

UNIVERSITY of HOUSTON

Office of Undergraduate Research and The Honors College present

Undergraduate **Research Day 2009**

THURSDAY, OCTOBER 1, 2009

Rockwell Pavilion
M.D. Anderson Library

Poster Presentations at 4 p.m.

Poster, oral and creative
presentations by UH undergraduates



UNIVERSITY OF HOUSTON

office of undergraduate **RESEARCH**

THE HONORS COLLEGE



OFFICE OF
UNDERGRADUATE **DISCOVERY** PROGRAMS

UNIVERSITY of HOUSTON

www.uh.edu/discovery

Program of Events for Undergraduate Research Day

Program for the Event



4:00-4:20 p.m. Viewing of Student Posters

4:20-5:00 p.m. Welcome and Remarks

Dr. Stuart A. Long
Associate Dean of Undergraduate Research and
The Honors College

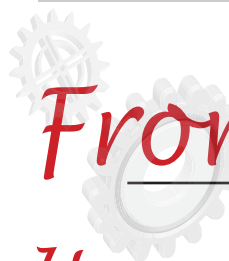
Dr. John Antel
Senior Vice President for Academic Affairs and
Provost for the University of Houston

Dr. Donald L. Birx
Vice President for Research for the University of Houston

5:00 p.m. Awards and Continue Poster Viewings

*A special thanks to the Texas Learning & Computation Center (TLC2)
for printing the posters, the Office of Undergraduate Discovery Programs
for contributing the awards, and the Division of Research
for contributing additional funds for the event.*

Undergraduate Research Day



From the Office of Undergraduate Research

Undergraduate Research Day

is celebrating its fifth anniversary this year, and this truly is a celebration—a celebration of students, a celebration of faculty mentors, and a celebration of the University of Houston. Today we honor the 44 students that participated in the 2009 Summer Undergraduate Research Fellowship program, as well as the achievements of all undergraduates that conducted substantive research projects within the past year.

For the students presenting at Undergraduate Research Day today, we applaud your achievements. We recognize that research can be challenging, tedious, and at times frustrating. Conducting research as an undergraduate, however, is invaluable in many ways. It offers you the opportunity to think independently, creatively and critically—encouraging and cultivating freedom of thought. Research also allows you to make a contribution to your field, and to discover new knowledge. It is perhaps one of the best ways to get to know faculty in your field and to develop lifelong mentorships with them. These experiences also acquaint you with graduate and undergraduate students in your field; colleagues and friends we hope you will stay in contact with for the years to come.

We also applaud the faculty mentors of the students presenting today. By devoting your time and energies in supporting these undergraduates, you are guiding and nurturing our future leaders. Through your involvement, you have enlightened our undergraduates and given them confidence in their abilities and in what they are capable of achieving in the future.

We also are thankful for the faculty who served as speakers in our SURF Brown Bag Lecture Series (visit page 29 for details). Through these lecturers' contributions, the SURF program provides students with insights that will help them be successful as both undergraduate researchers and as future graduate students or members of the professional workforce. This series is truly integral to the success of our summer research program.

Our selection committee is also instrumental to the success of the Office of Undergraduate Research. In addition to the challenging role of reviewing the many applications we receive for our scholarship and fellowship programs, the committee also provides us with guidance on improving and modifying our office's policies and procedures. We are so grateful to them for their contributions.

Last but certainly not least, we would like to extend our gratitude to the divisions and colleges that support our office each year. **Through the funding from the Provost's office, the Office of the Vice President for Research, The Honors College, the Cullen College of Engineering, the College of Natural Sciences and Mathematics, the College of Technology and the College of Pharmacy we are able to directly enrich the academic lives of over 150 undergraduates each year through mentored research programs.**

Thanks to all of you for celebrating this exciting day with us, and for supporting our undergraduate researchers.

Stuart Long

Associate Dean of Undergraduate Research and The Honors College, Professor of Electrical Engineering



Karen Weber

Program Director for Office of Undergraduate Research



The Office of Undergraduate Research



of Contents for Undergraduate Research Day Booklet

Undergraduate Research Day

October 1, 2009

Rockwell Pavilion

The Office of Undergraduate Research

The Honors College

University of Houston

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2009 Faculty Mentoring Award Recipient

Donald “Keith” Hollingsworth, from Mechanical Engineering, is the recipient of the Faculty Award for Mentoring Undergraduate Research for 2009. Keith has been working with undergraduates since 1990, and in that time has mentored over 40 students.

Since arriving at the University of Houston in 1989, Keith has been instrumental in creating research opportunities and fostering mentor relationships with mechanical engineering undergraduates. He is the Honors advisor for mechanical engineering students, which entails directing students toward research opportunities within the Mechanical Engineering Department, and has served as a thesis director for 11 Senior Honors Theses. He was also one of the chief architects in creating a UH/NASA mentoring experience for the Cullen College of Engineering from 2000-2002. In addition, as the co-creator of the BS/Graduate Fast-track program for the Cullen College of Engineering from 1998-2004, Keith assisted in creating a college-wide program that encourages undergraduates to transition into graduate school with six hours of dual-counted courses.

In regards to Keith’s strong mentorship, one of Keith’s students, Sandra Geffert, shares, “As a junior I was convinced that I wanted to graduate and pursue an MBA. Dr. Hollingsworth, knowing my interest in biology, encouraged me to write a Senior Honors Thesis under his guidance. In addition, thanks to him, as a senior I worked on a design project in collaboration with the Johnson-Space-Center. I became fascinated with space travel and the scientific research associated with it. These opportunities opened my eyes to engineering research at the graduate level. If Dr. Hollingsworth had not encouraged me, I do

not think I would be where I am today. I have [now] earned a Master’s degree and am currently finishing up my Ph.D. in mechanical engineering.”

Regarding Keith’s teaching ability, Keith has won several College and University wide teaching awards, including the W.T. Kittinger Award, the top teaching award in the Cullen College of Engineering, the Enron Teaching Award, the top teaching award in the University, and the El Paso Energy Corporation Faculty Achievement Award, an award that recognizes both teaching and researching activities. In addition, he has been awarded the Mechanical Engineering “Professor of the Year” award twice by mechanical engineering students. Dr. Larry Witte, Professor of Mechanical Engineering, adds, “Keith’s teaching is meticulous and demanding on students, but they clearly hold him in high esteem as do his faculty colleagues.”

Matthew Franchek, Professor and Chair of Mechanical Engineering, concludes, “Without a doubt, Keith is absolutely the best teacher and student mentor I have ever had the pleasure of knowing. Since his arrival at UH, Keith has been living the lifestyle of mentor and advisor to our students. We are proud of his research and teaching scholarship and feel fortunate to have him as one of our faculty.”



Donald “Keith” Hollingsworth
Associate Professor
Mechanical Engineering





Embracing Complexity in Building Design

SURF Student: Jennifer Andreas

Student's Major: Architecture

Faculty Mentor: Leonard Bachman

In the past few decades, technological advances have engendered countless new methods of gathering, analyzing, and responding to data that have had a significant impact on building design. This asymptotic increase in available information necessitates an appropriate shift in the attitudes of designers. It is now incumbent upon architects to not simply recognize but actually embrace the burgeoning complexities now inherent in building design. This research is an analysis of aesthetic theory as one possible mode of doing so. It reveals that there are several conflicting but inter-dependent attitudes towards aesthetics in architecture, some of which may be detrimental to the goals of contemporary architects in managing and applying the new data available to them. If one is to use aesthetic theory as a valid method of embracing complexity in building design, then one must be aware of both the purpose behind aesthetic intent and the specific and relevant context in which the building is to be placed.



Lower Extremity Reactive Kinematics to Simulated Trips and Slips

SURF Student: Qurrat-ul-ain Aziz

Student's Major: Health and Human Performance

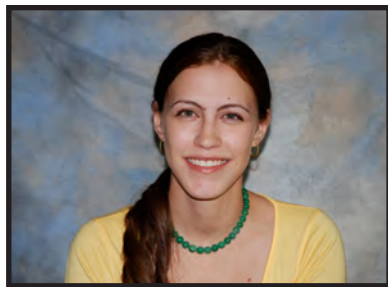
Faculty Mentor: Jian Liu

There are many fall incidents occurring involving slips and trips that results in harm to the victim. This problem is interesting to study because once focused on learning the biomechanics of how people trip and slip relative to the movement in the lower extremity and focus on preventing these falls and therefore prevent fall-related accidents. The research conducted aims to study the kinematics and motion of falling localized in the lower extremity, focusing on the hip, knee, ankle, heel, and toe of both the left and right leg. This accomplishment of preventing fall-related accidents will be applicable to the human population. Also, if the use of the new method of using the treadmill proves to be effective, it can be used as a stability-training tool, which is significant for fall prone elderly and patients with motion impairments. The equipments used include the GaitRite, Vicon, and split-belt treadmill.



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Examining the Relationships between Organizational Politics, Trust, Harassment, and Job Satisfaction



SURF Student: Lindsay Brown

Student's Major: Psychology

Faculty Mentor: Christiane Spitzmueller

Job satisfaction is one of the most studied constructs in organizational psychology. Due to the plethora of organizational and individual outcomes that are predicted by job satisfaction, it is important to understand its antecedents in hopes of establishing work environments that facilitate rather than decrease job satisfaction. Using archival data originally collected from the World Health Organization, we analyzed the responses of 1,040 full-time employees. Our study utilized structural equation modeling to examine the framework of relationships between perceptions of organizational politics, organizational distrust, supervisor trust, harassment, and job satisfaction. We found that organizational politics was an antecedent to each of the other variables, and that organizational trust and supervisor distrust mediated the relationship between politics and harassment. Harassment was also found to be a mediator between organizational distrust, supervisor trust and job satisfaction. Social exchange and psychological contract theories help explain the nature of these relationships. Future research will include the investigation of potential moderators to these relationships such as political skill, dispositional factors, and expressive writing.



Development of A Method for Identifying Breast Cancer Anti-Oncogenes With Lentiviral Mutagenesis

SURF Student: Cecilia Cai

Student's Major: Biology

Faculty Mentors: Anna Newman and Michael Lewis, Baylor College of Medicine



Retroviral mutagenesis is a powerful approach to identify genes that can either cause cancer or protect against it. Lentivirus, a type of retrovirus, provides the additional advantage of stably integrating into both dividing and non-dividing cells. My project involved creating a lentiviral construct to be used in an insertional mutagenesis system in breast cancer cell lines. This system is designed to generate and identify "anti-oncogenes". We hypothesize that expression of these "anti-oncogenes" can cause breast cancer cells to behave more normally. The lentiviral construct that I made contains a promoter for mammary epithelial cells, which is linked to three ATG sites followed by a splice donor cassette. The 3X ATG starts random translation of existing cell genes in three reading frames, while the splice donor induces alternative splicing of mammary cell genes. The construct also contains LoxP sites that permit recombinant deletion of the mutagenesis cassette, the Green Fluorescent Protein (GFP) gene, and genetic elements required for lentivirus formation. Thus, I have created an efficient new lentiviral of genes that protect cells against cancer. The next step is to infect cancer cells with this vector under conditions that will enable us to isolate these protective anti-oncogenes.



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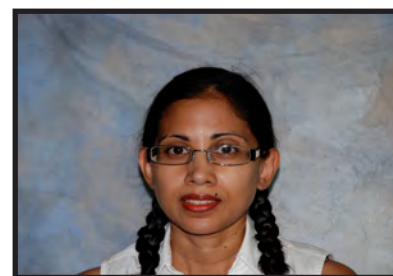
Novel Bioreducible Polymeric Gene Delivery System for Ischemic Heart Disease

SURF Student: Samuel Chung

Student's Major: Pharmaceutical Science

Faculty Mentor: Malavosklis Bikram

Ischemic heart disease (IHD) or coronary artery disease (CAD) is a leading cause of death in the United States. IHD is a condition that affects the supply of blood to the heart, resulting in a heart attack. Current treatments include bypass surgery, angioplasty, and pharmacotherapy. However, these treatments are very selective and limited. Gene therapy which transfers nucleic acids either RNA or DNA to human tissue to treat inherited as well as acquired diseases is a promising alternative compared to the traditional treatment. Currently, vascular endothelial growth factor (VEGF) is the most effective therapeutic gene for neo-vascularization. To this end, a novel biodegradable bioreducible polymeric carrier system was designed, synthesized and characterized for VEGF gene delivery. Using HPLC and MALDI-TOF, the MW of the polymer was ~3.2 kDa. The particle sizes of the polymer/DNA complexes were 100-231 nm with surface charges of 0.8-20 mV. Preliminary data with the reporter gene luciferase showed that the complexes produced significantly higher transfection efficiencies and lower cytotoxicities in stromal stem cells as compared to the control. Thus, these novel nonviral carriers are very efficient, versatile, and biocompatible polymers for nonviral VEGF gene delivery.



