

Annex A: Speakers' Biographies

Royal Swedish Academy and Nobel Laureates:

Professor K. Barry Sharpless (Nobel Prize in Chemistry, 2001)

Plenary Lecture: *Click Chemistry: Modular Synthesis for Function*



Prof. K. Barry Sharpless is the W. M. Keck Professor of Chemistry, The Scripps Research Institute, La Jolla, California. Though an academic, Sharpless has always looked for “useful” new chemical methods. He regards the oxidation of olefins as the single most versatile, powerful and reliable class of transformations in organic synthesis, so improving existing oxidative reactions and discovering new ones is a priority. He is best known for discovering general reactions for catalytic asymmetric epoxidation, dihydroxylation, and aminohydroxylation, for which he received the Nobel Prize in 2001. Current research focuses on click chemistry, his new synthetic stratagem for the rapid discovery of chemical function. A copper-catalyzed ‘fusion’ of azides and alkynes developed at Scripps is a near-universal best reaction for click chemistry, functioning under essentially all conditions (even in living cells) and proving to be a route to highly diverse chemical products of all types, whether polyolefins, smart materials or drugs. Sharpless graduated from Dartmouth College, received a Ph.D. from E. E. van Tamelen, Stanford University, and postdoced with J. P. Collman, Stanford, and at Harvard with Konrad Bloch. He served on the faculties of MIT (1970-1977), Stanford (1977-1980), MIT (1980-1990), and The Scripps Research Institute and its Skaggs Institute for Chemical Biology (1990-present).

Professor Richard Schrock (Nobel Prize in Chemistry, 2005)

Plenary Lecture: *Catalytic Reduction of Dinitrogen to Ammonia under Mild Conditions with Protons and Electrons*



Prof. Richard Schrock is the Frederick G. Keyes Professor of Chemistry, Massachusetts Institute of Technology, USA. His research has been focused on the fields of synthetic and mechanistic organotransition metal and inorganic chemistry, catalysis, and polymers. Prof. Schrock shared the Nobel Prize in Chemistry with Y. Chauvin and R. H. Grubbs in 2005 for their work on the development of the metathesis method in organic synthesis. Among his other awards are the ACS Award in Organometallic Chemistry (1985); the Harrison Howe Award of the Rochester ACS section (1990); an Alexander von Humboldt Award (1995); the ACS Award in Inorganic Chemistry (1996); the Bailar Medal from the University of Illinois (1998); and an ACS Cope Scholar Award in 2001. He was the Sir Geoffrey Wilkinson Lecturer and Medalist (2002) and the Sir Edward Frankland Prize

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Lecturer (2004), and has received the F. Albert Cotton Award in Synthetic Inorganic Chemistry (2006); the Theodore Richards Medal from the Northeast ACS section (2006), and the August Wilhelm von Hofmann Medal from the German Chemical Society (2005). He has also been elected to the American Academy of Arts and Sciences and the National Academy of Sciences. He was Associate Editor of *Organometallics* for eight years, and has published approximately 450 research papers.

Professor Ryoji Noyori (Nobel Prize in Chemistry, 2001)

Plenary Lecture: *Asymmetric Catalysis: Structural and Functional Engineering*



Prof. Ryoji Noyori is University Professor of Nagoya University and President of RIKEN, Japan. He is known for his research interest in the fundamentals and applications of molecular catalysis based on organometallic chemistry. Prof. Noyori won the Nobel Prize in Chemistry in 2001 together with W. S. Knowles and K. B. Sharpless for their work on chirally catalysed reactions. He has also received the Asahi Prize (1992); the Tetrahedron Prize (1992); the Japan Academy Prize (1995); the Arthur C. Cope Award (1997); the King Faisal International Award (1999); the Order of Culture (2000); the Wolf Prize (2001) and the Roger Adams Award (2001). He is a member of the Japan Academy and the Pontifical Academy of Sciences, and is a foreign member of the National Academy of Sciences, USA, the Russian Academy of Sciences, and the Royal Society, UK.

