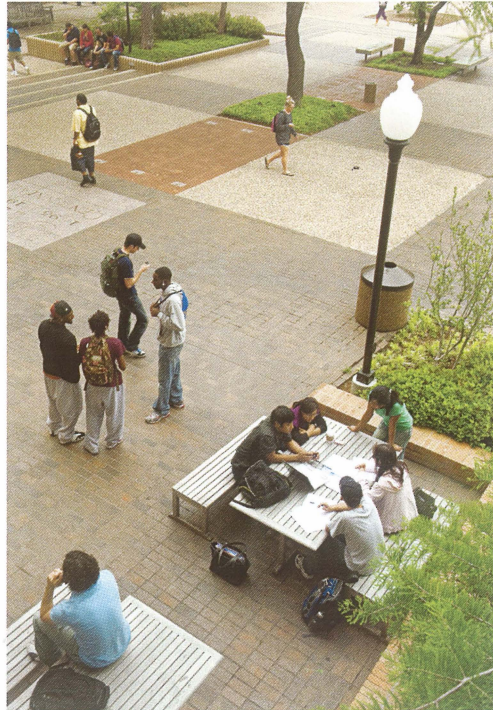


McNair Research Journal

THE UNIVERSITY OF TEXAS AT ARLINGTON

Summer 2009 • Volume 13



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 are also 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.

Copyright 2009 © The University of Texas at Arlington

Image of ranch woman on cover courtesy, Basil Clemons Photograph Collection, Special Collections, The University of Texas at Arlington Library, Arlington, Texas.



McNair Research Journal

Summer 2009 • Volume 13

THE UNIVERSITY OF TEXAS AT ARLINGTON

Message from the Vice President for
Research and Federal Relations 2

Notes from the Director 3

McNair Scholars Program 4

Acknowledgements 5

Friends of the Library McNair Scholarship Awards 6

Graduate Scholar Profile 7

Mentor Profile 8

ENGINEERING

Keduse Agonafer, Mechanical Engineering 9
Solar Shroud Design in a CFD Environment

LIBERAL ARTS

Hollis Cobb, Sociology 10
Exploring Attitudes Toward Homosexuality

Whitney Hansen, English 11
More than Sentimental Heroines and Schoolmarmes:
An Examination of the Depictions of Ranch Women in the American West

Anastasia Hayes-Stoker, History/German 12
Need Based or Elitist: Undergraduate Funding at
Harvard College from 1853 to 1872

Christopher Mangus, Art – Film/Video 13
The “Vandergriff Years” and the Growth of Arlington

Neri Sandoval-Villa, English 15
The Angels Living in the Desert: Ecocriticism in Arturo Islas’
Novel *The Rain God*

NURSING

Derrick Love-Jones, Nursing 15
Wheelchairs and Stretchers: An Infection Danger?

SCIENCE

Matthew Davis, Psychology 16
Impact of Bilateral Primary Somatosensory Cortex Lesion
on Mechanical Hypersensitivity and Escape/Avoidance Behavior

Steven Emenhiser, Environmental Geology 17
Lanzhou Street Dust Particle Analysis

Sharon Hernandez, Microbiology 18
Repeated Horizontal Transfer of a DNA Transposon,
SPACE INVADER (SPIN), in Squamates

Antonio López, Mathematics 19
Mathematical Aspects of Photonic Crystals

Andrew Palacios, Biology 20
Growth of *Prymnesium parvum* (*Haptophyta*) as a Function
of Different Water Media

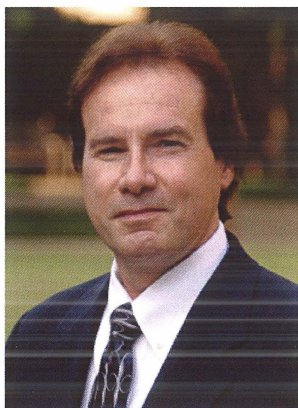
Crystal Red Eagle, Physics 21
Modified Newtonian Dynamics and Other Alternatives
to the Theory of Dark Matter

INTERDISCIPLINARY STUDIES/SUPA

Stephanie Fenniri, Interdisciplinary Studies/Urban Planning 22
The Impact of Gentrification on Latino Families in East Dallas

Juandell Parker, Interdisciplinary Studies/Biology 23
The Influence of Temperature on the Virulence of *Vibrio alginolyticus*
and *Serratia marcescens* (Pdl 100)

Message from the VP for Research and Federal Relations



Ronald McNair was a man who reached for the stars. As an African-American who grew up in the South during the 1950s, he overcame tremendous obstacles to earn a Ph.D. in physics from MIT, and ultimately served his

nation as a NASA astronaut. Despite his death in the 1986 explosion of the space shuttle Challenger, he remains an example of how anyone from any background, with the desire, dedication and drive, can succeed when given an opportunity. It was from his passion to succeed that the McNair Scholars program was born.

As participants in the McNair Scholars program, UT Arlington students are given the opportunity to explore the world around them by engaging in original research under the guidance of a faculty mentor. By accepting the challenges that come with engaging in original scholarship, the undergraduate students who participate in the McNair Scholars program have taken that all important first step in engaging in true discovery and original research. Upon

completion of the program, the students present the results of their research, sharing their accomplishments with the community. This program is truly rewarding for the mentors, students and their families, as it fosters a genuine sense of achievement. Most importantly, these budding scholars are now poised for success as graduate students and as *lifelong learners*. With their demonstrated commitment to intellectual inquiry, McNair Scholars are equipped for a lifetime of discovery, which will undoubtedly lead to positive contributions to society.

As faculty members, we are constantly reminded by the success of one student, Ronald McNair, that we have the all important responsibility to educate, train, mentor and encourage all students to pursue their dreams. While Ronald McNair is no longer with us, he continues to serve as a role model for perseverance, hard work and a commitment to excellence. As he once said, "Whether or not you reach your goals in life depends entirely on how well you prepare for them and how badly you want them." Dr. McNair epitomizes the principles upon which our nation has been built, proving that anyone truly dedicated to a dream can succeed—even in a quest to reach for the stars.

A handwritten signature in dark ink, reading "Ronald L. Elsenbaumer". The signature is fluid and cursive, with the first name and last name clearly legible.

Ronald L. Elsenbaumer
VP for Research and Federal Relations

Notes from the Director



As director of the McNair program at The University of Texas at Arlington, I have the privilege to observe during the spring and summer semesters the evolution of our Scholars into accomplished undergraduate researchers with increased potential for future academic success. McNair Scholars at UT Arlington—with program assistance—select their mentors and design their research projects in the spring semester, then implement their projects and present their results on campus in early August. As students execute their research plans, it becomes apparent that the internship will become for many participants a life-changing experience. Although every step of the research agenda is (and should be) challenging, as it moves undergraduates out of their comfort zone into unfamiliar territory, it is simultaneously

exhilarating, enlightening, engaging and ultimately quite rewarding.

