

## Joshua P. Emery

*Assistant Professor*

*Earth and Planetary Sciences, University of Tennessee*

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### Education

*December 2002: PhD in Planetary Sciences (minor in Geosciences); Univ. Arizona, Tucson*

*May 1995: Bachelor of Science in Astronomy and Physics; Boston University*

### Research Interests

The goal of my research is to contribute to the understanding of the formation and evolution of the Solar System and the distribution of organic material. As an observational planetary astronomer, I apply the techniques of reflection and emission spectroscopy and spectrophotometry of primitive and icy bodies in the near- (0.8 to 5.0  $\mu\text{m}$ ) and mid-infrared (5 to 50  $\mu\text{m}$ ) to address these topics. The Jupiter Trojan asteroids have been a strong focus of my research because they are a key group for distinguishing several models of Solar System evolution and for understanding the prevalence of organic material. I also regularly observe Kuiper Belt objects, icy satellites, and other asteroid groups to understand the state of their surfaces as related to these topics.

### Employment History

*2011 – present: Assistant Professor, University of Tennessee.*

*2010 – 2011: Research Associate Professor, University of Tennessee.*

*2008 – 2010: Research Assistant Professor, University of Tennessee.*

*2005 – 2008: Principal Investigator, SETI Institute.*

*2002 – 2005: Research Scientist, SETI Institute (NASA Ames contractor).*

*1998 – 2002: Graduate Research/Teaching Associate, University of Arizona.*

*1995 – 1998: Graduate Research/Teaching Assistant, University of Arizona.*

*1992 – 1995: Undergraduate Research Assistant, Boston University.*

### Fellowships, Scholarships and Awards

- Tom Cronin and Helen Sestak Faculty Achievement Award, *Univ. Tennessee, 2013-present*
- Asteroid 8242 Joshemery named in recognition of contributions to planetary science, *IAU, 2012*
- Outstanding Research Paper, *Johns Hopkins Applied Physics Lab, 2011*
- College of Science Outstanding Graduate Teaching Assistant (GTA), *Univ. of Arizona, 2001*
- Department of Planetary Sciences GTA Excellence Award, *Univ. of Arizona, Fall 1999*
- NASA Space Grant Fellowship, *University of Arizona, Fall 1995 – Summer 1997*

### Professional Organizations

- American Astronomical Society / Division for Planetary Sciences
  - Federal Relations Subcommittee, *2008-2012*
  - DPS Committee, *2014-present*
- American Geophysical Union

### Professional Service

- Group chief, panel member, and external reviewer for various NASA programs
- Journal reviews (*Icarus, Astronomy & Astrophysics, Meteoritics & Planetary Science, Astronomical Journal, Astrophysical Journal, Nature, Journal of Geophysical Research*)
- Keck Next Generation Adaptive Optics Working Group, *2006*
- Spitzer Warm Mission, Planetary Science Goals team member, *2007*
- NASA Infrared Telescope Facility Time Allocation Committee, *2007 – 2009*
- Spitzer Space Telescope allocation committee (*2010*) and DDT external reviewer (*2007 – 2010*)

**Research Publications** (\* denotes grad student author, \*\* denotes undergrad student author, \*\*\* denotes post-doc author)

59. Burr, D.M., N.T. Bridges, J.R. Marshall, J.K. Smith, B.R. White, **J.P. Emery** 2014. Experimental derivation of threshold wind speeds on Titan: Implications for dune-forming wind speeds and directions. *Nature* in press.
58. Gulbis, A.A.S., **J.P. Emery**, M.J. Person, A.S. Bosh, C.A. Zuluaga, J.M. Pasachoff, B.A. Babcock 2015. Observations of a successive stellar occultation by Charon and graze by Pluto in 2011. *Icarus* in press.
57. Beddingfield, C.B.\*, D.M. Burr, **J.P. Emery** 2015. Fault geometries on Uranus' satellite Miranda: Implications for internal structure and heat flow. *Icarus* 247, 35-52.
56. Lindsay, S.S.\*\*\*, F. Marchis, **J.P. Emery**, J.E. Enriquez, M. Assafin 2015. Classification and mineralogy of multiple asteroid systems from visible and near-infrared spectral data. *Icarus* 247, 53-70.
55. Wong, I.\*, M.E. Brown, **J.P. Emery** 2014. The differing magnitude distributions of the two Jupiter Trojan color populations. *Astron. J.* 148, 112.
54. Lauretta, D.S. and 28 others (including **J.P. Emery**) 2014. The OSIRIS-REx target asteroid 101955 Bennu: Constraints on its physical, geological, and dynamical nature from astronomical observations. *Meteor. Planet. Sci.* doi: 10.1111/maps.12353.
53. Rozitis, B.\*\*\*, E. MacLennan\*\*, **J.P. Emery** 2014. Detection of cohesive forces in the rubble pile asteroid (29075) 1950 DA. *Nature* 512, 174-176.
52. **Emery, J.P.**, Y.R. Fernandez, M.S.P. Kelley, K.T. Warden\*\*, C. Hergenrother, D.S. Lauretta, M.J. Drake, H. Campins, J. Ziffer 2014. Thermal Infrared Observations and Thermophysical Characterization of OSIRIS-REx Target Asteroid (101955) Bennu. *Icarus* 234, 17-35.
51. Cheley, S.R. and 15 others (including **J.P. Emery**) 2014. Orbit and Bulk Density of the OSIRIS-REx Target Asteroid (101955) Bennu. *Icarus* 235, 5-22.
50. Lorenzi, V., N. Pinilla-Alonso, J. Licandro, C.M. Dalle Ore, **J.P. Emery** 2014. Rotationally resolved spectroscopy of (20000) Varuna in the near-infrared. *Astron. Astrophys.* 562, A85 6pp.
49. Mommert, M. J.L. Hora, A.W. Harris, W.T. Reach, **J.P. Emery**, C.A. Thomas, M. Mueller, D.P. Cruikshank, M. Delbo, H.A. Smith 2014. The Discovery of Cometary Activity in Near-Earth Asteroid (3552) Don Quixote. *Astrophys. J.* 781, article id. 25, 10pp.
48. Thomas, C.A., **J.P. Emery**, D.E. Trilling, M. Delbo, J.L. Hora, M. Mueller 2014. Physical Characterization of Warm Spitzer Observed Near-Earth Objects. *Icarus* 228, 217-246.
47. Person, M.J. and 46 others (including **J.P. Emery**) 2013. The 2011 June 23 Stellar Occultation by Pluto: Airborne and Ground Observations. *Astron. J.* 146 (4), article id 85, 15pp.
46. Takir, D. \*, **J.P. Emery**, H.Y. McSween, C.A. Hibbitts, R.N. Clark, N. Pearson, A. Wang 2013. Nature and degree of aqueous alteration in CM and CI carbonaceous chondrites. *Meteoritics & Planetary Science* 48, doi 10.1111/maps.12171.
45. Vernazza, P., D. Fulvio, R. Brunetto, **J.P. Emery**, C.A. Dukes, F. Cipriani, O. Witasse, M.J. Shaible, B. Zanda, G. Strazzulla, R.A. Baragiola. Paucity of Tagish Lake-like parent bodies in the Asteroid Belt and among Jupiter Trojans. *Icarus* 225, 517-525.
44. Marchis, F. F. Vachier, J. Durech., J.E. Enriquez, A.W. Harris, P.A. Dalba, J. Berthier, **J.P. Emery**, H. Bouy, J. Melbourne, A. Stockton, C.D. Fassnacht, T.J. Dupuy, J. Strajnic 2013.

