



भारतीय प्रौद्योगिकी संस्थान मंडी

INDIAN INSTITUTE OF TECHNOLOGY MANDI

## Institute Colloquium

“What’s In a Song? Lessons From Crickets”



**Prof. Rohini Balakrishnan**

Centre for Ecological Sciences  
Indian Institute of Science  
Bangalore



**25th April, 2025**



**05:00PM**



**Auditorium, North  
Campus**

# What's In a Song? Lessons From Crickets

Prof. Rohini Balakrishnan

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## Abstract

Insects such as crickets and katydids are the first terrestrial animals to have evolved the ability to communicate using sounds and have continued to do so for over 250 million years. What can we learn from studying them? This talk will illustrate, using examples, how crickets and katydids contribute to our understanding of principles, processes and phenomena at multiple scales. Diverse species-specific songs used by males to attract females provide the opportunity to examine and compare the mechanisms by which these miniature actuators and sensor's function. Understanding these principles can inform biomimetic technology on the one hand as well as evolutionary ecology on the other.

Further, in natural animal communities, multiple individuals and species typically call together, raising the question of how communication takes place in noisy, acoustically complex environments. Rainforest dusk choruses provide among the most challenging acoustic scenarios and we examine potential sender and receiver strategies to solve the problem of acoustic masking interference. How female crickets navigate their way to localise individuals in choruses of singing conspecific males further raises the question of whether and how they can use the songs of individual males to choose between them. Males may in turn use alternative mating tactics: singing for a female, alone or in groups, as silent satellites, or even constructing their own acoustic amplifiers from leaves. Natural selection via predation should also affect signalling and searching behaviour of males and females: are loud, singing males taking on greater death risks while silent searching females remain relatively safe from predation, as widely believed?

Examining these questions at multiple levels has allowed insights into the interplay between natural and sexual selection, mechanics, physiology, ecological context and evolutionary history that together determine signal structures and signalling behaviour. Finally, the songs of these ancient singers may allow us to develop reliable, non-invasive methods to monitor biodiversity and ecosystem health in a rapidly changing world.

**Speaker Profile: -**

Prof. Rohini Balakrishnan is a bioacoustician and behavioural ecologist who studies animal acoustic communication at the interface of sensory, behavioural and community ecology, focusing on crickets and katydids as model systems.

Rohini Balakrishnan received her Ph.D. in Biology (Neurogenetics) in 1991 from the Tata Institute of Fundamental Research in Mumbai, India. She carried out postdoctoral research in bioacoustics at McGill University, Montreal, Canada from 1993-1996, and at the University of Erlangen, Germany (1996-1998). She joined the Indian Institute of Science, Bangalore, in 1998, where she is currently a Professor at the Centre for Ecological Sciences. She is well recognised for her work in bioacoustics and animal communication and is an elected member of the Executive Councils of the International Bioacoustics Society and International Society for Neuroethology. She was recently awarded a Fellowship of the Wissenschaftskolleg (Institute for Advanced Studies), Berlin. Two recently discovered cricket species have been named after her.