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## Education

A.B., with honors, Geology & Geophysics, Princeton University, 1996

Ph.D., Geophysics, Massachusetts Institute of Technology, 2002

## Publications

### Papers

Marone, C., Cocco, M., Richardson, E., and E. Tinti, The critical slip distance for seismic and aseismic fault zones of finite width, In: *Fault-zone Properties and Earthquake Rupture Dynamics*, edited by E. Fukuyama, International Geophysics Series, 94, 135-162, Elsevier., 2009.

Richardson, E. and C. Marone, What triggers tremor? *Science*, **319**, 166-167, doi:10.1126/science.115287, 2008.

Marone, C. and Richardson, E., Do Earthquakes Rupture Piece by Piece or All Together?, *Science*, **313**, 1748-1749, 2006.

Richardson, E., A.A. Nyblade, W.R. Walter, and A.J. Rodgers, Source characteristics of mining-induced seismicity from moment-tensor analysis and spatio-temporal relationships, in *Controlling Seismic Risk*, edited by Y. Potvin and M. Hudyma, 123-129, Australian Centre for Geomechanics: Perth, 2005.

Richardson, E., A.A. Nyblade, W.R. Walter, and A.J. Rogers, Seismic source characterization and energy partitioning from in-mine and regional broadband data in South Africa, *Proceedings of the 26th Seismic Research Review on Nuclear Explosion Monitoring*, Orlando, FL, 2004.

Richardson, E., A.A. Nyblade, W.R. Walter, and A.J. Rogers, Seismic source characterization and energy partitioning from in-mine and regional broadband data in South Africa, *Proceedings of the 25th Seismic Research Review on Nuclear Explosion Monitoring*, Tucson, AZ, 445-449, 2003.

Richardson, E. and T.H. Jordan, Low-frequency properties of intermediate focus earthquakes, *Bull. Seismol. Soc. Am.*, **92**, 2434-2448, 2002.

Richardson, E. and T.H. Jordan, Seismicity in deep gold mines of South Africa: Implications for tectonic earthquakes, *Bull. Seismol. Soc. Am.*, **92**, 1766-1782, 2002.

Richardson, E. and T.H. Jordan, Some properties of gold-mine seismicity and implications for tectonic earthquakes, in *Rockbursts and Seismicity in Mines—RaSIM5*, edited by G. van Aswegen, R.J. Durrheim, and W.D. Ortlepp, 149-156, South African Institute of Mining and Metallurgy: Johannesburg, 2001.

Sleep, N.H., E. Richardson, and C. Marone, Physics of friction and strain rate localization in synthetic fault gouge, *J. Geophys. Res.*, **105**, 25,875-25,890, 2000.

Richardson, E. and C. Marone, Effects of normal stress vibrations on frictional healing, *J. Geophys. Res.*, **104**, 28,859-28,878, 1999.

### Abstracts at conferences

M. Ge, E. Richardson, C. Marone, D. Elsworth, “A Large Block Test to Study the Energetic Failure of Rock Application to Rock-Bursting and Earthquake Mechanics (abstract) DUSEL (Deep Underground Science and Engineering Laboratory) NSF S-1 workshop, 2004.

Richardson, E. Modes of Rupture and Fault Maturation Processes in South African Gold Mines, (invited poster) Fall AGU, 2004.

Richardson, E., A.A. Nyblade, W.R. Walter, and A.J. Rodgers, Seismic source characterization and energy partitioning from in-mine and regional broadband data in South Africa, (poster) 26th Seismic Research Review on Nuclear Explosion Monitoring, 2004.

Richardson, E. “Source Characteristics of Mining-Induced Seismicity from Moment Tensor Analysis and Spatio-Temporal Relationships, (talk) Spring AGU, 2004.

Richardson, E., A.A. Nyblade, W.R. Walter, and A.J. Rodgers, Seismic source characterization and energy partitioning from in-mine and regional broadband data in South Africa, (poster) *Proceedings of the 25th Seismic Research Review on Nuclear Explosion Monitoring*, Tucson, AZ, 2003.

Richardson, E. and T.H. Jordan, Observations of apparent stress and repeating behavior in mining-induced seismicity (invited talk), Seismological Society of America, Eastern Section meeting, 2003.

Richardson, E. and T.H. Jordan, Apparent stress scaling relations for mining-induced seismicity (talk), *EOS Trans. AGU*, **83**, F1025, 2002.

Jordan, T.H., M. Boettcher, and E. Richardson, Earthquake scaling relations (talk), *EOS Trans. AGU*, **83**, F9, 2002.

Richardson, E. and T.H. Jordan, Some properties of gold-mine seismicity and implications for tectonic earthquakes (talk), 5th International Symposium on Rockbursts and Seismicity in Mines, South Africa, 2001.

Richardson, E. and T.H. Jordan, Implications of gold-mine seismicity for tectonic earthquakes: Predictions of scaling and rupture using a rate- and state-friction model (talk), *EOS Trans. AGU*, **81**, F1229, 2000.

Jordan, T.H., and E. Richardson, Implications of gold-mine seismicity for tectonic earthquakes: Predictions using a rate- and state-friction model (talk), 10th ISS International Seminar, Stellenbosch, South Africa, 2000.

Richardson, E. and T.H. Jordan, A physical model for bimodal seismicity in deep gold mines: Predictions for the critical earthquake (talk), 10th ISS International Seminar, Stellenbosch, South Africa, 2000.

Jordan, T.H. and E. Richardson, Some properties of gold-mine seismicity and implications for tectonic earthquakes (poster), SSA 2000.

Richardson, E., T.H. Jordan, and D. Amidzic, Properties of induced seismicity in the Far West Rand mining district, South Africa (talk), *EOS Trans. AGU*, **80**, F756, 1999.

Richardson, E. and C. Marone, Effects of normal stress vibrations on frictional healing: Experimental data and constitutive modeling (talk), *EOS Trans. AGU*, **79**, F640, 1998.

Richardson, E. and C. Marone, Effects of normal force vibrations on frictional healing (talk), *EOS Trans. AGU*, **79**, S224, 1998.

Richardson, E., J.J. McGuire, and T.H. Jordan, Low-frequency properties of intermediate-focus earthquakes (talk), *EOS Trans. AGU*, **78**, F449, 1997.

Richardson, E., J.J. McGuire, and T.H. Jordan, Low-frequency characteristics of intermediate-focus earthquakes (poster), 9th Annual IRIS Workshop, 1997.

Nolet, G., E. Richardson, and K. Lindenberg, Global travel times from cross-correlation (poster), *EOS Trans. AGU*, **76**, F384, 1995.

## **Work experience**

2008-present : Lead Faculty Member, M.Ed. in Earth Sciences program, Penn State

2003-present: Assistant professor of geosciences, Penn State

2002-2003: Research scientist, Penn State

1996-2002: Research assistant, MIT

## **Research interests**

Earthquake processes, including nucleation, stress-triggering, rupture mechanics; Fault dynamics and structures; Rock deformation.