- Characteristics and large bulk density of the C-type main-belt triple asteroid (93) Minerva. *Icarus* 224, 178-191
43. Dalle Ore, C.M., L.V. Dalle Ore, T.L. Roush, D.P. Cruikshank, **J.P. Emery**, N. Pinilla-Alonso, G.A. Marzo 2013. A compositional interpretation of trans-neptunian objects taxonomies. *Icarus* 222,307-322.
  42. Marchis, F., J.E. Enriquez, **J.P. Emery**, and 13 others 2012. Multiple asteroid systems: Dimensions and thermal properties from Spitzer Space Telescope and ground-based observations. *Icarus* 221, 1130-1161.
  41. Hargrove, K.D.\*, M.S. Kelley, H. Campins, J. Licandro, **J.P. Emery** 2012. Asteroids (65) Cybele, (107) Camilla and (121) Hermione: Infrared spectral diversity among the Cybeles. *Icarus* 221, 453-455.
  40. Takir, D.\* and **J.P. Emery** 2012. Outer Main Belt asteroids: identification and distribution of four 3- $\mu$ m spectral groups. *Icarus* 219, 641-654.
  39. Hardersen, P.S., E.A. Cloutis, V. Reddy, T. Mothé-Diniz, **J.P. Emery** 2011. The M-/X-asteroid menagerie: Results of an NIR spectral survey of 45 main-belt asteroids. *Meteor. Planet. Sci.* 46, 1910-1938.
  38. Clark, B.E. and 14 others (including **J.P. Emery**) 2011. Asteroid (101955) 1999 RQ36: Spectroscopy from 0.4 to 2.4  $\mu$ m and meteorite analogs. *Icarus* 216, 462-475.
  37. Thomas, C.A., D.E. Trilling, **J.P. Emery**, and 16 others. Explore NEOs V: Average albedo by taxonomic complex in the near-Earth asteroid population. *Astronomical Journal* 142, article id 85.
  36. Dalle Ore, C.M. and 19 others (including **J.P. Emery**) 2011. Organic materials in planetary and protoplanetary systems: nature or nurture? *Astronomy & Astrophysics* 533, id.A98.
  35. Lellouch, E., J. Stansberry, **J. Emery**, W. Grundy, D.P. Cruikshank 2011. Thermal properties of Pluto's and Charon's surfaces from Spitzer observations. *Icarus* 214, 701-716.
  34. Sánchez-Lavega and 44 other (including **J.P. Emery**) 2011. Long-term evolution of the aerosol debris cloud produced by the 2009 impact on Jupiter. *Icarus* 214, 462-476.
  33. Lim, L.F., **J.P. Emery**, N.A. Moskovitz\* 2011. Spitzer IRS (5-30 micron) Spectra of Basaltic Asteroid 956 Elisa: Mineralogy and Thermal Properties. *Icarus* 213, 510-523.
  32. Marchis, F., J.E. Enriquez\*, **J.P. Emery**, J. Berthier, P. Descamps, F. Vachier 2011. The origin of 90 Antiope from component-resolved near-infrared spectroscopy. *Icarus* 213, 252-264.
  31. Mueller, M.. and 16 others\* (including **J.P. Emery**) 2011. ExploreNEOs III. Physical characterization of 65 potential spacecraft target asteroids. *Astron J* 141, article id 109.
  30. Harris, A.W. and 16 others\* (including **J.P. Emery**) 2011. ExploreNEOs II. The accuracy of the warm Spitzer near-Earth object survey. *Astron J* 141, article id 75.
  29. **Emery, J.P.**, D.M. Burr, D.P. Cruikshank 2011. Near-Infrared spectroscopy of Trojan asteroids: Evidence for two compositional groups. *Astron J* 141, article id 25.
  28. Decamps, P., F. Marchis, J. Berthier, **J.P. Emery** and 15 others 2011. Triplicity and physical characteristics of asteroid (216) Kleopatra. *Icarus* 211, 1022-1033.
  27. Licandro, J., H. Campins, M. Kelley, K. Hargrove\*, N. Pinilla-Alonso, D. Cruikshank, A.S. Rivkin, **J. Emery** 2011. 65 Cybele: Detection of small silicate grains, water-ice, and organics. *Astron. Astrophys.* 525, id A34.
  26. Rivkin, A.S. and **J.P. Emery** 2010. Detection of ice and organics on an asteroidal surface. *Nature* 464, 1322-1323.
  25. Trilling and 15 co-authors\* (including **J.P. Emery**) 2010. ExploreNEOs I. Description and first results from the Warm Spitzer Near-Earth Object survey. *Astron. J.* 140, 770-784.

