

SETI INSTITUTE

Activity Report Q3 2018

Peer-Reviewed Publications (In Press and Published)

1. Andrews H, **Peeters E**, Tielens AGGM, and Okada O (2018). Whipping IC63/IC59 Astron. Astrophys., in press.
2. Barge LM, FC Krause, J-P Jones, K Billings, and **P Sobron** (2018). Geoelectrodes and Fuel Cells for Simulating Hydrothermal Vent Environments, *Astrobiology*, 18: 1147-1158.
3. Bertrand T, Forget F, **Umurhan OM**, Grundy WM, Schmitt B, et al. (2018). The nitrogen cycles on Pluto over seasonal and astronomical timescales. *Icarus* 309, 277-296.
4. **Beyer RA**, O Alexandrov, and S McMichael (2018) The Ames Stereo Pipeline: NASA's open source software for deriving and processing terrain data, *Earth and Space Science* available online, <https://doi.org/10.1029/2018EA000409>
5. Bevington, J., C. P. McKay, A. Davila, I. Hawes, Y. Tanabe, and **D. T. Andersen** (2018), The thermal structure of the anoxic trough in Lake Untersee Antarctica, *Antarct Sci. (In Press)*.
6. Cady S, **JR Skok** et al. (2018). Siliceous Hot Spring Deposits: Why They Remain Key Astrobiological Targets, In: *From Habitability to Life on Mars*, (Cabrol, N and E Grin, eds.) Elsevier, 179-210.
7. **Cartwright RJ**, Emery JP, Lucas M, Pinilla-Alonso N, Rivkin AS, and Trilling DE (2018). Red material on the large moons of Uranus: Dust from the irregular satellites? *Icarus* 314, 210-231. <https://doi.org/10.1016/j.icarus.2018.06.004>
8. Cockell, C.S, et. 49 al., including **Bonaccorsi, R.**, 2018 *Subsurface scientific exploration of extraterrestrial environments (MINAR 5): analogue science, technology and education in the Boulby Mine, UK*, International Journal of Astrobiology, <https://doi.org/10.1017/S1473550418000186>
9. **Cody AM** and Hillenbrand LA (2018). The many-faceted light curves of young disk-bearing stars in upper Sco – Oph observed by K2 Campaign 2. *Astron. J.* 156, article id.71, 16pp.
10. **Cuk M**, Dones L, Nesvorny D and Walsh KJ (2018). Secular resonances between Iapetus and the giant planets. Accepted to MNRAS, <https://arxiv.org/abs/1809.09072>.
11. Dharmawardena TE, Kemper F, Scicluna P, Wouterloot JG, Trejo A, et al., including **Camí J** (2018). Extended dust emission from nearby evolved stars. *MNRAS* 479, 536-552.
12. Earle, AM, W. Grundy, C.J.A. Howett, C.B. Olkin, A.H. Parker, et al. including **RA Beyer** and **CM Dalle Ore** (2018). Methane distribution on Pluto as mapped by the New Horizons Ralph/MVIC instrument, *Icarus* (314), Pages 195-209, <https://doi.org/10.1016/j.icarus.2018.06.005>.

13. Elyajouri M, Lallement R, Cox NLJ, **Cami J**, Cordiner MA, et al. (2018). The EDIBLES survey. III. C₂-DIBS and their profiles. *Astron. Astrophys.* 616, id.A143, 19pp.
14. Esposito, Thomas M., Gaspard Duchêne, Paul Kalas, Malena Rice, Élodie Choquet, Bin Ren, Marshall D. Perrin, et al. including **F. Marchis**, 2018. Direct Imaging of the HD 35841 Debris Disk: A Polarized Dust Ring from Gemini Planet Imager and an Outer Halo from HST/STIS. *The Astronomical Journal, Volume 156, Issue 2, article id. 47, 16 pp. (2018)*. 156. doi:10.3847/1538-3881/aacbc9.
15. Echeverría-Vega, A., C. S. Demergasso, G. Chong, A. E. Serrano, M. Guajardo, O. Encalada, V. Parro, Y. Blanco, Luis Rivas, M. Moreno-Paz, J. Luque, K. C. Rose, **N. A. Cabrol**, Watershed-induced limnological and microbial status in two oligotrophic Andean lakes exposed to the same climatic scenario, 2018, *Frontiers in Microbiology*, section Aquatic Microbiology, 296225.
16. Furlan E, Ciardi DR, Cochran WD, Everett ME, Latham DW, et al., including **Huber D** (2018). The Kepler follow-up observation program. II. Stellar parameters from medium- and high-resolution spectroscopy. *Astrophys. J.* 861, article id. 149, 22pp.
17. Gibson, J. L., R. E. Stencel, W. Ketzbeck, J. Barentine, **J. Coughlin**, R. Leadbeater, and G. Saurage. Structure in the disc of epsilon Aurigae - analysis of ARCES and TripleSpec spectra from the 2010 eclipse. *MNRAS*, **479**:2161–2182, September 2018. doi: 10.1093/mnras/sty1552
18. **Gulick V., Glines N., Hart, S., Freeman P.** (2018). Geomorphological Analysis of Gullies on the Central Peak of Lyot Crater, Mars. *GSL Special Publications London: Martian Gullies and their Earth Analogues*, accepted.
19. Grunblatt SK, **Huber D**, Gaidos E, Lopez ED, Barclay T, et al. (2018). Do close-in giant planets orbiting evolved stars prefer eccentric orbits? *Astrophys J. Lett.* 861, article id. L5, 5pp.
20. **Hargitai H., V. Gulick, N. Glines** (2018). Paleolakes of Northeast Hellas: Precipitation, Groundwater-fed, and Fluvial Lakes in the Navua-Hadriacus-Ausonia Region, *Astrobiology*18 (12).
21. **Hargitai, H. and Gulick, V.** (2018). Late Amazonian Aged Channel-and-Island Systems East of Olympus Mons, Mars. In: *Dynamic Mars*, Elsevier.
22. **Hargitai H., V. Gulick, N. Glines** 2018. The Geology of the Navua Valles Region of Mars. *Journal of Maps*, accepted July 2, 2018.
23. H.E.S.S. Collaboration, including **Huber D** (2018). The starburst galaxy NGC 253 revisited by H.E.S.S. and Fermi-LAT. *Astron. Astrophys.* 617, id. A73, 7pp.
24. Hobley DEJ, Moore JM, Howard AD, and **Umurhan OM** (2018). Formation of metre-scale bladed roughness on Europa's surface by ablation of ice. In press, *Nature Geoscience*.

25. IceCube Collaboration, including **Huber D** (2018). Multimessenger observations of a flaring blazar coincident with high-energy neutrino IceCube-170922A. *Science* 361, id. eaat1378.
26. Jencson JE, Kasliwal MM, Adams SM, Bond HE, Lau RM, et al., including **Cody AM** (2018). SPIRITS 16tn in NGC 3556: a heavily obscured and low-luminosity supernova at 8.8 pc. *Astrophys. J.* 863, article id.20, 20pp.
27. **Jin, M.**, Petrosian, V., Liu, W., Nitta, N. V., Omodei, N., Rubio da Costa, F., Effenberger, F., Li, G., Pesce-Rollins, M., Allafort, A., & Manchester, W. B. (2018) "Probing the Puzzle of Behind-the-Limb Gamma-ray Flares: Data-driven Simulations of Magnetic Connectivity and CME-driven Shock Evolution", *ApJ*, in press
28. Kastner JH, Qi C, Dickson-Vandervelde DA, Hily-Blant P, Forveille T, et al., including **Gorti U** (2018). A subarcsecond ALMA molecular line imaging survey of the circumbinary, protoplanetary disk orbiting V4046 Sgr. *Astrophys. J.* 863, article id. 106, 14pp.
29. Kong F, M Zheng, B Hu, A Wang, N Ma, and **P Sobron** (2018). DLT Saline Playa in an Hyperarid Region on Tibet Plateau-I, *Evolution and Environments Astrobiology*, Published Online:24 May 2018 <https://doi.org/10.1089/ast.2018.1830>
30. Liu, W., **Jin, M.**, Downs, C., Ofman, L., Cheung, M. C. M., & Nitta, N. V. (2018) "A Truly Global Extreme Ultraviolet Wave from the SOL2017-09-10 X8.2+ Solar Flare-Coronal Mass Ejection", *ApJ*, **864**, 24
31. Lyra W and **Umurhan OM** (2018). The initial conditions for planet formation: Turbulence driven by hydrodynamical instabilities in disks around young stars. Review accepted for publication in *PASP*. 30pp.
32. Maragkoudakis A, Ivkovich N, **Peeters E**, Stock DJ, Hemachandra D, and Tielens AGGM (2018). PAHs and star formation in the HII regions of nearby galaxies M33 and M83, *MNRAS*, accepted.
33. Mogul, R., Vaishampayan, P., Bashir, M., McKay, C., Schubert, K.E., **Bonaccorsi, R**, et. al., 2017. *Microbial Community and Biochemical Dynamics of Biological Soil Crusts Across a Gradient of Surface Coverage in the Central Mojave Desert*, *Front. Microbiol.*, 23 October 2018 *Terrestrial Microbiology*. *Front. Microbiol.*, 23 October 2018 <https://doi.org/10.3389/fmicb.2017.01974>
34. Moore, JM, WB McKinnon, DP Cruikshank, GR Gladstone, JR Spencer et al. including **MR Showalter, RA Beyer, OL White, CL Chavez, and OM Umurhan** (2018). Great Expectations: Plans and Predictions for New Horizons Encounter with Kuiper Belt Object 2014 MU69 ('Ultima Thule'), *GRL*, doi: 10.1029/2018GL078996.
35. Pajuelo, M., B. Carry, F. Vachier, M. Marsset, J. Berthier, P. Descamps, W. J. Merline, et al. including **F, Marchis** 2018. Physical, spectral, and dynamical properties of asteroid