I salute the focus, self-discipline and effort that our Scholar interns display while engaged in the McNair summer research internship. At the same time I recognize and appreciate the guidance that faculty mentors provide to our researchers, as it is essential to the ultimate quality of this venture. Indeed, the entire university has been, since the inception of the program in 1990, not only committed but also enthusiastic in its support of this program and those UT Arlington students who participate in it. I would particularly like to thank President James D. Spaniolo, Senior Vice Provost Michael K. Moore, Vice President for Research and Federal Relations Ronald L. Elsenbaumer, and Dean of the UT Arlington Library Gerald Saxon for their continued encouragement of McNair Scholars.

I wish our Scholars ongoing success as they complete their undergraduate studies, apply to graduate school and prepare for careers in the professoriate!

A handwritten signature in black ink that reads "Joan W. Reinhardt". The signature is fluid and cursive, with a long horizontal stroke at the end.

Joan W. Reinhardt
Director of McNair Scholars Program (SOAR)

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 almost three hundred students in various majors with their preparation

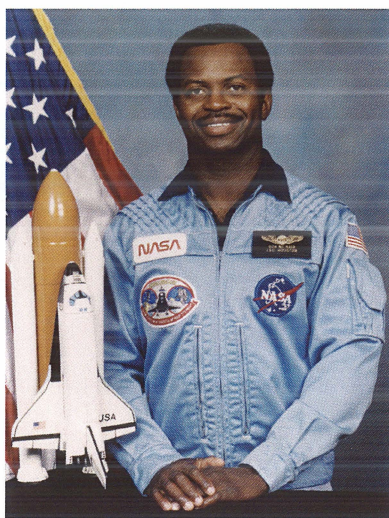
for graduate study. UT Arlington McNair graduates have subsequently earned masters and doctorates not only from their alma mater but also from an impressive array of universities including Indiana University, the University of Pennsylvania, Rice University, the University of Michigan, and Southern Methodist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



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

Staff Members



Cheri Counts
Administrative Assistant



Najla Khan
Graduate Research Associate

Acknowledgments

FACULTY MENTORS

Thomas Adam, Ph.D., Department of History
Dereje Agonafer, Ph.D., Department of Mechanical Engineering
Tuncay Aktosun, Ph.D., Department of Mathematics
William Arcé, Ph.D., Department of English and Center for Mexican-American Studies
Deborah Behan, Ph.D. (candidate), School of Nursing
Manfred Cuntz, Ph.D., Department of Physics
Cédric Feschotte, Ph.D., Department of Biology
Perry Fuchs, Ph.D., Department of Psychology
James Grover, Ph.D., Department of Biology
Andrew Hunt, Ph.D., Department of Earth and Environmental Sciences
Peggy Kulesz, Ph.D., Department of English
Maria Martinez-Cosio, Ph.D., School of Urban and Public Affairs
Zdzislaw Musielak, Ph.D., Department of Physics
Laura Mydlarz, Ph.D., Department of Biology
Linda Rouse, Ph.D., Department of Sociology and Anthropology
Bart Weiss, MFA, Department of Art and Art History

RESEARCH LIAISON

Verdell Marsh, Ph.D., VA North TX Healthcare System

MCNAIR SELECTION COMMITTEE (FALL 2008-SUMMER 2009)

Laureano Hoyos, Ph.D., Department of Civil Engineering
Raymond Jackson, Ph.D., Office of Graduate Studies and Department of Psychology
Pawel Michalak, Ph.D., Department of Biology
Joan Reinhardt, Ph.D., Director/McNair Scholars Program (SOAR)
Joan Rycraft, Ph.D., School of Social Work
Christian Zolniski, Ph.D., Department of Sociology and Anthropology and Center for Mexican American Studies

Friends of the Library McNair Scholarship Awards

At their October 23, 2009 meeting, the Friends of the UT Arlington Library awarded two \$500 scholarships (and very impressive plaques) to McNair Scholars Juandell Parker (Interdisciplinary Studies/Biology major) for her paper *The Influence of Temperature on the Virulence of Vibrio alginolyticus and Serratia marcescens (Pd1100)* and Crystal Red Eagle (Physics major) for her findings entitled *Modified Newtonian Dynamics and Other Alternatives to the Theory of Dark Matter*. To determine the scholarship recipients, the members of the current Friends McNair Scholarship Committee attended campus research presentations by fifteen Scholars on August 6.

The Friends of the UT Arlington Library instituted the annual McNair awards as of fall 2005, to be funded annually by a special endowment. At this year's award meeting, Jeff Guinn, former book editor for the *Fort Worth Star-Telegram* and the author of several works, spoke about his recent best-seller, *Go Down Together: The True, Untold Story of Bonnie and Clyde*. He also generously donated his honorarium to be split between the two McNair Scholars, thereby increasing their individual scholarship awards. The McNair program very much appreciates this gesture of support for its Scholars.

The McNair Scholars program congratulates our current scholarship winners.



Crystal Red Eagle, Jeff Guinn, Dr. Joan Reinhardt, Juandell Parker

PREVIOUS MCNAIR SCHOLARSHIP AWARDEES

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 206

Samuel Odamah (Architecture)

Mentor: Gary Robinette, MLA

Monet Joseph (Biology/Biomedical Engineering)

Mentors: Drs. Kytai Nguyen and 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

FRIENDS OF THE UT ARLINGTON LIBRARY MCNAIR SCHOLARSHIP COMMITTEE (SUMMER 2009)

Dorothy Burton

Robert Ressler

Robert Stallings

OFFICERS OF THE FRIENDS OF THE UT ARLINGTON LIBRARY (2008-2009)

Tommie Wingfield, President

Greg McKinney, First Vice President

Shirley Applewhite, Second Vice President

Richard Browning, Treasurer

Linda Simmons, Secretary

Betty Clark, Parliamentarian

Graduate Scholar Profile

Jennifer Jamison, Ph.D.

Jennifer Jamison was accepted into the UT Arlington McNair Scholars Program in spring 2001 as a junior chemistry major. She was an excellent student and proved to be an exemplary McNair Scholar. As a new student, Jennifer had received a Freshman Achievement Scholarship and was later awarded the Chemistry and Biochemistry Scholarship. Jennifer participated in the McNair Summer Research Internship in 2002, under the guidance of Dr. Gary Kinsel. The resulting paper was entitled *The Use of LabVIEW Software for Laboratory Data Analysis*.

In fall 2002, Jennifer and Dr. Joan Reinhardt attended the annual Compact for Faculty Diversity Conference in Orlando, Florida. Later that semester Jennifer presented her research at the 11th National Ronald E. McNair Research Conference in Delavan, Wisconsin, and in spring of 2003 at the 5th Annual Texas National McNair Research Conference hosted by the University of North Texas. Jennifer also acquired valuable experience for future teaching at UT Arlington by serving as an undergraduate teaching assistant in chemistry.

Prior to her graduation in May 2003, Jennifer was accepted into the Ph.D. program in chemistry at Rice University. She began her graduate studies that summer as an NSF Alliance for Graduate Education and the Professoriate (AGEP) Doctoral Scholar. In 2004 she won first place for a poster presented at the NSF New Mexico AGEP Conference. In spring 2005, Jennifer was named an NIH Keck Fellow (under a Nanobiology Training Grant).

Jennifer's graduate research focused on several topics under the direction of Drs. Vicki L. Colvin and Kathleen S.

