

Craig B. Agnor

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Education

- Ph.D. Physics, University of Colorado, Boulder, Colorado. 2002.
Thesis Title: ‘Late Stage Accretion of the Terrestrial Planets’
Thesis Advisor: Dr. Robin M. Canup
- M.S. Physics, Miami University, Oxford, Ohio, 1996.
- B.S. Physics, Denison University, Granville, Ohio, 1991.

Research Interests

- The origin and evolution of the solar system, planetary satellites and extrasolar planets.
- Celestial mechanics and solar system dynamics.
- Planetary evolution via giant impacts.
- The dynamics and signatures of large-scale orbital migration in planetary systems.
- Computational physics and the gravitational N -body problem.

Research Experience

Lecturer (*i.e.*, equivalent to Assistant Professor in the US), School of Physics and Astronomy,
Queen Mary, University of London, London, UK. August 2007 - present. Tenured in 2011.

Assistant Researcher, Earth & Planetary Sciences Department.
University of California, Santa Cruz, USA. February 2006 - July 2007.

Postgraduate Researcher, Earth Sciences Department.
University of California, Santa Cruz, USA. April 2002 - January 2006.

Research Assistant, Southwest Research Institute & University of Colorado. Boulder, CO.
1996-2002.

Teaching Experience

Lecturer (*i.e.*, equivalent to Assistant Professor in the US), School of Physics and Astronomy,
Queen Mary, University of London, London, UK. August 2007 - present. Tenured 2011.

Modules Taught:

- ASTM001 Solar System - masters-level introduction to solar system dynamics.
- PHY241 Planetary Systems - second-year undergraduate module in planetary astrophysics (I have written this module).
- MTH6110 Communicating and Teaching Mathematics: The Undergraduate Ambassadors Scheme - final-year undergraduate module. Participating students are placed in local secondary schools where they assist with learning and gain experience in teaching as a career (I have written this module).

Student Thesis Projects Supervised:

The Relevance of Lagrange Points to Lunar Origin, Ahmed Al-Refaie, BSc thesis, 2010, Distinction. Now a postgraduate at QM.

The Formation and Evolution of Earth's Moon, Rosemary Cave, MSc thesis, 2010, Distinction. Now a Ph.D. student at QM.

The Origin and Dynamics of Sedna: Implications for the Kuiper Belt and Scattered Disk, Oliver Hughes, MSci thesis, 2010.

The Late Evolution of the Outer Solar System, Emma Thompson, MSc thesis, 2008.

Postgraduate Certificate in Academic Practice, completed 2011.

Teaching Assistant, University of Colorado. Boulder, CO, USA. 1998.

Worked with the campus Student Academic Services Center to provide academic support for low-income, first-generation, and disabled undergraduate students.

Teaching Assistant, Miami University. Oxford, OH, USA. 1994-1996.

Developed new introductory physics laboratory course for non-majors. Delivered lectures in large introductory physics classes.

Science Department Chairman, Moorestown Friends School, Moorestown, NJ, USA. 1993-1994. Supervised the implementation of the fifth through twelfth grade science curriculum. Managed the hiring, support, development and evaluation of science department faculty members.**Physics Teacher**, Moorestown Friends School, Moorestown, NJ, USA. 1991-94

Designed curriculum for and taught courses of introductory physics, AP physics, astronomy, algebra and photography.

Educational Consultant, Edmund Scientific Co., Barrington, NJ, USA. 1993-1994.

Developed laboratory manuals to accompany new educational products and implemented their use in my introductory physics classes.

Publications

Agnor, C.B. and D.N.C. Lin 2012, On the Migration of Jupiter and Saturn: Constraints from Linear Models of Secular Resonant Coupling with the Terrestrial Planets, *Astrophysical Journal* **745**, 143-163.

Tinetti, G. and the EChO Science Working Group 2011, EChO - Extrasolar Planet Characterisation Observatory. *Experimental Astronomy*, *In Press*. Available via the *arXiv* server.

