

MCS RCN - CIG - CSDMS Webinar Mini-Series on
**The Role of Computational Geoscience in the
Predictive Assessment of Plate Boundary Systems and Hazards**

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January 2021

Computational geoscience plays a fundamental role in understanding the multi-physics, multi-scale problems inherent in plate boundary systems. There are a range of challenges, from uncertainties about the fundamental governing relationships to the implementation of solution strategies on supercomputers.

SZ4D-MCS, CIG, and CSDMS team up for this webinar series, highlighting a group of outstanding speakers who will discuss two worked examples that illustrate some of the pathways of how high-performance computing can be used to make headway on challenging solid Earth problems. Each of our two webinar series includes three presentations, covering background and introduction, theoretical and computational challenges, and science insights, respectively. Each webinar consists of a 40 min presentation and 20 min for discussion.

We hope this format will serve to foster community-wide discussion about the science problems, and how computational geoscience can play a role in future science, education, and infrastructure-driven activities. The two series will be held January 12-14, 2021, on A) *Induced Seismicity and Fault System Dynamics*, and January 19-21, 2021, on B) *Surface Processes and Tectonics*, with details below.

You can register for [Series A](#) and [Series B](#). (You must register separately in order to attend both series.) For more information, or to join our mailing list, see <https://www.sz4dmcs.org/webinars>.

Series A) *Induced Seismicity and Fault system Dynamics* - [Register here](#)

1. **Jan. 12, 11am PST**, 8pm CET: James H. Dieterich (UCR), intro by Kayla A. Kroll (LLNL):
Induced Seismicity; A multidisciplinary issue spanning the energy sector
Convener: Thorsten Becker and Thomas Goebel
2. **Jan. 13, 11am PST**, 8pm CET: Joshua A. White and Kayla A. Kroll (LLNL)
Modeling Induced Seismicity in the HPC-era
Convener: Magali Billen and Thorsten Becker
3. **Jan. 14: 11am PST**, 8pm CET: Kayla A. Kroll and Joshua A. White (LLNL)
The Future of Induced Seismicity with Exascale Computing
Convener: Magali Billen and Thorsten Becker

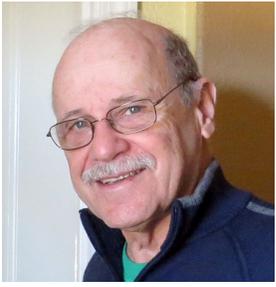
Series B) *Quantifying the Links Between Surface Processes and Tectonics* - [Register here](#)

1. **Jan. 19, 9am PST**, 6pm CET: Nicole Gasparini (Tulane) and Greg Tucker (CUB)
Cyberinfrastructure for modeling surface processes across scales
Convener: Alison Duvall and Mark Behn

2. **Jan. 20, 9am PST**, 6pm CET: Susanne Buiter (RWTH Aachen)
How coupled tectonics and surface processes shape extensional plate boundaries
 Convener: Leif Karlstrom
3. **Jan. 21, 9am PST**, 6pm CET: Katy Barnhart (USGS Landslide Hazards Program)
Testing surface process models with numerical experiments: examples from landscape evolution and debris-flow inundation
 Convener: Alison Duvall

Thank you,
 Gabriel Lotto
 SZ4D Modeling Collaboratory for Subduction RCN

Speaker bios:

	<p>Kayla A. Kroll (Lawrence Livermore National Laboratory)</p> <p>Dr. Kroll received her Ph.D. from UC Riverside in 2015 where she applied observational seismology and numerical simulation to understand earthquake nucleation and triggering, fault interaction, and induced seismicity. Kayla completed a postdoc and converted to Research Scientist at LLNL in 2018, where she focuses her efforts on understanding induced seismicity and developing mitigation methods related to energy applications. Kayla serves as the Deputy Group Leader of the Seismology Group and to serve on the LLNL management team for the DOE’s SMART Initiative for Carbon Storage.</p>
	<p>James Dietrich (University of California Riverside)</p> <p>Dr. Dietrich’s spent much of his career at the USGS where he focused on modeling of earthquake rupture dynamics, volcano deformation, development of an analytic model of earthquake rates, laboratory studies of fault friction, and the assessment of earthquake probabilities. He later took a position at UC Riverside, where he worked to develop the earthquake simulator code <i>RSQSim</i> for multi-event simulations of earthquakes in geometrically complex fault systems. Dietrich is currently a Distinguished Professor of the Graduate Division, Emeritus at UC Riverside.</p>
	<p>Joshua White (Lawrence Livermore National Laboratory)</p> <p>Joshua White is a research scientist at LLNL. His research focuses on integrating large-scale computing with geophysical monitoring to improve our understanding of complex geologic systems, with an emphasis on geologic carbon storage and induced seismicity. He is also the working group lead for the DOE National Risk Assessment Partnership. He received a B.S.E. in Civil and Environmental Engineering from Princeton, and a M.S. and Ph.D. in Civil and Environmental Engineering from Stanford, before joining LLNL in 2009.</p>



Nicole Gasparini (Tulane University)

Nicole M. Gasparini is an associate professor in the department of Earth and Environmental Sciences at Tulane University. She explores how landscapes evolve over different spatial and temporal scales and is a co-developer of *CHILD* and *Landlab*, widely used modeling tools. Her team uses field observations, landscape modeling, remote sensing and other data to explore questions that intersect hydrology, tectonics, and sedimentology, with geomorphology at the core.



Greg Tucker (University of Colorado at Boulder)

Greg Tucker is a Professor of Geological Sciences and a fellow of the Cooperative Institute for Research in Environmental Sciences (CIRES) at the University of Colorado at Boulder. His research focuses on computational and theoretical geomorphology, and geoscientific software. Since 2017 he has served as the Executive Director of the Community Surface Dynamics Modeling System (CSDMS).



Suzanne Buiter (RWTH Aachen University)

Dr. Buiter is a professor in Tectonics and Geodynamics at RWTH Aachen University in Germany. She teaches and researches deformation processes from outcrop to plate scale. Suzanne's tools are numerical finite-element and analogue (sandbox) techniques. Dr. Buiter worked for 16 years for the Geological Survey of Norway and was a postdoc in Halifax (Canada) and Bern (Switzerland) before that.



Katy Barnhard (USGS Landslide Hazards Program)

Katy Barnhart is a geomorphologist interested in using numerical models for prediction and hypothesis testing. Her work focuses on erosion and sedimentation hazards across the Earth's surface. She received her PhD in Geological Sciences from the University of Colorado Boulder. Her primary affiliation is with the Landslide Hazards Program of the U.S. Geological Survey, and she is also associated with the University of Arizona Department of Geosciences, and the Cooperative Institute for Research in Environmental Sciences at the University of Colorado Boulder.