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Nationalité actuelle : Etats-unis

FONCTIONS ACTUELLES

Scientifique en Chef, Programme de Geodynamique, Geophysique, et Geodesie Espace, SGT, Greenbelt, MD,
1986-present. Situe dans le laboratoire geodynamique planetaire, Goddard Space Flight Center, NASA, Greenbelt,
MD, USA

FONCTIONS PASSÉES

Professeur invité, (1ère classe), ISTerre Laboratoire de Geodynamo, Université de Joseph Fourier, Grenoble,
France, 2012

Professeur invité, Global Center of Excellence (COE) program, Tohoku University, Sendai, Japan, Printemps,
2011

Professeur invité, (1ère classe), Laboratoire de Planetologie et Geodynamique, Université de Nantes, été 2005,
2008 ; Scientifique en visite, 2010, 2011

Scientifique en visite, GeoForschung Zentrum, Potsdam, Germany, 2005, 2006, 2007

Professeur invité (2e classe), Institut de Physique du Globe de Paris, Laboratoire de geomagnetisme, Paris, France.
été 2000, 2001.

Scientifique en visite, Geological Survey of Japan, Tsukuba and Kyoto, Japan, 1997.

Géologue principal, Phoenix Corp, McLean, Virginia, USA 1984-1985

Géophysicien, U.S. Geological Survey, Flagstaff, Arizona, USA Sept. 1976- 1981.

TITRES UNIVERSITAIRES

Ph.D., Géologie, Université de Princeton, Princeton, New Jersey, USA, 1980-1984

M.A., Géologie, Université de Princeton, Princeton, New Jersey, USA, 1980-1982

M.S., Sciences Planétaires, Institut Californien de Technologie, Pasadena, Californie, USA, 1975-1976

B.S., Géophysique, Institut Californien de Technologie, Pasadena, Californie, USA, 1971-1976

THÈMES DE RECHERCHES

Champs aimantés du monde et planètes(http://geodynamics.gsfc.nasa.gov/personal_pages/purucker/purucker.html)

ACTIVITÉS PROFESSIONNELLES

Jurys de thèses : Nasfica Grammatica (2000, Université de Bretagne Occidentale), Benoit Langlais (2001, IPGP),
Jon Turner (2003, Université de Sydney, Australie), Yoann Quesnel (2006, Université de Nantes) ;

Encadrement de thèse : Cathrine Fox Maule (Université de Copenhague, Danemark, 2002-2005); Ruth Carley
(Université d'Edimbourg, depuis 2006)

HDF : Erwan Thébaud (IPG-Paris), 2014

Encadrement de stage d'études : Sebastien Catz (2007, École Polytechnique, Paris); Christine DeLong (2003),
Daniel Peterson (2004), Ethan Schaler (2006-2007), Joseph Nicholas (2006-2008), Chris Bodine (2008) stages
d'été;

Scientifique Associé, Mercury Messenger, 2007-2015.

CoProposant de Swarm (mission ESA, sélectionnée pour lancement en 2013);

CoProposant de The Great Escape (Mars Scout, 2011, vers Mars, Phase A);

CoProposant de MEMOIRE (sur Dyanmo/Premier, 2002, vers Mars);

CoProposant de MIME (sur BepiColombo / Mercury Planetary Orbiter, 2012, vers Mercure);

CoProposant de Ørsted (1999), CHAMP (2000) et SACC (2000), satellites mesurant le champ magnétique de la Terre;

Organisateur ou coorganisateur de 7 sessions scientifiques dans des assemblées internationales (First Swarm International Science Meeting, IUGG, AGU...);

PUBLICATIONS

Purucker, M.E., Head, J.W., and Wilson, L., 2012, Magnetic signature of the lunar South Pole-Aitken Basin: Character, origin, and age, *J. Geophys. Res-Planets*, 117, E05001, doi:10.1029/2011JE003922

Winslow, R.M., Johnson, C.L., Anderson, B.J., Korth, H., Slavin, J.A., Purucker, M.E., and Solomon, S.C., 2012, Observations of Mercury's northern cusp region with MESSENGER's magnetometer, *Geophys. Res. Lett.*, in press

Korth, H., Anderson, B.J., Raines, J.M., Slavin, J.A., Zurbuchen, T.H., Johnson, C.L., Purucker, M.E., Winslow, R.M., Solomon, S.C. and McNutt, R.L., 2011, Plasma pressure in Mercury's equatorial magnetosphere derived from MESSENGER magnetometer observations, *Geophys. Res. Lett.*, 38, L22201, doi: 10.1029/2011GL049451.