Excavation of a Crossroads Deposit at Magnolia Plantation

SURF Student: Alexandra Currier

Student's Major: Anthropology

Faculty Mentor: Kenneth Brown

This project involved the research and excavation of a crossroads deposit in Cabin 4 of the Magnolia Plantation, a part of the Cane River Creole National Historic Park in Natchitoches, Louisiana. A crossroads deposit is made up of four ritual deposits buried underneath the floor of the cabin in cardinal directions (North, South, East, and West). The Eastern and Southern deposits had already been unearthed. A Western deposit had been found, but not yet excavated, and there was reason to believe there might be a Northern one as well. The findings were that the Western deposit consisted mostly of ash and plaster. The Western deposit usually has to do with the transition to death, as does the color white. With that in mind, it seems appropriate that ash and plaster, both a white color, would be found there. The Northern deposit was not found, either because of rodent activity or because it was above-ground altar, which is historically not uncommon in African Creole culture. The altar also would have been acceptable to the surrounding Catholic culture in the area. The next step in this project should entail further analysis and research of these deposits.



Undergraduate Research Day



Early Implicit Learning: The Effect of Context in a Visual Search Task

SURF Student: Kevin Darby

Student's Major: Psychology

Faculty Mentor: Hanako Yoshida

The contextual cueing effect refers to a robust phenomenon in which repeated visual context guides attention to relevant information by constraining search. The effect is measured with an object search task in which a target (e.g., the letter T) is located within repeated or non-repeated visual contexts (e.g., configurations of the letter L) throughout the experiment. Shorter response times for the repeated configurations indicate that contextual information has affected search. The effect has been replicated in studies with adults but the few studies concerning the effect in children have produced mixed results. The present work aims to determine whether children are sensitive to repeated contextual information and why previous studies have produced ambiguous results by implementing new child-friendly stimuli. Limited initial data suggests that 10- to 13-year-old children (but not children under 6 years) are sensitive to repeated contextual information in the presence of greater stimulus complexity.

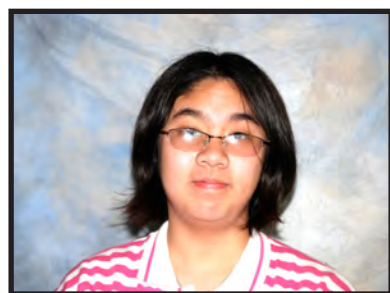


Observation of Contact Angle Hysteresis of Water on Self Assembled Monolayer by Using Contact Angle Goniometry

SURF Student: Lillian Duong

Student's Major: Chemistry

Faculty Mentor: Steven Baldelli



During the project, the construction of a contact angle goniometer was for the studies of the interaction between liquids and solid surfaces. Using a 2-lens system, a CCD camera, and the sessile drop method, observations were made of water's contact angle on Self Assembled Monolayers (SAMs). The contact angle of water on the SAMs was measured to be 99° while the contact angle on a good film would be $\approx 118^\circ$. The hysteresis is then found by using the tilting plate goniometry. The plane of the stage that the drop of water is on is tilted until the drop reaches the point of incipient motion, which is when the drop is about to move. The contact angle developed after the tilting has an advancing and receding angle that is used by subtracting the receding from the advancing angle to find the hysteresis, which is found to be $\approx 6^\circ$. The resulting contact angle hysteresis suggests that the SAMs are relatively even and smooth, but still have certain defects that occur based on preparation.



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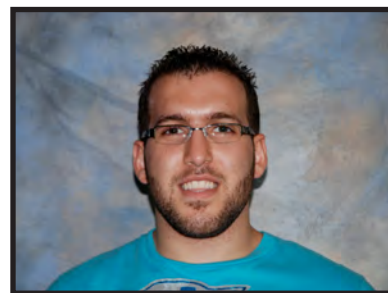
Generation and Detection of Microbubbles using Phase Stabilized Swept Source Optical Coherence Tomography

SURF Student: Mustafa Elzarif

Student's Major: Biomedical Engineering

Faculty Mentor: Kirill Larin

Every year approximately 32% of the scuba divers are affected with diseases associated with decompression sickness, venous gas emboli etc. which are caused by microbubbles in the blood and tissues. The symptoms could be very severe and so it is required to diagnose such diseases before the symptoms could appear. This proposed research includes the development of a phase resolved system called phase stabilized swept source optical coherence tomography (PhS-SSOCT) for the robust 3-D imaging of the microbubbles and to perform phase sensitive measurements to quantify the microbubbles in blood micro vessels and tissues. Contributions of this research are: development of high imaging depth PhS-SSOCT, imaging of blood microvessels embedded in the tissues, 3-D reconstruction of microvessels from the obtained raw data, injection of microbubbles into the blood microvessels using a peristaltic pump, imaging microbubbles inside the micro vessels and quantification of micro bubbles from the phase sensitive measurements and the 3-D images.



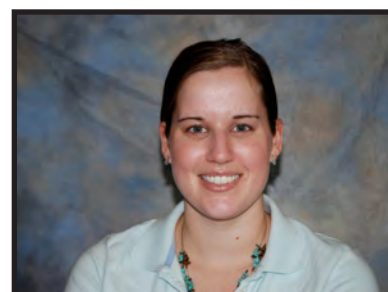
Researching Spanish Conquest In Colonial Mesoamerica

SURF Student: Kristi Emler

Student's Major: History

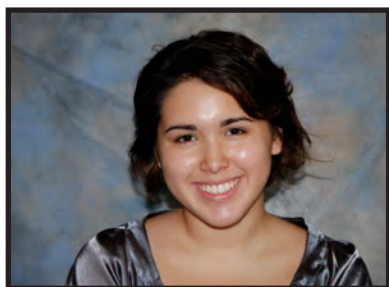
Faculty Mentor: Susan Kellogg

The specific task that was accomplished during this 10-week program was to help Dr. Susan Kellogg identify the primary and secondary sources for developing an annotated bibliography within the two fields of archaeology and history. The findings will build upon her previous book and earlier research, *Law and the Transformation of Aztec Culture, 1500-1700*. The main purpose of compiling this bibliography was to move beyond traditional themes and look at cultural change as influenced by recent research on ethnicity, environment, and changing patterns of urbanism across early colonial Mesoamerica. This was accomplished through the usage of four universities' electronic databases. This comparison, within the four regions of Colonial Mesoamerica, will have a major impact within the discipline because it will expand beyond the subject matter of domination and subjugation as a single event and will focus instead on cultural change within a comparative context. The primary focus is the impact of conquest upon labor patterns and the development of new identities based on class, race, and gender. Dr. Kellogg's next step is to begin reading to identify the dominant interpretations as well as new information and other sources.



Undergraduate Research Day

Marianismo: Making a Documentary on the Disproportionate Spread of HIV in Latina Women Populations



SURF Student: Erica Fletcher

Student's Major: Anthropology and Psychology

Faculty Mentor: Janice Hutchinson

A documentary was created about the cultural factors that place Latina women at a disproportionately high risk for contracting HIV. Three HIV positive women and several experts in the fields of anthropology and public health were interviewed. The documentary is entitled *Marianismo* because I found that the concept of marianismo typifies the reasons why HIV is becoming a major problem within the Latino community. The term “marianismo” comes from the idea of the Holy Virgin Mary, the model woman who is pure, selfless, and submissive and who will quietly endure suffering for the sake of preserving her family. Growing up, Latina women have traditionally been socialized to act subordinate, inexperienced sexually, and passive about condom usage with their partners. For married women, economic dependency and the hope of preserving their family often discourage women from leaving abusive or unfaithful men. This study hopes to encourage further discussion on cultural awareness and education strategies in order to promote healthy lifestyles among Latina women.



Structure and Growth of Supported Pt Alloy Nanoparticle Catalysts for Use in Hydrogen Fuel Cells



SURF Student: Donald Forgie

Student's Major: Chemical Engineering

Faculty Mentor: Peter Strasser

Wide Angle X-ray diffraction (XRD) is a technique to study structural aspects of crystalline solids. Here we use XRD to investigate the formation and growth of Pt-Cu bimetallic alloy nanoparticle catalysts. These particle catalysts are used in hydrogen fuel cells to convert hydrogen and oxygen to water and electricity with high efficiency. The metal alloy catalyst particles were synthesized by liquid metal precursor impregnation followed by high temperature furnace reduction. Ex-situ XRD yielded information on the ordering and crystallographic structure of. We also set up and validated a high temperature XRD method which enabled the direct observation of particle growth during heat treatment. Our study revealed the formation of a cubic Cu rich and one non cubic Pt:Cu 1:1 ordered alloy phase, Our in-situ method yielded direct insight into the growth trajectory of Pt nanoparticles.



Material Culture in Pre-Hispanic Latin America

SURF Student: Jorge Galvan

Student's Major: Industrial Design

Faculty Mentor: Donna Kacmar

This project was an investigation of the material culture of indigenous people in Latin America in the pre-Conquest period and how their environment enabled the technologies that these communities developed. For the investigation, a series of information graphics was created that visually analyzed the people's relationship to a variety of material found naturally in their habitats and developed a taxonomy that categorizes the most customary materials. In addition to the graphics and taxonomy, a structural analysis was developed of the mortar and pestle, a tool that was ubiquitous in these communities. The inspiration for the project derived from the initiatives of designers working in under-privileged communities to develop solutions to local problems that are culturally appropriate. This study sought to address the emerging gap between poor people and high technology. Of particular interest is the low-tech applications of these materials for these techniques may still be relevant today. This project will be developed further by continuing to expand the material taxonomy and product concepts based on the finding of these traditional materials.



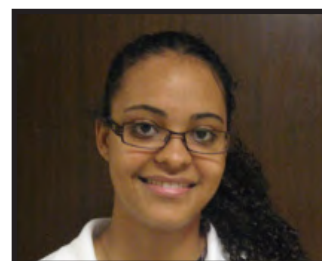
Model Polymeric Interfaces Via Self-Assembled Monolayer Technology

SURF Student: MacKenzi Green

Student's Major: Chemistry and Biology

Faculty Mentor: T. Randall Lee

This project explored the synthesis and study of ω -cyclohexylhexadecanethiol, which can be used to generate self-assembled monolayers (SAMs) that mimic the surface of the industrially and commercially important plastic polyethylene. Our unique model system allows the study of interfacial chemistry and reactivity of polyethylene in the absence of surface reconstruction, which can obscure the nature of the chemical reactions that lead to polymer degradation. Preparation of the target molecule involved a series of organic reactions, including nucleophilic substitution, Wittig addition, and hydrolysis. For each reaction, the product was analyzed by NMR spectroscopy to ensure that the desired molecule was generated. The completed final target molecule will be deposited as a SAM on gold, where the interfacial properties and reactivity will be explored in the context of related model interfaces that also mimic the surface of polyethylene.



Undergraduate Research Day

Role of the Toll-like Receptor-Adapter Protein TIRAP in Drug-Induced Liver Toxicity

SURF Student: Phuong Ha

Student's Major: Chemistry

Faculty Mentor: Romi Ghose



Drug-Induced Liver Injury (DILI) has become the rising health problem in the U.S. and the major reason for drugs removal from the market. DILI is known to be associated with inflammation. Inflammatory responses in liver are mediated by toll-like receptors and the intracellular adaptor proteins, including TIRAP. The goal of this research is to investigate the role of the toll-like receptor-adaptor protein TIRAP in mediating the toxicity of drugs in the liver. We hypothesize that the toxicity of these drugs is mediated by TIRAP. In order to test this hypothesis, liver cells isolated from TIRAP wild-type mice and TIRAP knock-out mice were treated separately with Acetaminophen (APAP) or Chlorpromazine (CPZ) or Troglitazone (TGZ), followed by an enzyme assay to examine drug toxicity. The level of enzyme released upon cell lysis in TIRAP knock-out is lower than in TIRAP wild-type, which means the toxicity of drugs in the absence of TIRAP is reduced. The toll-like receptor-adaptor protein TIRAP is likely to involve in drug-induced liver toxicity.

