

Annual Report 2008-2009

WAKE FOREST UNIVERSITY
Office of Research and Sponsored Programs



WAKE FOREST
UNIVERSITY

OFFICE OF RESEARCH AND SPONSORED PROGRAMS STAFF

Lori Messer, MPA, CRA, Director

Stephen L. Williams, CRA, Assistant Director

Pam Moser, MPH, Associate Director for Faculty Research Compliance & Support

Julie Edelson, PhD, Editor, Researcher

Susan Edwards, Coordinator, Research Services

MISSION

Wake Forest University's Office of Research and Sponsored Programs assists the Associate Provost for Research and Faculty Affairs in building faculty research programs of nationally recognized excellence. Our mission is to assist faculty in their pursuit and management of sponsored activities; to encourage and to support ethical research achievement, especially involving human subjects, in compliance with all relevant laws and regulations; to protect the university's interests; and to acknowledge and publicize faculty distinction.

The Office of Research and Sponsored Programs gratefully acknowledges Ken Bennett's photographs.



ASSOCIATE PROVOST FOR RESEARCH AND FACULTY AFFAIRS

Dear Colleagues,

Congratulations on a fantastic year for research and creative work. In 08/09 we saw an 11% rise in proposal submissions and a whopping 66% increase in dollars requested from external sponsors. On the pages that follow you will find details of this work broken down and reported by sponsor as well as by department. You will also find some feature stories on funded projects and fellowships awarded to our faculty.

As many of you also know, such a year could not have happened without the hard work of our staff in the Office of Research and Sponsored Programs. Lori Messer, Pam Moser, Stephen Williams, Julie Edelson

and Susan Edwards go above and beyond the call of duty to be encouraging and to help faculty submit proposals successfully. In this vein, we also provide quantitative information about the variety of things that our ORSP staff work on in a typical year as well as reporting on how we invest our internal funds to help faculty research and creative work.

Thanks again for all of the hard work you do to obtain external support on behalf of Wake Forest University.

Sincerely,
Mark E. Welker

OUTSTANDING PROJECTS



Ola Furmanek, Associate Professor of Spanish, won support from the Piedmont Triad Partnership to advance the *Piedmont Triad Healthcare Spanish Interpreting Initiative*.

The Romance Languages Department, Maya Angelou Center for Health Equity, North Carolina Baptist Hospital, Forsyth Technical Community College, and Davidson County Community College seek to remediate the urgent need for healthcare interpreters to serve the Spanish-speaking population. They will first develop and implement a curriculum to train community college faculty to teach medical interpreting to undergraduates and then develop and implement an associate degree curriculum for Spanish-language medical interpreters.



Rebecca Alexander, Associate Professor of Chemistry, Assistant Professor of Biology
Erik Johnson, and **Patricia Dos Santos**, Assistant Professor of Chemistry, used funding

from the North Carolina Biotechnology Center to develop the *Biotechnology Partners Fellowship Program*. Wake Forest undergraduates and faculty mentors partner with counterparts at Salem College and NC A&T University in synergistic summer biotechnol-

ogy research projects. Kaitlin Hamilton from Salem College and Wreanna Ward from WFU worked on complementary aspects of Dr. Johnson's experimental work, while Dr. Dos Santos mentored Dalila Fryer from NC A&T and Emily Earles from WFU.

In addition, with **Shannon Mihalko**, Associate Professor of Health and Exercise Science, and **Harry Titus**, Professor of Art, Dr. Alexander helped to found the URECA Center to promote undergraduate research and creative activities across the College of Arts and Sciences. It aims to facilitate faculty/student partnerships to study and to create new knowledge or works through incentives and other resources and to showcase undergraduate research and creative works in various ways, including an annual fall Undergraduate Research Day.