- (107) Camilla and its satellites. *Icarus*, Volume 309, p. 134-161. 309: 134–161. doi:10.1016/j.icarus.2018.03.003.
36. **Rho J**, Geballe TR, Banerjee DPK, Dessart L, Evans A and Joshi V (2018). Near-infrared spectroscopy of supernova 2017eaw in 2017: Carbon monoxide and dust formation in a type-II supernova. *Astrophys. J* 864, article id.L20, 6 pp.
37. **Rho J**, Gomez HL, Boogert A, Smith MWL, Lagage P-O, et al., including **Peeters E** and **Cami J** (2018). A dust twin of Cas A: cool dust and 21 μm silicate dust feature in the supernova remnant G54.1+0.3. *MNRAS* 479, 5101-5123.
38. Schenk, PM, **Ross A. Beyer**, WB McKinnon, JM Moore, JR Spencer, et al. including **Oliver W. White** and **Orkan M. Umurhan** (2018), Basins, Fractures and Volcanoes: Global Cartography and Topography of Pluto from New Horizons, *Icarus*, available online, <https://doi.org/10.1016/j.icarus.2018.06.008>.
39. Schenk, PM, **R. A. Beyer**, WB McKinnon, JM Moore, JR Spencer, et al. including **Oliver W. White** and **Orkan M. Umurhan** (2018), Breaking up is hard to do: Global cartography and topography of Pluto's mid-sized icy Moon Charon from New Horizons, *Icarus*, available online, <https://doi.org/10.1016/j.icarus.2018.06.010>.
40. **Sobron P**, A Wang, DP Mayer, J Bentz, F Kong, and M Zheng (2018). DLT Saline Playa in a Hyperarid Region of Tibet Plateau-III: Correlated multi-scale surface mineralogy and geochemistry survey, *Astrobiology*, in press, Published Online:10 Aug 2018 <https://doi.org/10.1089/ast.2017.1777>
41. Socia, W.F., Q. J. Welsh, D. R. Short, J. A. Orosz, R. J. Angione, G. Windmiller, **D. A. Caldwell**, and N. M. Batalha. KIC 9832227: Using Vulcan Data to Negate the 2022 Red Nova Merger Prediction. *ApJ*, **864**:L32, September 2018. doi: 10.3847/2041-8213/aadc0d.
42. Stassun KG, Oelkers RJ, Pepper J, Paegert M, De Lee N, et al., including **Huber D** (2018). The TESS input catalog and candidate target list. *Astron. J.* 156, article id. 102, 39pp.
43. Teague R, Henning Th, Guilloteau S, Bergin EA, Semenov D, et al., including **Gorti U** (2018). Temperature, mass, and turbulence: a spatially resolved multiband non-LTE analysis of CS in TW Hya. *Astrophys. J.* 864, article id.133, 15pp.
44. Tirsch D, **JL Bishop**, JRC Voigt, LL Tornabene, G Erkeling & R Jaumann (2018). Geology of central Libya Montes, Mars: Aqueous alteration history from mineralogical and morphological mapping, *Icarus*, **314**, 12-34.
45. **Tiscareno MS** and Hedman MM (2018). A review of Morlet wavelet analysis of radial structure in Saturn's rings. *Philosophical Transactions A***376**, 20180046.
46. Wang, J., M. Perrin, D. Savransky, P. Arriaga, J. Chilcote, R. De Rosa, M. Millar-Blanchaer, et al. including **F. Marchis** 2018. Automated data processing architecture for the Gemini

Planet Imager Exoplanet Survey. *Journal of Astronomical Telescopes, Instruments, and Systems*, Volume 4, id. 018002 (2018). 4. doi:10.1117/1.JATIS.4.1.018002.

47. Wang, J., JR. Graham, R. Dawson, D. Fabrycky, RJ. De Rosa, L. Pueyo, Q. Konopacky, et al. including **Franck Marchis** 2018. Dynamical Constraints on the HR 8799 Planets with GPI. *eprint arXiv:1809.04107*.
48. Wang A, **P Sobron**, F Kong, M Zheng, and YS Zhao (2018) DLT Saline Playa in an Hyperarid Region on Tibet Plateau-II: Preservation of Salts with high Hydration Degrees in Subsurface, *Astrobiology*, in press, Published Online:28 Aug 2018 <https://doi.org/10.1089/ast.2018.1829>
49. White TR, **Huber D**, Mann AW, Casagrande L, Grunblatt SK, et al. (2018). Interferometric diameters of five evolved intermediate-mass planet-hosting stars measured with PAVO and the CHARA array. *MNRAS* 477, 4403-4413.
50. Yamane Y, Sano H, van Loon JTh, Filipovic MD, Fujii K, et al., including **Rho J** (2018). ALMA observations of supernova remnant N49 in the LMC. I. Discovery of CO clumps associated with x-ray and radio continuum shells. *Astrophys. J* 863, article id. 55, 15pp.
51. Zhang YG, Gajjar V, Foster G, **Siemion A**, Cordes J, Law C and Wang Y (2018). Fast Radio Burst 121102 Pulse Detection and Periodicity: A Machine Learning Approach *Astrophys. J* in press.

Conferences: Abstracts and Proceedings

1. Adams, E., Gold, R., Willson, D., Ricco, A.J, Hoffer, E., Greenberg, J., **Bonaccorsi, R.** Boone, T., Ma, J., and McKay, C.P., (2018). *EFun: the Plume Sampling System for Enceladus*. COSPAR 2018 Pasadena, July 14-22.
2. Andrews H, **Peeters E**, Tielens AGGM, and Okada Y (2018). Whipping IC63/IC59. Presented at "Cosmic Dust: origin, applications & implications," Copenhagen, Denmark, June 11-15, 2018.
3. **Backman, DB**, (8/31) *SOFIA and Cosmic Origins*, NASA STEM Summer Training, 25 teachers, NASA Ames.
4. **Backman, DB, Clark, C, Harman, P**, (7/25) EM Spectrum and Multi-wavelength Astronomy Workshop for Airborne Astronomy Ambassadors, Newport Beach, CA
5. Benner LAM, Brozovic M, Naidu SP, **Busch MW**, Giorgini JD et al. (2018). Goldstone/Green Bank radar imaging of near-Earth asteroid 2012 TC4, *DPS Meeting*, abstract #508.06.
6. Birch S, Hayes A, Randolph L, Vincent J-B, **Umurhan OM**, et al. (2018). Developing a general understanding of the evolution of cometary landscapes through numerical simulations. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. B1.1-58-18.
7. **Bishop JL** (2018). Using mineralogy to reveal diverse geochemical environments and climate on Mars, *International Mineralogical Association*, Abstract Book p.6. <https://www.ima2018.com/wp-content/uploads/IMA18-Abstract-book August-2018.pdf>
8. **Bonaccorsi, R.**, Willson, D., Gold, R., Adams, E., Ricco, A.J., and C.P. McKay (2018) *Contamination Management of Sample Collection Devices for Life Detection on Icy World Plume Fly-through Missions*. COSPAR 2018 Pasadena, July 14-22.
9. **Braunschweig, P., F. Marchis** and M. Millar-Blanchaer, P41E-1307 Using RDI with Gemini Planet Imager Exoplanet Survey Data, AGU Fall Meeting, Washington DC, 10-14 Dec 2018
10. Brooks SM, Spilker LJ, **Showalter MR, Pilorz SH**, and Edgington SG (2018). The structure of Saturn's B ring from Cassini CIRS high-resolution scans. Cassini Science Symposium. <http://lasp.colorado.edu/home/wp-content/uploads/2018/08/Cassini-Science-Symposium-Program-with-cover-web.pdf>.

