Thursday, April 15, 2004

7:00PM–9:00PM **Conference Check-In**
Regency Ballroom Foyer, Ballroom Level

8:00PM–10:00PM **Student Social (Undergraduate Students Only)**
Tidewater Room, Second Floor

Friday, April 16, 2004

7:30AM **Conference Check-In**
Regency Ballroom Foyer, Ballroom Level

9:00AM–9:30AM **Poster Room Open for Posters to be Put Up**
Exhibit Hall A, Exhibit Level

9:30AM–10:15AM **Opening Comments: Arden L. Bement, Jr., Acting Director (NSF); Shirley M. Malcolm, Director of Education and Human Resource Programs (AAAS); Rosemary R. Haggett, Division Director, DUE (NSF)**
Regency Ballroom E, Ballroom Level

10:15AM–10:30AM **Conference Charge: Myles G. Boylan, Lead Program Director, DUE (NSF)**
Regency Ballroom E, Ballroom Level

10:45AM–12:15PM **Topical Session Series A (10 parallel sessions)**

- *A1* *Building Students' Observational and Analytical Skills Using GIS-Based Investigations of Earth Processes*
  Washington Room B, Ballroom Level
- *A2* *Remote Instrumentation*
  Conference Theater, Ballroom Level
- *A3* *Computer Security: Pedagogy and Practice*
  Roosevelt Room, Third Floor
- *A4* *Teaching Through Touching: Using LEGO® Bricks to Teach Engineers and Liberal Arts Students Engineering*
  Lincoln Room, Third Floor
- *A5* *Peer-Led Team Learning: A Versatile Student-Centered Curriculum Strategy*
  Kennedy Room, Third Floor
- *A6* *Disciplinary Research Strategies for Assessment of Learning in Large Classes*
  Washington Room A, Ballroom Level
- *A7* *Evaluating Outcomes: Dare to Discover!*
  Jefferson Room, Third Floor
- *A8* *Teaching a Calculus Course with WeBWorK™, an Online Homework System*
  Fairfax Room, Third Floor
- *A9* *Marrying Engineering Design and Service Learning Through EPICS: Engineering Projects in Community Service*
  Arlington Room, Third Floor
- *A10* *Making Proposal Writing an Affirming Adventure for Faculty: Inspiring Innovation*
  Prince William Room, Third Floor

12:15PM–1:45PM **Lunch (Plenary I)**
David Goldston, Chief of Staff (U.S. House of Representatives Committee on Science)
Regency Ballroom E, Ballroom Level

2:00PM–3:30PM **Topical Session Series B (10 parallel sessions)**

- *B1* *Inquiry Teaching: What Is It and How Do We Know If It Works?*
  Washington Room B, Ballroom Level
- *B2* *Networked Learning: Using Technology to Improve Learning in Undergraduate Education*
  Conference Theater, Ballroom Level
- *B3* *Connecting Science to Society*
  Jefferson Room, Third Floor
- *B4* *SCALE-UP: Student-Centered Activities for Large Enrollment Undergraduate Programs*
  Kennedy Room, Third Floor
- *B5* *What I Wish I Had Known in Art School*
  Lincoln Room, Third Floor
- *B6* *Preparing Students for Research and Teaching: Pedagogy, Practice, Curricular Design, and Assessment to Improve Student Learning*
  Roosevelt Room, Third Floor
- *B7* *Mixed Marriages: Learning to Collaborate Across Disciplines*
  Fairfax Room, Third Floor
- *B8* *Unlocking the Clubhouse: Institutional Reform for Diversity*
  Arlington Room, Third Floor
- *B9* *Teaching as Research*
  Washington Room A, Ballroom Level
- *B10* *Impact of Disciplinary Integration at Two Institutions*
  Prince William Room, Third Floor

3:30PM–4:00PM **Break I**
Regency Ballroom Foyer, Ballroom Level

4:00PM–5:30PM **Poster Session I**
Exhibit Hall A, Exhibit Level

5:30PM–6:30PM **Social Hour/Hors d'oeuvres**
Exhibit Hall A, Exhibit Level

8:00PM–10:00PM **Hazel A. Barton, Ashland Endowed Professor of Integrative Science (Northern Kentucky University), IMAX Movie: Amazing Caves**
Regency Ballroom E, Ballroom Level