Susan Smith, Head of Research, Instruction, and Technology Services at Z. Smith Reynolds Library, won a 3-year grant from the Institute of Museum and Library Services to support

Digital Forsyth. This collaboration among Z. Smith Reynolds Library, the School of Medicine's Coy C. Carpenter Library, the Winston-Salem State University Archives at the C. G. O'Kelly Library, and the Forsyth County Public Library contextualizes and posts photographs from their collections online, focusing on people, places, businesses, institutions, and events significant to state and national cultural heritage.

OUTSTANDING PROJECTS



Uli Bierbach, Associate Professor of Chemistry, has won a National Institutes of Health grant to explore *Novel DNA-metalating Hybrid Anticancer Agents* that, in animal studies,

have proved ten times more effective than current treatments. His unique chemical approach has produced the new, platinum-based treatment to manage aggressive, previously intractable tumors that account for more than three-quarters of all lung cancers, the leading cause of cancer-related death in both men and women. This multifaceted research program at the intersection of anticancer drug development and structural and molecular biology is performed in collaboration with Associate Professor Greg Kucera in the Department of Cancer Biology and a team of graduate and undergraduate students and postdoctoral associates.



Jed Macosko, Assistant Professor of Physics, had a stellar year. First, he and two Wake Forest alumni won a Digital Media & Learning award from the MacArthur Foundation for *Cell-*

Craft, a video game that teaches children how cells work. Second, the North Carolina Biotechnology Center will fund *Visualizing Biotechnology in Three Dimensions* in which 15 Atkins High School seniors

will create animations showing how biotechnology harnesses cellular machinery to cure diseases, detect biohazards, and manufacture new materials. Third, NCBC will also support *Drug Discovery at the Nanoscopic Level: Lab-On-Bead™ Processing of Encoded Chemical Libraries*. In partnership with biotechnologists at Harvard and the Université Louis Pasteur, this project aims to validate bead reagent kits and microfluid instruments to discover new drugs and diagnostics. Fourth, the National Institutes of Health AREA-awarded *Better, Faster Live-Cell Imaging: Motion-Enhanced DIC (MEDIC) with Fluorescence* will develop a novel light microscopy imaging system to visualize how human cellular machinery moves submicroscopic cargo crucial to health. An administrative supplement creates summer research jobs on the project for K-12 teachers and undergraduate students.



Fred Salsbury, Associate Professor of Physics, has won his first National Institutes of Health R01 award, *Targeting the MSH2-dependent Apoptotic Pathway*. This multidisciplinary project involving physical modeling, chemical synthesis, cell biology, and animal models aims to develop lead compounds for a novel chemotherapeutic that selectively activates a cell death pathway by binding to specific protein conformations. In addition to its medical relevance, it demonstrates the importance of dynamics in drug design and the role of physics-based modeling in understanding dynamics.

OUTSTANDING PROJECTS



Gloria Muday, Professor of Biology, is Principal Investigator, with Co-PI Dean **Jacquelyn Fetrow**, Reynolds Professor of Computational Biophysics, and senior personnel Mathematics Professor **Edward Allen**, and **William Turkett**, Assistant Professor of Computer Science, for the *Arabidopsis 2010 Collaborative Research Project: Modeling Biological*



Networks in Arabidopsis through Integration of Genomic, Proteomic, and Metabolomic Data, funded by the National Science Foundation. It brings together six research groups from WFU and Virginia Tech with expertise in genomics, proteomics, metabolomics, and computational systems biology. The project aims to determine how hormonal controls of gene expression are linked to changes in protein synthesis and metabolite accumulation, focusing on a class of metabolites that includes compounds, such as flavonoids, that are important as antioxidants in human diet and modulate plant growth and development. Studies will produce a comprehensive map of these functions in *Arabidopsis thaliana*, a small flowering plant that was first to be sequenced. The project will train undergraduate and graduate students and postdoctoral researchers and partner with local and national groups to develop K-12 student opportunities.



