



ATOC COLLOQUIUM

Welcome!

Please join us for the next ATOC Colloquium on **Friday, Feb. 20** from **11:00 AM–12:00 PM**, which will be held in **SEEC S228** and simulcast over Zoom. This week's colloquium features **Dr. David Lawrence (NCAR CGD)**. Please join us for conversation beginning at 10:45 AM and stay for lunch afterwards.

The Future of Earth System Modeling and the Community Earth System Model

Earth System models, including the NSF NCAR Community Earth System Model (CESM), are foundational tools for earth system scientists. The present and future of Earth System modeling is being shaped by the urgent societal need for actionable information: credible projections of weather and climate impacts, assessments of the reliability of mitigation and intervention strategies, and robust characterization of risks associated with potential climate tipping points. To keep CESM at the leading edge of climate and Earth System modeling requires continuous development and evolution to respond to a rapidly changing scientific and technological landscape. The challenges and opportunities are myriad and include (1) seamless and skillful Earth system prediction across timescales, from subseasonal to seasonal to decadal to multi-decadal (~30-year) projections within a unified modeling framework; (2) high-resolution (~0.25°) and ultra-high-resolution (kilometer-scale) capabilities; and (3) emerging AI/ML approaches—including hybrid models and fast emulators—that offer transformative potential to improve physically-based models, accelerate experimentation, and enable new workflows. These opportunities coincide with rapidly changing computing architectures, driving the need for code modernization, performance portability, and differentiable model components. I will describe efforts across the CESM activity to deliver the future of CESM. As the scope of the CESM project becomes increasingly expansive and complex, the need to involve the broader community to advance CESM is more true now than ever.



Zoom: <https://cuboulder.zoom.us/j/4713174822>

Passcode: ATOC

About the ATOC Colloquium

The Department of Atmospheric and Oceanic Sciences (ATOC) Colloquium is typically held **every other Friday** from **11:00 AM–Noon**. Colloquia alternate between the following formats: (A) Full-length talk by a faculty member or invited speaker, (B) Three conference-length talks by graduate students. If you would like to nominate a speaker (including self), please email the ATOC Colloquium Committee Chair, Prof. Jianghanyang (Ben) Li (Jianghanyang.li@colorado.edu). Please visit www.colorado.edu/atoc/colloquium for further details.