Royal Society Presentation (final 1)

In this brief presentation, I will highlight two key phases that have shaped my research and professional career.

The first phase began in 1974 when I returned to Sudan after earning my DPhil in Mathematics from Oxford University. I joined Khartoum University, where I eventually became a professor and dean of the Faculty of Mathematics.

Beyond teaching and various administrative duties, I continued my research in Plasma Kinetic Theory, focusing on the derivation and solution of kinetic equations to study transport problems of multi-species plasma in thermonuclear fusion experiments.

My return to Sudan, however, came with challenges. The lack of access to contemporary scientific journals and the absence of peers in my specialised field resulted in a sense of isolation that eventually diminished my research productivity.

Like a few young physicists and mathematicians in developing countries at the time, I was lucky to be offered the associateship position at the International Centre for Theoretical Physics (ICTP), based in Trieste, Italy, which allowed me to visit the Center multiple times over the subsequent years. This opportunity broke my isolation, reconnected me with the global scientific community, and revitalised my research efforts in theoretical plasma physics.

I also developed an interest in the physics of wind-blown sand and dust in drylands, a phenomenon prevalent in many African countries, including Sudan. Collaborating with colleagues, we designed physical and mathematical models to deepen our understanding of wind-blown soil particles and the intricate surface formations they create in deserts in the form of massive sand dunes and dust clouds. Remarkably, these models also proved valuable in studying snowdrifts.

The second phase began in 1983, a decade after my return to Khartoum, when Professor Abdus Salam, the founding director of the ICTP, invited me to the Centre for three months to help organise the founding meeting of the Third World Academy of Sciences (TWAS). Invitations were sent to the 42 founders, 22 of whom were fellows of the Royal Society. The meeting was a great success, establishing TWAS's foundation, electing its first Council with Abdus Salam as President and appointing me as Executive Director . I had no idea that this brief visit would lead to a multi-year commitment as TWAS's Executive Director.

With strong support from the Italian Government, TWAS experienced significant growth in membership, programs, and international recognition, becoming a leading advocate for scientific excellence in the developing world.

In 1988, TWAS organised a landmark conference on women in science in developing countries, which led to the establishment of the Organisation for Women in Science (OWSD) in Trieste. Managed by TWAS, OWSD now boasts over 11,000 members, making it the largest organisation for women in science in the world.

In 2000 and 2003, the InterAcademy Panel (IAP) and the InterAcademy Medical Panel (IAMP) chose to relocate their offices to Trieste under the auspices of TWAS. In 2003, the Italian Government legislated annual funding for TWAS and IAP on a permanent basis.

These organisations—TWAS, OWSD, IAP, and IAMP—alongside ICTP and ICGEB, have established Trieste as a prime hub for international collaboration in science and global policy discussions. I am honoured to have contributed to this remarkable system

After retiring as the Executive Director of TWAS, I served as Co-Chair of IAP and later became TWAS's fifth President. I am delighted to share that, after me, TWAS elected in 2023 its first woman President, Professor Quarraisha Abdool Karim from South Africa. She has also been elected as a Fellow of the Royal Society this year and is currently seated with the other group of newly elected Fellows.

In 1985, during the inauguration of TWAS in Trieste, African scientists, led by Professor Thomas Odhiambo, decided to establish the African Academy of Sciences (AAS). I worked closely with Thomas during the formative years of AAS and succeeded him as President, a position that I held from 2001 to 2011.

During my time at TWAS, one of the most rewarding initiatives was enhancing the role of national academies to support science-driven development in Africa. In 2001, I organised a key meeting in Nairobi with the Presidents of the seven existing national merit-based academies in Africa, leading to the creation of the Network of African Science Academies (NASAC) with me as the Founding President.
Supported by IAP and TWAS, NASAC embarked on strengthening these seven academies and creating new ones. Today, with 32 member academies, NASAC is one of the four influential regional networks affiliated to IAP, promoting science and development across Africa.

In conclusion, my journey as a researcher and contributor to the establishment and development of scientific organisations, as well as international scientific cooperation, has been immensely rewarding. This journey would not have been possible without the guidance and collaboration of many mentors and peers.

Being recognised by one of the world's oldest and most prestigious academies is a true honour, for which I express my deepest gratitude.

As a Foreign Member of the Royal Society, I am committed to enhancing the Society's impact in developing countries, with a focus on scientific collaboration and support for prominent researchers, particularly women and young scientists from Africa and the Least Developed Countries.