is liberated from the patriarchal world, becoming one with the landscape. Through painting I aim to create a visual representation of naturalist poetry and literature, which conveys a longing for humans to reconnect with nature, and through that find peace, truth, and freedom. “I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived.” - Henry David Thoreau



internship

CONGRESSIONAL INTERNSHIP FOR BOB FILNER

CHRISTOPHER ARCITIO

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The following analysis investigates the experiences acquired from interning at the District Office for Congressman Bob Filner at the 51st Congressional District and provides an in-depth evaluation of themes relating to the study of Political Science - bureaucracies, representatives often being characterized as single-minded election seekers, as well as the congressman's "homestyle" in his district derived from observations taken from the internship. Do representatives operate successful bureaucracies within their own district offices? Is Congressman Bob Filner a single-minded election speaker as David Mayhew claims that all congressmembers are? What type of homestyle does Bob have? This analysis provides firsthand knowledge on the trials and tribulations that accompany any internship of public officials and examines the role of the congressman in relation to the themes. The results indicate that this particular congressman exhibits a particular homestyle while also proving to fit the other two themes.

INTERNSHIP WITH STATE SENATOR MIMI WALTERS

ASHLEY ATTIA

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

In the summer of 2010, I was given the opportunity to intern for State Senator Mimi Walters. The senator and her staff members are dedicated to serving and representing the constituents of the 33rd District of California. As an intern at the district office in Laguna Hills, I was able to experience firsthand the unique nature of California politics. Throughout the internship, I assisted with representative-constituent relations by responding to constituency feedback. Additionally, I was given the opportunity to help staff members with the numerous constituent casework files. I chose this internship primarily because I would like to one day be an elected official. My experiences at State Senator Mimi Walter's district office has undoubtedly given me a better understanding of what it means to be a state senator. I learned a great deal from this experience and I look forward to similar internships in the future.

LOCAL GOVERNMENT OPERATIONS GREENHOUSE GAS EMISSIONS INVENTORIES FOR THE CITIES OF ESCONDIDO AND LEMON GROVE

HOLLY AYALA, ALLISON REINICKE

FACULTY ADVISOR: DREW TALLEY, ENVIRONMENTAL STUDIES

INTERNSHIP SUPERVISOR: BRIAN HOLLAND AND NICOLA HEDGE

ICLEI AND THE SAN DIEGO FOUNDATION

Local governments play a fundamental role in addressing the causes and effects of human-caused climate change through their actions at both the community and government operations levels. Our positions as Climate Fellows worked as a part of a collaborative project with The San Diego Foundation and ICLEI-Local Governments for Sustainability, to perform baseline greenhouse gas inventories for the Cities of Escondido and Lemon Grove. The objective of the government operations greenhouse gas emissions inventory is to identify the sources and quantities of greenhouse gas emissions resulting from government operations. Our inventories required collection, organization, and manipulation of data and using Microsoft Excel and Clean Air and Climate Protection Software to compile comprehensive reports. The inventory is a necessary first step in addressing greenhouse gas emissions to provide insight to the scale of emissions from various sources and to create and to set emission reductions targets and measure future progress.

MEDIA, POLITICS, AND THE LATINO POPULATION

CHRISTOPHER CABEZAS

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Internships provide students with the “real world” experience. In the “real world,” the Hispanic population is growing in the United States and Spanish is becoming more and more common. At Univision, the largest Spanish-language television network in the United States, I will not only gain technical media experience, but I will also gather political knowledge as it interweaves with the media and the Latino population. I work directly with the nightly news producer, Pedro Calderón Michel, as a Production Assistant. I support the various stages of newsgathering, writing, editing, and many other responsibilities. It is indispensable for me to be aware of all local, national and international news every day. In addition, I have the opportunity to meet and greet prominent Spanish-language figures such as politicians and celebrities. My mission is to discover my true passion whether it is media or politics, and in the process contribute to quality broadcast news.

RORY REID FOR GOVERNOR 2010

KRISTEN CARVER

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I have always been taught that politics is something that affects everyone, and that being informed about the issues, your representatives, and voting is an important part of being a responsible citizen. As a student who is also studying many aspects of the political process, I wanted to undertake a more active political role — being involved with a campaign from the inside seemed like an exciting and meaningful opportunity. My time spent working in my home state of Nevada for Democrat Rory Reid’s governor campaign allowed me to better understand the amount of organization, strategy, and communication involved in promoting a candidate for office. In particular, it opened my eyes to just how much work, time, passion, and steadfast dedication it takes to create an effective campaign.

THE DEMOCRATIC TRANSITION OF NEPAL

NOOR DIAB

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

JOAN B. KROC INSTITUTE FOR PEACE & JUSTICE

As a peace and justice intern, my assignment was to write weekly articles for the Peace and Justice Update on the nations of South Africa, Zimbabwe, and Nepal. Meanwhile, I worked with Dee Aker and Chris Groth on the “Nepal Project” and did extensive research on the troubles of democratic transitioning experienced in Nepal. The concept was to assess the underlying causes of political deadlock in Nepal in order to offer a possible solution for a faster but stable transition into democracy. The strategy was to analyze Nepal’s political and economic regime performance, while applying democracy theory, in a quest to pinpoint a transition solution. As an International Relations major and Peace and Justice minor, this kind of work advanced my knowledge and experience in the realm of international relations, which was my initial goal. These skills will assist me in my future aspirations in working towards international policy solutions.

A LOOK INTO CONSULTING THE POLITICAL REALM

LAUREN DIAZ

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

INTERNSHIP SUPERVISOR: CHRIS CROTTY, CROTTY CONSULTING, INC.

I am currently interning for Crotty Consulting, Inc. located downtown in San Diego. The primary mission at Crotty Consulting, Inc. is to provide clients with expertise in their political campaigns, communications, or in their public relations. As an intern, I deal with an array of activities such as researching, creating and designing direct mail, updating bimonthly reports, and billing clients. I have the opportunity to actually work directly with clients by creating PowerPoint presentations and assisting at client meetings. I initially chose this internship opportunity because I knew that this company would allow me to fuse together my passion for politics and creative abilities. As a Political Science and a Communication Studies double major, I see how theories from both subject areas directly apply to the day-to-day activities at Crotty Consulting, Inc. From this internship experience, I hope to improve my own communication skills, as well as better understand the campaign process at local and regional levels. My supervisors at Crotty Consulting, Inc. agree that this internship will help me find a job once I graduate in May.

THE BORDER ECONOMY: THE MONEY OF US-MEXICO RELATIONS IN VIOLENT TIMES

DANIELLE FARIAS

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

TRANS-BORDER INSTITUTE

The U.S.-Mexico border region remains a politically contentious area rife with conflicts such as drug trafficking, arms dealing and illegal immigration. The consequences of these conflicts are not only political, but also economic. Foreign and domestic investment suffers when security is uncertain. The implications of that uncertainty trickle down and affect employment, development and trade. As the economic development intern at the Trans-Border Institute I researched the changing economic and political conditions of the U.S. and Mexico, and its effects on U.S.-Mexico relations as well as the overall economic development of America's Third World neighbor. Mexico is essential to the economic health of the U.S. and is an emerging world market. However, issues such as inequality, lack of infrastructure, and violence create a specific challenge for the U.S. in the coming years.

ASSOCIATED STUDENTS

ZACH FLATI

FACULTY ADVISOR: JASON SCHREIBER, ASSOCIATED STUDENTS

Associated Students' official mission statement is to serve as “representatives who promote opportunities for growth and expression, address student issues, and enrich a diverse, inclusive, and engaged community.” As the Vice-President, my official responsibilities include overseeing academic and student organizations' issues as well as the election and appointment processes. Unofficially, I create opportunities for different communities of our campus to collaborate, advise the president and executive team as well as acting as the AS spokesperson championing the organization. I chose to run for this position because I appreciate the USD undergraduate student body, believe in its potential for improvement and can contribute with my critical-thinking, connections and cleverness. The VP position has furthered my interest in elected and appointed public office. This position, from day one, has afforded me the opportunity to learn a tremendous amount of teamwork, public perception, pressure, competing interest groups, mass communication and elections.

GREENHOUSE GAS EMISSIONS FOR THE LOCAL GOVERNMENTS OF CORONADO AND SANTEE

EMILY GARDNER, KATHERINE GODFREY

FACULTY ADVISOR: DREW TALLEY, ENVIRONMENTAL STUDIES

INTERNSHIP SUPERVISOR: BRIAN HOLLAND, ICLEI - LOCAL GOVERNMENTS FOR SUSTAINABILITY

Local governments are often overlooked in their role in addressing causes and effects of human-induced climate change. This past semester we worked as a part of collaborative team with other students along with ICLEI-Local Governments for Sustainability and The San Diego Foundation, to compile information to perform a baseline greenhouse gas inventory for the Cities of Coronado and Santee. The objective was to allow each city to easily understand their sources and quantity of greenhouse gas emissions. This process required collaboration, collection, organization and manipulation of this data using Microsoft Excel and Clean Air and Climate Protection Software to create a comprehensive, detailed report. This inventory process is a progressive first step in addressing the problem of greenhouse gas emissions, providing insight to various source emissions and their relative emissions levels, as well as providing a launching pad for further reduction targets and goals, and a measure of future progress.

JUSTICE IN MEXICO PROJECT: TRANS-BORDER INSTITUTE

FELICIA GOMEZ

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS
TRANS-BORDER INSTITUTE

The Trans-Border Institute works to promote border related scholarship, activities, and community as well as promoting USD's outreach to the cross-border community. Through the Trans-Border Institute, the Justice in Mexico Project was founded in attempts to conduct research on justice reform and the rule of law in Mexico, to produce and distribute publications, to sponsor and organize seminars, conferences, and events that promote discussion of rule of law related topics, and to generate and to organize relevant data on the rule of law indicators in Mexico. The three focus areas of research revolve around order, accountability, and justice. As a Justice in Mexico intern with the Trans-Border Institute, I research issues that revolve around the rule of law and accessibility to justice in Mexico and the border region, while maintaining the Justice in Mexico blog. As an undergraduate majoring in both International Relations and Spanish, while pursuing a minor in Peace and Justice Studies, I have always had a strong interest and passion for understanding foreign policy issues as well as issues that revolve around access to justice and human rights. My passion to help others has now, as an intern, taken the form of raising awareness of what is happening in Mexico with hopes that change will occur through my research. After my internship with the Trans-Border Institute is finished, I would like to continue to gain experience in the NGO sector as well as pursue higher education through graduate school. My experience with TBI has taught me the importance of border relations and created for me a better understanding of what is happening in Mexico today. *Mission of TBI and the Justice for Mexico sources: TBI website

INTERNATIONAL RESCUE COMMITTEE

LESLIE HALL

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Each year the Immigration Department at the International Rescue Committee oversees thousands of cases that assist the needs of refugees and asylees. As a front desk volunteer, my responsibilities include providing administrative support to case managers, scheduling appointments, data entry, filing and making phone calls to clients. My goal is to gain insight and understanding into the complex and complicated process of the immigration system and to build communication skills among fellow co-workers and clients who seek immigration assistance. Since I am an International Relations major, working at the IRC has given me the opportunity to expand my education into a new and challenging field. From this experience, I hope to achieve valuable knowledge about immigration law and management skills that will contribute to my future career in working with other non-profits or government agencies.

OCEAN DISCOVERY INSTITUTE

STEPHANIE HENSON

FACULTY ADVISOR: DREW TALLEY, MARINE SCIENCE

Ocean Discovery Institute (ODI) is an organization that reaches out to underrepresented and underserved students and introduces them to science. Through field trips, group activities, and science exploration, ODI empowers youth to change their world in positions as scientific and environmental leaders. I was an Intern responsible for assisting the lead instructor during classroom lectures and activities. Additionally, I helped students with further questions and small group instruction, following a lesson plan from ODI. Lastly, I instructed groups of students at the Birch Aquarium during a fieldtrip. I chose this internship because it is perfect for my career goals; I plan to teach oceanography once I obtain my bachelors degree. I learned more efficient methods for communicating science to students from ODI instructors. This internship was great experience in teaching science and how to teach using a lesson plan and fieldtrip.

CHICANO PARK - UNIVERSITY OF SAN DIEGO DOCUMENTATION PROJECT: WHAT IS LOWRIDER CULTURE?

**MICHAEL LOPEZ HEREDIA, ANNETTE GARCILAZO, STEVEN MENDULEE,
JULIETA BARRIOS**

FACULTY ADVISOR: ALBERTO LOPEZ PULIDO, ETHNIC STUDIES

What is lowrider culture? Lowrider culture is a community of people who share similar interest in a particular style of car, lowriders. Lowriders brought together a concept and nonverbal statement to simply say “we’re different, but not less” during the time of muscle cars, capable of tremendous speeds that seemed available to only those of “higher” class. This notion of class created those perceived as inferior yet had the similar resources available to make a stand; they did this by differentiating themselves. While everything was being built to great heights and vehicles were getting faster, a different approach “slow and low” was set into place, the birth of lowriders. In today’s lowrider culture, beyond the aesthetics, the same idea “we’re different, but not less” still lives. As part of the Chicano Park - USD Documentation Project - this project presents the history of lowrider culture and the impact it has had in the development, and evolution of Chicano communities, particularly Chicano Park here in San Diego.

THE NOBLEST MOTIVE IS THE PUBLIC GOOD

KIRA JOHAL

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

As an intern for the County Board of Supervisors, I work with Supervisor Dianne Jacob of District 2 to better represent the region's community. I assist in presenting issues from constituents to Jacob's staff. I work with her department to submit referrals to the Chief Administrative Officer on issues in regards to Public Safety, Health & Human Services, Land Use, Community Service, and Finance & General Government. I also service Jacob's team advisors with constituent emails, phone calls, and general office responsibilities. I attend committee meetings throughout the region to help Supervisor Jacob address regional issues presented by the district communities. Supervisor Jacob works to represent the citizens of San Diego County. As an intern, it is my responsibility to be an informative liaison between the neighboring communities and Dianne Jacob as their elected representative.

A "PEACEFUL STATE" OF MIND: ANALYZING FOREIGN STATES AND THEIR PROSPECTS FOR PEACE

WHITNEY JOHNSON

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The Joan B. Kroc Institute for Peace & Justice focuses on countries that are undergoing political and social change, and attempts to aid in the peaceful transition, development and consolidation of these areas. As an intern, I specifically focus on the political and socio-economic events that are occurring in the Middle East and North Africa (for example, Tunisia, Egypt, Bahrain and Libya), analyzing and preparing weekly reports on the main topics that are occurring within the region. I also assist with events that the IPJ hosts and provide general office support. I chose this internship, as an International Relations and French major, because it represented an opportunity to both utilize and expand my current political and historical knowledge. I plan on applying this experience and newly gained knowledge of peaceful development and peaceful consolidation abroad, as I am currently in the process of applying to the U.S. Foreign Service.

TAKE-OUT PRACTICES OF SUSTAINABLE RESTAURANTS IN SAN DIEGO

DAVID LANDEROS

FACULTY ADVISOR: DREW TALLEY, ENVIRONMENTAL STUDIES

INTERNSHIP SUPERVISOR: ALICIA GLASSCO, SAN DIEGO COASTKEEPER

The City of San Diego is considering limiting the purchase of Styrofoam products in department spending, city offices, and city events in order to set the example for other business and cities in San Diego County to reduce marine debris. My internship at the San Diego Coastkeeper was with the Marine Debris Department. Together we worked to gather information specifically concerning take-out practices regarding the use of Styrofoam alternatives in various businesses and restaurants throughout San Diego County. My duties included drafting a survey, gathering a list of restaurants and businesses, as well as contacting these businesses to conduct our survey. The purpose of gathering this data was to understand how using Styrofoam Alternatives impacts a business. We hope to present this information to the City of San Diego to show how limiting the use of Styrofoam will be both cost effective as well as environmentally sustainable.

EDUCATING YOUTH IN MARINE SCIENCE THROUGH SUMMER LEARNING ADVENTURES CAMP AT THE BIRCH AQUARIUM AT SCRIPPS

CAITLIN LELLES

FACULTY ADVISOR: DREW TALLEY, MARINE SCIENCE

INTERNSHIP SUPERVISOR: CHARINA CAIN, BIRCH AQUARIUM AT SCRIPPS

Every summer the Education and Public Programs Department at the Birch Aquarium at Scripps organizes a series of Summer Learning Adventures Camps for children 4-15 years old. Many camps happen onsite at the Birch Aquarium, and some give older campers the opportunity to experience nature at beaches and reserves in San Diego County. No matter the age of the camper, though, all camps are designed to educate children about oceanic sciences and human impacts, by communicating Scripps research, and embracing hands-on and creative experiences in a fun and informative manner. I had the pleasure of working as an intern and assisting camp counselors in various week-long camps over the course of the summer of 2009. In the process I acquired many teaching skills, refined my own knowledge of marine science and organisms, and learned of many opportunities open to Marine Science undergraduates.

TRANS-BORDER INSTITUTE

ANNA LIZANO

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

The Trans-Border Institute, which was founded in 1994, is dedicated to “promoting border-related scholarship, activities and community at USD, and promoting an active role for the University in the cross-border community.” As an intern, I make daily posts for the Justice in Mexico news blog, which concerns itself with matters regarding rule of law, social injustice, and security. I research articles that cover topics such as homicides, femicides, kidnappings, and drug cartel violence.

INTERNATIONAL RESCUE COMMITTEE RESETTLEMENT INTERNSHIP

EMILY LOHMEYER

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This semester, I interned at the International Rescue Committee’s (IRC) San Diego branch. The IRC provides opportunities for refugees to thrive in America. Each year, thousands of refugees are invited by the U.S. government to seek safety and freedom. Forced to flee conflict or persecution, many have survived for years against incredible odds. They step off the plane with next to nothing but their dignity, hope and determination. My internship took place in the IRC’s resettlement department. I worked closely with case managers to alleviate their intense workload and ensure that their clients received all available social services. In addition, I mentored one newly arrived family by conducting home visits and tutoring sessions on a weekly basis. I chose to pursue this internship to gain experience in the daily activities of a remarkable international organization. The most valuable aspect was the direct insight into the humanitarian consequences of worldwide conflicts.

RETROFITTING COMMERCIAL BUILDINGS TO INCREASE ENERGY EFFICIENCY

BRETT LYALL

FACULTY ADVISOR: MICHEL BOUDRIAS, ENVIRONMENTAL STUDIES

INTERNSHIP SUPERVISOR: KATE REIFER, CORE ENERGY CONCEPT

Core Energy Concepts is a sub-division of Dan Levy construction, and has been working to make commercial buildings in San Diego more energy efficient. While interning there, I have performed site-walks to determine what areas of the building require modification in order to reduce overall energy usage. I have also been working with SDG&E and other San Diego utility companies, promoting the rebates they offer to their customers. Commercial energy auditing is an inexpensive and effective tool for reducing the energy demand in major cities, including San Diego. One focus of Core Energy has been retrofitting local McDonalds Franchises. Part of my poster will analyze the reduction in energy usage and the decreased amounts of CO₂ emissions, if every McDonalds in the U.S made the same retrofits as the stores in San Diego.