Saturday, April 17, 2004

7:30AM **Conference Check-In**
Regency Ballroom Foyer, Ballroom Level

7:30AM–8:30AM **Breakfast**
Regency Ballroom E, Ballroom Level

8:30AM–10:00AM **Topical Session Series C (10 parallel sessions)**

- *C1* *Creating and Using Visual Representations to Construct Knowledge in STEM Education*
  Washington Room B, Ballroom Level
- *C2* *Visualizing Scientific Data Sets: From Molecules to Galaxies*
  Conference Theater, Ballroom Level
- *C3* *Science for All Americans: A Universally Accessible Class for the New Millennium*
  Roosevelt Room, Third Floor
- *C4* *Just-in-Time Teaching: Addressing Student Engagement, Interaction, and Learning via Coordinated Web/Classroom Activities*
  Jefferson Room, Third Floor

C5 *Biology, Chemistry, and Biomedical Engineering Undergraduate Laboratories: Ideas for Adaptation*
Lincoln Room, Third Floor

C6 *Concept Inventories: Tools for Uncovering STEM Students' Misconceptions*
Arlington Room, Third Floor

C7 *Achieving Interdisciplinary Impact: Clearing the Hurdles to Mesolore's Classroom Adoption*
Fairfax Room, Third Floor

C8 *Activities for Introducing Students to Statistics*
Prince William Room, Third Floor

C9 *Looking at Learning*
Kennedy Room, Third Floor

C10 *Undergraduate Research: Approaches to Success*
Washington Room A, Ballroom Level

10:00AM–10:30AM **Break II**
Regency Ballroom Foyer, Ballroom Level

10:30AM–NOON **Poster Session II**
Exhibit Hall A, Exhibit Level

NOON–1:15PM **Lunch (Plenary II)**
Denice D. Denton, Dean, College of Engineering (University of Washington)
Regency Ballroom E, Ballroom Level

1:30PM–3:00PM **Topical Session, Series D (10 parallel sessions)**

D1 *Using Computation and Visualization to Enhance the Teaching of Ordinary Differential Equations*
Washington Room B, Ballroom Level

D2 *Virtual Laboratories*
Conference Theater, Ballroom Level

D3 *Research Instrumentation Used in Education*
Jefferson Room, Third Floor

D4 *Teaching Spatial Analysis and Data Visualization in Undergraduate Social Science Research Methods and Data Analysis Courses*
Lincoln Room, Third Floor

D5 *Calibrated Peer Review: A Writing and Critical Thinking Instructional Tool*
Washington Room A, Ballroom Level

D6 *Tutorials in Introductory Physics: A Research-Based Approach to Improving Student Learning in the Introductory Course*
Arlington Room, Third Floor

D7 *Adding to Your Tool-Belt: Strategies for Improving Retention Through Learning Communities and Partnering with Two-Year Colleges*
Roosevelt Room, Third Floor

D8 *Roots and Branches: Promoting the Diffusion of Curricular Reform Ideas Throughout Undergraduate Science Education*
Kennedy Room, Third Floor

D9 *Using Environmental Impact Analysis for Teaching Interdisciplinary Science*
Fairfax Room, Third Floor

D10 *Engineering Education: It Starts with the Learner*
Prince William Room, Third Floor

3:00PM–3:30PM **Break III**
Regency Ballroom Foyer, Ballroom Level

3:30PM–4:45PM **Interactive Plenary, Eric Mazur, Gordon McKay Professor of Applied Physics (Harvard University)**
Regency Ballroom E, Ballroom Level

Agenda

5:30PM–6:30PM **Social Hour**
Exhibit Hall A, Exhibit Level

6:30PM–9:30PM **Banquet (Plenary III) Frederick S. Humphries, President (National Association for Equal Opportunity in Higher Education)**
Regency Ballroom E, Ballroom Level

