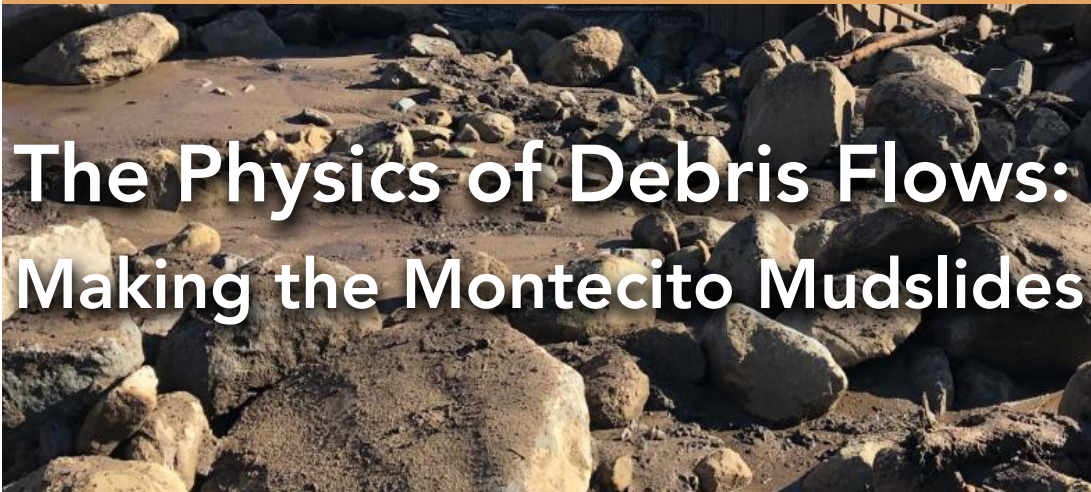




# FRIENDS OF THE KITP

## KAVLI INSTITUTE FOR THEORETICAL PHYSICS

# Chalk Talk



## The Physics of Debris Flows: Making the Montecito Mudslides

The scale of destruction resulting from the recent Montecito mudslides was historic, yet the landscape of the Santa Barbara region tells us that such 'debris flows' are common on geologic timescales. Numerical models are now capable of simulating some important aspects of debris flows; however, physics-based "predictions" of such flows remain elusive. In this talk I discuss what is known about the formation, growth and runout of the Montecito debris flows, and the frontier challenges in the physics of fluid-granular flows that limit predictability. The destructive capacity of these flows resulted from two combined effects: (1) soil on the burned hillsides "liquefied" under intense rain and sent high-concentration mudflows into the canyons; and (2) these dense mudflows moved downstream as a wave, that easily picked up boulders from the channels and concentrated them into a front. The mechanisms underlying these two effects are not well understood; however, emerging ideas from physics - including a current program at KITP - help to illuminate a path forward.

Wednesday, March 28, 2018

Kohn Hall, UCSB

5:30 Courtyard Reception

6:15 - 7:15 Presentation and Discussion

Attendance by Reservation Only

RSVP by Friday, March 23:

Online: <https://www.kitp.ucsb.edu/chalk-talk-rsvp>

Phone: (805) 893-6307 or [friends@kitp.ucsb.edu](mailto:friends@kitp.ucsb.edu)

Lot 10 parking

As you enter campus from Hwy 217, turn right onto Mesa Rd, merge into the left lane, and at the stop light turn left into Parking Structure 10. Park, buy a permit from the dispenser (near the elevator and stairs), and display the permit on your dashboard. The KITP is right next door to the parking structure.



**Douglas Jerolmack**

Professor, University of  
Pennsylvania

Douglas Jerolmack is a professor in the Departments of Earth and Environmental Science, and Mechanical Engineering and Applied Mechanics, at the University of Pennsylvania. He obtained his PhD in geophysics from MIT, and did postdoctoral work at the University of Minnesota. His research focuses on pattern formation at the interface of fluid and sediment, on Earth and planetary surfaces. His group uses laboratory experiments, combined with field work and theory, to elucidate the minimum number of ingredients that are required to explain geophysical flows and their contribution to forming landscapes. He has received young researcher awards from the American Geophysical Union and the British Society for Geomorphology.