11. Brooks SM, Spilker LJ, **Showalter MR**, **Pilorz SH**, and Edgington SG (2018). The Structure of Saturn's B Ring from CIRS High-Resolution Thermal Scans, 117.02.
12. Brozovic M, Benner LAM, Naidu SP, Giorgini JD, Warner BD et al. including **Busch MW** (2018). Goldstone and lightcurve observations of radar-bright binary near-Earth asteroid 2018 EB, *DPS Meeting*, abstract #508.08.
13. **Cami J** & PDR-ERS team, including **Peeters E** (2018). Radiative feedback from massive stars as traced by multiband imaging and spectroscopic mosaics. Presented at the 2018 IAU General Assembly, held August 20-31, Vienna, Austria.
14. **Cami J** (2018). The ESO diffuse interstellar band large exploration survey: first results. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. F3.2-33-18.
15. **Cami J** (2018). Interstellar fullerenes. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. F3.2-7-18.
16. **Cartwright R.J.**, Cruikshank D.P., Emery J.P., Pinilla-Alonso N., 2018. Do the large moons of Uranus have “fluffy” regoliths dominated by small grains? *Division for Planetary Sciences 50*. Control ID: 3044510.
17. **Cartwright R.J.**, Cruikshank D.P., Emery J.P., Pinilla-Alonso N., 2018. Does red dust from the irregular satellites accumulate on the large moons of Uranus? *2018 AGU Fall Meeting*. Abstract ID: 353257.
18. **Cotera A** and **Simpson JP** (2018). Star formation in the galactic center: FORCAST observations of Sgr B1. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. E1.18-20-18.
19. Cruikshank Dale; **Orkan M. Umurhan**; Jeffrey M. Moore; William Grundy; William B. McKinnon; **Cristina M. DalleOre**; Bernard Schmitt; **Ross A. Beyer**; Kirby D. Runyon; Francis Nimmo; Alan D. Howard; S. Alan Stern; James T. Keane; **Richard Cartwright**; **Oliver L. White**; John Spencer; Richard P. Binzel; Catherine B. Olkin; Harold A. Weaver; Leslie A. Young; Kimberly Ennico; Carey M. Lisse, 2018. Recent cryovolcanism on Pluto. *Division for Planetary Sciences 50*. Control ID: 3047631.
20. **Cuk M** (2018). Reconsidering the moon’s formation and tidal evolution. Presented at Diversis Mundi: The Solar System in the Exoplanetary Context, held March 5-9 at SO, Santiago, Chile, id.11, <http://www.eso.org/sci/meetings/2018/ops2018.html>
21. **Cuk M**, El Moutamid M, and Tiscareno M (2018). Orbital history of Mimas and Enceladus. Presented at The Final Cassini Science Symposium, held August 12-17, University of Colorado, Boulder, CO, <http://lasp.colorado.edu/home/2018-cassini-science-symposium/>
22. **Ertem G**, SP Kounaves, CP McKay (2018). Protection of organic compounds from gamma radiation by Mars analogue minerals, European Astrobiology Network

Association annual meeting, Berlin, Germany. [http://www.eana-net.eu/Conferences/Docs EANA18/EANA2018 Information.pdf](http://www.eana-net.eu/Conferences/Docs/EANA18/EANA2018%20Information.pdf)

23. **Estrada PR**, Durisen RH, and Cuzzi JN (2018). Implications for the micrometeoroid flux measured by Cassini CDA for ballistic transport in Saturn's rings. Presented at The Final Cassini Science Symposium, held August 12-17, University of Colorado, Boulder, CO, <http://lasp.colorado.edu/home/2018-cassini-science-symposium/>
24. Fahy, J, **Harman, PK et al** (9/ 11) ASP Annual Meeting, *Building Community Around Girl Scout Space Science Badges* workshop, Rohnert Park
25. **Fenton, LK**, Cason, H. C., **Michaels, TI** (2018) Climate forcing of bedform migration and crest alignment on Mars: where atmospheric modeling and morphometry meet, *Mars Workshop on Amazonian Climate*, 18-22 June, Lakewood, CO, USA, Abst. #4030.
26. **Freedman, R.** (2018), The Calculation of Atomic and Molecular Opacities for Astrophysical Applications, *15th International HITRAN Conference*, Cambridge, MA, Abstract# III-2, http://hitran.org/media/hitrان-conferences/hitrان-15-2018/res/hitrان_abs_book_2018.pdf#page=59
27. **French RS, Showalter MR, Stopp DJ, Gordon MK, and Tiscareno MS** (2018). Outer Planets Unified Search (OPUS): Status and Future Plans, 50th Annual DPS Meeting, 315.12.
28. **Glines N. and Gulick V.** 2018. Thermokarst Features in Lyot Crater, Mars: Implications for Recent Surface Water Freeze-Thaw, Flow, and Cycling. Late Mars Workshop #5018.
29. **Gordon MK, Showalter MR, French RS, and Tiscareno MT** (2018). Cassini and the PDS Ring-Moon Systems Node. Cassini Science Symposium. <http://lasp.colorado.edu/home/wp-content/uploads/2018/08/Cassini-Science-Symposium-Program-with-cover-web.pdf>.
30. **Gulick V. and Glines N.** 2018. Gullies and Thermokarst Landforms in the Central Peak Region of Lyot Crater: Implications for a Late Mars Microclimate. AGU Fall Meeting # 388437.
31. **Gulick V. and Glines N.** 2018. Gully Formation on Mars: Implications for Late Paleo Microclimates. Late Mars Workshop #5028.
32. Habart E & PDR-ERS team, including **Peeters E** and **Cami J** (2018). Radiative feedback from massive stars as traced by multiband imaging and spectroscopic mosaics. Presented at the European Week of Astronomy and Space Science (EWASS) meeting, April 3-6, 2018.
33. **Hargitai H.** and Pitura M. (2018) Four Centuries of European Planetary Mapping: Towards Mapping for New Human Surface Operations. EPSC, abstract #258, <https://meetingorganizer.copernicus.org/EPSC2018/EPSC2018-258.pdf>

34. **Hargitai H.** (2018) Planetary Maps Designed for Children. EPSC, abstract #170, <https://meetingorganizer.copernicus.org/EPSC2018/EPSC2018-170.pdf>
35. **Harman, PK et al** (9/ 10 – 13) *Building Badges, Bridges and Teams*, talk at ASP Annual Meeting, Rohnert Park, CA
36. **Harman, PK et al** (9/ 10 – 13) *Space Science Badges: Engaging Girl Scouts*, Poster at ASP Annual Meeting, Rohnert Park, CA
37. **Huang X** (2018). Improve the prediction accuracy of isotopologue microwave spectra by combining ames-296K SO₂ IR lists with experimental models: a benchmark study. Presented at the 73rd International Symposium of Molecular Spectroscopy, June 18-22, Champaign-Urbana, IL.
38. **Huber D** (2018). Astroseismology versus Gaia: how accurate are scaling relations for solar-like oscillators? Presented at the 2018 IAU General Assembly, held August 20-31, Vienna, Austria. Division G, on Aug 24.
39. Jensen P, Shannon MJ, **Peeters E**, and Stock DJ (2018). Aliphatic features in mid-infrared Polycyclic Aromatic Hydrocarbon spectra. Presented at “Cosmic Dust: origin, applications & implications,” Copenhagen, Denmark, June 11-15, 2018.
40. **Jin, M.**, Liu, W., Cheung, M., Nitta, N., Manchester, W.B. et al. (2018). “Global Magnetohydrodynamics Simulation of EUV Waves and Shocks from the X8.2 Eruptive Flare on 2017 September 10”, *Proceedings of the conference held 30 July-3 August, 2018 in Cocoa Beach, FL, id.207*
41. Knight C, **Peeters E**, Tielens AGGM, Stock DJ, and Berné O (2018). Probing the Size Distribution of PAHs in Reflection Nebulae. Presented at “Cosmic Dust: origin, applications & implications,” Copenhagen, Denmark, June 11-15, 2018.
42. Liu, W., **Jin, M.**, Cheung, M., Ofman, L., Downs, C., Nitta, N. “The Best and Last of Solar Cycle 24 – The Global EUV Wave from The X8 Flare-CME Eruption On 2017-Sept-10: SDO/AIA Observations And Data-constrained Simulations”, COSPAR 2018, E2.1-0019-18
43. Liu, W., Petrosian, V., Pesce-Rollins, M., Rubio Da Costa, F., **Jin, M.**, Effenberger, F., Omodei, N., Allafort, A., Nitta, N. “High-Energy Aspects of Solar Flares: Recent Advances in Observations and Models”, COSPAR 2018, E2.2-0023-18
44. Manchester, W.B., van der Holst, B., & **Jin, M.** “Polar Observations: Impacts for Coronal and Solar Wind Modeling”, Polar Perspectives 2018 - Boulder, Colorado
45. Manaud, N., Nass A, van Gasselt S, Lewando M, Pio Rossi A, Hare T, Carter J, and **Hargitai H.** (2018) OpenPlanetaryMap: Building the first Open Planetary Mapping and Social platform for researchers, educators, storytellers, and the general public. EPSC, abstract #78, <https://meetingorganizer.copernicus.org/EPSC2018/EPSC2018-78.pdf>