LIBERTY IN NORTH KOREA

SARAH PALMER

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I worked for Liberty in North Korea. Their mission is to redefine the North Korea crisis through creative storytelling, while providing emergency relief to North Korean refugees and pursuing an end to the human rights crisis. I was the Chapter Coordinator Intern for LiNK. I discussed with chapter presidents what their chapter had done in the past to raise awareness about the human rights crisis and raise funds and how they could improve. I created resources, including fundraising plans and how-to guides, and helped create the Fall 2010 Chapter Campaign. I chose this internship because I wanted to gain experience working for a non-profit. I learned about many different aspects of the crisis, how to be better organized, and how reach out to people more effectively.

IRC PEACEMAKERS

SARAH PALMER

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I worked for the International Rescue Committee (IRC). The IRC serves refugees and communities victimized by oppression or violent conflict worldwide. Founded in 1933, the IRC is committed to freedom, human dignity, and self-reliance. This commitment is expressed in emergency relief, protection of human rights, post-conflict development, resettlement assistance, and advocacy. I was the Outreach Coordinator for the IRC Peacemakers program. I organized events and created an online presence for the IRC Peacemakers. I chose this internship because I enjoyed working with the students, but I wanted to help the program grow. I learned about planning events and reaching out to different communities to gain support.

LIDAR STUDIES OF PLANKTON LAYERING USING THE CALIPSO SATELLITE

EMMETT PERL

FACULTY ADVISOR: KATHLEEN KRAMER, ELECTRICAL ENGINEERING

INTERNSHIP SUPERVISOR: DR. JAMES CHURNSIDE, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

For many years, airborne LIDAR has been used to survey plankton concentrations across the globe, giving us an indication of how climate affects ocean life. However, use of a space-based LIDAR would greatly expand the range of these studies. I explored the feasibility of using LIDAR from the CALIPSO satellite to find plankton layers in the ocean and determined the limiting factors of the instrument. In this study, I searched a year's worth of data for evidence of plankton layering in the ocean and was able to identify over 1000 possible layers. This shows that space-based LIDAR is a practical means of identifying sub-surface scattering layers in the oligotrophic ocean. A future space-based LIDAR with improved range resolution would allow for a better survey of worldwide plankton concentrations, giving us a better picture of how climate affects life in the ocean.

MONITORING THE BORDER REGION: INTERNSHIP AT THE TRANS-BORDER INSTITUTE

ERNESTO REYES-HERNANDEZ

**FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS
TRANS-BORDER INSTITUTE**

As a freshman pursuing a degree in International Relations, I am constantly looking for opportunities to gain experience in the field of international politics. During the spring of 2011, I interned at the Trans-Border Institute of USD. I selected this internship because I wanted to learn more about how the United States interacts with Latin American countries, specifically Mexico. The Institute promotes activities to strengthen the relationship between the United States and Mexico and focuses on the situation in the border. As an intern, I post daily to the Trans-Border News Blog, which monitors the San Diego-Tijuana border region. My duties also include writing a report on a book that deals with U.S-Mexico relations and interviewing a prominent border scholar. My time spent at the TBI provides valuable experience for my future career in foreign service.

ASSOCIATED STUDENTS - SPEAKER OF THE SENATE

DIANA RODRIGUEZ-AGISS

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

I am working in the Associated Students' Executive Board of USD. The Associated Students' Leadership Team serves University of San Diego Undergraduates as official student representatives who promote opportunities for growth and expression, address student issues, and enrich a diverse, inclusive, and engaged community. In my position as Speaker of the Senate, my role is to oversee the 30 senators and make sure that they are reaching out to their constituencies and bringing issues to Senate. I also serve as the AS Representative on the Student Affairs Committee of the Board of Trustees, as a representative in the Finance Committee, and on other committees as necessary. I applied for this position because I wish to pursue a career in politics and this is a great way for me to enhance my experience in how a governing body serves its constituents. I plan on continuing my involvement in AS during my last year at USD because I have gained such a valuable experience and I have grown professionally.

BUREAU OF INDIAN AFFAIRS

JOY VALDEZ

FACULTY ADVISOR: GARY GRAY, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

With more than 565 federally recognized tribes scattered across the United States today, Tribal Governments have struggled to maintain the prosperity and longevity of Native Americans. My internship was at the Bureau of Indian Affairs in Palm Springs, California, which works primarily with the Agua Caliente Band of Cahuilla Indians. The Bureau of Indian Affairs' role is to protect tribal land, legal rights, as well as Indian assets. Their primary trust function is to provide protection and management of Agua Caliente tribal land. Services provided at the Palm Springs agency range from Estate Planning, Real Estate services, Indian services, and Trust services. The intricate relationship between the United States Government and Tribal Governments have allowed an ongoing recognition, and practice of tribal sovereignty through the Interior with the Department of Interior Bureau of Indian Affairs.

IMPROVING COURIER SERVICES FOR RADY CHILDREN'S HOSPITAL

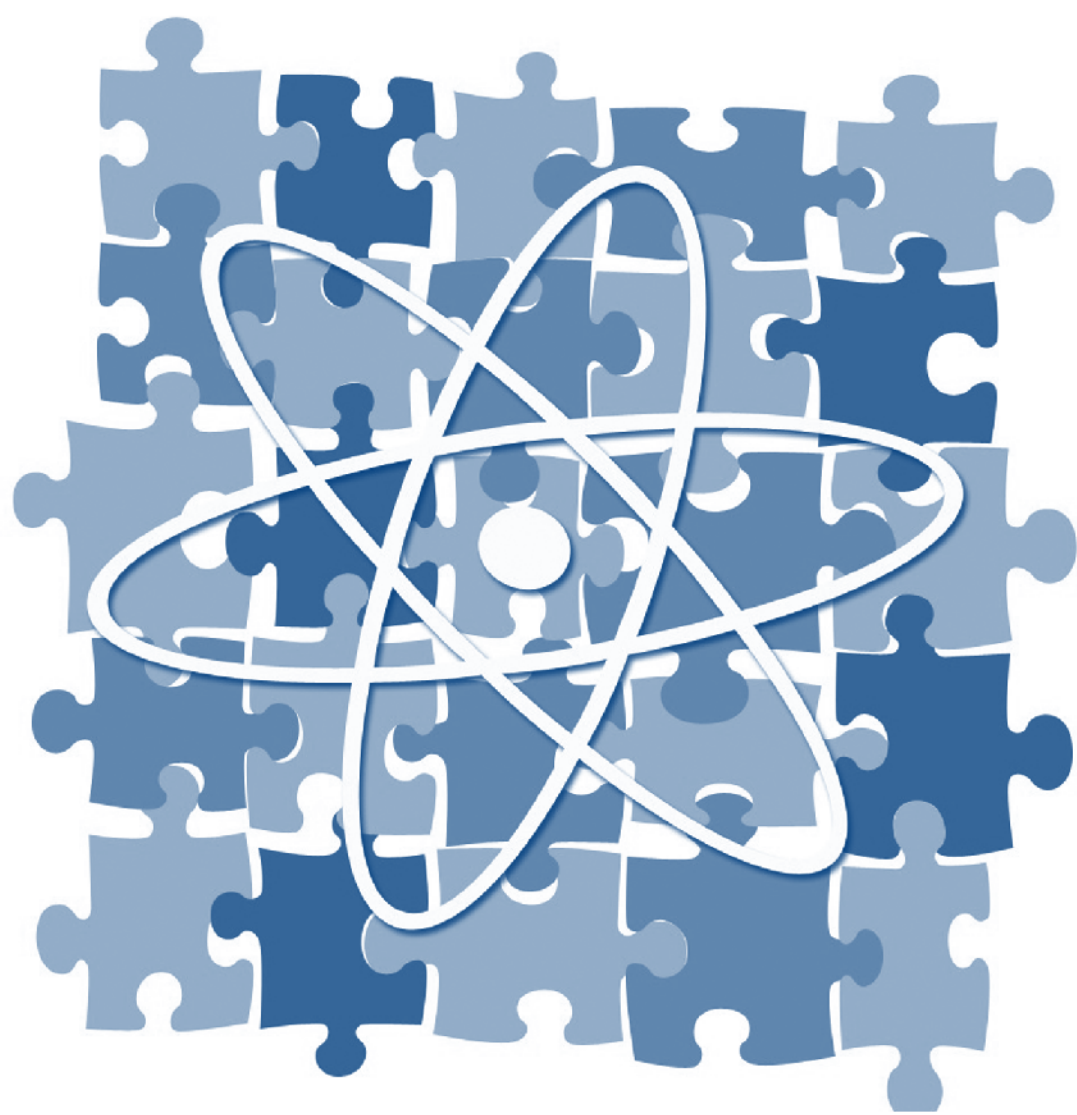
TAY YOUNG, ANDREA WARREN, RENEE THOMASHOW, ROY LEYRER

FACULTY ADVISOR: RICK OLSON, INDUSTRIAL & SYSTEMS ENGINEERING

INTERNSHIP SUPERVISOR: RACHEL WEBER, RADY CHILDREN'S HOSPITAL

For our Senior Design Project, we are working with Rady Children's Hospital to improve their courier services. They currently use multiple courier services to deliver such things as medical records, blood samples, and medical equipment to clinics all throughout San Diego County. We will be using skills developed throughout our curriculum to cut costs by looking for opportunities to combine routes between the multiple couriers, and to find an optimum route for each courier to use. We will also perform analyses to determine if some or all of the tasks can be performed in-house. By inspecting the costs required to bring the operation in-house and the savings that it would bring them we will be able to determine if this possibility is profitable. Finally, we will be forecasting the future demands Rady Children's Hospital will encounter once they move to a paperless system in the fall of 2011.

RESEARCH



HARE KRISHNAS IN PACIFIC BEACH

ALYSSA ANINAG, JOSEPH SEILER, MARISSA PLEDGER, KELLY GOLDSTEINHOLM

FACULTY ADVISOR: EVELYN KIRKLEY, THEOLOGY & RELIGIOUS STUDIES

The International Society of Krishna Consciousness (ISKCON), popularly known as Hare Krishnas, has had an established temple in Pacific Beach for decades. There is an active worshipping community of a hundred, and approximately a dozen monks in residence. Through research and interviews, we explore the relationship of the Hare Krishnas to their surrounding community in Pacific Beach. They have experienced misunderstanding, alienation, and bias-related incidents as an “outcast” religion. Why? What do they believe and how do they practice? The temple is working to gain acceptance. In addition to weekly ritual services open to the public that include prayer, dancing, chanting, and a vegetarian meal, the temple has a newspaper, Krishna Lounge, and active online presence. In these ways, Hare Krishnas seek to neutralize negative perceptions and convey their beliefs and practices accurately. Despite some hostile reception, ISKCON feels its PB location has enabled it to thrive in San Diego.

ANALYSIS OF TREE-RING DATA FROM THE QINGHAI-TIBETAN PLATEAU TO EXTRACT CLIMATIC SIGNALS DURING 1100-1300, 1600-1800, AND 1800-2000 CE

ARMAND ANSELMO

FACULTY ADVISOR: ZHI-YONG YIN, ENVIRONMENTAL STUDIES

One of the most abundant and reliable climate proxies available to scientists today is tree-ring data. Through analysis of tree-ring chronologies, scientists have been able to extract climate variation patterns relating to soil moisture, precipitation, and temperature. Qilian junipers, *Sabina przewalskii* Kom., from the northeastern Tibetan Plateau have been used to produce extensive tree-ring chronologies. This project investigates the climate of two 200-year periods, ~1100-1300 CE and ~1600-1800 CE, in comparison with the climate of ~1800-2000 CE. Statistical methods, such as various descriptive statistics, correlation analysis, and inferential tests, were used to investigate how tree-growth varied in these three independent time-periods. It was found that climate and tree-growth have statistically significant relationships, and that tree-growth fluctuated between each 200-year time period, with greater growth taking place in the last 200 years. The results also show that climatic conditions in months prior to the growing season played a significant role in tree-growth.

RADY'S CHILDREN'S HOSPITAL: FRESH START CLINIC IMPROVEMENT

ANDREW ARCIDIACONO

FACULTY ADVISOR: RICK OLSON, INDUSTRIAL & SYSTEMS ENGINEERING

In Spring 2011, I will be participating in a study at Rady's Children's Hospital. As part of a four-man group, I will be conducting a study of the Fresh Start Urology and Plastics Clinic in order to help facilitate change for the betterment of the clinic. Specifically, the group will be tracking patients to analyze the overall admission-to-check out procedures in order to make recommendations for improvement. The clinic has experienced bottlenecks and inefficiencies, which they wish to minimize through our efforts.

PRODUCING HISTONE COMPLEXES IN BACTERIA: IMPROVING SOLUBILITY AND INVESTIGATING THE ROLE OF HISTONE CHAPERONES IN ASSEMBLY

MICHAEL BAGLEY, SHIMMYRAM GABBARA

FACULTY ADVISOR: ROBERT DUTNALL, CHEMISTRY & BIOCHEMISTRY

Packaging DNA with histone proteins into a structure called chromatin allows an enormous amount of genetic material to be squeezed into the confines of a cell and plays an important role in controlling gene expression. The Dutnall lab has developed methods based on co-expression in bacteria that provide a convenient way to produce and purify histone protein complexes for studies of chromatin structure and its role in gene regulation. We are trying to improve the solubility of bacterially produced histone H2A-H2B complexes by co-producing them with the histone chaperone protein Nap1. We are also investigating the role of Nap1 in the assembly of H2A-H2B complexes. These studies are aimed at improving yields of soluble histone complexes, and will also provide insight into the mechanisms that produce histone protein complexes for chromatin assembly during DNA replication in a typical eukaryotic cell.

IDENTIFYING MYOSTATIN (MSTN) IN YELLOWTAIL (*SERIOLA LALANDI*) USING DEGENERATE PCR

ALYSSA BERNARDI

FACULTY ADVISOR: CURTIS LOER, BIOLOGY

Genes associated with increased muscle growth have become a focus for improving livestock and aquaculture finfish quality and growth rates. The protein myostatin is a negative regulator of skeletal muscle growth in vertebrates and mutant forms of the gene contribute to muscle hypertrophy. In fish, myostatin also plays a role in maintaining tissue growth, osmolarity and reproductive tissue function. We want to identify the myostatin gene in yellowtail in order to study the effect of the protein on muscle growth in fish. The myostatin gene has been sequenced in other

bony fish, is highly conserved, and mutants have been linked to enhanced muscle growth. We plan to use degenerate polymerase chain reaction (PCR) to design primers based on the myostatin sequence in other bony fish and then to amplify, clone and sequence the gene in preparation for future experiments involving fish that have been exercised.

SYNTHESIS OF CHIRAL LIGANDS FOR ENANTIOSELECTIVE CATALYSIS

**LAUREN BERNIER, JESSICA CRYDER, CURTIS MOORE,
ARNOLD RHEINGOLD**

FACULTY ADVISOR: CHRISTOPHER DALEY, CHEMISTRY & BIOCHEMISTRY

Many chiral compounds in pharmaceuticals are made using enantioselective catalysis, a technique that uses asymmetric catalysts that can discriminate between different achiral molecules to yield enantiopure drugs. Numerous catalysts have been developed that are successful in many reactions, but improvements are required in catalyzing a broader range of reactions, tolerating functional groups, and all while generating a high degree of enantioselectivity. Our research focuses on the synthesis of a new series of chiral bis(2-imin-4-substituted-oxazolyl)isoindolines through the preparation of two cadmium complexes, Cd[bis(Ph-oxazoline)isoindoline]₂ and Cd[bis(1-pr-oxazoline)isoindoline]₂, followed by the separation of the ligand from the complexes. Once isolated, these ligands will be investigated in enantioselective catalysis. Herein we report on our progress on these goals.

CELLULAR MECHANISMS OF CEREBRAL INJURY AND PROTECTIVE STRATEGIES IN COMPLEX CARDIAC OPERATIONS

BRITTNEY BEYER

FACULTY ADVISOR: VALERIE HOHMAN, BIOLOGY

Cardiopulmonary bypass (CPB) and hypothermic circulatory arrest (HCA) are commonly used during complex cardiac operations in children. In HCA, the patient is cooled to 18°C (deep) or 25°C (tepid) and perfusion to the body and brain is stopped for up to an hour, creating a bloodless operating field. Due to the lack of oxygen in the brain, which normally receives 15% of total cardiac output, neurological injury, including seizures, stroke, and developmental delays, is often a result of these repairs. To improve neuroprotection, selective cerebral perfusion (SCP) is commonly used, though there is limited evidence to support the best method, utility, and conditions. We are interested in using the pathway leading from ischemia to neuronal death to determine ways to minimize or eliminate cerebral injury, with particular focus on SCP, glutamate-based, and nitric oxide-based protective strategies, in order to improve long-term outcomes of congenital heart surgeries.

THE POLITICAL REPRESENTATION OF PORNOGRAPHY: A CALL TO ACTION

JARAE BIRKELAND

FACULTY ADVISOR: ESTEBAN DEL RIO, COMMUNICATION STUDIES

Our culture has conservative expectations of sex even though it is everywhere. My work advocates that people be correctly informed, be able to educationally deliberate the moral issues and understand how to take action in regards to sex, pornography and censorship in our hyper-sexualized culture today. The more we are able to talk about the pornography business and sex within our media and culture, the less awkward and embarrassing it becomes. As a part of my call to action, we are running a discussion group a couple of times a month to read and discuss articles based upon the Barnard Conference, a conference on feminist research and academic scholarship. We are also bringing in two guest speakers to campus to inform the USD community on the political representation of pornography. My hope is to have more informed citizens on issues regarding sexuality that face our media culture today.

SUPPLY DRIVE: THE DIFFERING EFFECTS OF PATHOS AND LOGOS

MEGAN BLAICH, SARAH PARKS, CHASE GERTSCH, MACKENZIE GILCREST, LINDSAY REUBEN, ALYSSA RODRIGUES

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

The focus of this research was on the communication processes associated with Head Start, a program that benefits children from birth to age 5, pregnant women, and their families by working to increase the school-readiness of children. Over a three-month period, the researchers conducted an on-campus supply drive, collecting goods such as books, art and school supplies, and educational toys in a test of what motivates people to donate. Results are described by comparing the amount of supplies collected through the opposing methods in a test of appeal effectiveness using emotions or statistics/logic. Specifically, this project used the USD Greek Life Chapters as a population of interest, with half of the fraternity and sorority chapters receiving an appeal to pathos, sharing stories and showing pictures. The other chapters received an appeal to logos, listings facts and statistics. Through drop boxes at various locations around campus accompanied by short questionnaires for donors to identify how they heard about the cause, we were able to determine which approach was more successful. Results are discussed in terms of strategies for successful peer marketing among college populations.

