

## DANTE S. LAURETTA

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### CHRONOLOGY OF EDUCATION

**Washington University**, St. Louis, MO

Dept. of Earth and Planetary Sciences

Ph.D. in Earth and Planetary Sciences, 1997

Thesis: Theoretical and Experimental Studies of Fe-Ni-S, Be, and B Cosmochemistry

Advisor: Bruce Fegley, Jr.

**University of Arizona**, Tucson, AZ

Depts. of Physics, Mathematics, and East Asian Studies

B.S. in Physics and Mathematics, Cum Laude, 1993

B.A. in Oriental Studies (emphasis: Japanese), Cum Laude, 1993

### CHRONOLOGY OF EMPLOYMENT

**Arizona Regents Professor**, Lunar and Planetary Laboratory, Dept. of Planetary Sciences,  
University of Arizona, Tucson, AZ; 2021 – present.

**Principal Investigator**, OSIRIS-REx Asteroid Sample Return Mission, NASA New Frontiers  
Program, 2011 – present.

**Professor**, Lunar and Planetary Laboratory, Dept. of Planetary Sciences, University of Arizona,  
Tucson, AZ; 2012 – 2021.

**Deputy Principal Investigator**, OSIRIS-REx Asteroid Sample Return Mission, NASA New  
Frontiers Program, 2008 – 2011.

**Associate Professor**, Lunar and Planetary Laboratory, Dept. of Planetary Sciences, University of  
Arizona, Tucson, AZ; 2006 – 2012.

**Assistant Professor**, Lunar and Planetary Laboratory, Dept. of Planetary Sciences, University of  
Arizona, Tucson, AZ; 2001 – 2006.

**Associate Research Scientist**, Dept. of Chemistry & Biochemistry, Arizona State University,  
Tempe, AZ; 1999 – 2001.

**Postdoctoral Research Associate**, Dept. of Geology, Arizona State University, Tempe, AZ  
Primary project: Transmission electron microscopy of meteoritic minerals.  
Supervisor: Peter R. Buseck; Dates: 1997 – 1999.

**Research Assistant**, Dept. of Earth and Planetary Sciences, Washington Univ., St. Louis, MO  
Primary project: Experimental studies of sulfide formation in the solar nebula.  
Advisor: Bruce Fegley, Jr.; Dates: 1993 – 1997.

**Research Intern**, NASA Undergraduate Research Program, University of Arizona, Tucson, AZ  
Primary project: Development of a logic-based language for S.E.T.I.  
Advisor: Carl Devito; Dates: 1992 – 1993.