46. Maragkoudakis A, Ivkovich N, **Peeters E**, Stock DJ, Hemachandra D, and Tielens AGGM (2018), PAHs and star formation in the H II regions of M83 and M33. Presented at “Cosmic Dust: origin, applications & implications,” Copenhagen, Denmark, June 11-15, 2018.
47. **Marchis F.**, S. Thibault, O. Côté, D. Brousseau, G. Allain, M-P. Lord, et al., P41C-1313 HiCIBaS: A precursor mission for high contrast imaging balloon systems, *AGU Fall Meeting*, Washington DC, 10-14 Dec 2018.
48. **Marchis F.**, Arnaud Malvache, Laurent Marfisi, Antonin Borot, Emmanuel Arbouch, Unistellar eVscopes: Smart, Portable And Easy-To-Use Telescopes For Exploration, Interactive Learning, And Citizen Astronomy, *IAU General Assembly 2018 Focus Meeting 14 (FM14)*, Vienna, August 20-31, 2018.
49. Marshall S, Cobb A, Raïssi C, Gal Y, Rozek A et al. including **Busch MW** (2018). Using Bayesian optimization to find asteroids' pole directions, *DPS Meeting*, abstract #505.01.
50. McKinnon W, Spencer J, Weaver H, Schenk P, Olkin C, et al., including **Umurhan OM** (2018). Convection of volatile ices on Pluto. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. B1.2-4-18.
51. Modesto J and **Tiscareno MS.**(2018). Radial distribution of textures in Saturn’s main rings. *AAS Division for Planetary Sciences*(Knoxville TN) 50, 117.06, October 22, 2018.
52. Naidu SP, Margot JL, Benner LAM, Taylor PA, Nolan MC et al. including **Busch MW** (2018). Radar observations and characterization of binary near-Earth asteroid (35107) 1991 VH, *DPS Meeting*, abstract #312.09.
53. Olkin C, Reuter D, Weaver H, Grundy WM, Schmitt B, et al., including **Dalle Ore C** (2018). Composition of Pluto, Charon and the small satellites. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. B1.2-7-18.
54. **Paganelli, F.**, Conrad, A. Costa Sitja, M. 2018. Ground Observation of Asteroids at Mission ETA through JPL Horizons and SPICE. European Planetary Science Conference (EPSC), Abstract #202, September 16-20, 2018, Berlin, Germany.
55. **Peeters E**, Stock DJ, Shannon MJ, Bauschlicher CW Jr, Allamandola LJ, Tielens AGGM, **Ricca A**, and Wolfire MG (2018). The photochemical evolution of the interstellar PAH family in photodissociation regions. Contributed talk at “Cosmic Dust: origin, applications & implications,” Copenhagen, Denmark, June 11-15, 2018.
56. **Peterson R** (2018). Prospects for a UV high-resolution theoretical stellar spectral library for old stellar systems. Presented at the 2018 IAU General Assembly, held August 20-31, Vienna, Austria. Focus Meeting 12, on Aug 23.

57. **Peterson R** (2018). Spectroscopic temperatures, gravities, and metallicities for Kepler giants. Presented at the 2018 IAU General Assembly, held August 20-31, Vienna, Austria. Division G, on Aug 24.
58. **Pilorz S**, Colwell J, **Showalter M**, Edgington S, Pearl J, Altobelli N. (2018). Thermal infrared determinations of particle size properties and ring emissivity with Cassini CIRS. Cassini Science Symposium. <http://lasp.colorado.edu/home/wp-content/uploads/2018/08/Cassini-Science-Symposium-Program-with-cover-web.pdf>.
59. Pointing, S., **Warren-Rhodes, K.**, Lee, K., Archer, S., Lacap-Bulger, D., Cabrol, N., Wettergreen, D., Zacny, K. (2018). Subsurface microbial habitats in an extreme desert Mars analogue environment. Extremophiles 2018, Italy, Sept 16-20.
60. Protopapa S, Reuter D, Weaver H, Grundy WM, Cruikshank DP, et al., including **Dalle Ore C** (2018). Tholin-like material across the surface of Pluto. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. B1.2-8-18.
61. **Race MS** and W Kramer (2018). *The Need for a Rational Framework for Coordinated Management of Exploration, Uses and Exploitation of Outer Space Environments and Resources*. COSPAR 2018. Pasadena, CA, Abstract #PEX-2-003318. [http://cospar2018.org/wp-content/uploads/2018/07/COSPAR2018 Onsite-Program vF-low-res JULY-21-2018.pdf](http://cospar2018.org/wp-content/uploads/2018/07/COSPAR2018_Onsite-Program_vF-low-res_JULY-21-2018.pdf)
62. **Race MS, JA Spry**, B Siegel, G Kminek, CA Conley (Eds.) and COSPAR Workshop Participants (2018). Developing Planetary Protection Requirements for Human Missions to Mars: Overview of Recent Workshops, Findings and Progress, 42nd COSPAR Scientific Assembly, Pasadena, CA, Abstract #PPP1-0016-18. [http://cospar2018.org/wp-content/uploads/2018/07/COSPAR2018 Onsite-Program vF-low-res JULY-21-2018.pdf](http://cospar2018.org/wp-content/uploads/2018/07/COSPAR2018_Onsite-Program_vF-low-res_JULY-21-2018.pdf)
63. **Rho J** and Klein R (2018). Poster highlights session, 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. E1.18-14-18.
64. **Rho J**, Klein R, Tielens AGGM, Berne O, Wallstrom S, et al., (2018). SOFIA far-infrared FIFI-LS observations of CO-rich knots in the supernova remnant Cas A. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. E1.18-11-18.
65. Robinson J and **Tiscareno MS**(2018). Photometry of giant propellers in Saturn's rings from close-range Cassini images. *AAS Division for Planetary Sciences*(Knoxville TN) 50, 117.07, October 22, 2018.
66. Shannon MJ, **Peeters E, Cami J**, and Blommaert JADL (2018). PAH emission toward the Galactic bulge. Presented at "Cosmic Dust: origin, applications & implications," Copenhagen, Denmark, June 11-15, 2018.
67. **Showalter MR**, Verbiscer A, Buie M, and Helfenstein P (2018). A New Look at Pluto's Small Satellites: Observations with HST in 2018, 50th Annual DPS Meeting, 315.14.

68. Singer K, Spencer J, McKinnon W, Weaver H, Grundy WM, et al., including **Umurhan OM** (2018). Cryovolcanism on Pluto and comparison to features across the solar system. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. B1.2-5-18.
69. **Sobron P**, A Davila, MB Wilhem, and A Sanz (2018). SERS analysis of Enceladus analogue ocean samples, *GeoRaman Conference*, Catania, Italy. p70.
70. Spilker LJ, Morishima R, Ferrari C, Deau E, **Pilorz S**, **Showalter MR**, Brooks SM, and Edgington SG (2018). Saturn Ring Results from the Cassini Composite Infrared Spectrometer. Cassini Science Symposium. <http://lasp.colorado.edu/home/wp-content/uploads/2018/08/Cassini-Science-Symposium-Program-with-cover-web.pdf>.
71. **Spry JA**, **MS Race**, LM Pratt, B Siegel (2018). Planetary Protection for Human Missions to Mars: A Forward Look. 42nd COSPAR Scientific Assembly, Pasadena, CA, Abstract #PPP 2-0014-18. [http://cospar2018.org/wp-content/uploads/2018/07/COSPAR2018 Onsite-Program vF-low-res JULY-21-2018.pdf](http://cospar2018.org/wp-content/uploads/2018/07/COSPAR2018%20Onsite-Program%20vF-low-res%20JULY-21-2018.pdf)
72. **Stucky TR**, D Bergman, BJ Glass & AI Davé (2018). Autonomous Regolith Extraction using Real-Time Diagnostics and Dynamic Plan Execution for 1 Meter Class Interplanetary Rotary-Percussive Drills, *ASCE Earth and Space 2018*, p.256.
73. **Summers, D.**, Quinn, R., and **Gulick V.** 2018. **F3.3-0008-18**Mid-IR Spectroscopy of Perchlorates.42nd Committee on Space Research Scientific Assembly Abstracts, July 14–22, 2018 p. 2030.
74. **Takir D**, Nakauchi Y, Kitazato K, Le Corre L, Hibbitts CA, and Emery JP (2018). Characterizing volatiles and organics on asteroid (162173) Ryugu. Presented at the 81st Annual Meeting of the Meteoritical Society, held July 22-27, Moscow, Russia. No. 2067, id. 6364.
75. Teodoro L, Cuzzi JN, **Estrada PR**, **Cuk M**, Kegerreis JA and Eke VR (2018). A new suite of hydrodynamical simulations of collisions between Saturn's icy mid-sized moons. Presented at The Final Cassini Science Symposium, held August 12-17, University of Colorado, Boulder, CO, <http://lasp.colorado.edu/home/2018-cassini-science-symposium/>
76. Throop H, **Showalter MR**, Dones HC, Weaver H, Cheng A, Stern SA, Young LA, and Olkin CB (2018). New Horizons Imaging of Jupiter's Main Ring, 50th Annual DPS Meeting 104.09.
77. Tielens A & PDR-ERS team, including **Peeters E** and **Cami J** (2018). Radiative feedback from massive stars as traced by multiband imaging and spectroscopic mosaics. Presented at the AAS232, June 2018.
78. Tirsch D, **JL Bishop**, JRC Voigt, LL Tornabene, G Erkeling & R Jaumann (2018). Aqueous alteration at central Libya Montes, Mars. *EPSC*. Abstract #365.

