

Kevin J. Walsh

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Professional Preparation

University of Notre Dame	Physics and Computing	B.S. 2000
University of Maryland	Astronomy	Ph.D. 2006
University of Maryland	Postdoctoral Res. Associate	2007
Observatoire de la Côte d'Azur	Poincaré Fellow	2008–2009
Southwest Research Institute	Research Scientist	2010–

Grants and Awards

- **NASA PG&G** (PI) 2013-2016 \$214,000

“Preserving Shape and Spin Information in Catastrophic Asteroid Disruptions”

- **XSEDE Supercomputer** (PI) 1.5 million hours for 2013

“Modeling the Formation of Pluto’s Small Satellites”

Space Mission Involvement

Walsh is a collaborator with NASA’s **OSIRIS-REx** asteroid sample return mission with a paid position as a deputy lead of the Regolith Development Working Group. This Working Group is tasked with compiling all information to constrain the nature and geologic history of the target asteroid Benu, including the maps of sampleability to help select sample sites.

Recent Invited Talks

1. July 21, 2014 “Terrestrial Planet Formation and the Mixing of Planetesimal Populations”, Characterizing Planetary Systems Across the HR Diagram, Cambridge England
2. June 4, 2014 “Identification and properties of asteroid families”, Workshop on “Internal structure of carbonaceous chondrites parent bodies and their link with primitive asteroids”, Villefranche sur Mer, France
3. May 27, 2014 “Formation of the terrestrial planets with LIPAD”, Workshop on “Accretion and early differentiation of the terrestrial planets”, Nice, France
4. Nov 8, 2013 “The origin of near-Earth asteroids” Kavli Frontiers of Science hosted by the National Academy of Science, Irvine, California.
5. Dec 7, 2012 “Terrestrial planet formation from a truncated disk – The Grand Tack” at AGU Fall meeting, San Francisco.
6. Aug 28, 2012 “Shaping of the inner solar system by the gas-driven migration of Jupiter” at IAU General Assembly XXVIII, Beijing, China.
7. May 28, 2012 “Shaping of the inner solar system by the gas-driven migration of Jupiter” at Planetary Origins and Frontiers of Exploration, Weizmann Institute, Israel
8. May 18, 2012 “Depletion and excitation of the asteroid belt by migrating planets” at Asteroids Comets and Meteors, Niigata, Japan
9. Nov 7, 2011 “Depletion and excitation of the asteroid belt by migrating planets” at Formation of the First Solids in the Solar System Workshop, Kauai

Recent Seminars/Colloquium

1. April 15, 2014 Kleigel Lecture in Planetary Sciences, Caltech
2. Feb 18, 2014 Whole Earth Seminar, UCSC
3. Feb 7, 2014 Colloquium, Florida Institute of Technology
4. Dec 5, 2013 Planetary Science Seminar, Brown University
5. Oct 31, 2013 Astronomy Seminar, Aristotle University of Thessaloniki

6. April 4, 2013 Colloquium, LPL, University of Arizona
7. Sep 25, 2012 Astrophysics Seminar, University of Notre Dame
8. Aug 13, 2012 Astronomy Seminar, ASIAA (Taipei)
9. Nov 1, 2012 Astrobiology Seminar, University of Washington
10. Jan 18, 2012 Astrobiology Seminar, University of Colorado
11. Oct 25, 2011 EAPS Colloquium, MIT
12. Summer 2009 Temps & Espace Seminar, IMCCE Paris
13. Spring 2009 Astronomy Seminar, DAMTP, Cambridge

Teaching Experience

- 2012 Adjunct Professor, Astro 3300, APS Dept., University of Colorado at Boulder
 2007 Adjunct Professor, Astro 330, Dept. of Astronomy, University of Maryland
 2001–2002 Instructor, Astronomy 111, Dept. of Astronomy, University of Maryland

Observing Experience

- IRTF Hawaii: 5 nights 2013A (PI), spectra of primitive Main Belt Asteroids.
 VLT UT3 Chile: 8 hrs of time in Spring 2009 (PI) & 2010 (co-I). 8-18 μ m imaging.
 KPNO Kitt Peak, AZ: 25 nights (PI), Asteroid lightcurves (4m & 2.1m).
 SPM 1.5m San Pedro Martir, Mexico: 4 nights (PI), Deep Impact support.
 VATT 2m Mt. Graham AZ: 5 nights (student) Jovian satellite lightcurves.