## **HONORS AND AWARDS**

Explorers Club Citation of Merit (2024)  
Goddard Memorial Trophy (2024)  
Eugene Shoemaker Lecturer of the American Geophysical Union (2023)  
NASA Group Achievement Award – OSIRIS-REx Sample Collection (2023)  
Sigma Xi Distinguished Lecturer (2023)  
Robert M. Walker Distinguished Lecturer – Washington University in St. Louis (2022)  
University of Arizona Commencement Speaker (2022)  
Space Foundation John L. "Jack" Swigert Jr. Award for Space Exploration (2022)  
University of Arizona Regents Professor (2021)  
American Astronautical Society Space Technology Award (2021)  
MOCA Tucson Local Genius Award (2021)  
University of Arizona Galileo Circle Dean's Award (2020)  
NASA Group Achievement Award – OSIRIS-REx Approach and Preliminary Survey (2019)  
Guinness World Record –The Smallest Object to be Orbited by a Spacecraft (2019)  
Guinness World Record –The Closest Orbit of a Planetary Body (2019)  
NASA Group Achievement Award – OSIRIS-REx Earth Gravity Assist (2018)  
Silver Prize (for Constellations) – International Serious Play Board Game Award (2018)  
Mensa Select Award (for Constellations) – Mensa Mind Games (2018)  
University of Arizona, College of Humanities Alumni of the Year (2017)  
NASA Silver Achievement Medal – OSIRIS-REx Asteroid Astronomy Science Team (2017)  
NASA Group Achievement Award – OSIRIS-REx Mission Team (2017)  
University of Arizona Alumni Achievement Award (2017)  
Boys and Girls Clubs of America Alumni Hall of Fame (2017)  
Arizonan of the Year (awarded to OSIRIS-REx) – Arizona Republic (2016)  
Best Family Board Game of 2016 (for Xtronaut) – Good Housekeeping Magazine (2016)  
Ceremonial First Pitch – Arizona Diamondbacks STEM Showcase (2016)  
Robert H. Goddard Award for New Opportunities Captured for the OSIRIS-REx Team (2014)  
Arizona Governor's Celebration of Innovation Award – Innovator of the Year, Academia (2011)  
Antarctica Service Medal of the United States of America (2010)  
Kavli Fellow of the National Academy of Sciences (2008)  
Award of Excellence Top 10 Oral Presentation AAPG Annual Convention (2008)  
UA College of Science Distinguished Early Career Teaching Award (2006)  
Top 100 Science Discoveries – Discover Magazine (2004)  
The Alfred O. Nier Prize of the Meteoritical Society (2002)  
Asteroid 5819 named Lauretta (2002)  
Stephen E. Dworkin Planetary Geoscience Award (1997)  
Harvey H. Nininger Meteorite Award (1996)  
Meteoritical Society Student Travel Grant (1994, 1996)  
McDonnell Fellowship for the Space Sciences (1993-95)  
NASA Undergraduate Research Space Grant (1992-93)  
Silver Prize, Southwest Regional Japanese Essay Contest (1992)  
Arizona Regents Presidential Scholarship (1988-91)

## **PROFESSIONAL SOCIETIES**

The Meteoritical Society, Fellow

American Association for the Advancement of Science, Fellow

American Geophysical Union

The Geochemical Society

Sigma Xi

## **PUBLIC PRESENTATIONS AND INVITED TALKS (PAST FIVE YEARS)**

1. “To Bennu and Back,” Colloquium, February 15, 2024, Hokkaido University, Sapporo, Japan
2. “Biogenic Element Distribution in Samples Returned by OSIRIS-REx,” February 13, 2024, Solar System Symposium, Sapporo, Japan
3. “From Asteroid to Earth: First Results from the OSIRIS-REx Mission and Implications for Planetary Science,” Lunar and Planetary Laboratory Colloquium, January 16, 2024, University of Arizona, Tucson, AZ
4. “From Asteroid to Earth: First Results from the OSIRIS-REx Mission and Implications for Planetary Science,” Eugene Shoemaker Lecture, December 11, 2023, American Geophysical Union, San Francisco, CA
5. AIAA Distinguished Speaker Lecture, November 29, 2023, Virtual
6. “OSIRIS-REx and Near-Earth Asteroid Bennu – Returning a Sample of the Early Solar System,” November 14, 2023, Space Studies Board, Irvine CA
7. Google Quantum AI Tech Talk, November 13, 2023, Google Quantum AI Lab, Santa Barbara, CA
8. “OSIRIS-REx Update,” SETI Live – Virtual – October 12, 2023
9. “OSIRIS-REx Update,” NASA Science Live – Virtual – September 26, 2023
10. “Astrobiology and Astroconsciousness,” Neuroscience Needs a Revolution to Understand Consciousness Symposium – Encinitas, CA, August 19, 2023
11. “The Economic Impact of Space Exploration,” International Economic Development Council – Keynote – Tucson, AZ, January 30, 2023
12. “OSIRIS-REx at Bennu: An evening with PI Dante Lauretta,” Public Lecture, Space and Rocket Center, Huntsville, AL, January 17, 2023
13. “OSIRIS-REx and Near-Earth Asteroid Bennu - Returning a Sample of the Early Solar System,” Colloquium, Washington University, St. Louis, MO, October 19, 2022
14. “Playing Tag with an Asteroid - NASA's OSIRIS-REx Mission at Asteroid Bennu,” Public Lecture, St. Louis, MO, October 20, 2022
15. “To Bennu and Back: NASA’s OSIRIS-REx Mission,” Colloquium, Brown University, Toronto, ON, August 5, 2022
16. “OSIRIS-REx - Status of NASA's Near-Earth Asteroid Sample Return Mission,” International Astronomical Union General Assembly, August 1, 2022
17. “OSIRIS-REx Sample Acquisition and Implications for the Nature of the Returned Sample from Asteroid (101955) Bennu,” Goldschmidt Geochemistry Conference, Honolulu, HI, July 11, 2022

