SPACE LIFE SCIENCES TRAINING PROGRAM

NASA Ames Research Center

Moffett Field, California

Summer 2022


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SPACE LIFE SCIENCES TRAINING PROGRAM
NASA SPACE BIOLOGY
SLSTP 2022
SPACE BIOSCIENCES
NASA AMES RESEARCH CENTER
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Juliana

Table of Contents

Staff and Management

SLSTP Staffers

20 Iris Irby

21 Brooke Shepard

SLSTP Management

22 Kimberly Cadmes

23 Elizabeth Keller

24 Hami Ray

25 Sigrid Reinsch

Space Biology Management

26 Amy Gresser

27 Parag Vaishampayan

28 Robert Vik

Mentors

30 Grace Belancik (SCB)

31 Jared Broddrick (SCR)

32 Egle Cekanaviciute (SCR)

33 Jonathan Galazka (SCR)

34 Diana Gentry (SGE)

35 Adrienne Hoarfrost (SCR)

36 Jessica Lee (SCR)

37 Lauren Liddell (SCR)

38 Lauren Sanders (SCR)

39 Sergio Santa Maria (SCR)

Executive Summary

The NASA Ames Space Life Sciences Training Program (SLSTP) is a unique summer institute of higher learning. The objective is to produce technically skilled scientists and engineers with the potential to become leaders in the US space program by providing a glimpse into the many disciplines that are required to conduct biological research in space. The success of the program is a result of the interaction of government, academia, and the private sector with each sector playing an essential and key role.

The program was established in 1985 and held at NASA Kennedy Space Center for twenty years, providing an opportunity for undergraduates to learn and experience how life sciences flight experiments are developed, prepared, and conducted. The intensive six-week summer training program exposed students to lecture series and hands-on research in active NASA research and flight support labs.

Over the years, similar education programs were established at other NASA centers to increase student education and interest in the field, and in 2013, SLSTP was piloted at NASA Ames Research Center (ARC). SLSTP at NASA Ames provides opportunities usually unavailable to those outside and within the Agency. The Ames SLSTP is unique in that it focuses on integrating the expertise of multiple disciplines into the space life sciences to gain a better and more comprehensive understanding of what is taking place today in the Space Program and thus, mold its future. SLSTP at NASA Ames continues the tradition of providing undergraduate students entering their junior or senior years with professional experience in space life science disciplines, with the objective of the program being to expose the research associates (RAs) to various aspects of NASA in topics including current research projects, development of unique tools for discoveries in space, tracing the progress of an idea from concept through completion, data analysis to publication, and impacts on science and society. The ten-week intensive summer program includes an important training opportunity where the students collaborate on a group project, which could have the potential of becoming a flight/launch opportunity, a ground study, or a publication, to name a few.

SLSTP is designed to operate as a joint effort with equal input, ideas, and energy coming from both the SLSTP Management Team and the research associates. The group meetings and discussions form part of the experience, which will help to shape SLSTP and the goals and interests of the Space Biology Program. The success of the SLSTP ultimately depends on the students. One major output of SLSTP is to ensure that the students engage and interact as a "team." Activities spark the development of each student's leadership qualities. Historically the SLSTP program has been held in-person at NASA Ames in Mountain View, California. However, due to the pandemic, the 2020-2022 programs were restructured to be conducted virtually, enabling the program to continue despite the challenging times.

Student Eligibility

To be eligible for the Space Life Sciences Training Program, students must:

- demonstrate an interest in space biosciences
- be enrolled as a junior, senior, or entering graduate student as of June 1 of the program year
- maintain a minimum 3.2 cumulative GPA
- concentrate in science (physics, chemistry, biology, etc.), math, engineering, computer science, or other areas of interest to the space biosciences
- be a US citizen as of June 1 of the program year

Contact Information

NASA Space Life Sciences Training Program information can be obtained through: www.nasa.gov/ames/research/space-life-sciences-training-program

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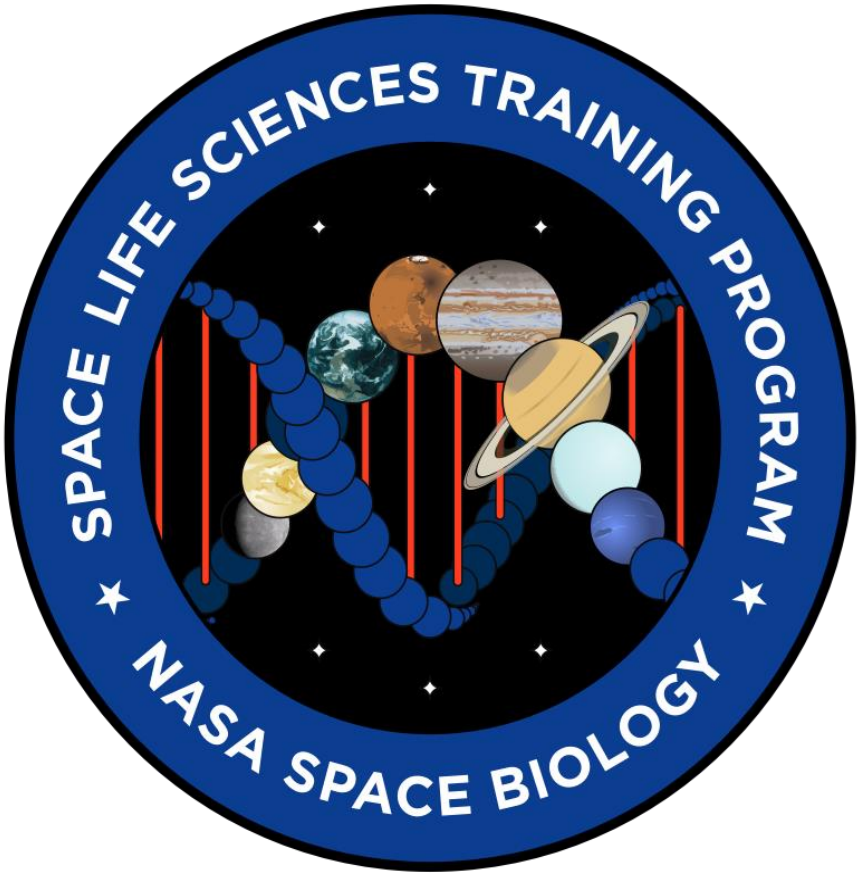
2022 Research Associates



Kylie Akiyama

Project: Developing New Autonomous Biosensor Technologies for Space Biology Research

University of California- Berkeley

Major: Bioengineering
PI: Sergio Santa Maria

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I used to be genuinely terrified of space. I vividly remember fourth-grade-me turning to my best friend and informing her that my greatest fears in life were of space and the deep ocean. Everything unknown about space and the numerous ways it could easily kill, freeze, boil, or spaghettify me seemed like a burden too great to bear for my 9-year-old self. I did not grow up dreaming of becoming an astronaut, playing with model rockets, or doing science experiments in my parent's kitchen. I liked watching Disney Channel Original Movies and reading Percy Jackson and I wanted to be a cinematographer. My parents could hardly imagine me as a scientist, and neither could I. But, many years and a couple of spontaneous science fairs later, I am now majoring in Bioengineering at UC Berkeley, spending my free time working with my synthetic biology and space technology clubs and hoping to continue pursuing the intersection between bioengineering and space exploration.

My first biology class in freshman year of high school was the first time I had seriously considered pursuing a career in the biosciences. I liked learning biology's beautiful little intricacies and it seemed like one of the most straightforward paths to helping people. If you could understand one's body and the environment that influences it, then you could heal it. An internship with the Baker Lab at Stanford University studying the genetic basis for preeclampsia made me realize I loved working in the wetlab and could picture myself puzzling through the multitudes of problems that science presents to us for as long as my life would let me. That was also the first time I timidly asked my graduate student mentor if we could read a paper about Space Biology together. Maybe it was a consequence of growing up, but sometime between fourth grade and junior year of high school, the unknowns of space that had scared me before became all too fascinating. "Everything unknown" about space became "everything we could learn" about the universe.

