



Women Physicists of Color Achieving at the Intersection of Race and Gender

K. Renee Horton, PhD Candidate
University of Alabama,
NASA Goddard Space Flight Center
Graduate Student Research Program Fellow
Southern Regional Education Board Fellow

THE UNIVERSITY OF ALABAMA

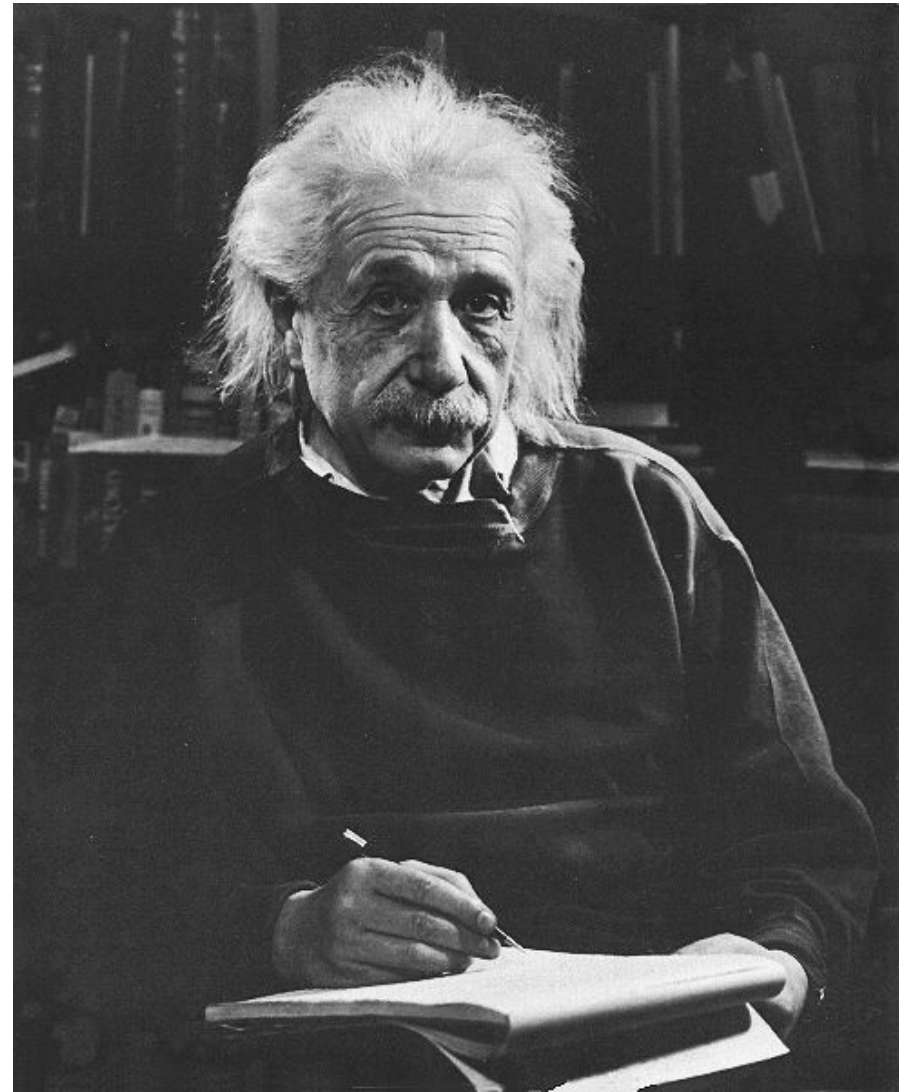
American Physical Society March 13-March 17, 2006