The Faces of Electra: A Study of Performance and Translation in Aeschylus, Sophocles, and Euripides' *Electra* Plays

SURF Student: Katelyn Halpern

Student's Major: English Literature

Faculty Mentor: John Harvey



Aeschylus' *The Libation Bearers*, Sophocles' *Electra*, and Euripides' *Electra* each construct their own Electra character and offer specific circumstances for her to navigate. The project goal was to understand these three Electras, compare and contrast the plots they follow, and discover innovative translations of the stories to support Dr. Harvey's new translation and production of Sophocles' *Electra*. To achieve these goals, the 45 translations available in the M.D. Anderson Library were evaluated, and the style and content of those most elegant and interesting were studied. Aeschylus' *Electra* showed herself to be gracious and deferential, Sophocles' passionate and angry, and Euripides' practical and self-possessed. These personalities are illustrated in (or created from) events that occur in all of the stories, but take on different qualities in each, including a reunion with brother Orestes, the murders of mother Clytemnestra and step-father Aegisthus, and the reaction to and consequences of the murders. The goals were generally met, and the research will be used to assist in the direction and choreography of the Center for Creative Work's production of Sophocles' *Electra* in Spring 2010.

The Office of Undergraduate Research

Analyzing Trends in High Episode Ozone Days in Houston Area in Relation to Attainment of Federal Standards

SURF Student: Renauda Helaire

Student's Major: Environmental Science

Faculty Mentor: Barry Lefer

Ozone pollution near the ground is the most wide-spread air quality problem in the U.S. The biggest concern with high ozone concentrations is the damage it causes to human health and vegetation. In Texas, four urban areas, including the Houston-Galveston region do not meet federal standards for ozone. Nonattainment areas are areas that have failed to meet federal standards for ambient air quality. The Houston-Galveston area was previously classified as being in moderate nonattainment of the 1997 8-hr ozone standard in 2004. However, the Texas Commission on Environmental Quality (TCEQ) was required to submit a revision of 8-hr ozone standards to the EPA, which was adopted on May 23, 2007. As a result of this revision, the Houston-Galveston area was reclassified as being in severe nonattainment. Studies of trends in ozone values will show improvement in air quality over the past ten years. Though it is not possible to predict future weather conditions, data can be used in meteorological modeling, which takes into account other important parameters including wind, temperature, and solar radiation. These models can then provide strong evidence as to whether future attainment goals might be reached.



Impulse Grocery Shopping: Investigation on Health Quality of Impulsive Grocery Purchases

SURF Student: Ashley Hurst

Student's Major: Entrepreneurship

Faculty Mentor: Jacqueline Kacen

Impulse buying is a common event of grocery store visits. Despite how adamant an individual is about sticking to their planned grocery list, the grocery store is filled with many opportunities to buy. There are both internal and external motivations involved in the decision making processes in grocery stores. External motivations include the marketing and merchandising of the products within a store that stimulate the senses. Internal motivations such as hunger, health and mood also influence buying habits. In this study, data was collected on 20 participants during three grocery store visits over 10 weeks. The focus of the study was to determine if impulse buys were healthy or unhealthy. Unhealthy products were those that were high in sugar, fat, cholesterol, salt or were highly processed. Overall, the results indicated that most of the items impulsively purchased were unhealthy. A knowledge of how influences such as hunger, nutritional needs, health, and mood affect the buying habits of shoppers can help shoppers both control expenses and live healthier.



Undergraduate Research Day

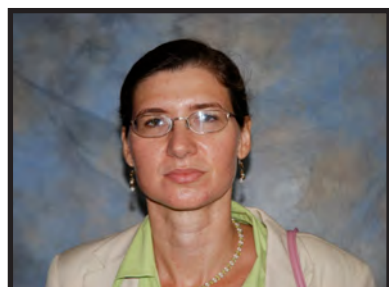
The Mechanical Philosophy



SURF Student: Casey Johnson

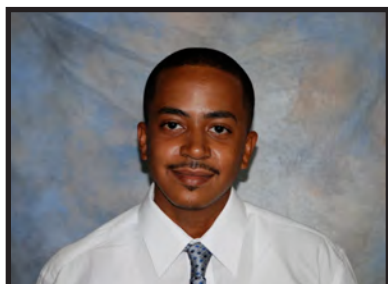
Student's Major: Philosophy

Faculty Mentor: Helen Hattab



The question of what elements make a philosophy “mechanical” remains unresolved since the mechanical philosophy is characterized in many ways. The aim of this research is to bring together and analyze the various characterizations so as to begin the process of creating a comprehensive and consistent characterization of what constitutes the mechanical philosophy. As such, the focus of the research was on secondary sources which we supplemented with examination of the works of René Descartes, Robert Boyle and John Locke. There are three mechanical principles found in the work of Descartes: the nature/machine analogy, a mechanical form of demonstration, and a geometrical physical foundation. These three principles are adopted in various forms and combinations by later philosophers which allows us to trace the mechanical philosophy through its various incarnations. However, this only provides a framework for the understanding of the mechanical philosophy, further research is necessary to determine the underlying features that mechanical philosophies have in common.

Researching the Impact of 20th Century Printing Equipment for Potential Acquisition by the Museum of Printing History



SURF Student: Colby Kibbe

Student's Major: Technology Leadership and Supervision

Faculty Mentor: Jerry Waite



This project was undertaken to supply the Museum of Printing History with a concise list of 20th century printing equipment to be preserved. The compiled list was created from print-related textbooks spanning from the early 1940s through the late 1990s. The initial scope of the project changed once an explosion in the creation of print-related product was noticed in the latter portion of the century. Determining that the incorporation of electronics into printing equipment was the cause of such rapid change, a question regarding this change was added to the list. Once compiled, a group of educators and industry personnel were surveyed to determine what equipment should be considered a top priority in acquisition by the museum. Among all persons asked, the most common answers were related to the incorporation of electronic equipment, such as keyboards and monitors, into the printing process. The first computer(s) used in the printing industry, such as the Apple II, was deemed the most important to preserve.

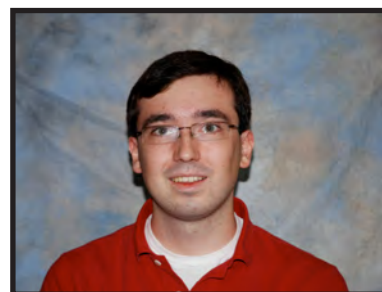
Application of Non-Uniform Fast Fourier Transform Methods for More Efficient Acoustic Solvers

SURF Student: Thomas Markovich

Student's Major: Physics

Faculty Mentor: Donald Kouri

A new method was presented to solve the Acoustic Wave Equation with nonuniform gridding by modifying the standard spectral algorithm. The algorithm presented, in particular, uses the fast fourier transform at non-equispaced nodes for efficient Acoustic Wave Equation solvers using Finite Differencing propagators in time. A comparative study was conducted to analyze the standard spectral methods and their NFFT counterparts and significant advantages were found for non-uniform grids as well as the applications of the DAF spectrally using nonuniform gridding. Finally, propagators were presented in both 1 and 2 dimensions, which showed 7-9% efficiency gains over the traditional approaches.



Analyzing Mathematical Models by Measuring Congressional Approval using 2006 Pre-Election Survey Data

SURF Student: Robert McNish

Student's Major: Political Science

Faculty Mentor: Scott Basinger

The purpose of this project is to analyze different methods of measuring causal effects and investigate the various pros and cons of each mathematical model used. By using survey data from a 2006 pre-congressional election study, we intend to look at the different possible models, build our own models to measure a public grading of Congress (on an A to F scale), and compare the results. This will help to determine the best course of action when building models, especially concerning the problem of whether it is better to run a simple regression model or take the risk of using bad controls.



Undergraduate Research Day



Impact of Perishable Products' Inventory Policies on Retailer's Profits

SURF Student: Melissa McWhirter

Student's Major: Supply Chain and Logistics Technology

Faculty Mentor: Vikram Tiwari

Managing inventory of perishable items, for example bakery items with only a one day shelf life, is especially challenging. Ordering too many or too few of these items directly impacts sales and profits. Using 63 days of sales data from a retailer, performance of the currently deployed inventory ordering policies is measured. A large product proliferation and high variability in daily sales makes forecasting sales difficult, leading to ad hoc and gut-feel inventory ordering. Analytical models developed in inventory management literature often fail to incorporate real-world constraints and hence their direct applicability is limited. Therefore, a mixture of basic analytical approaches, that factor-in retailer's constraints, is used to develop an inventory ordering policy for each of the eight stock-keeping-units included in the research. The superior performance of the recommended policy over the existing policy is noted.



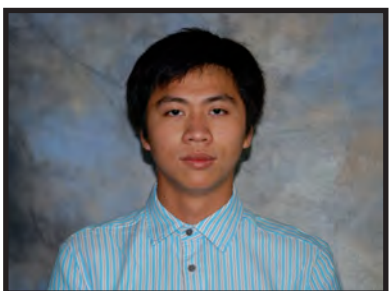
Palladium-Coated Silver Nanoparticles: New Materials for Catalysis and Drug Delivery

SURF Student: Hieu Nguyen

Student's Major: Chemical Engineering

Faculty Mentor: T. Randall Lee

This presentation describes the first known preparation and characterization of palladium-coated silver nanoparticles. To prepare these unique shell/core materials, individual silver nanoparticle cores having selected diameters were used to template the growth of a thin palladium overlayer. The size and morphology of the nanoparticles were controlled via the addition of systematically varying amounts of palladium stock solution into a defined amount of silver nanoparticle stock solution. The resultant composite nanoparticles were characterized by transmission electron microscopy (TEM), ultraviolet-visible (UV-vis) spectroscopy, and energy-dispersive X-ray (EDX) analysis. Importantly, the optical absorbance of these unique core-shell particles can be tuned from the visible to the near-IR regions of the electromagnetic spectrum. This unique optical tunability, when coupled with the relatively small dimensions of the materials, renders these nanoparticles attractive for uses in emerging industrial and biological applications, including solar-driven catalysis and photo-thermal drug delivery.



The Office of Undergraduate Research

Mechanical and Electro-Mechanical Properties of Carbon Nanofiber Paper Reinforced Elastomer Composites

SURF Student: Khoi Nguyen

Student's Major: Mechanical Engineering

Faculty Mentor: Li Sun

This research's objective was to characterize and reveal the electrical and mechanical coupling effect in the elastomeric carbon-nanofiber composites, and to evaluate the performance of the nanocomposites as electroresistive strain sensor. The dispersion-filtration method was developed to assemble low-cost carbon nanofibers into interconnected, self-supportive paper sheets. Recent testing conducted in the lab showed that by infiltration of elastomers into these carbon nanofiber sheets, conductive composites with their resistance very sensitive to applied strain were obtained. A detail analysis of the ECC material's temperature stability was studied. An experiment to determine whether or not the ECC material can produce reliable data over a long period of time was also conducted. The development of polymer nanocomposites for several space applications is a cutting edge arena with the use of nanoparticles to reinforce polymers and further provide an avenue for multi-functionality. These synthesized elastomeric carbon-nano composite (ECC) materials become very important within material science and engineering discipline due to their high specific strength, high ductility, conductivity, and biocompatibility. The results from this research showed that the ECC material is a strong candidate for many applications for the space industry and medical field.



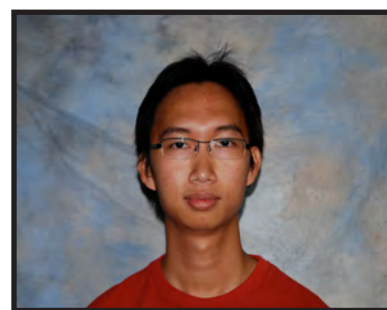
ProVision - An Evaluation of Academic Performance

SURF Student: Tai Nguyen

Student's Major: Supply Chain Management

Faculty Mentor: Robert Houston

Recent research reveals that African American males make up the largest percentage of prisoners in Texas and as adolescences they often drop out from school. One of many attempts to assist them in improving their academic achievement as well as life options is to provide increased support in their education prior to high school. Pro-Vision, an African American all-male Charter Middle School in Houston Independent School District has offered such opportunities since 1995. This study employs information on 334 students who attended Pro-Vision at some point from 2003-2004 to 2007-2008 academic years. Student academic achievement was analyzed for patterns and trends in performance over time. The results indicate an improvement in TAKS and Stanford score achievement with increased length of time students stayed in the program.

