Meredith Nettles
Curriculum Vitae

Lamont-Doherty Earth Observatory
Columbia University
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Education

Harvard University, Department of Earth and Planetary Sciences, Ph.D. (Geophysics), 2005
University of Arizona, Department of Geosciences, M.S. (Geosciences), 2000
Harvard and Radcliffe Colleges, A.B. (Government), Cum Laude in General Studies, 1995

Professional Experience

Columbia University, Department of Earth and Environmental Sciences
- Professor, 2019–
- Associate Professor, 2012–2019
- Assistant Professor, 2007–2012

Lamont-Doherty Earth Observatory of Columbia University
- Post-Doctoral Research Scientist, 2005–2007

Harvard University, Department of Earth and Planetary Sciences
- Graduate Research Fellow, 2000–2005
- Research Assistant, 1995–1997

University of Arizona, Department of Geosciences
- Graduate Research Assistant, 1997–2000

Selected Service to the Earth Science Community

NSF Advisory Committee for Office of Polar Programs, Fall 2018–present; Chair, Fall 2021–
NSF Search Committee for Assistant Director for Geosciences, 2020
NSF Antarctic Sciences Section, Committee of Visitors, 2013
Incorporated Research Institutions for Seismology (IRIS)
- Greenland Ice Sheet Monitoring Network (GLISN) Science Advisory Committee, chair, 2009–
- Global Seismographic Network Standing Committee, member, 2010–2012; chair, 2014–2016
- IRIS/UNAVCO Polar Networks Science Committee, 2008–2014
- Search Committee for IRIS President, 2013–14
- Nominating Committee (for Board of Directors and Chairman), 2010
- Data Management System Standing Committee, 2007–2009

Greenland Ice-Sheet Monitoring Network (GLISN) International Steering Committee, 2009–
USGS Powell Center Working Group for Earthquake Monitoring, 2018–
NASA Panel for review of Dragonfly geophone selection, 2020–21
NASA Research Review Panel, 2011

Honors

IRIS/SSA Distinguished Lecturer, 2014
DEES Undergraduate Student Committee Best Faculty Teaching Award, 2013, 2021
Cornell University Earth and Atmospheric Sciences Department Emerging Scholars Lecturer, 2005
NSF Graduate Student Fellowship, 1998 – 2001
Phi Beta Kappa, 1995
NASA Group Achievement Award (to ROSAT Mission Operations Team), 1994

Research Interests

Earthquake source studies, including glaciogenic seismicity and other unusual seismic sources, and systematic analysis of global seismicity; Geodetic and seismic constraints on glacier dynamics; Development and applications of GPS receiver hardware for high-risk environments; Interactions between the solid Earth and its fluid envelope; Mantle tomography.

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Publications

Stevens, L. A., M. Nettles, J. L. Davis, T. T. Creyts, J. Kingslake, I. J. Hewitt, and A. Stubblefield, Tidewater-glacier response to supraglacial lake drainage, *Nat. Commun.*, *13*, 6065, doi: 10.1038/s41467-022-33763-2, 2022.

Eddy, C. L., G. Ekström, and M. Nettles, Three-dimensional seismic anisotropy in the Pacific upper mantle from inversion of a surface-wave dispersion data set, *Geophys. J. Int.*, *231*, 355–383, doi:10.1093/gji/ggac194, 2022.

Stevens, L. A., M. Nettles, J. L. Davis, T. T. Creyts, J. Kingslake, A. P. Ahlstrøm, and T. B. Larsen, Helheim Glacier diurnal velocity fluctuations driven by surface melt forcing, *J. Glaciol.*, *68*, 77–89, doi:10.1017/jog.2021.74, 2022.

Olsen, K. G., M. Nettles, L. M. Cathles, J. C. Burton, T. Murray, and T. D. James, Improved estimation of glacial-earthquake size through new modeling of the seismic source, *J. Geophys. Res.*, *126*, e2021JF006384, doi:10.1029/2021JF006384, 2021.

