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BACKGROUND AND EDUCATION

BORN: 17 March 1961, West Palm Beach, Florida

PREVIOUS CAREER:

United States Navy, active duty enlisted, 1981-1989

Navy Nuclear Power Training Unit (Idaho Falls, ID), 1983-1986: instructor

USS Hawkbill, SSN-666 (Pearl Harbor, HI), 1986-1989: plant operator & supervisor

Eigen Engineering (San Jose, CA), 1989-1991: junior engineer (nuclear plant instrumentation)

Farley Nuclear Plant (Ashford, AL), 1991-1993: nuclear plant operator

EDUCATION:

University of Florida, 1979-1980 (electrical engineering)

Idaho State University, 1984 (electrical engineering)

Troy State University at Dothan, 1995-1998 (physical sciences)

Florida State University, 1998-2000: **B.S. in Physics**, cum laude

University of Arizona, 2000-2005: **Ph.D. in Planetary Sciences** (geosciences minor)

DISSERTATION:

Title: The seismic effect of impacts on asteroid surface morphology

Summary: an analytical and numerical modeling approach is used to investigate the effects of impact-induced seismic activity and impact ejecta emplacement on the geomorphology of fractured asteroids in the 5-100 km size range.

Dissertation Advisors: H. Jay Melosh and Richard Greenberg

POST-DOCTORAL EMPLOYMENT

INSTITUTION:

Center for Radiophysics and Space Research, Cornell University (Ithaca, NY), 2005-present

Research Associate (Joseph Veverka, supervisor)

Geophysical and geomorphological analysis of asteroids, comets, & satellites, in association with the NEAR, Deep Impact, Stardust NeXT, and Cassini missions.

CURRENT AND PENDING RESEARCH FUNDING:

NASA award NNX07AG04G-DDAP, *Investigating the Regional Seismic Effects of Impacts on the Surface Morphology of Asteroid 433 Eros*, **Principal Investigator** (2007-2009).

NASA award NNH06ZDA001N-DDAP, *Infrared Studies of the Material Excavated by the Deep Impact Experiment*, **Co-Investigator** (2007-2009).

NASA PG&G [approval pending], *A Detailed Numerical Modeling Investigation of Regolith Generation and Retention on Asteroid Surfaces*, **Principal Investigator** (2010-2012).

NASA PG&G [approval pending], *Thermal, Physical, and Climatic Effects of Impact Bombardments on Rocky Worlds*, **Co-Investigator** (2010-2013).

ADDITIONAL INFORMATION

RESEARCH INTERESTS:

Geophysics, geomorphology, tectonics, impact cratering, and related processes on asteroids, comets, planetary satellites, and terrestrial planets.

SPACECRAFT MISSION TEAMS:

Stardust-NExT mission: Science Team member, 2006-present

Cassini-Huygens mission: Imaging Team support / data analysis: 2005-present

Deep Impact mission: associate Science Team member, 2001-2007

TEACHING EXPERIENCE (Graduate Student):

NATS 102, The Universe And Humanity: Origin And Destiny, Spring 2001 (William Hubbard)
Occasional lectures, homework and test grading, office hours, review sessions

PTYS 206, Our Golden Age of Planetary Exploration, Fall 2001 (Timothy Swindle)
Frequent lectures, homework and test grading, office hours, review sessions

PROFESSIONAL ORGANIZATIONS:

AAS Division of Planetary Sciences (DPS)

American Geophysical Union (AGU)

The Meteoritical Society

WEBSITE (includes downloadable copies of all papers):

<http://www.astro.cornell.edu/~richardson/>

FELLOWSHIPS AND HONORS

Meteoritical Society, Pellas-Ryder Award, 2006

Lunar and Planetary Laboratory, Gerard P. Kuiper Award, 2005

Galileo Circle Fellowship, 2005

Graduate College Fellowship, 2000-2001

Troy State University at Dothan, Outstanding Student for 1997

PROFESSIONAL REFERENCES

Michael A'Hearn, Professor, Department of Astronomy

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H. Jay Melosh, Distinguished Professor, Department of Earth and Atmospheric Sciences

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PUBLICATIONS LIST

9 reviewed papers (6 first authored) in 5 years of publishing
 First-authored paper citation average = $71 / 5 = 14.2$
 Hirsch citation metrics: $h = 7$, $m = 1.4$
 Total citations (all work) = 307

REVIEWED JOURNAL ARTICLES:

- J.E. Richardson** (2009). Modeling impact ejecta plume evolution via an extension of the classic ejecta scaling-laws: a comparison to laboratory studies, *Journal of Geophysical Research - Planets*, [currently in review].
- J.E. Richardson** (2009). Cratering Saturation and Equilibrium: A New Model Looks at an Old Problem, *Icarus*, **204**, 697-715. (0 citations -- new paper)
- J.E. Richardson**, H.J. Melosh, C.M. Lisse, and B. Carcich (2007). A ballistics analysis of the Deep Impact ejecta plume: determining comet Tempel 1's gravity, mass, and density, *Icarus*, **190**, 357-390. (19 citations)
- P.C. Thomas, J.W. Armstrong, S.W. Asmar, J.A. Burns, T. Denk, B. Giese, P. Helfenstein, L. Less, T.V. Johnson, A. McEwen, L. Nicolaisen, C. Porco, N. Rappaport, **J.E. Richardson**, L. Somenzi, P. Tortora, E. P. Turtle, and J. Veverka (2007). Hyperion's sponge-like appearance, *Nature*, **448**, 50-56. (4 citations)
- D.P. O'Brien, R. Greenberg, and **J.E. Richardson** (2006). Craters on asteroids: reconciling diverse impact records with a common impacting population, *Icarus*, **183**, 79-92. (10 citations)
- J.E. Richardson**, H.J. Melosh, R.J. Greenberg, and D.P. O'Brien (2005). The global effects of Impact-induced seismic shaking on fractured asteroid surface morphology, *Icarus*, **179**, 325-349. (8 citations)
- M.F. A'Hearn, M.J.S. Belton, W.A. Delamere, J. Kissel, K.P. Klaasen, L.A. McFadden, K.J. Meech, H.J. Melosh, P.H. Schultz, J.M. Sunshine, P.C. Thomas, J. Veverka, D.K. Yeomans, M.W. Baca, I. Busko, C.J. Crockett, S.M. Collins, M. Desnoyer, C.A. Eberhardy, C.M. Ernst, T.L. Farnham, L. Feaga, O. Groussin, D. Hampton, S.I. Ipatov, J.Y. Li, D. Lindler, C.M. Lisse, N. Mastrodemos, W.M. Owen, **J.E. Richardson**, D.D. Wellnitz, and R.L. White, (2005). Deep Impact: excavating comet Tempel 1, *Science*, **310**, 258-264. (222 citations)
- J.E. Richardson**, H.J. Melosh, N.A. Artemeiva, and E. Pierazzo (2005). Impact cratering theory and modeling for the Deep Impact mission: From mission planning to data analysis, *Space Science Reviews*, **117**, 241-267. (10 citations)
- J.E. Richardson**, H.J. Melosh, and R.J. Greenberg (2004). Impact-induced seismic shaking on asteroid 433 Eros: a surface modification process, *Science*, **306 (5701)**, 1526-1529. (21 citations)
- J.E. Richardson**, R.A. Lorenz, and A.S. McEwen (2004). Titan's surface and rotation: new results from Voyager 1 images, *Icarus*, **170/1**, 113-124. (13 citations)

DISSERTATION:

- J.E. Richardson** (2005). The seismic effect of impacts on asteroid surface morphology, *Ph.D. Thesis*, Department of Planetary Sciences, University of Arizona.

AMATEUR WORK IN METEOR SCIENCE:

- P.S. Gural, P. Jenniskens, M. Koop, M. Jones, J. Houston-Jones, D. Holman, and **J.E. Richardson** (2004). The relative activity of the 2001 Leonid storm peaks and implications for the 2002 return, *Advances in Space Research*, **33-9**, 1501-1506.
- D.D. Meisel and **J.E. Richardson** (1999). Statistical properties of meteors from a simple, passive forward-scatter system, *Planetary and Space Science*, **47/1-2**, 107-124.
- J.E. Richardson** and W. Kuneth (1998). Revisiting the radio doppler effect from forward-scatter meteor head echoes, *WGN, the Journal of the International Meteor Organization*, **26:3**, pp. 117-130.