Since then, I have been incredibly fortunate to have the opportunity to work with the Hoehler Lab in the Exobiology Branch at NASA Ames, analyzing 16S rRNA gene amplicon sequencing data of subsurface and surface methanogen populations for projects assessing the parameters of life to search for on other planets and moons. Currently, I am also grateful to be working in the Arkin Lab at UC Berkeley under the Food and Pharmaceutical Synthesis Division of the Center for the Utilization of Biological Engineering in Space, working to improve the capacity to metabolically engineer *A. platensis* for small molecule production. Additionally, as a member of two research clubs on campus, iGEM at Berkeley and Space Technologies at Cal, I get to work alongside incredibly smart peers and friends on student-led projects that allow us to explore bioengineering and space on our own terms.

I am incredibly grateful for the chance to be a part of the SLSTP this summer. It will be an honor to learn from and work on projects at the cutting edge of space biology and work with teams who are just as enamored by how we can use bioengineering to both aid space exploration and use what we learn from space to help people on Earth.

Utah State University

Major: Bioengineering
PI: Jon Galazka

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Crystal Fowler

Project: Space Systems Biology – Reanalysis of Rodent Data from the SLS-1 Mission

I grew up in Southern Utah, not far from the Navajo Nation Reservation. I am Dine, Ute, and Zuni. I graduated with a B.S. in Biological Engineering in December 2021. I initially chose biological engineering because of my curiosity to explore and reshape the natural environment around me, but I stayed in biological engineering because I developed a life-long mission.

Space involves having limited resources, therefore designs built with these constraints provide solutions to challenges in our everyday environment. It is my mission to research plant life science in space to provide solutions to designing sustainable agriculture in these challenging drought-ridden times. I plan to become a Professional Engineer in the agricultural industry and work for NASA to achieve my mission.

I first started researching space life science when I learned about NASA growing plants in space through participating in the 2017 NASA X-HAB competition as a freshman in college. However, I dedicated my undergraduate years going after opportunities I thought I would enjoy, whether or not they were related to space or agriculture. I knew that a diverse knowledge background is crucial to solving space's engineering constraints.

I completed a biomechanical internship at Mayo Clinic to work with a 3D printed prosthetic. I learned wastewater treatment, applied downstream processing for pharmaceuticals and biodiesels, and studied equations for unit operations for metabolic engineering. During the pandemic, I participated in both the NASA L'SPACE Mission Concept Academy and Proposal Writing and Evaluation Experience. In turn, these academies helped me gain funding from my university to conduct seed research on a common variety of onion grown in Utah. Through these experiences, I picked up skills in coding, 3D CAD, 3D printing, and building circuits. I decided to add an Agronomy and Computer Science minors to my degree to help me fill potholes of knowledge in my research interests in the space life sciences. I derived great pleasure in applying and seeing the results of my diversified skill set.

The next step to achieve my mission is to join Cornell's Biological and Environmental Engineering PhD program in Fall 2022. I have an emphasis in sustainable agriculture and will continue researching external fluid impacts and internal fluid mechanisms of water in plants.

Overall, I am thankful for the opportunity to work with Dr. Galazka and the diverse team on a challenging new project that will diversify my skill set and expose me to more projects in the field of space biology. I am voracious to test, fail, and try again.

Juliana Gesztesi

Project: Communities of Microbes and the Effect of Nutrient-Deficient Zones (CoMENDZ)

Many starry nights, I find myself looking up, anticipating the inevitable breakthrough of interplanetary life and travel, and how I will contribute to the aerospace culture and legacy. Science and technology are quickly advancing, and I am eager to get my hands in the mix, leveraging my academic and professional experience in laboratory work, data analysis, and modeling. I chose to pursue bioengineering to discover what hinders biology in space. Fortunately, NASA's SLSTP program has allowed me to explore just that.

Prior to this summer, I worked at Sonata Therapeutics, a startup biotech company, where I explored the field of protein science. I contributed to protein production in mammalian cells, starting with bacterial plasmid preparation to purification and characterization using HPLC systems. I gained experience working in biotech, in addition to learning many valuable lab skills. At Sonata, my mentor — an intelligent and experienced biophysicist — inspired my ongoing fascination with the nature of proteins and how unique each one is.

As the leader for the College of Engineering branch of Northeastern's Interdisciplinary Women's Collaborative (IWC), I hosted software/programming workshops, organized cross-college events on asserting oneself in the workforce, and developed strong public communication skills. I have created opportunities to align my visions with the organization's goals, motivating my team to bring the most to the industry as women in STEM. Alongside the IWC, I have advanced my passion for teaching through my SAT tutoring company that has supported over 50 students, for which I have developed the curriculum and countless resources. In SLSTP, I will use my love for teaching to bring knowledge of and curiosity in space to school children.

At home in New York, I have a younger sister and brother, and two parents who have supported my adventures throughout my life. My hobbies include painting and exercise, and I love the outdoors!

I hope to bring my ingenuity, resourcefulness, and passion to NASA's SLSTP and aim to give as much to the program as the program would give to me.

Northeastern University

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Purdue University

Major: Bioengineering
PI: Lauren Liddell

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Kyra Keenan

Project: Investigating Biological Responses to Deep Space Radiation for Missions Beyond Low Earth Orbit (LEO) using Yeast

Far-off adventures took place on the floor of my living room at 8 years old as I eagerly flipped through the pages of "The Children's Atlas of the Universe." From here, my passion for space science blossomed, and I eventually swayed my parents into purchasing a Scientific American subscription so I could have the most recent updates in the field. I've saved nearly every issue that I've received since – my room is littered with article clippings discussing everything from quantum mechanics to planetary sciences. As a self-proclaimed bibliophile, I made countless trips to a local second-hand bookstore where I spent hours perusing the aging pages of second-hand scientific texts. This curiosity grew into a more serious intention to pursue a career in space science.

Growing up in Madison, Wisconsin has deeply influenced my current career aspirations. The UW-Madison Agricultural research station is quite literally right in my backyard, and I ended up working at their site in Arlington as a field research intern in the summer of 2021. I wasn't quite sure what to expect out of this position – I had never considered agriculture as an avenue for research, and I especially didn't expect to be splitting time between working in muddy soybean fields and rolling soil samples in a lab. I ended up falling in love with the work – even on the days we spent in 90-degree heat – and I now want to contribute to the development of robust cropping systems that can withstand high-stress environments presented by long-term spaceflight and climate change.

Since then, I've pursued a myriad of research endeavors. My primary research project in the Ni Lab involves studying the optimization of anaerobic co-digestion processes for biomethane production. I've also worked on characterizing bacteriophage proteins via predictive modeling software in the Clase Lab, and I help run a student organization that conducts research projects pertaining to bioregenerative systems in space. My research endeavors have been quite diverse to say the least, but I consider myself lucky to have the opportunity to study so many avenues of biological science. I'm ready to find a focus for graduate-level education. As of now, I'm likely going to pursue a doctorate in plant science. I'm incredibly excited to participate in NASA SLSTP to continue growing as a researcher.

With my passion for agriculture and plants, it is no surprise that I love the outdoors. I aim to visit all 62 National Parks in my lifetime. After I graduate in December of 2023, I'm packing up and moving out West to the Rocky Mountains to spend time skiing, hiking, and trail-running before pursuing my PhD. If I'm not outside, I'm probably reading, lifting, drawing, brewing kombucha, or listening to way too many podcasts (I am an AVID fan of Overheard at NatGeo). I cannot wait to see what the rest of this summer has in store at NASA!

University of California- Berkley

Major: Data Science
PI: Lauren Sanders

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Kevin Li

Project: Machine Learning to Study Spaceflight Effects on Biological Systems

I grew up dreaming under the stars. I say that in a literal sense, as the decoration in my childhood room was space-themed and there were actual glow-in-the-dark stars and miniature planet models hanging from my ceiling, but also figuratively. The fact that humans had been able to gain incredible insight into concepts much larger than ourselves in the universe convinced young me that our potential for discovery was unbounded.

