

News Release

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FOR IMMEDIATE RELEASE

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RESEARCH CORPORATION AWARDS \$3.6 MILLION IN GRANTS TO SCIENTISTS IN CHEMISTRY, PHYSICS AND ASTRONOMY

*Awards Promote Research at Primarily Undergraduate Institutions
and Encourage Ph.D.-Granting Institutions to Excel at Both Teaching and Research*

(Tucson, AZ) – Research Corporation, America's first foundation for the advancement of science, announces the awarding of seventy-seven grants to scientists at colleges and universities across the United States and Canada. Research Corporation supports scientists in many of the cutting-edge areas of science—from extragalactic radio jets to quantum dots; from a 3D magic-angle spinning NMR spectrometer to a nanoHertz gravitational wave detector; and from enzyme sensor microchips to advanced oxidation techniques for removing carcinogenic nitrosamines from treated drinking water.

Examples of this year's awardees and their proposed research programs include:

Pierre Bergeron, Department of Physics at University of Montreal, will investigate white dwarf stars as cosmochronometers and distance indicators. (Cottrell Scholar Award)

Helen E. Blackwell, Department of Chemistry at University of Wisconsin, Madison, will study the regulation of bacterial communication pathways with synthetic ligands. (Cottrell Scholar Award)

C. Renee James, Department of Physics at Sam Houston University, will study the Carina Dwarf Spheroidal, the rosetta stone for dwarf galaxy evolution. (Cottrell College Science Award)

Aram M. Nersissian, Department of Biochemistry at Occidental College, will conduct structural and mechanistic characterization studies on Factor VIII, the causative agent of Hemophilia A. (Cottrell College Science Award)

Carl C. Wamser, Department of Chemistry at Portland State University, will study photoconductive porphyrin polymers as nanostructured material for solar energy conversion. (Research Opportunity Award)

Through the Cottrell College Science Awards (CCSA) program, faculty at primarily undergraduate institutions are challenged to explore new areas of science, to make new discoveries that contribute to their discipline and to initiate new research programs that can be sustained by other extramural funding sources, as well as with institutional support. A key element in these research programs is that they involve undergraduate students in meaningful ways. It is also expected that these endeavors will spill over into teaching, thereby raising the quality of undergraduate education.

Research Corporation Awards \$3.6 Million in Grants, Continued

The CCSA program supports both beginning and established faculty, with an emphasis on faculty initiating an area of research. These awards are announced twice a year. In this round of CCSA announcements, sixty-two scientists will receive \$2.25 million in grants, an average of \$36,000 per grant.

The prestigious Cottrell Scholar Awards (CSA) program is designed to support young faculty members at Ph.D.-granting institutions. These awards recognize institutions and faculty members who wish to excel at both teaching and research. The awards also reinforce faculty mentoring, communication and a heightened appreciation for instruction in university science departments.

Cottrell Scholars are announced once a year, and each award recipient receives a grant of \$100,000. Applicants must be in the third full calendar year of their first tenure-track position, and their applications consist of both research and teaching proposals. In this year's competition, the thirteen awardees were selected from a group of one hundred and thirty-six applicants.

Research Opportunity Awards (ROA) have been made to two mid-career and senior scientists at graduate institutions who wish to reestablish long-term funding by initiating a new program of experimental research. In the ROA program, the chair of each Ph.D.-granting astronomy, chemistry or physics department in the United States and Canada may nominate up to two tenured faculty members annually who are without major research funding. The goal is to seed a vigorous, competitive basic research program reestablishing the individual as a productive member of the scientific research community. Awards are announced twice a year, and each award is for \$50,000.

A list of all award recipients is attached.

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Research Corporation is a private foundation, established in 1912, that aids basic research in the physical sciences (astronomy, chemistry and physics) at U.S. and Canadian colleges and universities. As one of the country's first foundations, Research Corporation was incorporated before the term "foundation" came into popular use. Research Corporation's founder, Frederick Gardner Cottrell, was a distinguished scientist, inventor and philanthropist. He continues to serve as a model and inspiration for the scientists who receive these awards today.

Research Corporation supports ideas independently proposed by college and university faculty members and carries on activities related to science advancement. For more information about Research Corporation and its programs, visit the website (www.rescorp.org).

