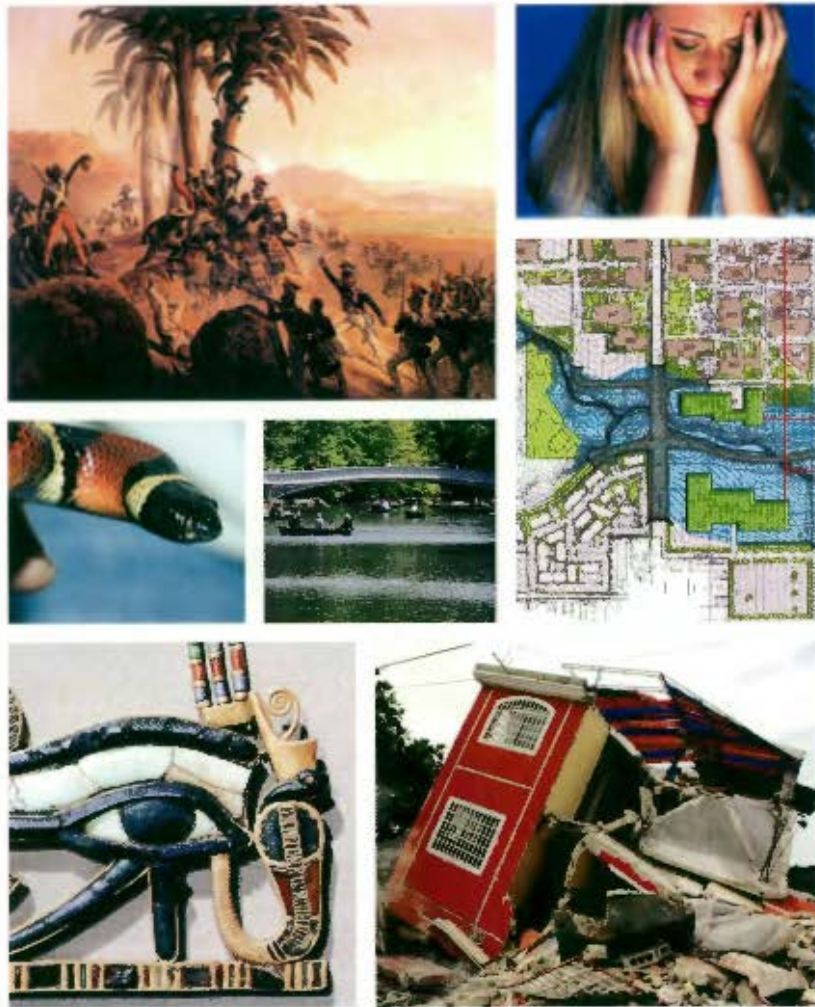


McNair Research Journal



Summer 2011 • Volume 15

THE UNIVERSITY OF TEXAS AT ARLINGTON



The Ronald E. McNair Postbaccalaureate Achievement Program is a federally funded **TRiO** program.

The McNair Research Journal is the annual research publication of the Ronald E. McNair Postbaccalaureate Achievement Program (McNair Scholars Program), a TRiO Program funded by the U.S. Department of Education, at The University of Texas at Arlington. The journal consists of summaries of papers written by McNair Scholars who participated in the McNair Research Internship the preceding summer. Journal contents solely reflect the research and opinions of the individual authors. Presentation of this material was made possible by a limited license grant from the authors who have retained all copyrights in the contributions. All other elements of the journal such as its structure and organization also are protected by copyright. The University of Texas at Arlington holds copyright to the journal but permits reproduction of its contents (not to exceed 100 copies) for non-commercial or educational purposes.

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Message from the Senior Vice Provost and Dean of Undergraduate Studies



For any individual who is remotely aware of what is happening in the world, it is virtually impossible to escape news of the very real and significant problems facing our society. As frequently is the case, the world confronts significant challenges including economic turmoil, concerns over the long-term health of our environment, continued political and social upheaval, and a host of other very real problems. The solutions are most frequently found in our universities. More specifically, the solutions frequently come from the discoveries and innovations from intellectual inquiry conducted by university faculty members. These discoveries might be new technological innovations, medical breakthroughs, or new ways of thinking about age-old social and ethical issues. The critical role that university faculty play in addressing complex issues means there is a special importance placed on preparing future generations in the methods of scholarly inquiry. The McNair Scholars program is one such program.

The University of Texas at Arlington has been a supporter of the McNair Scholars Program for more

than twenty years. This program pairs aspiring graduate students who meet the program's requirements with faculty mentors who agree to work closely with their Scholar. One key objective is to transfer the skills of inquiry from successful faculty members to the next generation of scholars. Along the way, so much more happens. Students develop lasting relationships with their mentors, discover they are indeed capable of sophisticated scholarly inquiry, uncover new intellectual discoveries, and see the possibilities available to them. This experience is truly transformative for the Scholar.

On behalf of UT Arlington, I congratulate each Scholar on your acceptance into this program and note the impressive work each of you completed under the supervision of your faculty mentor.

I also extend a note of thanks for the important contributions our faculty mentors have spent developing these fine Scholars.

Intellectual discovery is hard work, and through the McNair Scholars program another generation of scholars has been prepared by today's members of the academy. I would recommend each of us remember the names of the Scholars listed in this research journal because I predict we will see more than one of them contributing to their discipline for years to come. Congratulations on your achievement.

A handwritten signature in black ink that reads "Michael Moore". The signature is written in a cursive, flowing style.

Michael Moore
Senior Vice Provost and Dean of Undergraduate Studies

Notes from the Director



During the spring and summer 2011 semesters, the McNair research internship provided an opportunity to fourteen of our program participants to develop further as undergraduate scholars. Although the structure of the internship remains essentially the same from one year to the next, its character changes annually as new students enter the McNair program and bring to its research component a different range of majors, interests, and talents. As McNair interns become better acquainted with their faculty mentors, who guide them in the planning and implementation of their projects, they simultaneously form close bonds with their program peers during the internship. The encouragement of both their mentors and fellow researchers well complements staff support to McNair Scholars as they meet the challenges of a major research endeavor.