Matthews: the application of analytical ultracentrifugation to inorganic nanocrystals in organic solvents, the synthesis and characterization of nanobioconjugates, and the utilization of pH and protein surface modifications to control the assembly of nanobioconjugates into hierarchical structures. Jennifer has published two first-author articles (in *ACS Nano and Nanotechnology*), served as a supporting author twice (in *Nano Letters and Chemistry of Materials*), and has one final manuscript in preparation from her thesis work. She has been a teaching assistant and

lecturer at Rice, and has participated as a mentor, judge, guest lecturer and recruiter at various outreach events throughout the Southwest.

Jennifer received her Ph.D. in May 2009. This summer she began a post-doctoral research appointment in the College of Medicine at the Texas A&M Health Science Center. We wish her great success in her professional career!

Jennifer recently stated:

The McNair Program to me was more than just being encouraged to pursue the Ph.D. and being exposed to the intricacies of navigating the journey through graduate school. Besides extensive preparation for graduate school, this program made me believe that I could be successful by instilling confidence and providing many interactions with other scholars and professors from underrepresented groups. [...] I advise current scholars to absorb everything given by the program because all of it will come in handy at some point during their time in graduate school and even beyond.



Mentor Profile

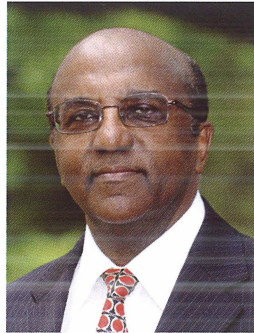
Dr. Dereje Agonafer

Dereje Agonafer is director of the Electronics, MEMS, and Nanoelectronics Systems Packaging Center, and Professor of Mechanical and Aerospace Engineering, at The University of Texas at Arlington. Upon completion of his Ph.D. at Howard University in 1984, Dr. Agonafer went to work for IBM, where he focused on the development of Computer Aided Thermal Engineering (CATE). Since joining the UT Arlington family in 1999, Dr. Agonafer has been a strong influence in the lives of his students, his department, and the University community. Under his guidance, five students have received Ph.D.'s and 58 more have received their M.S. degrees. He is currently advising 15 graduate students (six Ph.D.'s). In addition, Dr. Agonafer is a three-time mentor in the McNair Scholars Program. Last spring, he was the featured speaker (on the value of mentoring) at the McNair Summer Research Orientation Luncheon. He has eight patents and is currently funded by Semiconductor Research Corporation and has been funded by NSF and DOE.

Dr. Agonafer has given talks and offered courses throughout the United States and abroad. During the academic year 2007-2008, he gave invited seminars at Tufts University, Northeastern University, MIT and Harvard. In September 2006, he presented the keynote seminar at the 17th International Symposium on Transport Phenomena (ISTP-17) in Toyama, Japan. In January 2005, he gave an invited seminar at the US/Africa Materials Workshop in Capetown, South Africa, and in summer 2000 and 2001, he offered courses in such locations as Japan, Korea and China among others.

Dr. Agonafer serves on various advisory boards

including that of the NSF Mid-Infrared Technologies for Health and the Environment at Princeton University and also the Dean's Engineering Advisory Committee at both the University of Colorado and Howard University.



He is a Fellow of the American Society of Mechanical Engineers International and Fellow of the American Association for the Advancement of Science. He is also a member of IEEE, AIAA, ASEE and NSBE.

His professional commitment and achievements have garnered many awards from various organizations and institutions.

For example, in July 2009, he delivered a keynote seminar in San Francisco as a recipient of the 2009 InterPACK Excellence Award in recognition of his *excellence in research, standing and recognition in electronic packaging and a reflection of UT Arlington's rise within the international community*. In addition, Dr. Agonafer received the Thermi Award at the 24th annual Semi-Therm, March 2008, in San Jose, California. He was selected by MIT as a Martin Luther King visiting scholar September 1, 2007–August 31, 2008. In 1998, he received several awards including the *University of Colorado School of Engineering Distinguished Engineering Alumni Award in the category of Research and Invention*, the *Howard University Distinguished PhD Alumni Award*, and, finally, the *ASME K-16/EEPD Clock Award for Outstanding Contribution in Computer Aided Thermal Management of Electronic Packages*.

Clearly, Dr. Agonafer has led a very active and successful life of research, teaching, and advising. UT Arlington McNair Scholars are fortunate to benefit from the guidance of such an accomplished member of the faculty.



Keduse Agonafer

Mechanical Engineering Major

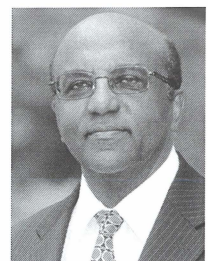
Keduse was born in Albuquerque, New Mexico, and earned his Bachelor of Science degree in Radio/Television/Film at The University of Texas at Austin. At UT Arlington, Keduse is pursuing a second undergraduate degree in engineering. He is a member of the American Society of Mechanical Engineers and is also a Louis Stokes Alliance for Minority Participation (LSAMP) scholar. Recently, Keduse's abstract was accepted for the *ITherm 2010 International Conference* in Las Vegas in June. This conference will focus on scientific and engineering exploration of thermal, thermo-mechanical and emerging technology issues associated with electronic devices, packages and systems. Keduse anticipates graduation by December 2010 and then hopes to pursue graduate study.

"As a part of the McNair program I was given an opportunity not only to apply the things I have learned as an undergraduate, but also to hone my research capabilities, set and reach my own goals, and discover how I might contribute to the collection of ideas in modern engineering."

Solar Shroud Design in a CFD Environment

The rate of technological advance in telecommunications in recent years has outstripped parallel advances in cooling methods. Although today's electronics are more robust and resistant to heat, failure due to high temperatures is still a concern. The outdoor installation of radio control units is very common and reliable cooling equipment is not always available. It is necessary, therefore, to design electronic cabinets that conduct the natural flow of surrounding air in such a way as to achieve natural heat dissipation into the environment. This passive cooling is required as a basis for any system regardless of the presence of forced convection devices. Such devices, like fans, are subject to occasional failure and should they stop directing air flow, the unit must dissipate heat quickly enough to protect sensitive internal electronics. At the same time, heat accumulation due to direct sunlight presents an increase in the amount of energy that must be removed. For this purpose, we considered the use of 12 different solar shrouds for the prevention of solar energy accumulation and the promotion of air flow and thermal energy removal. It was found that the installation of blind slats on the surface of the shroud resulted in the best reductions in electronics temperatures in a computer-simulated environment.

Mentor:
Dr. Dereje Agonafer
Department of Mechanical
and Aerospace Engineering





Hollis Cobb

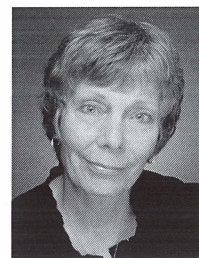
Sociology Major

A native of Fort Worth, Texas, Hollis began his post-secondary education—with a focus on music—at Tarrant County College and the University of North Texas. However, when an introductory sociology course at UT Arlington sparked Hollis' interest in group interaction, he opted for a new discipline. He was also awarded the UTA Academic Achievement Scholarship. A member of the Honors College, the American Sociology Association and the *Phi Kappa Phi* Honor Society, Hollis was selected as the Outstanding Undergraduate Sociology Student in 2008. He is currently exploring graduate programs and plans to earn his baccalaureate degree in May 2010.