BIG BROTHERS BIG SISTERS: ATTRACTING MORE MALE PARTICIPANTS

RACHEL BOTTING, KELLI HAGAN, KAILA WEEDMAN, TEDDY VALOVSKA, ANN-MARIE AUGER-ANDREWS

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

The nationwide non-profit organization Big Brothers Big Sisters (BBBS) seeks to create nurturing relationships between children and adult mentors. The San Diego chapter of the organization attracts participants through corporations, government, advocacy groups, and local partnerships as well as through mediated advertising campaigns. The San Diego chapter of BBBS has recently struggled with a shortage of male mentors, or Big Brothers, to match the number of participating Little Brothers. The purpose of this study was to evaluate the communication techniques employed by BBBS of San Diego to attract male mentors and to draw attention to areas where these techniques are weak or fail. Pointed focus groups were utilized in order to acquire this information. This study also discusses research results in light of human communication theories and proposes amendments/adjustments to the already existing communication between BBBS of San Diego and potential Big Brothers.

DETERMINING ISOTOPIC FRACTIONATION AND TURNOVER OF CALIFORNIA *FUNDULUS PARVIPINNIS* TISSUES TO CALIBRATE WETLANDS FOOD WEBS

JULIE BRODFUEHRER

FACULTY ADVISOR: DREW TALLEY, MARINE SCIENCE

The ecological complexity of a salt marsh is manifested by its food web, which contains numerous reticulate connections between consumers and resources, which are critical to understanding and protecting these habitats. Analyzing stable isotopic shifts between resources and consumers is a first step towards calibrating these food webs. Isotopic fractionation rates and tissue turnover rates of an abundant, important local wetland fish species, *Fundulus parvipinnis*, were examined to determine whether different tissues fractionate carbon isotopes similarly and if isotopic signatures equilibrate more rapidly in liver relative to muscle tissue. *Fundulus parvipinnis* were fed a stable diet of brine shrimp and tissue samples taken weekly. Our results show tissue turnover rates are significantly faster in liver relative to white muscle, and that the standard isotopic rule of “0.5 per mil change in ^{13}C per trophic level” does not hold for *F. parvipinnis*. These shifts should be assessed further to better define trophic relationships.

HUSSERL'S PHENOMENOLOGY AND HIS QUEST FOR TIME

CLARISSA BROWN

FACULTY ADVISOR: PETER GRATTON, PHILOSOPHY

Husserl's phenomenological method, the study of intentionality, brought him to a theory of time consciousness, which led Husserl to the study of temporal objects in particular duration. Using primal impressions (the now), retentions (immediate past), and protentions (expectations of the future) Husserl is able to formulate a method that describes each moment that occurs in time. This also allows him to explain how time flows, allowing each moment to move into the other. Using his example of a melody, Husserl explains that in order to hear the melody as a whole we must hear the flow of the notes that make up that melody, otherwise every moment would be the now.

WOMEN'S ROLES IN ISLAM

TIMOTHY BURTNETT, JESSICA LITVACK, ANNIE HEATON, CHANTEL DEPAEPE

FACULTY ADVISOR: EVELYN KIRKLEY, THEOLOGY & RELIGIOUS STUDIES

Many Americans perceive Muslim views of women as oppressive and misogynistic. Muslim women often experience bias and even harassment due to the belief they are uneducated and subordinate to their husbands and fathers. We challenge these views by analyzing women's roles in Islam through research at the Islamic Center of San Diego. Although Muslim women are raised differently in different parts of the world, in the Qur'an women are regarded as equal to men, but with different gifts and capabilities. Women have unique and integral roles to play in Islam. We explore women's roles in the mosque, wearing hijabs (head coverings), and gender separation in Islam. We conclude that negative stereotypes are due to ignorance and media portrayals.

STUDY OF VARIOUS LANTHANUM HALIDE NANOCRYSTAL FORMATION AND SIZE DISTRIBUTION AS A FUNCTION OF ACIDITY

TAYLOR CALDWELL, SCOTT BELDING

FACULTY ADVISOR: JAMES BOLENDER, CHEMISTRY & BIOCHEMISTRY

Lanthanide-based fluoride and chloride nanocrystals exhibits distinct differences in size distributions based on the halogen counter ion used and the synthetic conditions. Specifically, the size of the nanocrystal structures appears to vary as a function of pH. The size distribution of the nanocrystals was resolved by ultracentrifugation techniques and quantified by luminescence measurements for nanocrystals containing 20% Eu^{3+} in either a LaF_3 or LaCl_3 structure. We will present a comparison of europium fluoride and chloride size distributions, at varying pH values, to elucidate the impact of synthetic conditions on assembly of these nanomaterials.

TROPICAL BIOINDICATORS: USING FORAMINIFERA TO ASSESS WATER QUALITY IN A CORAL REEF ENVIRONMENT, ST. JOHN, U.S. VIRGIN ISLANDS

MAVERICK CAREY

FACULTY ADVISOR: SARAH GRAY, MARINE SCIENCE

In the U.S. Virgin Islands, coral reefs are threatened by human activities. Urban development in the watersheds leads to increased sedimentation and inputs of land-based sources of pollution. For this study I will examine if Foraminifera, a single-celled calcareous protist, can be used as a measure of water quality in St. John. Hallock et al (2003) developed the Foraminifera in Reef Assessment and Monitoring (FORAM) Index as a simple way to determine the suitability of a coral reef environment is for coral growth or recovery. My study aims to apply the FORAM Index to sediments from St. John and compare reef conditions and water quality between reefs below developed and undeveloped watersheds. Benthic surface sediments were collected at 4 coral reef sites. Sediments were wet sieved, and foraminifera were picked, identified and enumerated. Data presented will include community composition and calculated FORAM indices for all four coral reef sites.

NIKA WATER: A BETTER WAY TO COMMUNICATE A CAUSE

ADRIANA CARRASCO, ASHLEY CAPURRO, KARISSA SMITH, CATHERINE DEL SANTO, KAYLEIGH BOND

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

Nika Water's mission is to encourage youth to become involved in bringing clean water to the impoverished world. Although Nika has grown tremendously in the few past years, there remains a lack of awareness for the organization's cause. This is exemplified through Nika's low popularity ratings on Facebook. Although many may recognize the "Nika" name, there is not sufficient evidence to suggest that people are fully aware of their mission. Nika's weakness has been their inability to successfully communicate with audiences through social networking sites. The present research studied how Nika can improve their popularity by successfully advertising their message on Facebook. This research contributes to a better understanding of how to best communicate and adhere to a young, cyber audience by conducting surveys on the Internet, at USD and local high schools. The current study benefits Nika through findings associated with the successful promotion of their water to the younger generations.

USD PERCEPTIONS OF DIVERSITY AND INCLUSION

SOPHIA CARRILLO

FACULTY ADVISOR: LISA NUNN, SOCIOLOGY

How “inclusive” is USD? What is “diversity” to you? These questions and more are examined in an in depth analysis of diversity and inclusion on campus. The data come from an original survey distributed to a random sample of 1,000 USD undergraduate students. The IRB approved project is supported by an A.S. academic research grant and is a collaborative effort with the Center for Inclusion and Diversity. The data will reflect the attitudes towards current political culture and climate on campus, and will identify student perceptions and recommendations in outreach of underrepresented groups and evaluation of existing programs. Diversity and Inclusion initiatives are crucial to USD’s accountability as a responsible institution of higher education. This is a social reproduction problem that needs to be addressed by the USD Community for the benefit of current and future students.

MONITORING KINETICS OF THE COUPLING OF 2,5-DIIODOBENZOIC ACID AND LEUCINE ON A SOLID SUPPORTING USING MAGNETIC LEVITATION

KAREN CESAFSKY, JOE SALAMEH, TRAN LE, AILEEN PARK

FACULTY ADVISOR: LAUREN BENZ, CHEMISTRY & BIOCHEMISTRY

Magnetic levitation is used to study small density changes of porous polystyrene beads via suspension in a paramagnetic solution. These density changes are the result of a chemical reaction between a leucine functionalized Wang resin and 2,5-diiodobenzoic acid. By observing a change in levitation height, which is directly correlated to bead density, a pseudo first order plot can be constructed to measure the kinetics of the coupling reaction. By performing this reaction at several temperatures, an Arrhenius plot was constructed in order to determine the activation energy of the reaction. We compare these height measurements to changes in density, measured independently using a centrifugation technique.

STRUCTURAL CONTROL OF A THREE-STORY BUILDING USING A SELF-POWERED AND SELF-SENSING MR FLUID DAMPER SYSTEM

TIARA CHAPEL

FACULTY ADVISOR: RICK OLSON, INDUSTRIAL & SYSTEMS ENGINEERING

The project examined the feasibility of applying 200kN Magnetorheological (MR) fluid dampers controlled/powered by electro-magnetic induction (EMI) devices through a 3-story building to provide seismic protection. The EMI device is subject to interstory velocity, which produces a voltage proportional to the velocity seen by the MRD. Before being sent to the MR damper the voltage from the EMI devices is passed through circuits, which implement a primary & secondary

controller. The primary controller uses a Linear Quadratic Gaussian (LQG) to determine desired control forces. The secondary controller, an Inverse Algebraic Controller determines the command signal to send to each MRD. The project describes initial analytical studies of the proposed system. MRDs are modeled with a Hyperbolic Tangent Model, and EMI as a linear equation, the control circuits are assumed to be realized exactly. The building is modeled as a single degree-of-freedom. MATLAB simulation is used to illustrate effectiveness of the system.

THE EFFECTS OF SOCIO-ECONOMIC STATUS ON LATINO CHILDHOOD OBESITY

JOSE ROSALES CHAVEZ

FACULTY ADVISOR: JULIA SCHAFFER, CHEMISTRY & BIOCHEMISTRY

The Latino community is the fastest growing community in the United States. Unfortunately, this population also has the highest obesity rate among children. The study of Latino children and obesity is of great importance due to the undesirable consequences this problem could bring to the entire United States community. It is estimated that by the year 2030, the Latino community will make up 20.1% of the total U.S. population. Without efficient prevention programs, a great number of Latino adults will be obese. As a consequence, the U.S. will spend vast amounts of money on medical care for obese Latinos and it will also lose Latino productivity. This paper analyzes how socio-economic status (SES) is suggested to be the major factor affecting the obesity rates in Latino children. It also analyzes how SES affects aspects of society, culture and the economy, which in turn become risk factors for obesity.

GUADALUPE: MAPPING THE MEANING OF A CULTURAL SYMBOL

GIBRAN CHAVEZ-GUDINO

FACULTY ADVISOR: ORLANDO ESPIN, THEOLOGY & RELIGIOUS STUDIES

From the time that the devotion was taken over by the clergy, the Virgin of Guadalupe has been pushed into the role of Mary. This role leaves devotees exposed to criticism of superstition or heterodoxy, and ultimately unveils the bias of the Eurocentric ecclesiastical institution. Because most devotees relate to Guadalupe in ways that other Christians, including other Catholics, would identify as pneumatological, an examination of the pneumatological possibilities of this devotion becomes necessary. This paper will review the historical outline of the devotion and examine its pneumatological possibilities.

TOCOM LAB

JAMES COOK, BRIAN TAYLOR, WILLIAM O'QUINN, JAMES O'HARA, DAVID MORALES

FACULTY ADVISOR: SUSAN LORD, ELECTRICAL ENGINEERING

TOCOM Lab team's focus is to make the word sustainability tangible, to give people a better understanding of exactly what the word means. With the assistance of Siemens Industry, the TOCOM Lab team will demonstrate energy sustainability through the implementation of control systems in a lab environment. The team is building a mobile lab space, which will serve as a model environment that will have a control system to manage the internal temperature, measure the humidity and CO₂ of a controlled environment. The mobile lab unit will be able to be transported between the electrical engineering labs and the mechanical engineering labs in Loma Hall.

COMMUNITY COACHING CENTER

LINDSEY DAVITT, KARA CUNNINGHAM, KATIE CRIMI, COLLEEN DUNN, ANTHONY PAVLOVIC

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

The current research project focuses on the Community Coaching Center, a local San Diego organization with a stated goal of developing "appropriate social behaviors for school aged individuals with autism while promoting awareness and inclusion in the community." Our research focused on the relationships between the organization and its volunteers and fostering the communication between them. By bettering these relationships, the organization will have a greater impact on the community as a whole. This project tested different strategies for improving volunteer involvement, ultimately finding new ways for volunteers to be consistently - and actively - a part of the Community Coaching Center nonprofit organization.

BIOAVAILABILITY OF HEAVY METALS IN SEDIMENTS FROM U.S. VIRGIN ISLANDS

THOMAS DECARLO

FACULTY ADVISOR: SARAH GRAY, MARINE SCIENCE

Bioavailable metals are easily released from sediments into the environment and may contaminate food webs. This study examined how bioavailable metals in sediments and soils varied from the watershed to the reef and how metal concentrations were affected by human development on the steep volcanic tropical island of St. John, USVI. A single reagent sequential extraction procedure using EDTA was adopted as a first-order proxy of bioavailability of metals in these sediments. Metal concentrations varied greatly between different marine and terrestrial environments, and appeared to accumulate in the lower areas of watersheds. Bioavailable metals did not appear to be influenced by human activities and were below EPA threshold effects levels. The general

concentration trend of metals was $Mn > Cu > Zn > Co > Cr = Cd = Ni$. Future research will examine how the distribution of bioavailable metals varies with the mineralogical and textural phase of the sediment.

MILITARY SELECTION MECHANISMS AND MEDIAN HOUSEHOLD INCOME

ANGELITA DELGADO, BRISA HALVIATTI

FACULTY ADVISOR: MICHELLE CAMACHO, SOCIOLOGY

Is there a relationship between military selection mechanisms and median household income by geographic region? Recent research from the Department of Defense (DOD) suggests there are no socioeconomic disparities in enlistment. However, the DOD does not keep data on the household income of enlistees. We produced a statistical map documenting regional income using census tracks and the corresponding locations of military recruiting offices in San Diego County. The goal is to triangulate our findings with qualitative interview data from military recruiters. We will visit select military recruiting centers based on stratified economic zones. The significance of this project will bring evidence to bear on the question of whether or not military recruiting offices disproportionately draw from economically impoverished regions. In short, is there a “poverty draft?” Future research will examine the motivations of potential recruits who enlist and the correlations of individual socioeconomic backgrounds.

THE EFFECTS OF PSYCHOSOCIAL STRESS ON SALIVARY CORTISOL AND ALPHA-AMYLASE

ANKITA DHAR, CYNTHIA GUTIERREZ, MADDIE LENARD, ROSS KENDALL, KELLY CORREA

FACULTY ADVISOR: VERONICA GALVAN, PSYCHOLOGICAL SCIENCES

Research has shown that psychosocial stressors can increase the salivary levels of stress hormones such as cortisol (Dickerson & Kemeny, 2004) and alpha-amylase (Nater & Rohleder, 2009). Our research focuses on the effect of “everyday distracters,” such as conversations, on a bystander’s stress levels, which are indicated by these hormone levels. Participants heard a one-sided or two-sided conversation while completing an SAT exam. Baseline saliva samples were collected before the SAT task and 20, 40, and 60 minutes after the conversation. We expected to find that participants exposed to the one-sided distracter would have higher stress levels. Results illustrated that there was no group difference between participants exposed to either conversation. However, a larger number of subjects may reveal a difference based on gender and hormonal status. Thus, further research is being conducted to statistically validate the notion that common daily distractions increase people’s stress levels.

IMPROVING LIVES THROUGH THE INCORPORATION OF ART

GENEVIEVE DIBARTOLO, RACHEL HORGAN, ALEXANDRA PONCE, CINDY LAPE, JULIANNE DAVIS

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

ARTS is an organization which tries to incorporate art into the lives of children and teens. By allowing students to express themselves during or after traumatic events, ARTS has significant impact on the lives of youth. The present research used a quantitative approach to study the communication nature of the organization, scrutinizing the effort of ARTS and suggesting ways that our research results can help them have an even more significant impact on the lives of San Diego youth.

RECONCEPTUALIZING THE PROBLEM DEFINITION OF FINANCIAL STATEMENT FRAUD DETECTION

MICHAEL DICARLO

FACULTY ADVISOR: JOHAN PEROLS, ACCOUNTANCY

Prior financial statement fraud machine learning research has assumed that fraud detection is a binary classification problem where firms are either fraudulent or non-fraudulent. This study reconceptualizes the financial statement fraud detection problem and places different types of fraud, such as revenue fraud and expense fraud, in different fraud sub-classes. We will empirically examine the impact of this reconceptualization on the performance of two leading statistical and machine learning models, logistic regression and support vector machines. Research taken upon the area of financial statement fraud detection can help auditors and regulators improve their fraud risk models and predict business fraud faster and with better accuracy.

PACKAGING AND SHIPPING PROCESS IMPROVEMENT

ANDREW DISOTELL, TIARA CHAPEL, RODRIGO DIAZ, BRIAN PARTIDA

FACULTY ADVISOR: RICK OLSON, INDUSTRIAL & SYSTEMS ENGINEERING

From 25 years of sheet metal and machining experience, L&T Precision has grown from a small manufacturing company to a 48,000 square foot facility with over 100 employees. Located in Poway, the company has provided many San Diego industries, including defense, aerospace, and medical, with unmatched services. However, L&T Precision is currently experiencing hardships from their rapid growth and steady success. Specifically, the company is struggling to transition to the high production requirements. Our team of senior Industrial and Systems Engineering students will focus upon the packaging and shipping department at L&T Precision to standardize and improve the efficiency of the process. We will identify the impeding elements that have caused excess work in process and hindered both lead times and worker efficiency. In the next

two months, our team will analyze historical data, perform direct time studies, and construct simulation models to distinguish the problems and propose recommendations.

JIM HARRISON AND HIS RELATIONSHIP WITH NATURE: A POETICALLY DEPICTED CATALYST THAT EMBODIES THE CONSTRUCTION OF AN ABSOLUTE REALITY

ALEXIS DOMBROUSKI

FACULTY ADVISOR: JOSEPH JEON, ENGLISH

Jim Harrison's relationship with the natural world, as depicted in three of his poetical works "Letters to Yesenin," "After Ikkyū? and Other Poems," and "Saving Daylight" acts as a catalyst through which several of his religious conversions are revealed. In each conversion, Harrison actively seeks out what religious identity best corresponds with his own perception of what Absolute Reality is. The initial, and even superficial, analysis of Harrison's poetical portrayal of his relationship with nature points to what religious conversion he is undergoing at the time he writes a specific work. However, upon a more extensive analysis, the core of Harrison's poetry is the actual and isolated development of his connection to the natural world. This developmental spiritual exploration allows Harrison to cultivate and heighten his own understanding of spatial awareness. Through this spatial awareness, Harrison is able to construct an Absolute Reality in which both his self-relationship and his relationship with the natural world are unified.