Clifford Zeyl, Associate Professor of Biology, has achieved continuous external funding since coming to Wake Forest. He currently holds two awards from the National Science

Foundation and has won REU supplements each year to support summer participation for a Wake Forest undergraduate. *Evolutionary Advantage, Recombination, and Adaptation in Experimental Yeast Populations* experimentally tests three conflicting hypotheses proposed to explain the evolutionary success of sexual reproduction. Undergraduate and graduate students gain education and training in the methods of both classical yeast genetics and molecular genetics and genomics. *Mating Behavior in Allopatric and Sympatric Postzygotically Isolated Populations of the Model Saccharomyces paradoxus* looks at the processes causing genetic isolation between a yeast population in the process of becoming a new species and its closest relatives. It tests the mating preferences of individual cells from each population and studies their genetic basis and ecological context.

FELLOWSHIP AWARDS

Carolyn Couch, Associate Director of Career Services, is one of 25 nationwide chosen to participate in a Fulbright International Education Administrators group seminar on German higher education and society. The group will visit universities in Berlin and other cities.

LeRhonda S. Manigault, Assistant Professor of Religion, has been awarded the Louisville Institute's First Book Grant for Minority Scholars and a Ford Foundation Diversity Fellowship. She will complete her book, "Ah Tulk to de Dead all de Time": *Religion, Music, and Lived Memory Among Gullah/Geechee Women*. It is an ethnographic study of ten African-American women in coastal South Carolina and the communicative, religious practice they call "talking to de dead." This perceived ongoing exchange between living and deceased members of the community is facilitated by socio-cultural activities, such as storytelling and sweetgrass basketry, but more often revealed through prayer and singing sacred songs. Gullah/Geechee religion blends African and Christian practices, and the women who talk to the dead in no way view it as antithetical to their Christian identities. Rather, they see it as a way to celebrate their past while promoting their Christian faith. This study's interdisciplinary method joins womanist thought, ethnomusicology, history, and anthropology, and integrates scholarly and lived perspectives on religion to deepen our understanding of African-American women's contributions to American religion.

This year, Wake Forest won 2 of 30 Ralph E. Powe Junior Faculty Enhancement Awards, which provide seed money for research by outstanding junior faculty at Oak Ridge Associated Universities (ORAU) member institutions.



Jennifer Erway, Assistant Professor of Mathematics, will develop and implement *Optimization Methods for Solving the Einstein Constraint Equations*.

Up to now, attempts at a solution have relied on ad hoc approaches and Newton methods with restarts. This project will tailor unconstrained minimization work to solve the problem implicit in these equations using state-of-the-art nonlinear optimization techniques. It will also develop a class of preconditioners to help solve the linear system arising from each discretization.



Timo Thonhauser, Assistant Professor of Physics, in *Ab-initio materials modeling including van der Waals Forces*, aims to develop a new approach for conducting quantum-mechanical

simulations of water. It will enable researchers to effectively study a difficult-to-describe interaction that is essential to understanding many mysterious properties of water.

COMPLIANCE



ORSP provides administrative support to the Institutional Review Board (IRB) under 45 CFR §46. Pam Moser, Associate Director for Faculty Research Compliance and Support, maintains IRB records; facilitates communication between the IRB and researchers; coordinates meetings; updates and maintains the University's IRB policies and website; monitors training for researchers and other key personnel; provides continuing education for IRB members; and keeps the University's Federalwide Assurance (FWA) and IRB Registration current.

In 2008-2009, the IRB reviewed 153 new applications, an increase of 11%, consistent with the general increase in campus research initiatives. Eight studies were reviewed by the full board, 90 qualified as expedited review, and 55 as exempt research. In addition, 57 amendments, 24 continuing reviews, and 3 safety events were processed.

Training and support for eIRB, the electronic application submission and review system, continued for individual users across campus. Group outreach efforts targeted the Psychology Graduate Program, Babcock Graduate School of Management, and the Richter Scholar Program. Active protocols were submitted as paper applications will remain in paper until closed; however, fewer than 10 paper protocols were active by year's end.