Sohn, D.-H., K.-D. Park, J. L. Davis, M. Nettles, and P. Elosegui, Rapid ionospheric variations at high latitudes: Focusing on Greenland, *Adv. Space Res.*, *65*, 1673–1684, doi:10.1016/j.asr.2020.01.022, 2020.

Olsen, K. G., and M. Nettles, Constraints on terminus dynamics at Greenland glaciers from small glacial earthquakes, *J. Geophys. Res.*, *124*, 1899–1918, doi:10.1029/2019JF005054, 2019.

Howe, M., G. Ekström, and M. Nettles, Improving relative earthquake locations using surface-wave source corrections, *Geophys. J. Int.*, *219*, 297–312, doi:10.1093/gji/ggz291, 2019.

Gaherty, J. B., W. Zheng, D. J. Shillington, M. E. Pritchard, S. T. Henderson, P. R. N. Chindandali, H. Mdala, A. Shuler, N. Lindsey, S. J. Oliva, S. Nooner, C. A. Scholz, D. Schaff, G. Ekström, and M. Nettles, Faulting processes during early-stage rifting: seismic and geodetic analysis of the 2009–2010 Northern Malawi earthquake sequence, *Geophys. J. Int.*, *217*, 1767–1782, 10.1093/gji/ggz119, 2019.

Eddy, C. L., G. Ekström, M. Nettles, and J. B. Gaherty, Age dependence and anisotropy of surface-wave phase velocities in the Pacific, *Geophys. J. Int.*, *216*, 640–658, doi:10.1093/gji/ggy438, 2019.

Okal, E. A., N. Saloor, S. H. Kirby, and M. Nettles, An implosive component to the source of the deep Sea of Okhotsk earthquake of 24 May 2013: Evidence from radial modes and CMT inversion, *Phys. Earth Planet. Inter.*, *281*, 68–78, doi:10.1016/j.pepi.2018.04.007, 2018.

Ekström, G., and M. Nettles, Observations of seismometer calibration and orientation at USArray stations, 2006–2015, *Bull. Seismol. Soc. Am.*, *108*, 2008–2021, doi:10.1785/0120170380, 2018.

Olsen, K. G., and M. Nettles, Patterns in glacial-earthquake activity around Greenland, 2011–13, *J. Glaciol.*, *63*, 1077–1089, doi:10.1017/jog.2017.78, 2017.

Veitch, S. A., and M. Nettles, Assessment of glacial-earthquake source parameters, *J. Glaciol.*, *63*, 867–876, doi:10.1017/jog.2017.52, 2017.

McCarthy, C., H. Savage, and M. Nettles, Temperature dependence of ice-on-rock friction at realistic glacier conditions, *Phil. Trans. R. Soc. A*, *375*, 20150348, doi:10.1098/rsta.2015.0348, 2017.

Murray, T., M. Nettles, N. Selmes, L. M. Cathles, J. C. Burton, T. D. James, S. Edwards, I. Martin, T. O'Farrell, R. Aspey, I. Rutt, and T. Baugé, Reverse glacier motion during iceberg calving and the cause of glacial earthquakes, *Science*, *349*, 305–308, doi:10.1126/science.aab0460, 2015.

Murray, T., N. Selmes, T. D. James, S. Edwards, I. Martin, T. O'Farrell, R. Aspey, I. Rutt, M. Nettles, and T. Baugé, Dynamics of glacier calving at the ungrounded margin of Helheim Glacier, southeast Greenland, *J. Geophys. Res.*, *120*, doi:10.1002/2015JF003531, 2015.

Ferriss, E., T. Plank, D. Walker, and M. Nettles, The whole-block approach to measuring hydrogen diffusivity in nominally anhydrous minerals, *Am. Mineralogist*, *100*, 837–851, doi:10.2138/am-2015-4947, 2015.

Ekström, G. and M. Nettles, Long-period moment-tensor inversion: the Global CMT Project, 13 pp., in *Encyclopedia of Earthquake Engineering*, eds. M. Beer, I. A. Kougioumtzoglou, E. Patelli, and I. S.-K. Au, Springer-Verlag Berlin Heidelberg, doi:10.1007/978-3-642-36197-5_291-1, 2014.