Anderson, B.J., Johnson, C.L., Korth, H., Purucker, M., Winslow, R.M., Slavin, J.A., Solomon, S.C., McNutt, R.L., Raines, J.M., Zurbuchen, T.H., 2011, The global magnetic field of Mercury from MESSENGER orbital observations, *Science*, 333, 1859-1862

Purucker, M.E. and Clark, D.A., 2011, Interpretation and mapping of the lithospheric magnetic field, (Mandea, M. and Korte, M., eds), in *Geomagnetic Observations and models*, IAGA Special Sopron book series 5, Springer, pp 311-338.

Purucker, M. E., and J. B. Nicholas, 2010, Global spherical harmonic models of the internal magnetic field of the Moon based on sequential and coestimation approaches, *J. Geophys. Res.*, 115, E12007, doi:10.1029/2010JE003650.

Thebault, E., Purucker, M., Whaler, K.A., Langlais, B., and Sabaka, T.J., 2010, The magnetic field of the Earth's lithosphere, *Space Science Reviews*, 155:95-127, DOI 10.1007/s11214-010-9667-6.

Blewett, D. T., E. I. Coman, B. R. Hawke, J. J. Gillis-Davis, M. E. Purucker, and C. G. Hughes, 2011, Lunar swirls: Examining crustal magnetic anomalies and space weathering trends, *J. Geophys. Res.*, 116, E02002, doi:10.1029/2010JE003656.

Lillis, R., Purucker, M., Halekas, J., Louzada, K., Stewart, S., Manga, M., and Frey, H., 2010, Study of impact demagnetization at Mars using Monte Carlo modeling and multiple altitude data, *J. Geophys. Res.* 115, E07007, 22 PP. 2010 doi:10.1029/2009JE003556

Pankine, A., Zhanqing, L. Parsons, D., Purucker, M., Weinstock, E., Wiscombe, W., and Nock, K., 2009, Stratospheric satellites for Earth observations, *Bull. Am. Met. Soc.*, v. 90, August, 2009, doi: 10.1175/2009BAMS2624.1

Friis-Christensen, E., Luehr, H., Hulot, G., Haagmans, R., and Purucker, M., 2009, Geomagnetic Research from Space, *EOS*, 2009, 90, 25, 213-214.

Anderson, B.J., Acuna, M.H., Korth, H., Slavin, J.A., Uno, H., Johnson, C., Purucker, M., Solomon, S.C., Raines, J. M., Zurbuchen, T.H., Gloeckler, G. and McNutt, R.L., Jr., 2010, The Magnetic Field of Mercury, *Space Science Reviews*, 152:307-339, DOI 10.1007/s11214-009-9544-3

Langlais, B., Lesur, V., Purucker, M.E., Connerney, J.E.P., and Manda, M., 2009, Crustal magnetic field of terrestrial planets, *Space Science Reviews*, doi:10.1007/s11214-009-9557-y, 27 pp.

Rajaram, M., Anand, S.P., Hemant, K., and M.E. Purucker, 2009, Curie isotherm map of Indian subcontinent from satellite and aeromagnetic data, *Earth and Planetary Science Letters*, 281, 147-158.

Purucker, M.E., Sabaka, T.J., Solomon, S.C., Anderson, B.J., Korth, H., Zuber, M.T., and Neumann, G.A., 2009, Mercury's internal magnetic field: Constraints on large- and small-scale fields of crustal origin, *Earth and Planetary Science Letters*, 285, 340-346, doi:10.1016/j.epsl.2008.12.017.

Anderson, B.J., Acuna, M.H., Korth, H., Purucker, M.E., Johnson, C.L., Slavin, J.A., Solomon, S.C., McNutt, R.L., 2008, The structure of Mercury's magnetic field from MESSENGER's first flyby, *Science*, v. 321, pp. 82-84, 4 July 2008

Purucker, M., T. Sabaka, G. Le, J.A. Slavin, R.J. Strangeway, and C. Busby, 2007, Magnetic field gradients from the ST-5 constellation : Improving magnetic and thermal models of the lithosphere, *Geophys. Res. Lett.* 34, L24306, doi : 10.1029/2007GL031739.

Purucker, M.,E., 2007, Magnetic Anomaly Map of the World, *EOS Trans. AGU*, 88 (25), 263.