18. “OSIRIS-REx Samples of Near-Earth Asteroid (101955) Bennu: Testing Theories of the Origin of Life,” Astrobiology Science Conference, Atlanta, GA, May 19, 2022
19. “What is Astrobiology”, Increasing Student Interest and Engagement in Space Exploration Conference, April 29, 2022
20. “Science and Humanities United – Why We Explore”, Arizona Junior Science and Humanities Symposium Keynote Speaker, March 18, 2022
21. “Asteroid Exploration at the University of Arizona”, Space Camp at Biosphere 2 Lecturer, February 17, 2022
22. “Astrobiology and Astroconsciousness: An illustrated discussion with UArizona professors Dante Lauro and Stuart Hameroff”, Museum of Contemporary Art, Tucson, Arizona, December 9, 2021
23. “OSIRIS-REx: Updates and Expectations”, Planetary Science Symposium Physical Research Laboratory, Ahmedabad, India, November 30, 2021
24. “OSIRIS-REx Overview”, NASA Lucy Mission Science Team Meeting, October 14, 2021
25. “Calibration Challenges for NASA’s OSIRIS-REx Mission”, CalCon Keynote Speaker, Space Dynamics Laboratory, North Logan, Utah, September 1, 2021
26. An Evening with UArizona Leaders, February 25, 2021 | Virtual Zoom Meeting
27. University Fellows Colloquium Panel Discussion – Engaging with the Media, February 11, 2021
28. “To Bennu and Back: NASA’s OSIRIS-REx Mission” Keck Institute for Space Studies/Caltech Virtual Talk, November 30, 2020
29. “To Bennu and Back: NASA’s OSIRIS-REx Mission” University of Arizona Humanities Seminar Program, November 20, 2020
30. “OSIRIS-REx at Asteroid Bennu” Colloquium, Brown University, Providence, RI, March 4, 2020
31. “Comparing the B-type Asteroids Bennu and Phaethon”, Japanese Aerospace Exploration Agency, DESTINY+ Mission Science Team Meeting, Chiba, Japan, October 10, 2019.
32. “Latest Results from the NASA OSIRIS-REx Asteroid Sample Return Mission”, Goddard Scientific Colloquium, NASA Goddard Space Flight Center, September 25, 2019
33. “OSIRIS-REx at Asteroid (101955) Bennu: The Site Selection Campaign”, EPSC-DPS Joint Meeting 2019, September 17, 2019
34. “OSIRIS-REx – Exploration of Asteroid (101955) Bennu”, Gordon Conference on the Origins of Solar Systems, June 24, 2019
35. “OSIRIS-REx – Exploration of Asteroid (101955) Bennu”, NASA Goddard Space Flight Center 60<sup>th</sup> Anniversary celebration, May 2, 2019
36. “Solar System Exploration and the Future of Humanity”, University of Arizona, College of Humanities of the 21<sup>st</sup> Century, April 4, 2019
37. “Science and the Humanities: An Integrated Approach to Solar System Exploration”, University of Arizona, College of Humanities Seminars Program, February 19, 2019

