

Faculty Name:

Yuan Yang

Faculty Email:

yy2664@columbia.edu

Lab:

Yang lab

Project Title:

Anode-free lithium batteries with high energy density

Description:

Anode-free lithium metal battery uses a lithium-containing cathode (e.g. NCA, NCM) and a Cu foil as the current collector for the anode. Such design avoids the use of air-sensitive lithium anode and has a high energy density. This project targets to understand parameters that control lithium deposition/stripping and cell performance in such anode-free batteries, and develop new gel polymer electrolytes to enhance cycling performance. The objectives of this project include 1) Understanding parameters controlling lithium deposition properties and coulombic efficiency between Cu foil and electrolytes. 2) Improving the performance of anode-free batteries by interfacial modifications and electrolyte tuning. 3) Developing gel polymer electrolytes for anode-free lithium batteries.

The two master students will assist a postdoc working on this project and carry out research activities such as preparing electrolyte, cell testing, and data analysis. The two master students has started to work in my lab since Jan 1, 2024. They will learn basic skills of battery fabrication and analysis in Spring 2024, and carry out extensive research activities in the summer

Location of Research:

On Site

of hrs/week:

35

Department/Program:

Applied Physics and Applied Mathematics

Eligibility:

MS

To apply, please contact:

Yuan Yang

yy2664@columbia.edu