



Environmental Engineering & Sciences

Department of Civil and Environmental Engineering
CEE 595AG Seminar

Friday, March 24, 2023 | 10:00 – 10:50 a.m. CST | 3310 Newmark Lab

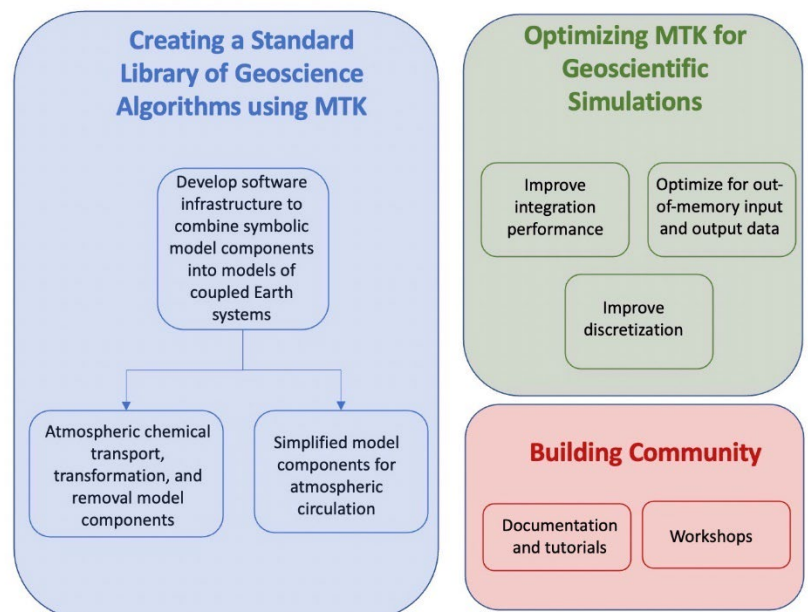
Development of the Symbolic Equation-Based Geoscientific Models

Presented by: Jialin Liu (Advisor Prof. Christopher Tessum)

Current model development focuses on tightly-coupled model components for numerical efficiency, requiring development by a close-knit team. Additionally, in order to develop performant large-scale models, developers are required knowledge of both physics and chemistry processes and extensive numerical methods for integrating differential equations.

These two factors are not conducive to model development. Future model development must be integrated across scientific disciplines, while model components must also be tightly coupled with each other. What is needed is a framework for model development that allows for a separation of concerns where scientific domain experts can focus on accurately and parsimoniously representing geoscientific phenomena, experts in numerical methods can focus on efficient, scalable integrators, etc.

To promote convergent research and facilitate the integration of geoscientific models across disciplines, we aim to create a robust “geoscience standard library” of symbolic equation-based model components. These components can be combined with each other to create large-scale models and further optimized using Modeling Toolkit to maximize computational efficiency for geoscience applications.



Jialin Liu | Advisor Prof. Christopher Tessum

Jialin Liu is a first-year PhD student from Prof. Christopher Tessum’s group. Her research focuses on the development of the symbolic equation-based atmospheric chemical models.