While I wasn't planning on pursuing a space-related career back then, the personal microcosm of the universe I had in my room reminded me just how far humankind's curiosity could take us and, more importantly, how much more we still *didn't* understand. The latter point would seem discouraging, but it was what I was most excited about, because all the knowledge we didn't have was just more room for drastic life-changing discoveries that could be made. For me, I was most intrigued by advancements in an area that was a bit closer to home, one that was extremely relevant to every individual on the planet: health and medicine. Throughout my pre-collegiate years, I had always envisioned myself as a physician nor biologist, as I wanted to directly touch the lives of those who needed the most assistance.

However, another passion of mine started developing in parallel with medicine during middle school and high school: math and computation. I was fascinated by abstract problem solving and the explosion of technology and engineering that was happening around me, and I believed there was so much untapped potential for such feats in engineering to transform the medical field. So when I came to Berkeley, a place known for both its scientific atmosphere and its innovative engineering culture, I decided to dive into the intersection between biomedicine and computation and double major in Molecular/Cellular Biology and Data Science, which turned out to be one of the most rewarding decisions in my life.

The summer after freshman year, I joined my first research group at a lab in Evanston Hospital, where I was involved in a project that used machine learning to extract insight into the neurological differences between different forms of dysmenorrhea using patient EEG data. This experience marked a watershed in my scientific pursuits, as it was the first time I felt I was finally able to use all that theory I had been learning to push the boundary between unknown and known, a boundary I had wanted to expand ever since I was a kid staring up at my glow-in-the-dark stars. It also reinforced my interest in this promising interdisciplinary intersection of computational biology. I would later also take part in a project at UCSF that used deep learning to extract microscopic information from biological neurons (a project I like to describe as "using artificial neurons to learn more about real neurons"), as well as a summer experience at SENS Research Foundation and the Snyder Lab at Stanford University that involved analyzing multi-omic data to discover biomarkers of human aging, an area of biology I had always been intrigued by.

In addition to the immense amount of expertise I gained from my mentors and peers from these projects, I also learned a fundamental truth: I could not treat my scientific endeavors as solo missions. Even one man flights required a team of thousands. During all these experiences, my willingness to have humility, to genuinely listen to others' stories and ideas, and to accept that there was something I could learn from everyone was ultimately just as crucial to scientific progress, if not more so, than my technical skills. That was why I was excited to learn about NASA's SLSTP internship, because to me, NASA is the quintessence of teamwork and collaboration. I remember digging into the story of the Apollo 13 incident as a kid and being in complete awe at the precision of communication across hundreds of thousands of miles that ultimately prevented what could have been a disastrous event in an indescribable demonstration of synergy and cooperation.

I am now proud to announce that, this summer, I will be graduating from doing observational research on plastic planet models on my bedroom ceiling to conducting research on the spaceflight effects on biological systems using machine learning at NASA Ames Research Center! As someone who aspires to become not just a better researcher, but also a better team player, I'm excited to immerse myself in an organization that embodies collaboration and learn from some of the most passionate, inspiring, and future-oriented boundary-pushers and team players on this planet, all while leaving my own footprint on a project that is ever-so relevant at the dawn of accessible spaceflight!

University of Houston

Major: Physics
PI: Jessica Lee

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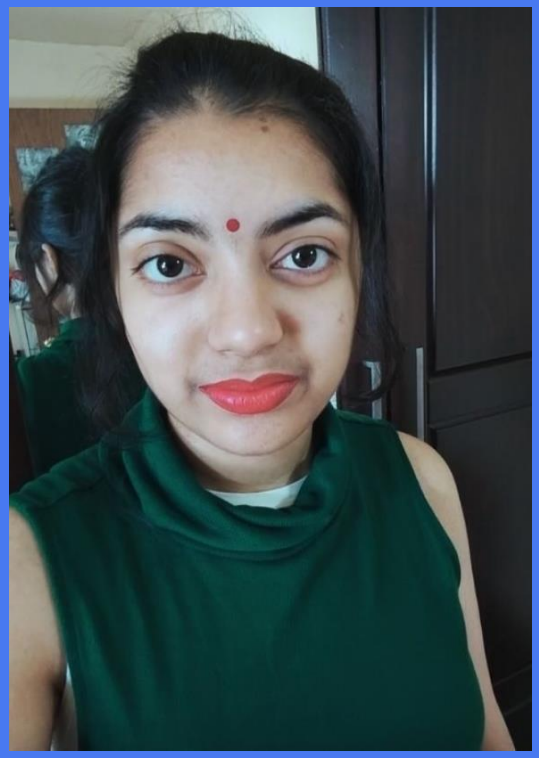
Daniel Palacios

Project: Implementing alamarBlue Dynamics in a Spatially Explicit Microbial Radiation Model

I grew up in Monterrey, Mexico, a modest city where crime and violence were common and the extreme corruption of the government was tremendously real, brutal, and worrisome. With these conditions being the norm, many citizens are denied access to socioeconomic mobility and are unable to venture out to new things, such as science. From the hardships presented by such conditions, I decided to move to the United States. The separation from my family was beyond devastating and difficult. However, it was necessary to seek better opportunities and obtain a higher education. Adapting to a new language and culture added significant stress on my shoulders, so I found refuge in my academics and scientific books. I rapidly grew a passion for the unknown and the mysteries of the Universe. I eventually developed a great admiration for many research scientists such as Brian Greene, Stephen Hawking, and Carlo Rovelli and I wanted to dedicate my life to becoming one of them.

I began my academic life in the United States in high school, during this time I live with and take care of my grandparents. As elderly adults, it was more difficult for them to learn the English language, considering that they did not have the privilege of obtaining a college degree. Because of this, I would help them by running errands and by translating important documents related to insurance, medical bills, and more. When the academic school year began, I was placed in ESL (English Second Language) classes. After learning English, I was allowed to transition to classes without the support of ESL the next year. In my senior year, I challenged myself and chose to take College level courses, where I was very successful. With my persistent dedication and consistency, I received a Department award in every Math and Science course. Many believed that I had “natural talent”. However, it was ultimately my passion and love for these subjects that facilitated my learning. I firmly believe that anyone who puts in the necessary effort and time can become a successful scientist, no matter their background. This same dedication naturally led me to pursue a college degree at the University of Houston, where I am currently double majoring in Physics and Mathematics. As a first-generation college student, I felt a lot of pressure to navigate through my college experience on my own and became discouraged. Thankfully, I was able to meet my mentors (professors and upper classmates) along the way whose advice and guidance have greatly shaped my academic and research experience.

At the Center for Theoretical Biological Physics located at Rice University, I was fortunate enough to gain research experience during my freshmen year by studying gene regulatory networks. In the following years, I worked on two different projects with my professors at the University of Houston, where I studied the properties of Quark-Gluon Plasma (the state of matter during the origins of our Universe), and asymmetric superconductivity. Since spring 2021, I have been currently working at NASA JSC where I investigate machine learning and natural language processing techniques for text mining on space hardware failure reports. These experiences immensely enhanced my love for science and research. In Fall 2022, I will start attending the Baylor College of Medicine where I will obtain a Ph.D. in Quantitative & Computational Bioscience. SLSTP will help me to connect my diverse computational background to space biology and prepare me better for my graduate studies. In the future, I hope to use my experience in SLSTP to apply for a NASA grant or fellowship.



CUNY New York City College of Technology

Major: Computer Engineering Tech
PI: Diana Gentry

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Puja Roy

Project: Data Collection and Analysis for Biosignature Studies

I was born in Brooklyn, New York. Throughout my childhood, I was fascinated about space exploration and astronomy since it defined the meaning of life and the Universe itself. I often watched scientific movies, read Time Magazines and comic books based on science fiction at school and the Public Library. As a child, I dreamed of working for NASA in my own workstation on a computer and envisioned myself working with a variety of software and technologies to conduct research and solve problems. In high school, most of my favorite subjects were Science, in particular Biology, Math, and English. These courses drew my interest towards the STEM field which is why I decided to pursue a bachelor's degree in Computer Engineering Technology/Computer Science at CUNY New York City College of Technology (City Tech).

