MGS Luncheon

Thursday, April 14th

11:45am – 1:15pm (talk starts at 12:15pm)

Join us **in-person at the Northern in Billings** (Speaker will be remote on Zoom), or from the comfort of your home **via Zoom**

RSVP to montanageologicalsociety@gmail.com

If you want to join us at the Northern Hotel, RSVP by latest Friday April 8th!

If you prefer to join us on Zoom, RSVP by Wednesday April 13th to receive the Zoom link

---

SPEAKER: DR. HILARY MARTENS

UNIVERSITY OF MONTANA

Earthquakes in western Montana: Analysis of aftershocks following the 2017 M5.8 Lincoln event and crustal strain accommodation via bookshelf faulting

A M5.8 earthquake ruptured near Lincoln in July 2017 -- the largest earthquake to strike Montana in more than half a century. Since then, thousands of small- to medium-magnitude aftershocks have ruptured, shedding light on crustal structure and dynamics. Using data from a state-of-the-art seismic network deployed specifically to study the Lincoln aftershock sequence (University of Montana network), we refine hypocenter locations and analyze the mode of fault slip for hundreds of earthquakes over a four-year period. The data are supplemented by the Montana Regional Seismic Network and the Advanced National Seismic System. We show that the mainshock occurred on a left-lateral, N-S trending strike-slip fault, which is oblique to the main structural fabric of the Lewis & Clark Line (LCL). We identify several additional clusters of aftershocks that lie predominantly to the west of the mainshock and that also trend approximately N-S. The sequence of sub-parallel clusters that strike roughly perpendicular to the mapped faults of the LCL suggest strain accommodation via a bookshelf faulting mechanism, where distinct crustal blocks rotate clockwise about a vertical axis. We are also using the wealth of new seismic data to generate tomographic models of crust and upper-mantle velocity structure in western Montana.

Biography

Dr. Martens studies intraplate earthquake activity in western Montana and also investigates interactions between the solid Earth and its fluid envelopes using space geodesy. Dr. Martens received her PhD in Geophysics from the California Institute of Technology in 2016. She also holds master's degrees in Geophysics and Space Science from Cambridge University and University College London, respectively. Dr. Martens was born and raised in Missoula, Montana, and is an alumna of UM (Physics, Music, 2008), where she is now an Assistant Professor in the Department of Geosciences.