24. Burr, D.M., R.M.E. Williams, K.D. Wendell\*, M. Chojnacki\*, **J.P. Emery** 2010. Inverted fluvial features in the Aeolis/Zephyria Plana region, Mars: Formation mechanism and initial paleodischarge estimates. *J. Geophys. Res.* 115 (E7). E07011.
23. Vernazza, P., B. Carry, **J. Emery**, et al. 2010. Mid-infrared spectral variability for compositionally similar asteroids: Implications for asteroid particle size distributions. *Icarus* 207, 800-809.
22. Cruikshank, D.P., **J.P. Emery**, K.A. Kornei\*, G. Bellucci, E. d'Aversa 2010. Eclipse reappearance of Io: Time-resolved spectroscopy (1.9 – 4.2  $\mu\text{m}$ ). *Icarus* 205, 516-525.
21. Mueller, M., F. Marchis, **J.P. Emery**, A.W. Harris, S. Mottola, D. Hestroffer, J. Berthier, M. di Martino 2010. Eclipsing binary Trojan asteroid Patroclus: Thermal inertia from Spitzer observations. *Icarus* 205, 505-515.
20. Reddy, V.\*, **J.P. Emery**, M.J. Gaffey, W.F. Bottke, A. Cramer, M.S. Kelley 2009. Composition of 298 Baptistina: Implications for the D/T impactor link. *Meteor. & Planet. Sci.* 44, 1917-1927.
19. Dalle Ore, C.M., M.A. Barucci, **J.P. Emery**, D.P. Cruikshank, et al. 2009. Composition of KBO (50000) Quaoar. *Astron. Astrophys.* 501, 349-357.
18. Campins, H., **J.P. Emery**, M. Kelley, Y. Fernández, J. Licandro, M. Delbó, A. Barucci, E. Dotto 2009. Spitzer observations of spacecraft target 162173 (1999 JU3). *Astron. & Astrophys* 503, L17-L20.
17. Descamps, P., F. Marchis, J. Durech, **J.P. Emery**, et al. 2009. New insights on the binary asteroid 121 Hermione, *Icarus* 203, 88-101.
16. **Emery, J.P.** C. Dalle Ore, D.P. Cruikshank, Y.R. Fernandez, D.E. Trilling, J.A. Stansberry 2007. Ices on (90377) Sedna: Confirmation and compositional constraints. *A&A* 466, 395-398.
15. Grundy, W.M., B.J. Buratti, A.F. Cheng, **J.P. Emery**, et al. 2007. New Horizons mapping of Europa and Ganymede. *Science* 318, 234-237.
14. **Emery, J.P.**, D.P. Cruikshank, J. Van Cleve 2006. Thermal emission spectroscopy (5.2 – 38  $\mu\text{m}$ ) of three Trojan asteroids with the Spitzer Space Telescope: Detection of fine-grained silicates. *Icarus* 182, 496-512.
13. Stansberry, J.A., W.M. Grundy, J.L. Margot, D.P. Cruikshank, **J.P. Emery**, G.H. Rieke, D.T. Trilling 2006. The albedo, size and density of binary Kuiper Belt object (47171) 1999 TC<sub>36</sub>. *ApJ*, 643, 556-566.
12. Burr, D.M., **J.P.Emery**, R.D. Lorenz, G.C. Collins, P.A. Carling 2006. Sediment transport by liquid surficial flow: Application to Titan. *Icarus*, 181, 235-242.
11. Warell, J., A.L. Sprague, **J.P. Emery**, R.W.H. Kozlowski, A. Long 2006. The 0.7 – 5.3  $\mu\text{m}$  IR spectra of Mercury and the Moon: Evidence for high-Ca clinopyroxene on Mercury. *Icarus* 180, 281-291.
10. Burr, D.M., R.J. Soare, J.-M. Wan Bun Tseung\*, and **J.P. Emery** 2005. Young (late Amazonian), near surface, ground ice features near the equator, Athabasca Valles, Mars. *Icarus*, 178, 56-73.
9. **Emery, J.P.**, D.M. Burr, D.P. Cruikshank, R.H. Brown, J.B. Dalton 2005. Near-infrared (0.8 – 4.0  $\mu\text{m}$ ) spectroscopy of Mimas, Enceladus, Tethys, and Rhea. *Astron. Astrophys.*, 435, 353-362.
8. Cruikshank, D.P., J.A. Stansberry, **J.P. Emery**, Y.R. Fernandez, M.W. Werner, D.E. Trilling G.H. Rieke 2005. The high albedo Kuiper Belt Object (55565) 2002 AW<sub>197</sub>. *ApJ*, 624, L53-L56.

