



INDIAN INSTITUTE OF SPACE SCIENCE AND TECHNOLOGY DEPARTMENT OF EARTH AND SPACE SCIENCES

INVITED TALK ON FEEDING AND VENTING THE GALACTIC CENTRE: THE MILKY WAY'S NUCLEAR GAS CYCLE



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ABSTRACT

The Galactic Centre (GC) is the Milky Way's most extreme environment, hosting a supermassive black hole and displaying phenomena ranging from supernova remnants and magnetic loops to large-scale winds. Its proximity provides an unparalleled opportunity to probe, at high resolution, how gas dynamics, chemistry, and feedback processes interact in galactic nuclei. A key driver of activity in the GC is the gas inflow along the Galactic bar. Although this region is dominated by turbulence, shear, and tidal forces that are typically regarded as suppressing star formation, new observations show that stars are nevertheless forming within these high-velocity streams. By using shock and density-sensitive molecules as diagnostic tools, it becomes possible to uncover the hidden conditions of the inflowing gas and to ask how star formation persists in such a hostile environment. In addition, the detection of molecular gas in the GC outflow raises the question of how molecules can survive in extreme nuclear winds while being transported several hundred parsecs above the Galactic plane. These findings are particularly compelling because they provide direct evidence of large-scale feedback in a galaxy that is neither a starburst system nor an AGN host. This talk will highlight multiwavelength and multi-species results that link chemistry and dynamics, showing how inflow and feedback regulate star formation in galactic nuclei, with implications for the long-term evolution of the Milky Way and other galaxies.

ABOUT THE SPEAKER

Dr. Veena V. S. is an alumnus of IIST. She completed her PhD in Astronomy & Astrophysics from IIST in 2018, where her doctoral work focused on the structure, evolution, and kinematics of massive star-forming regions. She subsequently held a Humboldt Fellowship at the University of Cologne, Germany, and a postdoctoral position at the Max Planck Institute for Radio Astronomy (MPIfR), Germany, and is currently a guest researcher at MPIfR. She is a recipient of the 2019 K. D. Abhayankar Award for the best thesis presentation by the Astronomical Society of India.

Her research focuses on molecular gas evolution and star formation in extreme environments, with particular emphasis on the Galactic Centre and the large-scale structure of the Milky Way. She combines millimeter, submillimeter, and low-frequency radio observations from facilities such as APEX, IRAM, Yebes, and GMRT, and has led multiple major observational programs from forefront as the Principal Investigator. She is actively involved in student supervision, proposal reviewing, and public outreach.



SPEAKER
Dr VEENA V S