AUDITORS IN NEGOTIATIONS: HOW TO HANDLE CLIENT RELATIONS

ERIN DOWNEY

FACULTY ADVISOR: JILLIAN PHILLIPS, ACCOUNTANCY

In my research, I explore the topic of how auditors interact with their clients. There are many difficult situations that auditors must relay about financial matters. One area of study that I wanted to focus on was how gender plays a part in these negotiations. I will read and analyze several papers to use as support as well as conduct surveys among students (who have audit experience) and professionals about how they view themselves as negotiators and their clients' reactions. By using the results from my case study questionnaire, I will be able to extrapolate data to determine how much of a role gender plays in audit negotiations, based upon how each individual indicates how he would act in a given situation.

USING OURSELVES AS A CASE STUDY: FINDINGS FROM A LEADERSHIP SEMINAR COURSE

MOLLIE DUFF, JAYZONA ALBERTO, JARAE BIRKELAND, MOLLY DONAHUE, LISA EIDSMO, JUAN ESPINDOLA, COLIN MORGAN, CAROLYN NOACK, KERRY SWEENEY, ALEXANDRIA TROOST, MORGAN WOODROW, ELIZABETH YOUNG

FACULTY ADVISOR: PAIGE HABER, LEADERSHIP AND EDUCATION SCIENCES

The purpose of the current study is to address the research question: How does a group engage in the process of taking responsibility for their own learning about leadership, and what are the leadership findings and implications from this process? As a class we were given the task of co-creating the course with the instructor. To do this we examined our own group and its dynamics and leadership processes to learn about leadership as it develops in real time. Through this process and by incorporating our own personal leadership experiences and challenges we identified key findings. These findings relate to the themes of trust, purpose, effective communication, roles, and authority. We also identified implications for effective leadership in group settings.

CHICK LIT: JANE AUSTEN'S POST-FEMINIST REWRITING

AVERY DURMAN

FACULTY ADVISOR: CYNTHIA CAYWOOD, ENGLISH

Jane Austen, one of the most prolific and well-loved novelists of the western world, has recently been cited as the inspiration for “Chick Lit” — a subgenre within women’s fiction that lightheartedly addresses issues of post-feminist women. How can an author as respected and revered as Austen be compared with this contemporary froth? Using Austen’s *Pride and Prejudice* as an example of her work, and Helen Fielding’s *Bridget Jones’ Diary* as an example of present-day Chick Lit, I will examine the parallel literary efforts between Austen and Chick Lit writers in citing reason as a characteristic, rather than an opponent, to traditional romance. The unique connection between Austen’s novels and the explosion of Chick Lit is found in the similarities between the texts in terms of their structural “wish fulfillment” plots, their mass market appeal, and, most importantly, their blend of rationalism and romance as a central dichotomy. Austen re-imagines the romance genre by juxtaposing romantic sentiment with rational thought, and Chick Lit authors mimic this, taking into account the cultural environment of the 21st century.

OUTSIDE THE LENS: AN UPCLOSE LOOK IN ASSISTING AT-RISK YOUTH IN THE SAN DIEGO AREA

LISA EIDSMO, MORGAN WOODROW, REMY KENNEDY, SAMANTHA CHILD, CATHERINE QUIRK

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

In today's struggling economy, non-profit organizations such as Outside the Lens, located in San Diego, are constantly searching for different methods of funding. At this time of the year, they are seeking additional grants and in the process, presenting their programs to corporations for sponsorship. In an attempt to strengthen their arguments for said funding, this research project observed students in various schools that are currently part of the programs Outside the Lens offers, and then provided evidence showing the effectiveness of the program. Through our observations and additional research, we produced useful statistics on the benefits of digital media for at-risk youth, and when combined with statistics about the number of at-risk youth in the San Diego, these are discussed in terms of the brain activity that is associated with digital media. The results of the research have helped to build a repertoire for Outside the Lens to present to corporations, informing teachers of how at-risk youth learn best. Additionally, it is hoped that these techniques can continue to be used to better the education of at-risk youth.

WAR AND WOMEN: FILLING THE GAPS IN WOMEN'S REPRESENTATION THROUGH THE YEARS

BROOKE EINSPANIER

FACULTY ADVISOR: NOELLE NORTON, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

This paper is an examination of women representatives in legislative bodies. Specifically the study will examine the percentage of women in legislative bodies during the years where the country is at war. According to voter opinion surveys it is unlikely for voters to vote for women based on the feminine characteristics to lead the government in a war-time situation. It stands to reason then that there will be fewer women in the legislative body during years when the country is at war. I will be looking at eight different countries to see if it is a global trend whether or not a country's involvement in war will affect the number of women representatives in the national legislative body.

IMAGE CORRELATION AND TRACKING IN MATLAB

JOE ELLIS

FACULTY ADVISOR: KATHLEEN KRAMER, ELECTRICAL ENGINEERING

Image correlation can be applied in a wide variety of different industries. It can be used for quality testing, pattern recognition, image searching, and image tracking. Image tracking through a video will be discussed in particular. The frequency domain and two-dimensional Fourier transforms

were utilized extensively in the image correlation process. These mathematical processes and operations were implemented in Matlab to perform image correlation and tracking. A similar technique to correlation can also be carried out to identify the position of a template image in a larger picture. This allows for accurate image placement, and is utilized widely in digital camera applications and in recognizing facial features. This technique is applied to the tracking of an image in a video. The subsequent path of the image is then plotted in Matlab showing the path an image has taken through a larger video image.

NON-PROFIT FOSTER CARE EXPOSURE IN THE SAN DIEGO COMMUNITY

CAREY ESHELMAN, HEATHER ASHTON BASCH, NOLAN CHANDLER, BRITTANY CONWAY, ALYSSA POWERS, ELLESSE TZINBERG

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

The San Diego community contributes to a large majority of donations and financial support to the Non-profit Organizations in San Diego. Youths in foster care are a specific target group that are in need of exposure and help from the surrounding community. Through our research, we discuss ways to connect a non-profit foster care organization with members of the community. Concentrating on school-aged children and their parents to assist with the needs of the foster care children, we surveyed these parents of school-aged children in an attempt to determine the most efficient way the non-profit organization can connect with this group of community members and their children.

3-D SUPER-RESOLUTION USING A PHASE MASK FABRICATED VIA GREY-LEVEL LITHOGRAPHY

CALLIE FIEDLER

FACULTY ADVISOR: DANIEL SHEEHAN, PHYSICS

3-D super-resolution can be achieved in microscopy instruments by means of phase masks that shape the point spread function. Grey level lithography is an attractive procedure for the generation of these phase masks. The photolithographic phase masks (PPM) encode the light emitted from a specimen via a topographical index of refraction variation consisting of a series of phase-singularities. In our case, the mask produces a double helix point-spread function (DH-PSF), which allows for the estimation of the object position throughout the depth of focus of a typical system. The goal of this project is to fabricate a PPM mask and to determine the best methods for its characterization. We manipulate the grey-scale lithography capabilities of the SF-100 Xpress system by priming the photoresist with multiple exposures prior to the final exposure pattern. This procedure allows us to produce the desired topography expressed by the photoresist after exposure and development (with feature sizes on the order of 10^{-6} m). Upon testing these phase masks in an optical system, we are able to observe the desired DH-PSF. Currently; experiments are being done to translate the fabricated topography of the photoresist into quartz through reactive ion etching.

“WHO WATCHES THE WATCHMEN?”: GENDER INEQUALITY AND POWER DISTRIBUTION AMONG SUPERHEROES

KRISTINE FRITSCHNER

FACULTY ADVISOR: DAVID SULLIVAN, COMMUNICATION STUDIES

Superheroes, an integral part of the media landscape, have brought about a new set of male and female characters for audiences to admire. However, they are not operating on equal ground; male superheroes are oppressing their female counterparts. From Wonder Woman's skimpy costume to the men training Buffy the Vampire Slayer, female heroes are merely accessories to male power. Inequality among superheroes reflects sexism in society. This in-depth analysis of the superhero film "Watchmen" from a post-structuralist feminist perspective is the start of my research on media, sexism and society. My goal is to continue and expand this research in order to facilitate changes in the influential television and film industries. Gender inequality is a worldwide problem that must be addressed. To succeed and establish equality, we must change the way media depict women, especially powerful figures such as superheroes.

CHINA'S INFLUENCE ON INTERNATIONAL TREATIES REGARDING HUMAN RIGHTS

JUDITH GARBO

FACULTY ADVISOR: LEE ANN OTTO, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

China is frequently spoken of as an upcoming superpower that could challenge the United States hegemony on international order and affairs. China has a permanent seat, with veto power, on the United Nations Security Council. With China's growth, it is important to be aware of the influence such a country has on global decisions. To what extent is China influencing the development on human rights oriented treaties? This inquiry looks at the debates surrounding the creation of an international treaty, China's position, and the final position and composition of the treaty. China signed and ratified the International Covenant on Economic, Social, and Cultural Rights, one part of what is known as the International Bill of Rights. China traditionally emphasizes these rights over political rights and civil liberties. It is anticipated that China will play a larger role in treaties relating to concerns for economic rights over political and civil rights.

SOUNDS FROM CHICANO PARK

ANGELA GARCIA, ELLA GUIMOND, ESTEPHANY FRANCO, LOREN ROBB

FACULTY ADVISOR: ALBERTO PULIDO, ETHNIC STUDIES

The experiences of Chicano people are ones that have been hidden from U.S. history for far too long. It is important to understand the significance of Chicano history and to appreciate the efforts of those who take part in writing that history. Through community building, social activism, and cultural expression, many individuals have dedicated their lives to giving the Chicano people

a place, presence, and voice in the U.S. This project will serve as a representation of the history of the Chicano people and the movement that continues to strive to carry on the legacy of the Chicano experience. By focusing on Chicano music and the life of Ramon Chunky Salazar, we hope to explore the influence and impact that such an expression has in a culture and community working toward social change.

AMERICAN INDIAN STUDENT PERCEPTIONS OF CAMPUS ENVIRONMENT

ROBERTA GARCIA

FACULTY ADVISOR: MICHELLE JACOB, ETHNIC STUDIES

The low enrollment of American Indian students in higher education is apparent across college campuses in the United States. At USD, the same is true, with less than one percent enrolled as undergraduates. In a review of the literature, I found that there are several key factors associated with American Indian recruitment and retention, including: campus environment/climate, preparedness for college, and social support received from family and community. For my summer McNair research project, I conducted a literature review and preliminary analysis of secondary quantitative survey data. The dataset I examined was the Diverse Learning Environments survey, which was administered to all USD students in 2009. My project analyzes the responses of self-identified American Indian Students. The purpose of my study was to examine: 1) The relationship between race/ethnic identity and campus involvement; 2) race/ethnic identity and the experience of harassment or discrimination; 3) experiencing harassment or discrimination and attrition; 4) involvement in ethnic or cultural center activities and retention. In my presentation, I share my preliminary findings and discuss how this line of research can help shape institutions to improve American Indian student recruitment and retention.

ISOTOPE LABELING: A NOVEL METHOD OF ANALYZING ISLAND FOOD WEBS IN THE GULF OF CALIFORNIA

ANDREW GIULIANO

FACULTY ADVISOR: DREW TALLEY, MARINE SCIENCE

The goal of this study is to determine the extent to which marine algal input subsidizes both terrestrial and intertidal food webs on islands in the Gulf of California, the specific pathways of subsidy, and how the pathways change with distance inland from the source. This study provides important information for conservation plans being formulated for this threatened archipelago. Marine algae were collected and grown in a tank with a ^{15}N isotope label. The use of isotopic labeling allows us to trace the influence of marine algae on terrestrial trophic pathways. The labeled nitrogen is easy to identify in consumers, thus acts as a tracer for marine algae being incorporated into the terrestrial food web. Currently, samples have been processed and we are waiting for results from the stable isotope lab. In the future, this method may be used to further analyze trophic connections and improve efforts to strengthen the ecosystem in this threatened area.

CHICANO PARK: A HISTORY THROUGH ART

JOSEPHINE GOMEZ, EIRENE ROCHA, BIANCA BRUNO

FACULTY ADVISOR: ALBERTO PULIDO, ETHNIC STUDIES

In Ethnic Studies 343 we have spent the past semester and will spend the rest of the current semester working on an oral history project having to do with Chicano Park. We are working in collaboration with Victor Ochoa, collecting his oral history about his involvement in the murals and artwork that beautifies Chicano Park. We are putting together a written summary of this history as well as collecting pictures of the art and of the historical events that have taken place at Chicano Park. This is our contribution to preserving the memories and history that makes up this place. We will display the significance of this work via a poster presentation.

BEAUTY, SEX AND MEN'S MAGAZINE MEDIA

ANTHONY GRAHAM

FACULTY ADVISOR: LISA NUNN, SOCIOLOGY

Magazine media is one of the most iconic ways in which we construct ideas about beauty, sex and health. Despite much research and critique into the world of women's magazines, men's magazines have yet to be seriously scrutinized under a sociological lens. This project conducts a content analysis of eight men's magazines for one subscription term (typically twelve months) in order to analyze the ideals and standards of both the body type and sexual actions of men. This project interrogates the ways that men are subjected to unfair and unobtainable expectations. The findings help us understand how magazines' portrayal of men who are not only physically fit, but dominant in all sexual endeavors can affect how real men interact with one another, and also how they interact with women. The analysis compares magazines aimed towards heterosexual men and toward homosexual men.

SPATIAL VARIATION OF PHOSPHATE, SILICA, AND CHLOROPHYLL A IN BAHIA MAGDALENA USING GIS (2003-2010)

GRANT GRAMAGLIA

FACULTY ADVISOR: MICHEL BOUDRIAS, ENVIRONMENTAL STUDIES

This project expounds on a long-term water quality research project in Bahía Magdalena, Baja California. During our visit to Bahía Magdalena we collected water samples along the shoreline and throughout the bay to express the spatial and temporal variation of biological and chemical parameters in response to local cannery operations. My specific research will utilize the data collected in 2010 along with past years to create GIS maps that visually express the dynamics of the bay. Also, this study will discuss the implications of a large hurricane on the water quality and physical dynamics of the bay.

NEW MEDIA VS. TRADITIONAL ADVERTISING IN PHILANTHROPIC DONATIONS

KARA GRIFFIN, KRISTEN BEAT, ALEISHA GARRIDO, AUDREY REED,
DANA WARD

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

The purpose of our research was to compare the efficiency of new media advertising vs. traditional advertising. We worked with the San Diego chapter of the Alpha Project in an effort to encourage the philanthropic donation of water bottles for the homeless. The project tested whether online communication/ advertising via Facebook, MySpace, and Twitter was more or less effective than traditional advertising via flyers, word of mouth, or Vista newspaper in the control environment of the USD campus. Specifically, we established two donation locations advertised separately in accordance to their platform of advertisement and measured the response and effectiveness of the means of advertising by the quantifiable number of water bottles donated at each location. This project was personally significant and important to us because we see homelessness as a growing problem within San Diego due to the economic downturn. At USD we have the privilege to pursue higher education while still taking part in community outreach, and see this research involvement with charity as an opportunity to make a difference within our direct community.

BLACK ATHLETES IN THE MEDIA

CHRIS HANNEKE

FACULTY ADVISOR: MARY BRINSON, COMMUNICATION STUDIES

Historically, Black athletes (not unlike other Black groups) have been portrayed less favorably in the media than White athletes. These portrayals shape the way they are perceived by those that watch them on television and read about them in the news. This study performed a content analysis to evaluate the way off-the-field scandals involving Black athletes are portrayed in the media in comparison to scandals involving White athletes. Our sample included various national and local newspapers. A quantitative study was employed using Centered Resonance Analysis (CRA), which uncovers both explicit and implicit media frames and patterns. Whereas other analysis methods equate word frequency with importance, CRA is based on linguistic theory concerning how people create coherence in their communication. Preliminary analysis supports our argument that this bias in media framing exists. Future research measuring effects of these varying frames on individual evaluations of Black versus White athletes should be considered.

SINGLE-MOLECULE STUDIES OF DNA SELF-DIFFUSION IN ENTANGLED LINEAR AND CIRCULAR DNA BLENDS

MICHAEL HARLANDER-LOCKE, CODY CHAPMAN

FACULTY ADVISOR: RAE ANDERSON, PHYSICS

We are examining the effects of surrounding DNA on self-diffusion of entangled linear and circular DNA. In order for the DNA to be entangled it must be sufficiently long and the DNA solutions must be highly concentrated. Long DNA constructs are replicated, carefully purified and concentrated. Then DNA specific enzymes are used to transform supercoiled constructs into linear and circular form. Using fluorescence microscopy and particle tracking, self-diffusion coefficients of single fluorescently-labeled DNA molecules within solutions of unlabeled entangled linear and circular DNA can be measured. Previous studies show that the self-diffusion of entangled circular and linear DNA differs from each other and is strongly dependent on the background DNA. By systematically varying the ratio of linear and circular constructs within the solution we can determine the exact effect that the topology of the background has on diffusion. We also examine the dependence of diffusion on concentration and DNA length.

SMART SHOWER SYSTEM

ALLISON HARMS, MATT GIGLI, DAVID HOPKINS, CHRIS STEWARD

FACULTY ADVISOR: CHUCK PATEROS, ELECTRICAL ENGINEERING

The ShowerMinder is a product that attempts to change behavior in water usage by making people mindful of how long they shower. Currently, the ShowerMinder lacks the ability to perform experiments and record data for behavior change analysis. The Smart Shower project aims to give USD a ShowerMinder with the capabilities to record shower data and wirelessly transmit the data to an online database. The data will be processed into useful formats, and an administrator-controlled version will be visible to the public. In addition, the ability to send instructions back to the ShowerMinder over the wireless network will be available in an effort to find the most influential setting. By combining the ShowerMinder idea with wireless data transmission capabilities, the Smart Shower can help change the behavior of consumers allowing them not only to save money on wasted water, but also conserve a cherished natural resource.

MAINSTAGE LIGHTING DESIGN: “ROSENCRANTZ AND GUILDENSTERN ARE DEAD”

WILLIAM HARTLEY

FACULTY ADVISOR: PAVLO BOSYY, THEATRE ARTS

In designing “Rosencrantz and Guildenstern are Dead,” I employed lighting techniques to create a comedic and dynamic canvas on which the action of the play could take place. I worked with the scenic designer, and my lighting design mentor, Pavlo Bosyy, to create a language which portrayed both the real and ridiculous in this complex piece of theatre. Working in the mainstage, Shiley Theatre, was a challenging task, but it was incredibly rewarding, and I was blessed to have had the opportunity to be the first student to accomplish a mainstage lighting design. I employed lighting design fundamentals in order to create fascinating stage pictures, and transport the characters to various locations, and even into the depths of their own minds.