"I am appreciative of the opportunity to do research this summer. The McNair program has given me a glimpse of what will be expected of me as a graduate student. The process has enhanced my writing skills, which is beneficial now and will help me throughout my career."

Exploring Attitudes Toward Homosexuality

In our society today, homosexuality remains a controversial topic. Issues such as HIV rates and campaigns for and against legalizing gay marriage draw public attention to homosexuality. Various viewpoints and attitudes related to homosexuality are expressed. In this paper a number of these views and attitudes are discussed. To explore existing research perspectives and findings on this topic, twelve journal articles that used a variety of methods to gather data on attitudes toward homosexuality were studied. The information provided about past and current attitudes highlights the need for additional research on this topic. The articles addressed homophobia as a central concept—its definition, measurement, causes and consequences. Several of the articles suggested that doctrines within Christianity influence attitudes toward homosexuality in a negative manner. However, some noted that when Christians are surveyed, scales designed to measure homophobia might actually be measuring dedication to biblical principles. If so, important aspects of respondents' attitudes toward homosexuality and homosexual persons are missed. Findings reported in these articles also indicate more negative attitudes toward homosexuals among African Americans, men, and the elderly, but the majority of articles concluded that more research is needed to understand the differences observed. Methods of data collection used and results obtained in the studies reviewed are summarized and discussed with reference to future directions for research.



Mentor:
Dr. Linda Rouse
Department of Sociology
and Anthropology



Whitney Hansen

English Major and Architecture History Minor

A native of Arlington, Texas, Whitney began her higher education at Tarrant County College, where she was admitted to *Phi Theta Kappa* Honor Society. Prior to her McNair research with Dr. Kulesz, Whitney worked on an oral history project with Dr. Kathryn Holliday (Architecture), focused on modern Texas architecture (Whitney researched architect Frank Welch). Whitney has also been an officer in the National Organization for Minority Architecture Students and has volunteered with Habitat for Humanity. Whitney is currently applying to various graduate programs. She will receive her baccalaureate in December.

"My experience as an undergraduate McNair scholar has been critical to my personal development in the academic world. Through the challenge of the summer research internship and various other McNair activities, I feel that the McNair program has given me not only the desire to pursue higher education, but also tools for success in graduate school."

More Than Sentimental Heroines and Schoolmarms: An Examination of the Depictions of Ranch Women in the American West

By centralizing romanticized images of tough cowboys, war heroes and explorers, the story of the American West reinforces a myth of the heroic male. Through the support of political leaders such as President Theodore Roosevelt, and cultural productions such as novels, art and film, nineteenth-century western America was envisioned as the space where a man could realize his essential manhood. Permeating the canons of both American literature and history, the myth of the heroic West problematically ignores a rich history of female experiences. This analysis examines both female and male authorship of western narratives depicting Anglo female presence in the West from the mid-nineteenth century onward. Looking at the 1885 Texas literary collection *Gems from a Texas Quarry*, Emerson Hough's 1923 western novel *North of 36*, and ranch owner Hallie Stillwell's autobiography *I'll Gather My Geese*, this research indicates that experiences recorded by women in Texas after the Civil War reveal a more inclusive depiction of Anglo female identity in the West than do works authored by men. Beginning in the late 1970s, feminist scholarship has endeavored to recover many important texts written by women that were once excluded from a patriarchal American literary canon. Early research tracing the literary presence of women in America tends to focus on Northeastern and Southern traditions of female writing. The object of this research is to expand the efforts of feminist scholarship by examining the rich and diverse histories of Anglo women who came to the West during the years of American expansion.

Mentor:
Dr. Peggy Kulesz
Department of English





Anastasia Hayes-Stoker

German and History Majors

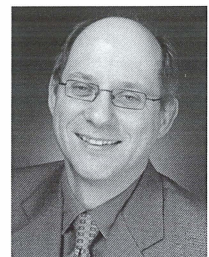
Anastasia grew up in the DFW area and initially attended Tarrant County College, where she earned her associate degree and held membership in *Phi Theta Kappa* Honor Society. At UT Arlington, she was awarded the Outstanding Transfer Student Scholarship and became an active member (and officer) of the Honors College. She was recognized as the Outstanding First-Year German Student by the Department of Modern Languages and also won the *Phi Alpha Theta* Kenneth R. Philp Undergraduate Merit Award for her first McNair research paper (summer 2008). Last year Anastasia presented her McNair research project at two national McNair conferences, and she also participated in ACES, the UT Arlington student research symposium. Anastasia will graduate by May 2010 and begin her graduate work next fall.

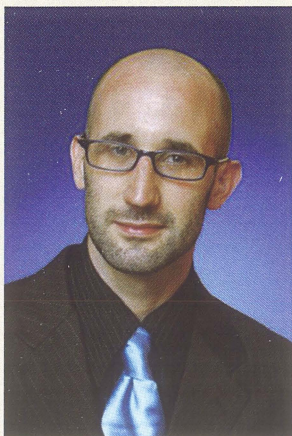
"McNair has been an invaluable experience for me. The program and its aims have been instrumental in my decision to attend graduate school. Through McNair I gained the insight and skills needed to tackle any project, no matter how daunting. As a result of my participation in McNair, I know that a doctorate degree is not far from my reach."

Need Based or Elitist: Undergraduate Funding at Harvard College from 1853 to 1872

Many undergraduates in the United States are dependent on some type of financial aid or scholarship to cover their tuition costs. Without such funding, these students would not be able to afford an undergraduate education. As tuition costs continue to increase, the number of students relying on financial aid to defray all or some of their expenses is greater than before. In a society supposedly built on the principles of merit and hard work, many deserving students might find themselves barred from higher education. Therefore, American colleges have the task of ensuring that their institutions do not become a realm for only the wealthy. In 1853, Harvard College became one of the first known American institutions of higher learning to offer undergraduate scholarships. These scholarships were available to those students who had demonstrated both need and merit. From their inception, these scholarships challenged the university administration to balance both criteria in the process of selecting qualified and deserving applicants. My project analyzed 237 letters written by former scholarship recipients in response to a survey organized by Harvard College in 1878. The main focus of my research was to evaluate these letters with regard to the social profile of scholarship holders and the function of these scholarships in the creation of an educated elite.

Mentor:
Dr. Thomas Adam
Department of History





Christopher Mangus

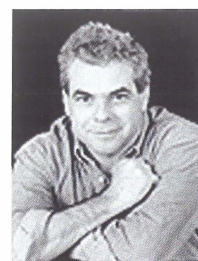
Art—Film/Video Major

Chris Mangus was born in Concord, Massachusetts. Prior to enrolling at UT Arlington, he attended the Art Institute of Dallas. A member of the Student Film Video Organization, Chris was a finalist in the 2007 Annual Photographers' Forum College Photography Contest; in 2008 he won second place in the UT Arlington Spike Lee Exhibit for his short documentary *Hip Hop Government*. Chris is also completing a feature-length documentary film related to his McNair research on the history of mass transit in Arlington, Texas. In October, he was funded by the McNair program to attend the 2009 Hot Springs Documentary Film Festival. Chris will attend graduate school after he earns his BFA in 2011.

