

Cosmologist who mapped universe, scans Indian students' minds in city

Students here more philosophical, says Penrose who expanded man's understanding of universe

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RENOWNED cosmologist and quantum physicist, Sir Roger Penrose, who shared the 1988 Wolf Prize in Physics with Stephen Hawking for their contribution to general relativity, expanding man's understanding of black holes and origin of the universe, was at Science Education and Research (IISER), Pashan, explaining his theory and studying, with a scientist's eye, the mind of Indian students.

He shared his work on the beginning and expansion of the universe and lauded the "philosophical bent" of the Indian students.

His work tries to plug the gap in the Big Bang theory and the Steady State theory. The Big Bang theory says the universe began with an explosion and is ever expanding but fails to explain the time before the explosion. The Steady State theory says the universe is infinite and matter gets created between galaxies but does not satisfactorily explain



SIR ROGER PENROSE

how this matter originates.

Sir Roger Penrose, talking about his theory said, "I feel the present universe is an aeon of succession. In the remote future, it will lose track of its size due to massive expansion. So it will be the next step towards the next big bang. Our universe in fact continually cycles through a series of aeons."

On Friday, he had delivered a lecture, "Seeing through the Big Bang into another world" at the Inter University Centre for Astronomy and Astrophysics (IUCAA) to a packed auditorium. One of his most talked about books is *Shadows of The Mind*.

HOW IT ALL BEGAN, WILL BEGIN AGAIN

Big Bang Theory: Universe created by explosion billions of years ago. Could not explain a beginning before the Big Bang.

Steady State Theory: Universe is infinite, has neither beginning nor end. Matter keeps getting created between galaxies. It does not explain how the matter is created though.

Gap plugged: Sir Roger Penrose built on these theories. He says the universe is a cycle of big bangs that occur after aeons. "The universe will lose track of its size due to expansion till another cycle occurs," he explained at IISER, Pashan.

His latest book, *Cycles of Time*, mathematically explains his theory of the universe.

His theory is consistent with present theories of the origin of the universe and builds upon them. Presence of circular patterns within the cosmic wave background suggest the universe

did not come into existence during Big Bang thus pointing towards some continuity.

After his interaction with students at IISER, he said, "Students in India have a philosophical bent of mind unlike students in western universities, who seem more obsessed with robotics and artificial intelligence, the difference in emphasis here is very evident."

He will be in Kolkata in January, where he will spend a week. He will talk about 'Quantum Entanglement' apart from addressing the Tagore Memorial Lecture. He will also visit IISER, Kolkata.

Currently Emeritus Rouse Ball Professor of Mathematics at the University of Oxford and Emeritus Fellow of Wadham College, he got his PhD in mathematics from the University of Cambridge in 1957. A Fellow of the Royal Society of London, Penrose was elected Foreign Associate of the US National Academy of Sciences in 1998. He was knighted in 1994.