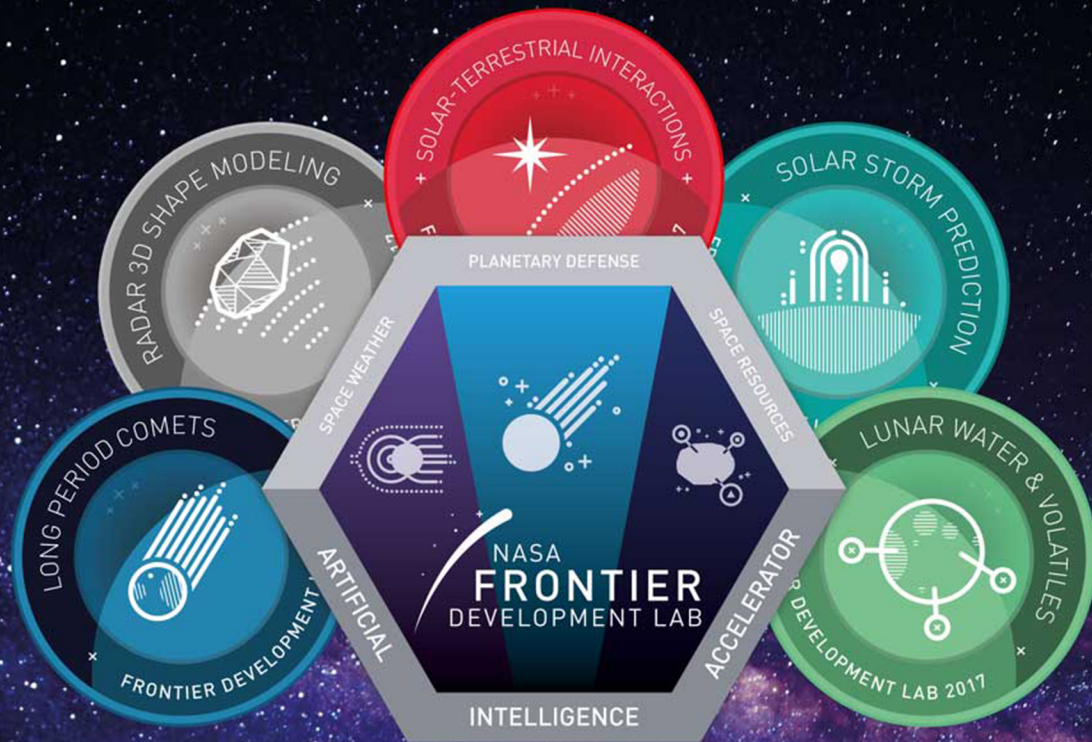
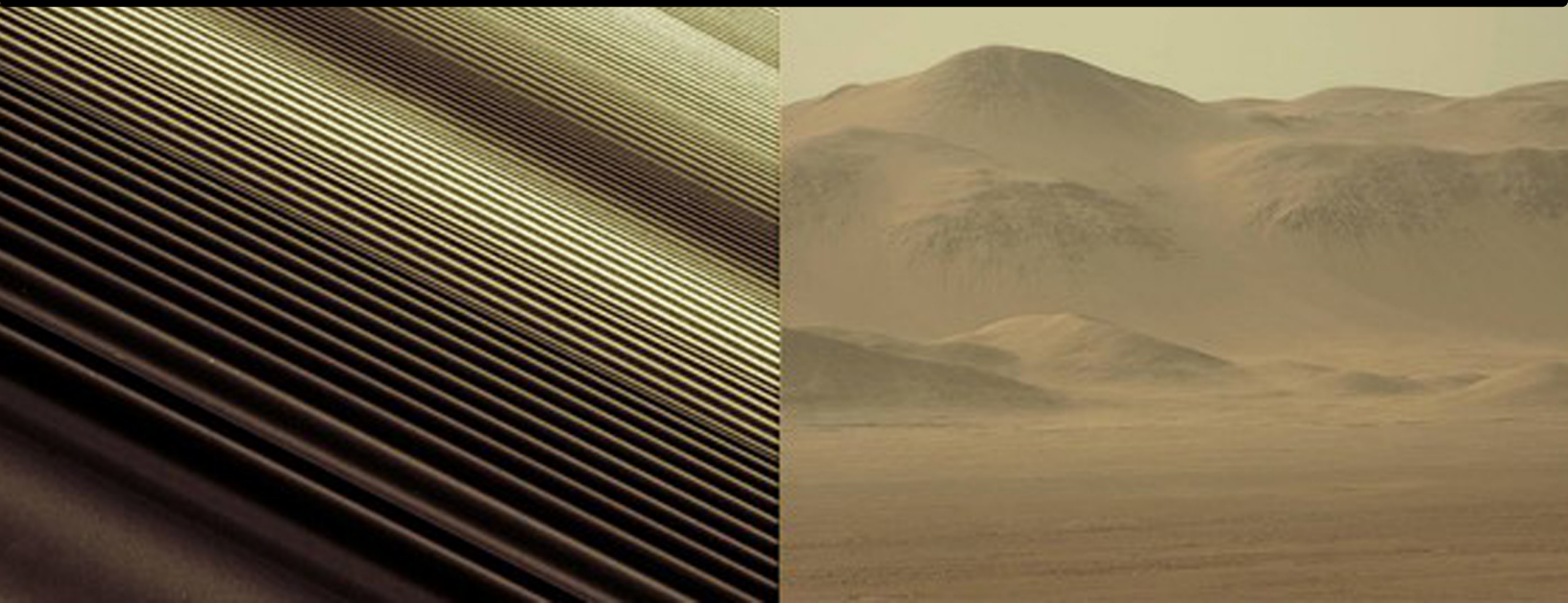