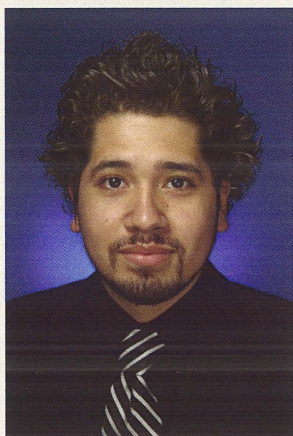
Acceptance into the McNair Scholars program granted me the opportunity to conduct full-time, in-depth research that I would not otherwise have had. As an aspiring documentary filmmaker, I understand the value of research and its necessity in the production of films. This experience gave me the resources, knowledge, and confidence to successfully pursue further research in the future.

The "Vandergriff Years" and the Growth of Arlington

With a land area of approximately one hundred square miles and a population of roughly 360,000, Arlington, Texas, ranks as the largest city in the United States without a public transportation system. In a classic example of suburban sprawl, city leaders past and present aggressively annexed and re-zoned available land until Arlington's physical growth was halted by its neighbors' borders. And while the city's density is still rather low at 3,600 residents per square mile, census estimates predict it will be home to 600,000 residents by 2030, a future density of 6,000 people per square mile. Arlington was planned, for better or worse, to be a sprawling, low-density and entertainment-minded suburb on the model of Anaheim, California. Under the leadership of the legendary Mayor Tom Vandergriff, who served 1951-1977, Arlington expanded rapidly through aggressive annexation and re-zoning of land. From a population of less than 8,000 in 1950, Arlington grew to a city of about 160,000 residents by 1977. At no time in his twenty-six years as mayor did Vandergriff and other city leaders create solutions to meet its transit needs. Besides the growing public transit needs of Arlington in the last century, this paper examines the 2002 city transit election, focusing on the circumstances and factors in its failure. Contributing to the proposal's defeat were certain vocal anti-transit groups (AIM, SMART), the lack of a proposed rail provision, public fears of subsidizing such a venture, especially after the demise of a city-funded marine theme park, the pressing need for street repair, and other factors.



Mentor:
Bart Weiss, MFA
Department of Art and Art
History (Film/Video)



Neri Sandoval-Villa

English Major
and Mexican American Studies Minor

Neri was born in Morelia, Mexico, and grew up in Dallas. While at Molina High School, he participated in the STARS program working with Dr. Borek of UT Southwestern Medical Center on crystallizing proteins. Prior to UT Arlington, Neri attended The University of Texas at Austin. Neri is an Honors College member (and HC mentor for UTA Hosts), an active participant in UTA Volunteers, and the Information technology coordinator for the National Society for Leadership and Success. He was also awarded the Academic Achievement Scholarship for Continuing Students and was admitted to *Phi Kappa Phi* Honor Society. In November, Neri presented his research at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin. Neri will begin graduate studies after he earns his BA in May 2011.

"The McNair Scholars program and Dr. Arcé facilitated a summer research experience of reading, writing, editing, polishing and presenting my ideas. Prior to joining McNair, I entertained the idea of applying for graduate program. But now, new opportunities have emerged and I have a list of universities to apply for in 2010."

The Angels living in the Desert: Ecocriticism in Arturo Islas' novel *The Rain God*

During the Chicano movement, the Southwestern desert region emerged as the focal point for the political and literary movement of the 1960s and 1970s. For the Chicano community, the desert became a landscape of possibilities, one in which a different social reality could be crafted. This stood in direct contrast to representations of the desert in traditional American literature, where the desert was often associated with death. In part, this is an inherited legacy of Judeo-Christian religion where the desert is the landscape of destruction, decay, isolation, punishment, and temptation. Consequently, for those who inhabited the Southwestern desert such as Chicano author Arturo Islas, traditional biblical representations of the desert proved problematic. In this essay I argue that Arturo Islas' award winning novel, *The Rain God: A Desert Tale*, repudiates traditional imagery of the desert as a dry landscape of death to provide alternative interpretations of life/death cycles within traditional Judeo-Christian beliefs. I explain how previous research on the novel has not provided a thorough discussion of the desert as a central theme that directly impacts the life/death cycles in the Angel family. Methodologically, I provide an ecomarxist reading of *The Rain God* and isolate the desert as a place key to understanding the novel's representation of race and class.

Mentor:
Dr. William Arcé
Department of English





Derrick Love-Jones

Nursing Major

Derrick was born in Tulsa, Oklahoma. He is an Air Force veteran and a Certified Emergency Medical Technician-Paramedic. Prior to UT Arlington, Derrick attended Dallas County Community College, where he was selected for *Phi Theta Kappa* Honor Society. Derrick also appeared on the National Dean's List (2007) and has volunteered with his church and other community organizations. In November, Derrick presented his research at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin. Anticipating a May 2010 graduation, Derrick is currently exploring various graduate school options.

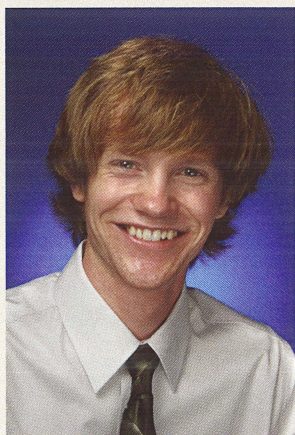
"Being a McNair Scholar has been a wonderful learning experience in which I've been able to immerse myself in research and prepare for teaching. Possibly having my research study published and receiving a grant to do a follow-up study have presented new career opportunities for me in the field of nursing. Thank you UT Arlington and the McNair Scholars Program for being instrumental in preparing me to continue my research and successfully navigate graduate school."

Wheelchairs and Stretchers: An Infection Danger?

Healthcare equipment has been identified as a likely source of infections. Research indicates that up to one-third of all nosocomial infections (NIs) may be prevented by adequate cleaning of equipment. Many studies have investigated several types of pathogens on hospital equipment such as stethoscopes, water basins and blood pressure cuffs, but none address specifically the types of pathogens or the infection risks of wheelchairs and stretchers. These two items are the primary means of patient transportation throughout a facility and should be cleaned routinely. This study will test for the presence of multi-drug resistant pathogens—methocillin resistant *Staphylococcus aureus* (MRSA), Vancomycin resistant *Enterococci* (VRE), and *Acinetobacter baumannii* microorganisms—on wheelchairs and stretchers that put patients at risk for acquiring NIs. It is clear from this study that wheelchairs and stretchers serve as a reservoir for pathogens that cause NIs. Hospitals need improved infection control practices such as hand-washing between patients, hand-washing by patient family members and disinfecting of equipment used to transport patients while visiting the hospital. The data gathered in this study will help policy makers set protocols for cleaning wheelchairs and stretchers to decrease the risks of acquiring NIs during hospital stays thereby resulting in reduction of total hospitalization costs.