<https://meetingorganizer.copernicus.org/EPSC2018/EPSC2018-365.pdf>

79. **Tiscareno MS (2018)**. Radial distribution of textures in Saturn's main rings. *Cassini Science Symposium*(Boulder CO), R14, August 13, 2018.
80. **Tiscareno MS** and Modesto J (2018). Radial distribution of textures in Saturn's main rings. *American Geophysical Union*(Washington DC), December, 2018.
81. **Umurhan OM** and Zahnle K (2018). Pluto's glaciers glaciations, and it's related mysteries. 42nd COSPAR Scientific Assembly. Held July 14-22 in Pasadena, CA. id. B1.2-3-18.
82. Walroth, RC., David Frederick Blake, Philippe Sarrazin, **Franck Marchis** and Kathleen Thompson, MapX: A Mapping X-ray Fluorescence Spectrometer for Planetary Science Applications, P31F-1430, *AGU Fall Meeting*, Washington DC, 10-14 Dec 2018
83. Weitz CM, **JL Bishop** & JA Grant. (2018) Analysis of Clay Deposits in and around Ladon Basin, *EPSC*, Abstract #547.
<https://meetingorganizer.copernicus.org/EPSC2018/EPSC2018-547.pdf>

Technical Reports & Data Releases

1. **Beatty DW** et al. including **JL Bishop** (2018). *The Potential Science and Engineering Value of Samples Delivered to Earth by Mars Sample Return*, White paper submitted to MEPAG August 14, 2018. 186 pages.
2. Kminek G, BC Clark, CA Conley, MA Jones, M Patel, **MS Race**, MA Rucker, O Santolik, B Siegel & **JA Spry** (Eds.) (2018) *Report of the COSPAR Workshop on Refining Planetary Protection Requirements for Human Missions*: accessible at https://planetaryprotection.nasa.gov/file_download/133/Report+COSPAR+workshop+refining+planetary+protection+requirements+for+human+missions+final20180424.pdf
3. **Jin, M.** (mentor) – NASA Frontier Development Lab Technical Memorandum (Challenge Title: Extreme UltraViolet Solar Spectral Irradiance.
4. **Showalter MR, Gordon MK, Tiscareno MS, French RS, Stopp D, and Olson D** released numerous updates to the PDS Ring-Moon Systems Node website (<https://pds-rings.seti.org>).
 - (1) The final deliveries of Cassini data;
 - (2) a major update to OPUS (<https://pds-rings.seti.org/search>), our search engine;
 - (3) a new collection of on-line press release images (<https://pds-rings.seti.org/galleries.html>); and
 - (4) updates to our collection of planetary observations from the Hubble Space Telescope.

Contribution to Ongoing/Planned missions

1. **Backman, DB, Clark, C, Harman, P,** (9/10 – 24) and 9/24 – 29) SOFIA AAA Flight Weeks, Palmdale, CA.
2. **Bishop JL** (2002-2018). Compact Reconnaissance Imaging Spectrometer for Mars (CRISM), Visible/near-infrared (VNIR) imager in orbit at Mars on the Mars Reconnaissance Orbiter (MRO) and mapping surface composition at scales as fine as 18 meter per pixel.
3. **Cabrol, NA.** (2002- Present). Mars Exploration Rover Science Team.
4. **Caldwell, D. A., Clarke, B. D., Coughlin, J. L., Mighel, K., Wohler, B.** (ongoing), Kepler/K2 Mission operations support, data processing support, science analysis support.
5. **Caldwell, D. A., Li, J., Morris, R. L., Smith, J. C., Tenebaum, P., Twicken, J. D.** (ongoing) TESS mission operations, including completions of spacecraft commissioning (July 2018), first processing of flight science data and release of first set of candidate transiting planets (Sep 2018).
6. **Cartwright R.J.,** Co-signer / contributor to the following white paper (2018): Outer Solar System Exploration: A compelling and Unified Dual Mission Decadal Strategy for Exploring Uranus, Neptune, Triton, Dwarf Planets, and Small KBOs and Centaurs. <https://arxiv.org/pdf/1807.08769.pdf>
7. **Jin, M,** Co-I of NASA SMEX MUSE mission (Phase A).
8. **Marcu O** (2017-ongoing). WetLab2, First facility to provide gene expression in space, on the International Space Station. Developing protocols and workflow for plant automated extraction and processing.
9. **MRO HiRISE:** Ginny Gulick, Ross Beyer, Livio Tornabene
10. **New Horizons:** Mark Showalter, Ross Beyer, Cristina Dalle Ore, Oliver White, Chloe Beddingfield.
11. **Sobron P** (ongoing). *NASA Mars 2020 rover mission Science Team member*, SHERLOC and SuperCam instrument development and operation.

12. **Sobron P** (ongoing). *ExoMars 2020 rover mission Science Team member*, RLS instrument development and operation.
13. **Spry JA** (2015-present) Mission support to the NASA Office of Planetary Protection for the New Horizons, OSIRIS-Rex, Parker Solar Probe, ARTEMIS and Solar Orbiter missions

Contribution to Mission Planning/Concepts

1. **Cartwright R.J.**, Co-signer / contributor to the following white paper (2018): Outer Solar System Exploration: A compelling and Unified Dual Mission Decadal Strategy for Exploring Uranus, Neptune, Triton, Dwarf Planets, and Small KBOs and Centaurs. <https://arxiv.org/pdf/1807.08769.pdf>
2. **Jin, M.**, Co-I for a SMEX mission planning for submission in 2019
3. **Marchis, F.** part of the science team as a mission director of Project Blue and ACEND
4. **Skok JR** (2010-2018) SPRING Mission, Developing mission concept for search for evidence of life in Nili Patera Mars. Serving as PI.
5. **Skok JR** (2018) BRAILLE Mission, VNIR and cave science advising.
6. **Skok JR** (2006-2018) MVP-SEM Space electron microscope development.
7. **Skok JR** (2016-2018) Made of Mars ISRU tech development.

Telescope Observation Time

1. **Cartwright R.J.** Observing run at NASA's IRTF (remote), Aug. 2018: Observing Triton with the iSHELL spectrograph (NIR).
2. **Cartwright R.J.** Observing run at NASA's IRTF (remote), Oct. and Nov. 2018: Observing the classical Uranian satellites with the SpeX spectrograph (NIR).
3. **Cartwright R.J.** Observing run at DCT (onsite in Happy Jack, AZ), Sep. 2018: Observing the classical Uranian satellites with the DeVeney spectrograph (VIS).
4. **Cartwright R.J.** *Observing run at NASA's IRTF (remote requested), spring 2019 (TBD): Observing the Galilean satellite Callisto with the SpeX spectrograph (NIR). *Decision pending.
5. **Marchis, F.** on-going Large Program with GPI for the GPIES campaign
6. **Marchis, F.** on-going Large Program with SPHERE for the HARISSA campaign

Official Committees/Working Groups

1. **Bishop JL** (Jan-August). *International MSR Objectives and Samples Team (iMOST)*, purpose is to re-evaluate and update the sample-related science and engineering objectives of a Mars Sample Return (MSR) program.
2. **Cabrol, NA.** Member, Executive Council, NASA Astrobiology Institute.
3. **Cabrol, NA.** Chair, NASA Astrobiology Biosignature Working Group.
4. **Cabrol, NA.** Member, NASA OPAG Roadmaps to Ocean Worlds (ROW).
5. **Cabrol, NA.** Member, NASA MEPAG Science Analysis Group (SAG) “Scientific Objectives for the Human Exploration of Mars” (HSO-SAG),
6. **Cartwright R.J.**, Joined the team developing the Key Science Programs (KSP) for Solar System science using Extremely Large Telescopes (ELTs), Sep. 2018.
7. **Jin, M.**, SDO Workshop Science Organizing Committee
8. **Marcu O** (April-ongoing). Speakers Committee, Palo Alto Rotary Club, purpose is to provide community engagement of business and professional advocates.
9. **Paganelli Flora** served on a NASA R&A review panel.
10. **Race MS** (ongoing). *International Encyclopedia of Astrobiology*, Editor, 3rd Edition, Planetary Protection Section.
11. **Race MS** (ongoing). *Astrobiology in the Real World*. Assoc. Editor, Astrobiology journal, Commentary section.
12. **Ross, B.** (ongoing) DPS Publications Committee Chair
13. **Ross, B.** (ongoing) MAPSIT Steering Committee
14. **Sobron P** (ongoing). ISSI/ISSI-BJ International Teams in Space and Earth Sciences. Member in: Cross-calibration of Laser-Induced Breakdown Spectroscopy (LIBS) instruments for planetary exploration.

15. **Spry JA** (ongoing) *Member of the EU-funded Planetary Protection for the Outer Solar System (PPOSS) team*, with upcoming training presentations in Pasadena (July) and Beijing (October) as well as a coordination meeting in Florence (Sept).
16. **Stucky TR** (Jan-Oct). *APEX Life Detection Thinkubator*, develops novel, pre-proposal stage life detection concepts.

