A Million Dollars Approved for Research at 80 Different Institutions

Some 90 different applications to do research in the natural and physical sciences received favorable consideration at the May meeting of Research Corporation's Cottrell Program Advisory Committee.

Of the total amount, the committee recommended $593,572 to fund 50 projects under the Cottrell Research Program, which supports basic research in the physical sciences at graduate and public undergraduate institutions. An additional $451,283 was voted for another 40 research proposals in the Cottrell College Science Program. This second Cottrell subdivision is open to faculty members in the natural sciences at private undergraduate colleges.

Taking advantage of "my last meeting to be attended as president of Research Corporation," James S. Coles thanked committee members for their service to the foundation and the advancement of academic science. Dr. Coles, who retired in June, remains a member of the grants advisory committee which will consider pending applications at its regular October meeting.

Cottrell Research Program

NEAL B. ABRAHAM, Bryn Mawr College: Studies of the onset and characteristics of instabilities in the output of single-mode, high-gain gas lasers—$13,900

HARMON B. ABRAHAMSON, University of Oklahoma at Norman: Sulfur monoxide complexes—$9,757

HECTOR D. ABRUNA, University of Puerto Rico: Electroanalysis with chemically modified electrodes—$12,000

ROBERT G. AITKEN, University of Colorado: A study of the critical behavior of the re-entrant ferromagnet-to-spin-glass transition in amorphous metglas alloys by means of specific heat measurements—$6,200

SANFORD A. ASHER, University of Pittsburgh: UV resonance Raman studies of aromatic molecules—$10,000

STEPHEN G. BAXTER, Tufts University: The cycloaddition chemistry of phospha-alkenes—$10,900

RONALD J. BIENIEK, University of Missouri-Rolla: Tractable theoretical methods for analyzing molecular collisions—$6,500

STEPHEN E. BRANZ, San Jose State University: Synthetic analogs of ionophore antibiotic A-23187 (two-year program)—$10,000

WAYNE E. BRITTON, University of Texas at Dallas: Electrochemistry of the perfluorcyclobutyl- and perfluorocyclopentylbenzenes and cyclooctatetraenes—$5,712

GARY W. BRUDVIG, Yale University: Electron paramagnetic resonance studies of the paramagnetic centers involved in photosynthetic 0_2 evolution—$15,800

DAVID S. CAFISO, University of Virginia: Molecular basis for membrane excitation—$12,500

ALAN CAMPION, University of Texas at Austin: Raman studies of molecules adsorbed on metal surfaces—$20,000

FRANK J. CASTORA, University of Maryland, Baltimore County: Evolution of mtDNA: Do different regions of the mitochondrial genome evolve at different rates?—$13,000

J. DAVID COHEN, University of Oregon: Properties of electronic gap states in hydrogenated amorphous silicon—$24,000

JUDITH G. COHEN, California Institute of Technology: Novae in M81 and M101—$15,000

JOSEPH K. DAUGHERTY, University of North Carolina-Asheville: Investigation of electromagnetic conversion processes in neutron star magnetospheres—$4,110

JULIAN A. DAVIES, University of Toledo: Carbon-hydrogen bond activation in alkanes and arenes—$10,000

LANCE E. DeLONG, University of Kentucky: Studies of superconductivity in exchange-enhanced Pauli paramagnets—$18,008

ROBERT W. DUNFORD, Princeton University: Parity nonconservation in singly ionized helium—$20,300

W. FARRELL EDWARDS, Utah State University: A study of magnetic merging and reconnection using a new electromagnetic formalism—$1,500

THOMAS ERBER, Illinois Institute of Technology: Hysteresis synchrotron radiation—$670

FEREYDOON FAMILY, Emory University: Development and application of direct renormalization group approach to polymers—$6,000

DONALD L. FEKE, Case Western Reserve University: Measurements of coupled primary- and secondary-minimum coagulation rates in colloidal dispersions—$12,800

CYNTHIA M. FRIEND, Harvard University: Surface chemical and photochemical studies of hydrocarbons adsorbed on group VIB transition metals—$24,650

JOSEPH R. GANDLER, California State University, Fresno: Acid-base catalysis: The conversion of alcohols into carbocations—$6,605

