



Cambridge Society for the Application of Research

Bacteria as Active Colloids

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WOLFSON LECTURE THEATRE CHURCHILL COLLEGE

7.30 p.m., Monday 28th May, 2012

A colloid is a suspension of particles in a liquid that, despite being heavier than the liquid, can nevertheless remain suspended against gravity because of thermal (or Brownian) motion. Colloidal particles have sizes in the range of 10 nm to just over 1 micron. Interestingly, the vast majority of bacteria have sizes in the upper end of this range. Thus, bacteria are colloids. But they do things that ordinary colloids do not do. In particular, they can grow and divide, and they are capable of self-propelled motion ('swim'). To a physicist, then, a suspension of bacteria can be considered an 'active colloid'.

In this lecture, we will first speculate briefly whether there are reasons why bacteria - the smallest known autonomous living organisms - must necessarily be colloidal in size, before moving on to examine bacteria as active colloids. We will see how the growth of a bacterial colony and the aggregation of motile bacteria can be seen as novel self assembly processes whereby micron-sized 'particles' can be harnessed to generate structures spontaneously.

About the speaker:

Professor Poon was educated at Cambridge, obtaining his first and second degrees at Peterhouse and St. John's College respectively. After some time as research fellow at St. Edmund's College, he moved to Portsmouth Polytechnic for a year, before joining Edinburgh University as a lecturer in 1990. He has been there since, becoming Professor of Condensed Matter Physics in 1999. Initially specialising in solid-state phase transitions, he moved into the then-new field of soft condensed matter physics in 1992, focussing on the study of colloidal suspensions, using these as 'model systems' to elucidate basic issues such as the nature of the liquid state and of the glass transition. More recently, he pioneered a real-time imaging technique for studying the deformation and flow of concentrated suspensions at single-particle resolution, giving access to unprecedentedly detailed information on a range of industrially-relevant problems and materials. Poon was elected Fellow of the Royal Society of Edinburgh in 2004, and was an EPSRC Senior Research Fellow from 2007 to 2012. The latter has enabled him to develop a new programme of research into the physics of bacteria.

Additional note:

The CSAR Lectures are open to all; CSAR members are admitted free. Non-members are asked to make a nominal donation of £3.00.

Coffee and biscuits will be available in the Wolfson Foyer from around 7pm until the start of the

lecture. Location information: <http://www.chu.cam.ac.uk/about/visitors/directions.php>

The talk will be held in the lecture theatre in Wolfson Hall (4):

