

Francis Nimmo

Department of Earth and Planetary Sciences, University of California Santa Cruz, Santa Cruz CA 95064

Tel. 1-831-459-1783 Fax. 1-831-459-3074 fnimmo@ucsc.edu <http://es.ucsc.edu/~fnimmo>

RESEARCH INTERESTS

Origin and evolution of solid body surfaces and interiors from observations and geophysical modelling.

RESEARCH ACHIEVEMENTS

- Used gravity and topography to probe the internal structures of Titan, Rhea and Enceladus
- Proposed reorientation to explain the locations of the hot spot on Enceladus and Sputnik Planitia on Pluto
- Proposed a link between plate tectonics and the presence/absence of a dynamo on Mars, Venus and the Earth

EMPLOYMENT

2011- Professor, UCSC
2007-2011 Associate Professor, UCSC
2005-2007 Assistant Professor, UCSC
2002-2005 Adjunct Assistant Professor, UCLA
2001-2004 Royal Society University Research Fellow, University College London
1999-2001 Visitor, California Institute of Technology
1998-2001 Junior Research Fellow, Magdalene College, Cambridge University
1997-1998 Post-doctoral research assistant, Cambridge University

EDUCATION

1993-1996 Ph.D. Volcanism and tectonics on Venus, Cambridge University
1990-1993 BA Geological sciences (1st class honours), Cambridge University

AWARDS

2020 Elected to National Academy of Sciences
2019 Harold Jeffreys lectureship, Royal Astronomical Society
2018 Paolo Farinella prize
2007 Macelwane medal, American Geophysical Union
2007 Urey prize, Division of Planetary Sciences, American Astronomical Society
2001 President's Award, Geological Society of London

SELECTED PROFESSIONAL ACTIVITIES

2019-present Editor, *AGU Advances*
2018-present *InSight* Participating Scientist
2016-2019 Editor, *Icarus*
2015- present Member on E-THEMIS, REASON and EIS instruments for *Europa Clipper*
2012-2018 Participating Scientist on *Cassini* and *GRAIL*; *New Horizons* embedded collaborator
2009-2010 National Academies' Planetary Decadal Survey member (satellites panel)
2006-2009 National Academies' Committee on Planetary and Lunar Exploration
2003-2015 Associate Editor, *J. Geophys. Res. Planets*
2003-present Series Editor, Cambridge University Press Planetary Science series

RECENT SELECTED PUBLICATIONS (*denotes a student, ^ a post-doc)

- *Bierson, C.J., **F. Nimmo**, S.A. Stern, Evidence for a hot start and early ocean formation on Pluto, *Nature Geosci.*, **13**, 468-472, 2020.
- Kamata, S., **F. Nimmo**, Y. Sekine et al. Pluto's ocean is capped and insulated by gas hydrates. *Nature Geosci.* **12**, 407-410, 2019.
- *Abrahams, J.A.N.H., **F. Nimmo**. Ferrovolcanism: iron volcanism on metallic asteroids. *Geophys. Res. Lett.* **46**, 5055-5064, 2019.
- Nimmo, F.**, I. Matsuyama, Tidal dissipation in rubble-pile asteroids, *Icarus* , **321**, 715-721, 2019.
- Nimmo, F.**, A.C. Barr, M. Behoukova, W.B. McKinnon, The thermal and orbital evolution of Enceladus: observational constraints and models in *Enceladus and the icy moons of Saturn*, P.M. Schenk, R.N. Clark, C.J.A. Howett, A.J. Verbiscer, J.H. Waite, eds., Univ. Ariz. Press, pp.79-94, 2018.
- Nimmo, F** et al., Reorientation of Sputnik Planitia implies a subsurface ocean on Pluto, *Nature* , **540** 94-96, 2016.
- *Bierson, C.J., **F. Nimmo**, A test for Io's magma ocean: modeling tidal dissipation with a partially-molten mantle, *J. Geophys. Res.*, **121** 2211-2224, 2016.
- Nimmo, F.**, R.T. Pappalardo Ocean worlds in the outer solar system, *J. Geophys. Res.*, **121** 1378-1399, 2016.
- Badro, J., J. Siebert, **F. Nimmo**, An early geodynamo driven by exsolution of mantle components from Earth's core, *Nature* **536**, 326-328, 2016.
- Nimmo, F.**, et al., Mean radius and shape of Pluto and Charon from New Horizons images *Icarus* **287**, 12-29, 2017.
- *Chen, E.M.A., **F. Nimmo**, Tidal dissipation in the lunar magma ocean and its effect on the early evolution of the Earth-Moon system *Icarus* **275**, 132-142, 2016.
- Tarduno, J.A., R.D. Cottrell, W.J. Davis, **F. Nimmo**, R.K. Bono, A Hadean to Paleoproterozoic geodynamo recorded by single zircon crystals, *Science* **349** 521-524, 2015.
- Nimmo, F.**, Thermal and compositional evolution of the core, *Treatise on Geophysics, Vol. 9*, pp. 201-219, 2015.
- Nimmo, F.**, Energetics of the core, *Treatise on Geophysics, Vol. 8*, pp. 27-55, 2015.
- Garrick-Bethell, I., V. Perera, **F. Nimmo**, M.T. Zuber, The tidal-rotational shape of the Moon and evidence for polar wander *Nature* **512** 181-184, 2014.
- Nimmo, F.**, C. Porco, C. Mitchell, Tidally-modulated eruptions on Enceladus: Cassini ISS observations and models *Astron. J.* **148** 46, 2014.
- Matsuyama, I., **F. Nimmo**, J.X. Mitrovia, Planetary reorientation, *Ann. Rev. Earth Planet. Sci.* **42**, 605-634, 2014.
- Iess, L., D.J. Stevenson, M. Parisi, *D. Hemingway, R.A. Jacobson, J.I. Lunine, **F. Nimmo** et al., The gravity field and interior structure of Enceladus, *Science* **344**, 78-80, 2014.
- *Hemingway, D., **F. Nimmo**, H. Zebker, L. Iess, A rigid and weathered ice shell on Titan, *Nature* **500**, 550-552, 2013.
- Spencer, J.R., **F. Nimmo**, Enceladus: An active ice world in the Saturn System, *Ann. Rev. Earth Planet. Sci.* **41**, 693-717, 2013.
- Tarduno, J.A., R.D. Cottrell, **F. Nimmo**, J. Hopkins, J. Voronov, A. Erickson, E. Blackman, E.R.D. Scott, R. McKinley, Evidence for a dynamo in the main group pallasite parent body, *Science* **338** 93-95, 2012.
- *Dwyer, C.A., D.J. Stevenson, **F. Nimmo**, A long-lived lunar dynamo driven by continuous mechanical stirring, *Nature* **479** 212-214, 2011.
- Nimmo, F.**, B.G. Bills, P.C. Thomas, Geophysical implications of the long-wavelength topography of the Saturnian satellites, *J. Geophys. Res.* **116** E11001, 2011.
- Khurana, K.K., X. Jia, M.G. Kivelson, **F. Nimmo**, G. Schubert, C.T. Russell, Evidence of a global magma ocean in Io's interior, *Science* **332** 1186-1189, 2011