Arridge, C.S. and the Uranus Pathfinder Team 2011, Uranus Pathfinder: Exploring the Origins and Evolution of Ice Giant Planets. *Experimental Astronomy*, Available online.

Li, S.-L., C.B. Agnor, and D.N.C. Lin, 2010, Embryo impacts and gas giant mergers I: Dichotomy of Jupiter's and Saturn's core mass. *Astrophysical Journal* **720**, 1161-1173.

Beurle, K., C.D. Murray, G.A. Williams, M.W. Evans, N.J. Cooper, and C.B. Agnor 2010, Direct evidence for gravitational instability and moonlet formation in Saturn's rings, *Astrophysical Journal Letters* **718**, L176-L180.

- Philpott, C., D.P. Hamilton, and C.B. Agnor 2010, Three-Body Satellite Capture: Application to Jupiter, *Icarus* **208**, 824-836.
- Agnor, C.B., A. Barr, B. Bierhaus, D. Brain and 38 co-authors 2009, The Exploration of Neptune and Triton, National Research Council 2009, Planetary Science Decadal Survey.
- Nimmo, F., S.D. Hart, D. Korycansky, and C.B. Agnor 2008, Implications of an impact origin for the Martian hemispheric dichotomy. *Nature* **453**, 1220-1223.
- Agnor, C.B. and D.P. Hamilton 2006, Neptune's capture of its moon Triton during a planet-binary gravitational encounter. *Nature* **441**, 192-194.
- Nimmo, F. and C.B. Agnor 2006, Isotopic Outcomes of N-body Accretion Simulations: Constraints on Equilibration Processes During Large Impacts from Hf/W Observations. *Earth and Planetary Science Letters* **243**, 26-43.
- Asphaug, E., Agnor, C.B. and Q. Williams 2006, Hit-and-run planetary collisions. *Nature* **439**, 155-160.
- Asphaug, E., Agnor, C.B., and Q. Williams 2005, Tidal Forces as Drivers of Collisional Evolution *Lunar Planet. Sci. XXXVI*, Abstract No. 2393.
- Agnor, C.B. and E. Asphaug 2004, Accretion Efficiency During Planetary Collisions *Astrophysical Journal* **613**, L157-L160.
- Levison, H.F. and C.B. Agnor 2003, The Role of Giant Planets in Terrestrial Planet Formation. *Astronomical Journal* **125**, 2692-2713.
- Ward, W.R., Agnor, C.B., and R.M. Canup 2002. Obliquity Variations in Planetary Systems. *Lunar Planet. Sci. XXXIII*, Abstract No. 2017.
- Agnor, C.B., and W.R. Ward 2002. Damping of Terrestrial Planet Eccentricities with a Remnant Gas Disk. *Astrophysical Journal* **567**, 579-586.
- Ward, W.R., Agnor, C.B., and H. Tanaka 2001. On the Accretion of Distant Planets. Proceedings of Astrophysical Ages and Timescales Conference. eds. T. von Hippel, N. Manset, and C. Simpson.
- Agnor, C.B. and W.R. Ward 2000. Secular Resonant Damping of Planetary Eccentricities. *Lunar Planet. Sci. XXXI*, Abstract No. 2086.
- Canup, R.M. and C.B. Agnor 2000. Accretion of the Terrestrial Planets and the Earth-Moon System. In *Origin of the Earth and Moon* (R.M. Canup and K. Righter, Eds.), Univ. of Arizona Press, Tucson.
- Agnor, C.B., R.M. Canup, and H.F. Levison 1999. On the Character and Consequences of Large Impacts in the Late Stage of Terrestrial Planet Formation. *Icarus* **142**, 219-237.
- Agnor, C. B., R. M. Canup, and H.F. Levison 1999. The Impact Phase of Terrestrial Planet Accretion. *Lunar Planet. Sci. XXX*, Abstract No. 1878.
- Alexander, S.G. and C.B. Agnor 1998. N-body Simulations of Late Stage Planetary Formation with a Simple Fragmentation Model. *Icarus* **132**, 113-124.