7. Stansberry, J.A., J. VanCleve, W.T. Reach, D.P. Cruikshank, **J.P. Emery**, Y.R. Fernandez, and 12 others 2004. Spitzer observations of the dust coma and nucleus of 29P/Schwassmann-Wachmann 1. *Astrophys. J. Suppl. Ser.* 154:463-468.
6. **Emery, J.P.** and R.H. Brown 2004. The surface composition of Trojan asteroids: Constraints set by scattering theory. *Icarus* 170, 131-152.
5. **Emery, J.P.** and R.H. Brown, 2003, Constraints on the surface composition of Trojan asteroids from near-infrared (0.8 – 4.0  $\mu\text{m}$ ) spectroscopy, *Icarus*, 164, 104-121.
4. Sprague, A.L., **J.P. Emery\***, K.L. Donaldson\*, R.W. Russell, D.K. Lynch, A.L. Mazuk, 2002, Mercury: Mid-infrared (3 – 13.5  $\mu\text{m}$ ) observations show heterogeneous composition, presence of intermediate and basic soil types and pyroxene, *Met. Planet. Sci.*, **37**, 1255-1268.
3. Sprague, A.L., L.K. Deutsch, J. Hora, G.G. Fazio, B. Ludwig\*, **J. Emery\***, W.F. Hoffmann, 2000, Mid-Infrared (8.1 – 12.5  $\mu\text{m}$ ) Imaging of Mercury, *Icarus*, **147**, 421-432.
2. **Emery, J.P.\***, A.L. Sprague, F.C. Witteborn, J.E. Colwell, R.W.H. Kozłowski, D.H. Wooden, 1998, Mercury: Thermal Modeling and Mid-infrared (5-12  $\mu\text{m}$ ) Observations, *Icarus*, 136, 104-123.
1. Mendillo, M., **J. Emery\***, B. Flynn, 1997, Modeling the Moon's Extended Sodium Cloud as a Tool for Investigating Sources of Transient Atmospheres, *Adv. Space Res.*, **19**, 1577-1586.

#### **Review Chapters and Conference Proceedings** (peer reviewed)

- Emery, J.P.**, F. Marzari, A. Morbidelli, L.M. French, T. Grav 2015. The complex history of Trojan asteroids. In *Asteroids IV* (eds. P. Michel, F. DeMeo, W. Bottke), Univ. Ariz. Press, Tucson, *submitted*.
- Delbò, M., M. Mueller, **J.P. Emery**, B. Rozitis, M.T. Capria 2015. Thermophysical modeling of asteroid surfaces. In *Asteroids IV* (eds. P. Michel, F. DeMeo, W. Bottke), Univ. Ariz. Press, Tucson, *submitted*.
- Rivkin, A.S., H. Campins, **J.P. Emery**, E.S. Howell, J. Licandro, D. Takir, F. Vilas 2015. Astronomical observations of volatiles on asteroids. In *Asteroids IV* (eds. P. Michel, F. DeMeo, W. Bottke), Univ. Ariz. Press, Tucson, *submitted*.
5. **Emery, J.P.** 2008. Physical properties of small Solar System bodies and implications for formation and evolution of planetary systems. In *New Horizons in Astronomy: Frank N. Bash Symposium 2007* (eds. A. Frebel, J. Maund, J. Shen, M. Siegel), Astron. Soc. Pacific Conf. Series. 393, 3-18.
  4. Barucci, M.A., M.E. Brown, **J.P. Emery**, F. Merlin 2008. Composition and surface properties of transneptunian objects and Centaurs. In *The Solar System Beyond Neptune* (ed. M.A. Barucci, H. Boehnhardt, D.P. Cruikshank, A. Morbidelli), Univ. Ariz. Press, Tucson, 143-160.
  3. Dotto, E., **J.P. Emery**, M.A. Barucci, A. Morbidelli, D.P. Cruikshank 2008. De Troianis: The Trojans in the planetary system. In *The Solar System Beyond Neptune* (ed. M.A. Barucci, H. Boehnhardt, D.P. Cruikshank, A. Morbidelli), Univ. Ariz. Press, Tucson, 383-396.
  2. Cruikshank, D.P., M.A. Barucci, **J.P. Emery**, Y.R. Fernandez, W.M. Grundy, K.S. Noll, J.A. Stansberry 2007. Physical properties of Trans-Neptunian objects. In *Protostars and Planets V*. (B. Reipurth, D. Jewitt, K. Keil, Eds.), Univ. Ariz. Press, Tucson, 879-891.
  1. Lisse, C.M., M.V. Sykes, D.E. Trilling, **J.P. Emery**, et al. 2008. Planetary science goals for the Spitzer warm era. In *The Science Opportunities for the Warm Spitzer Mission Workshop* (ed. L.J. Storrie-Lombardi, N.A. Silberman), Am. Inst. Phys. Conf. Proc. 943, 184-212.

