



ATOC COLLOQUIUM

Welcome!

Please join us for the next ATOC Colloquium on **Friday, Mar. 27** from **11:00 AM–12:00 PM**, which will be held in **SEEC N224** and simulcast over Zoom. This week's colloquium features **Dr. Melanie Becker (Centre National de la Recherche Scientifique)**. Please join us for conversation beginning at 10:45 AM.

The hidden memory of sea level: How climate's past shapes our coastal Future

What if I told you that sea level rise is not just about warming and melting ice? It's also about the ocean's memory. This memory, called internal climate variability (ICV), is driven by complex, unpredictable interactions within our climate system. A well-known example is the El Niño/Southern Oscillation.

The problem? ICV introduces chaotic irreducible uncertainty in sea level projections that conventional models often overlook. While many focus solely on gradual rises from warming, ICV can generate long-term, trend-like spontaneous deviations that can significantly mask the trends induced by external forcing.

The solution? We need to rethink our approach to sea level rise. It's not a steady climb; it's a rollercoaster ride shaped by memory. By utilizing advanced climate models, we can capture the dynamics of ICV. As we analyze the future impact of ICV on sea level rise for coastal megacities worldwide, we discover that if ICV uncertainty reaches its upper limit, new hotspots will emerge in Southeast Asian megacities, the western tropical Pacific Islands, and the Western Indian Ocean. ICV could add an extra 20 to 40 cm, pushing sea levels beyond worst-case scenarios by 2100. For low-lying coastal cities, that could mean the difference between manageable flooding and catastrophic inundation.

The real question? It is no longer just how much the sea will rise, but how fast and where, and whether our current plans are ready to tackle this uncertainty. The better the ICV uncertainty is taken into account and correctly estimated, the more effective adaptation strategies can be developed with confidence for coastal regions.

Join us for this talk, to explore the complexities of sea level rise and discover their implications for the future of coastal cities.

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.