Recent Invited Colloquia

American Geophysical Union Fall Meeting 2010 (invited), University of Kent (2/2010), Isaac Newton Institute workshop, Dynamics of Disks and Planets (8/2009), Cambridge University (6/2009), University of Central Lancashire (6/2009), University of Bern (5/2009)

Honors

QMUL Drapers Award, for Excellence in Teaching and Learning. Nominee in 2009 & 2011. I was recognized for teaching the module with the highest student satisfaction rating within Queen Mary's School of Physics and Astronomy (2011-12).
 QMUL Drapers Prize, for Developments in Learning and Teaching. Finalist 2009. 'Communicating and Teaching Mathematics: the Undergraduate Ambassadors Scheme'
 NASA Graduate Student Research Program Fellowship, 1999-2002.
 Outstanding Graduate Research Award, Miami University, 1996.
 Outstanding Graduate Teaching Award, Miami University, 1996.
 Sigma Pi Sigma, National Physics Honor Society, 1995-Present.

Funded Research Proposals

The Astronomy Unit's Consolidated Grant Proposal to the UK's Science Technology Facilities Council. Co-Investigator, 2011-2014.
 NASA Origins of Solar Systems Program, Grant Title: Dynamical Coupling and Solar System Evolution. Principal Investigator 2007-2010. \$192,000
 NASA Outer Planets Research Program, Grant Title: Origin and Evolution of Satellites in the Outer Solar System. Principal Investigator 2005-2008. \$207,000
 NASA Origins of Solar Systems Program, Grant Title: Collisional and Dynamical Evolution of Planets. Principal Investigator 2005-2008. \$137,000

Research Activities

Extrasolar Planet Characterization Observatory (EChO). ESA M-class mission proposal. Science working group member 2010-present.
 Uranus Pathfinder. ESA M-class mission proposal. Member of science working group 2010.
 Invited Participant: Isaac Newton Institute Workshop: Dynamics of Disks and Planets. August-September 2008, Cambridge, UK.
 Proposal Review Panel Member: NASA Origins of Solar Systems Program, NASA Planetary Geology and Geophysics Program.
 Manuscript Referee for the journals: Astronomy & Astrophysics, The Astrophysical Journal, The Astronomical Journal, Icarus, Monthly Notices of the Royal Astronomical Society, Nature, New Astronomy, Science.
 External Proposal Reviewer: NASA Planetary Geology & Geophysics, Origins, Outer Planets Research Programs, UK's Science, Technology and Facilities Council.
 Organizing Committee Member: Early Planetary Differentiation Workshop. Sonoma County, CA. December 2006.

Outreach Activities

Consulted with the BBC on the development of a follow up to the television series *Wonders of the Solar System* with Professor Brian Cox.

Consulted with the New Scientist on an article, *Giant Impact Shook Jupiter to Core*, that reported on the work of Li, Agnor & Lin 2010, in the August 14, 2010 issue.

Provided rendered images of Neptune and Triton for the popular science book *The 50 Most Extreme Places in Our Solar System* by David Baker and Todd Ratcliff (Harvard University Press 2010).

Provided rendered images for the book *The Far Out Guide to the Solar System* (Enslow Publishers 2011).

I frequently give invited seminars for local physics teachers in the East London area.

Contributed science advice and rendered images for a popular book on the planet Neptune by award winning children's book author Mary Kay Carson (published in 2010).

Memberships

American Astronomical Society Division of Planetary Sciences

American Astronomical Society Division of Dynamical Astronomy

American Association of Physics Teachers

American Geophysical Union

Royal Astronomical Society

February, 2012

*Reprints and additional information can be found at my web site: <http://www.maths.qmul.ac.uk/~agnor>