

# SEMINAR

Department of Earth Sciences

Indian Institute of Technology Kanpur



## On the origin and deep cycles of life-essential volatile elements on Earth and rocky planets

**Speaker: Prof. Rajdeep Dasgupta, Rice University, USA**



Dr. Rajdeep Dasgupta is a Maurice Ewing Endowed Chair Professor in the Department of Earth, Environmental, and Planetary Sciences of Rice University. He is a high-temperature geochemist and petrologist. He received his BSc and MSc in geological sciences from Jadavpur University in 1998 and 2000, respectively, and a PhD in 2006 from the University of Minnesota. Dasgupta also held a two-year post-doctoral research fellow position at Columbia University, New York, before joining Rice University in Houston as a faculty member. Dasgupta and his research group are known for their work on the roles and fates of volatiles and fluids in deep Earth and planetary processes.

**Abstract:** Elements such as carbon (C), nitrogen (N), hydrogen (H), sulfur (S), and oxygen (O) are essential for life as we know it and for the chemical habitability of planets. It is, therefore, critical to understand how Earth and other rocky planets could acquire these elements in their surficial reservoirs and atmosphere. While surface and atmospheric processes affect the short-term fluctuations of these elements on rocky planetary surfaces, the long-term budget of the same is shaped heavily by the planets' interior compositions and interior-surface communications. In this presentation, I will discuss our current understanding of how Earth and other rocky planets acquired the life-essential elements and how those elements get stored in different reservoirs and redistributed through whole planet-scale processes. I will show that melting in the planetary interiors is a key process in both setting the budget of the volatile elements in planets as well as making them available to the planetary atmospheres.

**April 23, 2024 | 4.00 pm | FB - 320**

**All are cordially invited to attend**