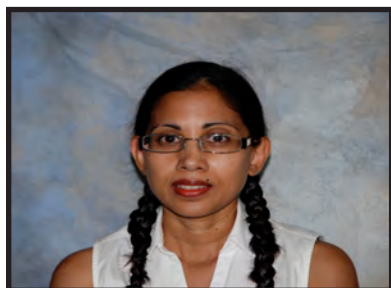


Synthesis of a Novel Drug Delivery System for the Treatment of Invasive Pulmonary Aspergillosis

SURF Studeent: Toan Nguyen

Student's Major: Biochemistry

Faculty Mentor: Malavosklisk Bikram



Invasive pulmonary aspergillosis (IPA) is a leading cause of death in immunocompromised patients, particularly those with leukemia or recipients of bone marrow transplantation (BMT) where mortality rates approach 60-90%. To this end, we propose to develop a highly specific liposomal drug delivery system that will deliver life-saving therapeutics such as amphotericin B to the infected deep tissue sites. The overall objective of investigating the synthesis and characterization of novel stealth targeted liposomes is to develop an innovative drug delivery system for human diseases. The investigation monitored different phospholipid formulations and characterization of the resulting liposomes using dynamic light scattering (DLS), transmission electron microscopy (TEM), and fluorescence microscopy (FM). Once the synthesis of the liposomes had been carried out using a rotary evaporator, the liposomes were hydrated using a phosphate buffer. After the centrifugation and sonication steps, the formulated liposomes were characterized by the above mentioned techniques. The optimum formulation ratio of the liposomes was found to be DPPC : DPPE : Cholesterol = 7.5 : 1 : 1.25, where DPPC is 1,2-dipalmitoyl-sh-glycero-3-phosphocholine and DPPE is 1,2-dipalmitoyl-sh-glycero-3-phosphoethanolamine. For these liposomes, TEM analysis indicated an average diameter size of 145 nm, which is in good agreement with the hydrodynamic diameter of 165 nm as determined by DLS analysis. Optimization of the liposome formulation as well as measurement of the more relevant physical properties, including entrapment efficiency, is currently under progress.



Palladium-Catalyzed Cross Coupling of C-H Bonds

SURF Student: Tu Nguyen

Student's Major: Chemical Engineering

Faculty Mentor: Olafs Daugulis



The goal of our research group is to develop new and useful reactions to produce novel materials via carbon-hydrogen bond activation. Our group has developed an effective general method for the coupling of R-CH₃ and Ar'-I by using palladium (II) acetate via activation of carbon-hydrogen bonds to achieve arylation of sp³ C-H bonds. The development of this method allows decreasing the cost and the number of steps needed to obtain such materials. Moreover, this method can be applied to efficient synthesis of pharmaceuticals.

The Office of Undergraduate Research

Revitalization of a City through Design: a Study of Houston Corridors

SURF Student: Natasha Ostaszewski

Student's Major: Architecture/Environmental Design

Faculty Mentor: Susan Rogers

Many areas in Houston that were once vibrant have declined. Low to moderate income families still remain in these areas; however, they are left without a comfortable and safe community. Through research with the Community Design Resource Center we developed tools and strategies for community change that would enhance the quality of life in low and moderate income communities throughout the Houston region. Field studies, design and precedent studies and community workshops were completed to develop a set of strategies. Four corridors were studied specifically: Airline, Broadway, North Main, and Holman. Each corridor has unique conditions yet the eight strategies developed apply to all. The strategies are to mix, thread, patch, spark, frame, fill, anchor and sow. The primary result of the research is that through design Houston's corridors and communities can be improved and the quality of life in these unique places enhanced.



Assessment of Houston Speech Language Pathologists

SURF Student: Sarah Panjwani

Student's Major: Communication Sciences and Disorders

Faculty Mentor: Martha Dunkelberger

Speech Language Pathologists (SLPs) are regularly called on to assess the speech and language skills of students from culturally and linguistically diverse (CLD) backgrounds. Often, due to a lack of proper assessment tools and Speech Language Pathologist (SLP) knowledge, over-identification or under-identification of language disorders occurs in students who are CLD. A survey of Houston SLPs was conducted to better understand the factors influencing how SLPs assess students from CLD backgrounds. The survey included two hypothetical scenarios of children who are CLD. The participants reported 17 languages spoken by the populations they served. However Houston SLPs reported proficiency in only 4 of those languages. Most SLPs correctly identified the children in the scenarios as impaired or not impaired. However, SLP confidence in the accuracy of the assessment decisions was lower than expected. Most SLPs reported the lack of availability of interpreters who speak the child's language to be a major problem in assessment of CLD populations.



Undergraduate Research Day

Evaluating the Effects of Various Load-Positioning Methods on Gait Stability During the Walk-to-Run Transition

SURF Student: Anish Pillai

Student's Major: Biology

Faculty Mentor: Adam Thrasher



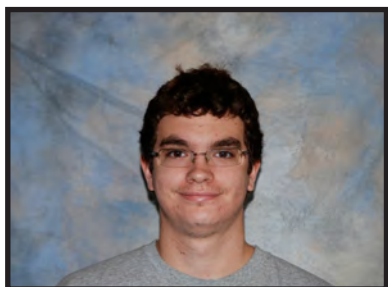
Backpacks are useful for students to carry required items, however, when overloaded and carried improperly, backpacks may actually be more harmful than they are helpful. Several studies have been done to identify the optimum weight and position for a backpack by examining postural stability while standing. However, there are few studies examining the effect of backpack positioning on gait stability while walking. Thus, this study evaluates various load-positioning methods to find out which method maximizes gait stability and minimizes the risk of falling. The study involves 10 backpack conditions, 6 conditions of walking at a preferred speed, and 6 conditions of walking at the calculated walk to run transition speed (Froude number = 0.5), where we expect to see a change in gait stability. The findings will be used specifically in the field of space of exploration to develop safer, more stable backpacks for astronauts.

Phase Diagram for a 2-D Two-Temperature Diffusive XY Model

SURF Student: Matthew Reichl

Student's Major: Physics and Mathematics

Faculty Mentor: Kevin Bassler



Using kinetic Monte Carlo simulations we have determined the phase diagram of the nonequilibrium 2-dimensional two-temperature diffusive XY model and investigated the robustness of the equilibrium behavior against a nonequilibrium perturbation to the dynamics. According to the Mermin-Wagner theorem, systems with continuous symmetry and dimension $D \leq 2$ can't have long-range order. The XY model, which has broad applications including superconductivity and liquid crystals, is an example of such a system. Despite the fact that it does not have long-range order, the 2-D equilibrium XY model still has an ordered phase at low temperatures. This ordered phase is characterized by bound vortex-antivortex pairs and there is a continuous phase transition, known as the Kosterlitz-Thouless transition, from it to a disordered phase in which the vortex-antivortex pairs are unbound. Contrarily, the nonequilibrium XY model is known to have steady states with long-range order, thereby "violating" the MW theorem. We find that the phase diagram of the nonequilibrium model consists of two symmetric ordered phases and a disordered phase. The boundaries of the disordered phase are characterized by a novel crossover exponent. We also find that even an infinitesimal nonequilibrium perturbation to the dynamics results in substantial changes to the system's behavior.

Development of a Human Breast Tissue Phantom for Optical Coherence Tomography Imaging

SURF Student: Panteha Rezaee

Student's Major: Biomedical Engineering

Faculty Mentor: Kirill Larin

Breast cancer is the second leading cause of cancer death in women, after lung cancer. One in eight women either has or will develop cancer in her lifetime. Accurate diagnosis and treatment of breast cancer can significantly increase survival rates. MRI, ultrasonography, and X-ray mammography are common imaging techniques that are currently used in breast cancer diagnosis but have certain limitations such as low sensitivity, low contrast, and harmful radiation respectively. Optical coherence tomography (OCT) is an imaging technique that transcends limitations that are imposed by conventional imaging techniques and can be combined with other imaging modalities to produce a new way to accurately detect breast cancer tumors. Phantoms with tissue like properties are used to test system design and evaluate optical techniques. As there is a need to test OCT's capability of distinguishing abnormal and normal tissue we developed a phantom to represent the optical properties of normal and abnormal tissue. The phantoms can be used to assess the ability of OCT to accurately detect cancer tumors in breast tissues.



Treadmill-Exercise Increases Antioxidant Homeostasis and Decreases Oxidative Stress-Induced Anxiety in Rats

SURF Student: Nada Sarraj

Student's Major: Human Nutrition and Foods

Faculty Mentor: Samina Salim

Anxiety disorders affect an estimated 40 million people in the U.S. Although effective treatments for anxiety disorders are available, a vast majority of anxiety patients are unresponsive to classical anti-anxiety medications and experience side effects. Improving the understanding of neural mechanisms of anxiety would create improved treatments and reduce the costs of anxiety disorders. This study investigated the involvement of oxidative stress in anxiety and a protective role of treadmill exercise against oxidative stress in the treatment of anxiety and propose exercise as a better intervention over drugs with their unavoidable side-effects. It was discovered that BSO increased the levels of oxidative stress markers in the brain regions implicated in the anxiety response. This was accompanied by decrease in Gsr1 and Glo1 levels, the antioxidant proteins implicated in anxiety. Also, anxiety behavior tests revealed that BSO treated rats were more anxious than control rats. Prior treatment with 4-week exercise training in rats attenuated BSO-induced increase in oxidative stress markers, decrease in Gsr1 and Glo1 levels and anxious behavior. This suggests a role of antioxidant enzymes in anxiety phenotype and support exercise as an intervention in the treatment of anxiety.



Undergraduate Research Day



Telesurgery Message Classification Module Design

SURF Student: Raghuvar Seth

Student's Major: Electrical Engineering

Faculty Mentor: Yuhua Chen

Emerging telesurgery technologies allow surgeons to operate on a remote patient with the help of surgical robots. Since precision is of the utmost importance in surgeries, the pursuit of controlling network delay and jitter is an imperative goal in such data networks. The main aim of this summer research initiative was to attempt to reduce these delays using Field Programmable Gate Arrays (FPGAs). In this project, a classification module is designed using Verilog Hardware Description Language (Verilog-HDL) to efficiently sort and hence prioritize different kinds of data packets. Important control text packets hence could be sent faster through network routers. Video packets were examined as left and right video for 3D video regeneration. This can help to reduce jitter between the left and right views.



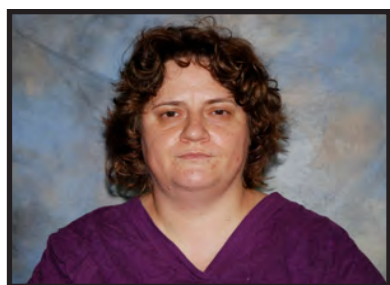
A Study of Troponin C Mutations A8V and D145E Related to Heart Disease

SURF Student: Kristin Tang

Student's Major: Biology

Faculty Mentor: Svetlana Tikunova

Heart failure is very common, costly, disabling, and may be lethal, despite medication and surgery. A common symptom in heart failure patients is systolic and diastolic dysfunction. Troponin C is a calcium-binding protein that regulates muscle contraction and relaxation. This project was conducted to compare calcium affinity and the rates of calcium dissociation between wild type cardiac troponin and two types of abnormal cardiac troponin, called A8V and D145E, which were derived from humans affected by hypertrophic cardiomyopathy. The purpose is to investigate how these mutations affect cardiac muscle function with the goal of applying this knowledge to treatment of heart disease.



The Office of Undergraduate Research

Latency and Jitter Measurement Tool for Telesurgery over Fiber-Optic Networks

SURF Student: Kevin To

Student's Major: Electrical and Computer Engineering

Faculty Mentor: Yuhua Chen

Telesurgery enables surgeons to operate on patients located hundreds or thousands of kilometers away. Using a 3D, high definition camera, a skilled surgeon directly controls a multi-armed robot which replicates the surgeon's movements with high precision. Currently, one of the biggest limitations in telesurgery is the latency of the video and control signals over networks. The goal of this research project is to create a real-time latency and jitter measurement tool over fiber optic networks for telesurgery, to test different methods for data transmission on optical networks. This tool was created as an encapsulated module designed on an FPGA using Verilog HDL.