REINHARD GENZEL, University of California, Berkeley: Far-infrared and submillimeter laser for astronomical spectroscopy—$20,000

RUSSELL W. GIANNETTA, Princeton University: Electronic properties of charged ^{4}He films—$12,000

FLORENCE K. GLEASON, University of Minnesota, Navarre: Isolation and characterization of antibiotics from freshwater cyanobacteria—$8,000

CHRISTOPHER M. GOULD, University of Southern California: Electron transport in disordered materials at ultralow temperatures—$16,500

CLIVE G. JONES, New York Botanical Garden, Cary Arboretum: Chemical ecology of sweet fern, *Comptonia peregrina* (Myricaceae) (two-year program)—$10,000

ALISTAIR J. LEES, State University of New York at Binghamton: Excited state properties of substituted group 6B metal carbonyls—$15,000

NATHAN S. LEWIS, Stanford University: Catalysis of sluggish electrode reactions by surface modification: derivatization of electrode surfaces with enzymes and proteins—$15,000

ERIC A. MAATTA, Kansas State University: New synthetic routes to sulfur-bridged complexes containing iron and molybdenum—$10,000

JAMES V. MAHER, University of Pittsburgh: The statistical physics of the turbulent mixing of fluids —$17,000

STEVEN H. MARGOLIS, Washington University: Low-energy trapped particles in planetary radiation belts—$2,250

A. R. MARLOW, Loyola University, La.: Relativity from quantum theory—$620

DENNIS S. MARYNICK, University of Texas at Arlington: Localized bonding patterns and structure in transition metal complexes—$4,400

ROBERT L. MERLINO, University of Iowa: Energetic upstreaming ions—a laboratory simulation—$12,500

DAVID L. MONTS, University of Arkansas: Use of hydrogen bonds to probe intramolecular energy redistribution—$18,775

JEANNE E. PEMBERTON, University of Arizona: Surface enhanced Raman scattering at novel mixed-metal electrode surfaces and its relation to surface electronic structure—$14,000

ROBERT M. PIRTLE, North Texas State University: Isolation of a mRNA coding for a major protein in the *Acanthamoebae* plasma membrane—$10,000

ROBIN D. ROGERS, Northern Illinois University: Preparation and characterization of novel organoactinide complexes—$8,425

ANGELO R. ROSSI, University of Connecticut: The electronic structure of open-shell molecular cations—$7,000

ERIC A. SCHIFF, Syracuse University: Photoconductive characterization of amorphous hydrogenated silicon—$15,000

ROBERT W. SHAW, Texas Tech University: Electron paramagnetic resonance spectroscopy and rapid kinetics of metalloenzymes—$12,500

JOHN W. SHRIVER, Southern Illinois University: Thermodynamics of the myosin power-stroke from temperature dependent mechanical parameters of muscle fibers—$11,540

WILLIAM R. SNYDER, Northern Illinois University: Boronic acid analogs of phospholipids as inhibitors of phospholipase C—$15,600

JOHN A. TANIS and E. M. BERNSTEIN, Western Michigan University: Correlated X-ray charge changing interactions in heavy ion-atom collisions —$9,550

MARK H. THIEMENS, University of California, San Diego: Oxygen isotopic analysis of atmospheric oxygen—$15,000

DALE J. VAN HARLINGEN, University of Illinois at Urbana-Champaign: Quantum noise in Josephson tunnel junctions and SQUID detectors—$21,000

MICHAEL ZEILIK, University of New Mexico: UBVRI photometry of RS Canum Venaticorum (RS CVn) stars—$2,000

Cottrell College Science Program

VIRGINIA D. ADAMS, Pacific Lutheran University: Mechanisms of plant succession on pyroclastic, debris and mud flows resulting from the Mount St. Helens eruption—$6,080

KODJOPA ATTOH, Hope College: Metamorphism of early Proterozoic rocks in northern Michigan—$9,000

GARRY R. BUETTNER, Wabash College: A study of (1) The oxidation of catechols; (2) The Haber-Weiss reaction (two-year program)—$15,800

