BOSE INSTITUTE

(AN AUTONOMOUS INSTITUTE UNDER
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D. M. BOSE MEMORIAL LECTURE-2025
141ST BIRTHDAY OF PROFESSOR DEBENDRA MOHAN BOSE

26 NOVEMBER 2025

BOSE INSTITUTE
KOLKATA

CELEBRATION OF

141ST BIRTHDAY OF PROFESSOR DEBENDRA MOHAN BOSE

D. M. BOSE MEMORIAL LECTURE-2025

Prof. Rajesh Gopakumar
Distinguished Professor and Centre Director
International Centre for Theoretical Sciences
Tata Institute of Fundamental Research, Bengaluru

Prof. Rajesh Gopakumar is a theoretical physicist who is Distinguished Professor and Centre Director of the International Centre for Theoretical Sciences, Tata Institute of Fundamental Research in Bengaluru. His research interests are in string theory and quantum field theory aiming to understand the nature of fundamental interactions in nature. He completed his MSc in physics from IIT Kanpur in 1992 and received his PhD from Princeton University in 1997. After a few years as a Research Associate at Harvard University, he joined Harish Chandra Research Institute, Allahabad in 2001 where he was until 2015. He was also a Visiting Fellow at the Institute for Advanced Study, Princeton, New Jersey from 2001 to 2004. Prof. Gopakumar's work in theoretical physics aims to understand the versatility of string theory and he has developed a program to decipher the AdS/CFT correspondence. His early research was primarily focused on large N gauge theories, non-commutative gauge theories and topological string theory. His work in the context of topological string theory has also had an impact in mathematics in what are now known as the Gopakumar-Vafa invariants. He has recently also worked on the conformal bootstrap in quantum field theory. He is the recipient of the B.M. Birla Science Prize in Physics in 2004, the ICTP Prize in 2006, the Swarnajayanti Fellowship in 2006, the Shanti Swarup Bhatnagar Award in 2009, the GD Birla Prize in 2013, The TWAS Prize for Physics in 2015, JC Bose National Fellowship in 2015. He was one of the inaugural recipients of the Frontier of Science Awards at the International Congress for Basic Sciences in 2023. He is a founding member of the Global Young Academy and was elected the Fellow of The World Academy of Sciences in 2015. He is also a Fellow of the Indian Academy of Sciences, the Indian National Science Academy (INSA) and the National Academy of Sciences, India (NASI). In 2019, he received IIT Kanpur's Distinguished Alumnus Award. In 2024, he received the INSA Distinguished Lecture Award (physical sciences).

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Director
and
Staff Members of Bose Institute
request the pleasure of your company at the

D. M. BOSE MEMORIAL LECTURE-2025

Speaker
Prof. Rajesh Gopakumar
Distinguished Professor and Centre Director
International Centre for Theoretical Sciences
Tata Institute of Fundamental Research, Bengaluru

titled

Why Strings?

on

26 November 2025 at 2.00 pm

Prof. Tanusri Saha-Dasgupta
Director
S. N. Bose National Centre for Basic Sciences, Kolkata
will preside over the programme.

Venue:
Unified Academic Campus
Block EN, Plot No. - 80, Sector-V
Salt Lake City
Kolkata - 700 091