RESEARCH CORPORATION AWARDS

Spring 2005

COTTRELL SCHOLAR AWARDS

Massachusetts Institute of Technology, Department of Physics

Eric W. Hudson

Searching for hidden order in exotic superconductors by scanning tunneling microscopy, \$100,000

Miami University, Department of Chemistry and Biochemistry

Hongcai Zhou

Hydrogen storage in novel C-N based porous materials, \$100,000

New York University, Department of Chemistry

Paramjit S. Arora

Control of protein-protein interactions with artificial alpha helices and innovations in the teaching and implementation of organic chemistry, \$100,000

Northwestern University, Department of Chemistry

Teri W. Odom

Nanoscaffolds for the growth and manipulation of chemical and biological structures at the single component-level, \$100,000

Southern Illinois University at Carbondale, Department of Chemistry and Biochemistry

Boyd M. Goodson

Enhancing NMR signals from biomolecular, organic and polymer thin films using optical nuclear polarization, \$100,000

Tulane University, Department of Physics

Zhiqiang Mao

Studies of metamagnetic quantum critical phenomena in ruthenates, \$100,000

University of Chicago, Department of Chemistry

Chuan He

A chemical crosslinking method to study DNA repair/modification proteins, \$100,000

University of Illinois at Urbana-Champaign, Department of Chemistry

Chad M. Rienstra

Science beyond the limits of diffraction and disciplinary borders: 3D magic-angle spinning NMR and the liberal arts, \$100,000

University of Missouri-Rolla, Department of Physics

Thomas Vojta

Disordered electronic quantum phase transitions and an interactive approach to teaching computational physics, \$100,000

University of Montreal, Department of Physics

Pierre Bergeron

White dwarf stars as cosmochronometers and distance indicators, \$100,000

University of Ottawa, Department of Chemistry

Keith Fagnou

Preventing catalyst decomposition and achieving reactivity in the direct arylation and animation of C-H bonds, \$100,000

University of Wisconsin, Madison, Department of Chemistry

Helen E. Blackwell

Regulation of bacterial communication pathways with synthetic ligands, \$100,000

University of Wisconsin, Madison, Department of Physics

Gary Shiu

Connecting string theory to experiment, \$100,000

COTTRELL COLLEGE SCIENCE AWARDS

Adelphi University, Department of Physics

Sean J. Bentley

Nonlinear and quantum optical properties of quantum dots for generation of new sources of quantum states of light, \$31,146

Amherst College, Department of Chemistry

Anthony C. Bishop

Chemical biology of cancer-associated protein tyrosine phosphatases, \$42,184

Appalachian State University, Department of Physics

Adrian Daw

Measurement of atomic and molecular parameters of nitrogen for geophysical, astrophysical and plasma-processing applications, \$44,818

Augustana College, Department of Physics

Eric Wells

Exploiting the ground state dissociation of hydrogen molecules as a tool for studying ion-molecule collision processes, \$42,289

Ball State University, Department of Chemistry

James S. Poole

A study of the reactivity and kinetics of 3-phenylpropyl radicals, \$42,616

Brock University, Department of Chemistry

Costa Metallinos

Approaches to chiral benzimidazolylidenes derived from phenanthrolines, \$20,995

Bucknell University, Department of Chemistry

David Rovnyak

Towards new relationships between metal coordination geometry and protein function in unusual zinc-binding cytoplasmic domains, \$47,836

California State University, Bakersfield, Department of Physics

Alexander Dzyubenko

Many-body effects in optics of a two-dimensional electron gas in magnetic fields, \$30,776

California State University, Long Beach, Department of Chemistry and Biochemistry

Stephen P. Mezyk

Removing carcinogenic nitrosamines from treated drinking water: The chemistry behind advanced oxidation technologies, \$35,000

California State University, Long Beach, Department of Chemistry and Biochemistry

Katarzyna Slowinska

Diffusion of molecular probes in a collagen matrix: Understanding hydrophobic interactions in local drug delivery systems, \$44,609

California State University, Northridge, Department of Physics and Astronomy

Debi Prasad Choudhary

Chromospheric magnetic field of solar active regions, \$32,418

California State University, Northridge, Department of Physics and Astronomy

Gang Lu

From electrons to finite-elements: A concurrent multiscale approach for metals, \$29,184

California State University, Northridge, Department of Chemistry and Biochemistry