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

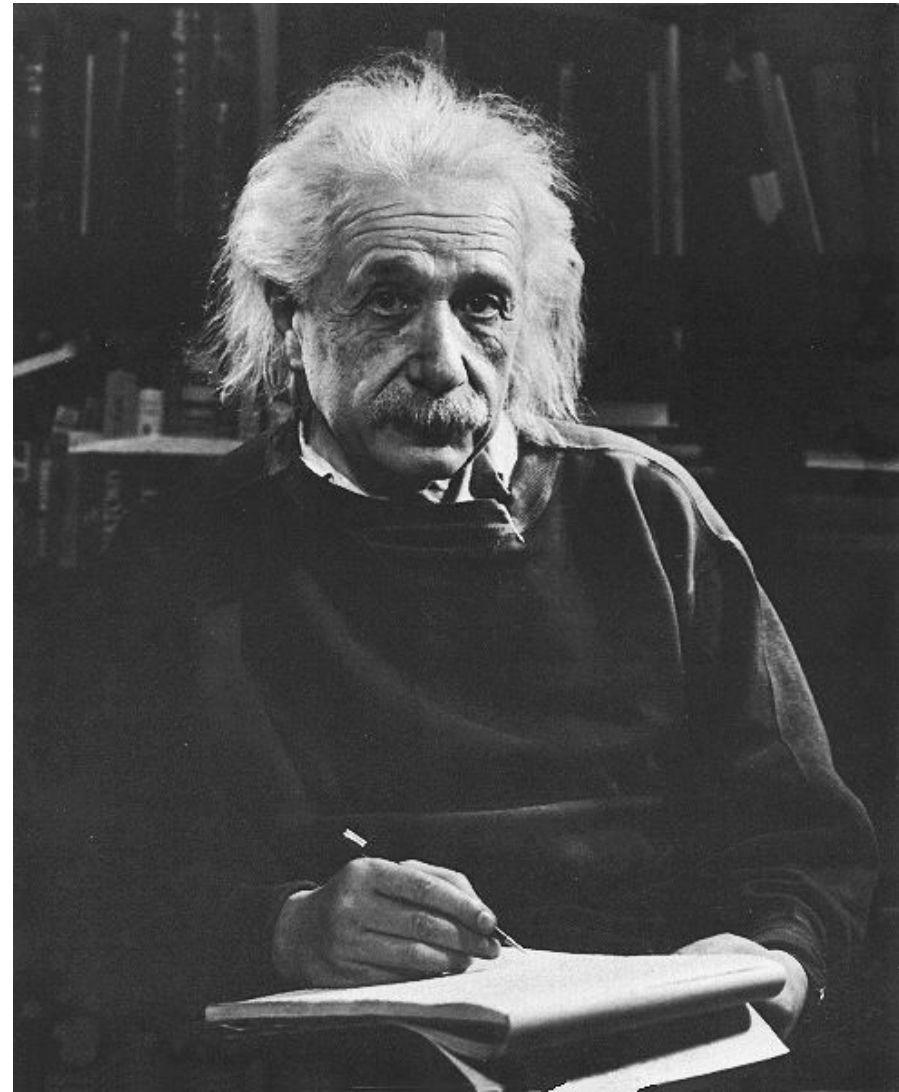
Baltimore Md

“The image of Einstein, with his shock of white hair and seemingly superhuman intellectual accomplishments, is not one that most people would gravitate toward nor view as achievable.”

Borg, A. et al, Attracting girls in Physics. Women in Physics, 2nd IUPAP International Conference on Women in Physics. AIP Conference Proceedings 2005.



And for African American Women this image is less attainable than for most, for we have less in common with him than the majority of the physics community. We are not white, we are not male and we would never be caught with our hair so unsightly.



The Intersection

“African American women are placed into exclusion in science and (more so in Physics), based on a “double bind” resulting from race and gender.”

Malcolm et al. The Double Bind: The Price of Being a Minority
Women in Science. AAAS Report 76-R-3, 1976

Price of Being a Physicist/Scientist

- Financial investment in education
- Human energy
- Personal endurance
- Personal commitment
- Loss of family time

**For Minority women, we pay
additional costs at each level of our
Intellectual Development.**

**The road to enter the heavily
populated “white male” scholarly
order of physics has many barriers
and obstacles that we must
overcome.**

Our white counterparts will often say that they too pay a price to become a part of the scholarly order of physics and this is true and that all women have the same struggle.

