

## 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.; M.Phil	1984; 1987
Columbia University	New York, NY	Geophysics	Ph.D.	1988

### Appointments/Professional Affiliations

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

### Research Interests

Earthquake physics, friction, and geomechanics. Recent themes have included: 1) slow earthquakes and the spectrum of tectonic fault slip behaviors, 2) application of machine learning to predict earthquakes and improve understanding of earthquake physics, 3) rate-state friction mechanics, fault healing and the application of laboratory derived friction constitutive laws to faulting, 4) rock-fluid interaction, reservoir properties, and poromechanics of rock deformation, 5) granular mechanics, 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.

### 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; 9 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](https://scholar.google.com/citations?user=dQnMIVcAAAAJ))

1. Bolton, D. C., Shreedharan, S., McLaskey, G. C., Rivière, J., Shokouhi, P., Trugman, D. T. and C. Marone, The high-frequency signature of slow and fast laboratory earthquakes, *J. Geophys. Res. Solid Earth*, 127, 10.1029/2022JB024170, 2022.
2. Shreedharan, S., Ikari, M., Wood, C., Saffer, D., Wallace L. and C. Marone Frictional and lithological controls on shallow slow slip at the northern hikurangi margin, *Geochem. Geophys. Geosyst.*, 10.1029/2021GC0101072022, 2022.
3. Volpe, G., Pozzi, G., Carminati, E. Barchi, M. R., Scuderi, M. M., Tinti, E., Aldega, L., Marone, C. and C. Collettini, Frictional controls on the seismogenic zone: insights from the Apenninic basement, Central Italy, *Earth and Plan. Sci. Lett.*, 583 117444, 10.1016/j.epsl.2022.117444, 2022.
4. Johnson, P.A., Rouet-Leduc, B., Pyrak-Nolte, L.J., Berozac, G.C., Marone, C., Hulbert, C., Howard, A., Singer, P., Gordeev, D., Karaflos, D., Levinson, C.J., Pfeiffer, P., Puk, K. M, and W. Reade, Laboratory earthquake forecasting: a machine learning competition, *Proc. Natl. Acad. Sci.*, 2021.
5. Shreedharan, S., Bolton, D. C., Rivière, J., and C. Marone, Competition between preslip and deviatoric stress modulates precursors for laboratory earthquakes, *Earth and Plan. Sci. Lett.*, 553, 10.1016/j.epsl.2020.116623, 2021.

## Outreach and the Public (recent)

- a. Freethink: Will We Ever Predict Earthquakes?  
<https://www.youtube.com/watch?v=S31ecvkijy8&feature=youtu.be>  
8 mins. Penn State part starts at about 2 min.
- b. Network Entertainment. The Age of AI  
<https://www.youtube.com/watch?v=0wy4u34fi4&vl=en>  
Episode 7 of Robert Downey Jr.'s New A.I. Documentary Series  
The lab earthquake spot starts at about 26 min.
- c. Machine Learning Predicts Labquakes from the Earthquake Machine  
<https://eos.org/features/machine-fault>
- d. Slow Earthquakes May Foretell Larger Events  
<http://www.sciencedaily.com/releases/2013/08/130815145148.htm>
- e. 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_22_16)
- f. Seismic Slowdowns Could Warn of Impending Earthquakes  
<http://www.smithsonianmag.com/science-nature/seismic-slowdowns-could-warn-impending-earthquakes-180960049/#MzX12VG2sr5p3r3m.99>
- g. ERC Adv. Grant TECTONIC: <https://cordis.europa.eu/project/id/835012>