

Stuart V. Schmitt, Ph. D.

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Summary

Geoscientist with excellent educational background, diverse knowledge base, and strong analytical ability. Highly adaptable to wide variety of analytical roles both within and beyond geoscience. Interacts effectively with coworkers of varied technical and personal backgrounds. Experienced in:

Geomechanics	Seismic processing	Induced seismicity
Inverse/optimization problems	Structural geology	Petroleum geology
Engineering mechanics	Electrical/electronic systems	Technical computing

Experience

Seismic processing geophysicist, DownUnder GeoSolutions June 2016–present

Works on a team that performs seismic imaging services for clients. Role includes time processing and depth imaging for both marine and land surveys.

- Implements seismic processing workflows with careful attention to detail and technical correctness.
- Writes scripts and C++ programs helpful in converting data and validating processing output. Helps the company avoid weeks of laborious transcription and manual quality control.
- Assists coworkers by developing creative methods to use available software to overcome technical obstacles and achieve desired results.

Geophysicist, Chevron Energy Technology Company, R&D Division Dec. 2014–Oct. 2015

Conducted work on strategic research and technology development projects that sought to integrate geomechanics, geophysics, and geology for the purpose of increasing exploration success and reducing operating risk.

- Provided insight and analysis on operating risks associated with induced seismicity.
- In a petroleum systems project, researched methods to improve modeling of thermal history for some basin types. Co-advised an intern project that yielded an improved workflow for those basins.
- Helped to deploy an internal technical development product that improves static reservoir model match to geophysical observations. Interfaced with geology and geophysics technical experts and was often instrumental in building interdisciplinary consensus.
- Completed courses in geophysical imaging, formation evaluation, and GoM geology as part of the corporation's early-career training program.

Ph.D. student, Stanford University, Geophysics Department 2006–2014

Researched frictional behavior of faults as slip nucleates and transitions into seismic rupture. Results provided further theoretical justification for a paradigm in which dynamic weakening occurs during earthquakes, but that faults have high frictional strength between earthquakes and are typically subjected to macroscopically weak stresses.

- Developed numerical models that couple elasticity and frictional sliding to shear heating, heat conduction, and pore fluid flow.
- Published two rigorously detailed research articles, with a third in preparation.
- Secured funding totaling \$82,000 in four successful research grant proposals.

Technician, PFS Corporation, Laboratory Division, Madison, WI 2006

Designed and fabricated instruments at a laboratory that tested strength and other properties of construction materials. Assisted management in developing market strategy for testing services.

- Designed and deployed innovative creep-testing apparatus that increased testing capacity more than tenfold, reduced cost per sample, and improved safety.
- Developed procedures and trained coworkers to quantify and report measurement uncertainty, resulting in PFS being first-in-industry to achieve accreditation for that service.

Experience (continued)

Graduate student, University of Wisconsin-Madison, Geoscience Department 2002–2005

Researched crustal deformation associated with subduction zone tectonics. Used a finite element model coupled with an inversion method to study a large earthquake using high-precision GPS. Conducted field campaigns to collect data.

- Published one research article about a significant earthquake that occurred during a field campaign.
- Engaged in field work beyond primary research, including an Antarctic marine geophysical survey.

Additional experience: Machinist, UW-Madison; Publications designer, Wisconsin Lottery

Education

Ph. D., Geophysics, Stanford University.

Dissertation title: *Thermal pressurization during earthquake nucleation and dynamic rupture.*
Advised by Paul Segall.

MS, Geophysics, University of Wisconsin-Madison.

Thesis title: *A geodetic study of the 22 January 2003 Tecomán, Colima, Mexico earthquake.*
Advised by Charles DeMets.

BA, Physics with minor in history, Lawrence University, Appleton, WI.

Publications

Schmitt, S. V., P. Segall, and E. M. Dunham (in preparation), Flash heating and thermal pressurization during the nucleation and dynamic rupture on weakly stressed faults, submission to *Journal of Geophysical Research* in 2017.

Schmitt, S. V., P. Segall, and E. M. Dunham (2015), Nucleation and dynamic rupture on weakly stressed faults sustained by thermal pressurization, *Journal of Geophysical Research Solid Earth* 120.

Schmitt, S. V., P. Segall, and T. Matsuzawa (2011) Shear heating-induced thermal pressurization during earthquake nucleation, *Journal of Geophysical Research* 116, B06308.

Schmitt, S. V., C. DeMets, J. Stock, O. Sánchez, B. Márquez-Azúa, G. Reyes (2007), A geodetic study of the 22 January 2003 Tecomán, Colima, Mexico earthquake, *Geophysical Journal International* 169.

Teaching experience

Stanford University Geophysics Department

- *Earthquakes and volcanoes*—introductory undergraduate course on the physics of earthquakes and volcanoes.
- *Predicting volcanic eruptions*—undergraduate discussion seminar on the science and policy surrounding volcanic hazards. Led classroom discussion and organized a field trip to Mt. St. Helens.
- *Crustal deformation and fault mechanics (parts 1 & 2)*—advanced graduate course on mechanical models of earthquake and volcano processes. Topics include dislocation models of faults, fracture mechanics, viscoelasticity, poroelasticity, fault friction, and earthquake cycle models.

UW-Madison Department of Geology and Geophysics

- *Introduction to applied geophysics*—senior/graduate level course in near-surface geophysics methods. Topics include gravity, magnetics, seismic surveys, resistivity, transient electromagnetics, and ground-penetrating radar.
- *Field methods in applied geophysics*—senior/graduate field course to accompany “Introduction to applied geophysics.”
- *The age of dinosaurs*—upper-level Internet course for non-majors about vertebrate paleontology of the Mesozoic.

Professional affiliations

Active member of SEG, GSH, AAPG, HGS, and AGU.