

Robin M. Canup

Planetary Science Directorate, Southwest Research Institute
1050 Walnut Street, Suite 400
Boulder, Colorado 80302

Employment

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|---------------------------|--|-----------------|
| Associate Vice President | Southwest Research Institute, Boulder Office | 03/10 – present |
| Institute Scientist | Southwest Research Institute, Boulder Office | 03/09 – 3/10 |
| Executive Director | Southwest Research Institute, Boulder Office | 03/07—02/09 |
| Director | Southwest Research Institute, DoSS | 04/05 – 3/07 |
| Visiting Professor | Division of Geological and Planetary Sciences, California Institute of Technology | 01/05 – 4/05 |
| Assistant Director | Southwest Research Institute, DoSS | 09/99 – 4/05 |
| Senior Research Scientist | Southwest Research Institute, Department of Space Studies (DoSS) | 03/98 – 09/99 |
| Research Associate | LASP, University of Colorado | 05/95 — 2/98 |

Education

Ph.D., M.S. Astrophysical, Planetary and Atmospheric Sciences University of Colorado, Boulder
B.S. Physics - Magna Cum Laude/Phi Beta Kappa Duke University, North Carolina

Honors and Awards

Asteroid 17836 Canup
Fellow, American Geophysical Union
James B. Macelwane Medal, American Geophysical Union
Harold C. Urey Prize, Division of Planetary Sciences of the American Astronomical Society
Patricia Roberts Harris Graduate Fellowship
Judith Resnik Memorial Scholarship

Selected Publications

Ward, W. R. and R. M. Canup 2010. Circumplanetary disk formation. *Submitted to Astron. J.*
Barr, A. C. and R. M. Canup 2010. Origin of the Ganymede-Callisto dichotomy by impacts during the late heavy bombardment. *Nature Geoscience* **3**, 164-167.
Canup, R. M. and W. R. Ward 2009. Origin of Europa and the Galilean satellites. In *Europa* (R. Pappalardo, K. Kurhana and W. K. McKinnon, Eds.), Univ. Az. Press, Tucson, 59-84.
Canup, R. M. 2008. Accretion of the Earth. *Phil. Trans. R. Soc. A.*, **366**, 4061-4075.
Barr, A. C. and R. M. Canup 2008. Constraints on gas giant satellite formation from the interior states of partially differentiated satellites, *Icarus*, **198**, 163-177.
Canup, R. M. 2008. Lunar forming collisions with pre-impact rotation. *Icarus*, **196**, 518-538.
Canup, R. M. 2008. Implications of lunar origin via giant impact for the Moon's composition and the thermal state of the protoearth. *Lunar Plan. Sci.* XXXIX, #2429.
Ward, W. R. and R. M. Canup 2006. Resonant migration of Pluto's outer satellites by Charon's tidal expansion. *Science*, **313**, 1107-1109.
Canup, R. M. and W. R. Ward 2006. A common mass scaling for satellite systems of gaseous planets. *Nature*, **441** 834-839.
Canup, R. M. and E. Pierazzo 2006. Retention of water during planet-scale collisions. *Lunar Plan. Sci.* XXXVII, #2146.