Davis, J. L., J. de Juan, M. Nettles, P. Elosegui, and M. L. Andersen, Evidence for non-tidal diurnal velocity variations of Helheim Glacier, East Greenland, *J. Glaciol.*, *60*, 1169–1180, 10.3189/2014JoG13J230, 2014.

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Publications

Foster, A., M. Nettles, and G. Ekström, Overtone interference in array-based Love-wave phase measurements, *Bull. Seismol. Soc. Am.*, *104*, 2266–2277, 10.1785/0120140100, 2014.

Steblov, G. M., G. Ekström, M. G. Kogan, J. T. Freymueller, N. N. Titkov, N. F. Vasilenko, M. Nettles, Y. V. Gabsatarov, A. S. Prytkov, D. I. Frolov, and M. N. Kondratyev, First geodetic observations of a deep earthquake: The 2013 Sea of Okhotsk M_W 8.3, 611 km-deep, event, *Geophys. Res. Lett.*, *41*, 3826–3832, 10.1002/2014GL060003, 2014.

Foster, A., G. Ekström, and M. Nettles, Surface wave phase velocities of the western United States from a two-station method, *Geophys. J. Int.*, *196*, 1189–1206, 10.1093/gji/ggt454, 2014.

Clinton, J. F., M. Nettles, F. Walter, K. Anderson, T. Dahl-Jensen, D. Giardini, A. Govoni, W. Hanka, S. Lasocki, W. S. Lee, D. McCormack, S. Mykkeltveit, E. Stutzmann, and S. Tsuboi, Seismic network in Greenland monitors Earth and ice system, *Eos Trans. AGU*, *95*, , 13–14, 2014.

Shuler, A., G. Ekström, and M. Nettles, Physical mechanisms for vertical-CLVD earthquakes at active volcanoes, *J. Geophys. Res.*, *118*, 1569–1586, 10.1002/jgrb.50131, 2013.

Shuler, A., M. Nettles, and G. Ekström, Global observation of vertical-CLVD earthquakes at active volcanoes, *J. Geophys. Res.*, *118*, 138–164, 10.1029/2012JB009721, 2013.

Veitch, S. A., and M. Nettles, Spatial and temporal variations in Greenland glacial-earthquake activity, 1993–2010, *J. Geophys. Res.*, *117*, F04007, 10.1029/2012JF002412, 2012.

Shuler, A., and M. Nettles, Earthquake source parameters for the 2010 Western Gulf of Aden rifting episode, *Geophys. J. Int.*, *190*, 1111-1122, 10.1111/j.1365-246X.2012.05529.x, 2012.

Ekström, G., M. Nettles and A. M. Dziewoński, The global CMT project 2004–2010: Centroid-moment tensors for 13,017 earthquakes, *Phys. Earth Planet. Inter.*, *200–201*, 1–9, 10.1016/j.pepi.2012.04.002, 2012.

Nettles, M., G. Ekström, and H. C. Koss, Centroid-moment-tensor analysis of the 2011 off the Pacific coast of Tohoku earthquake and its larger foreshocks and aftershocks, *Earth Planets Space*, *63*, 519–523, 2011.

Nettles, M., and A. M. Dziewoński, Effect of higher-mode interference on measurements and models of fundamental-mode surface-wave dispersion, *Bull. Seismol. Soc. Am.*, *101*, 2270–2280, 10.1785/0120110019, 2011.

Andersen, M. L., M. Nettles, P. Elosegui, T. B. Larsen, G. S. Hamilton, and L. A. Stearns, Quantitative estimates of velocity sensitivity to surface melt variations at a large Greenland outlet glacier, *J. Glaciol.*, *57*, 609–620, 10.3189/002214311797409785, 2011.

Andersen, M. L., T. B. Larsen, M. Nettles, P. Elosegui, D. van As, G. S. Hamilton, L. A. Stearns, J. L. Davis, A. P. Ahlstrøm, J. de Juan, G. Ekström, L. Stenseng, S. A. Khan, R. Forsberg, and D. Dahl-Jensen, Spatial and temporal melt variability at Helheim Glacier, East Greenland, and its effect on ice dynamics, *J. Geophys. Res.*, *115*, F04041, 10.1029/2010JF001760, 2010.