Investigating Trainers' Workplace Methods for Learning about Transfer

SURF Student: Sparsh Varma

Student's Major: Management of Information Systems

Faculty Mentor: Holly Hutchins

The objective of this research paper was to analyze qualitative data from training professionals and to identify how they learned about the topic of training transfer. Data were gathered from interviews, and was a follow up to the original data collection (e.g. an online survey followed by interviews that focused on two learning methods used by trainers) based on journal reviewer feedback. The results of the interview data were that trainers select learning methods mostly through informal learning activities, such as job experiences, searching the internet, and talking to colleagues. Trainers also reported that they preferred learning about training transfer through formal methods such as conferences and discussions with external trainers as well as academics. The results suggested that trainers select learning methods using multiple criteria and use their knowledge of transfer in different phases of learning process; namely, pre-training, during training and post-training.



Undergraduate Research Day



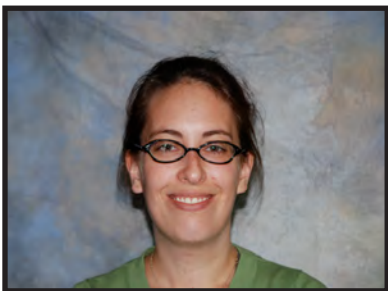
Perpendicular Triblock Copolymer Nanostructures

SURF Student: Thai Vu

Student's Major: Chemical Engineering

Faculty Mentor: Gila Stein

Block copolymer self-assembly offers a simple route to generate nanostructures over large areas. Block copolymers comprised of poly(styrene) (PS) and poly(methyl methacrylate) (PMMA) constituents are excellent low-cost lithographic templates, because the PMMA block can be selectively removed to produce a nanoporous mask for etching or deposition. Control over domain orientation and thickness is critical for applications in semiconductor patterning. The objective of this project is to template “thick” block copolymer nanostructures by controlling interfacial and surface energetics. This is achieved by chemically-modifying the substrate, and selecting a PMMA-PS-PMMA triblock copolymer architecture.



Phase Behavior of Hemoglobin Solutions

SURF Student: Kenuo Wang

Student's Major: Chemical Engineering

Faculty Mentor: Peter Vekilov

Sickle cell anemia is characterized by the abnormal sickle shape of the red blood cells, which is caused by the polymerization of a mutant hemoglobin, HbS. Previous studies have shown that the formation of denser phase of hemoglobin is the precursor of hemoglobin polymerization. My project was aimed at the phase behavior of hemoglobin solutions. We monitored samples of solution of normal human hemoglobin held in slides 100 to 500 microns thick by differential interference contrast. The results indicate that both the volume of the solution and the addition of free heme to the solution had great effect on the hemoglobin solution phase behavior. Future work will involve constructing phase diagram for hemoglobin solution, and it might contribute to finding a cure for sickle cell anemia.



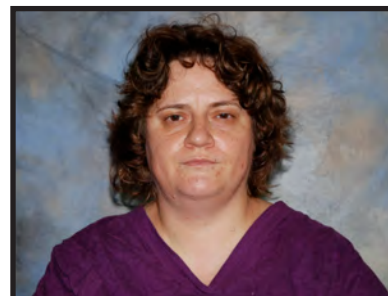
The Effects of TnC Mutations on Calcium Dissociation Rates

SURF Student: Miranda Willacey

Student's Major: Pre-Pharmacy

Faculty Mentor: Svetlana Tikunova

Hypertrophic cardiomyopathy (HCM) is an autosomal dominant disease that can cause sudden death. Mutations in sarcomeric genes are found in those affected with this disease. The mutations used in this study (E134D and C84Y in human cardiac troponin C) were previously found through analysis of 1025 patients with HCM from the Mayo Clinic. The patients with the E134D and C84Y mutations showed no family history of the HCM, so these mutations may be sporadic. The purpose of this study was to examine the effects of E134D and C84Y mutations on the calcium binding properties of troponin C incorporated into the troponin complex. Mutations were produced through the process of PCR, and DNA was sequenced for verification. By testing the mutants in a stopped flow apparatus, the rates of calcium dissociation from the mutants were determined. Compared to the wild-type, E134D had an insignificant difference in both the affinity and rates of calcium dissociation from the troponin complex. C84Y not only had a significantly lower affinity than the wild-type troponin complex, it also had 2-fold faster rate of calcium dissociation from the troponin complex. The difference in calcium binding properties may help explain why C84Y mutation causes HCM. Future plans include determining the effects of E134D and C84Y mutations after reconstitution of these troponin C mutants into the thin filaments of muscle.



The Study of Hydrogen Bonds in Water and Urea

SURF Student: Pengfei Xiao

Student's Major: Chemical Engineering

Faculty Mentor: B. Montgomery Pettitt

Water is a special molecule; life originates in water and relies on water. It is very important to understand why water is unique, especially as regards understanding the chemistry of life. One special physical characteristic of water is the Hydrogen Bond (H-bond) that water can form. This research investigates the energetic properties and consequences of the H-bond. The hydrogen bond between waters is best formed when the orbital overlap (S_{ij}) of the hydrogen atom and oxygen atom is negative. There is a minimum at a distance between heavy atoms (non hydrogen) of about 3 angstrom, where the molecule system is in the most stable situation. The urea-water H-bond is stronger than water-water which may help to explain some of its properties such as having a high solubility.



Undergraduate Research Day

Jan de Hartog's *The Hospital* and How it Contributed to the Creation of Harris County Hospital District and Ben Taub Hospital

SURF Student: Peter Zachry

Student's Major: History

Faculty Mentor: Charles Orson Cook



The research project focused on the Houston community's reaction to Jan de Hartog's *The Hospital*, written in 1964. Primary and secondary sources were examined to learn more about how the work contributed to the creation of the Harris County Hospital District and the opening of the Ben Taub charity hospital. The University of Houston's archives of materials relating to *The Hospital*, ranging from newspaper clippings to de Hartog's personal correspondence were also examined. In the book, de Hartog reveals the wretched conditions that existed at Houston's charity hospitals, first at Jefferson Davis Hospital, and then at Ben Taub. The battle between the governments of Houston and Harris County, over which the governing body is responsible for providing adequate health care for their respective constituents, has been an ongoing one. De Hartog inspired the first substantial contribution to health care in Houston since the creation of Jefferson Davis Hospital in 1924. Houston's history has been riddled with problems along these lines; Houston has traditionally been far behind other major cities regarding social services like health care. Houston has long been a mecca for capitalism for its beneficiaries, but not those individuals who are left by the wayside.

An Adaptive Inexact Newton Method for Non-linear Two-Point Boundary-Value Problems

SURF Student: Melvin Zaldivar

Student's Major: Mathematics

Faculty Mentor: Edward Dean



The research conducted this summer, focused on the general idea of solving nonlinear two-point boundary value problems using a new adaptive method. The inexact Newton's method encompasses a Claes Johnson adaptive method, which stipulates accuracy requirements for the linear problems to numerically approximate the solution to the nonlinear problem. Linear and nonlinear problems were all tested using different equally spaced grids. The objective was to be able to prove that by using the inexact Newton's method we could be able to find a mesh that would result in a smaller amount of error than having an equally spaced mesh.

The Office of Undergraduate Research



SURF Brown Bag Lecturers

Participants of the Summer Undergraduate Research Fellowship program have the privilege of attending the weekly Brown Bag Lecture Series, in addition to conducting their research endeavors with their faculty mentors. The lecture series presents a wide range of topics that are of interest to undergraduate students, such as confronting issues related to research ethics, applying to graduate and professional school, and learning to become proficient in the language of their particular disciplines.

The next few pages are comprised of biographical information on some of our highly esteemed lecturers that participate in our program. Through their involvement, they contribute in making the SURF program a first-rate research program at the University of Houston.



Julia Babcock

Dr. Babcock's research interests center around couples' relationships, couples therapy, and domestic violence. She is specifically interested in the role of emotion in functional as well as violent relationships. She and her students have built a psychophysiology and observational lab in which to use multi-methods assess emotional reactions during interpersonal situations. They assess autonomic responding and code facial affect displayed during couples' naturalistic conflict discussions and experimental tasks. They identify how violent and non-violent couples differ in the way that they respond to emotional stimuli and regulate their emotions. Recently they received a grant from NIMH to assess psychophysiological reactivity during interpersonal tasks as it differentiates borderline from antisocial/psychopathic personality features. Their research team also collaborates with police, courts, treatment providers, and victims' advocates to evaluate coordinated community interventions to domestic violence. They also frequently train treatment providers on the research on intimate partner violence. The ultimate goal of their research is to develop new interventions that might improve the efficacy of domestic violence treatment programs. This past summer, Dr. Babcock participated on the faculty panel on applying to professional and graduate school.





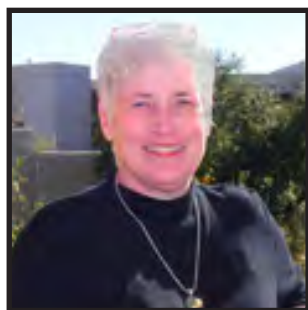
Kenneth Brown

Kenneth Brown is a professor in the Department of Anthropology, and is committed to unraveling the story of Africans arriving to the New World. For over 30 years Kenneth has brought groups of undergraduate and graduate students to former slave plantations located throughout Georgia, South Carolina, Louisiana, and Texas, where he trains these students to become anthropologists.



Ken has served as the Regional Vice President of the Texas Archaeological Society, a member and vice chair of the Texas State Board of Review for the National Register of Historic Places, Texas Historical Commission, and currently serves as a member of both the Underground Railroad Project and of the Gullah Cultural Initiative, National Park Service. He served as the chairman of the Department of Anthropology from 1983-1992, and was awarded the College of Social Sciences Teaching Excellence Award in 1999 and the Outstanding Professor, College of Social Sciences Alumni Association award in 2000. Ken was also the Office of Undergraduate Research's Faculty Award for Mentoring Undergraduate Research for the 2006-2007 academic year. He lectured to the SURF students on his research in the plantations.

Mary Gray



Mary Gray received her Ph.D. in English from the University of Houston with a primary emphasis in rhetoric and composition. Her dissertation critically evaluates a UH linked course learning community which integrated first-year composition, American history, and technology. She also holds a Master of Liberal Arts, concentrating in English and Art History, from St. Thomas University. As an instructor in the UH Writing Center, she conducted workshops for graduate students in the Department of Art History and the Bauer College of Business. She is currently a Houston Writing Fellow in the Department of English teaching first-year writing and sophomore literature courses. This past summer, Dr. Gray and Michelle Miley conducted a lecture for the SURF students on learning the language of their disciplines.



P. Shiv Halasyamani

Dr. P. Shiv Halasyamani is an Associate Professor in the Department of Chemistry at the University of Houston. Dr. Halasyamani teaches a wide range of courses, such as chemistry for honors freshman, descriptive inorganic chemistry for undergraduates, and solid state chemistry for graduate students. His research focuses on the synthesis and characterization of new oxide and halide materials with technologically important properties. Throughout his career, he has received many accolades, such as the NSF Early Faculty CAREER Award, the ACS Petroleum Research Fund Type G and AC Grants, and the Beckman Young Investigators Fellowship. He received his B.S. at the University of Chicago, his Ph.D. at Northwestern University, and was a Postdoctoral Fellow and Junior Research Fellow at Oxford University before arriving at the University of Houston. Dr. Halasyamani lectured on research ethics this past summer to the SURF participants.



Michelle Miley

Michelle Miley holds an M.A. in English Literature from Baylor University as well as a B.A. in English and Psychology. She has taught freshman and sophomore composition classes at Lubbock Christian University and Wayland Baptist University, and has coordinated and taught in the XL: Strategies for Learning program at Texas Tech University. She also coordinated the recruiting for the Petroleum Engineering Department at Tech. As the Writing in the Disciplines Assistant Director, Michelle develops and delivers writing instruction for courses across campus. Her course partnerships range from one-time presentations to teaching semester-long writing classes specific to particular disciplines. This past summer, Michelle and Dr. Mary Gray conducted a lecture for the SURF students on learning the language of their disciplines.