This thought is reiterated in the fact that “most studies do not focus on minority women in science and engineering.”

When they do include minorities, we are most times relegated to footnotes or parenthetical discussions. And this is just one item which sets us apart from our white counter parts.

Cheryl Leggon. “African American and Hispanic Women in Science and Engineering.”
Making Strides 3,7 (2001)

We are colleagues, mothers, sisters, friends and sometimes wives, as are our white counterparts, but our experiences cannot be distilled to only gender or race.

Our experiences that arises from the “intersection of race and gender” is what makes us different.

Early Barriers Pre-College

- Minimal support from families due to their lack of understanding or familiarity with science.
- Parents sometime lack the education to be a support system
- Financially unable to provide proper reading material for early preparation.
- Lack of teacher support to pursue science
- Possible alienation from African American peers
- Accusations of “acting white” or carrying the label of a “geek”
- Questioning whether or not we actually fit in.
- Lack of mentors to connect with or identify with

Many minority women consider science to be a “nerdy, male, and white occupation, characterized by scientists’ social isolation at work and in their personal lives



Packard and Hudgings. Physics Careers Website
Journal of College Science Technology. 2002

THE UNIVERSITY OF ALABAMA

American Physical Society March 13-March 17, 2006

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

Baltimore, Md

College Barriers

- Isolation in program because of racial misconceptions
- Cultural differences from other graduate students
- Race segregation as well as gender segregation
- Alienation from peers producing a lack of social support
- Lack research experience as an undergraduate
- Limited mentors to cultivate the interest in physics
- Lack of encouragement from physics faculty and sometimes actually discouragement during undergraduate studies



THE UNIVERSITY OF ALABAMA

American Physical Society March 13-March 17, 2006

Center for Materials for Information Technology
An NSF Materials Research Science and Engineering Center

Baltimore, Md

Barriers beyond the PhD

- Most times the women is the “only” in a department
– Isolation
- Having to mentor most of the minority student in the department because students will gravitate to them.
- Asked to be on several committees to represent the university diversity advancements- takes away from research
- Large percentage are single with no children
- Some are the first in their families to work in science and are alienated from their families because of career choice
- Social support at work is lacking

Cont'd

- Pulled between women's issues and minority issues
- Need to pretend indifference
- Pressure to marry from family
- Lack of informal system of "contacts" that the majority males have access to
- Having to suppress a natural aggressive behavior for achievement because most of our white counterparts don't express aggressiveness. We are viewed as pushy or demanding
 - It's stressed in our families that our education is our source of mobility and that is unlike our white counterparts who see marriage as an additional source of mobility

Achieving at the Intersection of Race and Gender



**Willie
Hobbs
Moore**



**Deborah
Jackson**



**Shirley
Jackson**



**Beth
Brown**



**Apriel
Hodari**

**There are ~50
African American
Women with
PhD's in Physics
and another 15
that work in
Physics**

THE UNIVERSITY OF ALABAMA

American Physical Society March 13-March 17, 2006

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

Baltimore, Md

Minority women especially represent a great untapped resource that could be drawn on to increase the scientific workforce in the U.S. (Ivie and Ray 2005)

It's time to fix
the leaky pipe



It's been shown that more Black women are receiving Bachelors in science and engineering than Black men.