Carte Mondiale des Anomalies Magnétique, Echelle 1 / 50 000 000, UNESCO, Paris, 2007

Purucker, M., and Whaler, K., 2007, Crustal Magnetism, Chapter 6, Volume 5: Geomagnetism, M. Kono (ed.), Elsevier, *Treatise on Geophysics*, 195-237

Nicholas, J. B., M. E. Purucker, and T. J. Sabaka, 2007, Age spot or youthful marking: Origin of Reiner Gamma, *Geophys. Res. Lett.*, 34, L02205, doi:10.1029/2006GL027794.

Langlais, B., and Purucker, M., 2007, A polar magnetic paleopole associated with Apollinaris Patera, Mars, *Planetary and Space Science*, 55(3), 270-279

Purucker, M., Lithospheric magnetic fields: Accomplishments of the Decade of Geopotential Research, *ESA Publication WPP-261*, 4 pages, 2006

Purucker, M., A new global magnetization model: validation and science results, *ESA Publication WPP-261*, 4 pages, 2006

Le, G., Slavin, J.A., Wang, Y., Strangeway, R.J., Sabaka, T., and Purucker, M., The ST-5 magnetic field constellation: First results, *ESA Publication WPP-261*, 4 pages, 2006

Olsen, N, R Haagmans, T J. Sabaka, A Kuvshinov, S Maus, M Purucker, M Rother, V Lesur, and M Manda, The Swarm End-to-End mission simulator study: A demonstration of separating the various contributions to Earth's magnetic field using synthetic data, *Earth, Planets and Space*, 58(4), 359-370, 2006

Maus, S, Luhr, H., and Purucker, M., Simulation of the high degree lithospheric field recovery for the Swarm constellation of satellites, *Earth, Planets and Space*, 58(4), 397-407, 2006

Manda, M., and M. Purucker, Observing, Modeling, and Interpreting Magnetic Fields of the Solid Earth, *Surveys in Geophysics*, <http://dx.doi.org/10.1007/s10712-005-3857-x>, 2005

Fox Maule, C., Purucker, M., Olsen, N., and K. Mosegaard, Heat flux anomalies in Antarctica revealed by satellite magnetic data, *Science (and Science Express)*, 309, 464-467, July 15, 2005 and (June 9, 2005).

Whaler, K. and Purucker, M., A spatially continuous magnetization model for Mars, *J. Geophys. Res.*, Vol. 110, No. E9, E09001, <http://dx.doi.org/10.1029/2004JE002393>, 02 September 2005

Purucker, M. and Ishihara, T., Magnetic images of the Sumatran region crust, EOS, Transactions of the American Geophysical Union, 86 (10), 8 March 2005, 101-102.

Chassefiere, E., ..., Purucker, M, and 43 co-authors, DYNAMO: A Mars upper atmosphere package for investigating solar wind interaction and escape processes, and mapping Martian fields, Advances in Space Research, 33, 2228-2235, 2004.

Fox Maule, C., Purucker, M., and Olsen, N., Magnetic crustal thickness in Greenland from CHAMP and Oersted data, in Earth Observation with CHAMP: Results from Three Years in Orbit, (Reigber, C., et al., eds), 255-261, published Sept 21,2004.

'Long-wavelength anomalies', 'Magsat', and 'R.A. Langel' entries in Encyclopedia of Geomagnetism and Paleomagnetism, Gubbins, D., and Herrero-Bervera, E. (eds), in press

Sabaka, T., Olsen, N., and Purucker, M., Extending Comprehensive Models of the Earth's Magnetic Field with Oersted and CHAMP data, Geophys. J. Int.,159, 521-547, Nov. 2004, <http://dx.doi.org/10.1111/j.1365-246X.2004.02421.x>

Langlais, B., Purucker, M., and Manda, M., Crustal magnetic field of Mars, Jour. Geophys. Res- Planets, 109(E2), E02008, doi:10.1029/2003JE002048, 2004.

Whaler, K., and Purucker, M., Martian magnetization-preliminary models, The Leading Edge, 22(8), 763-765, August, 2003.

Vennerstrom, S., Olsen, N., Purucker, M., Acuna, M.H. and Cain, J.C., The magnetic field in the pile-up region at Mars, and its variation with the solar wind, Geophy. Res. Lett., 30(7), 1369, doi: 10.1029/2003GL016883, 2003.

Stauning, P., Luhr, H., Ulte-Guerard, P., LaBrecque, J., Purucker, M., Primdahl, F., Jorgensen, J.L., Christiansen, F., Hoeg, P. Lauritsen, K.B. (editors). OIST-4 Proceedings, 4th Oersted International Science Team Conference, 2003, DMI Scientific Report 03-09, Copenhagen, 370 pp.

