

I²plus Special Lecture

Schedule: 17th, 18th, 19th, 20th, 25th, 26th & 28th Feb.,
2nd & 4th Mar. 2020

Place: ME Meeting Room (tba) (2F, Bldg #2, Noda)

Lecturer: Prof. Ranga NARAYANAN

(Distinguished Professor and William P. and Tracy Cirioli Term Professor,
Dept. Chem. Eng., Univ. Florida (USA))



Interfacial instabilities; Transport phenomena with applications to materials science and microgravity operations (90 min * 9 lec's)

Abstract: Transport of heat and mass and momentum are often accompanied by spatial and temporal pattern formation. Understanding the cause of pattern formation is pivotal as this research has application to the processing of materials on earth and under microgravity conditions. In the area of instabilities it is the goal of the present research to examine the physics of the spontaneous generation of spatial patterns in processes that involve solidification, electrodeposition, resonance, and free-surface convection. The pattern formation is associated with instabilities of a parent state as a control parameter is changed. Other processes of interest that involve instabilities are shearing flows with viscous dissipation of heat and oscillatory flows where flow reversal is the cause of non-rectilinear patterns. The mathematical methods used in our research are related to bifurcation theory, nonlinear energy methods and perturbation techniques. The experimental methods involve flow sensing by infrared imaging, shadow-graphy, and electrochemical titration.

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Organizer: International Research Div. of Interfacial Thermo-Fluid Dynamics (I²plus), RIST, TUS