I congratulate our interns on their dedication to designing and executing such sophisticated and successful projects. The skills that they have developed will assist them well when they make the approaching transition to graduate study. In addition, McNair Scholars benefit from the continuing influence of their mentors as they prepare for advanced study leading to the Ph.D. and a career in the academic world. We hope that the relationships they have formed with their mentors as undergraduates will continue when McNair Scholars someday join the professoriate.

For more than twenty years, the University of Texas at Arlington community has been very generous to this program. I would especially like to thank President James D. Spaniolo, former Provost Donald R. Bobbitt, new Provost Ronald L. Elsenbaumer, Senior Vice Provost Michael K. Moore, former Dean of the UTA Libraries Dr. Gerald D. Saxon, and Interim Dean Julie Alexander for their ongoing support of UT Arlington students who strive to achieve the McNair dream.

Finally, I wish our 2011 research interns—and all McNair Scholars—good fortune with their future graduate studies and careers in research and teaching.

A handwritten signature in black ink that reads "Joan W. Reinhardt". The signature is written in a cursive, flowing style.

Joan W. Reinhardt
Director of McNair Scholars Program

McNair Scholars Program

The McNair Scholars Program (officially known as the Ronald E. McNair Post-Baccalaureate Achievement Program) came to the campus of The University of Texas at Arlington in 1990. At that time the U.S. Department of Education funded a grant proposal submitted by Kathryn Head, director of the federal Student Support Services program. The new program, created by the U.S. Congress in 1988, honored Dr. Ronald E. McNair, who had tragically perished with his fellow astronauts on the space shuttle Challenger two years earlier.

The McNair program endeavors to assist talented undergraduates—either first-generation/low-income or underrepresented students (African American, Hispanic, Native American)—to prepare for graduate study leading to the Ph.D. and the professoriate. McNair Scholars follow in the footsteps of Dr. McNair, who came from a modest African-American family in a small South Carolina town. He tenaciously pursued his dream of a life in science, earning a Ph.D. in physics at the age of 26 from the prestigious Massachusetts Institute of Technology and later joining NASA.

Since its beginning at this institution, the McNair program has encouraged and assisted more than three hundred students in various majors with their



Dr. Ronald E. McNair, Scientist & Astronaut, 1950-1986

preparation for graduate study. UT Arlington McNair graduates have subsequently earned masters and doctorates not only from their alma mater but also from an impressive array of universities including Indiana University, the University of Pennsylvania, Rice University, the University of Michigan, and Southern Methodist University, among others.

Currently the UT Arlington McNair Scholars Program works with a minimum of thirty students each academic year, providing seminars

and classes on topics relating to graduate school and the GRE, a May institute to heighten Scholars' understanding of the culture of research, and the opportunity to engage in a summer research internship (supported by a \$3,000 stipend) as rising seniors. The program also provides guidance with the graduate school application process and travel funds for Scholars to participate in McNair (or professional) conferences and to visit prospective graduate programs.

The McNair Scholars Program enjoys strong support from the UT Arlington administration and greatly benefits from the expertise and enthusiasm of both faculty and staff. Faculty members who serve on the McNair Selection Committee or who act as research mentors to McNair interns deserve special recognition.

Staff Members



Cheri Counts
Administrative Assistant



Najla Khan
Graduate Research Associate II
(through August 2011)



NaKeshia Guillory
Learning Specialist II

Acknowledgments

FACULTY MENTORS

Monica Ramirez Basco, Ph.D.
formerly Department of Psychology

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Department of Mechanical and Aerospace Engineering

Shih-Ho Chao, Ph.D.
Department of Civil Engineering

Donald Del Cid, M.A.
School of Architecture

John Garrigus, Ph.D.
Department of History

James Grover, Ph.D.
Department of Biology

Penelope Ingram, Ph.D.
Department of English

Jared Kenworthy, Ph.D.
Department of Psychology

Hristo Kojouharov, Ph.D.
Department of Mathematics

Timothy Odegard, Ph.D.
Department of Psychology

Karl Petruso, Ph.D.
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Dean, Honors College

Ellen Pritham, Ph.D.
Department of Biology

Shannon Amerildo Scielzo, Ph.D.
Department of Psychology

Eric Smith-Urrutia, Ph.D.
Department of Biology

Kenneth Williford, Ph.D.
Department of Philosophy and Humanities

MCNAIR SELECTION COMMITTEE ACADEMIC YEAR 2010-11

Wendy Barr, Ph.D.
College of Nursing

James Grover, Ph.D.
Department of Biology

NaKeshia Guillory, M.B.A.
Learning Specialist, McNair Scholars Program

Laureano Hoyos, Ph.D.
Department of Civil and Environmental Engineering

Raymond Jackson, Ph.D.
Office of Graduate Studies;
Department of Psychology

Joan Reinhardt, Ph.D.
Director, McNair Scholars Program

Christian Zolniski, Ph.D.
Department of Sociology and Anthropology;
Center for Mexican-American Studies

Friends of the Library McNair Scholarship Awards

At their Nov. 18, 2011, meeting, the Friends of the UTA Library awarded two \$500 scholarships and plaques to LaQuishia Gill and Steven Nunez for their McNair summer research presentations. This marks the seventh year that the Friends of the UTA Library have awarded scholarships to McNair Scholars. To select the winners, the Friends' McNair Scholarship Committee representatives viewed all fourteen research presentations on August 4.

The Friends of the UTA Library first recognized the achievements of McNair Scholars in fall 2005. The establishment of an endowment permitted this initial award to be offered annually since then. Including this year, sixteen McNair Scholars have benefited from the generosity of the Friends of the UTA Library.

The McNair Scholars Program congratulates our 2011 scholarship winners on their excellent research presentations and thanks the Friends of the UTA Library for their ongoing support of this program.

