

Postgraduate Research and Innovation Symposium 2021

KEYNOTE LECTURE

You are invited to the Keynote Lecture of PRIS2021 entitled

“UNIVERSE”

by

Professor Neil Turok

Higgs Chair of Theoretical Physics, University of Edinburgh, UK;
Emeritus Director and Niels Bohr Chair, Perimeter Institute for Theoretical Physics, Canada;
Founder and Chair of International Governing Board, African Institute for Mathematical Sciences;
Chair, International Advisory Committee, Higgs Centre for Theoretical Physics



DATE:
09 Thursday
December
2021

TIME:
09h00 -
09h50

PLATFORM:
ZOOM

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PRIS
2021

09 and 10
DECEMBER 2021

INSPIRING GREATNESS



ABSTRACT:

One of the miracles of our existence is that we can understand the universe on scales vastly larger and vastly smaller than those of our everyday experience. The laws of physics have a remarkable economy and universality. They were discovered by asking simple, yet profound questions about nature: today's versions include:

What happened at the big bang? What are dark matter and dark energy? How did time begin? What does the future hold?

Yet those same mathematical laws are astonishingly useful: they underlie every modern technology and opportunity for innovation.

I will end by describing the African Institute for Mathematical Sciences, an institution opening doors for talented African youth to enter advanced science and to become the innovators of the future.



BIOGRAPHY: PROFESSOR NEIL TUROK

Neil Turok (PhD Imperial College London, 1983) was born to anti-apartheid activist parents who both later served as members of parliament in the New South Africa. Neil now holds the Higgs Chair of Theoretical Physics at the University of Edinburgh, UK. He also holds the Niels Bohr Chair at Perimeter Institute for Theoretical Physics in Canada where he is Director Emeritus. Previously, he was Professor of Physics at Princeton University and Chair of Mathematical Physics at the University of Cambridge.

Neil is a global leader in developing and testing theories of the universe. His team's predictions for polarisation-temperature correlations in the cosmic background radiation (CBR) and for galaxy CBR correlations induced by dark energy were confirmed at high precision. He and his collaborators have recently developed a new, foundational approach to quantum path integrals, with wide applications ranging from particle physics and quantum technologies to cosmology and radio astronomy. He and his colleagues have proposed a new picture of the cosmos – the CPT-symmetric universe – which provides an economical, testable explanation for the cosmic dark matter and an explanation for the arrow of time. In 2016, he was awarded an Honorary Fellowship of the UK Institute of Physics and the John Torrence Tate Medal of the American Institute of Physics for International Leadership in Physics.

Neil is the Founder and International Governing Board Chair of the African Institute for Mathematical Sciences (AIMS), a network of centres of excellence for postgraduate maths and science training, research, and public outreach spanning the African continent. Since 2003, AIMS has graduated over 2 300 African students at Masters level, of whom over 600 have proceeded to PhDs, in many areas of science. In 2008, Neil won the TED prize for his work in fundamental cosmology and for his work founding AIMS. With colleagues at AIMS and at Edinburgh, he has pioneered a new approach to user-friendly, accurate and affordable testing for COVID-19 called hypercube pooling, which is now being implemented at scale.

In 2019, Neil was named an Officer of the Order of Canada. He is the author of *The Universe Within*, a popular science bestseller, and co-author of *Endless Universe: Beyond the Big Bang*.