Popular Publications/Web Stories/ Other Media / Interviews

1. **Beyer RA** (July 13). *First global maps of Pluto and Charon show the worlds' highs and lows* article in ScienceNews, Beyer quoted: <https://www.sciencenews.org/article/first-global-maps-pluto-and-charon-show-highs-and-lows>.
2. **Busch MW** (September 13). Michael Busch and Chedy Raïssi were interviewed for the NHK popular-science program Cosmic Front Next about asteroid shape modeling in 2018 July. Interview was broadcast and made available for streaming in the 2018 September 13 episode (Japanese dub of English original; episode may eventually be reproduced in English): <http://www4.nhk.or.jp/cosmic/x/2018-09-13/10/21611/2120229/>.
3. **Cabrol, NA**. NBC interview about the discovery of a deep lake under the southern polar cap on Mars, July 25, 2018.
4. **Cabrol, NA**. Radio Canada about the discovery of a deep lake under the southern polar cap on Mars, July 27, 2018.
5. **Cabrol, NA**. Personaje – La científica que investiga en los Andes la vida extraterrestre. *Clarín Viva*, Argentina.
6. **Cabrol, NA**. Neel Interview about the discovery of a deep lake under the southern polar cap on Mars, August 8, 2018.
7. **Cartwright RJ** (2018). What is the red material found on Uranus' moons? Science Trends. <https://sciencetrends.com/what-is-the-red-material-found-on-uranus-moons/>
8. **Diamond, Bill** (September 30, 2018) Interviewed for article in PC Magazine *Here's Why Aliens Will Probably Come in Peace*
9. **Diamond, Bill** (October 1, 2018) Interviewed for article in Washington Examiner *James Webb Space Telescope to be a powerful eye in search for alien life*
10. **Harman, PK**, (8/21) *Girl Scout Space Science Badges* Webinar for NISE Net and Girl Scout Councils

11. **Marchis, F.** *The L Variable*, Morning Calm, September 2018
<http://morningcalm.koreanair.co.kr/e-book/ecatalog.jsp?Dir=69&catimage=1&callmode=normal>
12. **Marchis, F.** *Looking Sharp*, Popular Science, Fall 2018
<https://www.popsci.com/amateur-astronomers-help-extraterrestrial-researchers>
13. **Marchis, F.** *Planetary Radio*, 22 August 2018, 2018
<http://www.planetary.org/multimedia/planetary-radio/show/2018/0822-2018-franck-marchis-pluto-occultation.html>
14. **Marchis, F.** Featured in a press release presented at the IAU General Assembly, Vienna, Aug 20-26 2018. "Citizen Astronomy: Capturing A Snapshot Of Pluto's Atmosphere With Unistellar's eVscope" published by Unistellar
15. **Peeters E**, Berné O, and Habart E (2018). JWST Early Release Science (ERS) Proposal: Radiative Feedback from Massive Stars as Traced by Multiband Imaging and Spectroscopic Mosaics. In-Focus; PAH Newsletter, June edition.
16. **Shostak S.** "If space aliens are out there, why haven't we found them?" *NBC News*, June 11, 2018 <https://www.nbcnews.com/mach/science/if-space-aliens-are-out-there-why-haven-t-we-ncna881951>
17. **Shostak S.** "Here's the scientific explanation for that 'alien spaceship' on Mars," *NBC News*, June 23, 2018. <https://www.nbcnews.com/mach/science/here-s-scientific-explanation-alien-spaceship-mars-ncna885966>
18. **Shostak S.** "Amateur astronomy and alien visitors," *Sky's Up Magazine*, July-September, 2018, p.8. <https://view.joomag.com/skys-up-july-september-2018/0571783001530886804>
19. **Shostak S.** "Are we truly alone in the universe? New study casts doubt on rise of alien life in our galaxy," *NBC News*, July 15, 2018.
<https://www.nbcnews.com/mach/science/are-we-truly-alone-cosmos-new-study-casts-doubt-rise-ncna891286>
20. **Shostak S.** "A rogue star may explain why the outer solar system is so odd," *NBC News*, August 20, 2018, <https://www.nbcnews.com/mach/science/rogue-star-may-explain-why-outer-solar-system-so-odd-ncna902236>
21. **Shostak S.** "Why solar observatory's mysterious closing sparked talk of aliens," *NBC News*, September 19, 2018, <https://www.nbcnews.com/mach/science/why-solar-observatory-s-mysterious-closure-sparked-talk-aliens-ncna910996>.
22. **Shostak S.** "Intergalactic light beams might be just the ticket for making contact with space aliens," *NBC News*, October 5, 2018,
<https://www.nbcnews.com/mach/science/intergalactic-light-beams-might-be-just->

[ticket-making-contact-space-ncna916616](#)

23. **Shostak S.** “Why aliens might turn to star collecting to save themselves,” *NBC News*, August 7, 2018, <https://www.nbcnews.com/mach/science/thinning-cosmos-could-turn-space-aliens-star-collectors-ncna898296>
24. **Sobron, P.**, Missions to Planetary Analogs: Science and Technology That Enable Robotic Planetary Exploration, Science in St. Louis Series partnership of The Academy of Science – St. Louis and St. Louis County Libraries, June 21, 2018. <https://www.academyofsciencestl.org/event/missions-to-planetary-analogs-science-and-technology-that-enable-robotic-planetary-exploration/>
25. **Warren-Rhodes, K.**, Evidence of life on Jupiter’s moon Europa could be just inches below the surface, July 23 2018. Interview about recent evidence for potential for searching for life on Europa. <http://www.popsci.com/europa-jupiter-search-life>

[SETI Institute Facebook Live Episodes](#)

- October 5, 2018, Hosted by **Bill Diamond**. Guest, **Michael Busch**: Asteroid Ryugu and the Hayabusa 2 spacecraft.
<https://www.facebook.com/SETIInstitute/videos/171898087052037/>
- September 24, 2018, Science at the Carl Sagan Center, with **Nathalie A. Cabrol**:
<https://www.facebook.com/SETIInstitute/videos/894107637452869/>
- September 20, 2018, The End of the Kepler Space Telescope. Host: **Franck Marchis**; Guest: **Doug Caldwell**:
<https://www.facebook.com/SETIInstitute/videos/272836866674789/>
- September 13, 2018, Hosted by **Bill Diamond**. Guest, **Dava Newman** (former NASA Deputy Administrator and member of the SETI Institute Board of Trustee).
<https://www.facebook.com/SETIInstitute/videos/374488546423028/>
- September 6, 2018, Hosted by **Bill Diamond**. Guest, **Kathryn Bywaters**: Life Detection Instrumentation.
<https://www.facebook.com/SETIInstitute/videos/316974282401746/>
- August 24, 2018, Hosted by **Bill Diamond**. Guests: 2018 **SETI Institute Research Experience for Undergraduate (REU) students**. From "Observing Earth as an Exoplanet," and diving into the nature of Extremophiles growing in Sulfolobus, to classifying Saturn's rings, and exploring possible landing sites on Mars, the students have had an exciting summer.
<https://www.facebook.com/SETIInstitute/videos/941321676070242/>
- August 16, 2018, Hosted by **Nathalie A. Cabrol**. Guests: **The SETI Institute NAI Team** talking about their research in extreme environments to support the development of instruments and exploration strategies for the search for life on Mars.
<https://www.facebook.com/SETIInstitute/videos/1777409005710133/>
- August 8, 2018. Hosted by **Jonathan Knowles**. Guest: **Nathalie A. Cabrol** speaks about the discovery of a subsurface lake under the southern polar cap on Mars.
<https://www.facebook.com/SETIInstitute/videos/10156421618205535/>
- August 1, 2018. Presented by Sara Jennings, NASA Frontiers Development Lab (FDL). The FDL program is hosted by the SETI Institute during the summer. The video was recorded at the NASA Ames Space Portal. Guests: **FDL Space Resources Teams**.
<https://www.facebook.com/SETIInstitute/videos/10156404830075535/>
- July 26, 2018. Hosted by **Jonathan Knowles**. Guests: FDL Astrobiology and Exoplanet teams. <https://www.facebook.com/SETIInstitute/videos/10156388992825535/>
- July 18, 2018. Hosted by **Jonathan Knowles**. Guests: Space weather and heliophysics FDL teams.
<https://www.facebook.com/SETIInstitute/videos/10156369221640535/>

- July 5, 2018. Hosted by **Jonathan Knowles**. Guests: Jon Jenkins and **Doug Caldwell** who talked about They will talk about exoplanet exploration and discovery, the new NASA TESS mission, as well as the Kepler and K2 missions. <https://www.facebook.com/SETIInstitute/videos/10156336098545535/>
- July 2, 2018. Hosted by **Bill Diamond**. Guest: **Michael Busch** who talked about the Habayusa 2 mission, and other asteroid-related matters. <https://www.facebook.com/SETIInstitute/videos/10156328857890535/>

SETI Institute Big Picture Science Episodes

- June 4, 2018, Imaging Planets. **Nathalie Cabrol** was one of the guests. <https://www.seti.org/podcast/imagining-planets>
- June 11, 2018, Skeptic Check: Flat Earth. <https://www.seti.org/podcast/skeptic-check-flat-earth>
- June 25, 2018, Free Range Dinosaurs. <https://www.seti.org/podcast/free-range-dinosaurs>
- July 23, 2018, Identity Crisis. <https://www.seti.org/podcast/identity-crisis>
- July 30, 2018, It's in Material. <https://www.seti.org/podcast/its-material>
- August 6, 2018, Skeptic Check: Brain Gain. <https://www.seti.org/podcast/skeptic-check-brain-gain>
- August 13, 2018, It's Habitable Forming. **Nathalie Cabrol** was one of the guests. <https://www.seti.org/podcast/its-habitable-forming>
- August 27, 2018, New Water Worlds. <https://www.seti.org/podcast/new-water-worlds>
- September 10, 2018, Angles of a Hack. <https://www.seti.org/podcast/angles-hack>
- September 24, 2018, Skeptic Check: Heal Thyself. <https://www.seti.org/podcast/skeptic-check-heal-thyself>