GENDERED POWER DYNAMICS IN STRIP CLUB CULTURE

DARCY HAUSLIK

FACULTY ADVISOR: LISA NUNN, SOCIOLOGY

Strip clubs have long been observed under the sociological lens, as sexualized work places where men, both managers and clients, exert social and economic power over female dancers. Drawing on observational data in four clubs, this study employs a comparative analysis of both traditional strip clubs and male revues. The findings offer an analysis of the limitations of women’s ability to have the upper hand in the power dynamics of a sexualized space, even when they are the paying clientele rather than the hired bodies.

THE TRAVELING SALESMAN PROBLEM IN RATS

MEGHAN HAYHOE, BRIANNA BERNATH

FACULTY ADVISOR: RACHEL BLASER, PSYCHOLOGICAL SCIENCES

We studied the performance of rats on a navigational version of the traveling salesman problem. There were nine different spatial configurations of baited food cups (targets), and each of the 20 rats experienced all different configurations. There was one food pellet in each cup, and each rat had to eventually visit all the cups once. The rats could visit the food cups in any sequence from a set starting location. Because our interest was in spatial navigation and not short-term memory, all targets were visually available, and no distracter targets were used. The number of errors, total path distance, and specific sequence of choices were recorded and analyzed. All the rats demonstrated some degree of distance optimization in their route choices. The specific sequences chosen by the rats in each configuration were used to determine what strategies the rats used in their spatial navigation.

LOOKING FORWARD/LOOKING BACKWARD: THE UNIVERSITY OF SAN DIEGO'S UPWARD BOUND PROGRAM AND ACADEMIC SUCCESS

LORENA HERNANDEZ

FACULTY ADVISOR: JUDITH LIU, SOCIOLOGY

What is the relationship between the academic activities in USD's Upward Bound "the rock" program and academic success? Through looking at the types of academic activities in "the rock" program, this research will seek to reveal how Upward Bound contributes to the academic success of program participants. The data for this research study will be collected through surveys and interviews from the USD TRiO Upward Bound students and staff. The interviews with the staff will provide information on the intent and design of the academic activities. The data gathered from students will provide information as to which academic activities are more significant and meaningful. The goal of the research is to provide an evaluation of "the rock" program in how it might possibly interact with the other two program components, "the river" being the values (through counseling and service learning, influencing self-esteem and behavior), and "the tree" which helps students network with other peers and other TRiO students.

COMPARISON OF WATER TURBIDITY (TSS) AND SUSPENDED ORGANIC MATTER BETWEEN THE BAYS UNDER DEVELOPED AND UNDEVELOPED WATERSHEDS IN ST. JOHN, U.S. VIRGIN ISLANDS

YI-CHEN (JOYCE) HSIEH

FACULTY ADVISOR: SARAH GRAY, MARINE SCIENCE

High water turbidity may cause coral bleaching because the suspended sediments blocks the sunlight necessary for the photosynthesis of the symbiotic algae found in corals. The purpose of this project is to examine how watershed development affects the spatial and temporal variability in water turbidity, total suspended sediments (TSS), and suspended organic matter (SOM) of near shore waters with coral reefs in St. John. TSS was determined by filtering and weighing the water samples and suspended organic matter (SOM) was determined by Loss on Ignition. The results show that TSS was higher and organic matter percentage was lower in the most developed watersheds. TSS was measured during a storm runoff event to compare data collected at fair weather conditions. These TSS data were compared to the relevant studies to show how the health of coral reefs in St. John may be impacted.

BACTERIOPHAGE λ : AMINE SPECIFIC LABELING AND EVALUATION OF MAMMALIAN CELL INTERACTIONS

SHANNON IPPOLITI

FACULTY ADVISOR: DEBBIE TAHMASSEBI, CHEMISTRY & BIOCHEMISTRY

The study of virus nanoparticles is very promising for the development of vaccines, improved imaging, and targeted drug delivery. Two key characteristics of viruses which make them especially useful for these purposes are their capacity for multivalent display and their monodispersity. A novel virus for such purposes is bacteriophage λ , which has been very well studied and is used in cloning and as a model for gene regulation and virus assembly. We were interested in determining the potential use as a virus nanoparticle of the immature procapsid of bacteriophage λ . The stability of the procapsids and the labeling efficiency using a fluorescent dye were assessed through chromatography and spectroscopy, and the amine residues bound by the dye were identified through mass spectrometry. In addition, in vitro mammalian binding and uptake of the procapsids was analyzed, showing comparable results to currently used virus nanoparticles.

CHICANO PARK — UNIVERSITY OF SAN DIEGO DOCUMENTATION PROJECT: HISTORY OF COMMUNITY ORGANIZING

ANAYENSI JACOBO, LUPE ABREO, SUNNY HERNANDEZ, GINNA RODRIGUEZ

FACULTY ADVISOR: ALBERTO PULIDO, ETHNIC STUDIES

This project addresses a part of San Diego's history that has not been fully acknowledged and represented. The inception of Chicano Park is a vital part of Chicano/a history and one that brings together the multiple participants of various struggles that occurred at the time. Knowing the history sheds light on struggles currently encountered by the community. To know this history, it must be able to be passed on. Through the acquisition of oral history and in particular via the voice of Tommie Camarillo, we will be able to compile a history that can be preserved past the time of the original founders of the movement into the time of future generations. Tommie Camarillo has been an integral component in the continuing success of Chicano Park Day. As a community organizer, Tommie has a lot to offer and the knowledge she possesses in regards to this is invaluable. Through the life of Ms. Camarillo we will come to learn about the history of Chicano Park in San Diego.

EXPLORATIVE STUDY ON THE IMPORTANCE OF EDUCATION FOR A DEVELOPING COUNTRY

MORAYMA JIMENEZ

FACULTY ADVISOR: EMILY EDMONDS-POLI, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

Education has often been cited as a factor that promotes economic development. The well-being of the family, the community and the country has been known to improve in several dimensions when rates of education, particularly women, increase. The question is whether or not higher rates of education are associated with declining poverty rates. This is an important question because a positive relationship between education and development would potentially provide a clue for how to reduce poverty. Preliminary evidence indicates that education plays a lead role in economic development of a country; however, it is unlikely to be sufficient to eradicate poverty. This research reviews some of the existing literature and offers some insight on the nature of the relationship between increased education of women and increased economic development in two countries, Mexico and Argentina.

AN INVESTIGATION OF THE MICROCIRCULATION IN RAT MUSCLE TISSUE

ADAM JONES

FACULTY ADVISOR: FRANK JACOBITZ, MECHANICAL ENGINEERING

This investigation uses computer modeling and simulation to analyze the characteristics of capillary blood flow in rat spinotrapezius muscle fascia. The simulations are based on actual microscopic vessel networks mapped and integrated into the computer simulation. The models use information such as vessel diameter, blood hematocrit, local shear rates, and vessel dilation in representing the microcirculation's characteristics. Each capillary network consists of 286 vessels, and in this study, a total of 52 linked capillary networks are used. The results show normal distributions of the tube hematocrit within the vessels, and lognormal distributions of the vessel diameter, apparent vessel viscosity, Reynolds number, shear, and Wormersly number. In the future, an improved knowledge of the workings in capillary networks may help in the treatment of diseases originating in the microcirculatory system, and lead to earlier detection and treatment.

THE EFFECTS OF EXERCISE ON THE EXPRESSION OF INSULIN-LIKE GROWTH FACTOR IN JUVENILE YELLOWTAIL

SARAH JONES

FACULTY ADVISOR: SUE LOWERY, BIOLOGY

Insulin-like growth factor (IGF-1) plays an important role in animal development and juvenile growth. Exercise has been shown to increase IGF expression, especially in the skeletal muscle. DNA primers were designed for IGF and two internal controls, beta-actin and beta-2-microglobulin. Using quantitative PCR we compared the relative expression of IGF to our internal controls in exercised and unexercised fish. IGF expression in the red muscle doubled with three days of exercise at 60% maximal aerobic speed. The internal control genes in red muscle were up-regulated approximately 0.5 fold with exercise, perhaps due to a generalized increase in protein expression of rapidly growing juveniles. We intend to test muscle samples from fish exercised for longer periods to determine whether the IGF-1 expression increases compared to internal controls after greater stimulus.

SEARCHING FOR GENES INVOLVED IN BIOPTERIN SYNTHESIS IN THE NEMATODE *C. ELEGANS*

JAMES KAHN

FACULTY ADVISOR: CURTIS LOER, BIOLOGY

Tetrahydrobiopterin (BH4) is an essential cofactor for aromatic amino acid hydroxylase enzymes, which catalyze the formation of monoamine neurotransmitters from precursor amino acids such as tyrosine and tryptophan. In the absence of BH4, we observe a reduction in the synthesis of these neurotransmitters, thereby diminishing cell-to-cell signaling. This can translate into undesirable changes in the affected organism. Our current studies focus on identifying genes that are responsible for the synthesis, recycling, and regulation of BH4 in the model organism *C. elegans*, a small roundworm. We use a technique termed RNA interference (RNAi) to learn whether certain genes are responsible for production of BH4. RNAi allows us to block the function of individual genes by feeding the worms with genetically engineered bacteria that express double-stranded RNA of a gene of interest. We can then see whether loss of gene function causes a phenotype associated with BH4 deficiency.

THE RELATIONSHIP BETWEEN RELIGION, SPIRITUALITY, PEER AND PARENTAL INFLUENCE, AND ALCOHOL

NICOLE KATHOL

FACULTY ADVISOR: SANDRA SGOUTAS-EMCH, PSYCHOLOGICAL SCIENCES

Researchers continue efforts to explore factors that predict lower alcohol use in college students. Religiosity has been identified to be inversely related to alcohol consumption and its consequences (Johnson, Kristeller, & Sheets, 2007). There is widespread agreement that religion and spirituality represent distinguishable, but overlapping constructs that are related to alcohol consumption in unique ways. Thus, a primary aim of the current study is to employ a multi-dimensional approach to religion and spirituality (R/S) measurement and to examine how factors such as religious affiliation and peer/parental influences might relate to behavior. Undergraduate students will be asked to complete a series of questionnaires comprised of a comprehensive R/S measure and measures of behavior surrounding alcohol, religious affiliation proscriptions, and peer/parental influences. It is believed that religious affiliation and peer/parental attitudes and behavior toward both religion and alcohol will be modifying factors in the relationship between R/S measures and reported alcohol consumption.

IMPROVING ELECTRICAL PROPERTIES OF PENTACENE WITH BENZENE-1,4-DIBORONIC ACID IN SUPERCRITICAL CARBON DIOXIDE

JAMES KEEGAN

FACULTY ADVISOR: TRUC NGO, INDUSTRIAL & SYSTEMS ENGINEERING

Organic semiconductor materials have gained the attention of scientists and engineers because of their desirable characteristics such as low cost, lightweight, less complicated processing and flexibility. Pentacene in particular has been the focus of much research over the past years with high potential for flexible organic thin film transistor application. However, pentacene is extremely difficult to process due to its very low solubility in common solvents. This research investigated the feasibility of improving pentacene's conductivity for electronic applications by modifying its structure with an electron-deficient compound, such as benzene-1,4-diboronic acid (BDBA), in an alternative, green solvent supercritical carbon dioxide (scCO₂).

ENVIRONMENTAL ASSESSMENT REPORT FOR GREENHOUSE INTERNATIONAL “SOLAR HANGER PROJECT”

PETER LARR

FACULTY ADVISOR: DREW TALLEY, ENVIRONMENTAL STUDIES

Over the past decade, solar panel technology and its overall market share has increased significantly. Just in California alone, total solar power has tripled since 2003. Solar panels are being installed in commercial and industrial buildings, residential homes, and military installations. GreenHouse International Incorporated is just one of the several solar panel providers and installers in San Diego County. As an intern for GreenHouse, I learned the solar panel trade; how they are sold, how they are installed, and the technology of the photovoltaic system as a whole. GreenHouse Int. recently won a bid from a private investor to build a 3,000 panel solar array atop hanger roofs at a local municipal airport. The client owns many hangers at municipal airports across the United States, and has contracted this specific project as a pilot project. I performed a full Environmental Assessment Report of the .78MW solar array. Land use, greenhouse gas savings, grid stability, and reflectivity and albedo from the panels are all taken into account in the comprehensive report.

DEVELOPMENT OF A FLUORESCENCE OPTICAL TWEEZERS TO CHARACTERIZE SINGLE POLYMER INTERACTIONS IN COMPLEX POLYMERIC FLUIDS

KENT LEE, COLE D. CHAPMAN

FACULTY ADVISOR: RAE ANDERSON, PHYSICS

Intermolecular interactions within fluids with high concentrations of polymers are highly complex and not well understood. To better characterize these interactions, a fluorescence optical tweezers that combines a fluorescence microscope with a dual-trap, force-measuring optical tweezers was developed. An optical tweezers is a tightly focused laser that allows for trapping and force measurement of micron sized particles. Because DNA is a polymer, characterization of polymer interactions can be modeled by trapping a strand of DNA and measuring the forces exerted on the DNA by surrounding DNA. Fluorescence capabilities allow us to directly visualize DNA interactions while the optical traps allow us to take force measurements. By fluorescently-labeling the trapped DNA, we can determine both the shape changes that the measured force induces on the DNA as well as molecular configurations that produce each force. These studies will provide an important link between single-molecule dynamics and intermolecular forces in polymeric fluids.

C. ELEGANS LIFESPAN STUDY ON AGING

HANNAH LEVORSEN

FACULTY ADVISOR: CURTIS LOER, BIOLOGY

C. elegans has long been considered a model organism for the biological sciences due to its completely mapped genome. Through mutations of known genes within the worm, various experiments have been run to see the effect of the mutation in differing environments. Mutation in one gene can affect the lifespan of an organism depending on how it limits or aids the organism to suit its environment. Lifespan studies model how different mutations and treatments affect the *C. elegans* life trajectory. Applying the data found through these lifespans to human homologues may help us understand and predict age related diseases in humans. This project analyzes lifespan data on wild type and mutant worms following heat shock treatments and further addresses the importance of finding human homologues for known age-related genes in *C. elegans*.

CARPOOL COMPANION

JOSH LUBAWY, TREVOR FORTUNA, JOE ELLIS, ANDREW BYRNE

FACULTY ADVISOR: SUSAN LORD, ELECTRICAL ENGINEERING

Carpooling to school is a great way of saving gas, money, and more importantly, it helps to keep fewer cars on the road. USD has a carpooling program in place for commuters to incentivize driving to and from school with two or more people in the vehicle. This program gives commuters the ability to park in prime parking areas designated for those with carpool passes. Two problems currently exist with this parking system. First, patrons of the carpool system may be given a paper carpool pass, expecting to receive a carpool space, only to arrive at their designated area and find that none of the spaces are available. Second, patrons of the carpool system may arrive at the kiosks to be told that no carpool spaces are available by the area they requested and see open carpool spaces. Carpool Companion will eliminate these problems by implementing a network of parking sensors in individual carpool spaces that update a web page in real-time to reflect changes in the state of carpool parking. Our hopes are that a more efficient and accurate distribution of carpool passes will raise interest in the current carpool program and reduce stress on those patrons that currently take advantage of its benefits, fulfilling the goals of carpooling.

VOLUNTEER RECRUITMENT STRATEGIES

MELISSA LUCAS, SHANNON CAJKA, JENNIFER GABRIELLI, ALLISON SCHNEIDER, CICILYA KAUNANG

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

Shakti Rising is a nonprofit organization dedicated to creating positive social change by transforming the lives of girls, women and the larger community. When consulting with representatives from Shakti Rising, a need was expressed for help recruiting student volunteers to perform various duties for their organization. This particular project tested different communication strategies to determine the most persuasive marketing technique for Shakti Rising's Volunteer Recruitment. By conducting our research at multiple San Diego universities, various marketing materials featured different persuasive appeals with the intention of determining which is the most effective. The results of this study can be used by Shakti Rising in future volunteer recruitment endeavors.

ENZYME ACTIVITIES IN STAGING EARED GREBES

SYLVESTER LUU, PAUL NGUYEN

FACULTY ADVISOR: HUGH ELLIS, BIOLOGY

Eared Grebes are migratory water-birds that stage in the fall on lakes where they molt and put on fat, undergoing a major body composition shift but not affecting basal metabolic rate (BMR), unlike suggestions in the literature. BMR should be a summed function of metabolic activity of all tissues. If metabolism is unaffected by changes in the mass of organs and muscles, we suspect that their metabolic intensity must change, something not previously demonstrated. We measured two metabolic enzymes: lactate dehydrogenase (LDH) and citrate synthase (CS), indices of anaerobic and aerobic metabolism, respectively, looking at pectoralis and gastrocnemius muscles, heart, and digestive viscera (gizzard, intestine, liver, and kidney). Pectoralis (breast) and gastrocnemius (leg) values of CS are rather high compared to many other water- and shorebirds, but comparable values for LDH are lower than most similar birds. Data from viscera are unique because we cannot find comparable data reported elsewhere.

ARTS: A REASON TO SURVIVE

ALANNA MACDOUGALL, DANIELA GARCIA, CHRISTINE MENDEZ, CAMI BOHN, TORREY ALLEN

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

ARTS, A Reason To Survive, is a non-profit that works with youth from low-income families. ARTS helps children ages 3-22 channel their creativity to develop their music and art. In researching this non-profit, we have found that they have a need for art supplies. In trying to raise awareness and supply donations, we examined the effectiveness of different communication strategies. We

tested multiple tactics (i.e., face-to-face interaction, social networking sites, flyers, etc.) to see what worked best to make college students donate to a nonprofit organization. This is important for our field of study because we measured the techniques of persuasion and which strategies worked best. With these results we know what methods bring the most compliance on a college campus and further inform nonprofits on the most effective advertising and fund-raising tactics.

HIGH TEMPERATURE HYDROGEN DISSOCIATION ON REFRACTORY METALS: TEST OF THE SECOND LAW

DAVID MALLIN, JONATHAN GARAMELLA

FACULTY ADVISOR: DANIEL SHEEHAN, PHYSICS

We are investigating the dissociation rates of hydrogen gas on refractory metal surfaces (rhenium, tantalum, and tungsten) at high temperatures ($T < 2200\text{K}$) and low pressures ($P < 10$ Torr) to test predictions associated with the absolute status of the second law of thermodynamics¹. Differential dissociation rates were observed under non-blackbody conditions between tantalum, tungsten, and molybdenum; we hope to extend these results to rhenium. Ultimately we wish to test these predictions under blackbody cavity conditions. Differential heating of two metals under identical gaseous blackbody conditions would constitute a de-facto violation of the second law. We will discuss the current status of these ongoing experiments.

¹Sheehan, D.P. The second law and chemically-induced, steady-state pressure gradients: controversy, corroboration and caveats. Phys. Lett. A 280 185-190 (2001).