Professor Sumio Iijima (Gregori Aminoff Prize, 2007)

Plenary Lecture: *Discovery of Carbon Nanotubes*



Prof Sumio Iijima has been Professor at Meijo University, Nagoya since 1999 and he has been appointed as Director of Research Center for Advanced Carbon Materials at AIST in Japan and also partly works as a Special Research Fellow at NEC. After graduating from Tohoku University, he moved to Arizona State University where he developed high-resolution transmission electron microscopy (HRTEM) (1970-1982), which is a basis of the current TEM method. In 1982 he returned to Japan and worked for the 5 years Japanese government research project (ERATO) on nano-particles, and joined the NEC fundamental research laboratories in 1987. In 1991 he discovered carbon nanotubes that have initiated nano-materials science and nanotechnology. The discovery honored him with numerous awards, prizes and Honorary Doctorates including the 2001 Franklin Medal in physics, the Agilent Europhysics award and the APS McGroddy prize, the Imperial Prize and the Japan Academy Prize and Person of Cultural Merits (2002). In 2007, he was awarded the Aminoff Prize (Sweden), the Balzan Prize (Italy), and was also elected as the foreign associate of the National Academy of Science (USA).

Keynote Speakers:

Professor Bengt Nordén

Keynote Lecture: *Dynamic Aspects of Molecular Recognition, Assembly and Function*



Prof. Bengt Nordén is Professor of Physical Chemistry at Chalmers University of Technology, Sweden. His research interests are mechanisms of molecular recognition and function; DNA-supramolecular structures involving small as well as large molecules: chiral substitution-inert metal complexes and peptide nucleic acids. Prof. Norden is known for having developed spectroscopy with polarized light (linear dichroism) addressing biomolecular structures, e.g. 3D structure of DNA-recombinase complex in solution and cell-penetrating peptides, as well as membrane translocation mechanisms. He has been awarded the Göran Gustafsson Prize in 1992. Since 1991, Prof. Nordén has been an elected member of the Royal Swedish Academy of Sciences. He has been the Chairman of the Nobel Committee for Chemistry of the Royal Swedish Academy of Sciences during 2001-2004 and has been a member of this committee from 1996. He is president of the Chemistry Class of the Royal Swedish Academy since 2004. He is also Chairman of the Board of Directors of the Molecular Frontiers Foundation, a global think tank that promotes molecular sciences.

Professor Erik Thulstrup

Keynote Lecture: *Molecular Sciences and the Developing World: A Conflict Between Traditions and Future Demands*



Prof. Erik Thulstrup is Professor at the Department of Science, Systems and Models, Roskilde University, Denmark. His research focuses on polarization spectroscopy, where he developed a method for the production of aligned molecular samples and for optical spectroscopic studies of such samples. He is the author of three leading monographs in the field. Prof. Thulstrup also has interests in the role of scientific research and science education for economic development. He has done extensive science policy and research evaluation work in Eastern Europe, Africa, Asia, and Latin America for several donors and development banks. He was elected in 1996 to be the first and only Danish Fellow of the Third World Academy of Sciences. He has been a Fellow of the Norwegian Academy of Sciences since 1999.

Professor Jackie Y. Ying

Keynote Lecture: *Nanocomposite Engineering of Biomaterials*



Prof. Jackie Y. Ying is Executive Director of the Institute of Bioengineering and Nanotechnology, Singapore. Born in Taipei and raised in Singapore and New York, Prof. Ying has been on MIT's Chemical Engineering faculty since 1992, and was promoted to Professor in 2001. She has been recognized with a

number of research awards, including the American Ceramic Society Ross C. Purdy Award for the most valuable contribution to the ceramic technical literature during 1993, David and Lucile Packard Fellowship, Office of Naval Research Young Investigator Award, National Science Foundation Young Investigator Award, Camille Dreyfus Teacher-Scholar Award, Royal Academy of Engineering ICI Faculty Fellowship, American Chemical Society Faculty Fellowship Award in Solid-State Chemistry, Technology Review TR100 Young Innovator Award, American Institute of Chemical Engineers (AIChE) Allan P. Colburn Award for excellence in publications, and *Chemical Engineering Science* Peter V. Danckwerts Lectureship. She was named in the centennial issue of MIT's Technology Review magazine as one of the world's 100 young people likely to lead 21st Century innovators. In 2005, she was appointed to be among 237 leaders in the World Economic Forum's panel of Young Global Leaders, and was also elected as a member of the German Academy of Natural Scientists, Leopoldina. Prof. Ying serves on the Advisory Board of the Society for Biological Engineering and the Molecular Frontiers Foundation. In 2006, she was appointed by the U.S. National Academy of Engineering to serve on the blue-ribbon committee that identifies the grand challenges and opportunities for engineering.