Sunday, April 18, 2004

7:30AM **Conference Check-In**
Regency Ballroom Foyer, Ballroom Level

7:30AM–8:30AM **Breakfast**
Regency Ballroom E, Ballroom Level

8:30AM–9:30AM **Report by Student Attendees**
Regency Ballroom E, Ballroom Level

9:30AM–9:50AM **Break IV**
Regency Ballroom Foyer, Ballroom Level

9:50AM–11:40AM **Call to Action Session, Input to NSF (10 parallel sessions)**
Group CCLI-DM, Conference Theater, Ballroom Level
Group CCLI-CH, Washington Room A, Ballroom Level
Group CCLI-CCCD, Washington Room B, Ballroom Level
Group CCLI-EBT, Kennedy Room, Third Floor
Group CCLI-PF, Jefferson Room, Third Floor
Group CCLI-CFB, Lincoln Room, Third Floor
Group CCLI-KS, Roosevelt Room, Third Floor
Group CCLI-PBC, Arlington Room, Third Floor
Group CCLI-CHBC, Fairfax Room, Third Floor
Group CCLI-CG, Prince William Room, Third Floor

11:40AM–12:30PM **Final Plenary, Donald E. Thompson, Deputy Assistant Director, EHR (NSF)**
Regency Ballroom E, Ballroom Level

12:30PM **Adjourn**

Arden L. Bement, Jr.

Acting Director, National Science Foundation

Opening Comments

Friday • 9:30AM

Arden L. Bement, Jr., became Acting Director of the National Science Foundation on February 22, 2004. He joins NSF from the National Institute of Standards and Technology (NIST), where he was director for three years.

Prior to his appointment as NIST director, Dr. Bement served as the David A. Ross Distinguished Professor of Nuclear Engineering and head of the School of Nuclear Engineering at Purdue University. He has held appointments at Purdue University in the schools of Nuclear Engineering, Materials Engineering, and Electrical and Computer Engineering, as well as a courtesy appointment in the Krannert School of Management. He was director of the Midwest Superconductivity Consortium and the Consortium for the Intelligent Management of the Electrical Power Grid.

Along with his NIST advisory roles, Dr. Bement served as a member of the National Science Board from 1989 to 1995. He also chaired the Commission for Engineering and Technical Studies and the National Materials Advisory Board of the National Research Council; was a member of the Space Station Utilization Advisory Subcommittee and the Commercialization and Technology Advisory Committee for NASA; and consulted for the Department of Energy's Argonne National Laboratory and the Idaho National Engineering and Environmental Laboratory.

Dr. Bement holds an engineer of metallurgy degree from the Colorado School of Mines, a master's degree in metallurgical engineering from the University of Idaho, a doctorate degree in metallurgical engineering from the University of Michigan, an honorary doctorate degree in engineering from Cleveland State University, and an honorary doctorate degree in science from Case Western Reserve University. He is a member of the National Academy of Engineering (NAE).

Shirley M. Malcom

Director, Education and Human Resources Programs, American Association for the Advancement of Science

Opening Comments

Friday • 9:30AM

Shirley Malcom is Head of Education and Human Resources Programs (EHR) at the American Association for the Advancement of Science (AAAS). EHR includes AAAS programs in education, activities for underrepresented groups, and public understanding of science and technology. Prior to that, Dr. Malcom was head of the AAAS Office of Opportunities in Science from 1979 to 1989. Between 1977 and 1979, she served as program officer in the Science Education Directorate of the National Science Foundation (NSF).

Dr. Malcom serves on several boards, including the Howard Heinz Endowment. She is an honorary trustee of the American Museum of Natural History, a Regent of Morgan State University, and a trustee of Caltech. She has chaired a number of national committees addressing education reform and access to scientific and technical education, careers and literacy. Dr. Malcom is a former trustee of the Carnegie Corporation of New York and a fellow of the AAAS and the American Academy of Arts and Sciences. In 2003, she received the Public Welfare Medal of the National Academy of Sciences, the highest award bestowed by the Academy.

Dr. Malcom received her doctorate in ecology from The Pennsylvania State University; master's degree in zoology from the University of California, Los Angeles; and bachelor's degree with distinction in zoology from the University of Washington. In addition she holds thirteen honorary degrees. Dr. Malcom was a member of the National Park System Advisory Board from 1999-2003. She served on the National Science Board, the policymaking body of the National Science Foundation from 1994 to 1998, and from 1994-2001 served on the President's Committee of Advisors on Science and Technology.