CASA DE AMPARO: HELPING BRIDGE THE GAP FOR SAN DIEGO FOSTER CHILDREN AND THE INDEPENDENT WORLD

LAURA MASHAS, SAMANTHA HOLLER, KRISTEN GEHRING, MATT WEST, KAITLIN HEALY

FACULTY ADVISOR: JONATHAN BOWMAN, COMMUNICATION STUDIES

Casa de Amparo is committed to serving children who have been victim to abuse or neglect in the San Diego area. Their "New Directions" program was implemented to provide a guided transition from foster care to independent living. Volunteers are crucial to the success of the program and to encourage a positive outlook towards the future. Our research determined the most effective strategy to motivate young adults in serving as mentors for others in the community. We observed whether face-to-face interaction increased interest in the program as opposed to a textual representation of the information. We then recorded the feedback expressed by students after distributing flyers on college campuses and attending university organization meetings. Our results also scrutinized whether an emotional appeal versus an incentive approach motivated more students to become involved in a mentoring program in their community. Through our findings we provided Casa de Amparo with a beneficial and persuasive method for recruiting mentors.

CONSORTIUM ON THE GENETICS OF SCHIZOPHRENIA

DANIEL MATHIAS, SARA CAMPION

FACULTY ADVISOR: MICHAEL ICHIYAMA, PSYCHOLOGICAL SCIENCES

The Consortium on the Genetics of Schizophrenia II (COGS2) is the second phase of a multisite psychiatric research project sponsored by the National Institute of Mental Health, which includes UC San Diego, Mount Sinai School of Medicine, UCLA, University of Pennsylvania, and University of Washington. The purpose of the study is to analyze the role of endophenotypes in order to identify the genetic basis of Schizophrenia. As interns, we perform neurocognitive and neurophysiological assessments of both Schizophrenic patients and Control subjects. Assessment measures include: Prepulse Inhibition, Continuous Performance Test (Degraded Stimulus and Identical Pairs), California Verbal Learning Test, Letter-Number Span, and Pennsylvania Neurocognitive Battery. Should COGS2 be successful in discovering the genetic basis for Schizophrenia, the possibility of developing more effective treatments and a greater understanding of the etiology of the disorder could emerge.

INSULIN-LIKE GROWTH FACTOR-1 AS A MARKER FOR GROWTH IN CALIFORNIA YELLOWTAIL

ERIN MCCAFFERY

FACULTY ADVISOR: SUE LOWERY, BIOLOGY

There is a constant push in the aquaculture industry to find a cheaper, more economically sustainable diet to feed fish for market. Due to this, much scientific research is being performed to find the best solution. By replacing costly fish meal as a part of the diet for California Yellowtail with other types of animal protein as well as an innovative green algae, it can be determined if there is a better diet. To measure growth in more than a superficial manner, Insulin-Like Growth Factor-1 (IGF-1) can be used as a marker. The California Yellowtail were fed nine different diets containing different kinds of protein, and growth was measured throughout the trial. The mRNA of IGF-1 was isolated, converted into cDNA, and measured using the technique of qPCR. These data allow for the comparison of overall growth to the change in IGF-1 in experimentally fed fish.

SHRINKING MISCONCEPTIONS: A NEUTRAL PERSPECTIVE ON SHUAR TSANTSAS

CHEYENNE MCCARTHY, BEN KOOBA

FACULTY ADVISOR: ALANA CORDY-COLLINS, ANTHROPOLOGY

The Shuar, a tribal culture located in the Upper Amazon of Ecuador and Peru, are infamously known for shrinking heads of their dead enemies. This tradition is often interpreted with bias and negativity. Tsantsas are sacred talismans that Shuar men make to protect themselves from the vengeful spirits of their enemies, trapped within the heads. But tsantsas have deeper meaning:

they maintain the delicate balance between physical and spirit worlds, reinforce Shuar religious ideology, and bestow power upon their makers. The shrinking process involves methodical preparation (including shamanic consultation), extensive time and energy, and is followed by feasting and celebration. This project aims to foster awareness and understanding of the Shuar by presenting an objective glimpse into their unique practice of making tsantsas. We seek to diverge from the traditional biased perspective, and instead convey the history and significance of tsantsa production, in order to educate people and dispel misconceptions.

DETERMINING AGE AT DEATH FROM SKELETAL REMAINS: TODAY'S MOST MODERN VISUAL ANALYSIS FOR SUBADULT HUMAN IDENTIFICATION

MARY MCCORMICK

FACULTY ADVISOR: TORI RANDALL, ANTHROPOLOGY

One of the most important factors for identifying an unknown individual from skeletal remains is determining age. In subadult age determination, there are various methods of visual estimation, yet it is debated which of them is the most accurate and beneficial. Through performing detailed research on the methods by reading case studies, scholarly journals, and studying previous lab research, it will be possible to compare the various methods and determine which is most accurate. To date, my research has shown that tooth formation and tooth eruption are two of the most accurate visual methods available, signifying the importance of their presence when determining age at death. In determining if these methods provide the most truthful age estimation, it will be possible to further develop the credibility of studying teeth and provide others with the proof that these methods should be held in higher esteem.

THE IMPACTS OF A HURRICANE ON THE BENTHIC COMMUNITY STRUCTURE IN BAHIA MAGDALENA

AMANDA MCDONNELL

FACULTY ADVISOR: MICHEL BOUDRIAS, MARINE SCIENCE

A long-term project in Bahía Magdalena has compared the natural and anthropogenic impacts on sandy shore benthic communities. In October 2009, a category 5 hurricane struck the coast of Baja California Sur. My research project is to analyze the benthic community structure pre and post hurricane. This two-year comparison will emphasize the effects of a strong physical stressor on a system largely impacted by natural and anthropogenic forces. In conjunction with water quality, grain size, and abiotic data, five 50cc sediment cores were taken at five sites — two reference and three impacted - within Bahía Magdalena. Meiofauna, organisms <300 living between sand grains were sorted and identified to the lowest taxonomic group. Preliminary results for 2009 display similar trends between the two reference sites. The future goal of the overall project is to compare 2011 data with my analysis to determine if the hurricane impacts will be long term.

INVESTIGATING REDISTRICTING AS A SOCIAL JUSTICE ISSUE

KYLA MCKENNA, ARIANA BENHOFF, NOOR DIAB, MADELINE DIBB, ELLA GUIMOND, CANDICE NASIR, LISA RICCARDI, KALEA WISEMAN

FACULTY ADVISOR: ALBERTO PULIDO, ETHNIC STUDIES

The focus for our class this semester is how we can apply concepts regarding social justice to issues affecting our community. Our goal is to address the problem of redistricting and to organize a community forum through which we can educate the public. We want to explore how redistricting can affect what people care about. The topic of our research is how the redistricting process becomes a social justice issue and how this issue is relevant for faith-based communities. The redistricting process occurs after every census. In 2011, a San Diego county commission will be tasked with the complicated process of redrawing the district voting map. We will create a poster in order to inform the public about this process. Education is the first step to ensuring that redistricting will provide an equal playing field for all voters.

MICROFINANCE & ENVIRONMENTALLY SUSTAINABLE ENTREPRENEURSHIP

STEPHANIE MERCER

FACULTY ADVISOR: TARA CERANIC, BUSINESS ADMINISTRATION

There is an increasing awareness that the impacts of environmental issues are significant, and that long-term plans for economic development should factor in these issues. As the ideas of business, ethics, globalization and economic development converge, microfinance takes the stage as a tool to improve the lives of entrepreneurs in underdeveloped and developing countries. Development of small businesses is a catalyst for nationwide economic improvement. However, many of these entrepreneurs lack the minimum requirements for traditional lending solutions. What microfinance aims to provide is capital, with reasonable lending terms, as well as financial support, enabling entrepreneurs to create a sustainable source of income. The range of these entrepreneurial endeavors is great; examples include agriculture, energy production, construction and manufacturing. I will take an academic research approach combined with case studies to examine further whether, and if so, how, given all of its benefits, microfinance can also help the environment.

VARIABLE STARS AND PROTOPLANETARY DISKS

MICHELLE MEZHER, ANDREW VESCI

FACULTY ADVISOR: DAVID DEVINE, PHYSICS

During the intersession, we were given the opportunity to go to Arizona with Dr. Devine and use the Vatican Advanced Technology Telescope (VATT). Our goal was to measure the brightness of young stars that have associated proto-planetary disks of dense gas. These observations are part of a long-term project to look for a correlation between the variability of young stars and the evolutionary status of their associated proto-planetary disks. We will present preliminary results based on a comparison between the VATT data and similar observations obtained at Kitt Peak National Observatory. Within the disks that form around these young stars, there is a great potential for planetary systems to be formed. Planets that could be found in these systems are too small to be seen directly. By researching the variability of young stars, we hope to create an indirect method for identifying the stages of planet formation in a disk.

QUANTIFICATION OF ASCORBIC ACID VIA STOPPED-FLOW FLUORESCENCE

URSZULA MILEWICZ

FACULTY ADVISOR: DEBBIE TAHMASSEBI, CHEMISTRY & BIOCHEMISTRY

Ascorbic Acid (Vitamin C) quantification is crucial in pharmaceutical drugs to analyze their impact on biological processes. The purpose of this research project is to develop an experiment that can be used in an undergraduate course to determine ascorbic acid (AA) concentration using stopped-flow fluorescence. Students will be able to compare and contrast the published titration method to the stopped-flow technique. In the titration method, an iodine solution is standardized with ascorbic acid and then used to determine the concentration of AA in Vitamin C tablets. The reagent, o-phenylenediamine (OPDA), reacts with AA causing the formation of fluorescent quinoxaline, which can be measured by fluorescence spectroscopy. The unknown AA concentrations determined by kinetic and equilibrium rates of quinoxaline formation will be presented and compared to the titration results. Potential extensions of this experiment to other samples will also be presented.

A CRITICAL ANALYSIS OF CONSERVATIVE MEDIA'S PORTRAYAL OF BARACK OBAMA

MICHAEL MURPHY

FACULTY ADVISOR: MICHELLE CAMACHO, SOCIOLOGY

Popular conservative media critiques of President Barack Obama portray his character, policies, and identity as deviant from normative U.S. values and ideals. Sociologists and media researchers have long examined how mass communication outlets echo and reproduce dominant societal

ideologies. As an extension of their conservative political ideology, the right-wing media and its political commentators have chosen to portray our president in a number of critical ways. This study will analyze representations of Barack Obama's character and the discourse used by three right-wing media leaders: Glenn Beck, Sean Hannity, and Bill O'Reilly. I will perform content analysis of the most heavily circulated YouTube video clips featuring conservative medias' most popular political commentators discussing Obama's character and policies. Though some scholars have written on this subject matter, few have actually attempted an empirical investigation. The goal of this study is to provide a descriptive account of the many characterizations of Barack Obama that appear in the conservative media.

BARRIERS

CANDY MARIE NASIR

FACULTY ADVISOR: BAHAR DAVARY, THEOLOGY & RELIGIOUS STUDIES

Western scholarship and the popular imagination have historically been fascinated by the status of women in Islam. Contemporaneously, scholarly and popular mediated images of 'the Muslim woman' have included distorted representations of oppressed, muted, or veiled women living in what is often described as a misogynistic and violent religious culture. However, the challenges faced by Muslim women are grounded not in Islam itself, but in the hegemonic interpretations of Islamic law, most advantageous to patriarchy. Thus, Muslim women in contemporary society find themselves having to defend Islam to a world that reduces their faith and culture to misogyny, while simultaneously confronting gender inequity from within the larger Islamic community. 'Barriers' represents a Spoken Word projected reflection of the collective conscious of Muslim women in contemporary society who have internalized, while simultaneously rejected, the impact of cultural-imperialism, and post-colonialist depictions of Islam, Muslims, and Muslim women of the so-called 'third-world.'

CORRELATIONAL STUDY ON WELL-BEING, LIFE SATISFACTION, AND HAPPINESS IN VIETNAMESE AMERICANS

PHI NGUYEN

FACULTY ADVISOR: KEN KEITH, PSYCHOLOGICAL SCIENCES

Despite the myriad of current research on happiness, well-being, and life satisfaction in Western culture there is a lack of research in Eastern cultures. Specifically, the study of these measures among Vietnamese people is almost nonexistent. Having a better understanding of happiness, wellbeing, and life satisfaction in Vietnamese American adults may help to create more sustainable lives. Surveys were administered at various locations in San Diego to Vietnamese Americans in the 17 - 71-year-old age group. Eighty-four surveys were collected, showing positive correlations among the three measures. This study was a part of a growing body of research in the positive psychology field. Such surveys of Vietnamese American adults contribute to an understanding of Eastern cultural groups living in the United States.

TEMPERAMENTAL PREDICTORS OF TODDLER COMPLIANCE DURING A LABORATORY-STRUCTURED CONTROL SITUATION

CAROLYN NOACK, STACY LANGTON, ALEXANDRA FORKE

FACULTY ADVISOR: ADRIANA MOLITOR, PSYCHOLOGICAL SCIENCES

The present study examined relations between child temperament and compliance among toddlers during a control task (child clean-up). From a domain-specific socialization perspective, clean-up serves as a reciprocity task for children with a genuine interest in compliance due to histories of mutual accommodation during dyadic play. For others, however, clean-up reflects a control task where goals of children and caregivers conflict. Our research examined temperament dimensions associated with greater or lesser cooperation within a subsample of 30-month-old toddlers who were classified as experiencing a control situation during laboratory-structured toy clean-up. Results indicated that attentional focusing (ability to resist distraction) and impulsivity (speed of response initiation) were most predictive of child cooperation while children's frustration (negativity related to goal blocking) and inhibitory control (capacity to stop a behavior) were not. Further research will examine how child temperament interacts with maternal guidance to predict greater or lesser child cooperation during control situations.

A STUDY OF GENETIC ALGORITHM FOR DESIGN OPTIMIZATION OF ROBOTIC MECHANISMS

JAMES O'HARA

FACULTY ADVISOR: MING HUANG, MECHANICAL ENGINEERING

This project aims to develop a computer-based methodology for geometric optimization of robotic design by exploring the implementation of genetic algorithm optimization methods. The focus of the optimization is to maximize both available workspace and dexterity of the robotic design. Efficacy of the application of the genetic algorithm in robotic design optimization will be explored through comparison to other optimization methodologies. The expected outcome of this project is the establishment of a knowledge base in genetic algorithm optimization in the form of application tutorials and documented case studies.

SOCIAL COGNITION DIFFERENTIATES PEER AND PARTNER RELATIONAL AGGRESSION AND VICTIMIZATION

SHELDEN O'KANE, EILEEN FRANCO, JAMIE SHEA

FACULTY ADVISOR: JENNIFER ZWOLINSKI, PSYCHOLOGICAL SCIENCES

This study investigated whether social awareness would show a stronger association with relational aggression whereas rejection sensitivity would show a stronger association with relational victimization. College students (N=332, 60% female, mean age = 18 years) completed a demographics questionnaire, the Tromso Social Intelligence Scale, the Rejection Sensitivity Questionnaire, and the Social Behavior and Aggression questionnaire. Multiple linear regression analyses indicated that gender, and higher levels of physical aggression, rejection sensitivity, and social awareness were associated with more relational victimization by peers, R-square = .14, and partners, R-square = .17 (p values <.001). However, higher levels of both physical aggression and social awareness were the best predictors of relational aggression by peers, R-square = .18, and partners, R-square = .13 (p values < .001). These results suggest that unique factors are associated with relational aggression and victimization; however, these factors are not unique to peer or dating contexts.

QUANTIFYING IN SITU LARVAL BEHAVIORS: A FIELD STUDY IN MISSION BAY

MONICA ODDO

FACULTY ADVISOR: NATHALIE REYNS, MARINE SCIENCE

For invertebrates, the most important dispersal period is during the larval stage which has been thought to be a passive act. This period is crucial as it determines the dynamics of fish and invertebrate populations. Dispersal patterns were quantified in a field study in Mission Bay (in situ) to test how larvae change their orientation within the water column with respect to the changing tides. A novel imaging system (ISIIS) was used concurrently with plankton tows performed every hour during ebb and flood tide during a spring tidal period. Representative samples from plankton tows indicated larval swimming behavior was not passive. The majority of larvae in the samples were crustaceans. A noticeable difference occurred between the concentration of taxa in the night flood tide and all other sampling periods. There was a decreasing trend in concentration of taxa from night to day with day ebb samples having extremely low concentrations.

PREDATOR-INDUCED CONDITIONED PLACE PREFERENCE IN ZEBRAFISH

VLIANA PENALOSA

FACULTY ADVISOR: RACHEL BLASER, PSYCHOLOGICAL SCIENCES

Zebrafish have been suggested to be a useful animal model of human fear/anxiety disorders. In order to better understand anxiety-related behaviors in zebrafish, we developed a conditioned place aversion paradigm in which an aversive stimulus was paired with a neutral environment. Fish were placed in a two chamber (grey/clear) tank. One chamber was paired with either the presence of a predator, a conspecific, or no stimulus. A preference test for the chambers was then conducted without any stimulus present. We recorded behaviors that might indicate fear or anxiety: freezing, distance from stimuli, and duration in each chamber. Zebrafish approached the social stimulus, and avoided the predator. Responses habituated in the second encounter. In the subsequent test, they showed no preference for the location of the social fish, but significantly preferred the chamber that had been paired with the predator. This behavior may be related to predator-inspection.

ECONOMIC EFFECTS OF LANDFILLS ON SURROUNDING REAL ESTATE VALUES AND THE DIFFERING ENVIRONMENTAL HAZARD EFFECTS ON SOCIAL GROUPS

HANNAH PETERSON

FACULTY ADVISOR: ANDREW NARWOLD, ECONOMICS

The physical, neighborhood, and external characteristics of three different zip codes in the San Diego area surrounding a local dumpsite, the Miramar Landfill, were taken to demonstrate the economic effects on house sale values. Regression results from the sample indicate that closer proximity to the landfill has a negative affect on sale values, and low-income, minorities tend to reside in these areas. Based on these results, the study suggests that consumers consider the presence of a landfill in their neighborhood to be a detriment to house values despite the kind of landfill and further, environmental inequalities are present in this real estate area, whether or not it is deliberate.

INVESTIGATING THE FUNCTION OF THE HIF1 HISTONE CHAPERONE IN THE HAT1 HISTONE ACETYLTRANSFERASE COMPLEX

ELYSSA PICKLE, KAREN CESAFSKY, RYAN KAST, TAYLOR CALDWELL, ABRAHAM ICHINOE, JULIA KONONENKO, RAMEZ NASRY, LINDSAY ROW

FACULTY ADVISOR: ROBERT DUTNALL, CHEMISTRY & BIOCHEMISTRY

Hif1 is a histone chaperone protein that binds histones and assembles them onto DNA. Hif1 is part of a complex containing the histone acetyltransferase enzyme Hat1 and the Hat2 protein. The Hat1 complex specifically acetylates histone H4 and is believed to play a role in assembly of chromatin, the packaged form of DNA. Genetic studies indicate that the Hat1 complex is involved in regulation of gene expression and DNA repair. We have expressed the Hif1 protein and various Hif1 truncation mutants in bacteria and have co-expressed Hif1 with histones H3 and H4. Partially purified Hif1 binds core histones but not linker histones. We are using these materials to determine the molecular basis for interaction of Hif1 with histones and to investigate the role of histone acetylation. These studies will provide insight into the contribution of Hif1 to the biochemical activity and biological function of the Hat1 complex.

