



TIFR Centre for Interdisciplinary
Sciences



INDIAN NATIONAL SCIENCE ACADEMY

Hyderabad Chapter and

UNIVERSITY OF HYDERABAD

have great pleasure to invite you and your colleagues for

A public lecture by



Professor Timothy J. Pedley, F.R.S.

DAMTP, University of Cambridge, UK

Raman Professor, Indian Academy of Sciences

Title: “Micro-organism swimming: individual and collective behaviour”

Date & Time:

Wednesday, 24th February 2016, at 3.30 p.m.

Venue:

Seminar Hall, School of Life Sciences, University of Hyderabad

For info: Prof. A.S. Raghavendra (23010630) and Surajit Dhara (23134331)

ABSTRACT: Swimming micro-organisms are everywhere: inside people (sperm, gut bacteria) and outside (algae and bacteria in bioreactors, lakes, oceans). This talk will survey the fluid mechanics of micro-organism swimming, from the low Reynolds number locomotion of individuals to the not necessarily low Reynolds number flows that they collectively generate in suspensions. The survey for individuals will start from the analyses of Taylor and Lighthill in the 1950s and finish with the very recent demonstration that fluid mechanics alone is enough to coordinate the beating of multiple cilia into metachronal waves, at least on *Volvox*. The survey for suspensions will start from studies of gyrotaxis in the 1990s, go on to the coherent structures driven by cell swimming stresslets, discovered in the 2000s, and conclude with an attempt to develop a continuum model for relatively concentrated suspensions.