Anna P. Newman



Dr. Anna Newman is a geneticist who has studied protein secretion in the yeast *S. cerevisiae* and the development of the nematode *C. elegans*. In *C. elegans*, she discovered cell-cell interactions that occur during uterine development and characterized genes required for these processes. She performed her undergraduate studies at Harvard and received a Ph.D. in Cell Biology from Yale. She is the coauthor of over twenty research articles as well as of scientific review articles. Her work has been published in journals including *Nature*, *Genetics*, *Development*, and the *Journal of Cell Biology*.

She has taught and mentored students at the high school, undergraduate, and graduate levels. At the University of Houston, she teaches Introductory Biology and Genetics. She also organizes the Colloquium for Undergraduate Research in Biology, which provides students with a forum in which to present their research results. Dr. Newman participated on the faculty panel, this past summer, on applying to professional and graduate school.

Lisa Renaud



Lisa Renaud is a Career Counselor at the University Career Services office at the University of Houston. She provides career counseling to students in the Colleges of Natural Sciences & Mathematics, Pharmacy, and Optometry. She also assists students who are pursuing pre-professional training for healthcare careers.

She received her Bachelor of Science in Human Development from the University of Maine. She holds a Master's degree in Counseling from the University of Houston. She has over 4 years experience counseling and coaching students and alumni from both the University of Houston and Rice University. Lisa Renaud is a Licensed Professional Counselor.



Hanadi S. Rifai

Dr. Rifai is a Professor in the Civil and Environmental Engineering Department at the University of Houston. Her expertise includes ground water flow and transport modeling, risk assessment, natural attenuation, hazardous waste, hydrology, urban storm water quality, non-point source pollution, Total Maximum Daily Loads, Decision Support Systems and Geographic Information Systems. In addition to authoring the widely-used BIOPLUME II, BIOPLUME III and BIOPLUME IV computer models for biodegradation and natural attenuation modeling,

Dr. Rifai has built and manages the GIS (Geographical Information Systems) computer laboratory in the department. She also teaches professional courses on groundwater contaminant transport, remediation and groundwater modeling, natural attenuation, and risk assessment. Dr. Rifai conducted a lecture on pollutants in the Houston Ship Channel for the SURF participants.



Len Trombetta

Dr. Len Trombetta earned a B.S. in Physics from Rensselaer Polytechnic Institute in 1976, and a Ph.D. in Physics from Lehigh University in 1984. His Ph.D. dissertation was the result of research done at the Army Research Laboratory, Fort Monmouth, NJ, where he worked from 1981 until 1986. He joined the UH faculty in 1986 and is currently an Associate Professor. Dr. Trombetta enjoys teaching courses in electronics and solid state device physics. His research is on the electrical properties of semiconductors, and of insulators used in the fabrication of semiconductor devices. This past summer, Dr. Trombetta participated on the faculty panel on applying to professional and graduate school.





Additional Research Participants

Corticosterone and Leukocyte Levels of Sedentary, Wheel and Treadmill Acclimated Mice Following a Bout of Forced Exercise

Student Researchers: Nadia Agha and Joseph Potucek

Faculty Mentor: Brian McFarlin

Presenting a poster in the field of health and human performance.

Advance Food Safety Control by Means of Thermal Analysis

Student Researcher: Ulises Aldea

Faculty Mentors: Jay Neal and Francisco Robles

Presenting a poster in the field of technology and food safety.

Comparison of the Ozone Vertical Profiles from Brewer Spectrophotometer and Ozonesonde Balloons Measured at University of Houston Main Campus

Student Researcher: Darrell Anderson

Faculty Mentor: Barry Lefer

Presenting a poster in the field of earth and atmospheric sciences.

Bilingual Cognitive Advantage and Executive Function Tasks: Case of Argentinean Bilinguals and Monolinguals

Student Researcher: Maria Arredondo

Faculty Mentor: Hanako Yoshida

Presenting a poster in the field of psychology.



Behavioral Characterization of a Promyelocytic Leukemia Tumor Suppressor Factor (PML)-null Mouse: Does PML Have a Role in Cognition?

Student Researcher: Karlis Butler

Faculty Mentor: Maria Victoria Tejada-Simon

Presenting a poster in the field of pharmacological and pharmaceutical sciences.

Modulation of Cell Adhesion through Surface Chemistry Changes

Student Researcher: Patricia Chesser-Martinez

Faculty Mentor: Richard Willson

Presenting a poster in the field of biomedical engineering.

The Impact of Thin Celebrity Images on Postpartum Body Image and Appearance Management Behavior

Student Researcher: Chelsea Coffey

Faculty Mentor: Alyssa Adomaitis

Presenting a poster in the field of marketing.

Effect of Body Weight on Postural Stability, Gait Stability and Risk of Slipping

Student Researcher: Roopa Deepti

Faculty Mentor: Jian Liu

Presenting a poster in the field of health and human performance.



Regional Cortical Response to Stability Threatening Postural Disturbances

Student Researcher: Fatima Garcia

Faculty Mentors: William Paloski and Vladimir Ivkovic

Presenting a poster in the field of health and human performance.

Digital Camera

Student Researchers: Matthew Johnson, Colby Kibbe, Sarah Neill, and Tara Terrell

Faculty Mentor: Jerry Waite

Presenting a poster in the field of graphic communication technology.

Novel Method to Screen Active Ingredients in Herbal Compound Using Fluorescent Microscopy

Student Researcher: Parastoo Karimi

Faculty Mentor: Ke-He Ruan

Presenting a poster in the field of pharmaceutical sciences.



Expression of Soluble Factors by Biliary Epithelial Cells under Mechanical Stress

Student Researcher: Peter Lam

Faculty Mentor: William Foster

Presenting a poster in the field of physics.

Godzilla Mullion in the Western Pacific: Death of a Seafloor Volcanic System

Student Researcher: Matthew Loocke

Faculty Mentor: Jonathan Snow

Presenting a poster in the field of earth and atmospheric sciences.

Wireless Smart Heart Monitoring System

Student Researcher: Justin Loop

Faculty Mentor: Mequanint Moges

Presenting a poster in the field of wireless communication technology.

Comparison of Strength Changes in Females On and Off Oral Contraceptives Relative to the Menstrual Cycle

Student Researcher: Shobha Mathew

Faculty Mentor: Adam Thrasher

Presenting a poster in the field of health and human performance.



Retaining the McCollough Effect: Is Sleep Equal to Lack of Visual Exposure?

Student Researchers: Huy Nguyen and Greg Whittaker

Faculty Mentor: Bhavin Sheth

Presenting a poster in the field of electrical engineering.

Deletion of Promyelocytic Leukemia Tumor Suppressor Factor (PML) Affects Brain Plasticity and Synapse Connections

Student Researcher: Emmanuel Oni

Faculty Mentor: Maria Victoria Tejada-Simon

Presenting a poster in the field of pharmaceutical sciences.

Synthesis of 1,8-Naphthyridine and Benzo[b]-1,8-Naphthyridine Derivatives as well as their Ru (II) Complexes

Student Researcher: Theany Ouk

Faculty Mentor: Randolph Thummel

Presenting a poster in the field of chemistry.

Synthesis of Poly-Phenolic Derivatives and Evaluation for Anti-Bacterial and Anti-Fungal Activity

Student Researcher: Shyam Panchal

Faculty Mentors: Joydip Das and Vincent Tam

Presenting a poster from the Medicinal Chemistry Division of the College of Pharmacy.



Decline of General Practice Medicine

Student Researcher: Morgan Parrish

Faculty Mentor: Helen Valier

Presenting a poster in the field of medicine and society.

Sunergos Index: Identifying Multiple Muscle Coactivation

Student Researchers: Jasmine S. Patel, Jackie Guarino, Yessika Lopez, Tara M. Mitchell

Faculty Mentors: Amir Pourmoghaddam, William Paloski and Charles Layne

Presenting a poster in the field of health and human performance.

Synthesis and Characterization of Gold-Silver Alloy Nanoshells on Gd-doped Iron Oxide Nanoparticle Cores

Student Researcher: Jose Penaloza

Faculty Mentor: Malavosklisk Bikram

Presenting a poster in the field of pharmacological and pharmaceutical sciences.

Comparative Transcriptional Profiles of the Pulmonary Innate Immune Response to Isogenic Antibiotic-Susceptible and Multi-Drug Resistant *P. aeruginosa*

Student Researcher: Cynthia Perez

Faculty Mentor: Russell Lewis

Presenting a poster in the field of pharmaceutical sciences.



Multivariate Analysis of Dyadic Perfectionists' Levels of Relationship Satisfaction and Self-Reported Parenting Styles

Student Researcher: Krisztina Petho Robertson

Faculty Mentors: Jonathan Schwartz and Ryon McDermott

Presenting a poster in the field of educational psychology.

Social Injustice & Obesity in African Americans

Student Researcher: Marium Raja

Faculty Mentor: Rebecca Lee

Presenting a poster in the field of health and human performance.

Smart Crib

Student Researchers: Ana Ramirez, Derek Leazar, Ashish Desai, Jacqueline Flores

Faculty Mentor: Farrokh Attarzadeh

Presenting a poster in the field of engineering technology.

Microscopic Wetting or Self-Assembled Monolayers on Gold

Student Researcher: Carlos Reuda

Faculty Mentor: Emmanouil Doxastakis

Presenting a poster in the field of chemical and biomolecular engineering.



Remote Operated Vehicle

Student Researchers: Jade Sargeon, Viviana Verástegui, Erik Morales, and Mauricio Martinez

Faculty Mentor: Farrokh Attarzadeh

Presenting a poster in the field of engineering technology.

Molecular Modeling of the ATP-synthase Motor F0 Subunit and Proton Translocation

Student Researcher: Megan Scoppa

Faculty Mentor: Margaret Cheung

Presenting a poster in the field of physics.

Impact of CREB Phosphorylation on Chromogranin a Expression: Implications for Neuroendocrine Differentiation in Prostate Cancer

Student Researcher: Akhil Shenoy

Faculty Mentors: Chris Suarez and Chang-Deng Hu from Purdue University, Department of Medicinal Chemistry and Molecular Pharmacology

Presenting a poster in the field of medicinal chemistry and molecular pharmacology.

Automated Prototype Generation for Multi-Color Karyotyping

Student Researcher: Nicolas Valenzuela

Faculty Mentor: Fatima Merchant

Presenting a poster in the field of engineering technology.



Dielectrophoretic Field Flow Fractionalization of Erythrocytes at Varying Osmolarities

Student Researcher: Kevin Weaver

Faculty Mentor: Peter Gascoyne, M.D. Anderson Cancer Center

Presenting a poster in the field of biophysics.

Pedestrian Activity and the Built Environment

Student Researcher: Jeremy Williams

Faculty Mentor: Samantha Kwan

Presenting a poster in the field of sociology.

Let's BOUNCE: A Physical Activity Intervention

Student Researcher: Stewart Williams

Faculty Mentors: Stephanie Kellam, Laura Hinkson, and Norma Olvera

Presenting a poster in the field of health and human performance.

Identifying Melanoma Related Genes Using Published Microarray Gene Expression Data

Student Researcher: Nader Zamani

Faculty Mentors: Tao Wang, Russel Kaufman, and Meenhard Herlyn from Wistar Institute Cancer Center, University of Pennsylvania

Presenting a poster in the field of biological sciences.