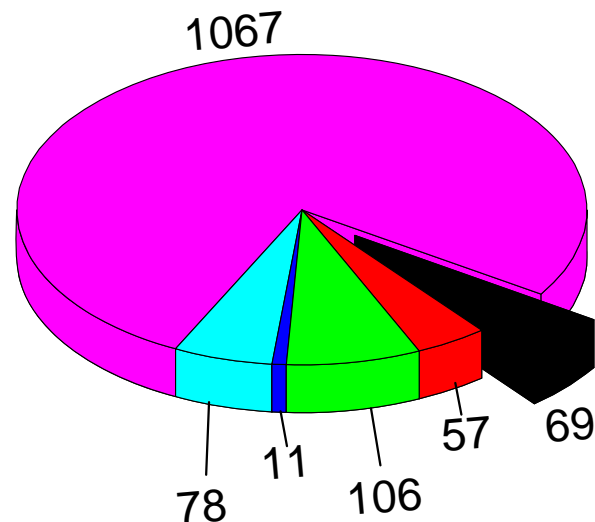
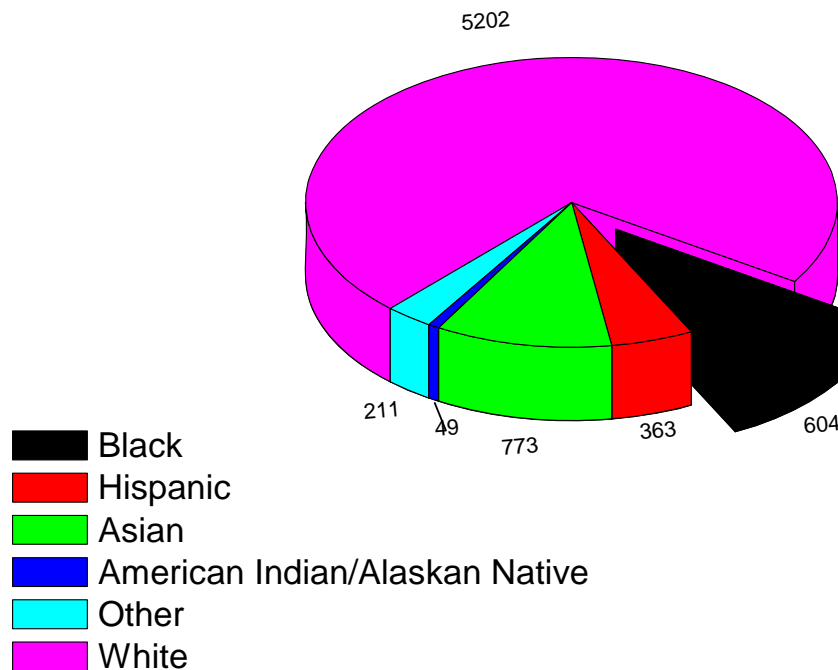
In 2001 black women (669) earned 67% more BS degrees in Physical Science than black males (448).

It's been shown that more Black women are receiving Bachelors in science and engineering than Black men.

In 2001 black women (669) earned 67% more BS degrees in Physical Science than black males (448).

National Science Foundation, Division of Science Resources Statistics, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2004*, NSF 04-317, Arlington, VA, 2004.

Distribution of Bachelor degrees awarded in Physical Science to Women US citizen/permanent residents. 2001 Total 7285



