AMU Invited Lecture Series in **MODERN CATALYSIS 2**
and Lecture in **Akademicki Poznań** initiative

Center for Advanced Technology UAM
Tuesday, May 09th, 2023, Building D, 1st floor, D111/4-6

10.00 Our Future Challenges in Chemical Syntheses *(Akademicki Poznań)*
11.00 Coffee Break
11.15 Inventing Reactions for Green and Sustainable Chemical Syntheses

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Our Future Challenges in Chemical Syntheses

Resource depletion, energy shortage, environmental deterioration and drug resistance represent the great challenges facing the future sustainability of our society. How to utilize the limited natural resource efficiently? How to harvest, store and transport renewable energy easily? How to preserve and restore the eco and environmental system? How to combat existing vicious diseases, such as cancer, and the current and possible future pandemics? These are some of the most important scientific issues of our time. Chemistry as the central science plays a key role in finding solutions to such challenges. As >97% of all manufactured products in our modern society involve at least one chemical process, exploring novel chemical transformations with an eye on future sustainability will have a profound impact in our society. This talk will discuss some key endeavors towards this objective from Green Chemistry perspectives.

Inventing Reactions for Green and Sustainable Chemical Syntheses

The efficient making of new molecules is central to any chemical products in the pharmaceutical, agrochemical, fine chemical, material science and electronic industries. On the other hand, the state-of-art chemical productions are generally based on non-renewable fossil-resources, often require lengthy transformations, and have low overall efficiency. Towards future sustainability in chemical productions, innovations in chemical science and technologies are imperative, to transform readily available naturally abundant resources and functionality into high valued products directly, guided by the principles of Green Chemistry. C-C bond formation is the essence of chemical syntheses, among which organometallic reactions (nucleophilic addition, conjugate additions, and cross-couplings) play the central role. For over 30 years, we have been exploring various novel C-C bond formation reactions that can simplify synthesis, decrease overall waste generation and maximize resource utilization, directly using naturally abundant feedstocks and functionalities. In this talk, we will discuss our effort in this endeavor with a focus on more recent developments of this subject.

Chao-Jun Li *received his BSc at Zhengzhou University (1983), MS at the Chinese Academy of Sciences in Beijing (1989) and his Ph.D. (with honor) at McGill University (1992) under the direction of T. H. Chan and D. N. Harpp. Then, Li spent two years (1992–94) as an NSERC Postdoctoral Fellow in Barry M. Trost's laboratory at Stanford University (US), and following that went to Tulane University (US) as an assistant professor. He was promoted to associate professor with tenure in 1998 and full professor in 2000. In 2003, he became a Canada Research Chair (Tier I) in Green Chemistry and a Professor of Chemistry at McGill University in Canada. He is an honorary research professor at the Chemistry Institute of the Chinese Academy of Science (1996–) and a guest professor at the University of Science and Technology in China (2001). He was a visiting professor (with Robert G. Bergman) at University of California at Berkeley (2002). He has also been the director of NSERC CREATE for Green Chemistry (2012–2018), the director of CFI Infrastructure for Green Chemistry and Green Chemicals (2008–2018) and has been the co-director of the FQRNT Center for Green Chemistry and Catalysis since 2009. Li serves as a associate editor in Chem. Commun. (since 2020) and Green Chem. (2005-) and sits in Editorial Advisory Boards of e.g., ACS Catal. (since 2021), Advanced Sustainable Systems (Wiley, 2021-), Chem. Soc. Rev. (2016-), Chem. Sci. (2010-) His research is focusing on exploring new fundamental reactions that can drastically shorten synthetic steps, more directly transform renewable biomass and abundant feedstocks (CO_2 and methane) into high valued products, and harvest solar light by chemical means and utilize photo-energy as energy input for chemical conversion. He has published over 500 publications, 8 books, 14 patents (total citations: 51 190, H-index = 109). He gave around 500 plenary, keynote and invited talks at international conferences and research institutions. Li was awarded with many honors and distinctions, e.g., Chemical Insitute of Canada Medal (2022), Humboldt Research Award (2021), Killiam Research Fellow (2018), Listed as one of the World Most Highly Cited Scientists by Claritive Analytics (2017). He was elected as Fellow of the European Academy of Science (2020) and Chinese Chemical Society (2020).*