

Institute Lecture

Lessons from Nature on Solar Light Harvesting

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and

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Wednesday, 12th February 2014, Time: 6.00 PM,

Venue: Outreach Auditorium

Abstract

The sun is a dilute energy source and natural photosynthesis concentrates the solar excitation by means of large “antenna” systems connected to a reaction center which initiates the conversion of solar energy to chemical energy. The understanding of the design principles at work in natural photosynthetic light harvesting has advanced substantially in recent years. Progress has been made at the microscopic level, in particular revealing the existence of long-lived quantum coherence and, at the system level, in constructing a microscopically based model for the regulation of light harvesting in response to variations in solar flux. In this talk, I will summarize the recent progress and briefly suggest ideas for applications to synthetic systems.

[1] Lessons from nature about solar light harvesting, G. D. Scholes, G. R. Fleming, A. Olaya-Castro and R.van Grondelle. *Nature Chemistry*, 3, 763 (2011).

About the speaker

Born in Barrow, England, in 1949, Prof. Fleming earned his Bachelor's of Science degree from the University of Bristol in 1971, and his Ph.D. in chemistry from the University of London in 1974. Following a post-doctoral fellowship at the University of Melbourne, Australia, he joined as a faculty of the University of Chicago in 1979. There, he rose through the academic ranks to become the Arthur Holly Compton Distinguished Service Professor, a post he held for ten years, starting in 1987. At University of Chicago, he also served for three years as the Chair of the Chemistry Department. In that role, he led the creation of University of Chicago's first new research institute in more than 50 years, the Institute for Biophysical Dynamics. In 1997, he moved to University of California Berkeley as a professor of Chemistry, and he started and directed a new division of physical biosciences for Berkeley Lab.

Prof. Graham Fleming was appointed as Vice Chancellor for Research at the University of California in 2009. Through high level positions at UC Berkeley and Lawrence Berkeley National Laboratory (where he was Deputy Laboratory Director from 2004 - 2006), he has been involved in the formation and operation of multiple major initiatives at Berkeley and LBNL. These include the \$500M BP funded Energy Biosciences Institute, The California Institute for Quantitative Bioscience and the Simons Institute for the Theory of Computing.

Throughout his administrative career, Prof. Fleming has remained a highly active and successful scientific researcher. He has authored or co-authored more than 440 publications, and is widely considered to be one of the world's foremost authorities on ultrafast processes. His ultimate goal is to develop artificial photosynthesis that would provide humanity with clean, efficient and sustainable energy. He is a member of the National Academy of Sciences, and the American Philosophical Society and a Fellow of the Royal Society, the American Academy of Arts and Sciences and a Foreign Fellow of the Indian National Science Academy.

Tea at 5.45 PM

All interested are welcome.

Amalendu Chandra
Dean of Research and Development