PREVIOUS MCNAIR SCHOLARSHIP AWARDEES

FALL 2010

Justin Erdmann

Mentor: Dr. Haiying Huang (Mechanical and Aerospace Engineering)

Bruce Rollins

Mentor: Dr. Judy Wilson (Kinesiology)



Left to right: Joan Reinhardt, LaQuishia Gill, Steven Nunez, and Donald del Cid

Sharie Vance

Mentor: Dr. Linda Rouse (Sociology/Anthropology)

FALL 2009

Juandell Parker (Biology)

Mentor: Dr. Laura Mydlarz

Crystal Red Eagle (Physics)

Mentors: Dr. Manfred Cuntz and Dr. Zdzislaw Musielak

FALL 2008

Tara McKelvy (Psychology)

Mentor: Dr. James Kopp

Gerrell Williams (English)

Mentor: Dr. Peggy Kulesz

FALL 2007

Yonathan Tafesse (Biology)

Mentor: Dr. Perry Fuchs (Psychology)

Omid Zaré-Mehrjerdi (Biology/Chemistry)

Mentor: Dr. Ellen Pritham

FALL 2006

Samuel Odamah (Architecture)

Mentor: Gary Robinette, MLA

Monet Joseph (Biology/Biomedical Engineering)

Mentors: Dr. Kytai Nguyen and Dr. Hanli Liu

FALL 2005

Bianca Canales (Political Science)

Mentor: Dr. Victoria Farrar-Myers

Rachel Hansen (Biology/Biomedical Engineering)

Mentor: Dr. Raul Fernandez, ARRI

Faith Nibbs (Anthropology)

Mentor: Dr. Josephine Caldwell-Ryan

DEAN OF THE UT ARLINGTON LIBRARY

Dr. Gerald Saxon (through August 2011)

Julie Alexander (Interim Dean)

FRIENDS OF THE UT ARLINGTON LIBRARY MCNAIR SCHOLARSHIP COMMITTEE REPS

Carol Lehman, Daniel Kauth, and William Stallings

OFFICERS (2011-12)

Shirley Applewhite, President

Richard Browning, 1st Vice President

Kit Goodwin, 2nd Vice President

Melissa Deur, Secretary

Carol Lehman, Treasurer

Greg McKinney, Parliamentarian

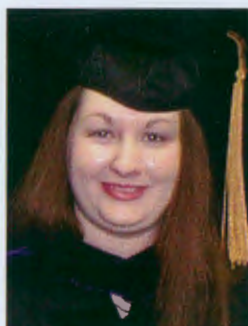
Photo courtesy of Maggie Dwyer, UT Arlington Library.

Graduate Scholar Profile

Dr. Sharon Eaves

Dr. Sharon Eaves transferred to UT Arlington as a first-generation college student (and a new mother) in fall 2002. Despite challenges ahead, she held on to her childhood dream of becoming a psychologist. Sharon was accepted into the McNair Scholars Program in spring 2003, as a junior psychology major. She excelled as a student and proved to be an outstanding McNair Scholar, graduating in May 2004 with a Bachelor of Arts in Psychology.

Prior to graduation Sharon had three graduate school offers, and she selected Louisiana State University in Baton Rouge because its program matched her interest in conducting research with elementary school age children. That fall, she began her graduate studies with full funding at Louisiana State University, where she earned a Master of Arts in psychology in August 2006 and a Ph.D. in psychology in December 2010.



Dr. Eaves is a senior lecturer in psychology at Shawnee State University in Portsmouth, Ohio, where she teaches several courses including Quantitative Methods in Psychology and Child and Adolescent Psychology. She

loves her job and feels that teaching is very rewarding. She has a great relationship with her colleagues whom she finds both interesting and friendly. Dr. Eaves is seeking a tenure-track position, as she also continues to publish work in her field.

Finally, she advises McNair Scholars that being a graduate student is very different from being an undergraduate: the professors expect you to be self-motivated because you are responsible for independent work, in addition to course work. Excellent time management skills also are essential for you to succeed. Dr. Eaves warns, "Don't try to rush through graduate school. You need to have teaching and publishing experience in order to get a job after graduate school, so take your time and get as much experience as possible."

Graduate Scholar Profile

Dr. Faith Nibbs

Dr. Faith Nibbs began her school career later in life. It wasn't until her two children were grown and in college themselves that she saw the need for higher education. With the help of the McNair program, she realized her potential to go beyond a bachelor's degree. "I grew up thinking graduate school was for *those* people. It wasn't until the McNair program that I began to believe that I was one of those people, that I could do it, too."

After graduating from UT Arlington as a member of the Honors College in December 2005, Faith was accepted to Southern Methodist University's doctoral program in anthropology with a fellowship and research assistantship. Her dissertation research was an extension of the summer research project she began as a McNair Scholar, as was her first peer-reviewed journal publication in 2009.

Since earning her Ph.D., Faith is engaged in research and publishing. Her wide range of scholarly interests include understanding immigrant communities and how long-term transnational communication and incorporation into local host societies coexist. Her collaborative research with a Dartmouth University sociolinguist explores how national discourses on



American freedoms are reappropriated by Southeast Asian refugees to gain agency in their lives and how these new discourses affect their identity. With UT Southwestern Medical Center in Dallas, she investigates socio-cultural adaptive behaviors, including structural inequalities that predispose migrant populations to unusually high levels of uric acid in immigrant populations in Europe.

Dr. Nibbs is an adjunct professor at UT Arlington and SMU while searching for a tenure-track faculty position. "Finding a school that has a McNair Scholars program is a high priority for me. I want to be able to give back to something that has meant so much to me."

Looking back at her own experience, she often gives McNair scholars this advice: If you are lucky enough to become a McNair Scholar, follow the program. Jump through all the hoops. Do everything they say without cutting corners. Independent research is the cornerstone of graduate school, and the McNair program is structured to give you experiences that will position you for admittance to and fellowship support in a competitive graduate program. Work with the program, and it will work for you.