## **SERVICE/OUTREACH (PAST FIVE YEARS)**

### **OUTREACH PRESENTATIONS – LOCAL/STATE**

1. Tucson Festival of Books – March 9, 2024
2. Gem & Mineral Show – A Day at the Alfie – January 27, 2024
3. Bennu on Display – Norville Gem & Mineral Museum – November 30, 2023,
4. University of Arizona Astronomy Club – November 17, 2023
5. Sands Club – Public Lecture OSIRIS-REx Follow Up – November 8, 2023
6. Ten West Panel, Tucson Convention Center – November 7, 2023
7. Fuel Wonder Insiders Campaign Event – November 2, 2023
8. TEDx Talk – Centennial Hall – November 1, 2024
9. Sands Club – Public Lecture – January 25, 2023
10. ΦBK Honorary Society – Keynote Speaker – May 1, 2022
11. Sonoran Science Academy Mars Presentation – September 9, 2021
12. UArizona Honors NOW Event – April 6, 2021
13. An Evening with UArizona President R. C. Robbins – February 25, 2021
14. UArizona President's Advisory Council – February 23, 2021
15. Skygazers Astronomy Club – December 13, 2020
16. Sonoran Science Academy OSIRIS-REx Presentation – October 2, 2020
17. Lunar and Planetary Laboratory, Summer Science Saturday – August 1, 2020
18. Whipple Observatory, Green Valley, AZ – March 4, 2020
19. Southern Arizona Leadership Council, Tucson, AZ – January 15, 2020
20. University of Arizona, Honors College, Tucson, AZ – November 15, 2019
21. Teen Astronomy Cafe at National Optical Astronomy Observatory – May 4, 2019
22. College of Humanities Charrette, Tucson, AZ – April 4, 2019
23. SUnMaRC Conference, Tucson, AZ – March 30, 2019
24. University of Arizona, Molecular and Cellular Biology Club – February 26, 2019

### **OUTREACH PRESENTATIONS – NATIONAL/INTERNATIONAL**

1. Lockheed Martin, Littleton, CO – January 31, 2023
2. Asteroid Mining Summer Program, MDA, Brampton, ON – May 24, 2022
3. Lockheed Martin, Littleton, CO – April 18, 2021
4. Motion Metrics Corporation, Vancouver, BC – April 9, 2021
5. NASA Small Bodies Assessment Group – January 25, 2021
6. NASA Small Bodies Assessment Group – June 1, 2020
7. Brown University Planetary Geology Class, Providence, RI – March 6, 2020
8. NASA Small Bodies Assessment Group – January 14, 2020
9. NASA Goddard Space Flight Center, Greenbelt, MD – September 24, 2019
10. Lockheed Martin, Littleton, CO – June 12, 2019
11. Boys and Girls Clubs of America Fund Raiser, Las Vega, NV – April 23, 2019
12. National Academy of Science, Committee on Astrobiology and Planetary Science, Washington, DC – March 25, 2019
13. NASA Small Bodies Assessment Group – January 29, 2019
14. Lockheed Martin, Littleton, CO – January 23, 2019
15. Boys and Girls Clubs of America Fundraising Campaign, 2018
16. Profs and Pints, Washington, DC, December 10, 2018
17. Creative Destruction Lab, Fireside Chat, Toronto, ON – June 7, 2018

## **DEPARTMENTAL COMMITTEES AND SERVICE**

Director, Lunar and Planetary Laboratory Electron Microprobe Laboratory (2016 – present)  
Science and Technical Oversight Committee, Kuiper Materials Imaging Core Facility (2017 – present)  
Graduate Admissions and Advising Committee (2021 – 2023, Chair)  
LPL Awards Committee (2018 – 2022, Chair)  
LPL Faculty Recruitment and Search Committee (2017 – 2018, Chair)

## **UNIVERSITY OF ARIZONA COMMITTEES**

Senior Vice President for Academic Affairs Search Committee (2024)  
College of Science Faculty Council (2022 – present)  
College of Humanities Deans Advisory Committee (2019 – present)  
Honors College Faculty Advisory Committee (2019 – 2022)  
Committee on Academic Freedom and Tenure (2013 – 2016; 2017 – 2020)

## **EXTRAMURAL – PEER REVIEWER**

Journals: *Science*, *Science Advances*, *Nature*, *Nature Communications*, *Meteoritics and Planetary Science*, *Geochimica et Cosmochimica Acta*, *Icarus*, *Earth and Planetary Science Letters*, *American Mineralogist*, *Journal of Atmospheric and Solar-Terrestrial Physics*, *Fuel*, *Transactions of the JSAS*

