

**EMBARGOED FOR RELEASE**  
**February 14, 2004 7:00 a.m. PST**  
**American Association for the**  
**Advancement of Science (AAAS)**  
**Women and Minorities in Science**  
**Networking Breakfast**

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**REPORT IDENTIFIES DESIGN PRINCIPLES THAT LEAD TO SUCCESS IN  
EDUCATING NEW GENERATION OF U.S. SCIENTISTS AND ENGINEERS**

*Rensselaer Polytechnic Institute president calls on nation's leaders to  
expand and adapt "what works"*

(At the AAAS annual meeting, Seattle, WA – February 14, 2004) Defining “what works” in higher education to keep women and minorities on the path to careers in science, engineering and technology, Rensselaer Polytechnic Institute president **Shirley Ann Jackson** today released a report by Building Engineering and Science Talent (BEST) that showcases nine design principles for success.

The report, titled “*A Bridge for All: Higher Education Design Principles to Broaden Participation in Science, Technology, Engineering and Mathematics,*” provides a blueprint for action in higher education.

“Today, I am urging our nation’s policymakers, business leaders, and educators to make the commitment to assure that the United States does not lack the world-class science and engineering talent it must have to maintain its pre-eminence,” Jackson said.

A national commitment is critical, Jackson said, because the nation’s scientists and engineers are aging and retiring and are not being replaced in sufficient numbers.

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“Young women and minority youth are now the demographic majority in the United States, but they represent only a small fraction of the scientists and engineers,” Jackson said, adding that the nation needs “a dramatic increase in participation by underrepresented groups” to maintain our science and engineering enterprise. We must tap this group if we are going to maintain our global leadership. “

The report, “**A Bridge for All,**” tells us how to do that, Jackson said.

“BEST has identified rigorous criteria that can be applied to university-level programs that focus on diversity while delivering world-class talent,” Jackson said during a speech at the American Association for the Advancement of Science’s (AAAS) Women and Minorities in Science Networking Breakfast, at the group’s annual meeting in Seattle. Jackson served as chair of the BEST Blue Ribbon Panel on Higher Education and is the president elect of AAAS.

“Higher education is being asked to meet three converging requirements: the *replacement* need to fill the shoes of the current science and engineering workforce (half of which is at least 40 years old); the *structural* need for scientists and engineers in promising technology sectors; and the *competitive* need to keep pace with an international surge in production of science and engineering talent,” said John Yochelson, president of BEST. “Despite efforts to diversify the scientific talent pool, the profession remains 3/4 male and 4/5 white.”

To create a program that works, BEST determined that it must include: institutional leadership, targeted recruitment, engaged faculty, personal attention, peer support, enriched research experience, bridging to the next level and continuous evaluation.

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These design principles were developed during a two-year net assessment of best practices in higher education, pre-K-12 and the workforce. BEST used available research and the judgment of 120 nationally-recognized business, academic and government leaders to identify eight design principles that support effective programs. A ninth principle, which is decisive but cannot always be designed in, is comprehensive financial assistance for low-income students. The panel found that students who have enough financial support to concentrate on academics outperform those who don't.

The BEST design principles have proven to play an integral role in helping students make the successful transition from school to work. These principles were consistently evident in seven higher education programs that BEST identified as exemplary (see attached list).

“The BEST effort is distinctive in its attempt to use the same rigorous approach and dependence on evidence that defines science,” said Jackson. “I believe that the findings of our Panel represent a starting point and not the last word. The good news is that these standards have begun to define what is effective, adaptable, affordable and deserving of further consideration as an intervention.”

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**About Building Engineering and Science Talent, (BEST)**

BEST, an initiative of the Council on Competitiveness, was established as an independent, 501(c)3 in September 2001 at the recommendation of the Congressional Commission on the Advancement of Women in Science, Engineering and Technology. The nation's scientists, engineers, mathematicians and technologists comprise an indispensable strategic asset. Despite decades of effort, however, this pool of talent remains about 3/4 male and 4/5 white.

BEST's mission is to build a foundation for action through a two-year net assessment of best practices in pre-K-12, higher education and the workplace to increase the participation of women, African Americans, Hispanics, Native Americans and persons with disabilities in the science, engineering and technology professions. Three blue-ribbon panels worked in parallel across the whole continuum of education and workforce development. Based on available research evidence and the professional judgment of 120 nationally recognized practitioners and researchers, the higher education assessment:

- Makes the case for national action to meet the U.S. talent imperative;
- Rates pre-K-12 programs that have research evidence of effectiveness or are worthy of investment in further research;
- Analyzes higher education and workplace exemplars;
- Distills the design principles that underpin effective programs, and
- Proposes an action agenda at the national and community levels engaging employers, educators, policy makers, professional societies and nonprofit organizations.

BEST will announce the results of the remaining two assessments during spring 2004.

