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Keynote Speaker

Bernie Fanaroff

Former Director Square Kilometer Array (SKA)
South Africa



Speaking Topic: **System engineering and society**

Biography. Dr Bernie Fanaroff was the Director of the Square Kilometer Array (SKA) Project Office through 2015 and as strategic advisor for the SKA South Africa Project from 1 January 2016 to December 2017.

Dr Fanaroff began his academic career in 1965 as an undergraduate at the University of the Witwatersrand, where he obtained a BSc and a BSc (Hons) in Theoretical Physics. He later obtained a PhD in Radio Astronomy from Cambridge University in 1974. It was at this time that Fanaroff, together with a British astronomer, Julia Riley, made a breakthrough in the classification of radio galaxies and quasars when they identified two classes of radio sources which now bear their names – Fanaroff-Riley class I and class II sources, or FR-I and FR-II as they are now universally known. Dr Fanaroff's paper on the Fanaroff-Riley classification has been cited well over 2000 times.

Upon his return to South Africa, Dr Fanaroff dedicated 19 years to the struggle against apartheid as an organizer and national secretary for the Metal and Allied Workers Union, which became the National Union of Metalworkers of South Africa (NUMSA) in 1987. After the first democratic election in 1994, Dr Fanaroff was appointed as the Deputy Director-General in the Office of President Nelson Mandela, and as the Head of the Office for the Reconstruction and Development Programme (RDP). He also served as the Deputy Director-General of the Department of Safety and Security, the Chairperson of the Integrated Justice System Board and the Inter-Departmental Steering Committee for Border Control.

After a distinguished career in public service, he was asked by the previous NRF CEO, Dr Khotso Mokhele, and the previous Director General for Science and Technology, Dr Rob Adam, to set up the South African SKA Project Office (SASPO) at the beginning of 2003, with the vision of bringing the largest radio telescope in the world to Africa. Together with Dr Mokhele and Dr Adam, and renowned scientists Dr George Nicolson and Prof Justin Jonas, Dr Fanaroff worked towards the vision of not just hosting SKA, but becoming a leading partner in the development of cutting edge technology for the SKA telescope and playing a leading role in SKA Science.

As Director of the SKA SA Project, Dr Fanaroff led the conceptualisation, development and construction of the South African SKA precursor, the 64 dish MeerKAT telescope array, which was completed in March 2018 on schedule, on budget and within the prescripts of the PFMA. This project included the construction of the prototype telescopes XDM and KAT 7 and the infrastructure to establish a huge observatory site at Losberg in the Karoo. A key part of the project has been the development of the SKA South Africa's highly-respected Human Capital Development programme.

Despite his retirement at the end of 2015, Dr Fanaroff has continued to work as an advisor to the SKA SA project, as well as an advisor to the Ministry of Science and Technology. He has been appointed co-chair of the BRICS (Brazil, Russia, India, China and South Africa) Working Group on Information and Communication Technologies and High Performance Computing, and as member of the Advisory Committee of the Breakthrough Listen project. He is also a founding member of the Academy of Science of South Africa (ASSAf); a Fellow of the Royal Astronomical Society; and was a Visiting Professor at Oxford University.

Abstract. I will look at how system engineering helped to make the design and construction of the MeerKAT radio telescope spectacularly successful, showing convincingly that the best science and technology can be done in Africa. I will also talk about the use of SE in South Africa's National Ventilator Project and the challenge of increasing the successful implementation of the National Infrastructure Plan.