#### **Paper Presentations at Professional Meetings** (asterisk denotes student author)

### Invited

- Emery, J.P.** (March 2014) OSIRIS-REx asteroid sample return mission. Georgia Tech; Dept of Earth and Atmospheric Sciences colloquium speaker.
- Emery, J.P.**, S. Lindsay (Dec 2013). Determining Mineralogy and Texture of Asteroid Surfaces from Mid-Infrared Spectroscopy. *Am. Geophys. Union, Fall Meeting 2013*, abstract #P22A-02.
- Emery, J.P.**, R. Cartwright\*, A.S. Rivkin, D.E. Trilling (Sep 2013) Spectral properties of Uranian moons. *Uranus beyond Voyager 2: From recent advances to future missions*. Observatoire de Paris, Meudon, France. **[INTERNATIONAL]**
- Emery, J.P.** (Jun 2013) Compositions of Primitive Asteroids: Constraints from 2 – 4  $\mu\text{m}$  Spectroscopy. *Asteroid Spectroscopy in Support of Gaia*. Observatoire de Cote d'Azur, Nice, France. **[INTERNATIONAL]**
- Emery, J.P.** (May 2013) Physical Properties of Trojan Asteroids. *International Workshop on Trojan Space Missions*, Observatoire de Cote d'Azur, Nice France. **[INTERNATIONAL]**
- Emery, J.P.** (Jun 2012) Ices and Organics in Asteroids and Comets. *Ices and organics in the inner Solar System*. UCLA iPLEX workshop.
- Emery, J.P.** (May 2012) Small bodies roundtable. *Spacecraft Exploration of Small Bodies*. Keck Institute for Space Science, Caltech.
- Emery, J.P.** (Jan 2012) Thermal Characterization of Surfaces of Small Asteroids. *Physical Characterization of MarcoPolo-R Targets*. Observatoire de Paris, Meudon, France. **[INTERNATIONAL]**
- Emery, J.P.** (Nov 2011) Northern Arizona University; Physics Dept Colloquium Speaker.
- Emery, J.P.** (Nov 2011) University of Hawaii; Astronomy Dept Colloquium Speaker.
- Emery, J.P.** (Sept 2011) Water in Asteroids. *Workshop on Water in Asteroids and Meteorites*, Observatoire de Paris, Paris, France. **[INTERNATIONAL]**
- Emery, J.P.** (Aug 2011) Themis family asteroids, *Themis Family Workshop*, Bear Fight Institute, Winthrop, WA.
- Emery, J.P.** (Apr 2011) Searches for organics on outer Main Belt asteroids, Trojan asteroids, and Kuiper Belt objects. *Astrobiology in the early Solar System*, Observatoire de Paris, Meudon, France. **[INTERNATIONAL]**
- Emery, J.P.**, C.M. Dalle Ore, D.P. Cruikshank, Y.R. Fernandez, D.E. Trilling, J.A. Stansberry, M.E. Brown, W.C. Fraser, D.M. Wright\* (May/June 2010) Reflectances of KBOs and Centaurs a  $\lambda > 2.5\mu\text{m}$ : Implications for organics. *Organic material in planetary systems: Nature or nurture?*, Observatoire de Paris, Meudon, France. **[INTERNATIONAL]**
- Emery, J.P.** (Nov 2009) University of Central Florida; Physics Dept Colloquium Speaker.
- Emery, J.P.** (Aug 2009) University of Tennessee; Earth & Planetary Sciences Dept Colloquium Speaker.
- Emery, J.P.**, L.F. Lim, F. Marchis, D.P. Cruikshank 2008. Asteroids and Centaurs: Silicate emission in the thermal infrared. *IAU Symposium: Asteroids, Comets, Meteors 2008*.
- Emery, J.P.**, J.A. Stansberry, Y.R. Fernandez 2008. Observations of small bodies with the Spitzer Space Telescope. *37<sup>th</sup> COSPAR Scientific Assembly*. **[INTERNATIONAL]**
- Emery, J.P.**, D.P. Cruikshank, L.F. Lim, F. Marchis 2008. Spitzer emissivity spectra of asteroids and icy bodies: Solar System context for studies of asteroid and Kuiper belts in other planetary systems. *Astrobiology Science Conference 2008*.
- Emery, J.P.** (July 2008) SETI Institute Colloquium Speaker
- Emery, J.P.** (Sept 2008) Instituto Astrofisica de Canarias (Canary Islands) Colloquium Speaker **[INTERNATIONAL]**
- Emery, J.P.** 2008. Physical properties of small Solar System bodies and implications for formation and evolution of planetary systems. *Univ. Texas Frank N. Bash Symposium*.

### Contributed (since 2009)

- Cartwright, R.J.\*, **J.P. Emery**, A.S. Rivkin, D.E. Trilling 2014. Distribution of CO<sub>2</sub> ice on the Large Uranian Moons: Evidence for Charged Particle Bombardment?, *Workshop on the Study of the Ice Giant Planets*, Columbia, MD, abstract #2007
- MacLennan, E.M.\* and **J.P. Emery** 2014. A novel method for thermal inertia determination. *Asteroids, Comets, Meteors*, June 30-July 4, Helsinki, Finland **[International]**
- Emery, J.P.**, Y. Fernandez, M. Kelley, K. Warden\*, C. Hergenrother, D. Lauretta, M. Drake, H. Campins, J. Ziffer. Thermal infrared observations and thermophysical characterization of the OSIRIS-REx target asteroid (101955) Bennu. *Asteroids, Comets, Meteors*, June 30-July 4, Helsinki, Finland **[International]**
- Rozitis, B.\*\*\*, E. MacLennan\*, **J.P. Emery**, S. Green 2014. Thermal inertia and bulk density of near-Earth asteroids. *Asteroids, Comets, Meteors*, June 30-July 4, Helsinki, Finland **[International]**
- Ness, R.G.\*\* and **J.P. Emery** 2014. Thermal Inertia Estimates of Four Near-Earth Asteroids from Spitzer Space Telescope Spectral Observations. *45<sup>th</sup> LPSC*, abstract #1430.
- Lucas, M.P.\* and J.P. Emery 2014. Asteroid-Meteorite Connections in the Hungaria Background Population: Correlations with Primitive Achondrites? *45<sup>th</sup> LPSC*, abstract #1766
- Takir, D., **J.P. Emery**, H.Y. McSween 2014. Toward an Understanding of Phyllosilicate Mineralogy in the Outer Main Belt Region. *45<sup>th</sup> LPSC*, abstract #2379.
- Lindsay, S.S.\*\*\*, **J.P. Emery**, F. Marchis, E. Enriquez, M. Assafin 2014. Mineralogy of S-complex Asteroids using Reflectance and Thermal Infrared Spectroscopy. *AGU Fall Meeting*, abstract #P23A-1765.
- {Co-author on 6 others in 2014}
- Lindsay, S.S.\*\*\*, **J.P. Emery**, F. Marchis, J. Enriquez, M. Assafin 2013. A Spectroscopic and Mineralogical Study of Multiple Asteroid Systems. *45<sup>th</sup> DPS*, abstract #112.04.
- Lucas, M.P.\*, and **J.P. Emery** 2013. Building Blocks of the Terrestrial Planets: Mineralogy of Hungaria Asteroids. *45<sup>th</sup> DPS*, abstract #205.06.
- Pinilla-Alonso, N.\*\*\*, **J.P. Emery**, D. Trilling, D.P. Cruikshank, Y. Fernandez, C.M. Dalle Ore, J.A. Stansberry 2013. Preliminary Results On The Surface Composition Of Centaurs From IRAC/Spitzer Photometry. *45<sup>th</sup> DPS*, abstract #414.05.
- MacLennan, E.\* and **J.P. Emery** 2013. Constraints on Spin Axis and Thermal Properties of Asteroids in the WISE Catalog. *45<sup>th</sup> DPS*, abstract #208.19.
- J.P. Emery**, R.G. Ness\*\*, M.P. Lucas 2013. A Search for Volatiles and Spectral Variation on the Surfaces of Trojan Asteroids. *45<sup>th</sup> DPS*, abstract #208.31.
- Pinilla-Alonso, N\*\*\*, **J.P. Emery**, D.P. Cruikshank 2013. IRAC/Spitzer photometry of the Pluto-Charon System. *The Pluto System on the Eve of Exploration by New Horizons: Perspectives and Predictions*, July 22-26 2013, Laurel, MD.
- MacLennan, E.M.\*, **J.P. Emery**, D.E. Trilling 2013. Thermal Inertia of Asteroids from Multi-Epoch Observations by WISE. *44<sup>th</sup> LPSC*, abstract #2757.
- Lucas, M.P.\*, **J.P. Emery** 2013. Surface Mineralogy of Mars-Crossing Asteroid 1747 Wright: Analogous to the H Chondrites. *44<sup>th</sup> LPSC*, abstract #1813.
- Beddingfield, C.B.\*, **J.P. Emery**, D.M. Burr 2013. Testing for a Contractual Origin of Janiculum Dorsa on the Northern, Leading Hemisphere of Saturn's Moon Dione. *44<sup>th</sup> LPSC*, abstract #1301.
- Cartwright, R.\*, **J.P. Emery**, A.S. Rivkin, D.E. Trilling 2013. Near-Infrared Spectroscopy of Uranian Satellites: Searching for Carbon Dioxide Ice on Umbriel, Titania, and Oberon. *44<sup>th</sup> LPSC*, abstract #1195.

