

UCLA Department of Physics & Astronomy

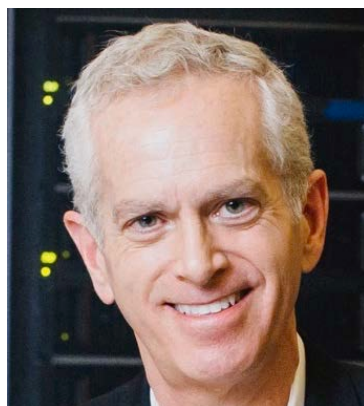
COLLOQUIUM

Thursday, April 17th at 4 p.m.

1-434 PAB

Examining Earth's fast radiative feedbacks using machine- learning-based emulators of the climate system

**William Collins
(LBL)**



The response of the climate system to increased greenhouse gases and other radiative perturbations is governed by a combination of fast and slow feedbacks. Slow feedbacks are typically activated in response to changes in ocean temperatures on decadal timescales and often manifest as changes in climatic state with no recent historical analogue. On the other hand, fast feedbacks can be activated in response to rapid atmospheric physical processes on timescales of weeks and are already operative in the present-day climate. This distinction implies that the physics of fast radiative feedbacks is present in the historical reanalyses that have served as the training data for many of the most successful recent machine-learning-based emulators of weather and climate. In addition, these feedbacks are functional under the historical boundary conditions pertaining to the top-of-atmosphere radiative balance and sea-surface temperatures. We discuss our work using historically trained weather emulators to characterize and quantify fast radiative feedbacks without the need to retrain for conditions pertinent to a future warmer climate.

Host: Seth Putterman

Refreshments at 3:30 p.m. on the PAB Patio. Undergraduates Welcome!