USC Research Gateway Scholars Program
Summer Research Institute
Office of Undergraduate Programs

July 27, 2017
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**Welcome**
Dear Members of the USC Community & Guests:

With great pleasure, we welcome you to the 2017 USC Research Gateway Scholars Summer Institute Symposium. The Symposium is designed to provide Scholars with the unique opportunity to present their summer research projects before an academic audience. Each project represents the Scholars' individual work under the advisement and mentorship of program staff, USC faculty and graduate students.

While working on individual projects, the Scholars' excitement, curiosity, and diligence was at an all-time high. We expect that they will continue their research explorations and further expand their projects. Please join us in celebrating their early contributions to scholarly research.

Thank you for attending today’s Symposium. We hope you enjoy meeting the Scholars and learning about their research interests and graduate school objectives.

Sincerely,

Dr. David Glasgow  
Director, USC Research Gateway Scholars Program  
Assistant Vice Provost, Office of Undergraduate Programs

David-James Gonzales, Ph.D.  
Academic Advisor & Program Coordinator

Kimberly Serpas, M.A. Candidate in Educational Counseling  
Administrative Coordinator & Program Advisor

Program Information
The USC Research Gateway Scholars Program is a student academic services initiative sponsored by the University of Southern California. The program provides graduate school preparation, research training, professional development, and competitive scholarships to a select group of high-achieving undergraduates from first-generation, low-income, and underrepresented ethnic minority backgrounds. It builds on the best practices and remarkable success of the USC McNair Scholars Program and is administered by the USC Office of Undergraduate Programs, along with the support of various USC academic and student services departments.

USC staff and faculty work closely with program participants as they complete their undergraduate requirements and encourage them to enroll in graduate programs. All academic disciplines are eligible, including the arts and humanities, social sciences, and STEM. The program tracks students’ progress all through their undergraduate years until the successful completion of advanced degrees. The goal is to increase the attainment of graduate-level degrees, specifically the Ph.D. and other doctorates. The program aims to diversify higher education at the graduate-level and the professoriate ranks.

In summary, the Research Gateway Scholars Program provides the following services: opportunities for research or other scholarly activities; summer internships; workshops and seminars designed to prepare students for graduate-level study, specifically the doctorate; academic tutoring; academic counseling; and advising designed to assist students with securing graduate-level admission and financial assistance. Furthermore, the program may provide the following: counseling services designed to improve the financial and economic literacy of students; mentoring programs involving faculty members and graduate students; and exposing students to cultural events and academic programs not usually available to underserved populations.

Program Staff and Instructors

David Glasgow, Ed.D.
Director, USC Research Gateway Scholars Program
Assistant Vice Provost, Office of Undergraduate Programs

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Academic Advisor & Program Coordinator

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Carlos Antonio Delgado, M.F.A.
Instructor

Alisa Sanchez, Ph.D.
Writing Instructor

Cecilia Caballero, Ph.D. Candidate in American Studies & Ethnicity
Graduate Assistant

Bo Cheng Jin, Ph.D. Candidate in Aerospace and Mechanical Engineering

Yesenia Hunter, Ph.D. Student in History
Graduate Assistant

Symposium Agenda

Continental Breakfast: 9:30AM – 10:00AM (foyer)

Welcome & Introductory Remarks: 10:00AM – 10:15AM
Group 1 Public Policy: 10:15AM – 10:55AM
Cindy Pineda
Ikpindi Fridaouss Nabine

Break: 11:00AM – 11:10AM

Group 2 American Studies & Social Science: 11:10AM – 12:10PM
Yaneiry Barrios
Karen Kwon
Eloisa Campuzano

Lunch: 12:10PM to 1:00PM (foyer)

Group 3 STEM: 1:00PM – 2:20PM
Sierra Williams
Alfredo Ruiz Gonzalez
Mia Yanez
Bita Ronit Farahmandian

Closing Remarks: 2:20 – 2:30PM

Ana Yaneiry Barrios

Major: Social Sciences with emphasis in Psychology and Contemporary Latino and Latin American Studies

Faculty Advisor: George Sánchez, PhD., Professor of History and American Studies & Ethnicity
**Title:** The Lasting Effects of the Guatemalan Genocide

**Abstract:** Between 1960 and 1996 in Guatemala, injustices against the indigenous and poor ladinos (non-indigenous Guatemalans) led to an outbreak of war. Guatemala experienced years of violence and mass killings, where the military targeted and eliminated the majority of the country’s indigenous population. Drawing from a series of taped interviews with genocide victims collected by The USC Shoah Foundation’s Institute for Visual History and Education, as well as interviews conducted with young Guatemalans between the ages of 18 and 32 years of age living in Los Angeles, California, I present each generation’s history and examine the effects the genocide has had on the lives of these individuals. By learning about and understanding the history of the Guatemalan genocide, I found differences in migration and identity patterns differentiated amongst the two different groups. I was able to confirm that although the genocide and violence occurred decades ago, Guatemalans are still experiencing the effects. Although other scholars have conducted research on the Guatemalan genocide, it was crucially important to study the difference between genocide victims living in Guatemala and those born post-genocide living outside of the country because it not only demonstrates differences between the two groups, but it also brings awareness to the genocide.