{Co-author on 20 others in 2013}

**Emery, J.P.**, M.S. Kelley, Y.R. Fernandez, C.W. Hergenrother, K.T. Crane, J. Ziffer, H. Campins, D.S. Lauretta, M.J. Drake 2012. Thermal and Physical Characterization of the OSIRIS-REX Target Asteroid (101955) 1999 RQ36. *44<sup>th</sup> DPS*, abstract #102.05.

Ness, R.\*\* , **J.P. Emery**. Near Infrared Spectroscopy of the Trojan Asteroids: Testing the Distribution of Spectral Types in the L4 and L5 swarms. *44<sup>th</sup> DPS*, abstract #110.12.

Takir, D.\* , **J.P. Emery**, R.N. Clark, H.Y. McSween, N. Pearson 2013. Comparative Analyses of Carbonaceous Chondrites and Additional Outer Main Belt Asteroids Using Near-Infrared (2-4  $\mu$ m) Spectroscopy. *44<sup>th</sup> DPS*, abstract #202.06.

Cartwright, R.\* , **J.P. Emery**, A.S. Rivkin, D.E. Trilling 2013. Spitzer/IRAC Photometry Of The Four Largest Uranian Satellites. *44<sup>th</sup> DPS*, abstract #112.13.

Lucas, M.\* , **J.P. Emery**, D. Takir 2013. Dunites In The Sky? VNIR Spectra Of Six Suspected A-class Asteroids. *44<sup>th</sup> DPS*, abstract #110.11.

Wright, D.M.\* , **J.P. Emery**, D. Cruikshank, C. Dalle Ore, Y. Fernandez, J. Stansberry, M. Brown, W. Fraser, R. McGuire, D. Trilling 2013. Near-infrared Photometric Search For Volatile Ices On The Surfaces Of Cold Classical Kuiper Belt Objects. *44<sup>th</sup> DPS*, abstract #405.03.

**Emery, J.P.**, L.F. Lim, N.A. Moskovitz 2012. The near-Earth encounter of 2005 YU55: Thermal inertia and inferred surface properties. *Asteroids, Comets, Meteors*, abstract #6453.

[INTERNATIONAL]

Takir, D.\* , H.Y. McSween, **J.P. Emery**, R.N. Clark, N. Pearson 2012. Constraints on the nature and degree of aqueous alteration in outer Main Belt asteroids. *43<sup>rd</sup> LPSC* abstract #1354.

Beddingfield, C.B.\* , D.M. Burr, **J.P. Emery** 2012. Evidence for a listric extensional fault system bounding Arden Corana on Uranus' moon Miranda. *43<sup>rd</sup> LPSC* abstract #1366.

Crane, K.T.\*\* , **J.P. Emery**, L.F. Lim 2012. Shape and thermal modeling of a selection of M-type asteroids. *43<sup>rd</sup> LPSC* abstract #1425.

{Co-author on 20 others in 2012}

**Emery, J.P.** and L.F. Lim (Oct 2011) Thermal Emission Spectroscopy of M-type Asteroids. *43<sup>rd</sup> DPS* , abstract #1438 [INTERNATIONAL].

Takir, D.\* , J.P. Emery, R.N. Clark, H.Y. McSween, Jr. 2011. Implications of infrared reflectance spectroscopy of CM/CI carbonaceous chondrites for outer Main Belt asteroids, *43<sup>rd</sup> DPS*, abstract #529 [INTERNATIONAL].

Takir, D.\* , **J.P. Emery**, H.Y. McSween 2011. Outer Main Belt asteroids: Identification and distribution of four spectral groups. *42<sup>nd</sup> LPSC*, abstract #1182.