Cambridge University Press  
University of Arizona Press  
NASA Research Opportunities in Space and Earth Science (ROSES)  
NSF: OCE International Support  
Austrian Science Fund  
Agence Nationale de la Recherche - France  
The Marsden Fund - New Zealand Government  
Swiss National Science Foundation  
MacArthur Fellows Program  
European Research Council Executive Agency  
The UK's Strategic Science Investment Agency, Particle Physics and Astronomy Research Council (PPARC)  
The Leverhulme Trust, London, UK  
Shota Rustaveli National Science Foundation of Georgia

## **EXTRAMURAL – OTHER**

Director – Arizona Astrobiology Center (2023 – present)  
Science Advisory Board – United Launch Alliance (2022 – present)  
Chief Scientist – Peace Satellite Project, Space Trust (2020 – present)  
Co-Investigator – ESA Hera Asteroid Mission (2020 – present)  
Science Review Panel – United Arab Emirates MAX Mission (2022, 2024)  
Organizing Committee – The Science of Consciousness Conference (2022, 2024)  
Organizer and Chair – University of Arizona-University of Nairobi-Space Trust Symposium (2021)  
Board of Directors, Boys and Girls Clubs of Tucson (2018 – 2022)

Co-Investigator – JAXA Hayabusa2 Asteroid Sample Return Mission (2013 – 2022)  
Chief Scientist – Creative Destruction Lab, Space Track (2021)

## **TEACHING & EDUCATIONAL ACTIVITIES**

### **COURSES TAUGHT**

S02 NATS 102: The Universe and Humanity, 3 credit hours, 160 students  
F02 PTYS 510: Principles of Cosmochemistry, 3 credit hours, 12 students  
S03 PTYS 195A: First Year Colloquium: Meteorites, 1 credit hour, 15 students  
S03 PTYS 900: Team X – Spacecraft Mission Design, 3 credit hours, 9 students  
F03 NATS 102: The Universe and Humanity, 3 credit hours, 160 students  
S04 NATS 102: The Universe and Humanity, 3 credit hours, 72 students  
F04 PTYS 510: Principles of Cosmochemistry, 3 credit hours, 18 students  
F04 PTYS 195A: Asteroids, Comets, and Meteorites, 1 credit hour, 20 students  
S05 PTYS 499/699: Team X – Spacecraft Mission Design, 3 credit hours, 8 students  
F05 NATS 102: The Universe and Humanity, 3 credit hours, 160 students  
S06 NATS 102: The Universe and Humanity, 3 credit hours, 86 students  
F06 PTYS 510: Principles of Cosmochemistry, 3 credit hours, 14 students  
S08 PHYS 498: Senior Capstone, 3 credit hours, 1 student  
F08 PTYS 510: Principles of Cosmochemistry, 3 credit hours, 12 students  
S09 PTYS 195A: Asteroids, Comets, and Meteorites, 1 credit hour, 20 students  
F09 PTYS 407: Chemistry of the Solar System, 3 credit hours, 16 students  
S17 PTYS 495/595: Special Topics – Spacecraft Mission Design and Implementation, 19 students  
F17 PTYS 499/499H: Independent Study – Star and Planet Formation – 6 students  
F18 HNRS 499H/EDL 396B: Gameful Learning and Community Outreach – 8 students  
S19 HNRS 499H/EDL 396B: Gameful Learning and Community Outreach – 16 students  
F19 HNRS 499H/EDL 396B: Gameful Learning and Community Outreach – 18 students  
S20 EDL 396B: Gameful Learning and Community Outreach – 15 students  
F20 EDL 396B: Gameful Learning and Community Outreach – 15 students  
S21 PTYS 495B/595B: Special Topics – Spacecraft Mission Design and Implementation, 19 students  
F21 PTYS 214: Astrobiology – A Planetary Perspective, 42 students  
F22 PTYS 214: Life in the Cosmos, 79 students  
S23 PTYS 407: Chemistry of the Solar System, 24 students  
F23 PTYS 214: Life in the Cosmos, 80 students