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**Eloisa Campuzano**

**Major:** American Studies & Ethnicity

**Faculty Advisor:** Stanley Huey, PhD., Associate Professor of Psychology and American Studies & Ethnicity
Title: Stitching a Community Together: Youth as Agents of Community Transformation

Abstract: Previous research, such as Evans (2007), demonstrates that marginalized youth can serve as agents of community change or transformation when they receive support, whether in the form of financial aid or mentorship, from adults. Previous research was conducted with programs aimed towards giving youth the opportunities to create community change, but has not considered how youth-led movements can transform their communities. I utilize interviews, textual/visual content analysis of social media posts, and personal anecdotes to understand how the youth-led art collective Stitches is transforming the community of Springdale, Arkansas. My project was shaped within the already established theories of sense of community (Evans 2007) and the “revitalization movement” (Wallace 1956). The preliminary findings of my research are that Stitches is transforming the youth community by giving them a voice and a place in the larger physical transformation of Springdale. Yet, this project cannot fully assess the impact of Stitches in the Springdale community due to the 10-week time constraint of this project and the novelty of the organization. Hopefully, this project serves as an ode to the diverse and beautiful community of Springdale.

Ronit Farahmandian

Major: Computational Neuroscience

Faculty Advisor: Jason Zevin, PhD., Associate Professor of Psychology and Linguistics
**Title:** Validity of the Common Working Memory Tests in L2 Individuals

**Abstract:** This study investigates the validity of the common working memory test, called the digit ordering task, by examining if the language of test administration influences the test results. Another aim of this study is to investigate the difference between the working memory performance when the test is administered visually as opposed to verbally to the L2 subjects. Working memory tests were administered visually and verbally to English monolinguals and Persian-English L2 Participants. This continuing study may direct the research towards finding more accurate measures of the working memory in neurological conditions, psychological assessments and job placements.

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**Alfredo Gonzalez Ruiz**

**Major:** Mechanical Engineering

**Faculty Advisor:** Kaila Rajiv, PhD., Professor of Physics

**Title:** Fusion Ion Confinement in Spherical Ion Trap
Abstract: Fusion energy has the potential to meet the growing global demand for energy and end the reliance on fossil fuels, however it has proven to be an elusive goal. Previous magnetic and inertial confinement fusion devices have failed to achieve fusion rates high enough to be viable power sources. Fortunately, there are charged particle confinement methods that have yet to be studied as potential fusion devices. This study investigates the feasibility of using a spherically shaped quadrupole ion trap to confine charged particles at fusion energy conditions. SIMION, a charged particle trajectory simulation program, was used to determine the particle density and energy of trapped particles. Experimental fusion reactivity data, NACRE II, was used with density and energy data to determine the fusion rate within the device. These results provide evidence for the use of this device as a source of fusion energy and constituted the first design iteration towards a spherically shaped quadrupole ion trap for fusion energy. In addition, it demonstrates the possibility of enhancing ion traps, traditionally used for low density ion experiments, for use as fusion energy devices.

Karen Kwon

Major: Sociology

Title: Identity Formation Among Monoracial and Multiracial Individuals

Faculty Advisor: Leland Tadaji Saito, PhD., Professor of Sociology and American Studies & Ethnicity
Abstract: My research project studies the identity formation of monoracial and multiracial individuals. Specifically, I explore three research questions: how monoracial and multiracial individuals form their own racial identity; whether their familial experiences or social interactions have a more significant impact in the way they racially identify; and in what contexts monoracial and multiracial individuals come to the realization of race. I first created a personal information questionnaire to get an overview of participants’ racial background, awareness about their culture, and parents’ racial identification. Then, I interviewed three monoracial and three biracial/multiracial individuals to gain insight on how they formed their racial identities. During my research, I found that familial experiences and social interactions equally influence the racial identity of monoracial and multiracial individuals. When these individuals come to the realization of race, they are able to distinguish they are different from other individuals and often begin searching for their racial and ethnic niche. This research project establishes the significance of determining a racial identity and how that impacts one’s interactions with family members, friends, and colleagues. Most of all, establishing a racial identity affects the way an individual perceives him or herself.