The Office of Undergraduate Research



Senior Honors Thesis Participants

Thesis Participants 2008-2009

Marcella L. Bakat

Psychology

Thesis Director: Ed Applebaum

Christina Brady

English-Creative Writing

Thesis Director: Aaron Reynolds

Paul Brokhin

Economics

Thesis Director: Steven Craig

Sean Carroll

Art History

Thesis Director: Caroline Goeser

Monalisa Chandra

Sociology

Thesis Director: Anthony Dworkin

Roanna Yuk Heng Cheung

History

Thesis Director: Xiaoping Cong

Desiree Corbin

Human Development & Family Studies

Thesis Director: David Liberman

Lyndsey Crate

English

Thesis Director: Lorraine Stock

Heather Dorsey

Political Science

Thesis Director: Harrell Rodgers

Mary Edith Anne Elhardt

Biology/Political Science

Thesis Director: Maria V. Tejada-Simon

Alexandra Scarlett Fife

English-Creative Writing

Thesis Director: John Harvey

Dan Stuart Gerig

History/Political Science

Thesis Director: Orson Cook

Sylviana Gunawan

Architecture

Thesis Director: Geoffrey Brune

Kelsie E. Hahn

English-Creative Writing

Thesis Director: Aaron Reynolds

Kristina Harper

Psychology

Thesis Director: Mary J. Naus

Roberta Hawkins

Psychology

Thesis Director: Hanako Yoshida

Andres Hernandez

Biomedical Engineering

Thesis Director: Ralph Metcalfe

Robert Lyle Hood

Biomedical Engineering

Thesis Director: Adam Capitano

Veralisa Hunter

Sociology

Thesis Director: Anthony Dworkin

Anil Jahoor

Biochemical/Biophysical Sciences

Thesis Director: William Widger

Nathan A. Jarvis

Hotel and Restaurant Management

Thesis Director: Nancy Graves

Stacey Joldersma

Economics

Thesis Director: Nathaniel Wilcox

Kyle M. Jones

Economics/Political Science

Thesis Director: Steven Craig

Silky Joshi

Educational Psychology

Thesis Director: Jonathan Schwartz

Meera H. Kachhla

Architecture/Environmental Design

Thesis Director: Geoffrey Brune

Kymerly M. Keeton

English - Creative Writing

Thesis Director: W. Lawrence Hogue

Mubeen M. Khumawala

Finance

Thesis Director: Latha Ramchand

Hayley Frances Klein

Biology

Thesis Directors: Brigitte Dauwalder & Hugo Bellen (Baylor College of Medicine)

Natascha Lachner

Psychology

Thesis Director: Merrill Hiscock

Alex Matthew Lahti

Architecture

Thesis Director: Geoffrey Brune

Swati Laroia

Anthropology

Thesis Director: Jerome Crowder

Nathalia Giraldo Leon

Human Development and Family Studies

Thesis Director: Catherine Horn

Scott Frank Liang

Architecture

Thesis Director: Geoffrey Brune

Susan L. Lin

English- Creative Writing

Thesis Director: John Harvey

Christopher M. Lucas

English

Thesis Director: Aaron Reynolds

Fidel A. Menjivar

Economics

Thesis Director: Adriana Kugler

Melissa Marshall

Art History

Thesis Director: Rex Koontz

Daniel Matthew Mendiola

History

Thesis Director: Orson Cook

(continued on page 44)

Undergraduate Research Day



Thesis Participants 2008-2009

Markos Mendoza

Philosophy
Thesis Director: David Phillips

Hillary D. Montez

Communications Disorders
Thesis Directors: Margaret Blake & Martha Dunkelberger

Elizabeth Murray

Economics
Thesis Director: Adriana Kugler

Jack Arthur Najarian

Political Science/Economics
Thesis Director: Steven Craig

Lena H. Nguyen

Biology
Thesis Director: Jokubas Ziburkus

Ngan Thao Nguyen

Biology
Thesis Director: Jokubas Ziburkus

Vincent Nguyen

Biology
Thesis Director: Hye-Jeong Yeo

Eduardo V. Ortiz

Classical Studies
Thesis Directors: Casey Due Hackney and Richard Armstrong

Tayyab Pasha

Biology
Thesis Director: Helen Valier

Thuan Pham

Electrical and Computer Engineering
Thesis Director: Bhavin Sheth

Y-Linh Pham Nguyen

Architecture/Environmental Design
Thesis Director: Geoffrey Brune

Alfredo Pimentel

Architecture
Thesis Director: Geoffrey Brune

Jared Pinkston

Biology
Thesis Director: Xiolian Gao

David Alexander Quiroz

History/Biology
Thesis Director: John Moretta

Fatima Razvi

Political Science
Thesis Director: Donald Lutz

Lydia M. Rice

Applied Music
Thesis Director: Nancy Weems

Julita Rincon

Spanish
Thesis Director: Marie Hernandez

Lindsay Renee Roberts

Operations Management
Thesis Directors: Everette S. Gardner and Jamison Day

Jennette Cecilia Roesner

Music
Thesis Director: Betsy Weber

Esmeralda Salinas

Art History
Thesis Director: Rex Koontz

Andrea Schlather

Chemistry
Thesis Director: Rigoberto Advincula

Brian Schulz

Educational Psychology
Thesis Director: Jonathan Schwartz

Shelby Beth Scott

Psychology
Thesis Director: Julia Babcock

Basilios Sideris

Biomedical Engineering
Thesis Director: Ralph Metcalfe

Peter Heard Steigerwald

Applied Music
Thesis Director: Marcus Maroney

Mina Tabatabai

Biology
Thesis Director: Ke-He Ruan

Andrew S. Terrell

History
Thesis Director: Nancy Young

Sean M. Thompson

English-Creative Writing
Thesis Director: John Harvey

Steven James Thomson

Art History
Thesis Director: Rex Koontz

Dina Urena

Art History
Thesis Director: Rex Koontz

Ginni A. Van Katwijk

Sociology
Thesis Director: Russell Curtis

Dennelle Gibbins-Lyon Walsh

English-Creative Writing
Thesis Director: Elizabeth Gregory

Brian Weisinger

Psychology
Thesis Director: Mary J. Naus



The Office of Undergraduate Research



Provost's Undergraduate Research Scholarship (PURS) Recipients

PURS Recipients Spring 2009

Ansari, Serene

Health Human Performance

Faculty Mentor: Rebecca Lee

Baker, Lauren

Psychology

Faculty Mentor: Hanako Yoshida

Bass, David

Mechanical Engineering

Faculty Mentor: Ralph Metcalfe

Coffey, Chelsea

Human Development

Faculty Mentor: Alyssa Adomaitis

Croxatto, Giovanna

Earth & Atmospheric Sciences

Faculty Mentor: Bernhard Rappenglueck

Darby, Kevin

Psychology

Faculty Mentor: Hanako Yoshida

Faiz, Abida

Biology

Faculty Mentor: Daniel Martinez

Fernandez, John

Finance

Faculty Mentor: Craig Pirrong

Gadberry, Nico

English Literature

Faculty Mentor: Lynn Voskuil

Grimmett, John

Music

Faculty Mentor: Andrew Davis

Honarpisheh, Pedram

Electrical Engineering

Faculty Mentor: Dmitri Litvinov

Iqbal, Afshan

Biology

Faculty Mentor: Brigitte Dauwalder

Jefferson, Gevais

English Literature

Faculty Mentor: Margot Backus

Lingamfelter, Max

Mechanical Engineering

Faculty Mentor: Ralph Metcalfe

Loop, Justin

Engineering Technology

Faculty Mentor: Mequanint Moges

Lopez, Jennifer

Psychology

Faculty Mentor: Adriana Alcantara

Lowery, Matthew

Pharmaceutical Sciences

Faculty Mentor: Bradley McConnell

Mendiola, Daniel

History

Faculty Mentor: Charles Orson Cook

Montez, Hillary

Communication Sciences and Disorders

Faculty Mentor: Margaret Blake

Musico, Andrew

Hotel and Restaurant Management

Faculty Mentor: Jay Neal

Nguyen, Khoi

Mechanical Engineering

Faculty Mentor: Li Sun

Paola, Juliet

Hotel and Restaurant Management

Faculty Mentor: Mary Dawson

Pham, Thu

Pharmaceutical Sciences

Faculty Mentor: Malavosklis Bikram

Pillai, Anish

Health Human Performance

Faculty Mentor: William Paloski

Rashid, Amina

Pharmaceutical Sciences

Faculty Mentor: Jason Eriksen

Roberts, Lindsay

Decision and Information Sciences

Faculty Mentor: Jamison Day



(continued on page 46)



PURS Recipients Spring 2009

Rueda, Carlos

Chemical Engineering

Faculty Mentor: Manolis Doxastakis

Stout, Eric

Mechanical Engineering

Faculty Mentor: Fazle Hussain

Thomson, Steven

Architecture

Faculty Mentor: Michelangelo Sabatino

Umaka, Ejiro

Biology

Faculty Mentor: Gregg Roman

Weaver, Kevin

Mechanical Engineering

Faculty Mentor: Gangbing Song

Webb, Christopher

English Literature

Faculty Mentor: Irving Rothman

Williamson, Walter

Biology

Faculty Mentor: Bridgette Dauwalder



The Office of Undergraduate Research



PURS Recipients Fall 2009

Alexander, Antonio
Engineering Technology
Faculty Mentor: Farrokh Attarzadeh

Barber, Sara
Mathematics
Faculty Mentor: Gordon Johnson

Brown, Alexiz-Chloe
Educational Psychology
Faculty Mentor: Nicole Coleman

Brown, Michelle
Communication Sciences and Disorders
Faculty Mentor: Monica McHenry

Calaquian, Loreto Loy
Pharmaceutical Sciences
Faculty Mentor: Svetlana Tikunova

Clark, Rachel
Chemical Engineering
Faculty Mentor: Peter Vekilov

Cotoi, Nicoleta
Psychology
Faculty Mentor: Bruno Breitmeyer

Dowden, Janet
Health Human Performance
Faculty Mentor: William Paloski

Gonzalez, Larissa
Psychology
Faculty Mentor: Adriana Alcantara

Hemmick, John
Electrical Engineering
Faculty Mentor: Haluk Ogmen

Khatri, Shachi
Biology
Faculty Mentor: Brigitte Dauwalder

Khoury, Andrew
Electrical Engineering
Faculty Mentor: Kayali Amin

Kovitz, Joshua
Electrical Engineering
Faculty Mentor: Donald Wilton

Lam, Peter
Physics
Faculty Mentor: William Foster

Lu, Jenny
Health Human Performances
Faculty Mentor: Jian Liu

McCullough, Crystal
Anthropology
Faculty Mentor: Kenneth Brown

Merchan, Nolan
History
Faculty Mentor: Robert Buzzanco

Mogri, Ebrahim
Pharmaceutical Sciences
Faculty Mentor: Malavosklisk Bikram

Rodriguez, Lazaro
Electrical Engineering
Faculty Mentor: David Jackson

Serna, Alejandra
Biology
Faculty Mentor: Anthony Frankino

Snyder, Megan
Modern and Classical Languages
Faculty Mentor: Guillermo De Los Reyes

Urdaneta, Carlos
Chemical Engineering
Faculty Mentor: Dmitri Litvinov

Wilson, Sean
Hotel and Restaurant Management
Faculty Mentor: Jay Neal

Woodward, John
English Literature
Faculty Mentor: David Mazella

Zachry, Peter
History
Faculty Mentor: Charles Orson Cook

Zamani, Nader
Health Human Performance
Faculty Mentor: Adam Thrasher



Undergraduate Research Day

Office of Undergraduate Research's Programs

How to Get Started Conducting Research

All of the programs offered by the Office of Undergraduate Research require that students secure a faculty member with whom they would like to conduct research with before applying to one of the programs. This leads many students wondering how they should initiate the process.

Here are a few tips on how to secure a research opportunity at UH:

- Talk to current and past professors (during their office hours) from courses you have excelled in and have enjoyed. Even if the professor is not currently seeking an undergraduate researcher, he or she may know of a colleague that is seeking an undergraduate research assistant.
- Consult an academic advisor from your department to inquire about faculty members currently conducting research in your discipline.
- Check the webpage of faculty members currently seeking undergraduate researchers for ongoing projects, www.undergraduateresearch.uh.edu/facultyresearch.html. Also peruse your department's website to find out about the research the faculty within your discipline are conducting. You can also visit www.uh.edu/discovery/eDISCOVERY.html for a listing of faculty seeking undergraduate researchers.

The PURS is a research program offering junior and senior students \$1,000 scholarships to conduct research projects during the fall and spring semesters. This scholarship is open to students of all disciplines, including research proposals in the natural sciences, engineering, social sciences, humanities, business, technology, fine arts, architecture, education, and hotel and restaurant management. Candidates must have at least a 3.0 grade point average to apply. For more information and to view the online application, visit the PURS website at www.undergraduateresearch.uh.edu/purs.html.