Prof. Kaustuv Sanyal
Director
Bose Institute

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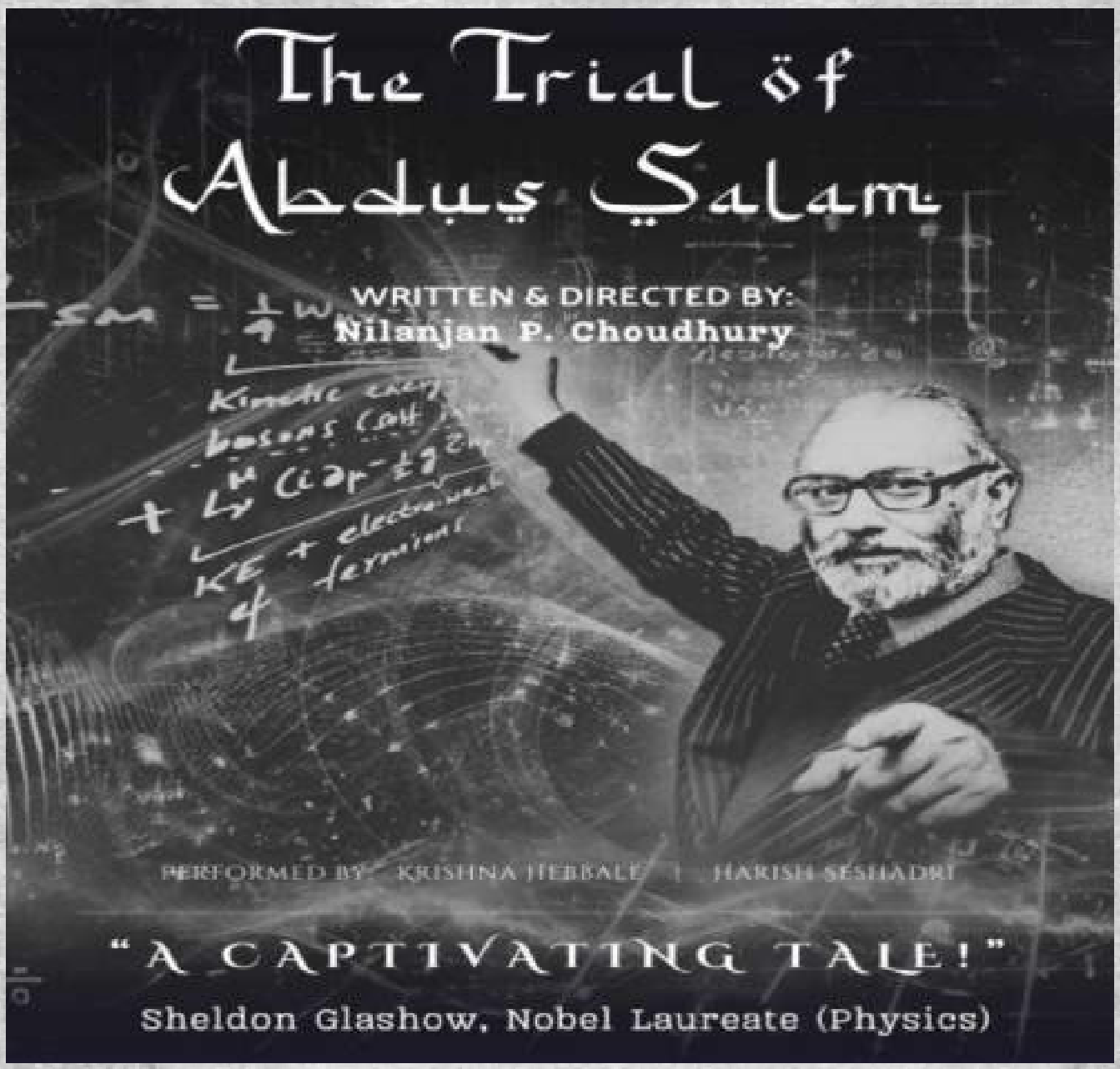
ABSTRACT

Why Strings?

String theory is the leading theoretical framework for describing a quantum theory of the gravitational force. In this talk, I will try to motivate, from a somewhat different perspective, why string theory is a natural framework to describe nature. This goes back to the works of Maxwell and Faraday on understanding the electromagnetic force. I will describe the evolution of their ideas in the physics of the 20th century, especially in the context of the strong interaction that holds the nucleus of the atom together. 21st century string theory has uncovered a remarkable connection between this line of thought and the parallel paradigm that emerged in the 1960's to 1980's for describing quantum gravity in terms of strings. I will try to give a flavour of this connection which is currently one of the most active areas of work in theoretical physics.