EDWARD W. BURKE, JR., King College: UBV photometric study of bright small amplitude variable stars—$4,100

AARON J. COX, JR., University of Redlands: High repetition rate picosecond dye laser and photophysical studies of triphenodioxazines (three-year program)—$29,383

PRENTISS G. COX, Mississippi College: Iron uptake and metabolism in cultured heart cells—$3,000

STEPHEN W. DIETRICH, University of Redlands: An investigation of the specific molecular interactions of aromatic sulfonamides with carbonic anhydrase (two-year program)—$22,000

JAMES A. DUNCAN, Lewis and Clark College: A study of the thermal rearrangement of 7-(1,2-butadienyl) bicyclo [2.2.1] hept-2-ene and related hydrocarbons—$1,200

WILLIAM EISINGER, University of Santa Clara: Regulation of cell expansion by ethylene (two-year program)—$13,200

JAMES E. FINHOLT, Carleton College: An investigation of a newly discovered intermediate in the oxidation of $Cr(H_2O)_6^{2+}$ to $(Cr(H_2O)_4(OH)_2)_2^{4+}$ by molecular oxygen (two-year program)—$10,400

WAYNE GADE and JEAN GADE, College of St. Catherine: Lectins: their survival in the rhizophere and possible function as antifungal agents—$4,645

PAUL L. GAUS, The College of Wooster: Synthesis and photochemical reactions of ligand-bridged dimers of tungsten pentacarbonyl and cyclopentadienyl manganese dicarbonyl (two-year program)—$12,400

SUSAN E. GERMERAAD, University of Santa Clara: Genetic transformation in *Drosophila* using cloned DNAs (two-year program)—$15,100

THOMAS E. GOODWIN, Hendrix College: A convergent organochemical synthesis of maytansine model compounds—$6,800

ANN M. HIRSCH, Wellesley College: Localizing boron in plants: a key to its role in metabolism?—$2,400

LAURA L. MAYS HOOPES, Occidental College: Methylation of a group of mouse moderately repetitive DNA sequences—$11,265

CLIFFE D. JOEL, Lawrence University: Possible chemical mechanisms of damage in retinal rod outer segments (two-year program)—$13,600

NOEL A. P. KANE-MAGUIRE, Furman University: Thermal and photochemical behavior of aromatic amino acid complexes (two-year program)—$14,000

NANCY H. KOLODNY, Wellesley College: NMR studies of the dependence of dinucleoside polyphosphate conformation on divalent cations (two-year program)—$16,000

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President's Message

(Continued from page 1)

well worthwhile if they result in just one discovery—another "laser" or recombinant DNA technique for example—that helps invigorate our industrial base.

Research Corporation's Grants Program has successfully targeted areas crucial to the advancement of science: assistance for younger investigators who need support to initiate independent research projects, and help for seasoned faculty scientists who seek aid to do particularly speculative work, or to shift to entirely new fields. The foundation's other area of emphasis is the support of investigators and science departments at outstanding liberal arts colleges, institutions that continue to train a large percentage of the students who go on to graduate work in the sciences. Faculty research projects in this setting give undergraduates a vital opportunity to do original work in science. The foundation will continue its grants-making activities in all of these areas, and will supplement them as its means permit.

In recent years a number of industrial firms, foundations and highly motivated individuals have chosen to help strengthen academic science as a philanthropic endeavor through the mechanism of Research Corporation's Grants Program. In closing I would like to extend the thanks of the foundation and the academic community to all of those who have contributed in this manner. It is hoped that others in industry and the nonprofit sector will make similar investments in the nation's scientific and technological future. *—John P. Schaefer*

College Science Grants

(Continued from page 3)

C. A. LEWIS and MICHAEL R. McCONNELL, Point Loma College: A. Ultrastructural analysis of sperm-egg interactions and hybridization in California abalone. B. Mechanisms of infection of gram-negative bacteria by bacteriophages. C. Morphological and biochemical studies on the digestive tracts of two morphs of the tadpole, *Scaphiopus multiplicatus*—$6,000

ARIEL G. LOEWY, Haverford College: Modulation of covalent interactions between cellular proteins (two-year program)—$13,650

