

Department of Physics & Astronomy

General Colloquium

Thursday, April 11th, 2024

PHYS 112 at 3:30 pm

Refreshments will be served at 3:00pm in PHYS 242

Dr. Sekazi Mtingwa

Co-Founder and Chair, LAAAMP Executive Committee



The Road Towards an African Light Source

Africa is the only habitable continent without a synchrotron light source. In this presentation, we will describe the history of synchrotron light source usage by African researchers and the 20-year effort to bring a multinational synchrotron facility to the African continent. We will highlight two major efforts. The first is *LAAAMP* (Lightsources for Africa, the Americas, Asia, Middle East and Pacific), whose goal is to enhance advanced light source and crystallographic sciences in developing countries. The second is the African Light Source Conceptual Design Report, which was completed in October 2023. Finally, we will report on new initiatives to bring multinational synchrotron light sources to the Greater Caribbean and Central Asian Regions, as well as to establish a Greater Caribbean crystallography research and training hub in Jamaica. enough electron densities to be Fermi degenerate (and maybe quantum melting of the Wigner crystal?).

Sekazi Kauze Mtingwa is Principal Partner at TriSEED Consultants, LLC and Administrative Judge with the US Nuclear Regulatory Commission. He is a Fellow of the American Physical Society (APS), American Association for the Advancement of Science (AAAS), and National Society of Black Physicists (NSBP). In the US, he co-founded NSBP and National Society of Hispanic Physicists, while internationally, he co-founded the African Light Source Foundation, Union of Physicists from Portuguese Speaking Countries, African Laser Centre, African Physical Society, Julius Nyerere University of Agriculture and Technology in Tanzania, African Institute for Mathematical Sciences in Ghana, Lightsources for Africa, the Americas, Asia, Middle East, and Pacific (*LAAAMP*), X-TechLab in Benin, and Greater Caribbean and Central Asian Light Source initiatives.

Mtingwa played an important role in the design and construction of accelerator systems at Fermilab used to discover the top quark. He is co-recipient of the APS's *2017 Robert R. Wilson Prize for Achievement in the Physics of Particle Accelerators* for the theory of intrabeam scattering, which played a crucial role in the discovery of the top quark at Fermilab, Higgs particle at CERN, quark-gluon plasma at Brookhaven National Laboratory, and achieving ultra-high brightness in the latest generation of synchrotron light sources. Mtingwa was the first African American to be awarded an APS prize, its highest category of honors.

Mtingwa received the *2015 Distinguished Service Award* from the American Nuclear Society for chairing a 2008 study on 21st century nuclear workforce needs that led to the US Department of Energy's allocating 20% of its nuclear fuel cycle R&D budget to university programs, thereby saving a number of those programs.

For his mentorship of students, Mtingwa received the *2017 US White House Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring*.

Mtingwa serves as Chair of the *LAAAMP* Executive Committee; Co-Chair of the Central Asian Synchrotron Light Source Initiative; and President of InCREASE, which seeks to increase access to national laboratories by Minority-Serving Institutions. Formerly, he served as Chair of the International Union of Pure and Applied Physics C13 Commission on Physics for Development; Co-Chair of the Greater Caribbean Light Source Initiative; and Founding Deputy Chair of the African Light Source Foundation, for which he serves as Editor-in-Chief of the facility's Conceptual Design Report.

For his research and work in creating STEM opportunities both in the US and around the globe, Mtingwa received the inaugural International Science Council's *2021 Policy-for-Science Award* and the AAAS's *2023 Philip Hauge Abelson Prize*.

Mtingwa graduated Phi Beta Kappa with BS degrees in both physics and mathematics from the Massachusetts Institute of Technology, and Master's and Ph.D. degrees from Princeton University.