Honors

- 2014 Kavli Fellow (Kavli Frontiers of Science 2013)
 2012 Asteroid 7987 renamed Walshkevin
 2008 Walsh et al. 2008 one of *Astronomy* magazine's top 10 stories for 2008
 2008–2009 Poincaré Postdoctoral Fellowship, Observatoire de la Côte d'Azur
 2006 Dean's Dissertation Fellowship, University of Maryland Graduate School
 2000–2002 Center for Teaching Excellence Distinguished Teaching Assistant 2001 & 2002

Professional Service

- NASA panel member 2012, 2013; External reviewer, 2011–2014
- Member International Space Science Institute “Granular Surfaces of Asteroids” 2010–2012.
- Referee *Nature* (2 papers), *ApJ Letters* (3 papers), *Astronomy & Astrophysics* (3 papers), *Icarus* (10 papers), *Astronomical Journal* (1 paper), *Earth Moon and Planetary Science* (2 paper), *Celestial Mechanics & Dynamical Astronomy* (1 paper)

Department/Volunteer Service/Other Activities

- Interviewed as part of BBC's special on Planet Formation (2013)
- “Distinctive Voices” talk at the National Academy of Science, Irvine, CA (Nov 7, 2013)
- Interviewed as part of Discovery Channel “How the Universe is Made” series (2013)
- Interviewed as part of BBC's comet ISON special (2013)
- Public talk at Telluride Public Library (Mar 30, 2012)
- Speaker at Fairmont Elementary Math Club (Jan 13, 2012)
- Completed 5 km “Defi de Monte Cristo” swim, Marseilles, France (2010)
- Completed 167 km “Etape du Tour” bike race, Provence, France (2009)
- 3rd in the World Ultimate Club Championships with Boulder/Denver Ultimate Frisbee team Johnny Encore (2014)
- Staff advisor and coach for University of Maryland Ultimate Frisbee team (2001–2006).

References

Dr. Hal Levison	Dr. Alessandro Morbidelli
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Dr. Derek C. Richardson	Dr. Dante Lauretta
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Publication List Summary: Walsh has published 28 papers in refereed journals, and was first author on 12. These appeared in (not counting those under review or in press):

Icarus: 11

Nature: 4 (1 was a *News & Views*)

Astrophysical Journal: 4 (2 were letters)

Annual Review of Earth and Planetary Science: 2

Science, Planetary and Space Science, Earth Moon and Planets, Advanced Science Letters, Astronomy and Astrophysics, Meteoritics and Planetary Science, MNRAS: 1

According to Google Scholar, there have been 1028 citations to his work (calculated on 19-March 2014). The calculated i10-index is 18 and the h-index is 15.

1. Lauretta, D. S. et al. The OSIRIS-REx Target Asteroid 101955 Bennu: Constraints on its Physical, Geological and Dynamical Nature from Astronomical Observations. 2014. *Meteoritics and Planetary Sciences*, in press.
2. Schunova, E., Jedicke, R., **Walsh, K. J.**, Granvik, M., Wainscoat R. J., Haghhighipour, N. 2014. Properties and evolution of near-Earth object families created by tidal disruption. *Icarus*, in press.
3. Nesvorny, D, Vokrouhlicky, D., Deienno, **Walsh, K. J.** 2014. Excitation of the Orbital Inclination of Iapetus during Planetary Encounters. *Icarus*, in press.
4. O'Brien, D. P. **Walsh, K. J.**, Morbidelli, A., Raymond, S. N., Mandell A. M. 2013. Terrestrial Planet Formation in the 'Grand Tack' Scenario. *Icarus* **239**, 74-84.
5. Jacobson, S. A., Morbidelli, A., Raymond, S. N., O'Brien, D. P., **Walsh, K. J.**, Rubie, D. C. 2013. Highly Siderophile Elements in the Earth's Mantle as a Clock for the Moon-forming Impact. *Nature* **508**, 84-87.
6. Knight, M. M. **Walsh, K. J.** 2013. Will comet ISON (C/2012 S1) Survive Perihelion?. *ApJ Letters* **776**, L5.
7. Brassier, R. **Walsh, K. J.**, and Nesvorny, D. 2013. Constraining the primordial orbits of the Terrestrial Planets. *MNRAS* **433**, 3417-3427.
8. **Walsh, K. J.**, Delbo, M., Bottke, W., Vokrouhlicky, D., Lauretta, D. 2013. Introducing the Eulalia and new Polana asteroid families: re-assessing primitive asteroid families in the inner Main Belt. *Icarus* **225**, 283-297.

