Author Spotlight

Shengqian Ma (马胜前)
Prof. Shengqian Ma obtained his B.S. degree from Jilin University in 2003 and graduated from Miami University (Ohio, USA) with a Ph.D. degree in 2008. After finishing a two-year Director's Postdoctoral Fellowship at Argonne National Laboratory (USA), he joined the Department of Chemistry at the University of South Florida (USA) as an Assistant Professor in August 2010. He was promoted to Associate Professor with early tenure in 2015 and Full Professor in 2018. In August 2020, he joined the Department of Chemistry at the University of North Texas (USA) as the Robert A. Welch Chair in Chemistry. His current research focuses on task-specific design and functionalization of advanced nanoporous materials including metal-organic framework, covalent organic framework, and porous organic polymer for energy, biological, environmental-related applications. He has received a number of awards during his research career, including NSF CAREER Award (2014), IUPAC Prize for Young Chemists (2009), and Young Investigator Award from American Chemical Society Division of Inorganic Chemistry (2008).

Jishan Wu (吴继善)
Prof. Jishan Wu received his B.S. degree in chemistry from Wuhan University in 1997 and his M.S. degree from Changchun Institute of Applied Chemistry, Chinese Academy of Sciences in 2000, under Prof. Xianhong Wang and Prof. Fosong Wang. He was awarded his Ph.D. degree in 2004 from the Max-Planck Institute for Polymer Research (Germany) under Prof. Klaus Müllen. He held a postdoctoral position with Sir Fraser Stoddart at the University of California at Los Angeles from 2005 to 2007 and then joined the Department of Chemistry, National University of Singapore (NUS) as an Assistant Professor in 2007. He was promoted to Full Professor in 2017. His main research interests include novel π-conjugated systems and supramolecular chemistry. In recent years, his group has done intensive work into open-shell singlet diradicaloids, which can be used as next generation molecular materials for electronics, photonics, spintronics and quantum devices. He has received over 20 awards during his independent career, including the Singapore Young Scientist Award (2010), NUS Young Researcher Award (2012), and NRF Investigatorship (2019).

Xinggang Zhang (张新刚)
Prof. Xingang Zhang obtained his Ph.D. from Shanghai Institute of Organic Chemistry (SIOC), Chinese Academy of Sciences (CAS) in 2003. After his postdoctoral work at the University of Illinois at Urbana Champaign (USA), he joined the faculty team of SOIC as a Research Associate Professor in 2008, and became a Research Professor in 2012. His research mainly focuses on organofluorine chemistry and chemical biology. He received several awards for his work, including the National Science Fund for Distinguished Young Scholars (2014), the 2015 RSC Fluorine Chemistry Prize, and 2015 Fifth Chinese Chemical Society (CCS)-Royal Society of Chemistry (RSC) Young Chemist Award.

Q1: Who helped you the most as you pursued your research career?

Prof. Ma: Several people profoundly impacted me during the pursuit of my research career. My high school chemistry teacher Mr. Xueliang Zhou stimulated my keen interest in chemistry and suggested that I go to the College of Chemistry at Jilin University for my undergraduate studies. My undergraduate research supervisor, Prof. Feng-Shou Xiao, the Qiushi Distinguished Professor at Zhejiang University, guided me into chemistry research and prompted me to pursue graduate studies in the United States. My Ph.D. advisor, Prof. Hongcai Zhou, a Robert A. Welch Chair in Chemistry at Texas A&M University (USA), provided me with rigorous and vigorous training in synthetic inorganic and materials chemistry, which laid a solid foundation for my independent research career.

Prof. Wu: I was trained by several renowned scholars in China, Germany, and the USA. Professor Xianhong Wang and Professor Fosong Wang at the Changchun Institute of Applied Chemistry, CAS, introduced me to an interesting research area – the chemistry and materials of π-conjugated molecules – and gave me a lot of freedom to explore. I received solid training at the Max-Planck Institute for Polymer Research under the supervision

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Professor Klaus Müllen, who heavily influenced my career in different ways. Then, I joined Sir Fraser Stoddart's group, where I enjoyed learning a new research topic – mechanically interlocked molecules and molecular machines. I received a lot of encouragement from Fraser after I started my independent career in Singapore. The people who helped me most after I joined NUS as an Assistant Professor were my collaborators. Over the years, I have established many collaborations with international leading scientists in different areas, including Juan Casado, Kuo-Wei Huang, Dongho Kim, Jun Ding, David Casanova, María Díaz-García, and many others, and we have become good friends. I would like to give special acknowledgement to Prof. Atsuhiro Osuka at Kyoto University who gave me a lot of kind and generous support. He has inspired me in different ways and is my academic hero.