Faculty Mentor Profile

Dr. James Grover, Department of Biology

Dr. James Grover is a professor of biology and chair of the Graduate Studies Committee for the Earth and Environmental Sciences program at the University of Texas at Arlington. He is also co-director of the Undergraduate Training in Theoretical Ecological Research (UTTER) program funded by the National Science Foundation (NSF). Dr. Grover arrived on campus in 1993 as an assistant professor. He had spent several years as a post-doctoral fellow in physiological ecology at the Max Planck Institute of Limnology in Plön, Germany, and as a research associate in population biology at Imperial College at Silwood Park in the United Kingdom. Dr. Grover earned his Ph.D. in ecology from the University of Minnesota.

Dr. Grover has a variety of research interests in his field including harmful algal blooms, specifically those involving golden algae, a species that has caused major fish kills in Texas reservoirs; mathematical modeling of ecological processes to explore population dynamics and species competition for resources; the biology of algae and other aquatic microorganisms; and water quality analysis.

During the last decade, Dr. Grover has received substantial funding from local, state, and national governmental agencies such as the NSF, the U.S. Department of Energy, the Texas Water Resources Institute, the Trinity River Authority, and the Tarrant

Regional Water District. He now is conducting research funded by Texas AgriLife and the U.S. Army Corps of Engineers on testing approaches to golden algae control.

Dr. Grover has authored numerous publications and



has given invited presentations, seminars, and workshops at more than 60 universities and governmental agencies in the U.S. and abroad. He has been active with local and international conference presentations and has served on various editorial boards, agency governing boards, NSF panels, local science fairs, and science Olympiads. He is

a member of the University Sustainability Committee and a former chair of the Working Group on Curriculum Research and Community Engagement.

Among the undergraduate and graduate courses Professor Grover has taught are Elementary Biostatistics, Mathematical Modeling in Ecology, Environmental Systems/Biological Aspects (graduate and undergraduate), and Biological Modeling (graduate).

A strong supporter of the McNair Scholars Program, Dr. Grover not only has served three times as a research mentor for McNair Scholars, but he also has been a member of the McNair Selection Committee. In the latter capacity, he has reviewed McNair semi-finalists during the winter holiday break and shared his assessments with fellow committee members in early spring semester.



Steven Nunez

Architecture major

Environmental and Sustainability Studies/
Urban and Public Affairs minors

Born in Los Angeles, California, but raised in Fort Worth, Steven arrived at UT Arlington after attending Tarrant County College and serving in the United States Marine Corp. He has held the position of president of the National Organization for Minority Architectural Students, is an active member of the International Education Fee Scholarship Committee, and has volunteered with the Playhouse Fun Project. Steven received the Transfer Honors Scholarship and the International Education Fee Scholarship. In November 2011, he was a co-recipient of the Friends of the UTA Library McNair Scholarship for his summer research presentation.

"I truly enjoyed my entire experience with the McNair Scholars Program. During the summer internship I learned how to properly conduct research and further develop my presentation skills, all of which will be beneficial during my graduate studies. I am truly grateful to the McNair Scholars Program for providing me with this wonderful opportunity."

Harvesting the Rain: A Proposal for Storm Water Management and Its Re-Use on The University of Texas at Arlington Campus

Fresh water scarcities and/or related crises are and will become increasingly common occurrences worldwide. Since The University of Texas at Arlington is located in an arid, drought-prone region, it is extremely important to begin addressing this problem by implementing storm water management and develop re-use tactics. This study consists of a conceptual design proposal for the implementation of campus-wide water management by creating multiple water reservoirs that will allow construction of new parking and educational edifices throughout the UT Arlington campus, thus creating a new plan. The water reservoirs will harvest the rain water run-off for future re-use on the campus, primarily for non-potable uses such as landscape irrigation, flushing toilets, maintenance/construction purposes, etc. This will reduce the amount of potable water that the University purchases for non-potable purposes. The construction of the reservoirs will require the inundation of multiple parking lots and thoroughfares. The proposal includes recommendations for replacing those parking lots with parking edifices and elevating the existing thoroughfares in the form of raised earth berms and low-altitude bridges. Over the past few years, UT Arlington has made great progress towards embracing sustainability as an important mission for the University. In adopting this proposal, UT Arlington will create a campus-wide laboratory that will benefit the research capabilities of the University and further establish itself as a leader in sustainability and storm water management.

Mentor:
Professor Donald del Cid
School of Architecture





John Black

Aerospace Engineering major
Mechanical Engineering minor

John grew up in Venus, Texas, where he graduated as class valedictorian in 2008. The following semester he began classes at UT Arlington and decided on aerospace engineering as his major. He has received the Outstanding Freshman Scholarship and the General Honors College Scholarship and was recognized as a University Scholar. He is a member of the American Institute of Aeronautics and Astronautics, the Honors College Council, Tau Beta Pi engineering honor society, and the University Martial Arts Association.

“The McNair Program has given me the opportunity to develop a relationship with a mentor and gain valuable undergraduate research experience in a laboratory setting.”

Experimental Investigation of Spring-In Behavior of Composite Materials

The purpose of this experimental investigation was to analyze several factors that contribute to the spring-in of L-shaped composite beams: symmetry, laminate thickness, ply orientation, and ply sequence. With a better understanding of the variables that influence spring-in comes the ability to better predict the amount of spring-in and subsequently the ability to create composite beams that are stronger and have a longer fatigue life. Composite materials increasingly are being adopted as high performance materials in aircraft, automobiles, and many other structures due to their high specific strength and stiffness. The L-beam represents a basic corner, and fundamental building block, of larger and more complex beams. However, in order to study these phenomena the methods of manufacturing composites through the bag-molding process using an autoclave must be learned. Important engineering skills learned in this experimental investigation include mold preparation, vacuum bagging techniques on both open and closed molds, the method for stacking individual layers of a laminate, measuring and adjusting the temperature of a curing cycle, and measuring curvature and spring-in. In the end, it is determined that symmetry is an important contributor to spring-in, and that laminate thickness, ply orientation, and ply sequence are all different factors that contribute to bending stiffness, a significant component in reducing this effect. It is hoped that with further research a better method of measuring spring-in might help refine the results of this study and that eventually other factors to spring-in could be investigated as well.