### **CURRENT STAFF SCIENTISTS AND ENGINEERS**

Carina Bennett (OSIRIS-REx SAMIS Project Manager and Software Engineer)  
Ken Domanik (Lunar and Planetary Laboratory, Electron Microprobe Manager)  
Anjani Polit (OSIRIS-REx Mission Implementation Systems Engineer)  
Andrew Ryan (OSIRIS-REx Sample Physical and Thermal Properties Lead)  
Cat Wolner (OSIRIS-REx Chief Editor)

### **CURRENT PH.D. STUDENTS**

Yuhui "Harry" Tang (Ph.D.)  
Kana Ishimaru (Ph.D.)  
Nathalia Vega-Santiago (Ph.D.)  
Melissa Kontogiannis (Ph.D.)

### **FORMER POSTDOCTORAL RESEARCH ASSOCIATES**

Eric Palmer (Ph.D. 2009 – University of Arizona)  
Jemma Davidson (Ph.D. 2009 – Open University)  
Andrew Ryan (Ph.D., 2018 – Arizona State University)  
Ronald Ballouz (Ph.D., 2018 – University of Maryland)

### **FORMER PH.D. STUDENTS**

Fred Ciesla (Ph.D. 2003)  
Matthew Pasek (Ph.D. 2006)  
Jade Bond (Ph.D. 2008)  
Eric Palmer (Ph.D. 2009)  
Eve Berger (Ph.D. 2011)  
Kathryn Gardner-Vandy (Ph.D., 2012)  
Devin Schrader (Ph.D., 2012)  
Kelly Miller (Ph.D., 2016)

### **FORMER M.S. STUDENTS**

Celinda Marsh (M.S. 2007)

### **UNDERGRADUATE RESEARCH INTERNS**

1. Frances McQueen (2002 – 2003)
2. Virginia Smith (2003 – 2004)
3. Alyssa La Blue (2003 – 2005)
4. Daniella DellaGiustina (2004 – 2009)
5. Devin Schrader (2005 – 2007)
6. Matthew Rodriguez (2006 – 2007)
7. Adria Brooks (2006 – 2008)
8. Courtney King (2008 – 2011)
9. Katrina Jackson (2008 – 2011)
10. Lujhendra Ohja (2009 – 2011)
11. Rachel Maxwell (2010 – 2011)
12. Jennifer Sterchio (2010 – 2011)
13. Ashley Nied (2015 – 2018)
14. Katherina Marchese (2016 – 2019)
15. Kerst Kingsbury (2018)
16. Jessica Forelli (2017 – 2020) – Honors Thesis Advisor
17. Collin Lewin (2017 – 2020) – Honors Thesis Advisor, Goldwater Fellow
18. Kana Ishimaru (2018) – summer intern from University of Tokyo
19. Lindsey Koelbel (2018 – 2021) – Brooke Owens Fellow
20. Sarah Graham (2019 – 2021) – Honors Thesis Advisor



21. Shae Henley (2021 – 2022)
22. Ruby Fulford (2021 – 2022) – Honors Thesis Advisor
23. Melissa Kontogiannis (2021 – 2023)
24. Sarah Nielsen (2022 – 2023)

#### **GRANTS AND CONTRACTS – CURRENT**

OSIRIS-REx Asteroid Sample Return Mission PI and Science Support – Phase-B/C/D/E

Role: Principal Investigator

Total Award: \$ 119.4M

Award Period: 12/16/2011 – 10/31/2025

Source: NASA MSFC New Frontiers Program Office – Contract NNM10AA11C

Annual Commitment (person months): 3

OSIRIS-APEX: An OSIRIS-REx Extended Mission to Apophis

Role: Emeritus Principal Investigator/ Co-Investigator

Total Award: \$60M

Award Period: 11/01/2023 – 9/30/2031

Source: NASA MSFC New Frontiers Program Office

Annual Commitment (person months): 1

Nanoscale Secondary Ion Mass Spectrometer for Planetary Materials

Program: Gordon and Betty Moore Foundation

Role: Collaborator

Proposal period: 06/01/2020-05/31/2025, Award amount: \$2,400,000

Commitment level: 0 FTE, capital equipment

The Kuiper Materials Imaging and Characterization Facility at the University of Arizona

