

Programme

Faraday Discussion 159: Crystallisation – A Biological Perspective

23 – 25 July 2012, Leeds Metropolitan University, UK

Monday 23 July

11:30	Registration in The Rose Bowl, ground floor
12.15	Lunch (pre-booked delegates only). Ground floor food court
13.00	Welcome and Introductions (In Lecture Theatre B, Level 4) Fiona Meldrum (Conference chair), <i>University of Leeds, UK</i>
13.15 Paper 1	Introductory Lecture: Effect of interaction specificity on the phase behaviour of patchy particles Nicolas Dorsaz, Laura Fillion, Frank Smalenburg and Daan Frenkel* (Spiers Memorial Award winner 2012) <i>University of Cambridge, UK</i>
Session 1	Current Ideas in Nucleation Session Chair: Nico Sommerdijk, <i>Eindhoven University of Technology, The Netherlands</i>
14:15 Paper 2	Amino acids form prenucleation clusters: ESI-MS as a fast detection method in comparison to analytical ultracentrifugation Matthias Kellermeier, Rose Rosenberg, Adrian Moise, Ulrike Anders, Michael Przybylski and Helmut Cölfen* <i>University of Konstanz, Germany</i>
14:20 Paper 3	Probing the structure and stability of calcium carbonate pre-nucleation clusters Aaron R. Finney and P. Mark Rodger* <i>University of Warwick, UK</i>
14:25 Paper 4	Exploring the influence of organic species on pre- and post-nucleation calcium carbonate Paolo Raiteri, Raffaella Demichelis, Julian D.Gale*, Matthias Kellermeier, Denis Gebauer, David Quigley, Louise B. Wright and Tiffany R. Walsh <i>Curtin University, Australia</i>
15:45	Afternoon Tea. Exhibition area, ground floor
16:15 Paper 5	Control of the nucleation of sickle cell hemoglobin polymers by free hematin Veselina Uzunova, Weichun Pan, Vassiliy Lubchenko and Peter G. Vekilov* <i>University of Houston, USA</i>
16:20 Paper 6	Structural evolution, formation pathways and energetic controls during template-directed nucleation of CaCO₃ Michael H. Nielsen, Jonathan R. I. Lee, Qiaona Hu, Thomas Yong-Jin Han and James J. De Yoreo * <i>Lawrence Berkeley National Laboratory, USA</i>

16:25 Paper 7	A two-step mechanism for crystal nucleation without supersaturation Tamás Kovács and Hugo K. Christenson* <i>University of Leeds, UK</i>
17:45	Close of Sessions
17:45 – 19:30	Poster Session and Wine Reception. Exhibition area, ground floor

Tuesday 24 July

Session 2	Self-assembly Crystal Growth Mechanisms Session Chair: Pupa Gilbert, <i>University of Wisconsin-Madison, USA</i>
09:30 Paper 8	Phase behavior of colloidal silica rods Anke Kuijk, Dmytro V. Byelov, Andrei V. Petukhov, Alfons van Blaaderen* and Arnout Imhof <i>Utrecht University, The Netherlands</i>
09:35 Paper 9	Inorganic salts direct the assembly of charged nanoparticles into composite nanoscopic spheres, plates, or needles Bartosz A. Grzybowski*, Bartłomiej Kowalczyk, István Lagzi, Dawei Wang, Konstantin V. Tretiakov and David A. Walker <i>Northwestern University, USA</i>
09:40 Paper 10	Real-space studies of the structure and dynamics of self-assembled colloidal clusters Rebecca W. Perry, Guangnan Meng, Thomas G. Dimiduk, Jerome Fung and Vinothan Manoharan* <i>Harvard University, USA</i>
11:00	Morning Coffee. Exhibition area, ground floor
11:30 Paper 11	Aggregation of ferrihydrite nanoparticles in aqueous systems Virany M. Yuwono, Nathan D. Burrows, Jennifer A. Soltis, Tram Anh Do and R. Lee Penn* <i>University of Minnesota, USA</i>
11:35 Paper 12	Biomimetic type morphologies of calcium carbonate grown in absence of additives Jens-Petter Andreassen*, Ralf Beck and Margrethe Nergaard <i>Norwegian University of Science and Technology, Norway</i>
11:40 Paper 13	Computer simulation of soft matter at the growth front of a hard-matter phase: incorporation of polymers, formation of transient pits and growth arrest Richard P. Sear* <i>University of Surrey, UK</i>
13:00	Lunch and Posters. Exhibition area, ground floor