Existing outreach programs continued for example, the IRB column in ORSP's bi-annual newsletter, *Research News*.

ORSP is gradually assuming oversight of potential financial conflicts of interest involving WFU research faculty. The University's Conflict of Interest Committee held two meetings this year to review potential conflicts disclosed by our research faculty. Guidance and support were provided by the WFUHS Office of Research Assistant Director for Conflict of Interest and the WFU Compliance Office.



PROFESSIONAL DEVELOPMENT INITIATIVES

In FY2009, the office spent over \$55K hosting and coordinating workshops and events, supporting research-related committees, and paying for faculty travel to sponsors and professional development seminars. Some of the supported events were:

- Creative Research Activities Development & Enrichment Program (CRADLE)
- New Faculty Luncheon
- North Carolina Biotechnology Center Workshop
- National Endowment for the Humanities Workshop
- Fulbright Workshop
- Recognition of Research Excellence
- Reception and Dinner to Honor Authors, Editors, and Fine & Performing Artists

The office edited 86 proposals and other documents and performed over 57 searches for funding opportunities. In addition, near the end of the fiscal year, we started meeting with faculty one-on-one to set up profiles in ResearchResearch.

INTERNAL AWARDS

The Office of Research and Sponsored Programs assists the Associate Provost for Research and Faculty Affairs in administering and coordinating several internal award programs. FY2009 awards are as follows:

Cross-Campus Collaborative Research Fund	\$143,898
Science Research Fund	\$67,842
Social, Behavioral, & Economic Sciences Research Fund	\$9,300
Centers	\$101,000
Bridge and supplemental funding	\$40,500

The office also assists the Associate Provost for Research and Faculty Affairs in managing matching/cost-share funds. In FY2009, \$257,464 was provided as match/cost share for faculty research projects and other support.

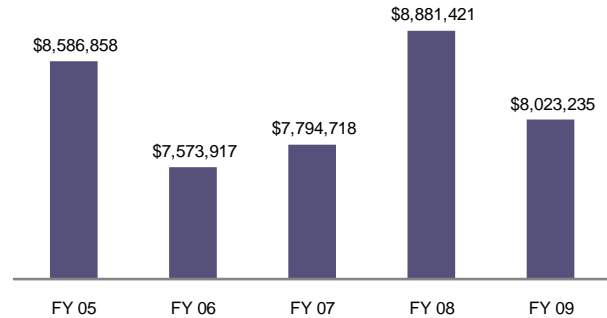
FUNDING HIGHLIGHTS

The statistics that follow summarize Reynolda campus sponsored research activity for Fiscal Year 2009. These graphs include funding processed through the Office of Research and Sponsored Programs and not gifts or the many fellowship awards made to individual faculty. Awards represent authorization to spend as opposed to research expenditures.

The big news this year is proposals. WFU Principal Investigators submitted 194 proposals, a record number. In addition, compared to last year, over \$32 million more dollars were requested. The increased proposal activity is directly related to the upcoming formation of new centers on campus. Several proposals were submitted to support centers as well as training grants for students. Approximately one-fourth of the proposals submitted were prepared by faculty in the Physics department.

Although awards were down, we had our third best year in terms of amount received. The Counseling department, the Provost's Office, and Romance Languages all received their first awards in Fiscal Year 2009. The National Institutes of Health sponsored 40 percent of all awards received either directly by WFU or through the School of Medicine.