COLIN F. MacKAY, Haverford College: The photochemistry of carbon suboxide—$5,855

DON H. MADISON, Drake University: Accurate inelastic electron-atom cross sections (three-year program)—$15,500

MICHAEL R. McCONNELL, Point Loma College: The mechanism of infection of *Salmonella anatum* by bacteriophage ϵ^{15} (two-year program)—$12,300

TIMOTHY J. McNEESE, Loyola College, Md.: Synthesis, structure, and reactivity of hydroxo group VI metal carbonyl derivatives (two-year program)—$14,835

MICHAEL E. MICKELSON, Denison University: Laboratory measurement of the infrared and visible spectrum of hydrogen deuteride—$9,500

JAY M. PASACHOFF, Williams College: Optical observations of solar prominences (two-year program)—$10,000

FRANK W. PERCIVAL, Westmont College: Identification and concentrations of naturally-occurring bound auxins in soybean seeds and seedlings—$5,500

HAROLD W. PINNICK, Bucknell University: Synthesis of anatoxin-a (three-year program)—$15,000

LOUIS V. QUINTAS, Pace University: Random graphs and phase transitions in aqueous solutions —$5,400

C. GARY REINESS, Pomona College: Development of neuromuscular junction in normal mice and mice with motor endplate disease (two-year program)—$20,000

RANDALL E. ROBINSON, Luther College: Synthetic and mechanistic studies of the copper(II)/hydrazine system—$2,500

MARTIN J. SERRA, Allegheny College: The separation of euchromatin from heterochromatin by affinity chromatography (two-year program)—$13,000

HOWARD W. SHIELDS, Wake Forest University: An EPR study of antibiotic binding with DNA (two-year program)—$10,800

DIANA B. STEIN, Mount Holyoke College: Chloroplast DNA sequence studies in the Osmundaceae —$12,000

WILLIAM H. TAMBLYN, Franklin and Marshall College: The chemistry and synthetic applications of the octahydrotriborate ion and its organometallic complexes (two-year program)—$19,220

STEPHEN K. TAYLOR, Olivet Nazarene College: Friedel-Crafts reactions of epoxides—$4,400

LARRY L. TIESZEN, Augustana College: Carbon isotope discrimination in C_3 and C_4 plants and the use of stable isotopic labels to study Great Plains paleoecology (three-year program)—$19,000

JERRY L. WALSH, Lafayette College: Substitution and isomerization in polypyridyl ruthenium(II) complexes (two-year program)—$10,850

STEVEN J. ZOTTOLI, Williams College: Regeneration of a vertebrate central neuron (three-year program)—$15,600

Grants and Grantees

(Continued from page 2)

trolled molecular environment." Not only has photooxidation of various organic substances on zeolites been demonstrated, but entirely new techniques have been developed for studying catalytic processes.

QUARTERLY BULLETIN
SUMMER 1982

Research Corporation, 405 Lexington Ave., New York, N.Y. 10174-0370

A foundation for the advancement of science and technology, Research Corporation serves educational and scientific institutions through grants-in-aid for basic research in the natural sciences, and by furthering the application of scientific discoveries.

Grants Program

Cottrell Research Grants support basic investigations in the physical sciences at graduate universities and public undergraduate institutions.

Cottrell College Science Grants support academic research projects in the natural sciences at private undergraduate institutions.

In addition to these regular programs, Research Corporation occasionally supports other important scientific endeavors within its general fields of interest.

Invention Administration Program

Services contributed to educational and scientific institutions include evaluating faculty and staff inventions, accepting assignment of those which appear to be useful and marketable, applying for patents through qualified counsel, licensing issued patents to industry, and defending against infringement when necessary.

Royalties received from patents assigned to the foundation are apportioned among the inventor, the institution and Research Corporation, with the institution's patent policy determining the inventor's share. The foundation's share is used to help support its Grants and Invention Administration Programs.

The *Quarterly Bulletin* is published three times yearly, with the Annual Report constituting a fourth issue. Articles may be quoted in whole or in part with credit to Research Corporation. Invention administration projects are reported in *Research and Invention*, an occasional newsletter. Address correspondence to W. Stevenson Bacon, Director of Communications.