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## Department of Atmospheric Sciences Seminar Announcement

Department of Atmospheric Sciences, S.O.E.S.T., University of Hawai'i at Mānoa  
2525 Correa Road, HIG 350; Honolulu, HI 96822 ☎956-8775



# MidPleistocene Transition from Budyko's Energy Balance Model

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**Date:** Wednesday, October 24, 2018  
**Refreshments:** 3:00pm at MSB lanai  
Free Cookies, Coffee & Tea Provided  
(Please Bring Your Own Cup)  
**Seminar Time:** 3:30pm  
**Location:** Marine Sciences Building, MSB 100

### Abstract:

Energy Balance Models (EBMs) arguably are the simplest form of global climate models. They allow for a deeper mathematical analysis to complement the understanding gained from more complex models. In this talk, I will revisit the long-standing question of which dynamical processes are responsible for the Mid Pleistocene Transition (MPT) in light of a low-order, flip-flop model based on Budyko's EBM. Built upon this EBM is a system of three non-smooth ordinary differential equations (ODEs), which admits glacial cycles and has similar characteristics as the proxy records. Furthermore, it can be shown that when a critical bifurcation parameter of the system is linked to key characteristics of benthic  $^{18}\text{O}$  records, the model simulates a realistic MPT. Interestingly, the particular bifurcation parameter is one that controls the relationship between temperature and precipitation.