Nettles, M., and V. Hjörleifsdóttir, Earthquake source parameters for the 2010 January Haiti main shock and aftershock sequence, *Geophys. J. Int.*, *183*, 375–380, 10.1111/j.1365-246X.2010.04732.x, 2010.

de Juan, J., P. Elósegui, M. Nettles, T. B. Larsen, J. L. Davis, G. S. Hamilton, L. A. Stearns, M. L. Andersen, G. Ekström, A. P. Ahlstrøm, L. Stenseng, S. A. Khan, and R. Forsberg, Sudden increase in tidal response linked to calving and acceleration at a large Greenland outlet glacier, *Geophys. Res. Lett.*, *37*, L12501, 10.1029/2010GL043289, 2010.

Nettles, M., and G. Ekström, Glacial earthquakes in Greenland and Antarctica, *Ann. Rev. Earth Plan. Sci.*, *38*, 467–491, 10.1146/annurev-earth-040809-152414, 2010.

Nettles, M., T. B. Larsen, P. Elósegui, G. S. Hamilton, L. A. Stearns, A. P. Ahlstrøm, J. L. Davis, M. L. Andersen, J. de Juan, S. A. Khan, L. Stenseng, G. Ekström, and R. Forsberg, Step-wise changes in glacier flow speed coincide with calving and glacial earthquakes at Helheim Glacier, Greenland, *Geophys. Res. Lett.*, *35*, L24503, 10.1029/2008GL036127, 2008.

Nettles, M., and A. M. Dziewoński, Radially anisotropic shear-velocity structure of the upper mantle beneath North America, *J. Geophys. Res.*, *113*, B02303, 10.1029/2006JB004819, 2008.

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Publications

Joughin, I., I. Howat, R. B. Alley, G. Ekström, M. Fahnestock, T. Moon, M. Nettles, M. Truffer, and V. C. Tsai, Ice-front variation and tidewater behavior on Helheim and Kangerdlugssuaq Glaciers, Greenland, *J. Geophys. Res.*, *113*, 10.1029/2007JF000837, 2008.

Ekström, G., M. Nettles, and V. C. Tsai, Seasonality and increasing frequency of Greenland glacial earthquakes, *Science*, *311*, 1756–1758, 2006.

Ekström, G., C. A. Dalton, and M. Nettles, Observations of time-dependent errors in long-period instrument gain at global seismic stations, *Seismol. Res. Lett.*, *77*, 12–22, 2006.

Lay, T., H. Kanamori, C. J. Ammon, M. Nettles, S. N. Ward, R. C. Aster, S. L. Beck, S. L. Bilek, M. R. Brudzinski, R. Butler, H. R. DeShon, G. Ekström, K. Satake, and S. Sipkin, Response to Comment on "The great Sumatra-Andaman earthquake of 26 December 2004", *Science*, *310*, 5753, 2005.

Tsai, V. C., M. Nettles, G. Ekström, and A. M. Dziewonski, Multiple CMT source analysis of the 2004 Sumatra earthquake, *Geophys. Res. Lett.*, *32*, 10.1029/2005GL023813, 2005.

Lay, T., H. Kanamori, C. J. Ammon, M. Nettles, S. N. Ward, R. C. Aster, S. L. Beck, S. L. Bilek, M. R. Brudzinski, R. Butler, H. R. DeShon, G. Ekström, K. Satake, and S. Sipkin, The great Sumatra-Andaman earthquake of 26 December 2004, *Science*, *308*, 1127–1133, 2005.

Ekström, G., A. M. Dziewoński, N. N. Maternovskaya, and M. Nettles, Global seismicity of 2003: centroid-moment tensor solutions for 1087 earthquakes, *Phys. Earth Planet. Inter.*, *148*, 327–351, 2005.

Ekström, G., A. M. Dziewoński, N. N. Maternovskaya, and M. Nettles, Global seismicity of 2002: centroid-moment tensor solutions for 1034 earthquakes, *Phys. Earth Planet. Inter.*, *148*, 303–326, 2005.

