

 Department Seminar

Dear Colleagues & Students,
You are cordially invited to a special seminar on

Date: 28th October 2026, Wednesday

Time: 2:00 pm – 3:30 pm

Venue: E7-03-08, 15 Kent Ridge Cres, Singapore 119276 ([Map](#))

Colloidal Metal Nanocrystals: From Academic Studies to Industrial Applications



By Prof. Younan Xia

Bloomberg Distinguished Professor

Materials Science and Engineering & Biomedical Engineering

Johns Hopkins University

Hosted by Asst. Prof. Ming Zhao

Abstract:

Although the first documented synthesis of colloidal metal nanocrystals can be traced back to the beautiful work on gold colloids by Michael Faraday in 1856, only within the last decade have methods become available for generating samples with the quality, quantity, and reproducibility needed for a systematic study of their properties as a function of size, shape, and structure, and for exploration of their applications. Of particular importance is to control the shape of colloidal metal nanocrystals, which may initially seem like a scientific curiosity but with implications going far beyond aesthetic appeal. For nanocrystals made of noble metals, the shape determines their chemical, plasmonic, and catalytic properties, as well as their relevance for electronic, photonic and catalytic applications. For more than 20 years, we have been working diligently to understand the nucleation and growth mechanisms leading to the formation of nanocrystals with specific shapes and structures. In this talk, I will discuss some of the recent developments in this field, with a focus on the shape-controlled synthesis of noble-metal nanocrystals under steady-state kinetics. The success of these syntheses has enabled us to tailor the properties of metal nanocrystals for a broad range of applications in photonics, imaging, medicine, catalysis, and fuel cell technology.

Biography:

Prof. Younan Xia is a Bloomberg Distinguished Professor at Johns Hopkins University, with joint appointments in Department of Materials Science and Engineering and Department of Biomedical Engineering. He received a B.S. degree in chemical physics from the University of Science and Technology of China (USTC) in 1987, M.S. degree in chemistry from University of Pennsylvania (with Alan G. MacDiarmid) in 1993, and Ph.D. degree in physical chemistry from Harvard University (with George M. Whitesides) in 1996. His group invented numerous nanomaterials with well-controlled properties for use in applications related to plasmonics, electronics, display, catalysis, energy conversion, controlled release, drug delivery, nanomedicine, and regenerative medicine. Notably, the silver nanowires invented by his group were commercialized for the manufacturing of flexible, transparent, and conductive coatings key to applications such as touchscreen display, flexible electronics, and photovoltaics. His technology on the alignment of electrospun nanofibers was commercially used for multiple clinical products in regenerative medicine, including those for the management of surgical and trauma wounds. Xia has co-authored over 900 publications in peer-reviewed journals, together with a total citation of more than 220,000 and an h-index of 226. He has been named a Top 10 Chemist and Materials Scientist based on the citation data. He has received many prestigious awards, including the Linus Pauling Medal (2024), ACS Award for Creative Invention (2023), MRS Medal (2017), ACS Award in the Chemistry of Materials (2013), NIH Director's Pioneer Award (2006), and NSF CAREER Award (2000).

More information can be found at <http://www.nanocages.com>.

Looking forward to seeing all of you!