CARL SAGAN CENTER

Activity Report June 2017
Dr. Nathalie A. Cabrol, Director



Peer-Reviewed Publications (only in press or published)

1. Koo, H., Hakim, J. A., Morrow, C. D., Eipers, P. G., Davila, A., **Andersen, D. T.**, & Bej, A. K. (2017). Comparison of two bioinformatics tools used to characterize the microbial diversity and predictive functional attributes of microbial mats from Lake Obersee, Antarctica. *Journal of Microbiological Methods*, **In Press**.
[doi:https://doi.org/10.1016/j.mimet.2017.06.017](https://doi.org/10.1016/j.mimet.2017.06.017)

Conferences: Abstracts and Proceedings

2. **Caldwell D.A.** (2017). The 4th Kepler/K2 Science Conference: Poster: 'KIC 9832227: Testing the "Red Nova" Merger Prediction Using Vulcan Data'
3. Chu J, Sanders DB, Larson KL, Mazzarella JM, Howell J et al. including **Lord S**, (2017). Understanding Local Luminous Infrared Galaxies in the Herschel Era. AAS Meeting #230, id. 401.05
4. **Coughlin JL** (2017). AAS 230: Talk. *The Final Kepler Planet Candidate Catalog (DR25)*
5. http://adsabs.harvard.edu/cgi-bin/nph-data_query?bibcode=2017AAS...23010204C&db_key=AST&link_type=ABSTRACT
6. **Coughlin JL** (2017). The 4th Kepler/K2 Conference: Poster The DR25 Kepler Robovetter
7. **Cuk M**, Dones HC, Nesvorny D, Walsh KJ (2017). A Secular Resonance Between Iapetus and the Giant Planets. DDA Meeting #48, id. 105.01.
8. El Moutamid M, Hedman MM, Nicholson PD, **Tiscareno MS**, Tajeddine R, and Burns JA (6/14/17). On what we have learned about the system of Saturn thanks to Cassini. *AAS Division on Dynamical Astronomy Meeting 48*, 304.01
9. **French, Robert S.; Showalter, Mark R.; Gordon, Mitchell K.** 2017. Precision Pointing Reconstruction and Geometric Metadata Generation for Cassini Images, 3rd Planetary Data Workshop, Flagstaff, AZ.
<http://astropedia.astrogeology.usgs.gov/downloadWeb/publish/links/images/Presentations2017/Monday/Humphreys/French-Talk-170612-PDW-CDAPS.pdf>
10. **Gordon, Mitchell K.; Showalter, Mark R.; Ballard, Lisa; Tiscareno, Matt; French, Robert S.; Olson, Daniel.** 2017. OPUS: A Comprehensive Search Tool for Remote Sensing Observations of the Outer Planets. Now with Enhanced Geometric Metadata for Cassini and New Horizons Optical Remote Sensing Instruments, 3rd Planetary Data Workshop, Flagstaff, AZ.
<http://astropedia.astrogeology.usgs.gov/downloadWeb/publish/links/images/Presentations2017/Tuesday/Humphreys/French-Talk-170613-PDW-OPUS.pdf>