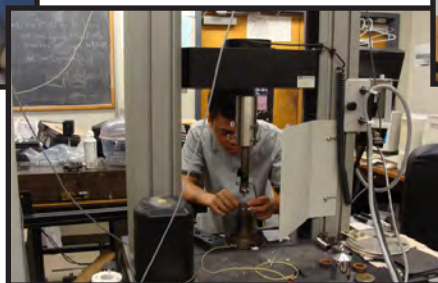
The Office of Undergraduate Research



SURF-UH is a full-time, 10-week summer research program, open to all continuing students, that provides a \$2,800 stipend to conduct research under the mentorship of a UH faculty member. The projects run the gamut from analyzing texts in the library, to conducting fieldwork, to experimenting with specimens in laboratories. Students from all disciplines are encouraged to apply. The deadline for SURF is in the middle of March each year. For more information and to view the online application, visit the SURF-UH website at www.undergraduateresearch.uh.edu/surf.html.

The Senior Honors Thesis is a capstone program that serves as the pinnacle of the student's undergraduate career in research. Student participants enroll in 3399H and 4399H, a total of six hours of coursework, which is typically applied toward their major degree requirements in their senior year. The student secures a thesis director that serves as the instructor of record and mentor of the project. A second reader and Honors reader also serve on the student's thesis committee, offering their advice during the research and writing process as well as at the student's defense of the thesis.

Many students site the thesis project as the highlight of their experience as an undergraduate. Students who complete a Senior Honors Thesis will graduate with Honors in Major (for students who complete a thesis, but not the curriculum of The Honors College), University Honors (for theses outside the major), or both University Honors and Honors in Major (for Honors College students who complete a thesis in their major). For more information on the Senior Honors Thesis program and to download the required forms for enrollment, please visit the thesis website at www.undergraduateresearch.uh.edu/thesis_guidelines.htm.



Undergraduate Research Day



The Honors College and The Office of Undergraduate Research assist students in finding and applying for nationally competitive scholarships. Nationally competitive scholarships are awards that require university endorsement to apply. Contact Karen Weber at kweber@uh.edu or at 713-743-3367 for more information. A more detailed listing of competitive awards can be found at www.undergraduateresearch.uh.edu/scholarshipindex.html. Among these scholarships are the following:

Rhodes Scholarships

The Rhodes awards 32 scholarships each year to American students for study at Oxford for 2-3 years. The Rhodes covers tuition and all other educational costs for the scholars' tenure at Oxford. Applicants must be full-time graduating seniors that have at least a 3.75 GPA, demonstrate strong leadership abilities, and possess a strong sense of social purpose. Candidates should also be U.S. citizens, unmarried, under the age of 24, and have attained a bachelor's degree before beginning their first term at Oxford. The deadline is in the beginning of October each year, but interested candidates should contact Karen Weber no later than the end of the spring semester of their junior year.

Rotary Ambassadorial Scholarships

The Rotary Ambassadorial Scholarship awards \$13,000-\$25,000 to fund at least one year of a study abroad program and the costs associated with the program. The purpose of the scholarship is to further international understanding and friendly relations among people of different countries. The Rotary Ambassadorial Scholarships' deadline is over a year before the period of study would begin. All applicants must be citizens of a country in which there are Rotary clubs. The deadline for the Rotary Ambassadorial Scholarship is at the beginning of February each year.

Marshall Fellowships

The Marshall Foundation offers 40 awards each year for two years of study at any university in the United Kingdom. The Marshall covers tuition, cost of living expenses, travel expenses, and other academic fees. Candidates should be graduating seniors with at least a 3.75 GPA, U.S. citizens, demonstrate strong leadership abilities and a commitment to public service, and have a clear rationale for studying in the United Kingdom. The deadline is in the beginning of October of each year, but interested candidates should contact Karen Weber no later than the end of the spring semester of their junior year.

Goldwater Fellowships

The Barry Goldwater scholarship funds up to \$7500 each year to sophomores and juniors interested in pursuing a research career in math, science or engineering. Candidates must have at least a 3.8 GPA, be U.S. citizens or permanent residents, and have demonstrated research experience. The national deadline is in the beginning of February of each year, but the campus deadline is in late November.

Fulbright Grants and Teaching Assistantships

The Fulbright funds all expenses for a one-year research grant or graduate study in over 140 countries. Fulbright teaching assistantships are also available in a variety of different regions. Candidates must be U.S. citizens and have a bachelor's degree by the time they begin their project overseas. The Fulbright deadline is October 21st of each year, but the campus deadline is typically about a month before the national deadline.

The Office of Undergraduate Research

Honors College at the University of Houston

The Honors College Philosophy

The Honors College at the University of Houston serves the intellectual needs of gifted undergraduates in more than 100 fields of study. We provide the careful guidance, flexibility, and personal instruction that nurture excellence. For the 300 students who join us each fall, we offer the advantages of a small college without sacrificing the resources and rich diversity of a large university. Our faculty and staff believe that a university education should offer more than the acquisition of skills for the workplace. The Honors College challenges the University's finest students to develop the attributes of mind and character that enhance all facets of life.

The Honors College Community

Special Classes and Course Selection

We draw on the talents of the finest faculty members within the University to provide a wide range of special courses with limited enrollment. Honors courses encourage student participation, interaction, and discussion.

Membership in a Community

You will enjoy special privileges, including The Honors College scholarships, priority registration, computer facilities, reserved lounge and study areas, study abroad opportunities, and special housing in The Honors College residence halls. Many intangible benefits come with participation in the Honors community—friendships that develop in the classroom carry over into other areas of student life. We foster an atmosphere of collegiality and a spirit of camaraderie through informal gatherings, social activities, and on- and off-campus cultural events.

Talented Classmates

When admitted to The Honors College, you will enter the company of the most academically talented undergraduates at the university. Members bring a variety of interests, aptitudes, and ambitions to their studies. Through daily association with other Honors students, you will discover the broad range of academic programs at the University.

Honors Curriculum

Our curriculum is designed to coordinate with the University of Houston's core curriculum. You will fulfill many of your university core requirements through Honors courses that take the place of regular required classes. One key sequence of courses, The Human Situation, is team-taught by Honors faculty and is designed to ensure that you are introduced to the great books of the Western tradition. For many Honors students, the Senior Honors Thesis represents the exciting culmination of a bachelor's degree. A thesis provides an excellent opportunity for you to work under the direction of faculty in your chosen field of study, applying your skills and knowledge toward the completion of a scholarly creative project.



The Honors College • University of Houston • www.uh.edu/honors • 713.743.9010

Undergraduate Research Day



for the University of Houston



Transforming the Undergraduate Experience through Research

The *Learning through Discovery Initiative* is the University of Houston's comprehensive Quality Enhancement Plan (QEP). The five-year initiative promotes a teaching and learning culture supportive of research in all disciplines for all undergraduate students. The initiative focuses on 1) providing research skills training and 2) expanding student research opportunities both on and off campus. Research skills and experience will equip our talented and diverse students with the valuable tools they need to compete in the global marketplace or as they pursue graduate studies.



Photo by Lacy/Shea

Discovery Resources and Programs

Students will benefit from a host of new programs and resources such as:

- Discovery Workshops & Tutorials – introductory research skills training via in-person workshops or online tutorials
- eDISCOVER – an online portal connecting students to research opportunities and mentors
- Reality Chats – in person and online chats with alumni and mentors about their career paths and research experiences in industry, academia, etc.
- Research Dissemination - opportunities to showcase student research including support for expansion of Undergraduate Research Day and Undergraduate Research Travel Fellowships to present at national conferences
- Research-Supportive Curriculum – a QEP Curriculum Development Grant Program provides support for enhancements to existing courses or development of new courses that incorporate inquiry-based learning or research training

About the Office of Undergraduate Discovery Programs

The Office of Undergraduate Discovery Programs was created in 2008 to coordinate and oversee implementation of the *Learning through Discovery Initiative*. The Office of Undergraduate Discovery Programs functions under the aegis of the Office of the Senior Vice President for Academic Affairs and Provost. This alignment facilitates coordination among various implementation partners on and off campus and centralizes support for students, faculty, and staff.

For more information and to see how you can become involved, please visit www.uh.edu/discovery.



The Office of Undergraduate Research

Phronesis The Honors College

“What is justice?”

“What is justice?” asked Socrates, the self-described “gadfly” of ancient Athens. For centuries, great thinkers from Plato and Aristotle to Machiavelli and Nietzsche have addressed such fundamental questions as the nature of war and peace, the relation between freedom and authority, and the origins of moral and political order. Reflecting on our own American experience, writers and political actors such as Jefferson, Hamilton, and Madison call us to consider the character of democracy, the grounds of liberal constitutionalism and the problems and promise of a free society. In the long course of intellectual history, these and other thinkers have taken up the issues of gender, the family, religion, commerce, and science, and, like the gadfly of Athens, urged us to reflect on the fundamental question of the human good.



Questions such as these will be the focus of a new program in Politics and Ethics established by the Honors College in collaboration with the College of Liberal Arts and Social Sciences. The program’s name, *Phronesis*, is the Greek word for prudence or practical wisdom, the quality that distinguishes good citizens and political leaders.

Students who participate in *Phronesis* will be part of a vibrant intellectual community engaged with some of the most profound and enduring questions of human life as well as central and current topics in politics and ethics. The program is housed in the Honors College as an interdisciplinary minor, established with the cooperation of faculty in Political Science, Philosophy, and Classical Studies. The curriculum will draw on the foundation provided by “The Human Situation,” the year-long intellectual history course required of all Honors freshmen. Students of any major can then choose from a variety of courses in political theory, philosophy, and classics. Representative offerings include “Liberalism and its Critics,” “Law, Society, and Morality,” “History of Ancient Philosophy,” “The Roman Republic,” and “Recent Islamic Political Thought.” In addition to course offerings that draw on the expertise of faculty across disciplinary boundaries, *Phronesis* also hosts public events that engage the wider University and community.



Contact Information:

Susan Collins, Director suecoll724@uh.edu

Christine LeVeaux-Haley, Interim Assistant Dean for Academic Programs Christine.Sharpe@mail.uh.edu

Andy Little, Advisor alittle@uh.edu

Medicine & Society The Honors College

The Medicine & Society Program at Houston

Houston is a city in which health care is an industry of immense importance historically, economically and culturally. The Texas Medical Center is the largest in the world and home to two medical schools, two schools of nursing, and a score of programs in the allied health sciences, as well as a dozen major hospitals, clinics, research laboratories, and other medical facilities. Despite this prestigious center and others within the state, Texas residents are underserved in the realm of public health. Many have little access to affordable health care, relying on frequently overburdened emergency services for their most basic medical needs. Other Texas residents that do have access find the system difficult to navigate, or even alienating in its lack of meaningful human interaction. What Texas shares with the rest of the United States is a health care system that is at one and the same time the best in the world and also fraught with problems for so many of its consumers.

Founded in 1941, the Texas Medical Center has grown to be amongst the largest in the world. It is now home to two medical schools, two schools of nursing, and a score of programs in the allied health sciences, as well more than a dozen major hospitals, clinics, research laboratories, and other medical facilities. With its on-site faculty expertise and its close ties to the Methodist Hospital and other institutions in the medical center, The Medicine & Society Program at Houston (est. 2005) is ideally positioned to coordinate and lead major educational projects including academic courses, public lectures, conferences, and research collaborations directed toward greater understanding of the relationship between medicine and wider society.

If you are a student or member of the public interested in more information about this Program please contact Helen Valier, Coordinator of The Medicine & Society Program at Houston at 713-743-9021, or by email hkvalier@uh.edu. We also welcome inquiries from organizations and groups wishing to collaborate with our members.



Contact Information:

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The Office of Undergraduate Research



SAVE THE DATE!



PURS Spring 2010 Application Deadline:
November 20, 2009

SURF 2010 Application Deadline:
March 24, 2010

**Faculty Mentoring Award Nomination
Deadline:**
February 8, 2010



The Center for Creative Work



The Center for Creative Work seeks to encourage the development of writers and artists at The Honors College by providing undergraduate students pursuing degrees in the creative arts with an innovative course and enrichment plan.

Students in The Center:

- Collaborate with local theater companies to present dramatic performances and readings;
- Conduct research and theses projects related to their chosen fields;
- Enroll in creative writing workshops and special topics classes;
- Attend screenings of national and international films outside the mainstream circuit and view world premieres of original dramatic works in Houston performed by nationally-recognized theater companies; and
- Attend week-long retreats to encourage their artistic development.

To find out more contact **Dr. John Harvey** at jrharvey@mail.uh.edu.



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