Nettles, M., and G. Ekström, Long-period source characteristics of the 1975 Kalapana, Hawaii, earthquake, *Bull. Seismol. Soc. Am.*, *94*, 422–429, 2004.

Wolfe, C. J., P. G. Okubo, G. Ekström, M. Nettles, and P. M. Shearer, Characteristics of deep ($\geq$13 km) Hawaiian earthquakes and Hawaiian earthquakes west of $155.55°$W, *Geochem. Geophys. Geosyst.*, *5*, Q04006, 10.1029/2003GC000618, 2004.

Ekström, G., M. Nettles, and G. A. Abers, Glacial earthquakes, *Science*, *302*, 622–624, 2003.

Ekström, G., A. M. Dziewoński, N. N. Maternovskaya, and M. Nettles, Global seismicity of 2001: centroid-moment tensor solutions for 961 earthquakes, *Phys. Earth Planet. Inter.*, *136*, 165–185, 2003.

Allen, R. M., G. Nolet, W. J. Morgan, K. Vogfjord, M. Nettles, G. Ekström, B. H. Bergsson, P. Erlendsson, G. R. Foulger, S. Jakobsdottir, B. R. Julian, M. Pritchard, S. Ragnarsson, and R. Stefansson, Plume driven plumbing and crustal formation in Iceland, *J. Geophys. Res.*, *107*, 10.1029/2001JB000584, 2002.

Chen, P. F., M. Nettles, E. A. Okal, and G. Ekström, Centroid moment tensor solutions for intermediate-depth earthquakes of the WWSSN-HGLP era, *Phys. Earth Planet. Inter.*, *124*, 1–7, 2001.

Von Herzen, R., C. Ruppel, P. Molnar, M. Nettles, S. Nagihara, and G. Ekström, A constraint on the shear stress at the Pacific-Australian plate boundary from heat flow and seismicity at the Kermadec forearc, *J. Geophys. Res.*, *106*, 6817–6833, 2001.

Nettles, M., T. C. Wallace and S. L. Beck, The March 25, 1998 Antarctic plate earthquake, *Geophys. Res. Lett.*, *26*, 2097–2100, 1999.

Nettles, M. and G. Ekström, Faulting mechanism of anomalous earthquakes near Bárdarbunga Volcano, Iceland, *J. Geophys. Res.*, *103*, 17,973–17,983, 1998.

Ekström, G. and M. Nettles, Calibration of the HGLP seismograph network and centroid-moment tensor analysis of significant earthquakes of 1976, *Phys. Earth Planet. Inter.*, *101*, 219–243, 1997.

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Publications

Book Chapters and Extended Abstracts

Kanao, M., S. Tsuboi, R. Butler, K. Anderson, T. Dahl-Jensen., T. Larsen, M. Nettles, P. Voss, D. Childs, J. Clinton, E. Stutzmann, T. Himeno, G. Toyokuni, S. Tanaka, and Y. Tono, Greenland Ice Sheet dynamics and glacial earthquake activities, in J. Müller and L. Koch, eds., *Ice Sheets: Dynamics, Formation and Environmental Concerns*, Nova Science Publishers, Hauppauge, NY, pp. 93–120, 2012.

Sykes, L. R., and M. Nettles, Dealing with hard-to-identify seismic events globally and those near nuclear test sites, *International Scientific Studies Conference*, Comprehensive Nuclear-Test-Ban Treaty Organization Preparatory Commission, paper no. SEISMO-26/J, 2009.

Nettles, M., Analysis of the February 10, 2006, Gulf of Mexico earthquake from global and regional seismic data, *Offshore Technology Conference*, paper no. 19099, 2007.

Dziewonski, A. M., G. Ekström and M. Nettles, Harvard centroid-moment tensor solutions 1976-96: Significance of the non-double couple component, in *Rockbursts and Seismicity in Mines*, edited by S. J. Gibowicz and S. Lasocki, pp. 3–16, A. A. Balkema, Brookfield, Vt., 1997.