11. Kraus AL, Ireland M, Mann A, **Huber D**, Dupuy TJ (2017). The Ruinous Influence of Close Binary Companions on Planetary Systems. AAS Meeting #230, id. 118.04.
12. Murray CD, Cooper NJ, Renner S, Santos Araujo NC, Noyelles B, and **Tiscareno MS** (6/15/17). High-resolution Cassini observations of Saturn's A ring in the vicinity of object "Peggy." *AAS Division on Dynamical Astronomy Meeting* 48, 401.05
13. Spitale JN and **Tiscareno MS** (6/15/17). Saturn's misbegotten moonlets. *AAS Division on Dynamical Astronomy Meeting* 48, 400.04
14. **Tarter JC** (6/18-23), Sufficiently Advanced Technologies: Indistinguishable From Magic, Nature, Paperclips?, *Starmus Festival IV: Life and the Universe*, Trondheim, Norway <https://www.starmus.com/>
15. **Thompson SE** (2017) The 4th Kepler/K2 Science Conference:. Invited Talk: "The Final Kepler Survey Catalog of Planet Candidates"
16. **Tiscareno MS**, Baker EJ, and The Cassini Imaging Team (6/15/17). Targeted flyby images of propellers in Saturn's A ring. *AAS Division on Dynamical Astronomy Meeting* 48, 401.02

Technical Reports & Data Releases

1. **Caldwell, D.A.**, 2017, K2 Campaign 11 Data Release Notes
2. **Coughlin, J.L.** 2017, Description of the TCERT Vetting Reports for the Data Release 25 Catalog (KSCI-19105-001) <https://keplergo.arc.nasa.gov/k2-data-release-notes.html>
3. **Coughlin JL** (2017) 2017b, Planet Detection Metrics:Robovetter Completeness and Effectiveness for Data Release 25 (KSCI-19114-001)
4. **Harp GR, Richards J** (2017). Final Report for prototype ATA backend system.

Popular Publications/Web Stories/ Other Media / Interviews

1. **Bywaters K** – Participated in a Live SETI Facebook Event on June 28, 2017, where she presented her work in biosignature detection. You can see it here: <https://www.facebook.com/SETIInstitute/videos/10155306702465535/>
2. **Fenton LK** curated the geoscience rocur Twitter account @GeoSciTweeps for the week of June 26 - July 2.
3. **Race M** (6/15) discussed Planetary Protection during a SETI Institute Facebook Live Event hosted by **B Diamond**. You can see it here: <https://www.facebook.com/SETIInstitute/videos/10155261970965535/>

4. **Shostak, Seth** (6/2) Progress in the Search for Life, Wits Radio Academy, Johannesburg, South Africa (via Skype)
5. **Shostak, Seth** (6/6) *Space Entrepreneur Thinks Aliens Are Here. Is He Right?* NBC News/Mach
6. **Shostak, Seth** (6/13) Guest on Ronn Owens Show, KGO Radio, San Francisco
7. **Shostak, Seth** (6/13) Guest on first NBC News/Mach virtual reality broadcast
8. **Shostak, Seth** (6/13) *Was It ET on the Line? Or Just a Comet?*, SETI Institute web site
9. **Shostak, Seth** (6/14) Guest on Michio Kaku Radio Show, *Science Fantastic*
10. **Shostak, Seth** (6/15) Interview about solar eclipse, KQED Radio, San Francisco
11. **Shostak, Seth** (6/23) Looking Sharp: How to Effectively Sharpen Digital Images, *Shutterbug Magazine*
12. **Shostak, Seth** (6/25) Guest on Pat Thurston Show, KGO Radio, San Francisco
13. **Tarter JC** (6/7) Interview with Norwegian journalist Anders Dunker at Hat Creek
14. **Tiscareno MS** (6/7) did follow-up filming with PBS *Nova*, who are working on a documentary about Cassini. The documentary will likely appear in September.
15. **Tiscareno MS** (6/7) did follow-up filming with Discovery Canada, who are working on a documentary about Cassini. The documentary will likely appear in September.
16. **Tiscareno MS** (6/22) was interviewed by Julien Wacquez, a graduate student in sociology at École des Hautes Études en Sciences Sociales, Paris, about the intersection between planetary science, science fiction, and society.
17. **Thompson, S.E. & Coughlin, J.L** (6/22) gave an update on the new Kepler planet candidates and talks about Earth-like planets on Science Friday during a SETI Institute Facebook Live Event hosted by **B Diamond**. You can see it here:
<https://www.facebook.com/SETIInstitute/videos/10155285181590535/>
18. **Thompson, S.E.**, NASA Sponsored press conference (2017-06-19) and numerous interviews surrounding release of Kepler final catalog, including Science Friday “Kepler Unveils a New Crop of Exoplanets” (2017-06-23).
<https://www.sciencefriday.com/segments/kepler-unveils-a-new-crop-of-exoplanets/>

