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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

ICTS MONTHLY COLLOQUIUM

The solar spicule forest and parallels with Faraday excitation experiments in the laboratory

At any given time, it is estimated that millions of spicules are present on the solar surface. We find an intriguing parallel between the simulated spicular forest in a solar-like atmosphere and the numerous jets of polymeric fluid in the laboratory when both are subjected to harmonic driving or Faraday excitation. In our radiative (both 2D and 3D) MHD simulations with realistic sub-surface convection, the solar surface oscillations are excited similarly to those harmonic vibrations. A forest of spicules are formed in our simulations bear substantially closer resemblance to clusters of jets observed in the solar atmosphere compared to earlier efforts. Taken together, the numerical simulations of the Sun and the laboratory fluid dynamics experiments provide insights into the mechanism underlying the ubiquity of jets.

Piyali Chatterjee

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Piyali Chatterjee is an associate professor at the Indian Institute of Astrophysics (IIA) in Bengaluru. Her primary interest is in the application of computational magnetohydrodynamics to the study of the Sun - from the solar interior to the corona. In particular, her recent research shows how delta sunspots can form and flare repeatedly; and demonstrate the generation of solar plasma jets. Piyali did her Masters and PhD in Physics from the Indian Institute of Science, Bengaluru. Subsequently she held postdoc positions at Nordita (Stockholm), HAO Boulder, and the University of Oslo before joining IIA. Piyali is one of the developers and maintainers of the open source, MPI parallel radiative MHD code - the Pencil Code. She is also involved in science related to Aditya-L1 (India's first solar mission to be launched in Aug, 2023).

3:00 PM, 29 August 2023

Zoom link: https://shorturl.at/xyMPS

Meeting ID: 827 2071 4104

Passcode: 754198

Madhava Lecture Hall, ICTS, Bengaluru