Role: Co-Investigator

Total Award: \$2,919,856

Award Period: 12/7/2022 – 12/6/2026

Source: NASA Planetary Science Enabling Facilities

Time Commitment: 0.01 person months/year

Amino Acid Frequencies in Ancient Life

Role: Collaborator

Total Award: \$150,000

Award Period: 08/20/2023 – 08/19/2026

Source: NNH22ZDA001N-FINESST

Annual Commitment (person months): NA (Advising graduate student Sawsan Wehbi)

#### **GRANTS AND CONTRACTS – PENDING**

None at present

#### **GRANTS AND CONTRACTS (PAST FIVE YEARS)**

Application of Machine-learning Algorithms for On-board Asteroid Shape Model Determination and Spacecraft Navigation

Role: Principal Investigator

Total Award: \$397,700

Award Period: 01/15/2018 – 01/14/2020

Source: NASA NNH17ZOA001N-17STP\_E1  
Annual Commitment (person months): 1

Workshop on Asteroid Science in the Age of Hayabusa2 and OSIRIS-REx

Role: Principal Investigator

Total Award: \$48,000

Award Period: 07/01/2019 – 12/31/2019

Source: NASA 18-TWISC18-0052

Annual Commitment (person months): NA (workshop support)

Comet Astrobiology Exploration Sample Return (CAESAR)

Role: Co-Investigator

Total Award: \$38K

Award Period: 01/15/2018 – 06/01/2019

Source: NASA NNH16ZDA011O: New Frontiers 4, subcontract from Cornell University

Annual Commitment (person months): 1

#### **PUBLICATIONS – BOOKS AND EDITED VOLUMES**

**2024:** **D. S. Lauretta**, *The Asteroid Hunter*. Grand Central Publications.

**2023:** **D. S. Lauretta**, B. May, et al. *Bennu 3-D: Anatomy of an Asteroid*. London Stereoscopic Company/University of Arizona Press.

**2011:** **D. S. Lauretta** (ed.) *Elements: An International Magazine of Mineralogy, Geochemistry, and Petrology*. Special Issue on Cosmochemistry, Volume 7, Number 1.

**2010:** D. Apai and **D. S. Lauretta** (eds.) *Protoplanetary Dust: Astrophysical and Cosmochemical Perspectives*. Cambridge University Press.

**2006:** **D. S. Lauretta** and H. Y. McSween (eds.) *Meteorites and the Early Solar System II*. University of Arizona Press, Tucson, AZ.

**2005:** **D. S. Lauretta** and M. Killgore. *A Color Atlas of Meteorites in Thin Section*. Golden Retriever Publications, Tucson, AZ and Southwest Meteorite Press, Payson, AZ.

**2002:** M. K. Crombie, C. T. Gholson, **D. S. Lauretta**, and E. B. Melchiorre. *Rich Hill: The History of Arizona's Most Amazing Gold District*. Golden Retriever Publications, Tucson, AZ.

#### **PUBLICATIONS – BOARD GAMES**

**2022:** Pisces: A High-Stakes Fishing Competition. Xtronaut Enterprises.

**2020:** Xtronaut 2.0. Xtronaut Enterprises.

**2019:** Downlink: The Game of Planetary Discovery. Xtronaut Enterprises.

**2017:** Constellations: The Game of Stargazing and the Night Sky. Xtronaut Enterprises.

**2016:** Xtronaut: The Game of Solar System Exploration. Xtronaut Enterprises.

## PUBLICATIONS – PEER-REVIEWED JOURNALS

### 2024:

273. Fulford, Ruby E., et al. "QRIS: A Quantitative Reflectance Imaging System for the Pristine Sample of Asteroid Bennu." *arXiv preprint arXiv:2402.18674* (2024).