Invitation to Speak (Professional and Public)

1. **Beyer, RA**, "The NASA Context for a Planetary Spatial Data Infrastructure" keynote talk given at the 3rd Planetary Data Workshop in Flagstaff, AZ.
2. **Busch MW**, "*Recent Radar Observations of Near-Earth Asteroids*", Lijiang, Yunnan, China, at the International Workshop on Solar System Small Bodies Exploration organized by Yunnan Observatories, (talk given remotely)
3. **Hollenbach, D** (2017). "The Effect of Photoevaporation on the First Stars" , held at the Star Formation in Space and Time conference, Florence Italy, June 5-9.
4. **Shostak, Seth** (6/1). *SETI*, via Skype, Rijksuniversiteit Groningen, The Netherlands (undergraduate lecture)
5. **Shostak, Seth** (6/8). *The Right Type of Extraterrestrials*, talk at Spacefest, Tucson, AZ
6. **Shostak, Seth** (6/11). *Astrobiology in the Outer Solar System* panel, Spacefest, Tucson, AZ
7. **Shostak, Seth** (6/18) *New Thoughts on SETI*, FutureCon/AwesomeCon, Washington Conference Center, Washinton, DC
8. **Shostak, Seth** (6/26) Interview on Russian TV about SETI and UFOs, Skype
9. **Tarter JC** (6/9-10), SETI: Indistinguishable From --- Magic? Nature? Paperclips?", *The Y Conf*, Offices of Y Combinator in San Francisco (Level 2, 965 Mission St,
10. **Tarter JC** (6/10-11), The 21st Century, the Century of Biology on Earth and Beyond, *The SETI-IBM Hackathon, ML4SETI*, Offices of Galvanize in San Francisco
11. **Tiscareno MS** (9/11) will give the September edition of the Benjamin Dean Astronomy Lecture at the California Academy of Sciences in San Francisco CA. His title will be "Farewell to Saturn: Cassini's spectacular end-of-mission science."
12. **Tiscareno MS** (9/15) is helping to plan an event at the SETI Institute to mark the end of the Cassini mission. He will likely speak at this event.

Significant Events and Activities

1. **All Hands Meeting** took place at the SETI Institute on June 8 (12-1:30 pm), and was an opportunity for an update on the Institute.
2. **Cabrol NA**, and **Diamond W.** visited the SETI Group at Berkeley on June 28, where they gave an update on the Institute and the new vision for the SETI search. They were

hosted by Andrew Siemon and Dan Werthimer. The presentation was followed by a tour of the Berkeley SETI Group labs.

3. **Fenton LK** attended a Mars Dust workshop on 13-15 June at LPI in Houston, TX. <https://www.hou.usra.edu/meetings/marsdust2017/>
4. **Gulick, VG** and **Glines, NH** (May 31). Ginny and Natalie hosted the 9th and final visit of the 7th and 8th graders of Evergreen Middle School (Cottonwood, CA) at Ames as their teacher Mr. Dennis Mitchell is retiring. The students gave a presentation highlighting their Mars studies during the school year with HiRISE images entitled: (Signs of) "Water, Water Everywhere and Not a Drop To Drink". They also showed us the different rovers that they had built this year. The students went on a tour of the Ames' Future Flight Central and the Exploration Center. They were treated to an inspiring talk by **Pascal Lee** on "Going to Mars", which was interspersed by lots of fascinating stories about his life, how he got interested in science and his 20 years of research at a Mars Analog site known the Haughton impact crater in the Canadian High Arctic. The Evergreen students handed out Mars Calendars that they had put together to the audience as a thank you. We presented a poster montage showing many of the images that they had submitted and studied through the years via the HiRISE Image Suggestion web facility HiWeb.



Image caption: Seventh and eighth graders from Evergreen Middle School, Cottonwood, CA with teacher Mr. Dennis Mitchell and local Ames science collaborators: Ginny Gulick and Natalie Glines (May 31, 2017).