Prof. Zhang: My wife, for sure. I am very fortunate to have her in my life. She is a professor in bridge seismic research and understands that science needs time and concentration. So she has always been supportive of my career. During the past years, she has spent a lot of time taking care of our son and doing the housework, in addition to her own research work, so that I can concentrate on my research. I am also very thankful to my doctoral supervisor, Prof. Feng-Ling Qing, post-doctoral supervisor, Prof. Wilfred A. van der Donk, and my colleagues at SIOC, who have encouraged and helped me a lot with my research career.

Q2: What are some difficult challenges you have faced during your research career? How did you overcome them?

Prof. Ma: The most difficult challenge I have faced during my research career was how to establish a unique research program at the early stage of my independent career, which should be distinct from my Ph.D./postdoctoral research yet avoid potential competition with my Ph.D./postdoctoral supervisors, and could receive national/international recognition in the field through highly visible publications as well as sustainable external funding support. This challenge was overcome thorough pioneering several research directions and leading their development in the field, which was based upon my extensive literature reading, critical thinking, and creative advancement.

Prof. Wu: The biggest challenge for me is how to secure enough resources to conduct fundamental research. Nowadays, funding agencies in many countries put more resources to translational research, and there is very narrow space for basic research. I insisted doing my own research and eventually I developed a niche research area. Fortunately, NUS and Singapore recognized my research excellence, and I have received quite good research funding support thus far.

Prof. Zhang: I have faced challenge after challenge during my research career. At the beginning of my independent research career, to develop and produce innovative research that can make a difference is the most difficult. To overcome this challenge, I spent a lot of time reading books and papers, discussing related chemistry with my friends, and conducting experiments to test my hypotheses. However, figuring out a simple way that solves a big problem still remains a challenge to me.

Q3: Who is(are) scientist(s) you most respect or admire? Why?

Prof. Ma: My most admired scientist is Linus Carl Pauling because he not only established the foundation for modern chemistry but also made great contributions to the peace of humanity.

Prof. Wu: I enjoyed reading old literature, in particular, the papers and books written by some important figures of the area, such as Eric Clar, Franz Sondheimer, Heinz Staab, Fritz Vögtle, and others. It was always an enjoyable to communicate with these wise predecessors through their articles. They inspired me the way of doing excellent research. Of course, I also have highest regards for many outstanding scholars of our current community, such as Lawrence T. Scott, Atsuhiro Osuka, Rik Tykwinski, Harry L. Anderson, Takahashi Kubo, Kenichiro Itami, Hiroshi Shinokubo, in addition to all my supervisors.

Prof. Zhang: The scientists I most respect are the ones who devoted their whole life to our country. I should learn their attitude toward science.

Q4: What do you see as the biggest obstacles and most promising applications in your research area?

Prof. Ma: The biggest obstacle in our research area of advanced nanoporous materials lies in their scale-up with competitive cost for industrial applications. In my opinion, the most promising applications for advanced nanoporous materials will be gas storage/separation and environmental remediation.

Prof. Wu: It is difficult to identify all of the applications of our molecules. The most important thing is that we provide deep insight to fundamental structure-electronic property relationship, which is critical for any material application. For the open-shell diradicaloids we are studying, the most promising applications could be spintronics and quantum devices, which require synergetic research from different areas.

Prof. Zhang: The biggest obstacle in my research area is the gap between fundamental research and industrial needs. However, this gap will be narrowed after extensive efforts. In my opinion, the applications of fluorinated compounds in pharmaceuticals, agrochemicals, and advanced functional materials will be the most promising.

Q5: What advice do you have for younger students and researchers beginning their careers in chemistry, and in particular those interested in your field?

Prof. Ma: I have three words for younger students and researchers who want to establish a career in chemistry: passion, patience, and perseverance. Passion means you need to indeed love chemistry research and it is beyond just interest. Patience means you cannot rush on your research work and there is no short cut in research.

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Perseverance means you cannot give up when facing failures in research and obstacles on your career path. In addition, younger researchers beginning their careers in chemistry can adopt the research philosophy "problem oriented, hypothesis driven, and rational design" to establish their own unique research programs in the field.

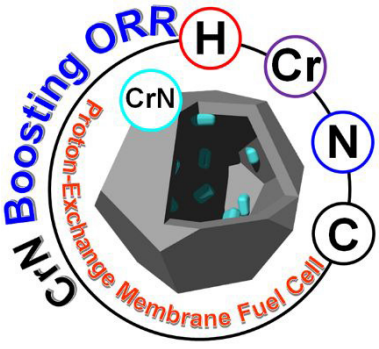
Prof. Wu: Do your own research! This is the advice given by Sir Fraser Stoddart, and I would like to say the same to young researchers. Also, do challenging research! It is more meaningful, and it will eventually lead you to high promotion.