Professor Louis Brus

Keynote Lecture: *Excited Electronic States of Ag Nanocrystals*



Prof. Louis Brus is the Samuel Latham Mitchill Professor of Chemistry and Professor of Chemical Engineering and Applied Chemistry at Columbia University, USA. Prof. Brus has been honored as NSF Predoctoral Fellow from 1966-1969. He was Elected Fellow of the American Physical Society in 1980 and Elected Fellow of the American Academy of Arts and Sciences in 1998. In 2004, he was elected to the U. S. National Academy of Sciences in Chemistry. Prof. Brus received the Herman Bloch Award "For Scientific Excellence in Industry" from the University of Chicago in 1995. He was Chairman of the Gordon Conferences Board of Trustees in 1998. In 2001, he received the Irving Langmuir Prize in Chemical Physics from the American Physical Society. He also received the Chemistry of Materials Prize from the American Chemical Society (2005) and the R. W. Wood Prize (with A. Ekimov and A. Efros) from the Optical Society of America (2006).

Professor Shuguang Zhang

Keynote Lecture: *Self-Assembling Peptide Systems*



Prof. Shuguang Zhang is at the Center for Biomedical Engineering and Center for Bits & Atoms, Massachusetts Institute of Technology. He received his B.Sc. from Sichuan University in China and Ph.D. in biochemistry & molecular biology from University of California at Santa Barbara. He was an American Cancer Society Postdoctoral Fellow at MIT and was a Whitaker Foundation Investigator. He is member of AAAS, American Society of

Biochemistry & Molecular Biology, the Protein Society, New York Academy of Sciences, Sigma Xi. He received an honorary professorship from Sichuan University. He is also an elected Chang Jiang distinguished scholar in China. He is a 2003 Fellow of Japan Society for Promotion of Science (JSPS fellow). His work on the designer peptide scaffold won the 2004 R&D100 award. His and his colleagues' work on direct harvesting of biosolar energy was selected to be the Top 100 Science Stories in 2004 by *Discover* Magazine and one of the 10 finalists of the 2005 Saatchi & Saatchi Award for World Changing Ideas. He is one of the 2006 John Simon Guggenheim Fellows. He is the recipient of the 2006 Wilhelm Exner Medal of Austria.

Professor Tom Brown

Keynote Lecture: *Mini-DNA with Interesting Properties Synthesized by Click Chemistry*



Prof. Tom Brown is the Head of the Synthesis Research group of the School of Chemistry, at the University of Southampton, UK. His research is focused on the synthesis of chemically modified oligonucleotides for the detection of specific PCR amplicons, the use of fluorescence in the measurement of the stability of nucleic acid structures and nucleic acid-drug complexes (with K.R.Fox), and the application of modified oligonucleotide in forensic and genetic DNA analysis. Prof. Brown is also interested in the synthesis of DNA triplex analogues for use in sequence-specific antigene and gene-correction applications (with Keith Fox) and studies on nucleic acid structure, DNA repair enzymes and DNA/anti-cancer drug complexes. More recently his research has also involved applications of novel aspects of oligonucleotide chemistry in the nanotechnology field. Prof. Brown was awarded a lectureship at the University of Edinburgh in 1985 after postdoctoral spells at Oxford and Cambridge Universities. He was promoted to Reader in 1991, then to Professor of Nucleic Acids Chemistry in 1993, having received both the Royal Society of Edinburgh MacDougall-Brisbane Prize for Research and the Royal Society of Chemistry Josef Loschmidt Award for research in Structural Chemistry in 1992. In 1993, he was awarded a Royal Society of Edinburgh Caledonian Research Fellowship. He moved to Southampton in 1995, where he became Professor of Bio-Organic Chemistry in the School of Chemistry. In 2004, he received a Royal Society Leverhulme Senior Research Fellowship for research on triplex-mediated DNA sequence recognition and in 2007 received the Royal Society of Chemistry award for Nucleic Acids Chemistry.