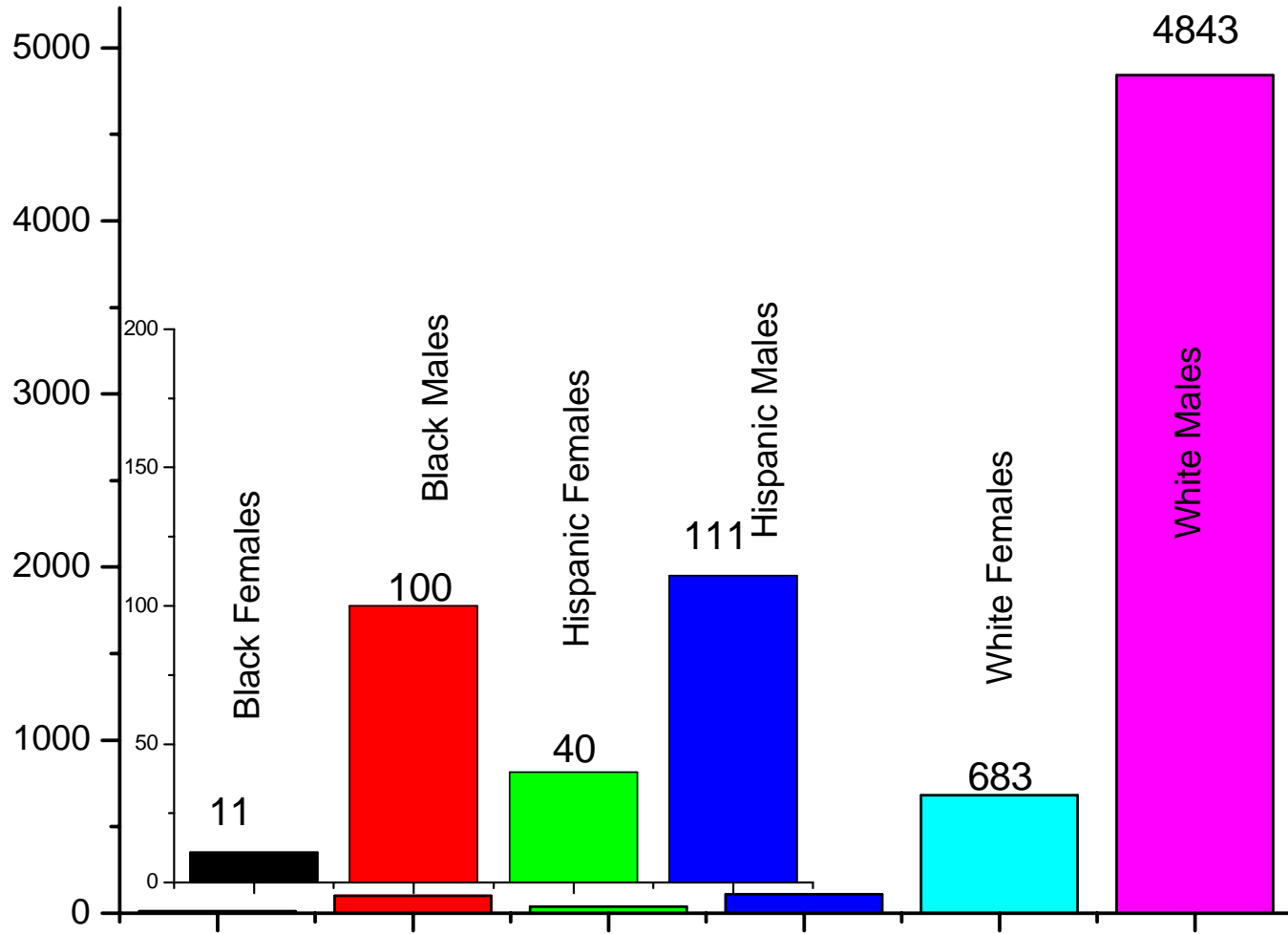
Distribution of Master's degrees awarded in Physical Science to Women US citizen/permanent residents. Total 1388

National Science Foundation, Division of Science Resources Statistics, *Women, Minorities, and Persons with Disabilities in Science and Engineering: 2004*, NSF 04-317, Arlington, VA, 2004.

THE UNIVERSITY OF ALABAMA

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

Number of PhD's awarded in 2001 in Physics



Underrepresented minority (URM) women faculty are almost nonexistent in science and engineering departments at research universities. In the “top 50” physics departments, there are no Black, Hispanic, or Native American Professors at all.

Donna J. Nelson. 2005. A National Analysis of Diversity in Science and Engineering Faculties at Research Universities. Norman, OK: University of Oklahoma.