272. Palmer, Eric E., et al. "Sensitivity Testing of Stereophotoclinometry for the OSIRIS-REx Mission. II. Effective Observation Geometry for Digital Terrain Modeling." *The Planetary Science Journal* 5.2 (2024): 47.

271. Palmer, Eric E., et al. "Sensitivity Testing of Stereophotoclinometry for the OSIRIS-REx Mission. I. The Accuracy and Errors of Digital Terrain Modeling." *The Planetary Science Journal* 5.2 (2024): 46.

270. Aponte, José C., et al. "Molecular distribution and <sup>13</sup>C isotope composition of volatile organic compounds in the Murchison and Sutter's Mill carbonaceous chondrites." *Meteoritics & Planetary Science* (2024).

269. Glavin, Daniel P., et al. "Investigating the impact of x-ray computed tomography imaging on soluble organic matter in the Murchison meteorite: Implications for Bennu sample analyses." *Meteoritics & Planetary Science* 59.1 (2024): 105-133.

268. Ishimaru, K., and D. S. Lauretta. "Analysis of layered boulders on asteroid (101955) Bennu and their implications for fluid flow on the parent body." *Meteoritics & Planetary Science* 59.1 (2024): 193-210.

267. Cody, George D., et al. "The nature of insoluble organic matter in Sutter's Mill and Murchison carbonaceous chondrites: Testing the effect of x-ray computed tomography and exploring parent body organic molecular evolution." *Meteoritics & Planetary Science* 59.1 (2024): 3-22.

### 2023:

**266. Lauretta, Dante S., et al. "OSIRIS-REx Sample Analysis Plan--Revision 3.0." *arXiv preprint arXiv:2308.11794* (2023).**

265. Bierhaus, E. B., et al. "A subsurface layer on asteroid (101955) Bennu and implications for rubble pile asteroid evolution." *Icarus* 406 (2023): 115736.

264. DellaGiustina, Daniella N., et al. "OSIRIS-APEX: an OSIRIS-REx extended mission to asteroid Apophis." *The Planetary Science Journal* 4.10 (2023): 198.

263. Adam, Coralie D., et al. "Stereophotoclinometry for OSIRIS-REx Spacecraft Navigation." *The Planetary Science Journal* 4.9 (2023): 167.

262. Leonard, Jason M., et al. "Post-flight Evaluation of Lidar-based Digital Terrain Models for OSIRIS-REx Navigation at Bennu." *The Planetary Science Journal* 4.7 (2023): 131.

261. Clark, B. E., et al. "Overview of the search for signs of space weathering on the low-albedo asteroid (101955) Bennu." *Icarus* (2023): 115563.

260. Gaskell, R. W., et al. "Stereophotoclinometry on the OSIRIS-REx Mission: mathematics and Methods." *The Planetary Science Journal* 4.4 (2023): 63.

259. Righter, K., et al. "Curation planning and facilities for asteroid Bennu samples returned by the OSIRIS-RE x mission." *Meteoritics & Planetary Science* (2023).
258. Marshall, J. R., et al. "Regolith migration on asteroid 101955 Bennu inferred from boulder alignment." *Planetary and Space Science* 229 (2023): 105659.
257. Naraoka, Hiroshi, et al. "Soluble organic molecules in samples of the carbonaceous asteroid (162173) Ryugu." *Science* 379.6634 (2023): eabn9033.
256. Yabuta, Hikaru, et al. "Macromolecular organic matter in samples of the asteroid (162173) Ryugu." *Science* 379.6634 (2023): eabn9057.
255. Noguchi, Takaaki, et al. "A dehydrated space-weathered skin cloaking the hydrated interior of Ryugu." *Nature Astronomy* 7.2 (2023): 170-181.
254. Jenniskens, Peter, et al. "An observing campaign to search for meteoroids of Bennu at Earth." *Icarus* 394 (2023): 115403.
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