5. The 2017 **Frontier Development Lab program** (FDL), hosted at the SETI Institute, began on June 26. **Jennissen, PM** and **Busch, MW** are among the Institute staff members participating in the program. The FDL program this year will develop new approaches to asteroid, comet, and solar threats using AI. See the SI Press Release here:

<http://www.seti.org/seti-institute/press-release/nasa-fdl-developing-new-approaches-asteroid-comet-and-solar-threats>

6. **“Happy Hours”** were organized by the Institute on June 8 from 5-7:00 pm. **Eliot Gillum** presented Optical SETI to visitors and friends of the Institute. The presentation was followed by conversation and networking.
7. The ***Machine Learning for SETI Hackathon*** took place June 10-11, 2017. Fifty participants, including data scientists and technologists spent the weekend hacking away at the SOMA facility in San Francisco. The accompanying code challenge will continue through July 31, 2017. See the Press Release for details, here: <http://www.seti.org/machine-learning-for-seti-hackathon>
8. **Tiscareno MS** (concluding this month). Member of the NASA PDS Roadmap Study Team, which has drafted a document to chart the future course of the NASA Planetary Data System.
9. **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.
10. **Tiscareno MS** (beginning this month). Co-chair of the Local Organizing Committee for the 2018 meeting of the AAS Division on Dynamical Astronomy, which will take place next April in San Jose CA.

Honors and Awards

1. **Mullally FR** (June 2017). Fergal Mullally wins NASA’s 2017 Exceptional Public Achievement Medal for revolutionary Kepler Object of Interest (KOI) vetting.

Highlights

2. **Dale Andersen:** June 18-20. NHK (Japanese Broadcasting Corporation), Japan's national public broadcasting organization presented its UHD 8K video trailer of the upcoming production tentatively titled **Antarctica, The Frozen Time Capsule** in Poitiers, France at the Euormax Giant Screen event. This documentary captures the Antarctic research led by Dale Andersen at Lake Untersee, above and below the thick, perennial lake ice.
3. **Dale Andersen:** Returned from 5 weeks of field work with NHK (Japanese Broadcasting Corp.) documentary team. Our work included documenting field sites in UHD 8K video relevant to Astrobiology, including sites in the Pilbara that host some of the oldest evidence of life on the planet, banded iron formations, modern stromatolites

located at Hamelin Pool in Shark Bay, and within Daintree Rainforest, the oldest continuous rain forest on the planet. This footage will be used to help tell the story of Andersen's research efforts in Antarctica.

4. **Bywaters K**, and **Takir D** have joined the Institute. The SI just welcome two new principal investigators. See the article that accompanied the announcement here: <http://www.seti.org/seti-institute/Kathryn-Bywaters-Driss-Takir-Join-SETI-Institute>
5. **Coughlin, J L** (2017): Team member on Hubble proposal that was awarded time.
6. **Coughlin, JL** (2017) SETI Facebook Live Event 2017-06-21
7. **Tarter, JC** (5/12) Interview WBEZ Chicago "Through the Decades with Bill Kurtis"

Where on Earth is the Flag?

The SETI Expedition Flag has been quite the traveler in the past few months already ... It is currently in the hands of Dale Andersen, who will take it to the High Arctic very soon. Since it was activated in October of 20, 2016, the flag has been to:

- October-November 2016 - Chile (Atacama, Altiplano, and Andes) at Salar Grande, Salar de Pajonales, El Tatio, and Laguna Lejía. SETI Institute NAI Team expedition, led by **NA Cabrol**
- November-December 2016 - Reunion Island - **F Marchis**
- March 2017 - Death Valley, USA - Fieldwork and MarsFest - **R Bonaccorsi**.
- May 2017 - Yilgarn Craton region of West Australia - Fieldwork led by **J Bishop**
- May-June 2017 - South Africa (Sutherland Observatory, Drimolen and Sterkfontain Caves) and meteorites sites in Namibia - **B Diamond**
- July 2017 - Heading for the Arctic!

A map soon to come!

Carl Sagan Center Science Council

*Research Division**Astronomy & Astrophysics**Astrobiology**Climate & Geoscience**Exoplanets**Planetary Exploration**SETI**Chair*

Paul Estrada

Janice Bishop

Dale Andersen

Franck Marchis

Virginia Gulick

Gerry Harp

Co-Chair

Uma Gorti

Nathalie A. Cabrol

Doug Caldwell

Lori Fenton

Eliot Gillum

Advisors to the Science Council

Mark Showalter

Margaret Race

Young Scientist Representative

Michael Busch