BROADENING PARTICIPATION ACROSS THE EDUCATION AND RESEARCH ENTERPRISES

James H. Wyche, Ph.D.
Provost & Chief Academic Officer
HOWARD UNIVERSITY

MIT
July 21, 2011
OVERVIEW

• Brookhaven /DOE Experience
• The changing face of diversity: A look back
• Demographic projections: 2050
• Pathways to diversifying the workforce
• Achieving distinction in the academy
THE CHANGING FACE OF DIVERSITY

• Reflections about Brookhaven National Laboratory Experience

• Personal/professional journey: Opening doors, improving access and opportunity

• Leadership Alliance, since 1992
**DEMOGRAPHIC PROJECTIONS: 2050**

- US population: increasingly diverse

- Gap between increasingly diverse population and diversity in science and technology
U.S. POPULATION 18–24 YEARS OLD, BY RACE/ETHNICITY: JULY 1990–99 AND PROJECTIONS TO 2050

Number of degrees

- Non-S&E women
- Non-S&E men
- S&E men
- S&E women


Degree counts range from 0 to 600,000.
FEMALE SHARE OF S&E GRADUATE STUDENTS, BY FIELD: 1995 AND 2005
FEMALE SHARE OF S&E POSTDOCTORAL FELLOWS, BY FIELD: 1995 AND 2005

Diagram showing the percentage of female postdoctoral fellows in various fields of study between 1995 and 2005.
PATHWAYS TO BROADENING PARTICIPATION

• Exemplars, lessons learned

NSF: National Science Foundation
• LSAMP: Louis Stokes Alliance for Minority Participation
• AGEP: Alliances for Graduate Education and the Professoriate
Louis Stokes Alliance for Minority Participation

LSAMP

Office of the Provost and Chief Academic Officer
UNDERREPRESENTED MINORITY PHDs PRODUCED ACROSS ALL STEM DISCIPLINES (2002–2006)

All Underrepresented Minorities
n = 6425

54% AGEP from 102 institutions
46% Non-AGEP from 181 institutions

American Indian / Alaska Native
n = 142
49% AGEP from 45 institutions
51% Non-AGEP from 45 institutions

Black
n = 2207
53% AGEP from 91 institutions
47% Non-AGEP from 156 institutions

Hispanic
n = 3871
45% AGEP from 153 institutions
55% Non-AGEP from 153 institutions

Native Hawaiian / Pacific Islander
n = 205
51% AGEP from 48 institutions
49% Non-AGEP from 54 institutions

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
All Underrepresented Minorities
n = 1921

American Indian / Alaska Native
n = 36
56% AGEP from 19 institutions
44% Non-AGEP from 15 institutions

Black
n = 619
62% AGEP from 66 institutions
38% Non-AGEP from 79 institutions

Hispanic
n = 1231
56% AGEP from 71 institutions
44% Non-AGEP from 80 institutions

Native Hawaiian / Pacific Islander
n = 35
60% AGEP from 18 institutions
40% Non-AGEP from 11 institutions

Source: NSF Survey of Earned Doctorates/Doctorate Records File and AGEP.us
PATHWAYS TO BROADENING AND SUSTAINING PARTICIPATION IN THE ACADEMY
**HIGHLIGHTS: EXPANDING UNDERREPRESENTED MINORITY PARTICIPATION**

- Underrepresented minority students lagging behind white and Asian students dramatically

- Goal? US will have to **more than double** the proportions of underrepresented minorities with a postsecondary degree in order just to meet the 55 percent mark achieved by Asian Americans/Whites.

- 25-34 year old cohort with an associate’s degree:
  - 26 percent of African Americans
  - 24 percent of Native Americans/Pacific Islanders
  - 18 percent of Hispanics and Latinos
DOCTORAL SCIENCE AND ENGINEERING FACULTY,
BY RACE/ETHNICITY AND COUNTRY OF BIRTH: 2003
# Baccalaureate Origin of African American Doctorates in the Natural Sciences & Engineering (2002-2006)