THE UNIVERSITY OF ALABAMA

American Physical Society March 13-March 17, 2006

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

Baltimore, Md

Despite such a bleak picture, there is hope. Of the 18 departments that award at least 40 percent of bachelor's degrees to women, 7 are Historically Black Colleges and Universities (HBCUs).

Firsts at predominantly white institutions continue to persevere despite the obstacles.

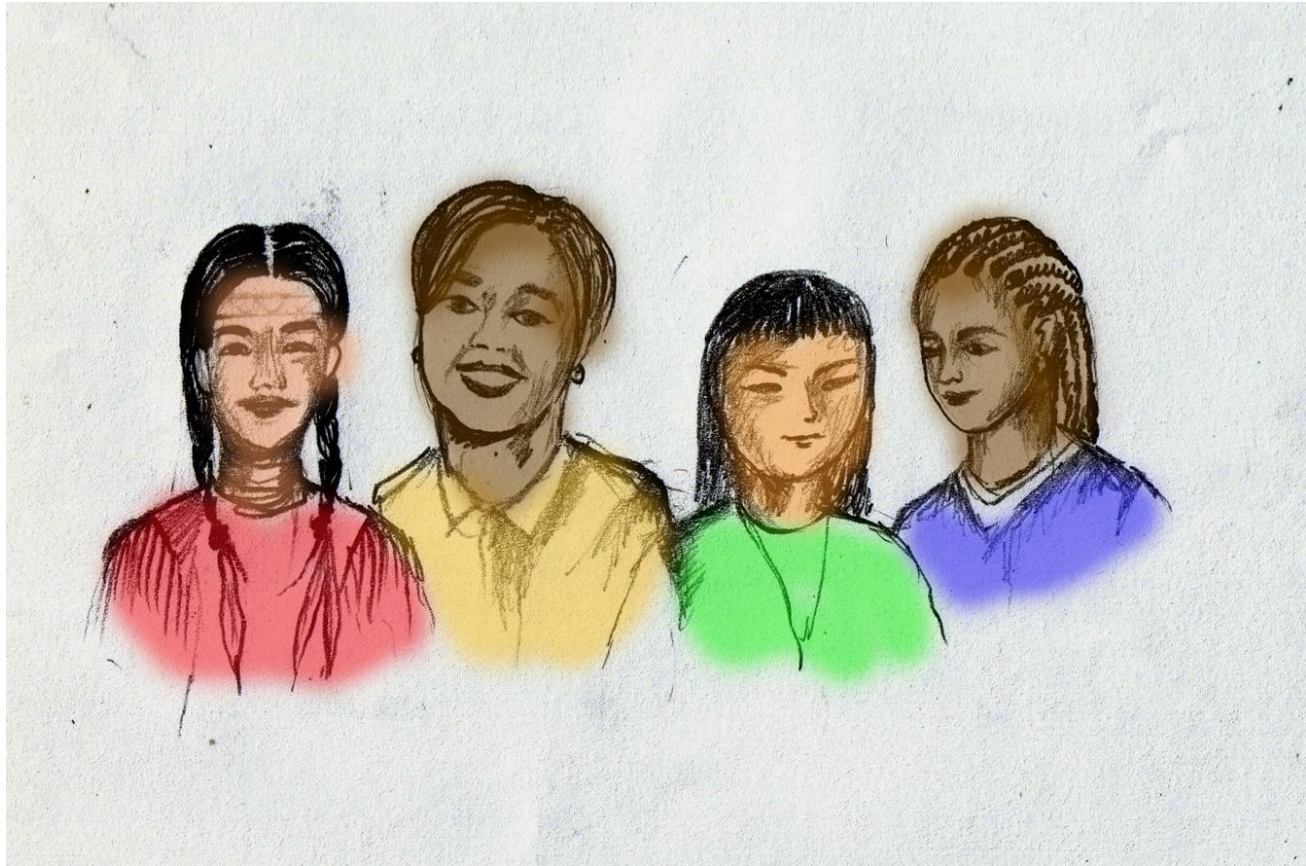
I, myself will be a first at The University of Alabama.