GENDER AND THE CONSTRUCTION OF AUTHORITY IN THE UNIVERSITY CLASSROOM

HALEY PITTMAN

FACULTY ADVISOR: CAROLE HUSTON, COMMUNICATION STUDIES

Establishing authority in the classroom can be a difficult undertaking for university professors, especially for women professors who often face contradictory expectations of being a nurturing mother in a setting traditionally reserved for authoritative father-figures. My research asks the following question: In what ways do gender self-identity influence a professor's enactment and perceptions of authority in the classroom? Data will consist of classroom observations of and interviews with two male and two female university professors. Classroom observations will examine linguistic and extralinguistic cues such as syntax, turn-taking, intonation, use of space, and themes that arise from classroom discourse. Interviews will focus on themes of credibility and immediacy. I predict that both sexes will employ a combination of male-typed and female-typed discourse strategies, though female professors will value immediacy and will enact a "collaborative" authority style, while male professors will emphasize credibility and enact a more "dominating" authority style.

INVESTIGATING THE pH-DEPENDENT FORMATION OF LIGHT-ABSORBING PRODUCTS FROM MIXTURES OF AMINE AND DICARBONYL COMPOUNDS

MICHELLE POWELSON

FACULTY ADVISOR: DAVID DE HAAN, CHEMISTRY & BIOCHEMISTRY

Several carbonyl compounds (methylglyoxal, glycolaldehyde, acetol) are present in clouds that have the potential to create brown products when reacted with ammonium sulfate or primary amines such as methylamine. The formation of light-absorbing products from these reactions are characterized as a function of cloud-relevant pH (from 3-6) using UV Visible spectroscopy. Observed color changes were faster at higher pH, and the bulk of the changes in the solutions' absorbance happened within the first day or two. The most rapid color change was observed for methylamine / methylglyoxal at pH's ranging from 4 to 5. In conclusion, these reactions between aldehydes and amines can form brown products at cloud-relevant pH.

CAN SEDIMENT TEXTURE BE USED AS A PROXY TO MEASURE TERRIGENOUS (LAND-DERIVED) SEDIMENT FLUX ON CORAL REEFS?

DESERAE RAWLING

FACULTY ADVISOR: SARAH GRAY, MARINE SCIENCE

In the U.S. Virgin Islands, one primary threat to coral reef ecosystems is land-derived (terrigenous) sedimentation. Some researchers have used the proportion (%) of fine grained (<75 microns) sediments as a proxy for terrigenous sediment based on the assumption that terrigenous sediment is predominantly fine grained and that coarser grained (>75 microns) sediments are primarily carbonate. Using the Loss on Ignition (LOI) method, we tested this assumption by comparing grain size distribution to composition of sediments collected in mangrove, shore, and coral reef sites below developed and undeveloped watersheds on St. John, USVI. Both terrigenous and carbonate grains were found in all locations and in all grain size fractions. However, the relationship between sediment composition and texture varied between environments. These data demonstrate that sieving is not an accurate or appropriate method of quantifying terrigenous sedimentation on coral reefs and that sediment texture is not proxy for sediment composition.

ENGINEERING A BRIGHTER SUDAN; BRINGING SUSTAINABLE ENERGY TO THE THEOU VILLAGE SCHOOL

ENRIQUE RAYON, EMMETT PERL, MOU RIINY, MICHAEL RIOS

FACULTY ADVISOR: SUSAN LORD, ELECTRICAL ENGINEERING

"Engineering a Brighter Sudan" involves bringing sustainable energy to a primary school in the remote village of Theou, Southern Sudan, where project member Mou Riiny was born. The project

will consist of specifying, designing, and building a power generation and storage system for the school. The system will provide enough power to provide lighting to the school, power several laptops, and support a community battery charging station. To accomplish this, a 5.4 kilowatt solar panel array will be used. Electrical energy from the solar panels will be stored in a 48 volt battery bank which will provide power to the school when the sun is not shining. A charge controller and inverter will be used to control the flow of power and deliver alternating current to the school. Finally, a diagnostic system will be designed to ensure that the system will provide reliable electricity long into the future.

ANALYZING STUDENT RETENTION THROUGH DATA MINING

LUIS RETANA, ROMMEL RICO

FACULTY ADVISOR: ERIC JIANG, MATHEMATICS & COMPUTER SCIENCE

Data Mining has been used extensively to optimize results by exposing patterns within data and turning these patterns into knowledge. This project seeks to uncover various patterns and characteristics of student retention hoping to gather valuable information so that universities can use this knowledge to maximize retention. To expose these patterns, various techniques from Data Mining such as Data Preprocessing and Machine Learning algorithms are used in building an analytic student retention model. The model has shown that certain student individual characteristics and institutional factors such as gender, ethnicity, financial aid, and grants play a significant role in retention. As future work we plan to develop more advanced data mining models in the hope of attaining more interesting insights to achieve higher student retention rates.

PERSONALITY TRAITS AND INDIVIDUAL LIFESTYLE CHOICES: LOCUS OF CONTROL AND THE PREVALENCE OF BODY PIERCING AND TATTOOING

HAYLEY ROBERTS

FACULTY ADVISOR: KENNETH KEITH, PSYCHOLOGICAL SCIENCES

Locus of control (LOC) is the extent to which individuals perceive that control of life events resides with inner or outer forces. External LOC has been linked to various psychological conditions and risky behaviors (e.g., depression, eating disorders, substance abuse). In the U.S., tattooing has been both popular and stigmatizing, and body alteration has been linked to low self-esteem, depression, and negative body-image. Recent studies have revealed positive correlations between tattooing and piercing and self-injurious behaviors. This study examines the correlation between acceptable forms of body alteration (tattooing and body piercing) and LOC, and explores the likelihood that body alterations are indicators of negative psychological conditions or other unhealthy behaviors.

CLC “CHLORIDE CHANNELS”: A SEARCH FOR INHIBITORS

LUIS RODRIGUEZ

FACULTY ADVISOR: KIMBERLY MATULEF, CHEMISTRY & BIOCHEMISTRY

CLC chloride transport proteins are membrane proteins that transfer chloride ions and protons into and out of the cell. There are two known structures of CLC proteins, but much remains to be known about their mechanism. The goal of our research is to find an inhibitor of CLC-ec1, a bacterial homolog that is amenable to structural and functional studies. There is a shortage of good CLC inhibitors, and we decided to pursue testing an array of natural products since natural product inhibitors of other ion channels have been invaluable for understanding their mechanisms. We measured the activity of CLC-ec1 in the presence and absence of naturally occurring compounds from: scorpion, sponge, and myxobacteria; including one scorpion venom peptide which had been previously shown to inhibit a human CLC. Unfortunately, we concluded that none of these compounds inhibited CLC-ec1. Our search for a better inhibitor continues.

SOCIOLOGICAL ANALYSIS OF THE 2011 SOCIAL MOVEMENTS

CELISSE RUIZ

FACULTY ADVISOR: THOMAS REIFER, SOCIOLOGY

Currently, the world is witnessing a dramatic political and societal shift within Muslim countries that have endured decades of dictatorial rule. In an attempt to understand these contemporary events, this paper will analyze these Arab Revolutions, focusing predominantly on Egypt, within the sociological framework of Social Movement Theory. Additionally, this paper will highlight the sociological impact of the increasing role of social media in relation to social movements. Given the precarious situation many women within this region find themselves, this paper will also address the role of women within these revolutions and how these movements occur in conjunction with feminist and women's movements. Social movements have lasting effects on many aspects of social life, thus this paper only serves to elucidate elements of the movement but more research needs to be done to provide a broader view of the national and international impact of these events.

LOW INCOME STUDENTS' FEELING OF BELONGING

DANI RUSSELL

FACULTY ADVISOR: LISA NUNN, SOCIOLOGY

Private universities across the United States, including USD, are concerned with the undergraduate students that come from low-income families in terms of their ability to build a sense of belonging on campus. This project conducts an original survey on the attitudes of low-income students relating to how equal and comfortable they feel on the USD campus. Variables include students' level of comfort in various activities: walking around campus, sitting in class, talking in class, going to professors' office hours, attending club meetings, playing sports, going to parties, going to social events (at USD), and going to social events with friends (i.e. dinner, movies, etc.). I will present results regarding low-income students surveyed. The findings come from an ongoing research study that was created in Fall 2010, and will eventually include samples from multiple private universities for comparison.

EFFECTS OF SULFITE-GLYOXAL ADDUCT FORMATION ON GLYOXAL PARTITIONING AND BROWN CARBON PRODUCTION

ALEC RYNASKI

FACULTY ADVISOR: DAVID DE HAAN, CHEMISTRY & BIOCHEMISTRY

Volatile organic materials in the atmosphere have been known to be integral in secondary organic aerosol (SOA) production. Such materials include glyoxal (CHOCHO), an α -dicarbonyl found in the atmosphere. Glyoxal is a significant source of SOA when reacting with other atmospheric compounds. With glyoxal's high vapor pressure it is expected to have a major partitioning into the gas phase when involved with aerosol. It is possible that sulfite compounds are involved in atmospheric chemistry that contribute to the particle partitioning of glyoxal. These products could be pushing glyoxal to remain in the particle phase in cloud chemistry. A defined pH range of when these reactions would have competitive kinetics is needed. In addition to the partitioning of glyoxal, sulfite adducts could lead to light absorbing compounds, including tetrahydroxybenzoquinone (THBQ). The reaction process of glyoxal and sulfite in this capacity has not been studied extensively, especially under atmospheric conditions.

NMR AND COMPUTATIONAL STUDIES OF DNA DUPLEXES CONTAINING THE GUANINE ISOSTERE 4-FLUORO-6-METHYLBENZIMIDAZOLE

HANNAH SADLER, ALYSSA NAVAPANICH, SHANNEN CRAVENS, STEFANIE SACKNOFF

FACULTY ADVISOR: TAMMY DWYER, CHEMISTRY & BIOCHEMISTRY

We have synthesized the non-polar guanine isostere 4-fluoro-6-methylbenzimidazole (H), a nucleobase not processed as well as other analogs by DNA polymerase. To investigate the potential structural basis for this behavior, we have studied the duplexes: d(CCAAHCTTCC):d(GGAAGXTTGG), where X = C, T or F (difluorotoluene). ¹⁹F NMR shows these latter duplexes exist in multiple forms; however when X = T we observe a single duplex. Using ¹H NMR spectroscopy and molecular dynamics simulations we determined the solution structure of the HT duplex (X = T) in which the purine analog H takes the syn glycosidic conformation. We have explored conformational space about the HX pair in each duplex using robust simulated annealing and energy minimization methods. We report computational predictions for the lowest energy glycosidic angle conformation for H in each HX pair and the forms of the HX pairs observed by NMR.

BIT SHELEJNIBO: THE IMPACT OF IMMIGRATION ON SOLAGUEÑOS IN LOS ANGELES

DAINA SANCHEZ

FACULTY ADVISOR: MICHELLE CAMACHO, SOCIOLOGY

Economic immigrants from Mexico to the United States are a heterogeneous group, however, few scholars examine the experience of Mexico's indigenous laborers abroad. One notable exception is the work of Michael Kearney who examines class, ethnicity, and migration of transnational Zapotec and Mixtec communities in the context of the San Joaquin Valley of California. Fewer studies examine how indigenous immigrant workers negotiate their identity and create new distinct Oaxacan ethnic enclaves within the urban metropolis of Los Angeles, California. My research focuses on the population from San Andres Solaga, a Zapotec-speaking community located in Oaxaca, Mexico. Through participatory interviews and observations, I explore how immigration and globalization have affected the identity of Solagueños currently residing in Los Angeles, California.

USING LANGUAGE TO CREATE SPACE: GLORIA ANZALDUA'S BORDERLANDS/LA FRONTERA: THE NEW MESTIZA

MOLLIE SCHULTZ

FACULTY ADVISOR: JOSEPH JEON, ENGLISH

The New Mestiza is a close examination of this nominal work by Anzaldua. She writes in both English and Spanish, creating a bridge throughout her work on both a generational and a cultural level. It simultaneously looks at the sociological effects that Anzaldua feels impact people of Chicano descent, and goes more deeply into the intertwined struggle between the inability to possess a language and the lack of an identity. If Chicanos feel that they neither have English nor Spanish as their own, they feel outside of both cultures. This paper examines how the lack of language and identity actually work to create a space for the people of the borders of the United States, creating for themselves their own, personal culture through the pain and what they feel they miss, the "new mestiza."

THE WHISPER NUMBER

DANIELLE SIDARI

FACULTY ADVISOR: MARKO SVETINA, FINANCE

Whether you work on Wall Street and witness the mayhem on the floor of the New York Stock Exchange or simply watch the money segments on morning television, you have been exposed to stocks and their relevance to the economy. Terms like NASDAQ and Dow Jones are often referred to as the measure of the stock market's health; while the illusory Earnings Per Share (EPS) for any given company is always reported as an indicator of their prosperity in comparison to these larger stock market giants. What makes the EPS rise or fall and how can people predict such things? My research investigates this very idea. Over the past four months I have kept track of quarterly earnings for 100 companies and my hope is to expose an unexpected source as the culprit behind the stock market frenzy in the 21st century.

VARIATION OF CONCENTRATIONS OF PRE-PRODUCTION PLASTIC PELLETS (PER M²) AT THE SANTA ANA RIVER MOUTH IN CORRELATION TO RUNOFF QUANTIFIED BY RAINFALL

TAYLOR SIMPKINS

FACULTY ADVISOR: MICHEL BOUDRIAS, MARINE SCIENCE

This study examines the correlation between industrial runoff and pre-production plastic pellets among post-rain debris on the Santa Ana River mouth's surrounding beaches. Samples of one square meter of sand were collected before and after rainfall, at the rackline of sites 100m west and 100m east of the Santa Ana River mouth. Data for the number of pre-production plastic pellets per m² was obtained by drying each sample, dry sieving with stacked 6 mm² and 3 mm² sieves, and sorting debris collected in the 3 mm² sieve to isolate pellets in each sample. Results from 2002 to present (2011) of samples collected after rainfall have a drastically high concentration of pellets per m² compared to very low concentrations of pellets per m² in pre-rain or dry season samples. The results show a strong increase in the number of pre-production plastic pellets washed onshore correlating to post-rain industrial runoff from the Santa Ana River.

EXAMINING THE EFFICACY OF INTERNATIONAL ORGANIZATIONS THROUGH THEIR USE OF ENFORCEMENT MECHANISMS

ELIZABETH SKURDAHL

FACULTY ADVISOR: MIKE WILLIAMS, POLITICAL SCIENCE & INTERNATIONAL RELATIONS

In today's interdependent and interconnected world, independent international organizations (IOs) have quickly become a significant means for coordinating states' actions, reaching agreements among the states, and solving mutual problems. However, as states increasingly rely on these organizations, a fundamental question must be answered: are IOs truly effective in achieving their goals? This question is extremely important, for it stands to reason that if IOs are not effective in facilitating international affairs, they should be abandoned and answers to collective problems should be found in different arenas. I seek to answer this question by evaluating the efficacy of an organization through its use of enforcement mechanisms. I will examine case studies of IOs with and without strong enforcement mechanisms to determine which structure is most effective in allowing an IO to best carry out its mandate.

VICTORIAN SCIENCE AND THEMES OF DARWINIAN EVOLUTION IN ENGLISH LITERATURE

BERNADETTE SMITH

FACULTY ADVISOR: HALINA DURAJ, INTERDISCIPLINARY HUMANITIES

The nineteenth century was a time of great scientific advancement, as biologists like Charles Darwin and Gregor Mendel contributed landmark discoveries to the scientific body of knowledge. Darwin's *Origin of Species* was highly controversial at the time of its publication, because of his theory of evolution and the implications that it had for the origins of man. Likewise, Mendel's work with pea plants was the first of its kind, demonstrating an early conception of genetics and the modes of inheritance. This burgeoning realm of scientific discovery affected the world's conception of what it means to be human. I seek to find the connections and thematic bridges between the science and the humanities. My research addresses ways in which Darwinian evolution and other biological themes affected English literature such as the novels of Jack London. By examining connections between nineteenth century science and literature, I hope to start a body of connective knowledge that can be built upon up through present day works.

CHICANO PARK: UNIVERSITY OF SAN DIEGO DOCUMENTATION PROJECT

DANIELLE SMITH, ARIANA BENHOFF, DAINA SANCHEZ, JANETTE RODRIGUEZ ROBLES

FACULTY ADVISOR: ALBERTO PULIDO, ETHNIC STUDIES

Ethnic Studies 343 (Chicano Studies) is working on a project that tells the story of some of the members of the Chicano community in San Diego. We chose to study this community through the lens of Chicano Park: a park under Coronado Bridge that the Chicanos brought to life. The park is a cultural expression and a concrete marker of political awareness and mobilization by community members. The members of the Chicano Park Steering Committee represent active agents of history who played key roles in the establishment, historical development, and evolution of the park. Our group generated a public and political biography about Rosa Olga Navarro, a *danzante* in the community who organizes an indigenous dance group. The dance plays an important role in the cultural expression of Chicano Park, and it is a symbol of the history of these people dating back to the time of the Aztecs.

INVESTIGATION OF A POTENTIAL INTERACTION BETWEEN CHPT AND CTRA IN RHODOSPIRILLUM CENTENUM

JENNY SMITH

FACULTY ADVISOR: TERRY BIRD, BIOLOGY

The purple photosynthetic *bacterium Rhodospirillum centenum* has a complex life cycle in which motile vegetative cells can differentiate into sessile, dormant cysts under starvation conditions. I plan to investigate a signal transduction pathway that regulates encystment in *R. centenum*. Previous research has demonstrated that a DNA-binding response regulator called CtrA blocks cyst cell formation, but only when the protein has been phosphorylated. My goal is to determine whether the protein ChpT is responsible for phosphorylating CtrA. ChpT shares homology with known histidine phosphotransfer proteins, which typically transfer phosphates from histidine kinases to cognate response regulators. My goal will be to construct an overexpression plasmid that carries *chpT* and can be introduced into the $\Delta chpT$ and $\Delta ctrA$ strains. If ChpT is responsible for the phosphorylation of CtrA, I expect that overexpression of this protein will rescue the hypercyst, motility defective phenotype of the $\Delta chpT$ strain but not for the $\Delta ctrA$ strain.