Rosemary R. Haggett

Director of the Division of Undergraduate Education, National Science Foundation

Opening Comments, Conference Host

Friday • 9:30AM

Rosemary R. Haggett is the Director of the Division of Undergraduate Education at the National Science Foundation. Prior, she was the Associate Provost for Academic Programs at West Virginia University (WVU), where she continues to hold the rank of Professor in the Division of Animal and Veterinary Sciences. As Associate Provost, Dr. Haggett had general oversight of the undergraduate and graduate academic programs of the university as well as the Honors Program, the Office of Service Learning, and the Undergraduate Academic Services Center. She co-chaired the WVU Assessment Council and has published in the area of student learning outcome assessment.

From 1994 to 1999, Dr. Haggett was the Dean of the College of Agriculture, Forestry, and Consumer Sciences at West Virginia University, and was one of the first woman agriculture deans in the country. She was also the Director of the West Virginia Agricultural and Forestry Experiment Station.

Prior to joining WVU, Dr. Haggett was a Division Director in the National Research Initiative and the Deputy Associate Administrator of the Office of Grants and Program Systems in the U.S. Department of Agriculture. She has also been a faculty member at Loyola University of Chicago.

Dr. Haggett holds a B.A. degree in Biology from the University of Bridgeport and a Ph.D. in Physiology from the University of Virginia. She did postdoctoral work in reproductive biology at Northwestern University. She is the recipient of the West Virginia Women's Commission "Celebrate Women Award" in the education category and the Irving Award from the American Distance Education Consortium (ADEC).

Speakers • Ballroom E

Myles G. Boylan

Lead Program Director, Division of Undergraduate Education, National Science Foundation

Conference Charge

Friday • 10:15AM

Miles G. Boylan is a program officer with considerable experience in different positions at the National Science Foundation. He is currently on a 1-year leave of absence working at the Center for the Advancement of Scholarship on Engineering Education (CASEE).

Within DUE in his current position, Dr. Boylan has been the lead program director for the Assessing Student Achievement and National Dissemination tracks of the CCLI program. He has also worked in the Science Talent Expansion Program (STEP), the Collaboratives for Excellence in Teacher Preparation (CETP) program, the STEM Teacher Preparation (STEM-TP) program, and the National STEM Digital Library (NSDL) program. He joined the National Science Foundation after holding academic appointments at the Ohio State University, Case Western Reserve University, and Colby College.

In the early 1990s at NSF, Dr. Boylan served as Executive Secretary of a National Science Board subcommittee formed to study the condition of national STEM literacy within the U.S. He was also a staff leader for a comprehensive study by the Advisory Committee for the NSF Directorate for Education and Human Resources called Shaping the Future of Undergraduate Education in STEM, released in 1996.

Dr. Boylan earned a bachelor's of science degree in mathematics from Michigan State University, a master's of science degree in organizational science from Case Institute of Technology, and a doctorate in industrial economics from Case Western Reserve University.

David Goldston

Photo Unavailable

Chief of Staff, U.S. House of Representatives Committee on Science

Plenary I

Friday • 12:30PM

David Goldston was appointed to run the U.S. House Committee on Science in January 2001. As chief of staff, he oversees a committee with jurisdiction over most of the federal civilian research and development budget, including programs run by NASA, NSF, the Department of Energy, the Department of Commerce, and the Environmental Protection Agency.

Prior to becoming staff director, Mr. Goldston was legislative director for Congressman Sherwood Boehlert (R-NY), who became chair of the Science Committee in January 2001. Rep. Boehlert has led efforts to protect the environment. As legislative director, Mr. Goldston was Rep. Boehlert's top environmental aide and also oversaw the legislative and press operations of the office.

Mr. Goldston came to Capitol Hill in 1983 as Boehlert's press secretary. From 1985 to 1994, he served on the Science Committee as the special assistant on the Subcommittee on Science, Research, and Technology. In that role, he oversaw the programs of the NSF and NIST and also directed Boehlert's efforts to shut down the Superconducting Super Collider.

From 1994 to 1995, Mr. Goldston was project director at the Council on Competitiveness, a private sector group with members from industry, labor, and academia. Goldston directed work on the report, "Endless Frontier, Limited Resources: U.S. R&D Policy for Competitiveness."