SETI Talks

- July 19, 2018, VR/AR in Space: The Next Space Revolution? Speakers included Timoni West (Unity Labs), Amaresh Kollipara (SETI Institute Board of Trustees), Franck Marchis (SETI Institute) and J.R. Skok (SETI Institute): <https://www.seti.org/event/vrar-space-next-space-revolution>

- August 14, 2018, Inspiring the Next Generation of Explorers: Education Programs at the SETI Institute Speakers included Pamela Harman (SETI Institute), Jessica Henricks (Girl Scouts of Northern California Council), Zoe Sharp (STAR Fellow), and Marita Beard (Airborne Astronomy Ambassador): <https://www.seti.org/event/inspiring-next-generation-explorers-education-programs-seti-institute>
- Human Exploration to Mars: Becoming Interplanetary Speakers included Dava Newman (SETI Institute Board of Trustees), Nathalie Cabrol (SETI Institute), Jennifer Heldmann (NASA Ames Research Center) and Jaya Bajpayee (NASA Ames Research Center)

Invitation to Speak (Professional and Public)

1. **Backman, DB**, (9/20) *How I Support Our Community* The Primary School 1st-grade classes, Palo Alto, CA.
2. **Bishop JL** (Aug./14). *Plenary Presentation: Using mineralogy to reveal diverse geochemical environments and climate on Mars*, International Mineralogical Association. https://www.ima2018.com/wp-content/uploads/IMA2018_program_14.8.18.pdf
3. **Busch MW** (August 17 & August 18) participated in two panel presentations at the Worldcon science fiction convention in San Jose CA.
4. **Busch MW** (September 2018 - January 2019) will talk with primary & secondary school classes as part of the “Skype A Scientist” project - <https://www.skypeascientist.com/>.
5. **Busch MW** served on a NASA R&A review panel.
6. **Busch MW** served on the NRAO observing proposal review panel.
7. **Bywaters KB**, (Sept./18). *Nanopore Life Detection Technology*, NASA Ames SSX Branch Seminar Series, Moffett Field, CA.
8. **Cabrol, NA**. Invited speaker. Panel hosted by Dava Newman (MIT, former NASA Deputy Administrator) entitled: *Human Exploration to Mars: Becoming Interplanetary*, SRI International, Menlo Park, September 13, 2018.
9. **Cabrol, NA**. Invited panelist at the Library of Congress, Washington, DC, for a day event hosted by Lucianne Walkowicz, Blumberg Chair of Astrobiology, September 27, 2018. <https://www.decolonizemars.org/becoming-interplanetary/>



Beat 1: The Right Stuff



Beat 2: Mars on Earth



**Beat 3: Alternative
Futurisms**

10. **Cabrol, NA.**, Invited speaker at the San Francisco Consular Corps Luncheon at the Diplomats Club of the Fairmont Hotel. **Rebecca McDonald** (Director of Communications), and **Pamela Harman** (Acting Director of Education) were also

present. Cabrol presented presenting the SETI Institute Carl Sagan Center for Research to the Consul Generals of ~50 countries.

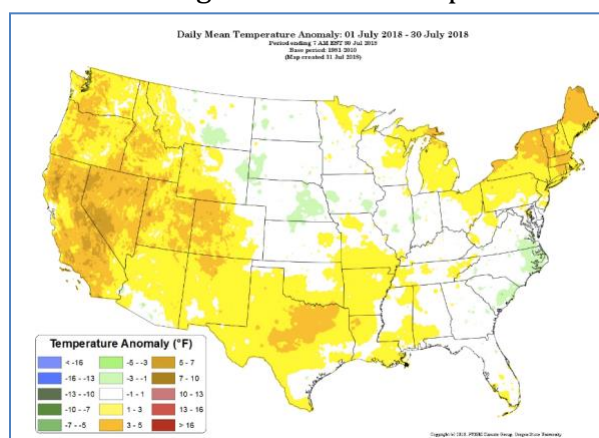
11. **Cartwright, R.J.**, Aug. 8, 2018. Exploring the satellite systems of Uranus and Neptune with LUVOIR. *Seminar talk for the Large UV/Optical/IR Surveyor team* (remote talk). <https://asd.gsfc.nasa.gov/luvoir/events/> Abstract solicitation for AGU 2018 in session P053: *The Uranus and Neptune Systems, and their Relation to Other Planets*. Talk or poster (TBD).
12. **Cuk M** (Sept 7, 2018), *Origin of the moon*, public talk to the SJSU Geology Club.
13. **Diamond, Bill** (September 18, 2018), USB CEO Summit on Disruptive Technology, Hong Kong, *Disruptive Technologies for Disruptive Forces – Humanity’s Next Step*
14. **Diamond, Bill** (September 25, 2018), NASA Technosignature Workshop, Houston, TX, *The Case for SETI and Technosignatures Research*
15. **Diamond, Bill** (August 16, 2018), FDL 2018 Final Presentations, Santa Clara, CA, Event Host
16. **Fenton LK** served on a NASA R&A review panel.
17. **Harman, PK** et al (8/14) *SETI Institute Education Programs*, SETI Talks, SRI, Menlo Park, CA
18. **Jin, M.** “Modeling Magnetic Flux Rope from the Sun to 1 AU”, Invited Scene-Setting Speaker in SHINE session “Understanding the Magnetic Configuration of CMEs”, SHINE 2018, Cocoa Beach, FL, *30 July-3 August, 2018*.
19. **Jin, M.** “Global MHD Simulations of CME-driven Shocks”, Invited Scene-Setting Speaker in SHINE session “Observations and Interpretations of Coronal Shock Waves”, SHINE 2018, Cocoa Beach, FL, *30 July-3 August, 2018*.
20. **Jin, M.** “Sun-to-Earth Modeling of Coronal Mass Ejections with a Global MHD Model: Facilitating Physical Understanding and Space Weather Forecasting”, Invited Speaker in *SCOSTEP’s 14th Quadrennial Solar-Terrestrial Physics Symposium (STP14)*, in Toronto, Canada.
21. **Jin, M.** “Sun-to-Earth Modeling of Coronal Mass Ejections with a Global MHD Model: Facilitating Physical Understanding and Space Weather Forecasting”, Invited Speaker in *XVIth Hvar Astrophysical Colloquium: International Study of Earth-affecting Solar Transients, ISEST 2018 Workshop*, in Hvar, Croatia.
22. **Marchis, F.** SETI Talk (10/25), Panelist for a discussion about *VR in Space*, *SRI International*, Menlo Park.

23. **Marchis, F.** invited speaker at Fall Starfest of the AAS of NY, Central Park Sheep Meadow, September 22 2018, talk “SETI & Unistellar Partnership” and demo of the industrialized prototype.
24. **Marchis, F.** invited to give an interactive presentation at California College of Arts , San Francisco, September 14 2018, on VR2Mars a VR2Planets app to explore Mars
25. **Peeters E** (May/). *The photochemical evolution of the interstellar PAH family with JWST: the JWST-ERS program on Photo-dissociation Regions*, Invited review talk at the CASCA 2018 meeting, Victoria, Canada, May 22-27, 2018
26. **Peeters E** (April/). *Critical laboratory data needs for interpreting IR observations of PAHs and dust*. Invited talk at the 2018 NASA Laboratory Astrophysics Workshop (LAW), Athens, GA, USA, April 8-11, 2018
27. **Peeters E** (April/). *Observational characteristics of the UIR bands and interstellar PAHs*. Invited review lecture series (3hrs) and hands-on sessions (3hrs) at the doctoral training program “Interstellar PAHs,” France, April 2-6, 2018
28. **Race MS**, (Aug./6). *Planning Missions to Mars and Beyond (Evening Public Talk) and Contest Judging for Children’s Build a Spaceship activity*, Newark Library, Newark CA.
29. **Race MS**, (Sept./21) *Astrobiology, ET, Planetary Protection and Societal Issues*. Invited Guest Lecturer in Course STCE4005-1 “AstroTheology and AstroEthics” at Graduate Theological Union, Center for Theology and Natural Sciences, Berkeley, CA.
30. **Shostak, S.** Jun 7, 2018. Mountain View Senior Center Talk (1:00 pm)
31. **Shostak, S.** Jun 7, 2018. Participation in Quizotron, Piano Fight, San Francisco, CA
32. **Shostak, S.** Jun 10, 2018. Talk for Bay Area Skeptics.
33. **Shostak, S.** Jun 12, 2018. “SETI and AI”, Pure Storage Corp., Mountain View, CA
34. **Shostak, S.** Jun 15-17, 2018. Various talks, panels, Aliencon, Pasadena, CA
35. **Shostak, S.** Jun 24, 2018. “SETI Today,” keynote, Astrobiology Australasia, Rotorua, New Zealand.
36. **Shostak, S.** Jul 7,8, 2018. Speaker, Spacefest, Starr Pass Resort, Tucson, AZ
37. **Shostak, S.** Jul 19, 2018 Red dwarf survey with the ATA,” COSPAR meeting, Pasadena, CA.
38. **Shostak, S.** Jul 28, 2018. “The 21st Century”, The Grove, Bohemian Club
39. **Shostak, S.** Aug 21, 2018. “Is Telling People How Science Works a Lost Cause?”, 2018 NSF STC Directors Meeting, Berkeley, CA