My dream of working at NASA officially became true when I received an offer letter amidst the pandemic during my sophomore year of college to intern at NASA Glenn Research Center remotely as a Software Engineer Intern. I worked on testing web-based aeronautics simulations, migrating web content, and driving traffic to the Beginners Guide to Aeronautics website and Re-Living the Wright Way website which are crucially imperative educational websites extensively utilized by government facilities, researchers, students, educators, companies, and foreign entities. During the Fall 2021 semester of my junior year of college, I was extended another offer to intern at NASA Langley Research Center remotely as an Office of the Chief Technologist Intern. I spearheaded and reverse-engineered the development of a user-friendly Project Management Tool on Microsoft Teams platform that allows tracking project milestones, accomplishments, resources and communicates efficiently with Project Principal Investigators, the Office of the Chief Technologist, and the Langley Technology Council. During the Spring 2022 semester of my junior year of college, I returned to intern at NASA Glenn Research Center as an AI, Machine Learning and Data Science Communications and Outreach Intern. I contributed on a variety of web space projects and assisted with web design and outreach elements in the areas of scientific computing, AI/Machine Learning, data science, and visualization. My work consisted of automating the AIML @ NASA newsletter, exploring topic modeling with Python to analyze/visualize the Agencywide AIML inventory data and updating the AIML @ NASA SharePoint website.

Throughout my college and career journey, I interned at NASA 3x for 5 semesters and contributed to areas of software engineering/web development, project management, and communications/outreach. Some of my interests include coding and data science. This summer, I am thrilled and looking forward to working on a space life sciences research project as a Research Associate at NASA Ames Research Center.

Eva Soler

Project: Space Systems Biology - Reanalysis of Rodent Data from the SLS-2 Mission

Columbia University

Major: Biomedical Engineering
PI: Jon Galazka

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When I first saw the ISS crossing the night sky from West Point in my hometown in Puerto Rico, I was amazed by the idea that a moving tiny spec of light was a manned Earth-orbiting station. It was only visible for 30 seconds, and my eyes were firmly planted on it, admiring the most socially-isolated place passing across my home. Ever since that moment, my deep fascination for space and the potential for human space exploration started.

Once I entered high school, I decided to shift my focus to STEM subjects to explore and better understand the bio-physical concepts that rule our world. In the process, I drifted from learning about the arts to understanding the massive expanse of the cosmos, and found a greatest passion for the intermix of engineering and its potential applications on the human body. As a sophomore at Columbia University studying Biomedical Engineering with a concentration in Genomics, I am excited to apply my cultural awareness and critical thinking, as well as my creativity and teamwork skills, to learn more about how engineering can help create solutions for human related problems. After all, in NASA and any space exploration project, anything that is related to the human body can be connected to Bioengineering. Therefore, I am excited to participate in the GeneLab project to analyze valuable space-bio related data to find nuances that shed light to solutions and discoveries that make space flight easier for astronauts.

For the past semester, I have worked in Columbia's premier Synthetic Biological Systems Laboratory, the Danino Lab, as an undergraduate researcher. Under the mentorship of Jaeseung Hahn, we have been working on a project designing sRNA strands to perform gene blocking with sRNA interference with the goal to use them for cancer therapeutic applications and other potential treatments. Through this experience, I familiarized myself with the laboratory environment and increased engagement with other biomedical scientists and thus developed my interest in Space Systems Biology. Currently, as student-researcher, I continuously develop my perseverance and curiosity in these fields and I am determined to explore its potential applications in the space environment. I am excited by the opportunity to contribute to NASA's Bioengineering segment while exploring my curiosity in the use of this technology as a tool to transmit knowledge through medicine. I look forward to the opportunity to learn how Space Systems Biology integrates these tools within the medical landscape, and to grow as an engineer and creative thinker.

Mitchell Villafania

Project: Neuroimmune Responses to Space Radiation

Embry-Riddle Aeronautical University

Major: Cellular Biology
PI: Egle Cekanaviciute

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My first memory of being fascinated with Biology was in the 2nd grade. While on a class trip, through a German forest, I remember talking with my science teacher about the potential of creating a plant that shares characteristics between dicot and monocot stems. Knowing what I know now, this was just a fanciful idea but the curiosity of the world around me never left. From that day in the 2nd grade, until I graduated from High School, I excelled in science and loved learning about the intricacies of life.

After high school, I joined the military and became a Kiowa Warrior helicopter pilot. During this hiatus from my education, I continued my love of science by embracing specialties that dealt with IR, RADAR, and directed energy systems within my organization. While on active duty, I started working towards a Bachelors of Science in Aeronautics with Embry-Riddle Aeronautical University.

I retired from the military in 2019 to thru-hike the Pacific Crest Trail. While on the PCT, I decided to return to Embry-Riddle and pursue a degree in Aerospace Physiology. In the short time that I have been in the Aerospace Physiology program I have developed a love of working in the lab. My efforts have been focused on the effects of microgravity (µg) on bacterial cells and observing the phenotypical changes. These changes have included biofilm formation, antibiotic resistance, oxidative resistance, and quorum sensing. To accomplish this research, I cultivated cells in simulated µg environments and then tested for changes. My future research will include sequencing to observe gene upregulation and downregulation after exposure as well as testing space microbial ecology to observe competitive bacterial effects during simulated µg exposure.

My summer Space Life Sciences Training Program research will be to learn about the effects of space radiation on neuroimmune response. I'm excited to learn as much as I can from the program while helping with the group project. Overall, I am excited and thankful to be part of the NASA Ames Research Center's SLSTP.

University of Minnesota- Twin Cities

Major: Biology
PI: Grace Belancik

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Nico Whitlock

Project: Microbial Mayhem - Microbial Growth Potential in CO2 Removal Systems Designed for Long-Duration Spaceflight

I once heard a retired Navy Captain say that he could always tell who the successful pilots would be during physical fitness sessions. He said he knew who would make it not by who was in the best shape necessarily, but by who got yelled at because they had stopped doing PT to gaze at an airplane passing overhead.

There just seems to be something about flight and spaceflight in particular that is so captivating to us as humans. My own interest in spaceflight began during a backcountry backpacking trip I participated in in Wyoming as a young man. In the Big Horn Mountains, far from light pollution, we were afforded humbling views of the universe while stargazing and lay for hours gazing at old, distant, fireballs. To wonder about our place in the universe is part of what makes us human. That wonder is the reason for my application to this program and my interest in space.

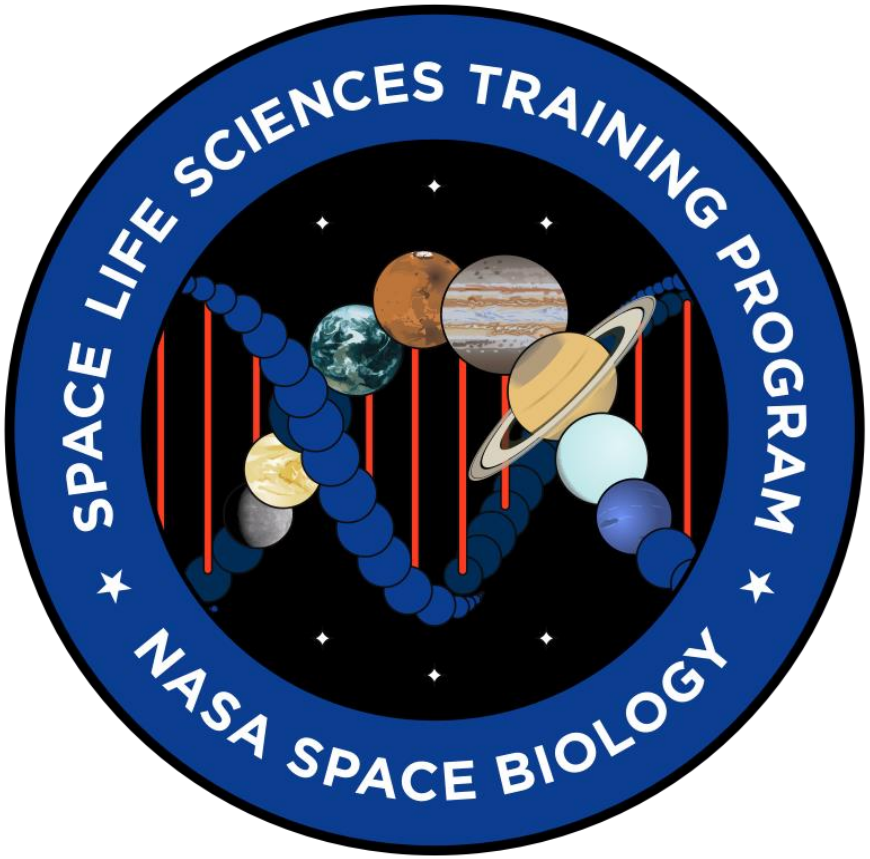
It was only after a stint working as a scribe in an Emergency Department that I began to become interested in a career in medicine as well. I particularly loved the chaos, intensity, and variety of Emergency Medicine. During a research internship at Hennepin County Medical Center in Minneapolis, I participated in research around the role of paralytics vs sedative medications in patients undergoing intubation. I realized just how much are still learning about physiology and how the body heals. My interest in medicine really lies in the realization that our health is the foundation upon which we can build great lives. Having seen physicians I worked with restore this foundation with patients, I have developed a desire to attend medical school to do the same. In accordance with my interest in medicine, I have engaged in biological coursework in my undergraduate career where I have modeled microscopic growth using digital environments.