<table>
<thead>
<tr>
<th>Rank</th>
<th>Institution</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total</td>
<td>399</td>
<td>386</td>
<td>464</td>
<td>495</td>
<td>488</td>
<td>2232</td>
</tr>
<tr>
<td>1</td>
<td>Florida Agricultural and Mechanical University</td>
<td>3</td>
<td>6</td>
<td>10</td>
<td>19</td>
<td>13</td>
<td>51</td>
</tr>
<tr>
<td>2</td>
<td>Howard University</td>
<td>10</td>
<td>5</td>
<td>7</td>
<td>12</td>
<td>14</td>
<td>48</td>
</tr>
<tr>
<td>3</td>
<td>Hampton University</td>
<td>9</td>
<td>6</td>
<td>11</td>
<td>7</td>
<td>11</td>
<td>44</td>
</tr>
<tr>
<td>4</td>
<td>North Carolina Agricultural &amp; Tech State Univ</td>
<td>6</td>
<td>6</td>
<td>12</td>
<td>8</td>
<td>10</td>
<td>42</td>
</tr>
<tr>
<td>4</td>
<td>Spelman College</td>
<td>13</td>
<td>5</td>
<td>7</td>
<td>9</td>
<td>8</td>
<td>42</td>
</tr>
<tr>
<td>6</td>
<td>Morehouse College</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>9</td>
<td>9</td>
<td>35</td>
</tr>
<tr>
<td>7</td>
<td>Southern University A&amp;M Col at Baton Rouge</td>
<td>4</td>
<td>6</td>
<td>7</td>
<td>11</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>8</td>
<td>Xavier University of Louisiana</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>10</td>
<td>5</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>Tuskegee University</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>9</td>
<td>31</td>
</tr>
<tr>
<td>10</td>
<td>Morgan State University</td>
<td>3</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>11</td>
<td>University of Maryland Baltimore County</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>7</td>
<td>24</td>
</tr>
<tr>
<td>12</td>
<td>Massachusetts Institute of Technology</td>
<td>3</td>
<td>6</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>12</td>
<td>University of Maryland at College Park</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td>14</td>
<td>Alabama Agricultural and Mechanical University</td>
<td>.</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>14</td>
<td>North Carolina State University at Raleigh</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>6</td>
<td>19</td>
</tr>
</tbody>
</table>

Source: NSF/SRS, WebCASPAR (Survey of Earned Doctorates)

Table excerpted from: Expanding Underrepresented Minority Participation: America’s Science and Technology Talent at the Crossroads
http://www.nap.edu/catalog/12984.html

Key:
- Historically Black Colleges and Universities
- Predominantly White Colleges and Universities
Arlie O. Petters
Professor of Mathematics, Physics, and Business Administration

Duke University: Arts & Sciences and Fuqua School of Business

Education:
Ph.D. MIT, 1991 (Mathematics); advisors: Bertram Kostant (MIT) and David Spergel (Princeton University)
Ph.D. thesis title: *Singularities in Gravitational Microlensing*
PRINCETON UNIVERSITY, 1988-1991 (Exchange Scholar; in absentia from MIT)
MIT, 1986-1988 (Department of Mathematics);
B.A./M.A. HUNTER COLLEGE - C.U.N.Y., 1986 (Mathematics and Physics)
M.A. thesis title: *The Mathematical Theory of General Relativity*
Erich D. Jarvis, Ph. D.

Exploring the Neurobiology of Vocal Communication

Duke University Medical Center

EDUCATION
1979-1983 Scholarships to Geoffrey Ballet and Alvin Ailey Dance Schools, NY
1979-1983 Dance Major, High School of the Performing Arts, NY
1988-1995 Ph.D., Molecular Neurobiology & Animal Behavior, The Rockefeller University, NY
Most Current Data:

Whites: 83.0%

African Americans: 3.5%

Hispanics: 5.4%

Asian Americans: 6.3%

American Indians 0.6%.

International Research Activities
• Africa
• Caribbean/Latin America
• South America
Model Programs to Sustain Participation in the Academy

- Howard Applied Science and Technology Institute: Recruiting junior scientists of color, providing both research and teaching opportunities
- Leadership Alliance
Example of a model initiative geared toward increasing the number of African American and underrepresented students pursuing careers in the STEM disciplines.
The Leadership Alliance
www.theleadershipalliance.org

- **A Consortium** of 33 Outstanding Academic Institutions

- **Shared Vision**: Greater diversity in the nation's institutions of higher learning

- **Shared Commitment**: Assist underrepresented minority students become future educators and leaders for our academic, public and government organizations

- **Shared Engagement**: By focusing on critical transitions along the academic pathway, the Alliance provides trainees with trusted information and experiences to envision their next horizon

