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Kerala State Centre

Visvesvaraya Bhavan, Thrivananthapuram



100 Years of Relentless Journey Towards Engineering Advancement for Nation Building

**Cordially invites you to attend the
Technical Talk on**

**Rocket Science at Microscopic Scale
~ The Self Propelled Colloids ~**

by

Dr Akhil Varma, PhD

Laboratory of Hydrodynamics (LadHyX)

Ecole Polytechnique, Paris, France

on 5th February 2020 Wednesday at 5:45 pm

Venue

**The Institution of Engineers (India) Hall
Visvesvaraya Bhavan, Thrivananthapuram.**

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Rocket science at microscopic scales

A talk on “Self-propelled colloids” by Akhil Varma

On Feb 5th at 5:30 PM

At the Institution of Engineers Hall, Trivandrum

With scientific advancements over the last decade, microscopic particles and droplets that can propel themselves through a fluid medium have been developed. These micro-swimmers are a gateway for controlled transport at microscopic scales.

Their ability to perform work and transport microscopic cargo credits them with an immense potential for biomedical and therapeutic applications such as targeted drug delivery. Besides these engineering applications, these self-propelled particles are interesting to study from a physical perspective because they display intriguing collective behaviour in large numbers which is yet to be completely understood.

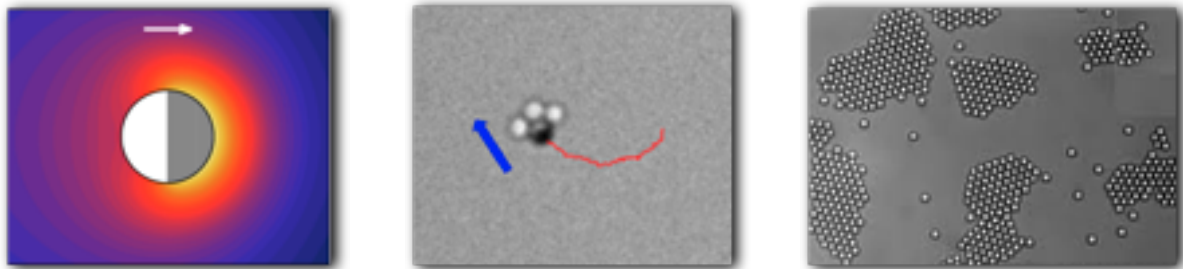


Figure: (left) Self-propelled Janus colloid swims in solute concentration gradients created by chemical reaction on the surface of the particle (Michelin & Lauga, 2014, JFM), (center) Janus colloid transporting cargoes (Baraban et.al, 2012, Soft Matter), (Right) Spontaneous clustering of light-activated colloids (Palacci et.al 2013 Science).

This talk will cover a brief overview of the progress that has been made over the years as well as the current research interests in the scientific community in designing, developing and understanding the dynamics of these self-propelled particles. Along with the experimental observations, we shall also explore the theoretical modelling approaches taken to provide insight into the different physical mechanisms by which these colloids self-propel, interact with each other and exhibit collective dynamics.

Akhil Varma

Dr Akhil Varma recently got his PhD from Laboratory of Hydrodynamics (LadHyX), Ecole Polytechnique, Paris, France where he developed theoretical models for studying active colloidal suspensions. He had previously obtained B.Tech degree in Mechanical and Industrial Engineering from College of Engineering Trivandrum (CET) and M.Tech in Applied Mechanics with a Gold Medal from Indian Institute of Technology Madras (IIT-M). His scientific interest broadly lies in the field of fluid mechanics, with focus on viscous and microscopic flows.