Mentor:
Dr. Wen Chan
Department of Mechanical
and Aerospace Engineering





Crystal Jamaica

Civil Engineering major
Construction Engineering minor

Born and raised in Dallas, Texas, Crystal attended El Centro Community College before entering UT Arlington as a civil engineering student in 2008. She is a recipient of the Rain for Rent Scholarship, the DFW-SHPE (Society of Hispanic Professional Engineers) Scholarship, and the Construction Research Scholarship. An honor roll student, Crystal serves as the treasurer of Chi Epsilon Civil Engineering Honor Society. She is an ambassador for the Leaders Educating about Diversity Recognition Award and is featured on the Multicultural Hall of Fame for the Multicultural Distinguished Service Society Recognition Award.

“The McNair Scholars Program has given me the opportunity to become more successful in college by exploring research as an undergraduate. I am very thankful to be a McNair Scholar because the program helps students to strive and persevere towards a higher education.”

Harvesting Seismic Energy for Emergent Use after Major Earthquakes

A major problem that many seismic-prone countries encounter after being struck by a major earthquake and its aftershocks is the electricity outage. As a consequence, essential facilities such as hospitals may lose their major functions. During a cold winter, people in residential homes also could suffer from a power shortage. Past experiences showed that the backup generators also could fail due to many reasons. How to find a power supply for emergent use after severe earthquakes in order to save lives is a critical topic. The motivation behind this research is to investigate the feasibility of utilizing earthquake energy from the main shock, as well as its numerous aftershocks, to generate electricity for urgent use. This concept could be realized by adapting existing technology such as hydraulic dampers. Specifically, part of the input energy from the earthquakes can be converted to electricity by using a damper turbine-battery system. In order for this concept to become successful, the transfer efficiencies from seismic energy to electricity should be as high as possible to provide sufficient energy transfer. Based on detailed investigation of the power usage of essential equipment in hospitals and residential houses, this preliminary study has shown that the potential of harvesting seismic energy for urgent use is feasible. However, future research to design a prototype system is needed to verify the conclusions of this study.



Mentor:
Dr. Shih-Ho (Simon) Chao
Department of Civil Engineering



Patricia Aguilar-Gurrola

English major

History/Political Science/Women's
and Gender Studies minors

Born in Durango, Mexico, Patricia grew up in southern California. Prior to enrolling at UT Arlington as a political science major, she attended Los Angeles Mission College in California and Eastfield Community College in Dallas. In spring 2010, a multicultural literature class awakened her passion for literary studies, and Patricia changed her major to English. She has been on the Dean's List and the Honor Roll and is the recipient of the Award of Excellence in Political Science, the Don Leigh Cravens Memorial Award, the Dora Nichols/Arlington Shakespeare Club Award, the College of Liberal Arts Academic Excellence Scholarship, and the UTA Academic Achievement Scholarship.

"The McNair Scholars Program has had a positive impact on my academic career. The summer research gave me the chance to work with a knowledgeable professor on a topic that I plan to pursue at the graduate level. McNair has given me the confidence to apply to doctoral programs I otherwise would not have considered."

Disciplining the Domestic: An Examination of Women as "Docile Bodies" in *Nervous Conditions* and *Backyard, El Traspatio*

In *Discipline and Punish*, Michel Foucault describes the acceptance of societal ideologies as an individual's state of "docility." Through ideologies, which slowly become normalized, the body becomes a "docile body" "that may be subjected, used, transformed, and improved" (136). Foucault explains how the prisoners in the Panopticon, an annular-structured prison designed by Jeremy Bentham in the late eighteenth century, can be compared to individuals in society. The purpose of the special prison was "to induce in the inmate a state of consciousness and permanent visibility that assures the automatic functioning of power" (201). Its design ensures the prisoner is visible at all times, but the prisoner cannot see the guard. This obliges the prisoner to accept self-surveillance. A "docile body" is created, therefore, when the individual participates in his own subjection. In *Unbearable Weight: Feminism, Western Culture, and the Body*, Susan Bordo applies Foucault's theory to women, describing the power over the "docile body" as "non-authoritarian, non-conspiratorial, and indeed non-orchestrated, [but powerful enough] it produces and normalizes bodies to serve prevailing relations of dominance and subordination" (26). Using Foucault's theory of the "docile body" and Bordo's contribution, I argue that the female characters in *Nervous Conditions* by Tsitsi Dangarembga and *Backyard* by Sabina Berman epitomize the "docile body" because they accept their roles as domestic servants and sexual objects. In addition, I emphasize the importance of using two distinct works of literature from different times because the "docility" of women transcends time and place.



Mentor:
Dr. Penelope Ingram
Department of English



Nicholas Gehm

Philosophy major

Business Administration minor

A Colorado native, Nicholas was born in Denver. Prior to UT Arlington, he attended McLennan Community College in Waco, Texas. In 2010, he transferred to UT Arlington and chose philosophy as his major.

"I thank the McNair staff for their support and for giving me the chance to participate.

The tools that I have gained from my time as a McNair Scholar have prepared me for the future challenges of graduate school and have given me confidence that I will be able to accomplish any academic goal that I set for myself."

The Conceivability-Possibility Relationship

Many developments in mathematics, the natural sciences, and philosophy depend on the principle (conceivability thesis) that if something is conceivable, then it is possible. But there seem to be counterexamples to this principle. For example, we can conceive of cars that travel faster than light, but according to well-confirmed physical theory this is impossible. We can conceive of there being only finitely many prime numbers, but it can be demonstrated that there must be infinitely many. Such examples raise serious questions about the scope and limits of the conceivability thesis. Many philosophers, from the time of René Descartes to the present, have attempted to answer them. This paper offers an analysis of the nature of the relationship between conceivability and possibility by examining several of these attempts. I provide a brief history of the philosophical discussion of this relationship, and I use contemporary discussion surrounding David Chalmers' conceivability thesis to articulate many of the crucial metaphysical, semantic, and epistemological issues involved. In particular, I discuss the important distinctions between various kinds of possibility, and I attempt to isolate the type of conceivability that stands a good chance of being a reliable guide to possibility. I conclude by defending the principle that the more essential characteristics we know about an object, the more reliable our conceivability intuitions about that object will be.

