



*Materials Science and Engineering*

## 2023 Annual Report

**Yun Hang Hu**

*Charles and Carroll McArthur Endowed Chair Professor*

The endowed professorship has provided a great support for my research, which created following achievements in 2023:

### ➤ Research highlights

In this year, our research was focused on fuel cells, solar energy, thermo-photocatalysis, and carbon nanomaterials, leading to 30 papers published in prestigious journals, 8 invited talks (including 8 keynotes) to international conferences, and 3 seminar talks (at Northwestern University, Argonne National Lab., and Wichita State University), such as:

- S. Fang, M. Rahaman, J. Bharti, E. Reisner, M. Robert, G. A. Ozin, **Y. H. Hu\***, “Photocatalytic CO<sub>2</sub> reduction”, *Nature Reviews Methods Primers* **3**, 61 (2023).
- L. Chang, S. Chen, Y. Fei, D. Stacchiola, **Y. H. Hu\***, “Superstructured NiMoO<sub>4</sub>@CoMoO<sub>4</sub> Core-Shell Nanofibers on Ni foam with Transition Layer for High-Performance Supercapacitors”, *Proc. Natl. Acad. Sci. USA* **120**, e2219950120 (2023).
- S. Fang, X. Lyu, T. Tong, A. L. Lim, T. Li, J. Bao, **Y. H. Hu\***, “Turning fallen leaves into a multifunctional magic material”, *Nat. Commun.* **14**, 1203 (2023).
- S. Chen, **Y. H. Hu\***, “Recycling of Plastic Wastes with Alkaline Earth Metal Oxides: A Review”, *Science of the Total Environment* **905**, 167251 (2023).
- S. Fang, X. Tong, D. Stacchiola, **Y. H. Hu\***, “Structural transition and chemical reactivity of atomic carbon chains”, *Chem. Commun.* **59**, 7383(2023).
- H. Su, **Y. H. Hu\***, “3D graphene for dye-sensitized solar cells and perovskite solar cells —feature article”, *Chem. Commun.* **59**, 6660-6673 (2023).
- Y. Fei, **Y. H. Hu\***, “Recent Progress in Removal of Heavy Metals from Wastewater”, *Chemosphere*, **335**, 139077 (2023).
- S. Fang, K. Sun, **Y. H. Hu\***, “Highly efficient thermo-photocatalytic degradation of tetracycline catalyzed by tungsten disulfide under visible light”, *Environ. Chem. Lett.* **21**, 1287(2023)
- W. Zhang, **Y. H. Hu\***, “Effects of CO and H<sub>2</sub>O on structure of LiNi<sub>0.8</sub>Co<sub>0.15</sub>Al<sub>0.05</sub>O<sub>2</sub> at high temperatures”, *Phys. Lett. A* **470**, 128774 (2023).
- S. Chen, S. Fang, **Y. H. Hu\***, “3D Meso/macroporous Carbon from MgO-templated Pyrolysis of Waste Plastic as an Efficient Electrode for Supercapacitors”, *Chemosphere*. **322**, 138174(2022).
- Y. Fei, T. Tong, J. Bao, **Y. H. Hu\***, “Graphene Nanoreactor for in situ Observation of Beam-induced NaH Decomposition under Transmission Electron Microscope”, *J. Phys. Chem. Lett.* **14**, 1 (2023).

### ➤ Highlights for National and International Honors and Awards

I was elected as a **Fellow** of the Canadian Academy of Engineering (CAE) and won the **Outstanding Science and Innovation Award** from Chinese Association for Science and Technology in the United States (CAST-USA) in 2023.