Thomas Minehan

Indium-mediated electron-transfer to carbonyl and thiocarbonyl compounds: Exploring the synthetic potential of radical reactions in aqueous media, \$35,218

Coastal Carolina University, Department of Chemistry and Physics

John Alan Goodwin

Immobilized iron porphyrins in catalytic peroxynitrite decomposition, \$45,800

Creighton University, Department of Chemistry

James T. Fletcher

Shape-persistent oligoarenes possessing peptidomimetic properties, \$36,827

Creighton University, Department of Chemistry

Mark A. Freitag

The effect of solvation on the Mannich reaction: An ab initio, density functional theory and QM/MM study, \$33,468

Denison University, Department of Physics and Astronomy

Daniel C. Homan

Investigating the circular polarization of extragalactic radio jets, \$23,700

Franklin and Marshall College, Department of Physics and Astronomy

John Kenneth Krebs

Optical spectroscopy of lanthanide impurities in sol-gel yttrium oxide nanoparticles, \$41,822

Franklin and Marshall College, Department of Physics and Astronomy

Andrea N. Lommen

The pulsar timing array: A nanoHertz gravitational wave detector, \$36,982

Franklin and Marshall College, Department of Chemistry

Ryan A. Mehl

Generation and evaluation of improved site-specifically incorporated photocrosslinking amino acids for in vivo membrane studies, \$39,704

Hamilton College, Department of Physics

Seth A. Major

Discrete geometry phenomenology and an inner product for cosmology, \$26,032

Harvey Mudd College, Department of Physics

Vatche Sahakian

Aspects of non-commutative geometry, \$32,058

Haverford College, Department of Chemistry

Alexander J. Norquist

Directed synthesis of noncentrosymmetric materials, \$36,704

Houghton College, Department of Physics

Mark E. Yuly

An experimental search for pre-existing nuclear D^{++} components using the $3\text{He}(n,2p)$ reaction, \$35,888

Illinois State University, Department of Chemistry

David L. Cedeno

Effects of molecular structure and environment on photophysical and photochemical properties of novel photosensitizers, \$34,176

Illinois State University, Department of Physics

Epaminondas Rosa Jr.

Synchronous transitions in plasmas with noncoherent and competing signals, \$33,122

Illinois Wesleyan University, Department of Physics

Linda M. French

Physical studies of primitive solar system bodies, \$34,018

Indiana University-Purdue University, Fort Wayne, Department of Physics

Desiderio A. Vasquez

Chemical pattern formation induced by shear flow, \$43,099

Lewis and Clark College, Department of Chemistry
Nikolaus M. Loening
The development and characterization of chemical shift thermometers for nuclear magnetic resonance spectroscopy, \$39,968

Loyola University, Department of Physics
Armin Kargol
Novel voltage protocols and analysis methods for the non-equilibrium response spectroscopy of voltage-gated ion channels, \$39,218

Marquette University, Department of Physics
Christopher J. Stockdale
Direct proof for the delayed formation of stellar mass black holes: A radio study of supernova 2001em, \$29,024

McPherson College, Department of Chemistry
Timothy J. Hubin
Antiviral bridged macrocycle derivatives and metal complexes: CXCR4 co-receptor antagonists, \$44,218

Miami University, Department of Physics
Samir Bali
Investigation of radiative interactions and quantum tunneling in optical lattices by correlation measurement of the scattered light, \$38,838

Middlebury College, Department of Physics
Noah Graham
Quantum Z-strings and oscillons in the electroweak standard model, \$33,720

Occidental College, Department of Chemistry
Aram M. Nersissian
Structural and mechanistic characterization of Factor VIII, the causative agent of Hemophilia A, \$36,676

Saint Louis University, Department of Chemistry
Michael A. Lewis
Effects of substitution on arene-arene interactions, \$43,086

San Diego State University, Department of Physics
Fridolin Weber
Cooling behavior of rotating neutron stars, \$30,379

San Francisco State University, Department of Chemistry and Biochemistry
Bruce A. Manning
Surface chemistry and remediation reactions of nanometer scale metallic iron particles, \$37,800

Sam Houston State University, Department of Physics
C. Renee James
The Carina Dwarf Spheroidal: The rosetta stone for dwarf galaxy evolution, \$41,778