Mentor:

Dr. Kenneth Williford
Department of Philosophy
and Humanities





Ashley Liggins

University Studies major

Ashley is originally from Baltimore, Maryland, and has lived in the Midwest. She attended Chicago State University, where she was a member of the Honors College and a Presidential Scholar before coming to UT Arlington. Ashley now serves as a Peer Academic Leader in nursing and a Supplemental Instruction Leader in political science for University College.

“Having a second opportunity at the research process through McNair really helped me to network with more faculty members and learn once again from an experienced and brilliant professor here at UT Arlington.”

Lighting the Fire: Baron de Vastey and the Black Nationalist Agenda in Post-Revolutionary Haiti

From 1806 until his death in 1820, Pompée Valentin Vastey (Baron de Vastey) served as secretary, spokesperson, propagandist, and royal tutor under Henri Christophe I, King of Northern Haiti. Throughout his tenure with Christophe, Vastey published numerous books, pamphlets, and treatises refuting the racist ideology of the Europeans as well as warning his fellow Haitians about traitorous leaders among them. Vastey’s work reached an even wider audience when published in multiple languages. However, there is no significant historical scholarship discussing Vastey and his contribution to the intellectual black voice in the Caribbean. In this paper I critically examine three works of Vastey (*Notes à M. le baron de V.P. Malouet*, *Le Cri de la Patrie*, and *Reflexions sur une lettre de Mazères*) published between 1814 and 1816. In analyzing these publications, I will attempt to show that Vastey was an important writer in early Haitian and Caribbean post-colonial history. Furthermore, this paper will reveal that his contribution to the global intellectual landscape helped to create a new black national consciousness for the recently independent country of Haiti. Ultimately, I argue that although Vastey was a representative of Christophe and his monarchy, he was definitely writing from the stance of a revolutionary when addressing the European world and refuting its claim of superiority and its right to subjugate Haitians.

Mentor:
Dr. John D. Garrigus
Department of History





Cassandra Valencia

Anthropology major

Linguistics minor

Cassandra was born in Dallas, Texas, but moved to Corpus Christi when she was eight years old. Before enrolling at UT Arlington, she attended Schreiner University as a freshman. After transferring, she became interested in human cultures of the past and decided to earn a Bachelor of Arts in Anthropology. She is an active member of the Anthropology Club and the Phi Kappa Phi Honor Society.

“The McNair Program gave me the opportunity to explore my interest in ancient cultures, as well as work with an outstanding mentor, who guided me throughout the research process. I greatly appreciate the McNair staff and my mentor for their help during the summer internship.”

The Ancient Egyptian Festival of *Thy*: A Celebration of the Saving of Mankind

The Egyptian festival of *Thy* celebrates the salvation of man from the goddess Sekhmet. In the Myth of the Solar Eye, the god Re sends Sekhmet to destroy his enemies, but she is overpowered by blood lust and goes on a rampage to destroy all of man. Re, in order to save mankind, tricks Sekhmet into drinking beer dyed red to resemble blood. Sekhmet becomes drunk and forgets about slaying mankind and transforms into the peaceful goddess Hathor. The festival is in commemoration of Sekhmet's binge on the red beer. Based on an analysis of hymns, a reconstruction of the festival activities can be made. The festival was celebrated to ensure that the harvest season would be profitable. The myth serves to explain how natural events occur, as well as explain the political and religious environment of Egyptian society at that time. The destruction of man is a theme mirrored not only in Egyptian mythology, but also in the mythologies of the Near East. The stories of Atrahasis, Utnapishtim, and Noah are similar to each other, but each has a different meaning and reasoning for the destruction of man. By comparing the stories of Atrahasis, Utnapishtim, and Noah, archaeologists and historians can gain a better understanding of ancient cultures and how they made sense of the world around them.

Mentor:
Dr. Karl Petruso
Department of Sociology and Anthropology
Dean, Honors College





Alyssa Allen

Psychology major

Alyssa was born and raised in Dallas, Texas, and started her college career at Mountain View College where she was admitted to Phi Theta Kappa and the All Texas Academic Team. Being a part of both organizations made her eligible for the Maverick All Texas Academic Team Scholarship, which provided full coverage of her educational expenses at UT Arlington. In her first year as an early transfer sophomore, Alyssa decided to join the Honors College and began her thesis research with Dr. Basco and Dr. Scielzo on assessing the attitudes of depressed patients.

“The McNair program has facilitated an enriching environment and experience in research that will give me an advantage when applying to graduate school. The relationships I have gained with my mentors have given me the necessary resources to be successful in my education upon graduation, and I thank the McNair staff for this wonderful experience.”

Does Patient Attitude or Therapist Skill Predict the Success of CBT for Depression?

Consistent predictors of symptom improvement in cognitive-behavioral therapy (CBT) for patients with major depressive disorder (MDD) have yet to be pinpointed in the medical field. Researchers have attempted to examine variables such as patient demographics, but we have yet to identify any systematic factors that relate to CBT success. In this study, we examined patients' attitudes and intentions and also therapists' adherence to CBT procedures. To assess patients' attitudes and intentions, we used Ajzen's *Theory of Planned Behavior* as a basis to create a self-report psychotherapy belief questionnaire. To assess therapists' adherence, the therapists were rated based on a CBT adherence scale as to how well they followed the procedures of CBT structure and CBT intervention. To test these variables, we performed multiple regression analyses with the number of therapy sessions the patients attended as a covariate. We found in each of our analyses that the number of sessions patients attended was the most important predictor of symptom improvement. The other variables examined related very little to patients' improvement. Therefore, it was concluded that as long as patients are attending sessions, they will experience improvement. Several possible study limitations were noted, in addition to presenting ideas for future research that analyze the predictors of symptom improvement in CBT for patients with major depression.