Dave, R.\* and **J.P. Emery** 2011. Near-Earth asteroid thermal modeling [NEATM] and thermophysical modeling of 10 low albedo NEAs using Infrared Spectrograph (IRS) on NASA's Spitzer space telescope. *42<sup>nd</sup> LPSC*, abstract #2583.

**Emery, J.P.**, W.M. Grundy, A. Lunsford, C.A. Hibbitts, C.B. Phillips, R.M.E. Mastrapa 2011. New Horizons/LEISA Observations of the icy Galilean satellites. *42<sup>nd</sup> LPSC*, abstract#2163.

Bramson, A.M.\* , C.B. Phillips, **J.P. Emery** 2011. A search for ongoing geologic activity on Jupiter's satellites. *42<sup>nd</sup> LPSC*, abstract #1606.

Marchis, F., J.E. Enriquez\* , **J.P. Emery** 2011. NIR spectroscopic study of multiple asteroid systems. *42<sup>nd</sup> LPSC*, abstract #2035.

{Co-author on 10 others in 2011}

Dave, R.\* , **J.P. Emery**, D. Cruikshank, M. Mueller, M. Delbo, D.E. Trilling, M. Mommert\* 2010. Thermal emission spectroscopy (5.2 to 38 microns) and analysis of 10 near-Earth asteroids. *42<sup>nd</sup> DPS*, abstract #13.24.

Wright, D.\* , **J.P. Emery**, D.P. Cruikshank, C. Dalle Ore, Y. Fernandez, J. Stansberry, D. Trilling 2010. Composition of ices on the surfaces of KBOs 136108 Haumea and 136572 Makemake.



42<sup>nd</sup> DPS, abstract #40.06.

Takir, D.\* and **J.P. Emery** 2010. Near-infrared spectroscopy of 12 outer Main Belt asteroids. 42<sup>nd</sup> DPS, abstract #53.09.

**Emery, J.P.**, C.A. Thomas, D.E. Trilling, R. Dave\*, M. Delbo, M. Mueller 2010. Near-infrared spectroscopy of NEOs: Characterization of targets of the ExploreNEOs (Spitzer) program. 42<sup>nd</sup> DPS, abstract #13.20.

**Emery, J.P.**, C.M. Dalle Ore, D.P. Cruikshank, Y.R. Fernandez, D.E. Trilling, J.A. Stansberry, M.E. Brown, W.C. Fraser, D.M. Wright\* (June/July 2010) Reflectances of KBOs and Centaurs at  $\lambda > 2.5 \mu\text{m}$ : Implications for organics. *TNO 2010: Dynamical and physical properties of Trans-neptunian objects*. Philadelphia, PA.

**Emery, J.P.**, and 7 others 2010. Thermophysical Characterization of Potential Spacecraft Target (101955) 1999 RQ36. 41<sup>st</sup> LPSC abstract #2282.

**Emery, J.P.**, D.P. Cruikshank, L. Lim, A.S. Rivkin, F. Marchis 2010. Advances in Solar System science: Research enabled by 2.5 – 25  $\mu\text{m}$  spectroscopy with SOFIA. *SOFIA Workshop: Scientific Opportunities for New Instrumentation*, Assilomar, CA.  
{Co-author on 15 others in 2010}

**Emery, J.P.**, and 15 others 2009. ExploreNEOS: The Warm Spitzer NEO Survey. *AGU Fall Meeting*.

Reiss, A.E.\*, F. Marchis, **J.P. Emery** 2009. Visible-Wavelength Integrated Spectroscopy of Binary Asteroids. *AGU Fall Meeting*.

Takir, D.\*, **J.P. Emery** 2009. Near-infrared spectroscopy of outer Main Belt asteroids. 41<sup>st</sup> AAS/DPS meeting, abstract #34.03. **[INTERNATIONAL]**

**Emery, J.P.**, D.P. Cruikshank, D.M. Burr 2009. Color Trends of Trojan Asteroids Suggest Two Compositional Groups. 41<sup>st</sup> AAS/DPS meeting, abstract #32.10. **[INTERNATIONAL]**

**Emery, J.P.**, D.P. Cruikshank, D.M. Burr 2009. Near-Infrared Spectroscopy of Trojan Asteroids: Evidence for Two Compositional Groups. 40<sup>th</sup> LPSC, abstract #1442.  
{Co-author on 14 others in 2009}

## Teaching Experience

3-7 Nov 2014 – Thermal observations of Asteroids (Advanced course – XIX Ciclo de Cursos Especiais, Observatório Nacional, Brazil)

Fall 2014 – GEOL 490/590 (Planetary Geodynamics, 9 students)

Fall 2013 – GEOL 680 (graduate seminar – Small bodies of the Solar System, 6 students)

Spring 2013 – GEOL 104 (Exploring the planets, 90 students)

Fall 2012 – GEOL 490/590 (Planetary Geodynamics, 5 students)

Spring 2012 – GEOL 104 (Exploring the planets, 105 students)

Fall 2011 – GEOL 680 (graduate seminar – Geology of the outer Solar System, 6 students)

Spring 2010, Spring 2012, Fall 2013 – Independent study

Spring 2011 – guest lecturer at Univ. Tennessee for GEO 104 (Exploring the planets)

Spring 2004, 2006, 2008 – guest lecturer at Santa Clara Univ. for Intro to the Solar System

Fall 1998 to Spring 2002 – GTA for several different planetary science courses

## Students Supervised

### PhD

Driss Takir (Spr 2009 – Spr 2013) *Implications of Aqueous Alteration in CM Carbonaceous Chondrites for Outer Main Belt Asteroids*. Co-advised with Prof. Hap McSween. Currently in post-doc position at Ithaca College.

Michael Lucas (Fall 2011 – present) *Building Blocks of Terrestrial Planets: Mineralogy of Hungaria Asteroids*. Awarded Oscar Ashley research fellowship from UT.