**About Rensselaer Polytechnic Institute**

Rensselaer Polytechnic Institute, founded in 1824, is the nation's oldest technological university. The school offers degrees in engineering, the sciences, information technology, architecture, management, and the humanities and social sciences. Institute programs serve undergraduates, graduate students, and working professionals around the world. Rensselaer faculty are known for pre-eminence in research conducted in a wide range of research centers that are characterized by strong industry partnerships. The Institute is especially well known for its success in the transfer of technology from the laboratory to the marketplace so that new discoveries and inventions benefit human life, protect the environment, and strengthen economic development.

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*BEST Design Principles*

<i>Principle</i>	<i>Evidence</i>
Institutional leadership	Commitment to inclusiveness across the campus community
Targeted recruitment	Investing in and executing a feeder system, K-12
Engaged faculty	Developing student talent as a rewarded faculty outcome
Personal attention	Addressing, through mentoring and tutoring, the learning needs of each student
Peer support	Student interaction opportunities that build support across cohorts and allegiance to institution, discipline and profession
Enriched research experience	Beyond-the-classroom hands-on opportunities and summer internships that connect to world of work
Bridging to the next level	Institutional relationships that help students and faculty to envision pathways to milestones and career development
Continuous evaluation	Ongoing monitoring of process and outcomes that guide program adjustments to heighten impact

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***BEST Exemplary Higher Education Programs***

***Undergraduate***

**University of Michigan**

*Women in Science and Engineering Residence Program  
(WISE-RP)*

Dr. Cinda-Sue Davis, Director  
1065 Frieze Building, 105 S. State  
Ann Arbor, MI 48109  
sdavis@umich.edu

[www.umich.edu/~wiserp/index.html](http://www.umich.edu/~wiserp/index.html)

**Drexel University**

*Gateway Engineering Education Coalition*

Roy A. Brothers, University Professor and Director  
Center for Educational Research  
Philadelphia, PA 19104  
fromm@drexel.edu

[www.gatewaycoalition.org](http://www.gatewaycoalition.org)

**University of Maryland, Baltimore County (UMBC)**

*Meyerhoff Scholars Program*

Ernestine Baker, Executive Director  
1000 Hilltop Circle  
Baltimore, Maryland 21228-5398  
rbaker@umbc.edu

[www.umbc.edu/Programs/Meyerhoff/Undergrad/](http://www.umbc.edu/Programs/Meyerhoff/Undergrad/)

***Graduate***

**National Consortium for Graduate Degrees for Minorities in Science  
& Engineering (GEM)**

Sandra Johnson, Executive Director  
P.O. Box 537  
Notre Dame, IN 46556  
Sandra.d.Johnson.301@nd.edu

[www.nd.edu/~gem/national\\_consortium\\_for\\_graduate.htm](http://www.nd.edu/~gem/national_consortium_for_graduate.htm)

***Faculty***

**Harvard University**

*Compact for Faculty Diversity*

Dr. Ken Pepion  
Read House, Appian Way  
Cambridge, MA 02138  
Ken\_pepion@gse.harvard.edu

[www.sreb.org/programs/dsp/directory/directoryindex.asp](http://www.sreb.org/programs/dsp/directory/directoryindex.asp)

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**American Association for Higher Education**

*Preparing Future Faculty*

Dr. Gerry G. Gaff

One Dupont Circle, NW

Washington, DC 20036

[www.preparing\\_faculty.org](http://www.preparing_faculty.org)

*Statewide*

*Discipline-Focused*

**University of North Carolina, Chapel Hill**

*Partnership for Minority Advancement in the Biomolecular Sciences*

(PMABS)

Dr. Walter "Skip" Bollenbacher

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[www.unc.edu/pmabs/](http://www.unc.edu/pmabs/)

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**BEST BLUE RIBBON PANELISTS**  
**Best Practices in Higher Education**

**Shirley Ann Jackson**, president of Rensselaer Polytechnic Institute, is former chairman of the Nuclear Regulatory Commission. A theoretical physicist, she has conducted research at AT&T Bell Laboratories and held a professorship at Rutgers. She is a life member of the MIT Corporation, a member of the National Academy of Engineering and the first woman to win the Black Engineer of the Year award. (Panel Chair)

**Willie Pearson, Jr.** chairs the School of History, Technology and Society at the Georgia Institute of Technology. A member of the National Academy of Sciences Committee on Women in Science and Engineering, he also chairs the AAAS Committee on Science and Engineering Public Policy and is vice chair of the NSF Committee on Equal Opportunities in Science and Engineering. (Panel Expert Leader)

**Margaret E. Ashida**, director of corporate university relations at IBM, is responsible for developing the corporation's relationship programs with targeted universities worldwide. She has held line management and headquarters staff positions at IBM, the ROLM Company, and Xerox.

**Walter E. (Skip) Bollenbacher**, professor of biology at the University of North Carolina at Chapel Hill, is executive director of the Partnership for Minority Advancement in the Bio-molecular Sciences. He is the principal investigator in NIH's Seeding Postdoctoral Innovators in Research and Education (SPIRE) program.

**Salvatore "Tory" Bruno** is vice president of engineering for Lockheed Martin's Space Systems Company. Previously, he served as chief engineer for the strategic missile program. He has been awarded invention disclosures and patents for his work on thrust vector, reaction, and inertial control systems.