- Ward, W. R. and R. M. Canup 2006. The obliquity of Jupiter. *Astrophys. J. Let*, **640**, L91-94.
- Canup, R. M. 2005. A giant impact origin of Pluto-Charon. *Science*, **307**, 546-550.
- Canup, R. M. 2004. Formation of the Moon. *Ann. Revs. Astron. Astrophys.*, **42**, 441-475.
- Canup, R. M. 2004. Simulations of a late lunar forming Impact. *Icarus* **168**, 433-456.
- Canup, R. M. and W. R. Ward 2002. Formation of the Galilean satellites: Conditions of accretion. *Astron. J.*, **124**, 3404-3423.
- Canup, R. M., Asphaug, E., Pierazzo, E. and H. J. Melosh 2002. Simulations of Moon-forming impacts. *Lunar Plan. Sci.* XXXIII, 1641-1642.
- Ward, W. R., Agnor, C. B. and R. M. Canup 2002. Obliquity variations in planetary systems. *Lunar Plan. Sci.* XXXIII, #2017.
- Canup, R. M. and E. Asphaug 2001. The Lunar-forming giant impact. *Nature*, **412**, 708-712.
- Canup, R. M., W. R. Ward, and A. G. W. Cameron 2001. A scaling relationship for satellite-forming impacts. *Icarus*, **150**, 288-296.
- Ward, W. R. and R. M. Canup 2000. Origin of the Moon's orbital inclination through resonant disk interactions. *Nature*, **403**, 741-743.
- 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 consequence of large impacts in the late stage of terrestrial accretion. *Icarus* **142** 219-237.
- Canup, R. M., H. F. Levison and G. R. Stewart 1999. Stability of a terrestrial multiple moon system. *Astron. J.* **117** 603-620.
- Cameron, A. G. W. and R. M. Canup 1998. The giant-impact occurred during Earth accretion. *Lunar Plan. Sci.* XXIX.
- Ida, S., R. M. Canup and G. R. Stewart 1997. Lunar accretion from an impact-generated disk. *Nature* **389**, 353-357.
- Canup, R. M. and L. W. Esposito 1997. Evolution of the G-ring and the ring hazard to Cassini. *Icarus* **126**, 28-41.
- Canup, R. M. and L. W. Esposito 1996. Formation of the Moon from an impact-generated disk. *Icarus* **119**, 427-446.
- Canup, R. M. and L. W. Esposito 1995. Accretion in the Roche zone: Co-existence of rings and ringmoons. *Icarus* **113**, 331-352

Research Activities

Principal Investigator: NASA Origins of Solar Systems, Planetary Geology & Geophysics, Outer Planets, and LASER Programs; NSF Planetary Astronomy Program
 Co-Investigator NASA Lunar Science Institute, Center for Lunar Origin and Evolution (CLOE)
 Review panel member: NSF Planetary Astronomy; NASA Planetary Geology and Geophysics; NASA Origins of Solar Systems; NASA Outer Planets
 Post-doctoral advisor for Dr. Amy Barr (2006 – 2008); Ph.D. advisor for Dr. Craig Agnor (1997-2002)
 Lead Editor, 'Origin of the Earth and Moon', University of Arizona Space Science Series, 2000.

Professional Organizations and Activities

AGU Hess Medal Prize Committee (2009 – present)
 Planetary Science Subcommittee of the NASA Advisory Council (2006 - 2009)
 DPS Prize Committee (2007 – 2009)
 NSF Astronomy Division's Committee of Visitors (2008)
 Guest Editor, Annual Reviews in Earth and Planetary Sciences (2008)

Editorial board member, *Icarus* (2003 - 2006)
Brouwer Award Committee, Division of Dynamical Astronomy, AAS (2003-2006); Chair (2005-2006)
Jupiter Icy Moons Orbiter Science Definition Team (2003-2004)
Committee Member (2001-2003), Division of Dynamical Astronomy
American Geophysical Union (1993 – present); Division of Planetary Sciences, AAS

Recent Invited Talks and Colloquia

University of Colorado (3/10); Princeton (2/10); AAAS Meeting (2/09) “*Formation of Terrestrial Planets*”; AGU Fall Meeting (12/08) “*Formation of Gas Giant Satellites*”; Royal Society Meeting, “*Accretion of the Earth*” (9/07); NAS Sackler Colloquium (1/07), UCSC (4/07), UCLA (3/05), Caltech (2/05)

Popular articles/activities

One of 2004 "Brilliant 10" young scientists, *Popular Science* magazine.
“Origin of Terrestrial Planets and the Earth-Moon System” In *Physics Today*, April 2004.
“Making Moons” In *Worlds Beyond*, S. Alan Stern, Editor. Cambridge University Press, 2003.
“Big Bang, New Moon” In *Technology Today*, Spring 1999.

Research Interests

Satellite and planet formation; origin of the Earth and Moon

Other

Principal dancer, Boulder Ballet (1993-2000) ([details](#))