Seattle University, Department of Chemistry
Peter J. Alaimo
Synthesis of novel N-heterocycles via tandem indium(0)-indium(III)-mediated reactions, \$41,218

Seton Hall University, Department of Physics
M. Alper Sahiner
Pulsed laser deposition and structural and electrical characterization of high-k dielectric films for the replacement of SiO₂ in CMOS gate region, \$32,574

Sonoma State University, Department of Chemistry
Jennifer Whiles Lillig
Characterization of key amino acids in the membrane activity of anti-Listerial bacteriocins, \$34,895

Southwest Missouri State University, Department of Chemistry
Gary A. Meints
Investigating local dynamics in damaged DNA via solid-state deuterium NMR, \$35,684

Texas A&M University at Commerce, Department of Physics
Anil R. Chourasia
Chemical reactivity at Hf/SiO₂ interface, \$43,650

University of Colorado at Colorado Springs, Department of Physics and Energy Science
Radek Lopusnik
Time- and frequency-domain investigations of thermally excited spin waves in ferrite and magnetic metallic films, \$43,683

University of Colorado at Colorado Springs, Department of Chemistry
David J. Weiss
The chemistry of enzyme sensor microchips, \$40,500

University of Memphis, Department of Physics
Sanjay R. Mishra
On the magnetic properties of rare-earth oxide coated ferromagnetic nanoparticles, \$40,218

University of Minnesota, Duluth, Department of Chemistry
Steven M. Berry
New mixed-valence dinuclear lanthanide complexes, \$35,144

University of Northern Iowa, Department of Chemistry
Robert Martin Chin
Di and trinuclear polyhydride transition metal complexes containing a rigid cyclopentadienyl framework, \$33,118

University of San Diego, Department of Physics
Michelle D. Chabot
Investigation of individual submicron magnetic structures at room temperature using micromechanical cantilever magnetometry, \$37,950

University of San Diego, Department of Chemistry
Jeremy Kua
Preliminary steps toward simulating self-assembly of metal-organic frameworks, \$37,348

University of Vermont, Department of Physics
Sanjeeva Murthy
Modification of the structure of polymer surfaces to control and direct cell growth, \$37,052

University of Wisconsin, Eau Claire, Department of Chemistry
Alan Gengenbach
Metalloporphyrin catalyzed oxidation of azo dyes, \$34,876

University of Wisconsin, La Crosse, Department of Physics
John S. Colton
T₂ measurements in GaAs, AlGaAs, and InGaAs layers and quantum wells via optically detected electron spin echo, \$21,853

University of Wisconsin, La Crosse, Department of Physics
Shauna Sallmen
Study of interstellar shells in our galaxy, \$27,418

Wellesley College, Department of Physics
Mark S. Goldman
Computational modeling of the neural basis of a visual masking illusion, \$36,461

Western Kentucky University, Department of Chemistry
Kevin M. Williams
Cleavage of proteins by bulky platinum complexes, \$29,576

Western Washington University, Department of Physics and Astronomy
Takele Seda
Low-temperature ⁵⁷Fe Mossbauer studies of the magnetic and electronic properties of nanomagnetic iron (oxy)hydroxides, \$34,064

Western Washington University, Department of Chemistry
Mark L. Wicholas
Bonding modes of isoindoline pincer ligands in transition metal complexes: Studies in zwitterion formation and C-H activation, \$47,468

Williams College, Department of Chemistry
Amy Gehring
*Biochemical characterization of the WhiJ sporulation proteins from *Streptomyces coelicolor**, \$41,219

Xavier University, Cincinnati, Department of Chemistry
Richard J. Mullins
*Synthesis and medicinal chemistry of kalkitoxin, a secondary metabolite of *Lyngbya majuscula**, \$35,754

Xavier University, Cincinnati, Department of Physics
Heidrun Schmitzer
Investigation of the feasibility of self-adjusting optical elements on the basis of angular momentum transfer at the end of an optical fiber, \$40,720

RESEARCH OPPORTUNITY AWARDS

Portland State University, Department of Chemistry
Carl C. Wamser
Nanostructured material for solar energy conversion: Photoconductive porphyrin polymers, \$50,000

University of Minnesota, Twin Cities, Department of Chemistry
Doreen Geller Leopold
Anion photoelectron spectroscopy of transition metal clusters and metal-ligand complexes, \$50,000