

Resumé: Batmanathan Dayanand (Daya) Reddy

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Professor Emeritus of Applied Mathematics
University of Cape Town

Education and academic positions

Daya Reddy graduated with a BSc degree in Civil Engineering from the University of Cape Town in 1973, with first-class honours, and a PhD degree in Engineering from Cambridge University in 1977. He held a post-doctoral position during 1978 at University College London and joined the University of Cape Town in 1979 as a Lecturer, jointly in the Departments of Civil Engineering and Applied Mathematics. He was appointed Professor of Applied Mathematics in 1989, and to the South African Research Chair in Computational Mechanics in 2006.

At the University of Cape Town, he has served as head of the Department of Applied Mathematics (1989–1994); and as dean of the Faculty of Science (1999–2005). He was elected by the Senate to serve three terms on the Council, the governing body of the university (1996–1999, 2002–2005, 2005–2008). He served as an acting deputy vice-chancellor over three periods, for a total of over two years.

Daya Reddy served as Vice-Chancellor *ad interim* of the University of Cape Town over the period March 2023 to July 2024.

He has held various leadership positions in the Centre for Research in Computational and Applied Mechanics (CERECAM) and its predecessors, in particular as Director 1999 to 2021.

Summary of profile as a researcher and educator

Daya Reddy's research interests lie in the broad area of solid and computational mechanics, straddling applied mathematics and engineering sciences. He enjoys considerable recognition nationally and internationally as a leader in his research field. Particular areas of interest include plasticity, finite element methods, and biological and biomedical mechanics.

Professor Reddy is the author, co-author or editor of over 200 publications, including two research monographs, two texts, and three edited volumes of invited papers. He has taught across the curriculum at undergraduate and postgraduate levels, and supervised to graduation 33 PhD and 38 Masters graduates, as well as 21 post-doctoral researchers. These include students and postdoctoral fellows from 14 African countries.

Editorial activities include membership of the editorial boards of a number of journals, service as a reviewer of book manuscripts for a major scientific publisher, and as a reviewer for more than 20 journals.

Honours and awards

Daya Reddy is the only elected Fellow or Member of all four South African academies: the Academy of Science of South Africa (ASSAf), by legislation the official academy of South Africa; the South African Academy of Engineering; the Royal Society of South Africa; and the Suid-Afrikaanse Akademie vir Wetenskap en Kuns. He is also a Fellow of The World Academy of Sciences (TWAS), the African Academy of Sciences, a founding Fellow of the Academy of Engineering and Technology of the Developing World; and a Fellow of the International Science Council. In 2024 he was elected a Member of the Pontifical Academy of Sciences of the Vatican, and a Member of the American Academy of Arts and Sciences.

He has held NRF A ratings (1996 – 2007, 2014 – 2021) and a B1 rating (2008 – 2013).

He has held visiting positions at various universities, including the Leibniz University of Hanover, Germany (as a Humboldt Research Awardee, during 2013 – 2015 for periods of one to three months a year); the University of Texas at Austin (Visiting Faculty Fellowship, Institute for Computational Sciences and Engineering, 2006) and Stanford University (Timoshenko Lecturer, 2008).

Daya Reddy was elected a Fellow of the International Association for Computational Mechanics in 2008. In 2009 he received the Award for Distinguished Service from the South African Association for Computational and Applied Mechanics, and in 2016 the Award for Research Distinction of the South African Mathematical Society.

He received the National Order of Mapungubwe (Bronze), bestowed by the President of the Republic of South Africa, in 2004, for distinguished international achievements. In 2012 he received the prestigious Georg Forster Research Award from the Alexander von Humboldt Foundation, Germany. The award “is granted in recognition of researchers whose fundamental discoveries ... have had a significant impact on their own discipline and beyond and who are expected to continue developing research-based solutions to the specific challenges facing ... developing countries”. In 2021 he received the degree of Doctor of Science, honoris causa, from the University of Stellenbosch.

Selected plenary, keynote and invited presentations in mechanics and applied mathematics

2014 International Congress of Mathematicians (ICM), Seoul, Korea: Invited Sectional 45-minute lecture

2016 1st International Conference on Emerging Trends in Applied Mathematics and Mechanics, Perpignan, France

2017 1st BRICS (Brazil, Russia, India, China, South Africa) Mathematics Conference, Beijing, China

2018 2nd International Conference on Emerging Trends in Applied Mathematics and Mechanics, Krakow, Poland

2019 7th International Conference on Mathematical Modelling and Computational Methods in Applied Sciences and Engineering, Olomouc, Czech Republic

2022 Pan-African Congress of Mathematicians (PACOM): Brazzaville, Republic of Congo

Wider contributions to science (leadership, organization, scholarship, and communication)

Within Africa, including South Africa Daya Reddy served (1999–2008) as a member of the Board of the National Research Foundation, and from 2002 to 2008 as Board chair.

He was elected a Member of the Academy of Science of South Africa in 1996, and served as its President over the period 2012 – 2016.

He played a leading role in the establishment of the Centre for High Performance Computing (CHPC), a South African national facility, in 2005.

The African Institute for Mathematical Sciences (AIMS) is a pan-African network of centres of excellence for postgraduate education, research and outreach, in six African countries. Daya Reddy was a founder member in 2003 of AIMS South Africa, the first such institute and the model for those established subsequently. He is a Council member and former Council Chair of AIMS South Africa and a Trustee of the AIMS Trust.

He has recently been appointed to the Governing Council of the African Open Science Platform.

Daya Reddy has served on the Steering Committee of the national Centre of Excellence for Mathematical and Statistical Sciences (CoE-MaSS), and chairs the Steering Committee of the Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy (SciSTIP). He also serves on the scientific advisory board of the National Institute for Theoretical and Computational Sciences (NITheCS) and is an editorial advisory board member of the South Africa Journal of Science.

Activities at the global level Daya Reddy served for three years, from 2018, as the President of the International Science Council (ISC), a body comprising 45 international scientific unions and associations, and national and regional scientific organizations from around 150 countries. He also served as co-chair of the policy arm of the InterAcademy Partnership (IAP), a global body comprising 140 national and regional merit-based academies. He currently serves on the steering committee of the Office for Astronomy Development, a body established by the International Astronomical Union to further the use of astronomy as a tool for development globally.

Daya Reddy is a member of the International Advisory Board of the Alexander von Humboldt Foundation of Germany, and currently chairs the Board.

He is invited on a regular basis to speak at international meetings concerned with aspects of science and public policy, promotion of science, academic and scientific freedom, and science diplomacy.

Selected keynote and plenary lectures in the areas of science policy and public engagement

2017 International Conference on Evaluating and Assessing the Societal Impact of Science, Stockholm: *'The ingredients of effective engaged scholarship'*

2018 3rd International Conference on Science Advice to Government, Tokyo, Japan: *'The Sustainable Development Goals and the science policy interface'*

2019 World Conference on Science Literacy, Beijing, China: '*Science literacy for sustainable development, for a shared and better future*'

2021 4th SDG Conference, Bergen, Norway: '*Public engagement, scientific literacy and the science-society nexus*'

2022 International Conference on Impact of Science, Leiden, Netherlands: '*Transforming Strategies and Policies for Impact*'