

Chris Marone

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Professional Preparation/Education

Binghamton University	Binghamton, NY	Geology	B.A.	1981
Columbia University	New York, NY	Geophysics	M.A.	1984
Columbia University	New York, NY	Geophysics	M. Phil.	1987
Columbia University	New York, NY	Geophysics	Ph.D.	1988

Appointments/Professional Affiliations

2020	<i>Assegno di Ricerca</i> (ERC Adv. TECTONIC), La Sapienza Università di Roma			
2003-	<i>Professor of Geophysics</i> , The Pennsylvania State University			
2014-2015	<i>Visiting Professor</i> , La Sapienza Università di Roma			
2009-2014	<i>Associate Head</i> , Dept. of Geosciences, The Pennsylvania State University			
2007-2008	<i>Visiting Fellow</i> , Istituto Nazionale di Geofisica e Vulcanologia, Roma			
2001-2003	<i>Assoc. Prof. of Geophysics</i> , The Pennsylvania State University			
1997-2000	<i>Assoc. Prof. of Geophysics</i> , Massachusetts Institute of Technology			
1992-1997	<i>Asst. Prof. of Geophysics</i> , Massachusetts Institute of Technology			
1991-1992	<i>Adjunct Asst. Prof.</i> , University of California at Berkeley			
1989-1990	<i>Research Fellow</i> , Melbourne Univ. and CSIRO Geomechanics, Australia			
1982-1988	<i>Research Assistant</i> , Lamont-Doherty Geological Obs. of Columbia University			
1981-1982	<i>Exploration Geophysicist</i> , Phelps Dodge Corp., Reston Va.			

Research Interests

Marone's recent research has focused on earthquake physics, friction, and geomechanics.

Recent themes have included: 1) slow earthquakes and the spectrum of tectonic fault slip behaviors, 2) rate-state friction mechanics, fault healing and the application of laboratory derived friction constitutive laws to faulting, 3) rock-fluid interaction, reservoir properties, and poromechanics of rock deformation, 4) the role of dynamic stressing in frictional instability, 5) granular mechanics and the effect of particle properties on friction and jamming, 6) the role of shear fabric and clay mineralogy on the frictional strength and constitutive properties of fault rocks, 7) the strength and rheology of fault rocks in nature, with particular focus on samples recovered in scientific drilling.

Honors and Awards

Louis Néel Medal of the European Geosciences Union
Fellow of the American Geophysical Union
American Geophysical Union Outstanding Reviewer
Paul F. Robertson Award for the Breakthrough of the Year, Pennsylvania State University
Research Achievement Award, Energy Institute, Pennsylvania State University
Outstanding Member of the Community, Awarded by PSU Fraternity and Sorority Chapters
Wilson Research Award, Pennsylvania State University
Kerr-McGee Career Development Professorship, MIT

Memberships

American Geophysical Union, Seismological Society of America, European Geoscience Union, Geological Society of America, American Physical Society

Graduate Student and Postdoctoral Advising

41 Graduate Students; 8 Post-Doctoral Scholars; 12 NSF Research Experiences for Undergraduates (REU) projects and undergraduate senior theses

Recent Publications (see more at scholar.google.com/citations?user=dQnMIVcAAAAJ)

1. Bolton, D. C., Shreedharan, S., Rivière, J., and C. Marone, C, Acoustic energy release during the laboratory seismic cycle: insights on laboratory earthquake precursors and prediction, *J. Geophys. Res. Solid Earth*, 125, 10.1029/2019JB018975, 2020.
2. Im, K., Saffer, D. M., Marone, C. and J. P. Avouac, Slip rate-dependent friction as a universal mechanism for slow slip events, *Nature Geosc.*, 10.1038/s41561-020-0627-9, 2020.
3. Kenigsberg, A. R., Rivière, J., Marone, C. and D. M. Saffer, Evolution of elastic and mechanical properties during fault shear: the roles of clay content, fabric development, and porosity. *J. Geophys. Res. Solid Earth*, 10.1029/2019JB018612, 2020.
4. Kenigsberg, A. R., Rivière, J., Marone, C. and D. M. Saffer, A method for determining absolute ultrasonic velocities and elastic properties of experimental shear zones, *Int. J. Rock Mech. and Min. Sci.*, 30,10.1016/j.ijrmms.2020.104306, 2020.
5. Manogharan P., Wood, C., Rivière, J., Elsworth, D. and Marone, C., Shokouhi, P., Elastodynamic nonlinear response of dry intact, fractured and saturated rock, American Rock Mechanics Association, ARMA 20-1673, 2020.
6. Miller, P. K., Marone, C., and D. M. Saffer., The role of deformation bands in dictating poromechanical properties of unconsolidated sand and sandstone, *Geochem. Geophys. Geosyst.*, 10.1029/2020GC009143, 2020.
7. Shokouhi, P., Jin, J., Manogharan, P., Wood, C., Rivière, J., Elsworth, D. and C. Marone, An experimental investigation of the coupling between elastodynamic and hydraulic properties of naturally fractured rock at the laboratory scale, American Rock Mechanics Association, ARMA 20-1519, 2020.
8. Shreedharan, S., Bolton, D. C., Rivière, J., and C. Marone, Preseismic fault creep and elastic wave amplitude precursors scale with lab earthquake magnitude for the continuum of tectonic failure modes, *Geophys. Res. Lett.*, 10.1029/2020GL086986, 2020.
9. Trugman, D., McBrearty, I. W., Bolton, D. C., Guyer, R. A., Marone, C., and P. A. Johnson, The spatio-temporal evolution of granular microslip precursors to laboratory earthquakes, *Geophys. Res. Lett.*, 10.1029/2020GL088404, 2020.
10. Veedu, D. M., Giorgetti, C., Scuderi, M. M., Barbot, S., Marone, C., and C. Collettini, Bifurcations at the stability transition of earthquake faulting, *Geophys. Res. Lett.*, 10.1029/2020GL087985, 2020.

Outreach and the Public (recent)

- a. Slow Earthquakes May Foretell Larger Events
<http://www.sciencedaily.com/releases/2013/08/130815145148.htm>
- b. Could We Someday Predict Earthquakes? [http://www.huffingtonpost.com/lab-notes/could-we-someday-predict-b_10578112.html?source=LANLToday&date=6 22 16](http://www.huffingtonpost.com/lab-notes/could-we-someday-predict-b_10578112.html?source=LANLToday&date=6%2022%2016)
- c. Seismic Slowdowns Could Warn of Impending Earthquakes
<http://www.smithsonianmag.com/science-nature/seismic-slowdowns-could-warn-impending-earthquakes-180960049/#MzX12VG2sr5p3r3m.99>
- d. ERC Adv. Grant TECTONIC: <https://cordis.europa.eu/project/id/835012>