Purucker, M., Sabaka, T., Olsen, N., and Maus, S., How have Oersted, CHAMP, and SAC-C improved our knowledge of the oceanic regions, OIST-4 Proceedings, 2003, 89-95.

Purucker, M. and Olsen, N., Modeling of the Earth's magnetic field and its variation with Oersted, CHAMP, and Oersted-2/SAC-C, OIST-4 Proceedings, 2003, 319-327.

Purucker, M., McCreddie, H., Vennerstrom, S., Hulot, G., Olsen, N., Luehr, H., and Garnero, E., Highlights from AGU's Virtual Session on New Magnetic Field Satellites, EOS, v. 83, no. 34, p.368, August 20, 2002 (with associated CD-ROM).

Purucker, M. and N. Olsen, Improving the definition of cratonic boundaries utilizing the lithospheric magnetic field derived from CHAMP Observations, in 'First CHAMP Mission Results for Gravity, Magnetic, and Atmospheric Studies', Reigber et al (eds), Springer, 2003, 275-280.

Ravat, D. and M. Purucker, Unraveling the magnetic mystery of the Earth's lithosphere: The background and role of the CHAMP Mission, in 'First CHAMP Mission Results for Gravity, Magnetic, and Atmospheric Studies', Reigber et al (eds), Springer, 251-260, 2003

Purucker, M., Langlais, B., Olsen, N., Hulot, G., Manda, M., The southern edge of cratonic North America: Evidence from new satellite magnetometer observations, Geophys.Res.Lett., 29(15),8000, doi:10.1029/2001GL013645,2002
[part of a special issue on results from the Oersted satellite. Plate 3 from this paper is the cover of a special Orsted issue on August 1, 2002 (Issue #15).]

Voorhies, C.V., Sabaka, T.J., and Purucker, M., On magnetic spectra of Earth and Mars, Journal of Geophysical Research-Planets, 107(E6), 5034, doi:10.1029/2001JE001534, 2002.

Ravat, D., Whaler, K., Pilkington, M., Sabaka, T., and Purucker, M., Compatibility of high-altitude aeromagnetic and satellite altitude magnetic anomalies over Canada, Geophysics, 67, 546-554, March-April, 2002

Chassefiere, E., .. Purucker, M., and 67 other authors, Scientific Objectives of the Dynamo Mission, Adv. Space Research, 27, 1851-1860, 2001.

Lowe, D.A.J., Parker, R.L., Purucker, M.E., and Constable, C.G., Estimating the crustal power spectrum from vector Magsat data, Journal of Geophysical Research, v.106, 8589-8598, May 10, 2001.

Chassefiere, E., and 68 co-authors, Scientific objectives of the DYNAMO mission, Advances in Space Research, 27, 1851-1860, 2001.

Golynsky, A., M. Chiappini, d. Damaske, F. Ferraccioli, J. Ferris, C. Finn, M. Ghidella, T. Isihara, A. Johnson, H.R. Kim, L. Kovacs, J. LaBrecque, V. Masolov, Y. Nogi, M. Purucker, P. Taylor, M. Torta, 2001, "ADMAP – Magnetic Anomaly Map of the Antarctic," 1:10 000 000 scale map, in Morris, P., and R. von Frese, eds., BAS (Misc.) 10, Cambridge, British Antarctic Survey.

Luhmann, J., Acuna, M., Purucker, M., Russell, C., and D. Lyon, The Martian magnetosheath: How Venus like?, Planetary and Space Science, 50, 489-502, 2002.

Olsen, N., Holme, R., Hulot, G., Sabaka, T., Neubert, T., Toffner-Clausen, L., Primdahl, F., Jorgensen, J., Leger, J-M., Barraclough, D., Bloxham, J., Cain, J., Constable, C., Golovkvov, V., Jackson, A., Kotze, P., Langlais, B., Macmillan, S., Manda, M., Merayo, J., Newitt, L., Purucker, M., Risbo, T., Stampe, M., Thomson, A., and Voorhies, C., Orsted Initial Field Model, Geophysical Research Letters, v. 27, 3607-3610, Nov. 15, 2000.

Purucker, M. and Dyment, J. Satellite magnetic anomalies related to seafloor spreading in the South Atlantic Ocean, Geophysical Research Letters, v. 27, 2765-2768, Sept. 1, 2000.

