



Self-Presentation

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Three episodes shaped my research and professional careers

First Episode

1. 1974: returned to Sudan after obtaining my Doctorate degree in mathematics from Oxford University and joined the University of Khartoum as a young Lecturer.
2. I did my research in theoretical Plasma Physics, which was a very exciting field of research at that time, because of its application to controlled thermonuclear fusion which promises unlimited supply of clean energy. My research resulted in formulating and solving a complex system of nonlinear partial differential equations and the derivation of simple diffusion equations that have been used to study transport processes in fusion experiments.
3. Upon my return from Oxford, however, I soon felt a discouraging sense of isolation. Without access to current journals and with no scientist working in my area of research to speak to, my research output started to increasingly wither.
4. At the same time my father, who was a successful businessman, wanted me to help him to expand his business and he asked me to travel to Italy to purchase machinery for his new soap factory. I was pleased to do that as it also gave me the opportunity to do a detour and visit the ICTP in Trieste.
5. There I met Abdus Salam, the founding Director of the Center, for the first time. I explained to him the research Challenges that I faced in Sudan and my intentions to move away from research and work with my father. He appeared deeply concerned and in order to help me remain in science and not be lost to the business world, he offered me the associate membership of the ICTP, which I gladly accepted.
6. Being appointed an ICTP Associate enabled me to travel to Trieste several times over the course of the next few years, breaking my isolation at home and actively resuming my research work in theoretical plasma physics.
7. I also started to develop interest in the physics of wind-blown sand and dust in the Sahara, a phenomenon that is rampant in most of African Countries, including my own. Together with my colleagues we developed physical and mathematical models that improved our understanding of the movement and impact of wind-blown soil particles and the resulting formations of complex surface features in deserts. The models also found useful applications in snowdrifts studies.

Second Episode

1. 1982: Salam informed me about the meeting he had with a group of eight eminent scientists from Developing Countries present at the 1981 PAS Plenary Session here in the Vatican. It was at that meeting that the idea to establish the Third World Academy of Sciences (TWAS) was first discussed and unanimously endorsed by the participants. Salam was asked to turn the idea into reality. He then surprised me by asking if I would be interested in helping him launch the Academy. Obviously, I could not say no to a man whose intervention saved my research carrier.
2. The following year (1983) I was invited to visit the ICTP to help organize the foundation meeting of TWAS. The meeting was a great success, but there was no money available to run programs. The truth is that many advocates and funders of international science at that time did not see the need for an organization like TWAS.
3. It was in 1985, shortly after spending a year at Laurence Livermore Lab on a Fulbright Scholarship, Salam informed me that the Italian Minister of Foreign Affaires, Giulio Andreotti, decided to provide \$1.5 million to officially inaugurate TWAS and launch its programs. He requested me to come back to Trieste for three months to help. Little did I realize that this three-month stay would turn into a commitment spanning nearly 25 years during which I served as TWAS founding Executive Director. During that period, thanks to the continued support of the Italian Government, TWAS had witnessed substantial growth in its membership, programs and international recognition, resulting in the Academy becoming a leading voice of excellence in science in the Developing World.

4. In 1988 TWAS organized a major conference on women in science in developing countries, which resulted in the establishment of the Organization for Women in Science (OWSD) based in Trieste under the management of TWAS. OWSD currently has over 7,000 members, making it the largest women's organization in the world.

5. In 2000, at their general assembly in Tokyo, Academy Members of the InterAcademy Panel (IAP) decided to transfer the secretariat of IAP from London to Trieste to be hosted by TWAS. Shortly afterwards, Yves Quéré and Eduardo Kreiger were elected IAP Co-Chairs. In 2003 the Italian Government approved a law to fund both TWAS and IAP on an annual basis. And in 2003 the InterAcademy Medical Panel (IAMP) also decided to transfer its secretariat from Washington to Trieste.

6. These four organizations (TWAS, OWSD, IAP and IAMP) together with the ICTP and the ICGEB make Trieste a unique place for international collaboration in STI and in global science policy debates. I was privileged to be able to contribute to the development and growth of this unique system of international organizations, the so-called "Sistema Trieste"

Third Episode

1. 1985, at the inauguration of TWAS in Trieste, when the African scientists present, under the leadership of Thomas Odhiambo, met and decided to establish the African Academy of Sciences (AAS). I worked closely with Tom to develop AAS during its formative years and later succeeded him as President from 2001-2011. AAS is modeled on TWAS with a specific focus on developing capacities and promoting excellence in science and education for sustainable development in Africa. It is based in Nairobi.

7. As Executive Director of TWAS and President of AAS at the same time I was in a privileged position to promote synergies between the activities of the two organizations, especially those that relate to building capacities, supporting young scientists and science-based development in Africa.

8. At the beginning of my AAS Presidency in 2001, I was concerned about the status of national merit-based Academies in the continent. There were only 7 merit-based Academies at the time among the 53 African nations and all, with the exception of ASSAf, were pretty inactive. The seven Academies met in 2001 in Nairobi and decided to form a network (NASAC) under the management of AAS and I was elected President of NASAC.

2. With the support of IAP, TWAS and NAS a major program to strengthen the 7 Academies and to establish new ones was launched, resulting in the establishment of 19 new academies in the following years. NASAC now has 26 members and is one of the four powerful IAP affiliated regional networks of academies.

9. Although both AAS and NASAC have developed and implemented important programs to support excellence in scientific research and education in Africa, compelling challenges stand in the way of progress towards achieving the SDGs in the continent. Addressing these challenges needs the full engagement of the African scientific communities and their academies of science, to assist in developing STI-based implementation strategies for the SDGs. This will require organizing regional and global forums that bring together leadership from the scientific, development, finance and diplomatic communities to discuss and implement common actions. The Pontifical Academy of Sciences will be an effective partner in this effort.