Fridaouss Ikpindi Nabine

Major: Public Policy, Planning, and Development

Faculty Advisor: Morgan Polikoff, PhD., Associate Professor of Education

Title: Resource Disparities in Rural and Urban Public Education Systems and its Impact on Student Achievement
Abstract: This is a quantitative and qualitative case study of public high schools in California examining resource disparities between rural and urban high schools to determine how they affect student achievement. Using income and locale, I established four school categories: low income rural, low income urban, high income urban, high income rural. In the quantitative section of my research, I identified ten schools in each category and provided a comparative profile of their resources and student outcome. Through qualitative methods, I interviewed 11 individuals to determine resources available to students in eight high schools across these four school categories. Analysis of the collected data from both methods reveal that while student achievement is more affected by income than locale, it is the interaction of high income and urban that produces the highest student achievement. Results from qualitative methods also indicate that urban schools attribute success in student achievement to professional teacher development, whereas rural schools attribute success to numbers of counselors and personnel.

Cindy Pineda

Major: Public Policy, Planning, and Development

Faculty Advisor: LaVonna Lewis, PhD., Teaching Professor of Public Policy

Title: A Call for Community Planning: Higher Education Attainment and the Influence of the Built Environment on Attitudes Towards Higher Education
Abstract: This study evaluates how a neighborhood’s built environment shapes residents’ higher education attainment and attitudes towards education, focusing on two neighborhoods in Oxnard, California. The Oxnard Mobile Home Lodge operates as the target site while Rose Park acts as the comparison site. A vetted survey was utilized to gather information regarding the residents’ highest level of school completion and residents’ attitudes towards educational buildings. The study collected a sample of 40 survey responses and assessed the data by using a Geographic Information System (GIS). Analysis shows that while the target site had a higher number of residents attending school or college in the past three months than the comparison site, the comparison site had a higher number of residents who had completed an associate’s or bachelor’s degree. In regards to attitudes, the residents in the comparison site felt satisfied with the access to educational buildings compared to the target site. Overall, the study indicates the residents of the target site are less likely to attain a higher education degree when contrasted to the comparison site. The analysis showcases how an association exists between the built environment and education attainment. Thus, a more holistic approach of planning should be introduced when creating neighborhoods to assure equal academic opportunities are available to all residents.

Sierra Williams

Major: Industrial and Systems Engineering

Faculty Advisor: John Carlsson, PhD., Associate Professor of Industrial and Systems Engineering

Title: First-Generation, Low Income, Minority Student Retention in STEM Fields

Abstract: After many attempts at increasing minority student representation in STEM, the numbers of Hispanic and African
American students pursuing STEM degrees are stagnant. The issue is worse for low-income, first-generation college students. The US labor force is highly dependent upon foreign scientists and engineers to help fulfill our STEM jobs. In order to discover the reason why this group of students are dropping out of STEM majors, I interviewed 11 students who were currently or have previously majored in STEM at some point in their college careers. I also interviewed 5 organizations whose goal was assisting students in getting to college or are specifically designed to introduce students to different scientific concepts. While analyzing the interviews, lack of adequate preparation, motivation, and issues with the curriculum of the STEM majors at USC were the primary reasons that students dropped out of STEM. In conclusion, personalized advising, early research experience, and remedial courses are the route to take in order to better suit the needs of our students. It is understood that remedial courses may push back students’ graduation dates but since it is a national problem, the US government should incentivize students and support them in pursuit of their degree.

Mia Yanez

Major: Human Biology

Faculty Advisor: Steven Finkel, PhD., Professor of Biological Sciences

Title: The Predictability of Antibiotic Susceptibility Using Genetic Mutations in Long Term Stationary Phase Escherichia Coli.

Abstract: *Escherichia coli* grows in 5 phases, the last named long-term stationary phase (LTSP) where rapid mutations cause populations to rise and fall in a low nutrient environment and
therefore cause LTSP E. coli to phenotypically and genotypically look different from the original strain. This transformation of bacteria relates to the antibiotic resistance problem, as bacteria mutate and evolve to become drug resistant. To stop this crisis, researchers have synthesized new antibiotics, but mutations against the drugs eventually arose. Instead, analyzing LTSP E. coli mutations to determine a correlation to antibiotic susceptibility may provide a better genomic understanding to combat this problem. Conducting such an investigation resulted in a supported correlation from LTSP E. coli genotype to their antibiotic phenotype. However, the data also revealed a clear divergence of certain samples from the parent strain to a new, more susceptible “strain”—explained by distinct mutations in the cell wall. Although research was performed only on the end of the 3-year LTSP E. coli, further investigation of earlier time-points will be pursued to determine when and how the divergence occurred. This type of genotype analysis may enhance the future application of drugs in prolonged bacterial infections and the understanding of antibiotic efficiency.

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