

CHIRON CORPORATION
RESEARCH POSITIONS AVAILABLE

NIH Research & Training
Opportunities

SCIENCE ONLINE SCIENCE MAGAZINE SCIENCE NOW NEXT WAVE HOME STKE/AIDS/SAGE SCIENCE CAREERS E-MARKETPLACE

Institution: AAAS | Access Rights | Contact Subscription Administrator at this Site | Join AAAS



American Association for the Advancement of Science
minority scientists network

site map

about us

search

students mentors administrators community GrantsNet

students > of particular interest

ADDITIONAL
RESOURCES



NEXT WAVE
U.S.



CAREER DEV
CENTER



POSTDOC
NETWORK



NEXT WAVE
CANADA



NEXT WAVE
U.K.



NEXT WAVE
SINGAPORE



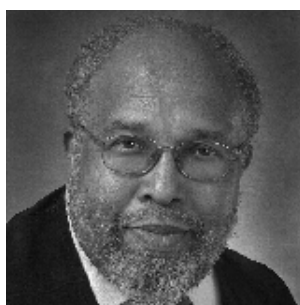
NEXT WAVE
GERMANY



NEXT WAVE
NETHERLANDS

FORUMS

A Mathematical Map for Success



CLINTON PARKS

MISCINET WRITER
WASHINGTON, D.C.
4 FEBRUARY 2005

RELATED ARTICLES

Although Williams had difficulties pursuing a career as a mathematical researcher, he urges young minorities to be persistent and never give up their dream.

Loving to Learn

Williams was born in Staten Island and raised in Baltimore. As a child, "I just found math fun and very easy," Williams says. Growing up, he never talked about his love of math with childhood friends because he knew they wouldn't understand. "I pretended to be this real hip, cool person everyone wanted to know," Williams says, "but all I wanted to do was learn."

Although he scored over 700 (out of 800) on the College Board Examination (now

As a child, Scott Williams (pictured left) loved math, and when his mother told him that great mathematicians are educated at the Massachusetts Institute of Technology (MIT), he immediately told her he would be doing mathematical research there one day.

Williams's career plans were unthinkable to his parents. Although they both held graduate degrees, as African Americans living in pre-civil-rights America, "all they could do was teach," as Williams puts it. "They did not even realize research was an option for me."

Williams, however, was not to be denied. Although that MIT job never materialized, he held on to his dream of becoming a mathematical researcher and currently works as a professor of mathematics at the State University of New York (SUNY)-Buffalo. This academic workaholic has written over 40 papers and lectured throughout the world on theoretical topology. Although Williams had difficulties pursuing a career as a mathematical researcher, he urges young minorities to be persistent and never give up their dream.

the Scholastic Aptitude Test), his high school guidance counselor refused to support Williams's applications to majority colleges, including MIT. Frustrated by his ordeal, Williams decided to stay close to home and attended Morgan State College, now Morgan State University, a historically black school.

As an undergraduate at Morgan State, Williams displayed his mathematical ability by solving five advanced math problems. His work was published in *The Mathematical Monthly*, a national mathematics journal for undergraduates. Moreover, he co-authored two papers on nonassociative algebra before receiving his B.S. in mathematics, with a minor in the humanities, in 1964.

Despite his academic success, Williams was unsure what to do after graduation. For a short time he worked in the product testing division of International Business Machines (IBM), but he found the work unchallenging and many of his co-workers unmotivated. Eventually, an uncle persuaded him that he needed a Ph.D. if he wanted to be a researcher, so he set his sights on Yale.

Yale, however, didn't share the same enthusiasm for Williams, and he was not accepted into their graduate program. Disappointed but undaunted, he entered the graduate program at Lehigh University in Bethlehem, Pennsylvania and earned a master's degree in mathematics in 1967 and a Ph.D. in topology (see sidebar) in 1969.

Topology

Attempting to explain topology--his specialty--in lay terms, Williams thinks for a bit, then chuckles. Roughly translated, topology is Greek for "map," he explains, and it deals with the properties of spatial objects and how they change under transformations. Topology is an extension of geometry, but instead of being concerned with measurements and shapes, it focuses on holes, connections between objects, and object manipulation. More abstract than traditional geometry, relative locations are more important than absolute measurements in topology.

To get a better understanding, Williams recommends looking at the [Interactive Real Analysis \(IRA\) online textbook](#) sponsored by Seton Hall University.

After earning his Ph.D., Williams received offers--to teach--from several colleges, so he decided to do a postdoc instead, at Penn State University's mathematics department. After finishing his postdoc in 1971, Williams joined the staff at SUNY-Buffalo as an Assistant Professor of Mathematics. He was promoted to full professor in 1985.

Working as a Theoretician

Williams calls his work "research for the sake of research." Unlike applied mathematicians, who use math to solve problems in other fields, he is concerned with expanding and improving the field of mathematics itself. Williams believes he is helping to set the agenda for applied research because, "Without that basic research, engineers and chemists have no place

to look." The world of theory and proofs has afforded him a large amount of professional independence--even as professors go--as well as trips to foreign universities where he has been escorted around "like a rock star."

Williams encourages young minority scientists--especially mathematicians--to pursue careers in theoretical research, because theoretical scientists tend to stay at the vanguard of their respective fields, unlike applied researchers who may soon find their fields rendered obsolete. Vacuum tube experts, for example, found themselves all but unemployable with the advent of microchips. Success, he notes, begins early in life when you start to be forward-looking. "You have to realize that what you learn in your classes is only going to be a small part of the kind of knowledge you need to really learn," Williams says.

A strong work ethic has served Williams throughout his career. Working nights and weekends are not unusual for him. Balancing his career with family obligations has been difficult, but manageable.

Spreading the Love of Math

Sharing his love of math has been important to Williams. He cofounded the National Association of Mathematicians, the first African American mathematics society (originally named Black and Third World Mathematicians), in 1969, but his Web site series Mathematicians of the African Diaspora has reached a broader audience.

This series started after Williams read a Buffalo newspaper article calling him "one of the top five blacks in mathematics." Just two years removed from getting his doctorate, he knew it wasn't true. "People didn't have much realization or respect for blacks in the field," he recalls. He found a Web site devoted to African American scientists, but it didn't adequately cover mathematics. So he set out to educate others, especially young people, about black contributions to the sciences and to create a networking resource. The site eventually expanded to include historical facts about the use of mathematics in Africa and biographies about physicists and computer scientists, as well as mathematicians.

Williams's dedication to his profession continues to inspire others to consider careers in mathematics.

Clinton Parks is a writer for MiSciNet and may be reached at cparks@aaas.org.

The editors suggest these related resources at Nextwave:

- **Exceptional, Chic, Successful**
Clinton Parks, 20 August 2004, UNITED STATES

- **Seeing the Forest for the Trees**
Clinton Parks, 6 February 2004, UNITED STATES
- **A Love for Numbers**
Edna Francisco, 16 January 2004, UNITED STATES
- **Adventures of a Mathematical Biologist**
Carlos Castillo-Chavez, 12 December 2003, UNITED STATES

Copyright © 2005 The American Association for the Advancement of Science