

## FRANCIS NIMMO

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### RESEARCH ACHIEVEMENTS

- Used gravity and topography to probe the internal structures of Titan 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

### EDUCATION

1993-96 PhD *Volcanism and tectonics on Venus*, St John's College, Cambridge University

1990-93 BA Geological sciences (1st class honours), St John's College, Cambridge University

### EMPLOYMENT

2011 - present Professor, UCSC

2007 - 2011 Associate Professor, UCSC

2005 - 2007 Assistant Professor, UCSC

2004 - 2005 Assistant Professor in Residence, UCLA

2002 - 2004 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 Fellowship, Magdalene College, Cambridge University

1997 - 1998 Post-doctoral research assistant, Cambridge University

### AWARDS ETC.

2015 Overseas Visiting Scholarship, St John's College, Cambridge

2011 Japan Society for the Promotion of Science Visiting Fellow

2011 Merle A. Tuve Visiting Fellow, Carnegie Institute of Washington

2007 Macelwane medal of the American Geophysical Union

2007 Urey prize of the Division of Planetary Sciences

2001 President's Award, Geological Society of London

1998-01 Junior Research Fellowship, Magdalene College, Cambridge

### PROFESSIONAL ACTIVITIES

2016- Editor, *Icarus*

2014- Team member of EIS, E-THEMIS and REASON Europa instruments

2014- New Horizons embedded collaborator

2012- Cassini Participating Scientist

2012- GRAIL Guest Scientist

2009-2010 National Academies' Planetary Decadal Survey (Satellites panel)

2007 NASA Enceladus Science Definition Team

2006-2009 National Academies' Committee on Lunar and Planetary Exploration (COMPLEX)

2006 National Academies' Committee on Mars Exploration Architecture

2003-2015 Associate Editor, *J. Geophys. Res. Planets*

## RECENT SELECTED PUBLICATIONS

- Hin, R.C., C.D. Coath, P.J. Carter, F. Nimmo et al., Magnesium isotope evidence that accretional vapour loss shapes planetary compositions, *Nature* **549**, 511-515, 2017.
- Nimmo, F., O.M. Umurhan, C.M. Lisse et al., Mean radius and shape of Pluto and Charon from New Horizons images, *Icarus* **287**, 12-29, 2017.
- Nimmo, F., D.P. Hamilton, W.B. McKinnon et al., Reorientation of Sputnik Planitia implies a subsurface ocean on Pluto, *Nature* **540**, 94-96, 2016.
- Badro, J., J. Siebert, F. Nimmo, An early geodynamo driven by exsolution of mantle components from the Earth's core, *Nature* **536**, 326-328, 2016.
- McKinnon, W.B., F. Nimmo, T. Wong et al., Convection in a volatile nitrogen-ice-rich layer drives Pluto's geological vigour, *Nature* **534**, 82-85, 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.
- 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.
- Nimmo, F., R.T. Pappalardo, Ocean worlds in the outer solar system, *J. Geophys. Res.* **121**, 1378-1399, 2016.
- Nimmo, F., T. Kleine, Early differentiation and core formation: Processes and timescales, *AGU Geophysical Monogr.* **212**, 83-102, 2015.
- 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.
- Behounekova, M., G. Tobie, O. Cadek, G. Choblet, C. Porco, F. Nimmo, Timing of water plume eruptions on Enceladus explained by interior viscosity structure, *Nature Geosci.* **8**, 601-604, 2015.
- Movshovitz, N., F. Nimmo, D. Korycansky, E. Asphaug, J. Owen, Disruption and re-accretion of mid-sized moons during an outer solar system Late Heavy Bombardment, *Geophys. Res. Lett.* **42**, doi:10.1002/2014GL062133, 2015.
- Zheng, Y., F. Nimmo, T. Lay, Seismological implications of a lithospheric low seismic velocity zone in Mars, *Phys. Earth Planet. Inter.* **240**, 132-141, 2015.
- Bryson, J.F.J. et al., Long-lived magnetism from solidification-driven convection on the pallasite parent body, *Nature* **517**, 472-475, 2015.
- Dwyer, C.A., F. Nimmo, J.E. Chambers, Bulk chemical and Hf-W isotopic consequences of incomplete accretion during planet formation, *Icarus* **245**, 145-152, 2015.
- Kamata, S., F. Nimmo, Impact basin relaxation as a probe for the thermal history of Pluto, *J. Geophys. Res.* **119**, doi:10.1002/2014JE004679, 2014.
- Besserer, J., F. Nimmo, M.A. Wieczorek, R.C. Weber, W.S. Kiefer, P.J. McGovern, J.C. Andrews-Hanna, D.E. Smith, M.T. Zuber, GRAIL gravity constraints on the vertical and lateral density structure of the lunar crust, *Geophys. Res. Lett.* **41**, doi:10.1002/2014GL060240, 2014.
- 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. Mitrovica, Planetary Reorientation, *Ann. Rev. Earth Planet. Sci.* **42**, 605-634, 2014.
- Nimmo, F., C. Porco, C. Mitchell, Tidally-modulated eruptions on Enceladus: Cassini ISS observations and models, *Astron. J.* **148**, 46, 2014.
- Iess, L., D.J. Stevenson, M. Parisi, D. Hemingway, R.A. Jacobson, J.I. Lunine, F. Nimmo, J.W. Armstrong, S.W. Asmar, M. Ducci, P. Tortora, The gravity field and interior structure of Enceladus, *Science* **344**, 78-80, 2014.
- Chen, E.M.A., F. Nimmo, G.A. Glatzmaier, Tidal heating in icy satellite oceans, *Icarus* **229**, 11-30, 2014.
- Hemingway, D., F. Nimmo, H. Zebker, L. Iess, A rigid and weathered ice shell on Titan, *Nature* **500**, 550-552, 2013.