The NASA Space Life Sciences Training Program: Accomplishments Since 2013

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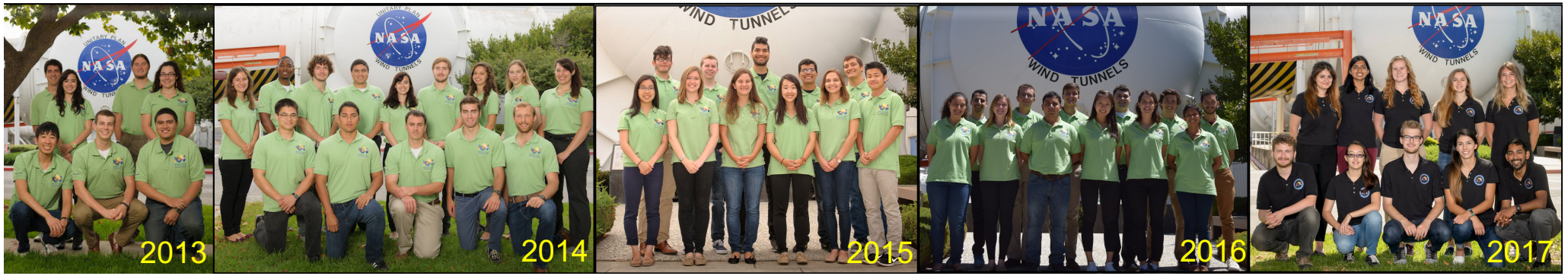

Outline

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- SLSTP History
- SLSTP at Ames
- SLSTP Process
- Mentor, Staffer, and Student Responsibilities
- 2017 research projects
- Quotes
- Summary and References

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SLSTP History: 1985 to 2005

- Started at **Kennedy Space Center** ~1985
- Six weeks per year
- Up to 40 students participated per year, selected on a competitive basis
- GPA ≥ 3.0, must have expressed interest in life sciences
- Students were provided
  - round trip to and from KSC
  - housing, meal allowance, and transportation
  - research and technology development experience
  - lectures, curriculum, and tours

https://www.nasa.gov/ames/research/space-life-sciences-training-program

Space Life Sciences Training Program at Ames

- The primary goal of the program is to train the next generation of scientists and engineers, enabling NASA to meet future research and development challenges in the space life sciences.
- Undergraduate students entering their junior or senior years with professional experience in space life science disciplines.
- Ten-week summer internship program (80% research, 20% group activities)
- Students are provided:
  - mentorship from NASA scientists and engineers
  - housing, a $6K stipend, and $500 travel allowance
  - transportation (2 vans driven by staffers) on Center and to offsite locations
  - travel support to ASGSR or other professional conference if abstract is accepted

NASA Funding: Space Biology Project

https://www.nasa.gov/ames/research/space-life-sciences-training-program

SLSTP at Ames: 2013 - 2017

- Restarted SLSTP at **Ames Research Center** in 2013
  - "Pilot program" of 6 students and 1 staffer
  - Increased students and staffers in 2014

- 49 students from 41 different Universities have completed the program to date
- 20 + mentors from Space Biosciences Division

Year	Number of female students	Number of male students	Total number of students
2013	1	5	6
2014	4	8	12
2015	4	6	10
2016	4	7	11
2017	7	3	10
Totals	20	29	49

Student Demographics	% of all student respondents
White	53
Asian	21
Hispanic or Latino	11
Black or African American	5
American Indian or Alaskan Native	5
Two or more races	5

https://www.nasa.gov/ames/research/space-life-sciences-training-program

Universities and Colleges

- 49 students from 41 different Universities in 24 U.S. States

Arizona State University
Carnegie Mellon University
Columbia University
Cornell University
CUNY City College, New York
Embry Riddle Aeronautical University
Georgia Institute of Technology
Harvard University (2)
Johns Hopkins University
Louisiana State University
Massachusetts Institute of Technology (3)
Michigan Technological University
Mitchell Community College
Oakland University
Pacific University
Pomona College
Purdue University
San Jose State University (2)
Stony Brook University
Temple University
University of Alabama
University of Arizona
University of California Berkeley (4)
University of California Davis
University of California San Diego
University of California Santa Barbara (2)
University of California Santa Cruz
University of California Los Angeles
University of Chicago
University of Colorado Denver
University of Houston
University of Kentucky
University of Maine
University of Maryland College Park
University of Minnesota Twin Cities
University of Missouri-Columbia
University of Nebraska
University of Pennsylvania
Washington University
Wesley College
Yale University

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Student Quotes

"SLSTP was an experience that I will never forget. My summer at NASA Ames has undoubtedly changed my life and career trajectory for the better."

"Having the honor to participate in NASA's Space Life Sciences Training Program was a great experience and a remarkable milestone in my life. Working at NASA has always been a distant dream of mine. It wasn't until I learned about this program that I found the courage to peruse that dream and make it a reality. The knowledge and experiences gained from this program will reign throughout my life forever."

"I am very happy with my time in SLSTP. This program taught me a lot not only about myself as a scientist, but also as a person and what I can bring to the table…"

"This program is intense, unique and exciting!"

"This internship experience greatly exceeded all of my expectations."

"Thank you SLSTP, for this incredibly rewarding experience. I am so lucky…and it still blows my mind that I interned for NASA!"

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Mentor, Staffer, and Student Responsibilities

Mentors

• Provide research project, select the student, provide mentorship, and accommodate student in lab/office for 10 weeks.