My interests in spaceflight and medicine seemed completely disparate until I spoke with a Navy Flight Surgeon and realized I could combine the two. I later attended the Aerospace Medical Association Conference and was blown away by the research that was presented. I was extremely lucky to become involved with the Space Surgery Association which examines the potential surgical implications of long-duration spaceflight and the possibility of a non-surgeon astronaut needing to perform surgery in 0g. My current interest lies in the way we can optimize human performance for spaceflight. This includes all of the facets of human performance, from nutrition to cognitive agility.

Outside of academics, I enjoy playing bass guitar in bluegrass, rock, and punk bands. I also like rock climbing, surfing, reading, exercising, and walking my aunt's Newfoundland dog.

I am excited to participate in the SLSTP program where I will be examining existing literature and modeling microbial growth to help ensure the safety of CO2 removal systems designed for long-duration spaceflight. Our ability to safely remove CO2 from the air is so important to me because of its crucial importance to mission success and I am thrilled to be involved in the exploration beyond our planet.

2022 Staff & Management



University of Florida

SLSTP Staffer

Major: Microbiology

PI: Jared Broddrick

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Iris Irby

Project: Investigation of Prophage Regions of Bacterial Strains Isolated from the International Space Station (ISS)

Like a scene out of Home Alone or Night at the Museum, when I was five I was left at NASA's Kennedy Space Center. My school group went back home on the buses, but I wanted to stay longer so I had the bright idea of hiding from my mom who was chaperoning the trip. She eventually came and found me, squandered my young fantasy of living in one of the model rockets, and we headed back on a city bus. Unbeknownst to her or the rest of the class, by the time I sat down on that bus my dream for studying space had been cemented in my mind and my eyes were firmly planted on the stars for the ride back.

Once I entered high school, I decided I also wanted to study the complete opposite of the massive expanse of the cosmos and learned about microorganisms. I was able to complete an independent experiment on antibiotic resistance on beneficial bacteria, and was fascinated by the harm and good that microscopic organisms can do and the huge effect they have on the world around them. I also found that I loved the experience of performing scientific research, and uncovering different answers to form a larger solution to a problem.

I followed this love of research to the University of Florida, where I immediately got involved with statistical research which led to an internship at Johns Hopkins All Children's Hospital, where I continued using statistics to display discrepancies in the medical field. These research opportunities led to my third great passion in life, which is using technology to answer biological questions. This newfound interest led to my current research with Dr. Apichai Tuanyok, where I study the pathogenic bacteria *Burkholderia pseudomallei*. My current project involves organisms smaller than before, as I am identifying all viruses found in the genomes of all strains of the bacteria. This research combines work in the lab with bioinformatics work online, which I have found gives me the most opportunities for success in my research.

All of these passions led to me majoring in Microbiology and Cell Science, with a minor in Bioinformatics with the overarching goal to study the impact of bacteria on space environments. I have just graduated from the University of Florida and am going to be attending the Georgia Institute of Technology for my Ph.D. in Biology with the NSF Graduate Research Fellowship starting this Fall. I am planning on studying the evolution of bacteria through gene transfer and obtaining a certificate in Astrobiology.

I enjoyed my time as a SLSTP Research Associate so much last year that I came back to work as a Staffer! Working for NASA has always been my largest goal in life, and I was able to learn and accomplish more last year than I would have ever imagined. I am continuing the work I started last year on understanding the genetic determinants of survival in spaceflight with my mentor Dr. Jared Broddrick. I am beyond honored to return to the program this year, and I cannot wait to see what is in store for myself and all the Research Associates!

University of Colorado – Boulder

SLSTP Staffer

Major: Molecular, Cellular, and Developmental Biology
PI: Sigrid Reinsch and Egle Cekanaviciute

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Brooke Shepard

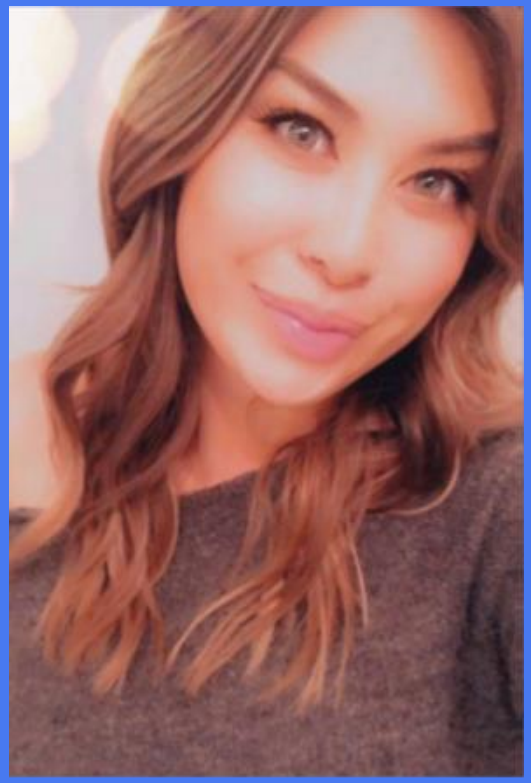
Project: Space Place - Inspiring Future Space Biologists with Online Education

I was born in Detroit, Michigan and spent much of my childhood as a bookish kid who loved video games. My parents were worried that video games would turn my brain to mush, but I saw them as an interactive piece of art that I delighted in, shaping the career interests that I hold today. One of the first games I ever played was Phantasy Star, a game about exploring new worlds in the outermost regions of space. Some of my fondest memories of childhood were playing this game with my brother, discovering the secrets of new planets and their funky creatures. I became fascinated with stories about life in space and the possibilities of the unknown. Little did I know, you can make a career out of that!

I got my bachelor's degree in Biology from Oakland University, where I did research on preclinical solutions to inflammatory bowel disease. During SLSTP 2018, I worked in Sharmila Bhattacharya's lab studying the effects of hypergravity on heat shock protein 40 in fruit flies. After that, I brought the space biology back to my home institution and did the university's first ever space biology research, where we studied the effects of simulated microgravity on induced pluripotent stem cells. Following this, I worked with the Blue Marble Space Institute of Science and we created a design for a 3D-printed rotating clinostat that can simulate microgravity in a low-cost, accessible way.

After I graduated, I worked for Neogen, a food safety company, where I troubleshooted biotechnology that tests for toxins and allergens in food. Once COVID-19 became prominent, I switched to the Genomics Platform at the Broad Institute of MIT and Harvard, where I did COVID diagnostic PCR testing and experimental development.

Now, I am a PhD student at the University of Colorado- Boulder in the department of Molecular, Cellular, and Developmental Biology, where I plan to understand the effects of microgravity on the mechanisms of life by combining my biology experience with faculty in aerospace and engineering. It is an honor to return to SLSTP. As a staffer, I hope to contribute some of my past experiences, learn more about life in space, and make this a great summer for SLSTP 2022!