Mentor:
Deborah Behan (Ph.D. candidate)
School of Nursing



Matthew A. Davis

Psychology Major and Biology Minor

Matt was born in Arlington, Texas, where he attended Sam Houston High School. He is a member of *Psi Chi* Honor Society, the Society for Neuroscience and the American Pain Society. He has worked on undergraduate research projects with both Dr. Yuan Bo Peng and his McNair mentor, Dr. Perry Fuchs. Matt presented posters at the Society for Neuroscience Annual Conference in 2008 (Washington, D.C.) and 2009 (Chicago). In addition to applying to graduate programs, Matt is submitting an application for a National Institutes of Health internship.

“Being in the McNair Scholars program has allowed me to research the unknown and contribute new knowledge to the scientific community. The experience I have gained while in the program will prove to be invaluable in furthering my academic and scientific career.”

Impact of Bilateral Primary Somatosensory Cortex Lesion on Mechanical Hypersensitivity and Escape/Avoidance Behavior

Melzack and Casey first described a model of pain in 1968 that consisted of multidimensional sensory, motivational and affective components. Efforts to understand underlying mechanisms have focused on the medial and lateral pain processing systems. The purpose of this study was to examine the role of the somatosensory cortex (S1) in both sensory and affective aspects of pain processing. It was hypothesized that animals with S1 lesions would demonstrate altered sensory processing in a chronic inflammatory state as shown by elevated mechanical paw withdrawal thresholds (MPWT), compared to animals with sham or somatosensory barrel field lesions, following subcutaneous injection of complete Freund's adjuvant (CFA). All animals were expected to demonstrate increased paw volume compared to pre-injection values, confirming the presence of the inflammatory condition despite any differences in MPWT values. It was also hypothesized that S1 lesioned animals would show preference for the light side of the chamber when tested in the place escape/avoidance paradigm (PEAP). During this test the animals receive repeated stimulation to the uninjured paw, as opposed to stimulation of the inflamed paw in the dark side of the chamber. The results showed that S1 lesions altered responses to mechanical stimulation in the presence of CFA-induced inflammation, but did not alter the inflammation-induced paw volume changes or the level of pain affect as demonstrated by the PEAP. Overall, these results confirm previous studies suggesting that the S1 is primarily involved in processing the sensory/discriminative dimension of pain, while other systems are more important for the processing of pain affect.



Mentor:
Dr. Perry N. Fuchs
Department of Psychology



Steven Emenhiser

Environmental Geology Major

Steven was born in Fort Worth, Texas. He attended Tarrant County College prior to UT Arlington. While at TCC, Steven was selected to travel to Bavaria, Germany, for field geology and to Salzburg, Austria, for the global *How America is Perceived in the World Conference*. At UT Arlington, Steven was chosen to participate in Dr. John M. Holbrook's NSF Research Experience for Undergraduates summer 2008 project mapping the Missouri River Basin. He spent six weeks in the field, later presenting the results at the Missouri River Commission annual meeting. Steven has won numerous scholarships and tutored at the elementary and college levels. He is a member of *Sigma Gamma Epsilon* Geology Honor Society and *Phi Kappa Phi* Honor Society. Steven will graduate in spring 2011 and then begin graduate work.

"It was a fantastic experience in the McNair Scholars program here at UTA! I got to research my own original topic and present it and publish it, and the program paid for everything. I learned advanced research methods and gained valuable laboratory experience under the supervision of a geosciences professor."

Lanzhou Street Dust Particle Analysis

The city of Lanzhou is considered as one of the most polluted cities in China and is one of the dirtiest cities in the world. The city is highly industrialized and dominated by major petrochemical, manufacturing and oil refining operations. Studies have found that Lanzhou has the highest rates of respiratory diseases in China. Obtaining element fingerprints for metal particles in dusts from different city locations can potentially provide information on the origins of the contamination of the dust. The aim of this study was to investigate the composition of the metal-bearing particles in street dust from Lanzhou by Computer Controlled Scanning Electron Microscopy (CCSEM) in order to assess the origins of these metals. Four street dusts from Lanzhou were submitted for CCSEM analysis. The analysis was configured to capture data from only the heavier element particles in the samples (average atomic number $> \text{Fe}$ and $< \text{Ti}$). The composition of between approximately 2,500 and 6,000 particles was automatically characterized in the SEM. A variety of heavy metal-bearing particles was observed, namely Pb-, W-, Cu-, Ni-, Cr-, and Zn-bearing. In addition, the metal-bearing particles presented very different morphological forms. Different proportions of the specific metal-bearing particle types were found in each of the street dusts. Combining the composition and particle morphology information, it was inferred that some particles were from high temperature processes, some were the result of industrial abrasion processes and some were from the general break-down (corrosion) of urban/industrial materials. Subsequent study of additional dusts should provide further insights.

Mentor:
Dr. Andrew Hunt
Department of Geology





Sharon Hernandez

Biology/Microbiology Major and Chemistry & Spanish Minors

Sharon was born in Alpine, Texas, but grew up in Presidio. While in high school she participated in the Upward Bound Math Science Program at UT Arlington, and was also awarded a Gates Millennium Scholarship. A member of the Honors College, Sharon also belongs to the Microbiology Society. In 2005, she won the Freshman Interest Group Einstein Award. Sharon presented her McNair research in fall 2009 at the Society for the Advancement of Chicanos and Native Americans in Science Conference (Dallas) and at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin. She plans to start graduate school in fall 2010, after she graduates in May.

"The McNair program has made me a better student and therefore opened new opportunities for achieving a higher education. The program is wonderful in that it provides students with all the necessary tools and preparation for graduate school. Being a McNair Scholar has by far brightened my experience here at The University of Texas at Arlington."

Repeated Horizontal Transfer of a DNA Transposon, *SPACE INVADER (SPIN)* in Squamates

Transposable elements (TE) are DNA sequences capable of changing from one location to another within a genome. Their insertions are potentially responsible for chromosomal rearrangements that can lead to genetic diseases. It is therefore important to study their transposition mechanisms to better understand their impact on the evolution of genomes. Studies have shown that TEs can in fact co-evolve along with their hosts via vertical inheritance, the movement of DNA through generations. However, recent studies have reported the invasion of a DNA transposon family called *SPACE INVADER (SPIN)* in seven tetrapod species, including species from five mammalian orders and the anole lizard, via horizontal transfer (HT). HT is the lateral movement of DNA between species that are sexually isolated and is more common in bacteria than in eukaryotes. Since the anole lizard was the only reptile previously studied, we have little knowledge of the distribution of *SPIN* within these taxa. Therefore, we sampled members of the squamate group (snakes and lizards) to find if other reptilian species have been sequestered by these elements and to verify how many more HT events may have taken place. In summary, most of the species in our study had either nonautonomous or autonomous or both *SPIN* copies present in their genome, indicating at least 20 independent horizontal *SPIN* invasions. Further work will focus on a more thorough dating of the different *SPIN* invasions in the various squamate taxa and on the geographical distribution of *SPIN*-positive species.