**Jane Zimmer Daniels**, program director of the Clare Booth Luce Program for Women in Science and Engineering at The Henry Luce Foundation, is past president of Women in Engineering Programs and Advocates Network (WEPAN). She is former program officer for the NSF Gender Equity in Science and Engineering Program. For 22 years she directed the Women in Engineering Program at Purdue University.

**Cinda-Sue Davis** directs the Women in Science and Engineering (WISE) Program at the University of Michigan. Recipient of the 2000 Maria Mitchell Women in Science Award, she has been a principal investigator on numerous NSF and foundation grants focusing on gender equity in science and engineering education.

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**Alfredo de los Santos, Jr.**, research professor for the Hispanic Research Center at Arizona State University, is the former vice chancellor of the Maricopa County Community College District, the second largest community college district in the U.S. He is the principal investigator of several comprehensive education and workforce development initiatives.

**Mary Frank Fox** is professor in the School of History, Technology and Society and co-director of the Center for Study of Women, Science and Technology at Georgia Tech. A specialist on gender, science, technology and academia, she has been a consultant to the National Research Council/National Academy of Science (NRC/NAS) and is former president of the Sociologists for Women in Society.

**Judy R. Franz**, executive officer of American Physical Society, is past president of the American Association of Physics Teachers. A condensed matter physicist who spent her previous career as a university faculty member, she is associate secretary general of the International Union of Pure and Applied Physics.

**Angela Ginorio** is associate professor in the Department of Women Studies at the University of Washington, where she directs the Rural Girls in Science program. She specializes in educating Latinas and girls living in rural areas, with a particular focus on science and engineering.

**Evelynn M. Hammonds**, associate professor of History of Science at Massachusetts Institute of Technology (MIT) is a historian of science specializing in history of medicine and public health in the US, with a special focus on race and gender in science and medicine. Professor Hammonds is founding director of the Center for the Study of Diversity in Science, Technology, and Medicine at MIT.

**Robert Ibarra**, senior associate at the Ibis Consulting Group, is assistant vice chancellor for academic affairs emeritus at the University of Wisconsin-Madison. He has conducted extensive research on multi-contextuality and Latinos in higher education.

**Alex Johnson** is president of the metropolitan campus of Cuyahoga Community College. He was a fellow with the American Council on Education (ACE) and served as chairman of the ACE Council of Fellows Executive Committee. He is a commissioner with the American Association of Community Colleges.

**Saundra Johnson**, executive director of the National Consortium for Graduate Degrees for Minorities in Engineering (GEM), is former director of the Minority Engineering Program at Pennsylvania State University.

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**Wayne Johnson** is executive director of Hewlett-Packard Company's worldwide university relations, including programs in research, recruitment, continuing education, and public affairs. He joined HP from the university relations program of Microsoft, and earlier held a variety of positions at Raytheon.

**Kenneth Maton**, professor and chair of the Dept. of Psychology at the University of Maryland, Baltimore County, evaluates math and science intervention programs at the pre-K through 12 and college levels. His research focuses on how inner-city youth cope with stress.

**Lionel "Skip" Meno**, dean of the College of Education at San Diego State University, served as commissioner of education for the state of Texas from 1991-1995. Earlier, he was deputy commissioner of education for the state of New York. He recently co-chaired California's Professional Development Task Force.

**Carol B. Muller** is founder and executive director of MentorNet, the national electronic mentoring network for women in engineering and science. She is also a consulting associate professor of engineering, Stanford University.

**Ken Pepion**, director of faculty programs at the Pacific Northwest Research Laboratories. He served as executive director of the Harvard University Native American Program and is a board member of the Society for the Advancement of Chicanos and Native Americans in Science.

**Clifton Poody** directs the Minority Opportunities in Research Division of the National Institute of General Medical Sciences. A biologist, he has written extensively on research and education issues affecting under-represented groups. He is a member of the Society for the Advancement of Chicanos and Native Americans in Science.

**James H. Stith**, a physicist and physics education researcher, directs the Physics Resources Center at the American Institute of Physics. He specializes in program evaluation and teacher preparation. He is past president of the American Association of Physics Teachers and the National Society of Black Physicists.

**Dan Sullivan**, corporate executive vice president of human resources at QUALCOMM, has direct responsibility for all human resources functions including: organization planning, learning, employee relations, and staffing and management development for the company's more than 6,500 employees.

**Orlando L. Taylor**, dean of Howard University's Graduate School of Arts and Sciences, created Howard's Preparing Future Faculty (PFF) program. He specializes in sociolinguistics, educational linguistics, and intercultural communication.

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**Isiah M. Warner** is professor and chair of the Chemistry Department at Louisiana State University. He has been awarded the U.S. Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring for his innovative work with under-represented minorities in these fields.

**Melvin R. Webb**, professor of biology and science education, directs the Program for Research Integration and Support for Matriculation to the Doctorate (PRISM-D) at Clark Atlanta University. He has received the Making Mathematics Work for Minorities Award.

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