Mentors:

**Dr. Monica Ramirez Basco
and Dr. Shannon Amerilda Scielzo**
Department of Psychology





Daisy Garza

Psychology major

A native of McAllen, Texas, Daisy grew up approximately twenty minutes from the Mexican border. Her college career began at the University of Texas Pan-American, where she completed freshman and sophomore courses before transferring to continue her education in psychology. At UT Arlington she received an Outstanding Transfer Scholarship and an Academic Enhancement Scholarship. Daisy is a member of Psi Chi psychology honor society.

"I thank the McNair Scholars Program for supporting, preparing, and advancing me and my fellow Scholars in our pursuit of graduate study. The opportunity to conduct research under a mentor gave me a clear understanding of what work at the graduate level would be like and provided me with a learning experience that was equally as challenging as it was rewarding."

Diachronic Disunity: Individual Differences and Possible Consequences

Discontinuity of the self, in the sense that one is not the same person he or she has always been, is defined as diachronic disunity. The adoption of the discontinuity metaphor of the self is the basis for diachronic disunity. It is proposed that social comparison theory, as well as theories of egocentric and change biases, provide validity for the adoption of the discontinuity metaphor of the self as a coping mechanism for individuals to deal with an undesirable past. This study is comprised of a series of questionnaires that will gather demographic information, as well as document any mental health problems, and measure current and past self-esteem; self-continuity (in terms of how often in their lives participants remember feeling as though they were no longer the same person); coping strategies; and the number and quality of life-changing experiences. Data analysis in this study will focus on differences in current and past self-esteem between diachronically disunited individuals and diachronically unified individuals. It is expected that, as a result of egocentric and change bias, as well as the effect of downward social comparison employed upon one's past self by his or her current self, individuals experiencing diachronic disunity will have significantly lower scores for past self self-esteem than for current self self-esteem, compared to self-esteem scores of individuals who are diachronically unified. It also is expected that diachronically disunited individuals will report more life-changing experiences than unified individuals.

Mentor:
Dr. Timothy Odegard
Department of Psychology





LaQuishia Gill

Psychology major

Spanish minor

A DFW area native, LaQuishia graduated from Mansfield High School and received the Freshman Honors Scholarship as an incoming Honors College member at UT Arlington. She was a member of Freshman Leaders On Campus and a UTA Ambassador. She serves as a Peer Academic Leader and vice president of the Psychology Society and is a member of Psi Chi psychology honor society. LaQuishia was a co-recipient of the Friends of the UTA Library McNair Scholarship based on her summer research presentation. LaQuishia was selected as Miss Black and Gold 2011 and Ms. UTA 2011-2012.

“The McNair program offered more than I had anticipated. I piloted original research on a topic of my choice while working with a mentor who was a perfect match. I thank everyone with McNair, my family and friends for their support, but mostly my faculty mentor, who provided an enjoyable working environment and the room to take initiative and grow as a student.”

Jury Decision-Making Based on Pretrial Publicity and Admissibility of Evidence

A well-established issue of the judicial system in the United States concerns the measures necessary to ensure a fair trial for the defendant. This study explores pretrial publicity and the admissibility of evidence in the courtroom, two facets of the issue that generate speculation concerning the ability to guarantee the rights specified by the Sixth Amendment. The two problems often are complementary, especially when there is pretrial presentation in the media of a specific piece of evidence that may later prove to be inadmissible in a court of law. This article explores a number of theories that purportedly explain the impact of these factors on jury decision-making, as well as possible solutions to the procedural kinks in jury selection. It also considers the reasons why simple judicial admonitions to disregard evidence are fairly ineffective and proposes a new study that examines the impact of admissibility and pretrial presentation of evidence in various combinations, using a 2 (Pretrial Publicity: Evidence-Present, Evidence-Absent) x 3 (Admissibility: Evidence-Ruled-Admissible, Evidence-Ruled-Inadmissible, Evidence-Not-Introduced) between subjects design. The assumption is that, when reinforced by pretrial publicity, a particular piece of evidence will result in a greater percentage of guilty verdicts especially when deemed inadmissible during the trial process. The ultimate goal of this experiment is to put forward possible methods to alleviate any inappropriate influences on the decision-making process of jurors.

Mentor:

Dr. Timothy Odegard

Department of Psychology





Asha Jassani

Psychology major

Born and raised in Miami, Florida, Asha calls Texas home. She started her undergraduate career at the University of Dallas. Although she was intimidated by transferring to a larger institution, Asha took advantage of the many opportunities and organizations UT Arlington had to offer. She became the public relations director of Golden Key International Honor Society and a member of Psi Chi psychology society, received the Continuing Student Scholarship, and has the honor to be called a McNair Scholar.

“Over the course of the summer, I had the opportunity to work on a unique research project with a faculty member and learn more about graduate school and the research process. With support from the McNair staff, family, and friends, I have been able to achieve my dreams and become one step closer to getting my Ph.D.”

The Effects of Outgroup Contact and Social Identity on Negative Outgroup Attitudes

The aim of this research project was to explore and examine the interactive effects of both outgroup contact and social identification on negative attitudes towards outgroup members. To conduct this study, data were collected from a total of 223 undergraduate students who completed an online questionnaire assessing the strength of ingroup identification (as Americans), the quality and quantity of contact with Latinos, and attitudes toward undocumented Latino immigrants. Social identity theory and intergroup contact theory were considered in conjunction for the first time in assessing their influences on negative outgroup attitudes. The convergence of the theories in this research suggest that (a) high levels of social identification within the ingroup can lead to negative outgroup attitudes, while (b) contact with outgroup members can lead to a reduction in negative outgroup attitudes. The results showed that, as expected, outgroup contact acted as a moderator of the typical negative correlation that is usually seen between ingroup identification and negative outgroup attitudes. Specifically, the results indicated that ingroup identification did not significantly predict outgroup attitudes for those with high quality of outgroup contact; whereas for those with mean and low quality of contact, ingroup identification significantly and negatively predicted attitudes towards outgroup members.