Purucker, M., Ravat, D., Frey, H., Voorhies, C., Sabaka, T., and Acuna, M., An altitude-normalized magnetic map of Mars and its interpretation, Geophys. Res. Lett., v. 27, 2449-2452, Aug. 15, 2000.

Purucker, M. and Clark, D. Exploration Geophysics on Mars: Lessons from magnetics, in The Leading Edge, pp. 484-487, May 2000.

Taylor, P., and M. Purucker, Robert A. Langel III (1937-2000), EOS, v. 81, no. 15, p. 159, April 11, 2000.

Purucker, M., Von Frese, R. and Taylor, P., Mapping and interpretation of satellite magnetic anomalies from POGO data over the Antarctic region, Annali di Geofisica, v. 42, p.215-228, April, 1999.

Ravat, D., and M. Purucker, The future of satellite magnetic anomaly studies is bright, The Leading Edge, March, 1999, p. 326-329

Purucker, M., R. Langel, M. Rajaram, and C. Raymond, Global magnetization models with a priori information, Journal of Geophysical Research, v.103, 2563-2584, 1998.

Purucker, M., T. Sabaka, R. Langel, and N. Olsen, The missing dimension in Magsat and POGO anomaly studies, Geophysical Research Letters, v. 24, p.2909-2912, 1997

Purucker, M., T. Sabaka, and R. Langel, Conjugate Gradient Analysis: A New Tool For Studying Satellite Magnetic Data Sets, Geophysical Research Letters, v. 23, p.507-510, March 1, 1996 .

Ravat, D., R. Langel, M. Purucker, J. Arkani-Hamed, and D. Alsdorf, Global vector and scalar Magsat magnetic anomaly maps, Journal of Geophysical Research, 100, 2011-20136, 1995

Arkani-Hamed, J., Langel, R., and M. Purucker, Scalar Magnetic Anomaly Maps of Earth derived from Pogo and Magsat Data, Journal of Geophysical Research, 99, 24075-24090, 1994.

Langel, R., M. Purucker, and M. Rajaram, The Equatorial Electrojet and Associated Currents as Seen in Magsat Data, Jour. Atm. Terr. Physics, V.55, p.1233-1269, 1993 .

Purucker, M., The Computation of Vector Magnetic Anomalies: A Comparison of Techniques and Errors, Physics of the Earth and Planetary Interiors, V. 62, p. 231-245, 1990.

Purucker, M., Petrologic, paleomagnetic, and structural evidence of a Paleozoic rift system in Oklahoma, New Mexico, Colorado, and Utah, Discussion, Geol. Soc. Amer. Bull., v. 100, p.1846-1847, 1988.

Purucker, M., Interpretation of an Aeromagnetic Survey along the Wichita Frontal Fault Zone, Oklahoma Geological Survey Guidebook 23, p. 129-136, 1986.

Van Houten, F., and M. Purucker, Glauconitic Peloids and Chamositic Ooloids—Favorable Factors, Constraints, and Problems, Earth Science Reviews, vol. 20, p. 211 - 250, 1984

Purucker, M., Time of Formation of Soft Iron Ore on the Gunflint and Mesabi Ranges (Ontario, Canada and Minnesota, U.S.), Economic Geology, vol. 78, p. 502-506, 1983.

Oolitic Ironstones and Banded Iron Formation: Controls on Chemical Sedimentation, Ph.D. thesis, Princeton University, 1983.

Purucker, M., D. Elston, and S. Bressler, Magnetic Stratigraphy of Late Cenozoic Glaciogenic Sediments, Taylor Valley, Transantarctic Mountains, AGU Antarctic Research Series, vol. 33, p.109 - 140, 1981

Purucker, M., Elston, D., and E.M. Shoemaker, Early Acquisition of Characteristic Magnetization In Red Beds of the Moenkopi Formation (Triassic), Gray Mountain, Arizona, Journal of Geophysical Research, vol. 85, p. 997 - 1012, 1980.

Elston, D., and M. Purucker, Detrital magnetization in red beds of the Moenkopi Formation (Triassic), Gray Mountain, Arizona, Journal of Geophysical Research, vol. 84, p.1653-1665, 1979.

RÉCOMPENSES

Green Prize for "Outstanding Ability and Achievement in the Field of Creative Scholarship," Institut Californien de Technologie, Pasadena, Californie, USA, 1976

NASA Public Service Group Achievement Award for Comprehensive modeling. 2009

NASA Group Achievement Award to MESSENGER Mission team, 2008