Session 3	Amorphous Precursor Phases Session Chair: Hugo Christenson, <i>University of Leeds, UK</i>
14:00 Paper 14	A metastable liquid precursor phase of calcium carbonate and its interactions with polyaspartate Mark A. Bewernitz, Denis Gebauer, Joanna Long, Helmut Cölfen and Laurie B. Gower* <i>University of Florida, USA</i>
14:05 Paper 15	The role of cluster formation and metastable liquid-liquid phase separation in protein crystallization Fajun Zhang*, Felix Roosen-Runge, Andrea Sauter, Roland Roth, Maximilian W. A. Skoda, Robert M. J. Jacobs, Michael Sztucki, and Frank Schreiber <i>Universitaet Tuebingen, Germany</i>
14:10 Paper 16	Polymer-induced liquid precursor (PILP) phases of calcium carbonate formed in the presence of acidic polypeptides with controlled compositions — relevance to biomineralization Anna S. Schenk, Harshal Zope, Yi-Yeoun Kim, Alexander Kros, Nico A. J. M. Sommerdijk and Fiona C. Meldrum* <i>University of Leeds, UK</i>
15:30	Afternoon Tea. Exhibition area, ground floor
16:00 Paper 17	Precipitation of ACC in liposomes – a model for biomineralization in confined volumes Chantel C. Tester, Ching-Hsuan Wu, Steven Weigand and Derk Joester* <i>Northwestern University, USA</i>
16:05 Paper 18	The role of the amorphous phase on the biomimetic mineralization of collagen Fabio Nudelman, Paul H. H. Bomans, Anne George, Gijsbertus de With and Nico A. J. M. Sommerdijk* <i>Eindhoven University of Technology, The Netherlands</i>
16:10 Paper 19	Revisiting geochemical controls on patterns of carbonate deposition through the lens of multiple pathways to mineralization Dongbo Wang, Laura Hamm, Anthony Giuffre, Takuya Echigo, J. Donald Rimsidt, James J. De Yoreo, John Grotzinger and Patricia Dove* <i>Virginia Tech, USA</i>
17:30	Close of sessions
19:30	Pre-Dinner Drinks (pre-booked delegates only). Food court, ground floor
20:00	Conference Dinner (pre-booked delegates only). Food court, ground floor

Wednesday 25 July

Session 4	Biological Crystallisation Mechanisms Session Chair: Derk Joester, <i>Northwestern University, USA</i>
09:30 Paper 20	Aragonite crystal orientation in mollusk shell nacre may depend on temperature. The angle spread of crystalline aragonite tablets records the water temperature at which nacre was deposited by <i>pinctada margaritifera</i> Ian C. Olson and Pupa U. P. A. Gilbert* <i>University of Wisconsin-Madison, USA</i>
09:35 Paper 21	Merging models of biomineralisation with concepts of nonclassical crystallisation: is a liquid amorphous precursor involved in the formation of the prismatic layer of the Mediterranean Fan Mussel <i>Pinna nobilis</i>? Stephan E. Wolf*, Ingo Lieberwirth, Filipe Natalio, Jean-Francois Bardeau, Nicolas Delorme, Franziska Emmerling, Raul Barrea, Michael Kappl and Frédéric Marin <i>Université de Bourgogne, France</i>
10:30	Morning Coffee. Exhibition area, ground floor
11:00 Paper 22	Oligomer formation, metalation, and the existence of aggregation-prone and mobile sequences within the intracrystalline protein family, Asprich Moise Ndao, Christopher B. Ponce and John Spencer Evans* <i>New York University, USA</i>
11:05 Paper 23	GSP-37, a novel goldfish scale matrix protein: identification, localization and functional analysis Kousei Miyabe, Hiroki Tokunaga, Hirotochi Endo, Hirotaka Inoue, Michio Suzuki, Naoaki Tsutsui, Naoki Yokoo, Toshihiro Kogure and Hiromichi Nagasawa* <i>University of Tokyo, Japan</i>
11:10 Paper 24	CaCO₃/Chitin hybrids: recombinant acidic peptides design based on a peptide extracted from the exoskeleton of a crayfish, and its effect on the morphologies of the hybrids Hiromu Kumagai, Ryou Matsunaga, Tatsuya Nishimura, Yuya Yamamoto, Satoshi Kajiyama, Yuya Oaki, Kei Akaiwa, Hirotaka Inoue, Hiromichi Nagasawa, Kohei Tsumoto and Takashi Kato* <i>The University of Tokyo, Japan</i>
12:30	Concluding Remarks Lecture Jim De Yoreo <i>Lawrence Berkeley National Laboratory, USA</i>
13:15	Acknowledgements
13:30	Close of Meeting