Mentor:
Dr. Jared B. Kenworthy
Department of Psychology





Aracely Vazquez

Biology major

Aracely was born in Dallas, Texas, and attended Eastfield Community College before transferring to UT Arlington. She is a recipient of the Carnegie Hero Fund Scholarship and has been a National Science Foundation Scholar for two years. Aracely has successfully completed two research projects, one at Eastfield and her McNair project. She presented at the DLIA Conference and attended the Annual Texas Microscopy Society Conference. Aracely also has one publication as a second author.

"I would like to thank the McNair program for this great opportunity and my faculty mentor for all of his help. This summer research experience taught me a great deal about my field and myself. I now have the confidence to face graduate school."

Microanalysis of *Micrurus tener* Vertebrae as a Means of Potential Species Differentiation and Identification

Snakes are among the oldest and most diverse group of animals yet little is known about the origin and evolution of snakes. In addition, the classification of snakes has been focused largely on the pattern and appearance of scales, body type, and coloration. This method has been proven effective for the classification of extant species; the opposite is true in the identification of fossil snakes, which consist mostly of vertebrae. Vertebral morphology has become a highly utilized taxonomic tool for fossil snakes because when found they consist mostly of vertebrae. Analyzing vertebral morphology over time may help determine the evolutionary relationship between fossil snakes and extant species of snakes. In Texas, only one species of coral snake, *Micrurus tener*, is considered to exist. However, mitochondrial haplotype and venom profiling data has provided evidence that conveys that more than one species of *Micrurus* may exist. In order to prove this hypothesis, this study will analyze the vertebral morphology in hopes of providing additional evidence of two species of *Micrurus*. Samples of *M. tener* from different regions of Texas, coastal and inland, were compared to each other and to *M. fulvius*, a species found in Florida. Statistical analyses did not provide significant evidence to support the hypothesis but did offer evidence that vertebral morphology could be used to differentiate among geographically closely related species. Evidence also was found that demonstrates vertebral element differences among females and males of the same species, thus indicating the contributing role of sexual dimorphism over vertebral variation.

Mentor:
Dr. Eric Smith-Urrutia
Department of Biology





Wilber Ventura

Mathematics major

Wilber grew up in Irving, Texas, and graduated from Nimitz High School before arriving at UT Arlington. He is a part of the Undergraduate Training in Theoretical Ecology and Research Program (UTTER) and the Scholarships for Undergraduates to Reach Goals in Education Program (SURGE). In addition, he serves as treasurer of the UT Arlington Actuarial Science Club and is a member of the Mathematical Association of America student chapter.

"I enjoyed my McNair experience and would like to thank my faculty mentors and the McNair staff."

Resting Stages and the Population Dynamics of Harmful Algae

Due to their impact on many aquatic ecosystems, harmful algal blooms have been a topic of recent studies. The unicellular species *Prymnesium parvum*, known as golden algae, releases potent toxins into its environment that can kill large numbers of fish. *P. parvum* is understood to have a motile state and a non-motile state. In the motile state *P. parvum* produces toxin and is metabolically active. In the non-motile state *P. parvum* is much less metabolically active and does not produce much toxin. Our research provides mathematical models for the conversions between the motile and non-motile states of *P. parvum*, which take place in a chemostat environment. Unlike a closed batch culture, the chemostat environment has inflows and outflows. Our models use systems of ordinary differential equations that represent change among the populations: *P. parvum*, nutrient, and toxin. In particular our models represent constant transition rates and growth-related transition rates. Through an analysis of models, we sought connections between the impact of resting stages of *P. parvum* on population dynamics and toxicity. Not much is known about the transition rates; therefore, the importance of creating simple models to represent the motile and non-motile states of *P. parvum* is great. In conclusion, both models make connections between the transition rates and levels of toxicity.

Mentors:

Dr. James Grover

Department of Biology

Dr. Hristo Kojouharov

Department of Mathematics





Maureen Vignaux

Biology major

A native of Norwood, Massachusetts, Maureen spent her early years in and around Boston. She began her undergraduate education at St. John's College with a study of the Great Books Curriculum. Although she retains her love of history and literature, her passion for science led her to genetics at UT Arlington, where she has been named to the Dean's List and has been inducted into the Phi Kappa Phi honor society.

"The most beneficial part of the McNair program was the final presentation. Explaining my research to a general audience allowed me to reflect on how much I had learned and accomplished in such a short time."

Investigation of the Evolution of the *Trichomonas foetus* Genome

Trichomonas foetus is a urogenital parasite that causes significant annual losses of cattle in the United States and abroad. While *T. foetus* is related to the human urogenital parasite, *T. vaginalis*, phylogenetic evidence suggests that adaptation of the urogenital environment occurred independently from different intestinal ancestors. Interestingly, colonization to the urogenital environment by both organisms was accompanied by a concomitant increase in genome size and the development of phagocytosis and pathogenicity. Work from our lab revealed that the increase in genome size exhibited by *T. vaginalis* occurred through the accumulation of transposable elements (TEs). TEs are mobile, repetitive parasitic sequences of DNA. We hypothesize that TEs have triggered an increase in size of the *T. foetus* genome, as well. To test this hypothesis we executed low-coverage next-generation sequencing of the *T. foetus* genome. *De Novo* bioinformatic techniques were utilized to construct a library of consensus repeats. The repeat library was annotated based on the combined computational evidence of three programs: RepClass, RepeatMasker, and Blast. Our study revealed that the *T. foetus* genome was indeed rich in TEs. Interestingly, TE amplification in *T. vaginalis* involved only one class of TE. In *T. foetus* a broader variety of TEs were found. This is more evidence that the TE amplification in both species is not homologous but analogous.

Mentor:
Dr. Ellen Pritham
Department of Biology



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