- The first African American to receive a PhD in Material Science.
- The first student with a disability to receive a PhD in Material Science
- The first of my parents children to receive a PhD
- The first offspring of my maternal and paternal grandparents to receive a PhD

Who does physics largely determines who will do physics insofar as physicists are the gatekeepers who determine who is qualified to be a physicist.

Physicists are humans who bring their socio-cultural and historical backgrounds to the practice of science. This background affects what is studied, how it is studied, and how results are to be used

The face of Physics must make a change

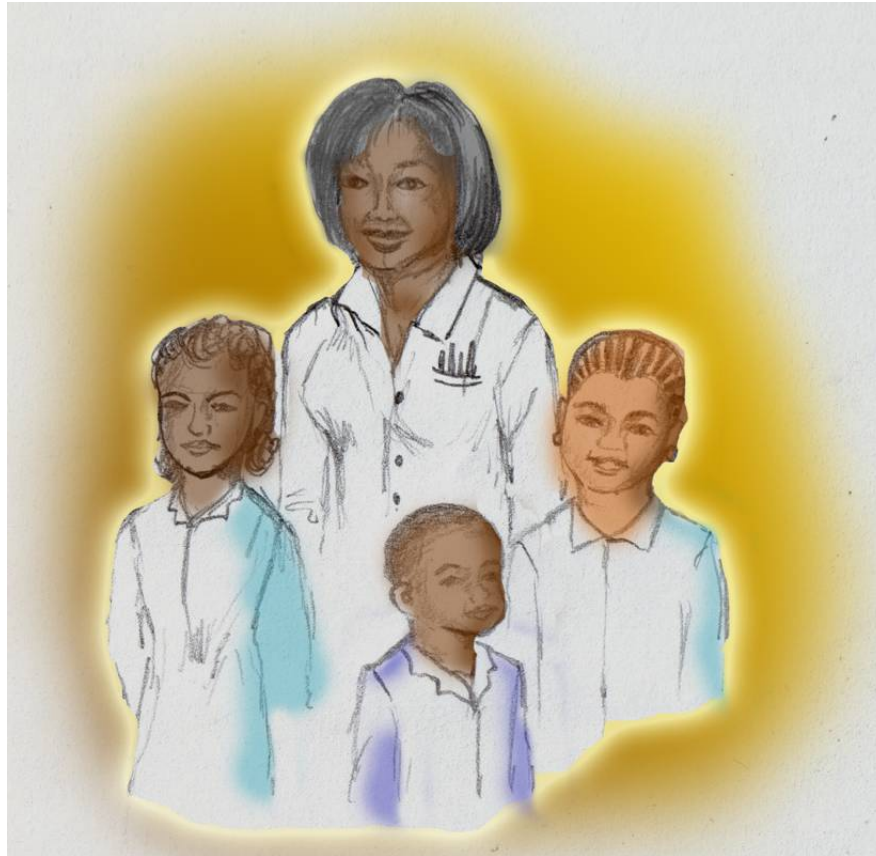


THE UNIVERSITY OF ALABAMA
American Physical Society March 13-March 17, 2006

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

Baltimore, Md

More Mentoring at a younger age must start to happen for minorities



THE UNIVERSITY OF ALABAMA
American Physical Society March 13-March 17, 2006

Center For Materials For Information Technology
An NSF Materials Research Science and Engineering Center

Baltimore, Md

**“It’s no longer possible to ignore the
“underrepresented majority”:
women, African Americans and
Latinos as well as nontraditional
white males. Who will be the next
generation of scientists and
engineers?”-**

**Shirley Jackson President of the
Assn. for the Advancement of
Science (AAAS)**

Who will be the future of Physics?

Those Achieving at the Intersection of Race and Gender Like Myself