

# Amitava Raychaudhuri

Shanti Swarup Bhatnagar Prize (1997)



**BORN IN KOLKATA IN 1952**

Meet **Professor Amitava Raychaudhuri**, an Indian theoretical physicist who spends his time thinking about the universe's biggest mysteries—the stuff that happens at the tiniest, most fundamental level! As an Emeritus Professor at the University of Calcutta, he is one of India's leading experts in particle physics and astroparticle physics.

After earning his Ph.D. from the University of Maryland, Dr. Raychaudhuri held research and teaching positions at prestigious places like the University of Oxford, Fermilab, and TIFR.

## Unlocking the Secrets of Matter

Dr. Raychaudhuri's work often goes beyond the Standard Model—our current best theory for how all matter and three of the universe's forces work. He's searching for the next big breakthrough!

- **Matter vs. Antimatter:** Why is our universe made of matter and not an equal mix of matter and antimatter? Dr. Raychaudhuri tackled this using **Supersymmetry (SUSY)** models. His work on **CP-violation** in SUSY deepened our understanding of this fundamental imbalance.
- **Ghostly Neutrinos:** He made crucial contributions to models that explain why **neutrinos**—those tiny, almost massless particles that barely interact with anything—have mass and can change type. This influences large-scale experiments, like those exploring the potential of the India-based Neutrino Observatory (INO).
- **Extra Dimensions:** He explored **Grand Unified Theories** and models involving **extra dimensions**, which look for new ways to unify the forces and suggest new particles that future colliders might detect.

## A Mentor and Leader

Dr. Raychaudhuri's influence extends through his leadership roles, including serving as Director of the Harish-Chandra Research Institute and Director of the S.N. Bose National Centre for Basic Sciences. He has mentored 11 Ph.D. students, shaping the future of theoretical physics in India. For his pioneering research, he received the Shanti Swarup Bhatnagar Prize (1997), India's highest science award.

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