Mr. Goldston graduated with a B.A. degree in American History from Cornell University in 1978.

Hazel A. Barton

Ashland Endowed Professor of Integrative Science, Northern Kentucky University

"Amazing Caves"

Co-star and Presenter

Friday • 8:00PM

Hazel A. Barton received her Ph.D. degree in microbiology from the University of Colorado Health Sciences Center. Following her degree, she spent some time working as an Instructor in the Department of Surgery at the same institution, before accepting a position in the laboratory of Dr. Norman Pace studying microbial ecology. Following her work with Dr. Pace, Dr. Barton moved to the University of Utah and subsequently the University of California, Davis, where she was a Research Assistant Microbiologist in the laboratory of Dr. John Roth, studying microbial physiology and adaptation to starvation. Dr. Barton is also a cave explorer and cave-diver, discovering, exploring and mapping caves in many different countries, and is presently a Director of the U.S. National Speleological Society and the Quintana Roo Speleological Survey of Mexico. Her work has been featured in the recent large format IMAX film *Journey into Amazing Caves* and in *Sports Illustrated*.

Dr. Barton is presently the Ashland Endowed Professor of Integrative Science at Northern Kentucky University, where she has an active undergraduate laboratory that studies the interactions of microbial communities in cave environments.

Denice D. Denton

Dean, College of Engineering, University of Washington

Plenary II

Saturday • NOON

Denice D. Denton is leading the University of Washington's College of Engineering through an unprecedented period of change, innovation, and growth. Recognized as a national leader in engineering education, she directs a college with 10 departments, nine major centers, 200 faculty, and approximately 3,000 students.

Dr. Denton has served as chair of the National Research Council's Board on Engineering Education, member of the Committee on Engineering Education of the National Academy of Engineering (NAE), fellow of AAAS and the Association of Women in Science, and co-director of the National Institutes for Science Education.

Dr. Denton actively encourages women and underrepresented minorities to consider careers in science and engineering. She has developed the "Microfabrication Demonstration Kit," which is being used in K-12 classrooms in more than 30 states to introduce students to microelectronics. She currently directs the University of Washington's NSF ADVANCE program for women in science.

Among her numerous research and teaching awards are the prestigious Kiekhofer Distinguished Teaching Award, the American Society of Engineering Education AT&T Foundation Teaching Award, the Eta Kappa Nu C. Holmes MacDonald Distinguished Young Electrical Engineering Teaching Award, the Benjamin Smith Reynolds Teaching Award, the W.M. Keck Foundation Engineering Teaching Excellence Award, the American Society of Engineering Education (ASEE) George Westinghouse Award, and the Institute of Electrical and Electronics Engineers (IEEE) Harriet B. Rigas Teaching Award.

Dr. Denton earned her B.S., M.S., and Ph.D. degrees in electrical engineering at MIT and conducts research on microelectromechanical systems and use of polymers in photonics and integrated circuits.

Eric Mazur

Harvard College Professor, Gordon McKay Professor of Applied Physics, and Professor of Physics, Harvard University

Interactive Plenary

Saturday • 3:30PM

Eric Mazur holds a triple appointment as Harvard College Professor, Gordon McKay Professor of Applied Physics, and Professor of Physics at Harvard University. An internationally recognized scientist and researcher, he leads a vigorous research program in optical physics and supervises one of the largest research groups in the Physics Department at Harvard University.

Dr. Mazur has made important contributions to spectroscopy, light scattering, and studies of electronic and structural events in solids that occur on the femtosecond time scale. In 1988, he was awarded a Presidential Young Investigator Award. He is a Fellow of the American Physical Society (APS) and has been named APS Centennial Lecturer during the Society's centennial year. Dr. Mazur has held appointments as Visiting Professor or Distinguished Lecturer at the University of Leuven in Belgium, National Taiwan University in Taiwan, Carnegie Mellon University, and Hong Kong University.