Space Biology
Project Coordinator
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Kimberly Cadmes

Kimberly is the Space Biology Project Coordinator at NASA Ames Research Center. She provides program and project management support to the Space Biology Project Office and academic programs, GeneLab for High School and Space and Life Sciences Training Program. Kimberly joined Ames in 2016 as a contractor, supporting the Office of the Chief Financial Officer as the Central Travel Office Workload Administrator. She delegated and processed Federal travel orders for Ames Science and Aeronautic Directorates, and Armstrong Flight Research Center deployments. In 2018, she went on to support the Ames Partnerships Office assisting the Patent Licensing team with licensing NASA developed technologies. In 2020, she was a recipient of the NASA Ames Honor Team Award as part of the Technology Transfer Office. Her work was also recognized by the FILMSS contract, and she was presented with a One KBR Award for significantly exceeding established annual performance goals, resulting in widest possible adoption of NASA technologies in the public sector. From there she went to support the Aeronautics Research Mission Directorate as part of the Aeronautics Projects Office Virtual Presence Team. In 2021, she received the NASA Agency Honor Group Achievement Award for her support of the 2021 Transformative Aeronautics Concepts Program Showcase. Kimberly is a detailed oriented individual and is passionate about acquiring new skill sets, improving processes and executing big picture goals. This is her second year supporting the Space Biology branch and she is excited to continue her work with the Space and Life Sciences Training Program.

Elizabeth Keller

Science Manager
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Elizabeth Keller receiver her BA and MA Degrees from San Jose State University in Neuro-Cognitive Science. She began her career in space-related work when she was hired as an Ames student research scientist in Aerospace Human Factors. She conducted research on astronauts working in low earth orbit. Later she was hired as a Science Associate in the Space Life Sciences Payloads Office where she worked supporting science payload operations for rodent research on the Space Shuttle. She's been back at Ames Research Center since 2012 as a Senior Scientist in the Space Biology project office, where she has supported budget planning for grants, science outreach, program assessment and analytics reporting, science communications, and as the Project Coordinator for the Space Biology ground grants and student research. Elizabeth is also the creator, author and producer of ExtremeScience.com, an online destination that established a new standard for approachable and engaging science education. Her success with Extreme Science got her noticed by the National Geographic Society, which signed her for a book contract. Elizabeth enjoys engaging the public on NASA's missions and inspiring the next generation.

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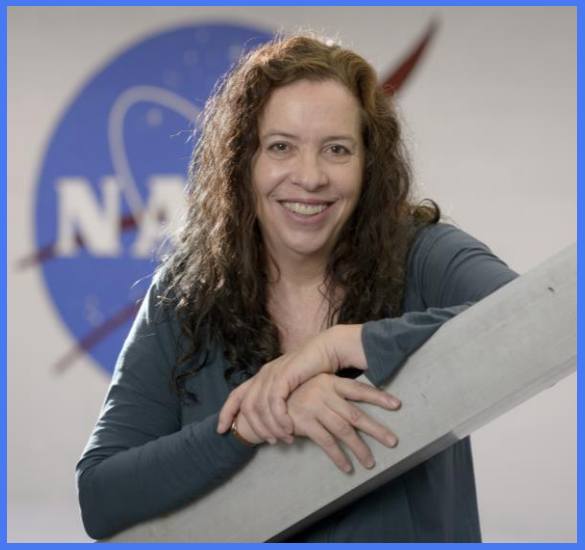
Hami Ray

Dr. Hami Ray received her B.S. in Biochemistry from the University of North Texas. While at UNT, Hami was selected as a Scholar into the Ronald E. McNair Post-baccalaureate Achievement Research Program, where she worked on a joint research project between the Biochemistry and Physics Departments. Taking the knowledge she gained while at UNT and in the McNair Program, Hami pursued a Ph.D. from the Pennsylvania State University. Upon receiving her Ph.D. in Pathobiology, Hami began her career as a Project Scientist at the National Aeronautics and Space Administration (NASA) Ames Research Center in Mountain View, California, where she served as the Project Scientist on the SPEGIS spaceflight payload flown on STS-118, among her other roles. Her career path then led her to the Cleveland Clinic Foundation in Cleveland, Ohio, where she initially worked as a Research Coordinator in the Transplant Center/Leukemia and Lymphoma Program, and ultimately as a Research Program Manager for the Center for Clinical Research. After taking a brief break to be a stay-at-home mom to her newborn child, Hami re-entered the NASA Ames family first as an Independent Contractor, then as a Senior Staff Scientist with ASRC Federal Space and Defense. Though she works remotely, Hami is excited to be a part of the SLSTP team and looks forward to continuing her work with the incoming students and staff. She's always just a phone call or email away and happy to assist where she can.



Director of Education and Outreach

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Sigrid Reinsch

Dr. Sigrid Reinsch is the Director of Education and Outreach for the NASA Ames Space Biology Project and directs two impactful summer internship programs: GeneLab for High Schools (GL4HS) and the Space Life Sciences Training Program (SLSTP). Dr. Reinsch has expertise in experiments with model organisms for space biology applications, cell, developmental, and molecular biology, and advanced light microscopy. She has been a civil servant at NASA Ames since 1998 and has 40 years of laboratory experience with a wide variety of model systems including plants, viruses, vertebrates (mice/frogs), invertebrates (nematodes, tardigrades) and cultured cells. Reinsch received a Bachelor of Arts degree in Biology from University of California Santa Cruz (UCSC), a Ph.D. in Cell Biology from the University of California San Francisco (UCSF), and performed post-doctoral training at the European Molecular Biology Laboratory (EMBL) in Heidelberg, Germany. Reinsch coordinates NASA Ames Space Biology efforts at multiple scientific conferences and public outreach events each year, organizing and hosting symposia, workshops, and other outreach activities. Reinsch has served as a Senior Scientist on the NASA GeneLab project since 2014 and currently serves as the GeneLab liaison for two international GeneLab Analysis Working Groups (AWG). She also leads the GeneLab Education Working Group (EWG). These groups function to mobilize scientists (AWGs) and teachers (EWGs) to use the data housed in the GeneLab public database for novel peer-reviewed publications, experimental proposals, and course curriculum at both the K-12 and university level. Reinsch is also a founding member of Cov-IRT (the Covid-19 International Research Team) and ISSOP (International Standards for Space Omics Processing) both of which activities resulted from her role in GeneLab. She is a long-standing and active member of the American Society for Cell Biology (ASCB), the American Society for Gravitational and Space Research (ASGSR), the Society for Developmental Biology (SDB) and the American Association for the Advancement of Science (AAAS).

Space Biology Deputy Portfolio Manager

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Amy Gresser

Amy received her B.S. in Biology from the Massachusetts Institute of Technology with minors in Brain and Cognitive Sciences and in Chemistry. She also holds a Ph.D. in Molecular and Cellular Biology from Harvard University where her research focused on neuronal coding in the rodent vomeronasal system. As a post-doctoral fellow at Cincinnati Children's Hospital Medical Center, she investigated gene regulation in the fruit fly and its role in neurological development and behavior. Amy then spent eight years as a contractor at NASA Ames Research Center where she supported Space Biology as a mission scientist for invertebrate, microbial, and cell biology payloads. In addition, she served as a science and operations lead for Fruit Fly Lab, payload manager for the Synthetic Biology Project's BioNutrients-2 experiment, and a department head for the Fully Integrated Lifecycle Mission Support Services contract. In 2022, Amy transitioned to civil service and is currently the Space Biology Deputy Portfolio Manager at NASA Ames. She manages a portfolio of more than 70 active grants focused on development and operations for life sciences experiments that utilize the International Space Station, free-flyer platforms, or ground-based analog systems.

Space Biology Portfolio Scientist

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Parag Vaishampayan

Parag Vaishampayan is the Space Biology Portfolio Scientist at NASA's Ames Research Center in California's Silicon Valley. He provides overall scientific leadership and direction to maintain the scientific integrity of projects within the ARC Space Biology Portfolio. He supports over 70 active space biology projects to better understand how spaceflight affects living systems in simulated ground-based experiments, the International Space Station (ISS), and preparing future human exploration missions beyond low Earth orbit (BLO).