Prof. Zhang: For younger students and researchers, they are more innovative and active, and they represent the future of China. When they begin careers in chemistry, it is important to do some unique, innovative, and useful chemistry.

Q6: Thank you for publishing your superb work in *CCS Chemistry*! Could you provide a brief summary of your article and current research direction in a few sentences?

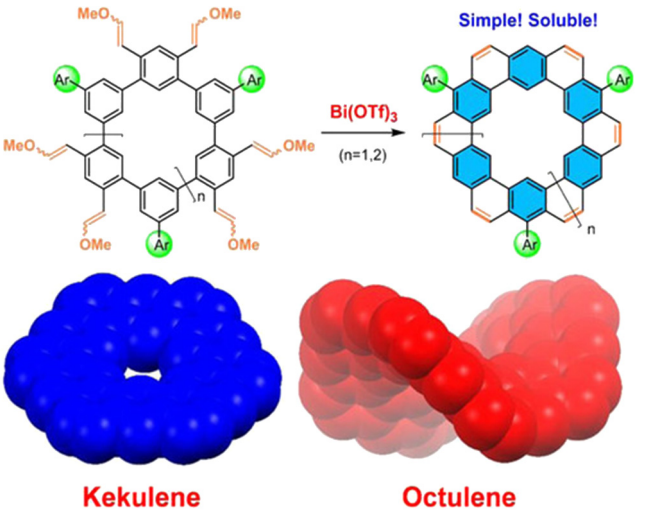
Prof. Ma: Our article in *CCS Chemistry* illustrated a new strategy to boost oxygen reduction reaction performance in PEMFC via the creation of synergies between atomically dispersed CrN_4 sites and chromium nitride nanoparticles using MOF as the precursor.

Learn more: Hui Yang, Xu Wang, Tao Zheng, Nelly Cantillo Cuello, Gabriel Goenaga, Thomas A. Zawodzinski, He Tian* (田鹤), Joshua T. Wright, Robert W. Meulenberg, Xiangke Wang* (王祥科), Zhenhai Xia, and Shengqian Ma* (马胜前). **CrN-Encapsulated Hollow Cr-N-C Capsules Boosting Oxygen Reduction Catalysis in PEMFC**. *CCS Chem.* 2021, 3, 208–218. Link: https://doi.org/10.31635/ccschem.020.202000645



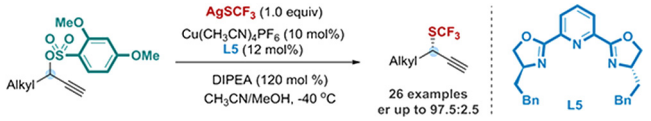
Prof. Wu: This piece of work deals with the challenging synthesis of cycloarenes, a type of polycyclic aromatic hydrocarbons with unique geometry and electronic structure. The first example of this family (kekulene) was reported in 1978, with tedious synthetic procedures. Over the years, there are still no efficient ways to synthesize such kind of molecules. In this work, we developed a facile synthetic method by using $Bi(OTf)_3$ catalyzed cyclization of vinyl ether and solved some long-standing problems. The method has been demonstrated very efficient for other expanded cycloarenes and carbon nanobelts in my group recently, and we will publish that work soon.

Learn more: Wei Fan, Yi Han, Shaoqiang Dong, Guangwu Li, Xuefeng Lu, and Jishan Wu* (吴继善). **Facile Synthesis of Aryl-Substituted Cycloarenes via Bismuth(III) Triflate-Catalyzed Cyclization of Vinyl Ethers**. *CCS Chem.* 2020, 2, 1445–1452. Link: https://doi.org/10.31635/ccschem.020.202000356



Prof. Zhang: In this article, we report a copper-catalyzed enantioselective nucleophilic trifluoromethylthiolation of secondary propargyl sulfonates with trifluoromethylthio silver, representing the first example of catalytic asymmetric nucleophilic trifluoromethylthiolation reaction. The reaction exhibits high efficiency, good enantioselectivity, high functional group tolerance, and broad substrate scope, paving a new way for the asymmetric synthesis of trifluoromethylthiolated compounds. My research mainly focuses on organofluorine chemistry, including inexpensive and bulk fluorine sources-oriented site-selective synthesis of fluorinated compounds via base metal catalysis, metal-difluorocarbene chemistry, and chemical biology in combination with organofluorine chemistry.

Learn more: Xing Gao, Yu-Lan Xiao, Shu Zhang, Jian Wu, and Xingang Zhang* (张新刚). **Copper-Catalyzed Enantioselective Trifluoromethylthiolation of Secondary Propargyl Sulfonates**. *CCS Chem.* 2020, 2, 1463–1471. Link: https://doi.org/10.31635/ccschem.020.202000353



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