

# Science Read

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## 3 women scientists tell their stories of hard-earned success

### (1) Pursuing a fascination with the universe beyond Sudan

Dr. Nashwa Eassa was born near Khartoum, the capital of Sudan. Her father was a teacher, and all six of her siblings graduated from college.

Her own interest in science stemmed from her curiosity about the world when she was in high school: *"I started getting interested in the universe and what it was about. I was just so curious to know."*

She excelled. However, when it came to choosing her major in college, she took a different path than the other top students.

"If you have high marks, you go to medicine or engineering; if you have low marks you go to science," she said, explaining that the best jobs are in engineering and medicine.



With her grades, she could have chosen that path with higher pay, but instead, she followed her passion and studied physics. She earned Master of Science in Material Physics and Nanotechnology from Linkoping University in Sweden and a PhD in Physics from Nelson Mandela Metropolitan University (NMMU) in South Africa. Now, she is Assistant Professor of Physics at Al Neelain University in Khartoum, and she is pursuing a postdoctoral fellowship in nanophotonics at NMMU.

Her current research focuses on development of titanium oxide nanoparticles and nanotubes structures. She won the Elsevier Foundation award for her research in nanoparticle physics, exploring ways to lessen the film that accumulates on the surface of a high-speed semiconductor, interfering with the flow of electrical current. She is also involved in a project developing methods for using solar radiation to treat water and for splitting water molecules so that hydrogen can be collected.

Two years ago, she founded the organization Sudanese Women in Science. With more than 100 members now, they aim help women become more effective scientists by teaching them to write scientific proposals and papers. In addition, they have established a cross-disciplinary team in chemistry, physics and biology to work on water treatment projects to purify the region's drinking water.

### (2) In Nigeria, encouraging young women to stay in science

Dr. Mojisola Usikalu was born in a small town in Southwest Nigeria. Her father died when she was 6 years old, and her mother raised the family on her income as a school teacher with support from her brothers.

Dr. Usikalu became interested in science when she was in secondary school. "I had a very good female physics teacher who mentored me and encouraged me to go into physics," she said.

She taught in secondary school to earn the money to complete her master's degree. In graduate school, she developed an interest in radiation and health physics. With scholarships from TWOWS (now OWSD) to do research at the Institute of Modern Physics at the Chinese Academy of Sciences in Lanzhou, China, she earned a PhD degree at Covenant University in Ota, Nigeria.



"I knew that what we give to the environment is what we get – that health and the environment are related," she explained.

Now, as Senior Lecturer in Physics at Covenant University, she researches the effects of radiation from the environment, including microwave radiation, ionizing radiation and radiation from mobile phones.

She received the Elsevier Foundation award for research on how radiation affects health, finding that exposure to microwave radiation, for example, could increase anxiety and reduce sperm counts in animals. She is also active in promoting physics in Nigeria, participating in programs to guide young women into studying university-level physics:

*"Many of my female students who had plans of stopping after their first degree are now considering perusing a degree in science after working with me. Once they see me as someone who has achieved something, so they are encouraged by my success, and I also encourage them that they can achieve success in science by dedication, determination and hard work."*

### **(3) A Nigerian physicist on becoming visible**

Dr. Rabia Sa'id grew up in a polygamist family, which is legal in parts of Nigeria; her father and two mothers had 10 children but lost three of them.

With her father a soldier, she attended an Army school, finishing at the top of her class. "If you were very intelligent in my country, the government directs you to do science," she explained.

"I've always wanted to study higher education; I never wanted to just stay back and be a wife and mother." But after high school, she put her dreams on hold. She had three young children, and she had to wait until she could balance motherhood with her studies. Ten years passed.



"Within that time, all my classmates had finished university and were working, and I was just a housewife, and I wanted to also be in their league," she recalled.

She admitted that she felt a tinge of envy when she saw students graduate who were not nearly as successful as her in school.

When she finally went back, she excelled in the sciences, with her top grades in physics. Now, she serves as Deputy Dean of Student Affairs at Bayero University in Kano and lectures undergraduate and postgraduate students in the Department of Physics.

Her research has covered electronics, particle physics, atmospheric physics and space weather physics, and she applies it to local environmental needs, including hydropower and waste recycling. She has been published in journals for applied physics.

She won the Elsevier Foundation Award for research that aims to solve Nigerian environmental challenges, such as decreasing deforestation by turning carpenter's waste into briquettes for use in place of firewood. She is currently working on a government project to gather atmospheric data.

She is now a mother of six children, two with disabilities, balancing that role with her work as mentor for local and national science projects that encourage youth participation. She is a role model for science education in her predominantly Muslim community, where girls' education is struggling to be recognized.

Dr. Sa'id closed her acceptance speech with a metaphor that brought tears to the eyes of people in the audience:

*"The spotlight is shining on me, but as we know with the physics of light, it is the interaction of the radiation with matter that enables visibility. So I'm standing before you today, and the light is shining on me, and I'm only visible because I'm interacting with all of you."*