9. **Walsh, K. J.**, Morbidelli, A., Raymond S. N., O'Brien, D. P., Mandell A.M. 2012. Populating the asteroid belt from two parent source regions due to the migration of giant planets - "The Grand Tack". *Meteoritics and Planetary Science* **47**, 1941–1947.
10. **Walsh, K. J.**, D. C. Richardson & P. Michel 2012. Spin-up of rubble-pile asteroids: Disruption, satellite formation and equilibrium shapes. *Icarus* **220**, 514–529..
11. Morbidelli, A., Lunine, J.I., O'Brien, D., Raymond, S.N., & **Walsh, K.J.** 2012. Building Terrestrial Planets. *Annu. Rev. Earth Planet Sci.* **40**, 251–275..
12. **Walsh K. J.**, M. Delbo, M. Mueller, R. Binzel & F. DeMeo 2012. Physical characterization and origin of binary near-Earth asteroid 1999 FG₃. *ApJ* **748**, 104..
13. Debes, J. H, **K. J. Walsh** & C. Stark 2012. The Link Between Planetary Systems, Dusty White Dwarfs, and Metal Polluted White Dwarfs. *ApJ* **747**, 148.
14. Levison, H F., **K. J. Walsh**, A. C. Barr & L. Dones 2011. NOTE: Ridge Formation and Despinning of Iapetus via an Impact-Generated Satellite. *Icarus* **214**, 773–778.
15. **Walsh, K. J.**, Morbidelli, A., Raymond, S. N., O'Brien, D. P., & Mandell, A. M. 2011. Origin of the Asteroid Belt and Mars' Small Mass. *Nature* **475**, 206–209.
16. Brasser, R., & **K. J. Walsh** 2011. Stability analysis of the Martian obliquity during the Noachian era. *Icarus* **213**, 423–427.
17. **Walsh, K. J.**, & A. Morbidelli 2011. The Effect of an Early Planetesimal-Driven Migration of the Giant Planets on Terrestrial Planet Formation. *Astronomy & Astrophysics* **526**, A126.
18. **Walsh, K. J.**, P. Michel, & D. C. Richardson 2011. Collisional and Rotational Disruption of Asteroids. *Advanced Science Letters* **4**, 311-324.
19. Richardson, D. C., **K. J. Walsh**, P. Michel, & N. Murdoch 2011. Numerical simulations of granular dynamics: I. Hard-sphere discrete element method and tests. *Icarus* **212**, 427–437.
20. Delbo, M., **K. J. Walsh**, M. Mueller, A. W. Harris & E. S. Howell 2011. Cool Surfaces of Binary Near-Earth Asteroids. *Icarus* **212**, 138–148.
21. Tanga, P., C. Comito, P. Paolicchi, D. Hestroffer A. Cellino, A. Dell'Oro, D. C. Richardson, **K. J. Walsh**, & M. Delbo 2009. Rubble-Pile Reshaping Reproduces Overall Asteroid Shapes. *Astrophysical Journal Letters* **706**, L197–L202.
22. **Walsh, K. J.** 2009. Asteroids with Satellites: Inventory, Properties and Prospects for Future Discoveries. *Earth Moon and Planets* **105**, 193–199.
23. **Walsh, K. J.** 2009. Asteroids: When planets migrate. *Nature* **457**, 1091–1093.
24. Richardson, D. C., P. Michel, & **K. J. Walsh**, and K. W. Flynn 2009. Numerical Simulations of Asteroids Modeled as Gravitational Aggregates with Cohesion. *Planetary & Space Science* **57**, 183–192.
25. **Walsh, K. J.**, D. C. Richardson, & P. Michel 2008. Rotational breakup as the origin of small binary asteroids. *Nature* **454**, 188–191.
26. **Walsh, K. J.** & D. C. Richardson 2008. A steady-state model of NEA binaries formed by tidal disruption of gravitational aggregates. *Icarus* **193**, 553–566.
27. Knight, M. M., **K. J. Walsh**, M. F. A'Hearn, R. A. Swaters, B. A. Zauderer, N. H. Samarainha, R. Vazquez, & H. Reitsema 2007. Ground-based visible and near-IR observations of Comet 9P/Tempel 1 during the Deep Impact encounter. *Icarus* **187**, 199–207.
28. Richardson, D. C., & **K. J. Walsh** 2006. Binary Minor Planets. *Ann. Rev. Earth & Planet. Sci.* **34**, 47–81.
29. **Walsh, K. J.**, & D. C. Richardson 2006. Binary near-Earth asteroid formation: rubble pile model of tidal disruptions. *Icarus* **180**, 201–216.
30. Meech, K. J. and 207 colleagues 2005. Deep Impact: Observations from a Worldwide Earth-Based Campaign. *Science* **310**, 265–269.
31. Rettig, T. W., **K. Walsh**, & G. Consolmagno 2001. Implied Evolutionary Differences of the Jovian Irregular Satellites from a BVR Color Survey. *Icarus* **154**, 313–320.