



## 35th Mid-Year Meeting, 28-29 June 2024

Venue: Auditorium of Biological Sciences Building, Indian Institute of Science, Bengaluru

### Special Lecture (Friday 28 June 2024: 09:30–10:10)



**Chairperson:** V. Nagaraja, Indian Institute of Science, Bengaluru

**Speaker:** Roop Mallik, Indian Institutes of Technology, Mumbai

**Title:** Fat on the move

Molecular motors are nano-scale machines that transport bacteria, virus, mitochondria etc. inside living cells. The use of optical tweezers for measuring the tiny forces exerted by these motors has been at the forefront of single-molecule interdisciplinary research for decades. Unfortunately, such studies reveal very little about how these motors function inside an animal. How tiny fat bodies are moved around by motors inside liver cells and how this motion reflects in blood tests will be discussed. The speaker will also describe his group's attempts to control this motion for therapeutic benefits.

**About the Speaker:** Roop Mallik is Professor of biosciences and bioengineering at Indian Institute of Technology, Mumbai. He received his PhD in 1999 from TIFR, Mumbai. He was a faculty member at the Department of Biological Sciences, Tata Institute of Fundamental Research, Colaba, Mumbai from 2006–2020. His research interests are intracellular transport, biophysics of lipids and motor proteins, pathogen degradation, metabolism and liver biology, lipid homeostasis. He was elected Fellow of the Indian Academy of Sciences in 2017 and was elected Fellow of INSA in 2022.

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### Public lecture (Friday 28 June 2024: 18:00–19:00)



**Speaker:** Shanti Pappu, Founder/Secretary, Sharma Centre for Heritage Education India, Chennai

**Title:** The many layers of Indian prehistory: From research to public outreach

The complex and multilayered story of the earliest prehistoric occupation of South Asia has generated vigorous debates on cultural evolution, population migration, and adaptation to past climatic changes. Here, the earliest processes of cultural evolution in South Asia beginning in the lower palaeolithic, more than a million years ago, and culminating with the transition to agro-pastoral modes of life in the 'Neolithic' will be discussed. These processes are situated within the context of past environmental changes and debates on population migrations out of Africa. The evolution of conceptual approaches and nomenclatures in Indian prehistory, with implications for ways in which the past is interpreted will be highlighted.

These issues are situated in the context of our long-term research in Tamil Nadu, with a focus on the sites of Attirampakkam, Sendrayanpalayam, and others. Prehistoric sites in India are rapidly vanishing under the onslaught of infrastructure development and lack of awareness of what these sites comprise. The urgent need for awareness creation and conservation to protect this heritage for the future and present sustainable plans for achieving the same will be discussed.

**About the Speaker:** Shanti Pappu is the Founder/Secretary of Sharma Centre for Heritage Education (SCHE; Established 1999), India, an Institute committed to both research in archaeology and public outreach. She specializes in prehistoric archaeology, beginning with cultures marking the earliest Palaeolithic occupation of India (beginning around 1.5 million years ago) and extending up to periods marked by transitions to Neolithic agro-pastoral communities. Her interests lie in prehistory and quaternary studies, history of archaeology, ethnoarchaeology, and experimental archaeology and museology. She obtained her PhD from the Deccan College, Pune, India. She has over 20 years of experience in prehistoric archaeology. She strongly believes that research, especially a less well-known field like prehistory, must be complemented by public awareness and outreach. Along with Dr. Kumar Akhilesh, she is responsible for developing the public archaeology and outreach programs at the SCHE and in developing the children's museum. Through in-house and outreach programs and traveling workshops, the team addresses school children and teachers, university students and faculty and interested local communities on aspects of archaeology. Workshops for children and teachers are conducted in English and several Indian languages, and comprise innovative teaching methods to bring alive the past. The Centre's public outreach programs seek to create an interest in Indian archaeology, that serves as a foundation for devising sustainable goals for heritage education, management and conservation.

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### Special Lecture (Saturday 29 June 2024: 09:30–10:10)



**Chairperson:** Kalyan Bidhan Sinha JNCASR, Bengaluru

**Speaker:** Mythily Ramaswamy, International Centre for Theoretical Sciences-TIFR, Bengaluru

**Title:** Differential Equations: A Glimpse

Differential equations, ordinary as well as partial, arise in many applications and their study is being pursued vigorously using a variety of tools. From an analyst's view point, the main issues of different types of solutions and their existence, uniqueness and also certain control aspects will be discussed.

**About the Speaker:** Mythily Ramaswamy is a senior scientist in mathematics at International Centre for Theoretical Sciences-TIFR, Bengaluru. She received her PhD in 1990. She was faculty at TIFR Centre for Applicable Mathematics, Bengaluru (until retirement in June 2019). She is adjunct professor at Chennai Mathematical Institute since 2019. She was elected Fellow of Indian Academy of Sciences in 2007 and NASI Senior Scientist. Her research interests lie in analysis of differential equations and applications to control problems.

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