CONFERENCE PRESENTATION ABSTRACTS:

- J.E. Richardson** (2009). The seismic effect of impacts on asteroid surface morphology: Three-dimensional modeling results, *40th annual Lunar and Planetary Science Conference (LPSC)*, No. 2144..
- J.E. Richardson** (2008). A 3-D model of asteroid surface evolution, crater creation and erosion, regolith generation, and hillslope processes, *The 2008 Asteroids, Comets and Meteors conference*, No. 8090.
- J.E. Richardson** (2008). Modeling the evolution of cratered terrain in three dimensions: a study of crater creation and erosion on airless bodies, *39th annual Lunar and Planetary Science Conference (LPSC)*, No. 2079..
- J.E. Richardson** and P.C. Thomas (2007). Modeling the cratering records of Hyperion and Phoebe: indications of a shallow-sloped impactor population, *AAS/Division for Planetary Sciences Meeting Abstracts*, **39**, No. 11.11.
- J.E. Richardson** (2007). Improving the modeling of impact ejecta behavior: the effects of gravity and strength near the crater rim, *38th annual Lunar and Planetary Science Conference (LPSC)*, No. 1345.
- J.E. Richardson**, J. Veverka, and P.C. Thomas (2006). Large impact features on Phoebe and Hyperion: early analysis results, *AAS/Division for Planetary Sciences Meeting Abstracts*, **38**, No. 69.04.
- J.E. Richardson** and H.J. Melosh (2006). Impact generated seismic activity on fractured-monolith asteroids: a seismic propagation theory, *LPI Contributions*, **1325**, 66-67.
- J.E. Richardson** and H.J. Melosh (2006). Modeling the ballistic behavior of solid ejecta from the Deep Impact cratering event, *37th annual Lunar and Planetary Science Conference (LPSC)*, No. 1836.
- J.E. Richardson**, H.J. Melosh, and Deep Impact Science Team (2005). The Deep Impact experiment and the physics of impact cratering, *Bulletin of the American Astronomical Society*, **37**, 703.
- J.E. Richardson**, H.J. Melosh, and R. Greenberg (2005). A stochastic cratering model for asteroids surfaces, *36th annual Lunar and Planetary Science Conference (LPSC)*, No. 2032.
- J.E. Richardson**, H.J. Melosh, and R. Greenberg (2004). Impact-induced seismic shaking on asteroid 433 Eros: the mechanics of a surface modification process, *Bulletin of the American Astronomical Society*, **36**, 1186.
- J.E. Richardson**, H.J. Melosh, and R. Greenberg (2004). The seismic effect of impacts on asteroid surface morphology: early modeling results, *35th annual Lunar and Planetary Science Conference (LPSC)*, No. 1864.
- J.E. Richardson**, H.J. Melosh, and R. Greenberg (2003). The seismic effect of impacts on asteroids: early modeling results, *American Geophysical Union (AGU), Fall Meeting 2003*, No. P52A-0476.

- J.E. Richardson**, H.J. Melosh, and R. Greenberg (2003). An impact ejecta behavior model for small irregular bodies, *34th annual Lunar and Planetary Science Conference (LPSC)*, No. 1241.
- O. Abramov, **J.E. Richardson**, and A.S. McEwen (2002). Altimetry-based analysis of valley systems on Mars, *American Geophysical Union (AGU), Fall Meeting 2002*, No. P51B-0361.
- J.E. Richardson** and H.J. Melosh (2002). A numerical impact ejecta model for the Deep Impact mission, *Bulletin of the American Astronomical Society*, **34**, 886.
- J.E. Richardson**, R.A. Lorenz, and A.S. McEwen (2001). Titan's surface and rotation: new results from Voyager 1 images, *Bulletin of the American Astronomical Society*, **33**, 1110.
- J.E. Richardson**, J. Bedient, R. Lunsford, N. McLeod, and P. Martin (1999). Refining visual meteor perception models: shower radiant altitude effect, probability function, and limiting magnitude effect, *The 1999 Asteroids, Comets, Meteors conference, IAU Commission 22 professional-amateur working group meeting*.
- J.E. Richardson**, D.D. Meisel, D.E. Binns, and A. Mallama (1999). Analysis of radiometeor rates using Fourier and Wavelet techniques, *The 1999 Asteroids, Comets and Meteors conference*, No. ACM99 20.02.
- J.E. Richardson** and D.D. Meisel (1997). An amateur radiometeor network and its scientific results, *Bulletin of the American Astronomical Society*, **29**, 821.
- D.D. Meisel, **J.E. Richardson**, and A. Mallama (1997). Wavelet and Fourier analysis of radiometeor rate data, *Bulletin of the American Astronomical Society*, **29**, 820.
- D.D. Meisel and **J.E. Richardson** (1996). Fourier analysis of sporadic meteor rates, *News Letter of the Astronomical Society of New York*, **4-10**, 5.