## Sibusiso Sibisi



### Education

PhD, University of Cambridge, Churchill College, 1983 BSc, Imperial College, London, 1979

### **Academic Positions**

Director, Wits Business School, Johannesburg (2018-) Advisory Board member, African Institute for Mathematical Sciences (2003-)

President and CEO, Council for Scientific an Industrial Research, Pretoria (2002-2017)

Co-founder and Director, iThemba Pharmaceuticals, 2001

Deputy Vice-Chancellor for Research and Innovation, University of Cape Town (2000-2002) Executive Director (R&D), Plessey SA, (1997-2000) Co-founder and Director, Massive Inference Techniques Limited, Cambridge (1994-2000) Research Associate, University of Cambridge (1989-1994) Fulbright Research Fellowship, Caltech, 1988 Research Associate, University of Witwatersrand,

Johannesburg, 1984

Main source: https://www.itweb.co.za/content/rKPNG878PzA74mwDI

# Black Mathematics at Cambridge

### Profile

# school inspector. His mother worked hard at keeping her family of seven children

**Two-dimensional reconstructions** from one-dimensional data by maximum entrop

periment consists of perturbing the magnetic

recover these parameters as well as find both the frequencies and decays, even though the recovery of decays is a notoriously ill-posed problem. Our problem is of the novel type

 $F(t) = \begin{bmatrix} dk \ e^{-kt} \end{bmatrix} d\omega \ e^{-i\omega t} f(k, \omega)$ 

of oscillators of strength  $f d\omega dk$  in the frequency-decay cell  $d\omega dk$  produces a one-dimensional time series F(t). The data

 $v_{\mu}(\omega) = f_{\mu}(\omega - \omega_{\mu})/(k_{\mu}^2 + (\omega - \omega_{\mu})^2)$ 

This part of the spectrum is rejected. The relevant part of the spectrum is the sum of lorentzians  $u(\omega) = \sum_{\mu} u_{\mu}(\omega)$  from which it is intended to extract  $f_{\mu}$ ,  $\omega_{\mu}$ ,  $k_{\mu}$ , for each species. However, close rapidly decaying components can overlap strongly and become confused. Apodization techniques<sup>6,7</sup> may be used to improve resolution. For instance, if the decays are all the same, equal to  $k_{\mu}$  says then multiplying F(t) by  $\exp(k_{\mu}t)$  and then equal to  $k_0$  say, then multiplying F(t) by  $\exp(k_0 t)$  and t Fourier transforming yields, ideally

 $\tilde{u}_{\mu}(\omega) = f_{\mu}\delta(\omega - \omega_{\mu})$ any case, a simple exponential filter is liable to give large noi amplification. Noise may be suppressed by modifying the filter For example,  $\exp(k_0t - Ct^2)$  where C > 0 is often used be suppressing noise leads to poorer resolution. In general the is no all purpose apodization filter.

interpretation of problems in number theory. He always combined the academic work with an interest for technological applications and business. "I believe these [science and business] are not two separate worlds...", he says.

Sibusiso Sibisi was awarded the Order of Mapungubwe: Silver by President Thabo Mbeki in September 2007. The official tribute accompanying this high award states: "Sibisi is a physicist and a mathematician who is also well-versed with the workings of the corporate world. His work recognises the importance of linking the academic world of science and the commercial world of business. This is heavily influenced by where he started his work, which was at one of the world's highest-profile innovation hubs, Cambridge Science Park." He has been involved in techonology innovation in support of a range of national priorities, including education, thoughout his life, and served on the Advisory Board of AIMS since its launch in 2003.

Dr Sibusiso Sibisi had been fascinated by science and technology since he was a child at Mariannhill, a Roman Catholic mission in KwaZulu-Natal. His mother, Harriet Ngubane, taught at the school and his father, Jethro Sibisi, was an educationist and

intact, while also studying at the University of Natal. Later, she obtained a scholarship to Cambridge where she completed a PhD in Social Anthropology. Sibusiso joined her in Cambridge, after completing his BSc at Imperial College.

Sibusiso Sibisi's research focuses on Bayesian statistics, exploring both numerical applications and theoretical problems, including probabilistic



Dr Sibusiso Sibisi and President Cyril Ramaphosa