CYCLE TO SUSTAIN

MARILYN SMITH, NICHOLE NORBY, JAVIER FLAMARIQUE, DAVID LEYVA

FACULTY ADVISOR: SUSAN LORD, ELECTRICAL ENGINEERING

Energy conservation is becoming progressively more important as the demand for electricity from renewable energy sources continues to increase. As consumers of electricity, people should have a grasp of the amount of electrical energy that they use and understand how their choices and habits affect the environment. Our goal for Cycle to Sustain is to provide a tangible display of the amount of energy that students use. Our design converts the mechanical energy from the wheel of a spin bicycle into electrical energy, and we will use that energy to power a display screen. The system will promote energy efficiency and conservation by relating physical work to the amount of power that is used in common electrical devices and appliances. By providing students the opportunity to compare their physical work to their daily electricity usage, they will witness firsthand what they can do to live a more energy efficient lifestyle.

QUANTIFICATION OF POLLUTION IN THE MAGDALENA BAY BY ANALYSIS OF TISSUE-SPECIFIC HEAVY METAL BIOACCUMULATION OF THE BLUE CRAB (*CALLINECTES SAPIDUS*)

SHANE SMITH

FACULTY ADVISOR: MICHEL BOUDRIAS, MARINE SCIENCE

Magdalena Bay is host to the town of Puerto San Carlos and is located on the west coast of Baja California Sur, Mexico. Puerto San Carlos is host to a fish cannery, thermoelectric plant, and large-vessel port that contaminate the bay with organic pollutants and heavy metals (Mn, Cd, Pb). The accumulation of pollutants in the marine organisms of the bay is a potential danger to the people of Puerto San Carlos because they consume many easily collected organisms (clams, crabs, scallops). Heavy metal accumulation has been found in the blue crabs (*Callinectes bellicosus*) that reside in the bay, including high levels of lead, cadmium, and manganese in these organisms. The crabs can accumulate metal through ingestion of food or by absorption of the surrounding water and sediment. We will present our findings of the amount of heavy metal accumulation in the Blue Crab of Magdalena Bay and the tissues in which specific metals are found.

METAL SELECTIVITY IN THE FERRIC UPTAKE REGULATOR

MEGUMI SUGAWARA, JOURDAIN ARTZ, MICHELLE DOMINGUEZ

FACULTY ADVISOR: STEPHEN MILLS, CHEMISTRY & BIOCHEMISTRY

This research is focused on understanding how metal selectivity is produced in the Ferric Uptake Regulator (Fur). Fur is a repressor protein found in bacterial cells that, when activated by metal, binds to DNA and blocks transcription of genes that promote iron intake. We have cloned and expressed Fur from several organisms, including *Shewanella oneidensis* and *Pseudomonas aeruginosa*. Using metal titration methods, the affinities of the different homologues were measured for various metals, including Co(II), Mn(II), Zn(II), and Fe(II). Surface binding assays and gel shift assays were used to determine the affinity of each Fur homolog for DNA with different metals bound. These affinities, in conjunction with the sequences of the proteins, will be used to identify the amino acids that may be important for metal selectivity in Fur.

SEXUAL SELECTION IN MORPHOLOGY OF MALE GENITALIA IN TWO SEED BEETLE SPECIES OF THE GENUS ACANTHOSCELIDES

JESSICA SULLY

FACULTY ADVISOR: GEOFFREY MORSE, BIOLOGY

Sexual selection can be a potent driver of speciation. In seed beetles (Coleoptera: *Bruchidae*), secondary sexual characters include spines on legs and male genitalia. Two recently diverged species, *Acanthoscelides aureolus* and *A. pullus*, have similar ecological associations, but males exhibit differences in sexual traits. *A. pullus* has large, numerous leg spines that vary across populations. *A. aureolus* has very few spines. If this is due to differences in sexual selection, I hypothesize that the male genitalia of *A. pullus* will show variation throughout its range, while *A. aureolus* will have little variation. I am testing this hypothesis by examining the male genitalia of many individuals and examining their microscopic structure. I am then using morphometric quantification of the structures to examine levels of variation in these traits, correlation with hindleg armature, and correlation with the population genetic structure to determine if sexual selection is driving the speciation of these beetles.

DEGREE OF EMOTIONAL REACTIONS OF COLLEGE FOOTBALL PLAYERS VS. NON-FOOTBALL PLAYERS

ANNA SZCZUBELEK, ZACHARY DARWISH

FACULTY ADVISOR: JENNIFER ZWOLINSKI, PSYCHOLOGICAL SCIENCES

This correlational study examines the differences in emotional reactivity between college football players and non-football players in a small liberal arts college in Southern California. After reading a sad vignette, 65 participants (33 college football players and 32 general male students) rated their levels of anxiety, depression, and overall emotional reactivity using a 9 item questionnaire in conjunction with a 5-point Likert scale. They were recruited through school courses, an athletic study hall, and on-site convenience sampling. Using 3 separate ANOVAs, the results indicated that the two groups significantly differed in levels of anxiety. No significant differences existed between the groups in the areas of depression and overall emotional reactivity. These findings can contribute to the existing literature in showing that there are not significant differences between college football players and non-football players in the aspects of depression and emotional reactivity but there is a noticeable difference in anxiety levels.

A TRASHY SITUATION

ALEXANDRA TAPPER

FACULTY ADVISOR: ESTEBAN DEL RIO, COMMUNICATION STUDIES

Positive advocacy of sustainable practices and “go green” efforts have become increasingly prominent within mainstream media – USD itself publicizing a positive environmental sustainability campaign. Freegans are a small but growing subculture who have turned to extreme sustainable practices to boycott capitalism and our economic system, claiming that practices such as dumpster diving, can collecting and other forms of “free” living can actively reject our capitalistic culture. Despite positive media coverage on sustainability, Freegans are aware of the reality of our highly wasteful society. I will be investigating lifestyles of the Freegan subculture, examining more closely the practices of dumpster divers and can collectors, with a focus on the San Diego community. I will investigate how this extremist subculture is portrayed within the media; they are often marginalized and framed negatively despite their environmental activism. In addition, I will examine how this subculture uses the public sphere of digital media, i.e. internet and blogs, to organize and advocate their message.

EXAMINATION OF THE HUMAN IMPACT ON THE DENSITIES AND SIZE FREQUENCIES OF THE OWL LIMPET *LOTTIA GIGANTEA* IN THE ROCKY INTERTIDAL OF SAN DIEGO, CA

ALLISON TENNYSON

FACULTY ADVISOR: NATHALIE REYNS, MARINE SCIENCE

The owl limpet *Lottia gigantea* can be used as a measurement of human exploitation in rocky intertidal habitats. *L. gigantea* is the largest limpet in North America, ranging from Washington to Baja California. It occupies the upper to mid rocky intertidal zones where it is an important space occupier. The protandrous nature of the owl limpet makes it sensitive to over-collection by humans. This study takes place in San Diego, California at three separate rocky intertidal locations with varying levels of human impact. Circle plots were used to measure owl limpet densities and size frequencies at each site. The data was taken over a two-year span in 2008 and 2009. The objective of this study was to examine the densities and size frequencies of *L. gigantea*, in order to determine the effects of human exploitation on the owl limpet populations.

SELF-ESTEEM AS A RESULT OF SOCIAL COMPARISON BY COLLEGE MAJOR

ELIZABETH THOMSON

FACULTY ADVISOR: ANNE KOENIG, PSYCHOLOGICAL SCIENCES

College students may compare their academic performance with peers of different majors, and if they outperform these peers their self-esteem should increase. I evaluated the effects of social comparison on self-esteem using a 2 (major: psychology, biochemistry) x 3 (social comparison: upward, downward, control) between-subjects design. Participants read a hypothetical conversation between themselves and a peer with a harder, easier, or the same major. Participants in the upward comparison condition reported significantly lower effort and intelligence than participants in the downward comparison condition, indicating that the manipulation worked as designed. However, there were no significant differences in overall self-esteem. A marginally significant interaction on academic contingent self-esteem indicated that biochemistry majors, but not psychology majors, reported more contingent self-esteem in the upward comparison than downward comparison condition, suggesting that worse performance in comparison to peers increased the impact of academics as a source of self-esteem. Data collection is still underway.

MYSTIC EXPERIENCE AND VISION IN THE POETRY OF WILLIAM BLAKE

MICHELLE TOOMEY

FACULTY ADVISOR: BARTON THURBER, ENGLISH

William Blake's poetry often expresses vivid mystical experiences with God, and uses those encounters to envision a new existence for humanity in which imagination and art are celebrated as the means by which to experience the supernatural. However, it is necessary to explore Blake's mystical experiences in comparison with those of the traditional Christian mystics, who often contradict Blake's opinions on the relationship between God and humanity, and furthermore to investigate how Blake's vision changes the perception of humanity itself. Does his emphasis upon sexual liberation contradict the core message of Christianity? Does the type of imaginative vision he promotes elevate the human to the level of a supernatural being? How does Blake use imagination to weld sensory experience with spiritual transcendence without falling prey to materialism? These questions are addressed through close analysis of Blake's illuminated poetry and the writings of several Christian mystics.

THE RELATIONSHIP BETWEEN EXERCISE AND MENTAL HEALTH IN UNIVERSITY STUDENTS

CHELSEA TOWLER

FACULTY ADVISOR: KENNETH KEITH, PSYCHOLOGICAL SCIENCES

The purpose of this study is to examine the relationship between exercise habits and mental health in university students. Past research has shown that increasing exercise activity decreases symptoms of anxiety and depression. This study will provide a better understanding of how current exercise habits relate to the experience of depressive, anxious, or stressful symptoms in university students. Participants will respond to a questionnaire asking about their depression, anxiety, and stress levels, and also about their exercise habits. Type, location, and regularity of exercise will all be examined. It is expected that outdoor exercise and team related sports activities will be associated with the lowest experience of depressive, anxious, and stressful symptoms. People who exercise alone or indoors will likely show higher instances of these symptoms. Because these symptoms can affect all people, future research may examine the relation between exercise and mental health in populations outside the university setting.

KINETIC ANALYSIS AND CHARACTERIZATION OF THE ATMOSPHERIC CONDENSED-PHASE GLYCEROL REACTIONS

JACOB TURLEY

FACULTY ADVISOR: DAVID DE HAAN, CHEMISTRY & BIOCHEMISTRY

The atmospheric oxidation of hydrocarbons and biological materials contribute to the presence of atmospheric sugars and multi-alcohols. These products are suspected components of secondary organic aerosols (SOA) formation. This investigation observes the atmospheric chemistry of the multi-alcohol, glycerol. A glycerol solution was allowed to react with air at room temperature and the resulting product was characterized by NMR, FTIR, ESI-MS, and GC-MS. The reaction was further studied via kinetic analysis, aerosol generation (VOAG/DMA) and cloud formation experiments (SMPS.)

THE EFFECTS OF FAIR VALUE ACCOUNTING ON CORPORATE AMERICA

BROOKE TUTTLE

FACULTY ADVISOR: THOMAS COPELAND, FINANCE

Fair value accounting, also known as mark-to-market accounting, is when an asset or liability of a company is value based on the current market price of that asset or liability (or an appropriate equivalent). In the early 1990s, controversy arose regarding this accounting principle and continued all the way into the financial crisis of 2008 and beyond. By following the evolution and implementation of this accounting principle under the U.S. Generally Accepted Accounting Principles, we will address the effects that its implementation can have on the financial statements of companies in various industries. In addition, we will be looking to see how the market reacts to the announcement of any fair value accounting regulations or modifications. Furthermore, we will assess how the market reacts when individual companies release information about their individual implementation of fair value accounting standards.

USD BIKE PROJECT: DESIGNING FOR A BICYCLE FRIENDLY CAMPUS AT THE UNIVERSITY OF SAN DIEGO

ANTHONY VAN DER ZEE, DEEP BEDI, CHAYNE JOHNSON, TIFFANY MENDOZA

FACULTY ADVISOR: RICK OLSON, INDUSTRIAL & SYSTEMS ENGINEERING

Our senior design project for industrial and systems engineering is on a proposed implementation of a bike rental system on the campus of USD. The scope of the project is to analyze various ideas on how USD could become a more bicycle friendly university and provide our methods and recommendations to the Office of Sustainability. Ultimately, our recommendations will lead to USD reorganizing their infrastructure, policy, transportation and develop a campus-wide initiative to promote a healthier lifestyle.

DETERMINING THE EVOLUTIONARY RELATIONSHIP BETWEEN THE SEED BEETLE GENUS *ACANTHOSCELIDES* AND ITS HOST PLANT GENUS *ASTRAGALUS*

TARYN VANGERPEN

FACULTY ADVISOR: GEOFFREY MORSE, BIOLOGY

A fundamental question in biology is the relative roles of ecology and geography in driving intraspecific differentiation and speciation. There are seven closely-related species of *Astragalus*-feeding seed beetles in the genus *Acanthoscelides*. This research aims to better understand their diversification in western North America. DNA was isolated from many individuals from numerous populations and multiple host plants, and two genes were amplified and sequenced using standard molecular systematics techniques. Genetic networks and phylogenies based on data collected were used to classify the species and identify any unidentified cryptic species within *Acanthoscelides*. There is very little host-associated variation or geographic structure within *A. aureolus*, but our results show strong geographic structure in *A. pullus*. Furthermore, there is evidence of multiple cryptic and previously undescribed species, suggesting that the highly diverse plant genus *Astragalus* is host to more species than previously thought.

SYNTHESIS, CHARACTERIZATION, AND REACTIVITY OF NITRILE HYDRATASE ANALOGUES

AMBER VITALO, JESSICA RODRIGUEZ, CURTIS MOORE, ARNOLD RHEINGOLD

FACULTY ADVISOR: CHRISTOPHER DALEY, CHEMISTRY & BIOCHEMISTRY

Nitrile hydratases (NHase's) are enzymes that convert nitriles to amides through hydration. They are of broad interest because of their use as industrial biocatalysts for kiloton/year amide production and their use in the bioremediation of nitrile-containing waste streams. The NHase active site consists of a low-spin metal ion (Fe(III) or Co(III)) that is coordinated to the enzyme through two amide nitrogens and three cysteine sulfurs, two of which have been post-translationally modified via oxidation. The coordination of the backbone amide N-atoms is uncommon in nature, as is the oxidation of the sulfur atoms, and the active site metal ion is at odds with common non-redox active enzymes. These unusual coordination features inevitably affect the NHase function. The successful preparation of functional models of NHase will allow for a better understanding of the structure-function relationship in NHase. Our progress on the synthesis of Co(III)- and Fe(III)-analogues will be presented.

CULTURAL DIFFERENCES IN AESTHETIC PERCEPTION

JOANN WEERSING

FACULTY ADVISOR: KENNETH KEITH, PSYCHOLOGICAL SCIENCES

To what degree do biology and culture affect a person's artistic preference? The study of aesthetics has explored the importance of mathematically-based preferences, such as the golden ratio, evolutionary and neurobiological reasons, formal art education, and basic elements of aesthetics, such as balance and visual weight. Cultural differences also affect a person's artistic preference, as can be seen in the examples of Greek and Roman aesthetics as compared to Japanese aesthetics. The current study explores the extent of the correlation between aesthetic preferences and cultural dimensions. Participants completed three questionnaires: an individualism-collectivism scale, a locus of control scale, and an aesthetic judgment questionnaire. The first two questionnaires measure dimensions of cultural characteristics. Results will be discussed in the context of the interplay between cultural dimensions and individual aesthetic perceptions.

FAIR TRADE AND THE TRIPLE BOTTOM LINE: PEOPLE, PLANET AND PROFIT

LAURYN WELLS

Faculty Advisor: Kristine Ehrich, Marketing

In recent years, the practice of fair trade in business has become more publicized. While many Americans think that fair trade is beneficial, most lack knowledge of its history and impact on important aspects of business and communities, both at home and abroad. Fair trade is supposed to have a positive impact on people such as farmers, but oftentimes the mandated benefits do not trickle down to the farmers themselves, and the lack of improvement goes unnoticed. Similarly, regarding environmental impact, fair trade is meant to have a positive effect. We will explore various practices promoted by fair trade, while assessing the impact on people and planet. Finally, profit is essential to a business. We will analyze and present evidence as to whether the strategic advertising of a product as "fair trade" has the ability to make a business more profitable and what impact this promotion might have on consumer perceptions.

FROM THE DIVINE SARAH TO LADY GAGA: THE AGENT/ OBJECT AND FEMALE SEXUALITY

LEAH WICKMAN

FACULTY ADVISOR: MONICA STUFFT, THEATRE ARTS

Using two case studies from the turn of the 20th century, Sarah Bernhardt and Mae West, as well as two case studies from the turn of the 21st century, Madonna and Lady Gaga, I investigate how these female popular culture icons willing present themselves as objects, actively participating in their own objectification. Using Liz Conor's theory of spectacularization, I consider how

putting one's sexuality on display should not be merely dismissed as an example of internalized oppression but rather demonstrates a potentially subversive power within the dominant and often subordinating patriarchal structure. Drawing upon feminist responses to Foucault's discourse theory, my work not only adds to the arguments regarding female sexuality but also counters the claim that we are in a post-feminist era. I argue for the continued need and importance for feminist critiques of and models within popular culture, proposing that we are not in a time of post-feminism but instead entering a new wave.

REGULATION OF SEROTONIN SYNTHESIS IN THE NERVOUS SYSTEM OF THE NEMATODE *C. ELEGANS*

ERIN WILLIAMS

FACULTY ADVISOR: CURTIS LOER, BIOLOGY

Serotonin is a key neurotransmitter that has many uses in humans and other animals. How nerve cells decide to use a neurotransmitter is not fully understood. Some serotonin neurons in *C. elegans* require function of a gene, *lin-39*. *Lin-39* is a homeotic complex gene that controls the function of 6 central nerve cells. Understanding the genes required to synthesize serotonin could be key in understanding novel therapies for different diseases associated with serotonin-deficiency. We have used RNA interference to examine the different genes on chromosome 1 in *C. elegans* to see if function similarly to *lin-39*. So far we have found that four genes potentially function like *lin-39*. We are continuing research to examine how neurons decide to use the neurotransmitter serotonin.

EXPLORING THE ROLE OF CONVERSATION TYPE AND CONTENT ON RECOGNITION AND DISTRACTION

CORINNE WRIGHT, SANDRA HOLMES-SURBECK, KANDICE OCHELTRIE, KITTRIC LOVEL

FACULTY ADVISOR: VERONICA GALVAN, PSYCHOLOGICAL SCIENCES

Research has shown that overhearing only one side of a conversation impairs performance on a cognitive task and is found more annoying than hearing both sides of a conversation. This study aimed to investigate these effects in a more naturalistic environment. We hypothesized that the content of a conversation, as well as the type of conversation, would cause a difference in performance, with engaging content and one-sided conversation-types more distracting. Participants were exposed to either one or both sides of a conversation while trying to unscramble a list of anagrams. They then completed a recognition task that required them to decide whether a word had been a part of the conversation that they overheard. Participants subjected to a one-sided conversation correctly identified significantly more words during the recognition tasks than participants who overheard a two-sided conversation.

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Debbie Tahmassebi	CHEMISTRY AND BIOCHEMISTRY
Allison Wiese	ART, ARCHITECTURE + ART HISTORY

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