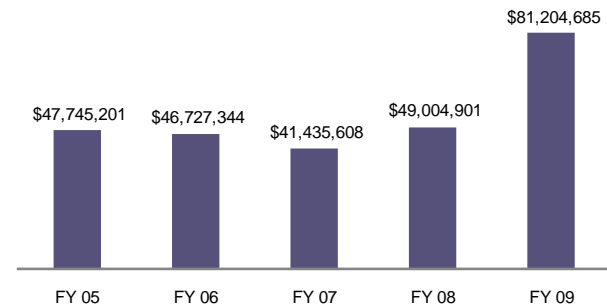
Awards Received Fiscal Years 2005-2009



Proposals Submitted Fiscal Years 2005-2009

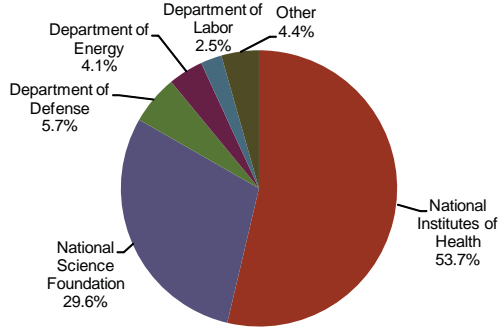


Amount Requested Fiscal Years 2005-2009

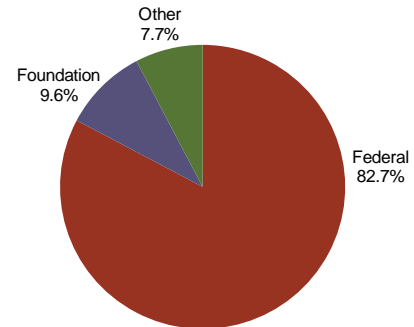


FUNDING HIGHLIGHTS

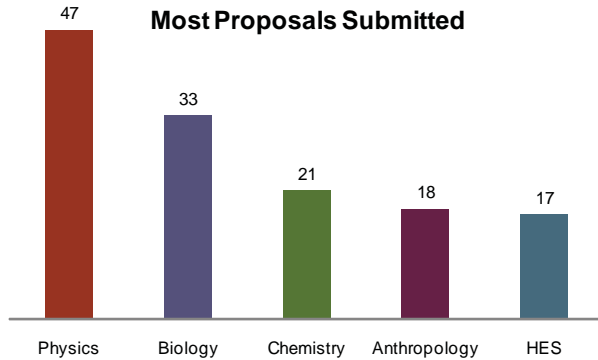
Federal Funding Breakdown



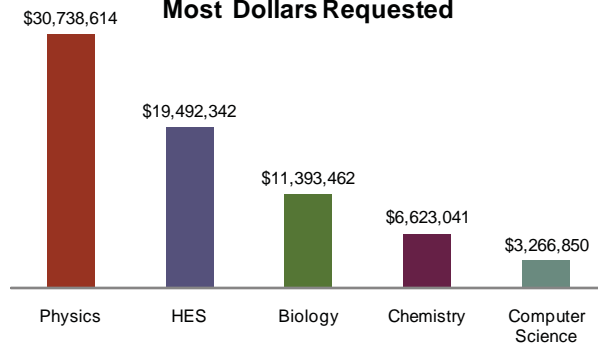
Awards by Source of Funding



Most Proposals Submitted



Most Dollars Requested



Department	Awards	Amount
Physics	33.5	\$2,519,760
Biology	14.0	\$1,608,734
HES	15.0	\$1,547,745
Chemistry	12.0	\$986,077
Computer Science	10.5	\$310,733
Entrepreneurship	1.0	\$230,513
Mathematics	7.0	\$177,586
Anthropology	14.0	\$163,192
Romance Languages	1.0	\$155,346
ZSR Library	1.0	\$90,117
Communication	2.0	\$84,194
Babcock	1.0	\$70,578
Graduate School	1.0	\$40,500
Counseling	1.0	\$14,031
Political Science	1.0	\$11,574
Psychology	1.0	\$9,055
Sociology	1.0	\$3,500



Office of Research and Sponsored Programs
117E Reynolda Hall
PO Box 7528
Winston-Salem, NC 27109-7528
336.758.5888
<http://www.wfu.edu/rsp/>