40. **Shostak, S.** Aug 24 through Sep 11, 2018. Nine talks on SETI and astronomy, southern France, MWT tours [Partial listing: (a) Are we closer to finding ET?, (b) Where are the aliens?, (c) How dark matter was found, (d) Could Earth be being visited?, (e) The future of humanity, (f) How the universe will end
41. **Shostak, S.** Sep 22, 2018. "The Search for Extraterrestrial Life", Sedgewick200 Geology Conference, Cambridge Univ., U.K. windup speaker
42. **Shostak, S.** Sep 28, 2018. "The Efforts to Find Extraterrestrial Intelligence," (colloquium) Georgia Tech, Atlanta
43. **Shostak, S.** Sep 28, 2018. "Finding ET" (popular talk), Georgia Tech, Atlanta.
44. **Showalter MR** (7/21/2018). *Spectacular Neptune photo shows Hubble Space Telescope has a new rival*, Interview. <https://www.nbcnews.com/mach/science/spectacular-neptune-photo-shows-hubble-space-telescope-has-new-rival-ncna893996>
45. **Showalter MR** was invited to be a keynote speaker at an International Ice Giant Workshop being planned for the Royal Society in London in late 2019.
46. **Skok JR** (Sept./28) *Seeking Signs of Life in Ancient Martian Hot Springs*, University of California, Santa Cruz.
47. **Tiscareno MS** (20 September 2018) gave the joint Astronomy / Earth and Planetary Sciences department seminar at the University of California in Berkeley CA.
48. **Tiscareno MS** (24 September 2018) gave the Physics department seminar at the University of Idaho in Moscow ID.
49. **Tiscareno MS** (13 November 2018) will speak about Cassini for the Community Tuesdays event at the Palo Alto Jewish Community Center.

Highlights/ Significant Events and Activities

1. **Andersen, A.** My field-team and I will be departing on 17 Oct for Cape Town, SA and fly to Antarctica on 23 Oct. Our traverse to Lake Untersee will begin by 1 November and we will carry out research at Untersee until mid-December.
2. **Rosalba Bonaccorsi:** Death Valley posts hottest month ever recorded on Earth, for the second July in a row with max temperature of 127 F reached in Furnace Creek July 2018. The Water Year 2018 also appears to be the first one of a new cycle of dry years to come. Previous drought in California occurred from 2012 to 2015. Rosalba has been monitoring the annual temperature and precipitation at several locations in Death Valley.



This year less than 38-40 mm precipitation was measured from October 2017 to September 2018. This precipitation pattern in Death Valley is consistent with the 2004-2018 precipitation pattern seen thru the PRISM climate data (1895-present) for the Mojave Climate region. As Astrobiology Fieldtrip Director Rosalba have been leading this year One-week REU Summer camp at the HCRO/ SETI Institute facility. The students had the chance to conduct radio astronomy experiments with Drs. Jill Tarter for two days,

followed up by hands-on experience at Lassen National Park's. They explored planetary-like terrains and conducted their own geology and Astrobiology-relevant observations.

3. **Cabrol, NA. and the SETI Institute NAI Team.** The SETI Institute NAI team met for its yearly in person meeting August 16-17, 2018 at the Mountain HQ to discuss main results and directions, as well as organize the upcoming field expedition in the Andes.
4. **Caldwell, D. A.** (June-Aug 2018) Mentor for REU/CAMPARE program project "Observing Earth as an Exoplanet," Kapoor, B.

5. **Cartwright RJ** (2018). Joined the team developing the Key Science Programs (KSP) for Solar System science using Extremely Large Telescopes (ELTs), Sep. 2018.
6. **Cuk M** (2018). Co-organized a graduate-level summer school “Workshop on Geology and Geophysics of the Solar System”, in Petnica, Serbia on June23 – July 1.
7. **Cuk M** (2018). Quoted in an article in Discover Magazine, July 20. “Exploring the Lost Moons of Our Solar System”.
<http://blogs.discovermagazine.com/crux/2018/07/20/exploring-the-lost-moons-of-our-solar-system/#.W7UXcvlRepp>

8. **Drake Award** - This year's event honored Dr. Victoria S. Meadows, a leader in the scientific analysis of environments on extrasolar planets, and in the search for signs of habitability and life. Presentation of award to Dr. Meadows was followed by short lecture and panel discussion with Victoria Meadows, **Nathalie Cabrol**, and **Jill Tarter**. Moderated by **Seth Shostak**. The event took place at SRI International



(Menlo Park) on July 7, 2018

9. **Harman, PK**, (7/10- 7/14) Girl Scout Astronomy Adventure Destination Camp, Pine Mountain Observatory, OR.
10. The discovery by **Showalter MR**, de Pater I, Lissauer JJ, and **French RS** of Neptune's 14th moon has been certified by the Minor Planet Center (<https://www.minorplanetcenter.net/iau/mpc.html>). It is now official designated Neptune XIV. The official name has not yet been announced.
11. **Smith, J. C., Caldwell, D. A.**, (July-Aug 2018) Mentors for the FDL Exoplanets Team
12. **Tiscareno MS** (continuing). Member of the AAS DPS Subcommittee on Professional Culture and Climate, which works towards making the community of planetary scientists an environment in which professional merit is the only criterion that determines each person's success.

13. **Warren-Rhodes, K.** Our team presented at the NAI meeting August 15-19 2018. We begin our field season to map biosignatures in the extreme environments of the Atacama Desert and Altiplano October 28-November 19. The team will work remotely, collect samples, including aseptic drilling, and install nanoclimate sensors in the Pajonales sulfate flats, El Tatio high-altitude geyser and hot springs, and Lake Leijia/Simba Volcano.

Field Work/Expeditions

1. **Cabrol, NA.** Preparation of the field expedition in the Chilean Andes for the SETI Institute NAI team that will take place October 27-November 19, 2018. Deployment sites include: Salar de Pajonales (4,300 m); El Tatio (4,400 m), Laguna Leija and Laguna Aguas Calientes (4,300 m), and the ascension of the Simba volcano for sampling of the summit lake (5,900 m) and deployment of environmental sensors (weather and UV). National Geographic will accompany the team at the first site.
2. **Sobron, P.** (September/ 4-11). Led expedition to Esja Mountain and Krysuvik hydrothermal field in Iceland to demonstrate UAV-based survey and sampling technologies for future planetary exploration.

Projects with Interns

1. **Bishop JL** (June-Aug). worked with REU/ SETI summer intern Gabriela Usabal on detection of the sulfate mineral jarosite at Mawrth Vallis, Mars using orbital VNIR imagery and spectroscopy in the lab.
2. **Bishop JL** (June-Aug). worked with PGGURP/ SETI summer intern Jasper Miura on detection of the sulfate mineral alunite at Mawrth Vallis, Mars using orbital VNIR imagery and spectroscopy in the lab.
3. **Cabrol NA.** Frontiers Development Lab – Astrobiology Teams I and II (mentor).
4. **Fenton L, JL Bishop** (June-Aug). worked with COMPARE/ SETI summer intern Tatiana Gibson on characterization of the gypsum-rich dunes at the Olympia Undae

region of Mars using orbital high resolution images and VNIR image cubes together with spectroscopy in the lab.

5. **Race MS** (June-Aug). worked with STAR/ SETI summer intern Lauren Tran doing background research on updates about Mission Implementation for the new NASA Planetary Protection website.
6. **Summers D** (June-Aug). worked with REU/ SETI summer intern Monica Chavan on growing the extremophiles *sulfolobus* and *colwellia*.

Honors and Awards

1. **Beyer RA, Hinson D, Umurhan O, and White O (July 11, 2018). Asteroids named!** For service to the New Horizons mission the asteroids (141995) Rossbeyer, (164536) Davehinson, (196411) Umurhan, and (201019) Oliverwhite were named for these SETI Institute scientists. Minor Planet Circular: https://minorplanetcenter.net/iau/ECS/MPCArchive/2018/MPC_20180711.pdf
2. **Bishop J.**, was elected as a Fellow to the Geological Society of America (GSA) at the spring GSA Council meeting, in recognition of their distinguished contributions to the geosciences through such avenues as publications, applied research, teaching, administration of geological programs, contributing to the public awareness of geology, leadership of professional organizations, and taking on editorial, bibliographic, and library responsibilities.”
3. Stoker, C.R., (PI), Bywaters, K.F., (Co-I) **Bonaccorsi, R.** (Co-I) (June 2018). **2018 Ames Research Innovation Award (ARIA).**What Happens to Life in an Ocean World Plume? Experimental study of cellular survival in simulated Enceladus-like plume. One-week REU Summer camp at the HCRO/ SETI Institute facility. RB has been is the REU Astrobiology Fieldtrip Director since 2013.
4. **Stucky TR, et al** (Sept/13th). *Group Achievement Award*, In recognition of a 2018 NASA Group Achievement Award for outstanding technical collaboration in developing a fully-automated drilling and sampling lander.
5. **Stucky TR, et al** (Sept/13th). *Group Achievement Award*, For superior dedication and performance in rapidly developing a simulation capability for a wide range of piloted and/or autonomous vehicles in support of emerging aviation.

