

**Special Seminar**

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**Visiting from the Senckenberg Institute, Frankfurt**

**The interaction of atmospheric circulation,  
precipitation, and mountain-building  
during the Cenozoic in Asia**

**Hosted by Jeff Collett**

**4 p.m. Monday, April 29  
ATS 101**

Modern climate in Asia is characterized by large-scale monsoonal circulation over India and southern China and vast, exceptionally arid deserts across much of Central Asia. This same area contains some of the highest mountains in the world, including the Himalayas and Tibetan Plateau, the Tian Shan, and the Altai. How and when this topography influenced climate over the Cenozoic Era (past 65 Myr) remains contentious. In this talk, I will use a large compilation of the stable isotopes of oxygen ( $\delta^{18}\text{O}$ )—derived from precipitation and as recorded in buried soil and lacustrine sediments—to explore the interaction between uplift, climate, and vegetation in Asia during the past 50 Ma. Oxygen isotopes in precipitation record the effects of large-scale atmospheric circulation, topography, and vegetation on moisture transport. Paleo-precipitation  $\delta^{18}\text{O}$  is largely invariant over the Cenozoic, indicating that large-scale atmospheric circulation over Asia has remained largely unchanged during the past 50 Myr, despite large changes in topography and in global climate. However, paleo-precipitation  $\delta^{18}\text{O}$  data from basins windward of the Tien Shan and Altai ranges show a significant, negative shift in the late Miocene (~8 Ma), coincident with hypothesized timing of uplift of these ranges, likely documenting the onset of orographic precipitation due to impingement of the mid-latitude westerly jet against this high topography. These results open the possibility of using large compilations of paleo-precipitation  $\delta^{18}\text{O}$  data to understand the controls on atmospheric circulation and moisture transport in warmer-than-modern past climates.