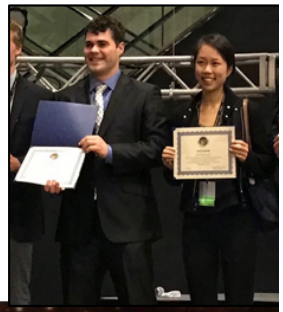
Staffers

• ~50% of their time on SLSTP student management, 50% research
• Draft profile books, coordinate speakers, communicate with management
• Drive students from place to place, guide students

Students

• Live in NASA Ames housing, participate in team building
• Support mentors by performing research tasks related to project description (~80% of their time)
• Group project and group activities (during week, evenings, and on weekends) (~20% of their time)
  Weekly summaries, lightning talks, mid-term, and final presentations
  Presentations to NASA HQ
• Final Paper and Testimonial describing summer experience
• Submit abstracts to ASGSR

If accepted, students attend ASGSR Conference!



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SLSTP 2017

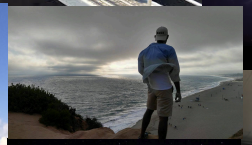
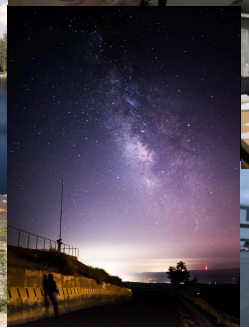
Project	Mentor	Org Code	Student	University	Major
Hypergravity exacerbates endoplasmic reticulum (ER) stress in Drosophila melanogaster: an evaluation of countermeasures	Sharmila Bhattacharya	SCR	Andrew Pelos	Pomona College	Molecular Biology
Studies in Bone Biology and Biomechanics	Josh Alwood	SCR	Amee Johnson	University of Colorado Denver	Public Health
Exposing Microorganisms in the Stratosphere (E-MIST)	David Smith	SCR	Tristan Caro	University of California Berkeley	Cellular Biology
Development & testing of radiation biosensors for NASA's BioSentinel mission	Sergio Santa Maria (Sharmila Bhattacharya)	SCR	Sawan Dalal	University of Houston	Biology
Skeletal responses to long-duration simulated weightlessness	Ruth Globus	SCR	Julia Adams	University of California Santa Barbara	Microbiology
Candidate nutritional countermeasure to mitigate adverse effects of spaceflight	Ann-Sofie Schreurs (Ruth Globus)	SCR	Ons M'Saad	Massachusetts Institute of Technology	Bioengineering
The Influence of Mechanical Unloading on Stem Cell-Based Tissue Regeneration	Elizabeth Blaber (Eduardo Almeida)	SCR	Esther Putman	University of Kentucky	Neuroscience and Biology
GeneLab Data Curation and Analysis	Homer Fogle (Sylvain Costes)	SCR	Maya Ramachandran	Columbia University	Biology
Synthetic biology for solar system exploration: How do microbes respond to spaceflight and how can we utilize them for in situ manufacturing?	Jonathan Galazka	SCR	Lily Neff	Wesley College	Biochemistry
Epigenetic Mechanisms and Sex Differences in Prenatal Programming of Adult Brain, Physiology and Behavior	April Ronca	SCR	Sophie Benson	Harvard University	Human Biology
Staffer	John Hogan	SCB	Joseph (Niko) Vlastos	Arizona State University	Biomedical Engineering
Staffer	Rusty Hung, Uland Wong, (Terry Fong)	TI	Onalli Gunasekara	University of California, Irvine	Aerospace Engineering

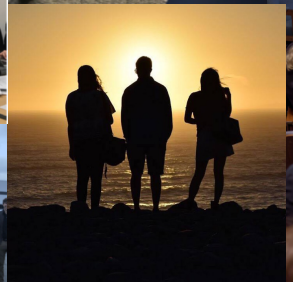






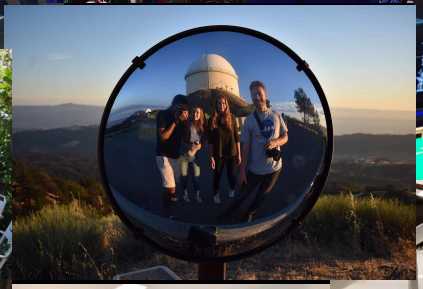

slstp



CHARLES ELACHI MISSION CONTROL CENTER

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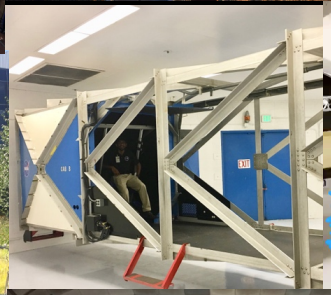


Jon Rask, director of NASA's Space Life Sciences Training Program
"This summer, college students in the NASA Space Life Sciences Training Program got hands-on experience in space life science research."


THE VERGE
Why NASA is sending bacteria into the sky on balloons during the eclipse
It has to do with life on Mars

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Summary

- SLSTP has been successfully run for 5 years at Ames
- 20+ mentors have trained 49 students in space life sciences disciplines and NASA culture
- Supported advancement of Space Biology research and technology development efforts
- Inspired mentors and managers
- ~30% of students are coauthors on manuscripts that are in process or will be published
- ~35% of students are now in graduate school
- 2 SLSTP alums are currently employed at a NASA center
- Expanded student involvement in ASGSR
- Students emphasize their experience is
  - challenging, rewarding, inspiring
  - life changing, career defining
  - one that fosters great friendships
  - excellent for networking
  - an outstanding team building and leadership opportunity
- Interested in exploring the possibility of expanding SLSTP to include other centers

Funding from the Space Biology Project is gratefully acknowledged.

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