In addition to his work in optical physics, Dr. Mazur is interested in education, science policy, outreach, and the public perception of science. He believes that better science education for all—not just science majors—is vital for continued scientific progress. To this end, Dr. Mazur devotes part of his research group's effort to education research and finding verifiable ways to improve science education.
In 1990, he began developing Peer Instruction, a method for teaching large lecture classes interactively. Dr. Mazur's teaching method has developed a large following, both nationally and internationally, and has been adopted across many science disciplines.

Frederick S. Humphries

President, National Association for Equal Opportunity in Higher Education

Plenary III

Saturday • 6:30PM

Frederick S. Humphries took office as the fourth President of the National Association for Equal Opportunity in Higher Education (NAFEO) on January 1, 2002, where he has worked diligently to raise the profile of the nation's 118 historically and predominately black colleges. He has fought vigorously for increased resources and the expansion of programs at NAFEO member institutions.

A renowned scholar and admired public servant, Dr. Humphries has had a distinguished, 27-year career as president of Florida A&M University (FAMU) and Tennessee State University. During his nearly 17-year tenure at FAMU, he more than doubled enrollment while simultaneously raising academic standards. He increased the number of National Achievement Scholars at the school—ranking first in the nation three times. Dr. Humphries also made FAMU the nation's number one producer of African-Americans with baccalaureate degrees and third in the nation as the baccalaureate institution of origin for African-American doctoral degree recipients.

A tireless fundraiser, Dr. Humphries raised more than $60 million for FAMU, making the university's endowment the largest of the nation's public Historically Black Colleges. He also increased FAMU's sponsored research dramatically.

Dr. Humphries is respected throughout the nation for his keen insights on the education of minority students, particularly in math and the hard sciences, and his unique and visionary approaches to producing successful educational outcomes. Dr. Humphries received a B.S. degree in chemistry from FAMU and a Ph.D. degree in physical chemistry from the University of Pittsburgh.

Speakers • Ballroom E

Donald E. Thompson

Deputy Assistant Director of the Directorate for Education and Human Resources, NSF

Final Plenary

Sunday • 11:40AM

In his role as Deputy Assistant Director of the Directorate for Education and Human Resources at NSF, Donald E. Thompson serves as the focal point for NSF's agency-wide commitment to enhancing the quality and excellence of STEM education and research through broadening participation by underrepresented groups and institutions.

Dr. Thompson has spent more than 25 years in higher education as a Professor of Education and Urban Planning, researcher in the field of program/systems implementation and evaluation, and Administrator at the University of Michigan and, more recently, at Western Michigan University, where he served as Associate Vice President for Academic Affairs, Dean of the College of Education, and Vice President for Research and Dean of the Graduate College.

While at Western Michigan University, Dr. Thompson led the dramatic growth of research and graduate studies that catapulted the university to the ranks of the top 100 universities in the Carnegie Classification System. During his tenure and under his leadership, research grew from $4 million to $85 million in external funding, and the graduate student population grew to more than 6,000. Equally important was the development of curricula and programs that broadened the participation of underrepresented groups and international students. Through collaborations with Historically Black Universities, Hispanic-Serving Institutions, and international partners, the research and graduate studies enterprise became one of the nation's best models for academic inclusion.

Theodore W. Hodapp

Program Director, Division of Undergraduate Education, NSF

Conference Host

Theodore W. Hodapp is the chair of the Physics Department at Hamline University in St. Paul, Minnesota. Currently on loan to the NSF as a Program Director in the Division of Undergraduate Education (DUE), he helps administer DUE programs, including all four CCLI tracks, CSEMS and Noyce scholarships, the Teachers Professional Continuum (TPC), which is run jointly with the Division of Elementary, Secondary and Informal Education, as well as the National STEM Digital Library (NSDL).

Dr. Hodapp's research interests lie in quantum optics, where he has worked with single-atom manipulation, atom-photon interactions, optical traps, and laser cooling. More recently, he spent time at the 3M company working on design and characterization of optical displays.

Dr. Hodapp is the chair of the Physics and Astronomy Division of the Council on Undergraduate Research, and has served on the American Physical Society's (APS) Committee on Education and chaired the prize committee for research at a predominantly undergraduate institution. He helped write teacher licensure standards for K-12 science and physics licensure within the state of Minnesota and is continuing to organize efforts at the national level to improve licensure requirements and their evaluation through the APS.