Mentor:
Dr. Cédric Feschotte
Department of Biology



Antonio Lopez

Mathematics Major and French Minor

Antonio, born in Puebla, Mexico, participated in the McNair Research Internship for the second time in summer 2009. A member of the Honors College, the National Society of Collegiate Scholars and Golden Key, Antonio also engaged in the NSF Research Experience for Undergraduates (under Dr. Aktosun) and has received numerous undergraduate awards and participated in mathematics conferences throughout the United States. He graduated in August and entered the doctoral program in mathematics at UT Arlington in fall semester 2009, receiving several scholarships and fellowships to support him at the graduate level.

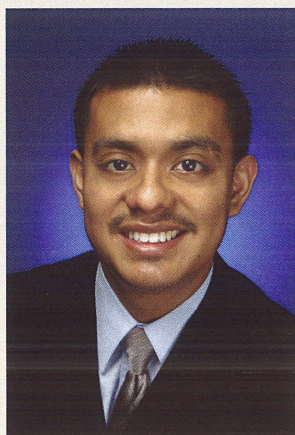
"My participation in the McNair Scholars program has enabled me to start doing research at the undergraduate level and that has helped me to see mathematics in a completely different way. Not only has it shown me the importance of doing research, but it has also motivated me to go to graduate school with the goal of obtaining a Ph.D. It has helped me to successfully complete my undergraduate studies, obtain my bachelor's degree, graduate with honors and be accepted in the doctoral program in mathematics at UT Arlington, where I am currently a graduate student."

Mathematical Aspects of Photonic Crystals

Photonic crystals have become an area of high research interest due to their ability to affect the propagation of electromagnetic waves. Photonic crystals are nanostructures exhibiting the interesting behavior that light at certain frequencies cannot travel through them, whereas at other frequencies it can. The mathematical aspects of photonic crystals are investigated in this work. Due to the periodic nature of the refractive index, light or electromagnetic waves at some frequencies cannot travel in a photonic crystal and such frequencies are known as forbidden frequencies. On the other hand, if light at a particular frequency is able to travel in the crystal, then that frequency is known as an allowed frequency, and all allowed frequencies are said to make up the spectrum of the crystal. The goal is to discover a systematic way to determine all the allowed and forbidden frequencies when the periodic structure of the refractive index of the photonic crystal is known. For this purpose, Maxwell's equations, which describe the electromagnetic wave propagation of the photonic crystal, are investigated. The partial differential equations obeyed by the electric field and magnetic field are written in the frequency domain in a way that the frequency appears as a spectral parameter. Bloch's theorem is then used to determine all the allowed frequencies. Various cases of periodic refractive indices are considered such as a layered medium in which the refractive index is a function of one spatial variable only and where that refractive index is approximated by a piecewise constant function of location.

Mentor:
Dr. Tuncay Aktosun
Department of Mathematics





Andrew Palacios

Biology Major and Chemistry Minor

Andrew is a native of Dallas, Texas. He attended Townview Magnet High School (Health Professions), where he participated in research at area medical and dental schools. A Certified Emergency Medical Technician, Andrew has volunteered as a translator at the Methodist Hospital of Dallas. At UT Arlington, Andrew has won several awards (including the Academic Connections and the NSF UTTER Scholarships) and is a member of the Medical and Dental Preparatory Association, the Chess Club, and is a founding member and VP of the National Society of Leadership and Success. In October he won first place in Environmental Science for his poster at the Society for the Advancement of Chicanos and Native Americans in Science Conference (Dallas). He also presented his research at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin. Andrew will graduate in 2011 and then attend graduate school.

"The McNair Scholars program further fueled my inspiration to continue my education beyond a secondary education and into research. My research opportunity allowed me to learn numerous chemical tests not taught at an undergraduate level, while giving me a profound understanding of life at a micro level. The opportunity to cultivate a professional relationship with a scientist in my field of interest is what I most appreciate about the McNair Scholars program."

Growth of *Prymnesium Parvum* (Haptophyta) as a Function of Different Water Media

Prymnesium parvum (golden alga) forms harmful algal blooms. The recent apparent increase in incidences of algal blooms is worldwide. Since its arrival in Texas in 1985, *P. parvum* has killed thousands of fish and has directly affected fishing and tourism around some of the major water reservoirs in Texas. This experiment provides a direct comparison of *P. parvum* growth in laboratory media versus growth in natural lake waters of Texas. Five sets of water media were compared in a 21-day time period: a standard artificial medium (ASW), unaltered lake water (U), lake water with added salt (+S), lake water with added salt and nutrients (+SN), and lake water with added nutrients (+N). Results showed that *P. parvum* grows equally well in ASW, Lake Granbury +SN, and Lake Waco +SN. While growth in neither water medium was significantly greater than in the others, the ASW still provided the highest cell density count after a 21-day time span. This study is important because *P. parvum* poses toxic threats to water resources in Texas. It is currently uncertain what causes these algae to "bloom" and release their toxins. Effective means to manage *P. parvum* and its negative impact have yet to be established.



Mentor:
Dr. James Grover
Department of Biology



Crystal Red Eagle

Physics Major and Classical Studies & Mathematics Minors

Crystal resides in Fort Worth, Texas. In summer 2008 she participated in the NSF Research Experience for Undergraduates Program through the UT Arlington Mathematics Department (under Dr. Tuncay Aktosun). She has also conducted research on space physics with Dr. Ramon Lopez and served as an undergraduate teaching assistant in astronomy. Crystal has won numerous awards and scholarships including the International Order of Odd Fellows Education Scholarship, the Physics AACCESS Scholarship, and the 2009 Friends of the UTA Library McNair Scholarship. She has been involved in Olympus Mons Astronomy Club and the Society of Physics Students (past/current treasurer). In fall 2009, she presented her McNair research at the Society for the Advancement of Chicanos and Native Americans in Science Conference in Dallas and at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin. Crystal graduates in May and plans to begin graduate school next fall.

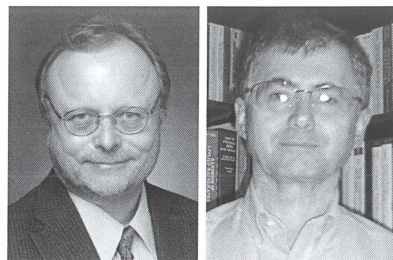
"When I found out about the McNair Scholars program, I knew that I had to be a part of it. It offered all the opportunities for research and help with graduate admissions that I wanted and needed to reach my seemingly unobtainable goals. I am extremely fortunate and honored to be a McNair Scholar."

Modified Newtonian Dynamics and Other Alternatives to the Theory of Dark Matter

An investigation of different alternative theories to explain the proposed presence of the elusive "dark matter" is presented. Newton's Second Law and the gravitational force equations are used while incorporating an experimental version of Modified Newtonian Dynamics (MOND). This is done using an acceleration-scaled modification and an experimental-length scaled modification of a specific form of the Yukawa potential. Both modifications are described and compared to the theory of dark matter. This study is based on mass calculations for the experimental Yukawa potential alternative to dark matter. These are compared to the classical equations for mass calculations which, by implication, include dark matter. Derivations of the classical and revised experimental-length scaled equation for $M(R)$ are shown with explanations on important features. Four galaxies were chosen: NGC 1620, NGC 3145, NGC 4378 and NGC 7664, whose rotational curves, and therefore orbital speed at distances from the center, have been previously deduced by observations. Several data points were taken from the rotation curves and entered into the classical and revised Yukawa potential equations derived for $M(R)$ in order to compare the results. When the results of $M(R)$ in the classical and experimental revised Yukawa potential equation data are compared, several conclusions are made. Some interesting and unexpected results are obtained. The benefits and disadvantages of MOND and the revised Yukawa potential modification are briefly discussed regarding future research.