Programme Schedule for 26 November 2025:

01:50 pm – 02:00 pm	:	Introduction to the Speaker
02:00 pm – 03:00 pm	:	D. M. Bose Memorial Lecture-2025 by Prof. Rajesh Gopakumar
03:00 pm – 03:30 pm	:	High-Tea
03:30 pm – 03:40 pm	:	Introduction to the Play "The Trial of Abdus Salam" by Prof. Rajesh Gopakumar,
03:40 pm – 05:15 pm	:	Play: "The Trial of Abdus Salam" directed by Nilanjan P. Choudhury
05:15 pm – 05:30 pm	:	Concluding Remarks



About the play:

In the autumn of 1979, Abdus Salam became the first Muslim to win the Nobel Prize in Physics for his contributions towards unifying the electromagnetic and the weak nuclear forces. This culminated in the Standard Model, a theory that has yielded profound insights into the nature of the physical world.

A devout Muslim, Abdus Salam had repeatedly emphasized the crucial role that Islam had played in the shaping of his science, his life and his vision. A vision that was inspired by the surahs of the Quran which spoke to him of a deep fundamental unity amongst all things and all peoples.

A vision that he realized not only through his work in the unification of fundamental forces but also through his creation of the International Centre of Theoretical Physics (ICTP) in Trieste, Italy – which is today a welcoming home for scientists from all across the world and a precious gift of the intellectual freedom, community and resources, vital for the advancement of human knowledge.

Yet this grand unifier of forces and people has been ostracized as a heretic and a traitor, his life and legacy unacknowledged in Pakistan, the land of his birth.

Prof. Debendra Mohon Bose

(26 November 1885 – 2 June 1975)

Eminent Physicist • Visionary Director of Bose Institute

Prof. Debendra Mohan Bose was one of India's foremost physicists and science administrators. A graduate of Christ's College, Cambridge, he was trained at the Cavendish Laboratory under Sir J. J. Thomson and C. T. R. Wilson, and earned his Ph.D. from Humboldt University, Berlin (1919).

He was among the only two Indian physicists - the other being M. N. Saha - to attend the **Como Conference (1927)** in Italy. His pioneering research on artificial transmutation, magnetism, and later cosmic rays, in collaboration with Dr. Bibha Chowdhury, led to the early observation of mu-mesons in the Darjeeling-Sandakphu region (1939-42), long before similar discoveries were internationally recognized. C. F. Powell, Nobel Laureate (1950), later acknowledged Bose's pioneering role in meson studies.

Prof. Bose became the Director of Bose Institute in 1938, transforming it into a multidisciplinary research center of international standing. He expanded its scope to include Physics, Biophysics, Chemistry, Botany, Cytogenetics, Plant Breeding, and Microbiology, and introduced research in Biochemistry and Molecular Biology. Under his leadership, the Institute achieved several milestones, including the development of the first Wilson Cloud Chamber and Cockcroft–Walton neutron generator in India, the establishment of indigenous electron microscopy, and groundbreaking work, such as Dr. S. N. De's discovery of cholera toxin.

He also initiated the Acharya J. C. Bose Memorial Lecture (1938) and encouraged scientists to design their own instruments, preserving J. C. Bose's spirit of innovation. Prof. Bose played a key role in India's emerging nuclear research programme through CSIR's Atomic Research Committee.

A close associate of Gurudev Rabindranath Tagore, he served as Treasurer (Artha Sachiva) of Visva-Bharati and was awarded the University's highest honour, Deshikottoma, in 1961. In recognition of his lifetime contributions, he received honorary Doctor of Science degrees from the University of Calcutta and Jadavpur University.

In his later years, Prof. Bose turned to philosophical questions on the relationship between science and spirituality and edited A Concise History of Science in India. His visionary leadership and pioneering research laid the foundations for India's modern scientific enterprise.