Before joining Ames, he worked at NASA's Jet Propulsion Laboratory (JPL) since 2008. He has supported planetary protection implementation for several NASA missions, including MSL, InSight, M2020, MARCO, and Psyche. He has successfully managed several multi-year, multi-institutional research projects.

His research work has appeared in more than 60 peer-reviewed publications, book chapters, and several (more than 50) presentations. He was instrumental in developing and implementing several novel molecular approaches, instruments, and bioinformatics analysis tools widely used by microbial ecologists. He is a leading microbial ecologist and bioinformatician working in the field of Space biology, Astrobiology and planetary protection. He is the recipient of several prestigious honors and awards, such as the NASA Exceptional Public Service Medal (2017), JPL Explorer award (2016), Voyager award (2016, 15), and Mariner award (2012).

https://www.nasa.gov/ames/research/space-biosciences/parag-vaishampayan

Space Biology Portfolio Manager

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Robert Vik

Robert Vik is currently a Portfolio Manager within the Ames Research Center Biosciences Division. He manages both the Space Biology Portfolio and the International Space Station Biological Payload Development and Sustaining Engineering portfolios for NASA Ames.
Prior to this he was Division Chief for Space Superiority within the Army Space and Missile Defense Command's Technical Center; an assignment he accepted in September of 2019 after completing Senior Service College.

From February of 2013 to July of 2017, Mr. Vik was the Army's program manager for Cryptographic Systems under the Program Executive Office Command, Control, and Computers Tactical (PEO C3T). Mr. Vik started his career with the Army in November of 2009 as the Chief Engineer for the Ground Mobile Radio program.

Before accepting a position with the Army, Mr. Vik spent 20 years working at SPAWAR Systems Center - Pacific (SSC - PAC). In his last position, (2005 – 2008), he was a Branch Chief leading a branch that served as the nexus for a cross departmental rapid response "skunk works" developing capability for the National Intelligence Community. From February 2004 to March 2005 Mr. Vik was the Project Manager for Signals Characterization technology. In this role he was responsible for the development of SIGINT collection systems and processing systems for tactical and space-based sensors. He oversaw development of processing algorithms and dissemination architectures for spacecraft payload data.

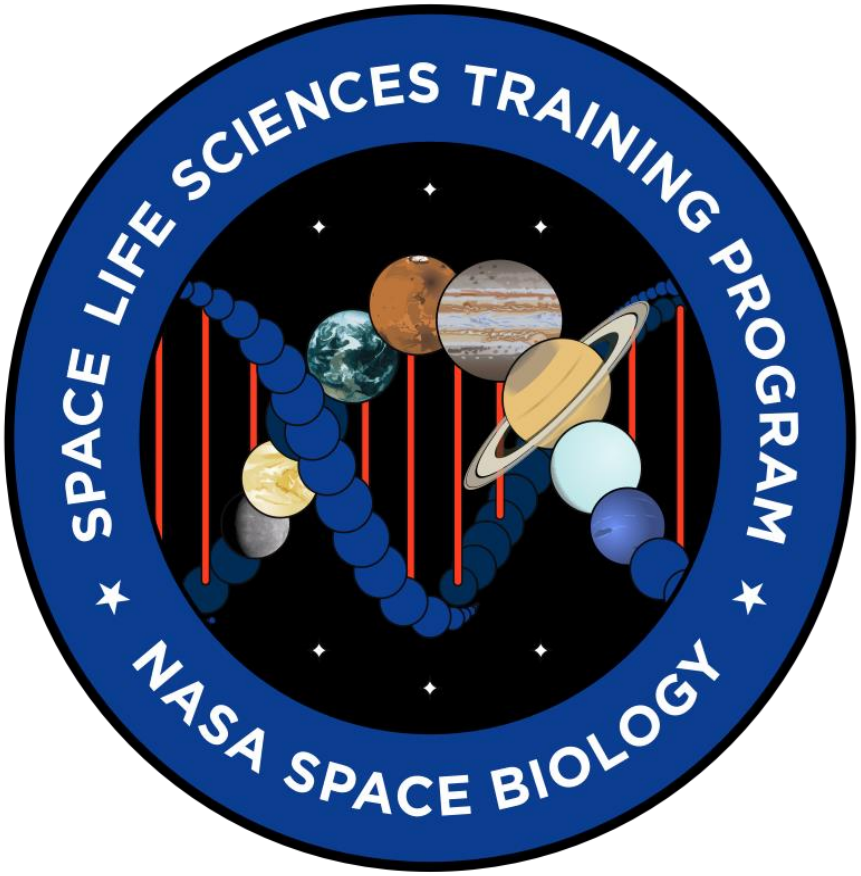
Between 2001 and 2004 Mr. Vik served as a Network Architect and Design Engineer in support of the National Geospatial Intelligence Agency (NGA). In this role he performed Systems Engineering and designed global network architectures for the timely dissemination of intelligence products to forward deployed users.

Mr. Vik spent one year (1999) at the Pentagon working for Deputy Assistant Secretary of the Navy (DASN) for C4I/EW/Space. As the Special Assistant for Communications he provided planning for and oversight of communications and Satellite acquisition programs of record and Advanced Concept Technology Demonstrations (ACTDS) for the Secretary of the Navy.

The early years of Mr. Vik's Government career, (December 1987 to December 1998), were spent working at SSC - PAC as a design engineer and project manager for a variety of projects.

Mr. Vik has a Master of Science Degree in Systems Engineering with an emphasis in Space Systems from the Naval Post Graduate School, a Bachelor of Science Degree in Electrical Engineering from San Diego State University, and a Bachelor of Arts Degree with a double major of International Relations and Economics from the University of California at Davis. He has won numerous awards a few of which include: The Army Superior Civilian Service Award, The Navy Meritorious Civilian Service Award, and the National Reconnaissance Office (NRO) Team Achievement Award.

2022 Mentors



Grace Belancik

Physical Scientist,
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NASA Ames Research Center

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Ms. Belancik is a Chemical Engineer in the Bioengineering Branch at NASA Ames Research Center, Moffett Field, CA. She supports the Human Exploration and Operations Mission Directorate, specifically Environmental Control and Life Support Systems. Her focus is on research and development of new physio-chemical technologies for air revitalization to be used in future missions on spacecraft, stations, and planetary bases. Her current projects include use of liquid sorbents to continuously capture CO2, use of cryogenic coolers to deposit trace contaminants and CO2, and developing dust separation methods to perform spacecraft aerosol analysis. Prior to working at ARC, Ms. Belancik was a Materials Engineer at Marshall Space Flight Center, where she developed techniques to produce fuel for Nuclear Thermal Propulsion and provided materials expertise to restart production of the RS-25 rocket engine. Ms. Belancik received her B.S. in Chemical and Bimolecular Engineering at the Georgia Institute of Technology, and is completing her M.S. in Chemistry at San Jose State University.

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Jared Broddrick

Dr. Jared Broddrick is a systems biologist supporting the Space Biology Microbiology Discipline and Human Research Program. His research efforts combine omics datasets and mathematical models to derive a mechanistic understanding of microbial physiology in the space environment. Systems biology views life as an interconnected series of networks. The hierarchy of these networks starts at the genome and proceeds through gene-expression and protein networks before arriving at the interaction of life and its environment. Understanding how the spaceflight environment constrains microbial networks is relevant to outstanding questions in the areas of human health in the exploration of space (e.g. microbiome, bacterial pathogenicity, etc.), bioengineering solutions to long-duration spaceflight, and the adaptation of microbial organisms to spacecraft environments. Following the completion of his PhD in biological sciences at the University of California San Diego, Dr. Broddrick was a postdoctoral fellow in the Exobiology Branch at NASA's Ames Research Center. He conducted various fieldwork projects including an investigation into the evolution of photosynthesis on earth which was conducted in Yellowstone. Dr. Broddrick is supportive of educational opportunities at NASA Ames and is excited to be a mentor for this year's SLSTP!

