UNIVERSITY OF MARYLAND

THE BURGERS PROGRAM FOR FLUID DYNAMICS
FLUID DYNAMICS REVIEWS SEMINAR SERIES

RESONANT INSTABILITY AT LIQUID-FLUID INTERFACES- PHYSICAL PHENOMENA, MATHEMATICAL MODELING, EXPERIMENTAL EVALUATION

Friday, October 11th, 2019 | 10:30 - 11:30am
2164 Martin Hall, DeWALT Seminar Room

Guest Speaker

DR. RANGA NARAYANAN

William P. and Tracy Cirioli Chair and Distinguished Professor
Department of Chemical Engineering
University of Florida

ABSTRACT

Resonance driven instability or Faraday instability occurs when vertically stacked fluid bilayers are subject to periodic forcing in a direction that is normal to their common interface. The forcing can arise from several means, for example, by mechanical motion, by acoustic means, or even via electrostatic fields. The instability at the interface, which is manifested by ordered patterns, has its origins in the resonance between the imposed frequency and the system's natural frequency. Our talk will focus on a comparison between theory and experiments showing remarkable agreement between the two.

We also show how and why electrostatic forced resonance is an excellent candidate to determine interfacial tension between fluids such as liquid semi-conductors and encapsulants.

BIO

Ranga Narayanan is William and Tracy Cirioli Chair and Distinguished Professor of Chemical Engineering at the University of Florida. His research is in the area of pattern formation and hydrodynamic stability. He has around 120 journal papers in addition to five authored and edited books. He is a Fellow of the American Physical Soc. (DFD), AIChE, AAAS and the Inst Math. and Application (UK). He has been a Fellow at the Inst Adv Study in Durham UK and received a Distinguished Fulbright Chaired Fellowship in Israel 2012, another at ULB Belgium (2001) and a Humboldt Award in addition to several Japan Society fellowships.

A. JAMES CLARK SCHOOL OF ENGINEERING