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## Department of Atmospheric Sciences Ph.D. Dissertation Announcement

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Ph.D. Dissertation Title:

# Modeling Orographic Precipitation Over The Island Of Oahu

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**Time: 9:00 AM**  
**Location: IPRC Conference Room, POST 414**

### Abstract:

A linear diagnostic upslope model named Hawaiian Orographic Precipitation (HOP) model has been developed to provide a high-resolution picture of the vertical motion and precipitation over the Island of Oahu. The HOP model shows the vertical motions can often exist near the surface that are on the order of  $10 \text{ m s}^{-1}$ , agreeing with direct observations along the Ko'olau Mountains. The HOP model vertical motion and Orographic Rainfall Index (ORI) are loosely correlated with precipitation during the month of February 2017, but the microphysics of the HOP model are not sufficient to produce a meaningful diagnosis of the actual precipitation during that time. The model performs well when the Froude Number is above 1, and is at its best when the precipitation is light and falls out over the mountain. The HOP model does not perform well in light wind and synoptically forced weather conditions.

The high-resolution terrain gradient from the HOP model is applied to the Weather Research and Forecasting (WRF) model in a new method for calculating the lowest level vertical motion. The new method produces a different vertical motion pattern, which affects the weather over the island. The skill of the model is improved during the 09 March 2012 storm by using the new method.