Co-Mentors:

Dr. Manfred Cuntz, Dr. Zdzislaw Musielak
Department of Physics





Stephanie Rivera Fenniri

Interdisciplinary Studies/Urban Planning Major
and Mexican American Studies Minor

Stephanie was born in Mesquite, Texas, but currently lives in Dallas. She is a member of the Honors College (HC) and has served in numerous campus organizations, including secretary of the HC Council (2008-09), current HC advocate, presenter at the Cultural Connections Conference (2009), an officer in UTA Volunteers and a member of the Multicultural Affairs Diversity Team. She has won many scholarships and awards, including the Honors Presidential Scholarship and the Women of Excellence Award. Stephanie attended the Lone Star Diversity Conference (2009) and presented her McNair research at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin and at the Honors Undergraduate Research Conference in November. She graduates in May and will start graduate school next fall.

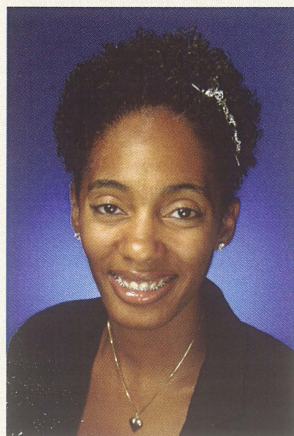
"The McNair experience provided me with the opportunity to engage in a level of research that otherwise may have not been possible. Not only was I able to work one-on-one with an expert in the field of study, Dr. Martinez-Cosio, but the research process also aided in making me aware of the ways I can positively impact the community through my scholarship. The experience further fueled my desire to pursue a career in urban planning and obtain a Ph.D. so that in the future I may serve as mentor to others."

The Impact of Gentrification on Latino Families in East Dallas

This research explores the views of Latino homeowners to the impending gentrification of their neighborhood in the Southwest region of the United States. The targeted neighborhood is in an area of Dallas experiencing rapid commercial development and residential transformation. Mostly Spanish-speaking Latino homeowners' experiences are analyzed through an interdisciplinary approach. Previous studies on Latinos and gentrification focus on major East-Coast cities. There is not a significant amount of research about Latino displacement in the Southwest, despite U.S. Census data showing Latinos as the fastest growing minority group in the United States. According to Kennedy and Leonard (2001), indigenous residents of inner cities are dually displaced by gentrification because they lose their homes and any potential opportunities presented by neighborhood change. Interviews were conducted with 15 Latino families in Lower Greenville, an older neighborhood in Dallas, Texas. The questions in the interview included information pertaining to quality of life, education, employment and Latino residents' relationship with middle-class "gentry." Findings indicate that Latino homeowners have a strong sense of place, supporting Logan and Molotch's (1987) use versus exchange value concepts. Despite the changes taking place in the community, Latino homeowners in the study area were adamant about staying in their homes and their strategies for resisting gentrification are analyzed. Policy recommendations include developing a formula for making a percentage of a gentrifying neighborhood available to developers, and the development of a process to integrate a community's cultural characteristics into the new developments rather than marginalizing local residents.



Mentor:
Dr. Maria Martinez-Cosio
School of Urban and Public Affairs



Juandell Parker

Interdisciplinary Studies/Biology Major

Born in St. Louis, Missouri, Juandell is now a resident of Bedford, Texas. After graduating from high school, she joined the U.S. Navy and did college-level work at several institutions. Juandell earned her associate degree and a certificate in biotechnology from Mountain View College. She is also a member of *Phi Theta Kappa* Honor Society. In spring 2009 she attended the Lone Star Diversity Conference and last fall she presented her research at the 18th Annual National McNair Scholars Research Conference in Delavan, Wisconsin. Juandell was also a recipient of the Friends of the UT Arlington Library 2009 McNair Scholarship. She intends to begin graduate work in fall 2010 after graduating in May.

"My summer research has served as a foundation for future research, to which I will continue to contribute. Through my McNair research experience I assisted on the project design, wrote a detailed essay covering my research and presented my findings to an audience of university professors and students. While challenging, the experience I have gained is incalculable."

The Influence of Temperature on the Virulence of *Vibrio Alginolyticus* and *Serratia Marcescens* (Pd1100)

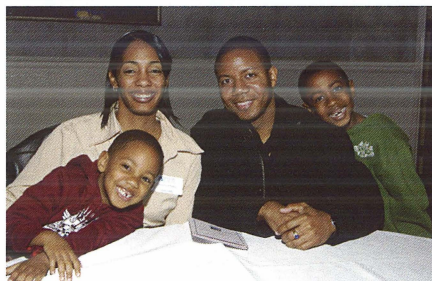
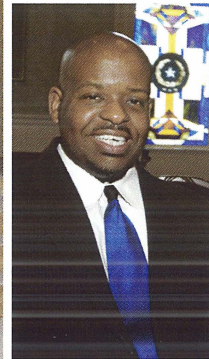
Massive outbreaks of disease have devastated coral populations around the globe. A number of bacteria are known to be affiliated with coral disease, and temperature has been shown to play a pivotal role in the way bacteria that inhabit coral normally function. We examined the effects of temperature on several different bacterial virulence factors: bacterial growth, protease activity, hemolytic activity and anti-bacterial activity. This study investigated *Vibrio alginolyticus* and *Serratia marcescens* (Pd1100), two specific bacteria suspected to initiate disease in thermal-stressed coral. Our work established that temperature has a direct correlation with the virulence of *V. alginolyticus* and *S. marcescens*. While the results from the allelopathic interactions and protease activity revealed no clear trends, the growth rates as well as the hemolytic capabilities of *V. alginolyticus* and *S. marcescens* were shown to be influenced by environmental temperature. These data support our hypothesis that increases in temperature cause the virulence of *V. alginolyticus* and *S. marcescens* to intensify. Further investigation must be conducted to understand fully how thermal anomalies impact coral.

Mentor:
Dr. Laura Mydlarz
Department of Biology

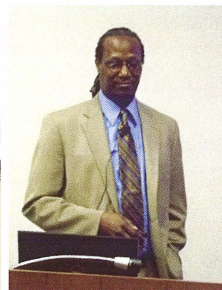


Year at a Glance

New Scholar Reception



Presentations



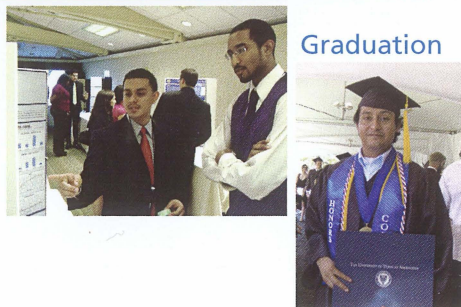
Summer Research Banquet



National McNair Conferences (Texas and Wisconsin)



Graduation





UNIVERSITY OF
TEXAS
ARLINGTON