**Member Institutions**

- Brooklyn College
- Brown University
- Chaminade University
- Claflin University
- Columbia University
- Cornell University
- Dartmouth College
- Delaware State University
- Dillard University
- Harvard University
- Howard University
- Hunter College
- Johns Hopkins University
- Montana State University–Bozeman
- Morehouse College
- Morgan State University
- New York University
- Prairie View A&M University
- Princeton University
- Spelman College
- Stanford University
- Tougaloo College
- Tufts University
- University of Chicago
- University of Colorado at Boulder
- University of Maryland, Baltimore County
- University of Miami
- University of Pennsylvania
- University of Puerto Rico
- University of Virginia
- Vanderbilt University
- Xavier University of Louisiana
- Yale University
Programs of The Alliance

Programs at Four Levels
1. Undergraduate Summer Research
2. Graduate/Postdoc Transitions
3. Leadership Alliance National Symposium
4. Faculty Resource Network
Origins and Disciplines of Participants in Undergraduate Summer Program

Institutional Origins of Alliance Summer Students

- LA/ MSI
- LA/Non-MSI
- Non LA/ Non- MSI
- Non LA/ MSI

Undergraduate Majors of LA Students 1993–2008; n=2022

- Biosciences 50%
- Social Sciences 19%
- Humanities 13%
- Physical Sciences & Engineering 18%

Increasing numbers of students from Non-MSIs

Students are principally in the STEM Fields
Graduate Enrollment of Leadership Alliance Students 1993–2006 n=1346

- No enrollment in Graduate Program 38%
- Enrolled in Graduate Programs 62%
  - Masters 8%
  - MD 19%
  - PhD 26%
  - Other Clinical 2%
  - MD/PhD 2%
  - Professional Masters 5%

What Types of Training do Students Pursue?
The Majority of Students enroll into graduate training programs
With one quarter of these enrolling into PhD Programs
Enrollment in Doctoral Programs Over Time

The proportion of those entering PhD programs has increased...

...so that the overall outcome is more students in PhD training.
Gender and Racial/Ethnic Distributions

Women enrolling in doctoral programs dominate the Biosciences and the Social Sciences, but...

...there is no difference in disciplines by race or ethnicity
Disciplines of Doctoral Students, Cumulative 1993–2006

- Biosciences: 44%
- Social Sciences: 23%
- Humanities: 13%
- Engineering and Physical Sciences: 20%

Undergraduate Majors of LA Students 1993–2008; n=2022

- Biosciences: 50%
- Engineering and Physical Sciences: 18%
- Social Sciences: 19%
- Humanities: 13%

The disciplinary mix of those entering graduate training....

...is similar to the disciplinary mix of the entire entering undergraduate pool
Completion and Advance Training

Time to Degree
Source: NSF Survey of Earned Doctorates, 2005 Table 16

Engaged in Postdoctoral Study at Higher than National Rates

<table>
<thead>
<tr>
<th>Field</th>
<th>Leadership Alliance</th>
<th>National Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biological Sciences</td>
<td>7.1</td>
<td>6.2</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>6.9</td>
<td>6.2</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>8.0</td>
<td>6.4</td>
</tr>
<tr>
<td>Humanities</td>
<td>9.7</td>
<td>6.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Field</th>
<th>National Average</th>
<th>LA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Humanities</td>
<td>5.9%</td>
<td>26.7%</td>
</tr>
<tr>
<td>Social Sciences</td>
<td>14.8%</td>
<td>36.0%</td>
</tr>
<tr>
<td>Physical Sciences</td>
<td>28.5%</td>
<td>38.1%</td>
</tr>
<tr>
<td>Life Sciences</td>
<td>55.2%</td>
<td>66.7%</td>
</tr>
</tbody>
</table>
Howard University Black Male Initiative:

An Overview
Howard University Black Male Initiative: An Overview

I. The Process
   A. Historical Perspectives
   B. Research and Literature Review
   C. National Outcomes to Date
   D. Best Practices
Howard University Black Male Initiative: An Overview

II. The Howard Model

A. Pre-college K6-8 program (e.g., MS² HU Middle School)
B. Linkage to DC K9-12 (Banneker, Dunbar, Phelps, etc.); other targeted regions (Houston, LA, Chicago, NY, KC)
C. Summer Bridge Academic Enrichment Programs
D. Pre-college Advising Programs: The DC Academy
E. College Prep Transition Programs
F. HU Advising Deanery and Honors College
G. Frosh-Senior Summer Research Programs
H. International Research/Study Abroad Experience
I. Career and Awards Planning and Preparation
J. Metric analyses and Student Tracking
"I think what this committee wants to know is whether or not the situation at the end of the rainbow can be sustained without a bailout."