

## IAS Distinguished Lecture

# Macromolecular Engineering by Taming Free Radicals

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Date : 24 October 2018 (Wednesday)

Time : 4:30pm – 6:00pm ( *Light refreshments will be served from 4:00pm to 4:30pm* )

Venue: Connie Fan Multi-media Conference Room, 4/F, Cheng Yick-chi Building  
City University of Hong Kong

### Abstract

Many advanced nanostructured functional materials were recently designed and prepared by controlled/ living radical polymerization (CRP). More than 100 million tons of polymers are produced annually world-wide by conventional radical polymerization. However, macromolecular engineering is impossible in this process. Copper-based ATRP (atom transfer radical polymerization) catalytic systems with polydentate nitrogen ligands are among most efficient controlled/living radical polymerization systems. Recently, by applying new initiating/catalytic systems, Cu level in ATRP was reduced to a few ppm. ATRP of acrylates, methacrylates, styrenes, acrylamides, acrylonitrile and other vinyl monomers was employed for macromolecular engineering of polymers with precisely controlled molecular weights, low dispersities, designed shape, composition and functionality. Examples of block, graft, star, hyperbranched, gradient and periodic copolymers, molecular brushes and various hybrid materials and bioconjugates prepared with high precision will be presented. These polymers can be used as components of various advanced materials such as health and beauty products, biomedical and electronic materials, coatings, elastomers, adhesives, surfactants, dispersants, lubricants, additives, or sealants. Special emphasis will be on nanostructured multifunctional hybrid materials for application related to environment, energy and catalysis.

### Biography

Krzysztof (Kris) Matyjaszewski is J.C. Warner University Professor of Natural Sciences at Carnegie Mellon University. He discovered Cu-mediated atom transfer radical polymerization, commercialized in 2004 in US, Japan and Europe. He has co-authored >1,000 publications (cited 95,000 times, h-index 149), co-edited 20 books, >90 book chapter and holds 59 US patents. He is the editor of Progress in Polymer Science. Matyjaszewski received 2017 Franklin Medal in Chemistry, 2015 Dreyfus Prize in Chemical Sciences, 2014 National Institute of Materials Science (Japan) Award, 2012 Prize of Société Chimique de France, 2012 Maria Curie Medal, 2011 Wolf Prize in Chemistry, 2009 Presidential Green Chemistry Challenge Award, and from the American Chemical Society: 2015 Overberger Prize, 2013 AkzoNobel North America Science Award, 2011 Hermann Mark Award, 2011 Award in Applied Polymer Science, 2002 Polymer Chemistry Award, 1995 Creative Polymer Chemistry Award. He received ten honorary degrees (Ghent, Lodz, Athens, Moscow, Toulouse, Pusan, Paris, Haifa, Poznan and Padova) and is a member of National Academy of Engineering, Polish Academy of Sciences, Russian Academy of Sciences, honorary member of Israel and Chinese Chemical Society and a fellow of National Academy of Inventors, IUPAC and American Chemical Society.



All are welcome

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