Richard Cartwright (Fall 2011 – present) *Processes on icy satellites: Radiolysis and dust accumulation on Uranian satellites, and icy cobble production on the Saturnian moon Titan*. Co-advised with Prof. Devon Burr.

Eric MacLennan (Fall 2012 – present) *Factors Influencing Asteroid Regolith: An Observational Investigation*. Awarded Oscar Ashley research fellowship from UT.

### Masters

Riddhi Dave (Spr 2010 – Sum 2011) *Thermal Emission Analysis of 10 Near-Earth Asteroids*. Accepted into PhD program in geophysics at Univ. of Houston.

Daine Wright (Spr 2011 – Spr 2013) *Reflectance spectrophotometry of Kuiper Belt objects*. Currently employed at Oak Ridge National Lab (remote sensing).

Nate Wigton (Fall 2013 – present) *Spectral search for water on near-Earth asteroids*.

### Undergraduate

Chad Melton (Fall 2014 – present) *Compositions of Kuiper Belt Objects*. Expected graduation, Spr 2016.

Richard Ness (Fall 2011 – present) *Asteroid spectroscopy*. Expected graduation, Spr 2014.

Katherine Moore (Sum 2011 – Fall 2012) *Reduction of Spitzer space telescope data*.

Kelsey Crane (Spr 2010 – Spring 2012) *Shape modeling of asteroids*. Awarded UT summer research fellowship (2011). Graduate school at Purdue Univ.

Emily Lea (Spr 2010 – Spr 2011) *Reduction of Spitzer space telescope data*.

Daine Wright (Fall 2009 – Fall 2010) *Surface composition of Haumea and Makemake*. Won first place in university-wide research symposium. Graduated Fall 2010, admitted to Master's program in Earth & Planetary Science at UT.

Allie Bramson (Summer 2010) *A search for ongoing geologic activity on Jupiter's satellites*. Co-advised with Cynthia Phillips as part of SETI Institute Research Experience for Undergraduates (REU) program. Currently in graduate school at Univ. Arizona.

Bill Freeman (Summer 2010) *Investigation of the origin of 2008 TC3 through spectral analysis of asteroids and lab spectra of Almahatta Sitta and minerals*. Co-advised with Janice Bishop and Franck Marchis as part of SETI Institute REU program.

Abby Reiss (Summer 2009) *Visible wavelength integrated spectroscopy of binary asteroids*. Co-advised with Franck Marchis as part of SETI Institute REU program.

Heather Stewart (Summer 2008) *Compositional investigation of Trojan asteroids using space- and ground-based observations*. Co-advised with Franck Marchis as part of SETI Institute REU program. Currently in PhD program in physics at Catholic Univ.

Stephen Im (Jan – Aug 2008) *Thermal emission analysis of primitive asteroids*. Advised as part of Foothill-De Anza community college internship program. Currently a research assistant at NASA Ames Research Center, applying to graduate school for engineering.

Kathy Kornei (Summer 2007) *Eclipse reappearance of Io: Time resolved spectroscopy*. Advised as part of NASA Ames summer research program. Continued on to a PhD in astronomy at UCLA.

### **PhD and Master's Committees**

Keenan Golder (Spr 14 – present) – PhD, Earth & Planet Sci. – *TBD*. Expected graduation, Fall 2017.

Oliver Hamil (Spr 14 – present) – PhD, Physics – *Braking Index of Isolated Pulsars*. Expected graduation, Spr 2015.

Chris Wetteland (Spr 14 – present) – PhD, Earth & Planet Sci. – *Radiation processing of planetary materials*. Expected graduation, Spr 2016.

Chris Tate (Fall 2013 – present) – PhD, Physics – *Remote Neutron Spectroscopy Applications on Mars and Earth*. Expected graduation, spring 2015.

Nicole Lunning (Spr 13 – present) – PhD, Earth & Planet Sci. - *Vesta from Mantle to Regolith: Insights into Processes on Vesta from Howardites and Carbonaceous Chondrites*. Expected graduation, Spr 2016.

Ashley Dameron (Fall 2012 – present) – MS, Earth & Planet Sci. – *Using Slope Angles of Inner Walls of European Double Ridges to Test Proposed Models of Formation*. Expected graduation, Fall 2014.

Chloe Beddingfield (Spr 2011 – present) – PhD, Earth & Planet Sci. – *Tectonics and Cratering on Icy Satellites*. Expected graduation, spring 2014.

Helena Pais (Spr 2011 – Spr 2013) – PhD, Physics – *Three dimensional equation of state for core-collapse supernova matter*. Expected graduation, spring 2014.

Sarah Drummond (Fall 2011 – Spr 2012) – Master's, Earth & Planet Sci. – *Drainage Networks Indicate Tensional Tectonism on Titan*.

Caitlyn Williams (Spr 2010 – Spr 2011) – Master's, Earth & Planet Sci. – *Improving Ground Penetrating Radar Surveying Efficiency for Archaeological Geophysics*.

Sheri Singerling (Fall 2010 – Spr 2012) – Master's, Earth & Planet Sci. – *The Search for Pyroclastic Material in Howardites: Evidence of Explosive Volcanism on Vesta*.

### **Post-doctoral Research Associates Supervised**

Sean Lindsay (July 2012 – July 2014) – Mineralogy of primitive asteroids from mid-infrared thermal emission spectroscopy. Mineralogy of multiple asteroid systems (i.e., asteroids with moons) from near-infrared reflectance spectroscopy.

Noemi Pinilla-Alonso (Aug. 2012 – present) – Compositional analysis of Kuiper Belt Objects from reflectance measurements in the 3-9  $\mu\text{m}$  spectral range.

Ben Rozitis (Jan. 2014 – present) – Developing a thermal model for the OSIRIS-REx mission. Thermophysical analysis of asteroids.