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Egle Cekanaviciute

Egle is a Principal Investigator / Research Scientist in the Radiation Biophysics Laboratory in the Space Biosciences Research Branch at NASA Ames Research Center. She received her B.A. in Neurobiology from Harvard University in 2008 and her Ph.D. in Neuroscience from Stanford University in 2014, followed by postdoctoral research at the University of California, San Francisco on host-microbiome interactions in neuroimmune disease. Egle is an interdisciplinary biologist, combining experimental and computational approaches to investigate the neuroimmune and neurovascular impairments caused by spaceflight and deep space radiation, which is a major astronaut health risk in lunar and Mars exploration. Egle's most recent project is developing high-throughput 3D human organ-on-a-chip models to investigate the effects of simulated deep space radiation on the brain and the blood-brain barrier. In addition, Egle is the Course Director of NASA STAR: Spaceflight Technology, Applications and Research program for training investigators in space biology and in conducting spaceflight experiments. In her free time, Egle enjoys running, languages, science outreach and heavy metal, though hopefully not all at once.

GeneLab Project Scientist
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Jonathan Galazka

Dr. Jonathan Galazka became the NASA GeneLab Project Scientist in 2017, joining the Space Biosciences Research Branch in 2015. Before this, he was a NASA Postdoctoral Program Fellow at NASA Ames Research Center studying the genetic and epigenetic response of yeast to microgravity exposure and a Postdoctoral Scholar in the lab of Dr. Michael Freitag at Oregon State University, where he studied the mechanisms of heterochromatin establishment and the role of heterochromatin in maintaining genome structure. Jon attained his PhD at the University of California, Berkeley in the lab of Dr. Jamie Cate, studying biomass degradation and conversion by filamentous fungi and yeasts at the Energy Biosciences Institute. In his free time, Jon enjoys spending time with his family in nature.

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Moffett Field, California

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Diana Gentry

Dr. Diana Gentry hails originally from Yonkers, New York; she came out to the SF Bay Area for college, studying mechanical engineering at Stanford University, and was introduced to NASA Ames Research Center through an internship with the GeneSat project, a miniature satellite program designed to study microbiology in space. The arrangement proved mutually agreeable, and she stayed to receive a Ph.D. while working as part of the Ames Graduate Cooperative Program, demonstrating a manufacturing method for structural biomaterials using 3D-printed arrays of genetically engineered cells. She has been a full-time researcher at NASA since 2015 and is now the head of the Bioengineering & Instrumentation Group (BeING) Lab and the co-director of Ames's recently established Aerobiology Laboratory. Her current projects at NASA Ames focus on 'top down' approaches to studying complex, emergent biological systems, including developing an optical/biofluidics system to detect small changes in microbial cultures aboard the BioSentinel small satellite mission, machine-learning-directed experimental evolution of microbial cultures, modeling the distribution and variation of Mars analogue biosignatures, and studying the spatial and temporal distributions of microbes in cloud and fog water as a potential analogue for Venus. Dr. Gentry describes herself as a “professional wearer of many hats”, bridging science and engineering to discover new ways of addressing questions in astrobiology, space biology, and bioengineering. She has hosted interns from a number of NASA student programs, as well as co-advising master’s and Ph.D. students at nearby universities, and is excited to host this summer’s SLSTP cohort.

Adrienne Hoarfrost

Postdoctoral Fellow
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Dr. Hoarfrost is a biologist, oceanographer, and deep learning scientist with experience developing deep learning and machine learning approaches for complex, high-dimensional, often low-sample-size biological settings across marine science, Earth science, and space science applications. She has experience in computational, experimental, and field-based approaches to biological systems research, which gives her an ability to communicate across disciplinary boundaries to find innovative solutions to hard problems. She believes that understanding and modeling biological systems and their interactions with their environment is key to our ability to live sustainably, to adapt to and mitigate climate change, to explore our universe, and to understand the origins and coevolution of life and Earth.

Google Scholar:
https://scholar.google.com/citations?user=kac7U1wAAAAJ&hl=en
Github:
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Research Scientist,
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Jessica Lee

Dr. Lee's research interests span the breadth of Space Microbiology, and she uses both wet-lab experimentation and computational modeling to understand what microbes really experience when they come to space with us. How do they feel space stresses like microgravity and radiation, and how is that different from what multicellular organisms experience? What is the fate of the microbes that hitchhike on space hardware? How can we use our knowledge of microbial ecology to ensure healthy built environments for human explorers? How can we use microbes to produce food and medicines to support deep-space exploration, while ensuring those products are safe to consume? At NASA she is a project scientist supporting biological research beyond Low Earth Orbit, contributes to an effort to catalogue and archive all of NASA's microbial isolates, and is keen to further microbial bioinformatics education through NASA GeneLab. Dr. Lee completed her S.B. in Biology at MIT, followed by two M.Sc. degrees at the University of Oxford, one in Biodiversity and one in Integrated Biosciences. She then completed a Ph.D. in Earth System Science at Stanford University, focusing on the ecology of nitrogen-cycling bacteria in San Francisco Bay. She has also studied methylotrophic bacteria as a postdoctoral researcher at the University of Idaho, and microbial phenotypic heterogeneity and evolution as a postdoc at San Francisco State University. She has been working at Ames since 2020.

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Lauren Liddell

Dr. Liddell is a scientist supporting BioSentinel, NASA's latest biological CubeSat, and first interplanetary space bioscience mission. BioSentinel is manifested on Artemis I, the first test flight of NASA's Space Launch System rocket --- the same rocket that will send U.S. Astronauts back to the Moon, Mars, & beyond. BioSentinel will gather important data on how the deep-space radiation environment affects DNA repair, metabolism, and growth of a living organism (budding yeast). Scientific insights gained from BioSentinel will help prepare for future human exploration into deep-space.

Before joining NASA Ames, Lauren received a Ph.D. in DNA Repair & Molecular Genetics from City of Hope Beckman Research Institute (2014, Duarte, CA), under the mentorship of Dr. Adam Bailis. Her graduate work focused on investigating the homologous recombination mechanism for DNA repair in budding yeast. She then joined Dr. John Pringle's laboratory at Stanford University (2014 - 2017) for her postdoctoral studies, where she helped develop genetic tools in a new model organism, the sea anemone, to better understand the effects of global warming on coral bleaching.

Beyond research, Lauren is passionate about skydiving (420 jumps, 12 wingsuit), training students (in the sky & at the bench), and her 100 lbs big friendly giant, Slider.

Staff Scientist at Blue Marble Space Institute of Science
NASA *Ames Research Center Moffett Field, California*

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Lauren Sanders

Dr. Lauren Sanders is a bioinformatician working at NASA Ames in the GeneLab Data Processing team and helping lead the Artificial Intelligence for Life in Space (AI4LS) team. Her work focuses on deploying machine learning methods with multi-omics and non-omics spaceflight and space-relevant data to better understand the effects of spaceflight on living systems. Dr. Sanders received a Ph.D. in Biomolecular Engineering and Bioinformatics from University of California, Santa Cruz under the mentorship of Dr. David Haussler and Dr. Olena Vaske. Her doctoral thesis focused on the use of comparative genomics and 3D organoid models to identify developmental origins and cancer drivers in childhood cancers.

Sergio Santa Maria

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Dr. Sergio Santa Maria is a Research Scientist in the Space Bioscience Division at NASA Ames Research Center in Moffett Field, CA. His research interests are in the areas of DNA damage repair, space radiation, and biosensor technologies. He is currently the Lead Project Scientist for NASA's BioSentinel mission, a 6U nanosatellite that will fly as a secondary payload on NASA's ARTEMIS-1, scheduled for launch in 2022. He is responsible for the development of the space radiation biosensors that will be used in BioSentinel and for testing and validation of the biosensors using different ionizing radiation sources, including particle accelerator experiments at the NASA Space Radiation Laboratory at Brookhaven National Laboratory and the proton accelerator facility at Loma Linda University. Additional projects involve the development of new biosensor technologies using dielectric spectroscopy and adaptive evolution studies under simulated microgravity. He earned his Ph.D. in Biochemistry and Molecular Biology from The University of Texas Medical Branch in 2008 and continued his postdoctoral studies at New York University School of Medicine as an American Cancer Society Postdoctoral Fellow from 2009 to 2013. He started working at NASA Ames Research Center in 2014.