2023

AMELIA EARHART FELLOWS

Expanding opportunities for women in aerospace engineering and space sciences

In an effort to carry out its mission that women have access to all resources and are represented in decision-making positions on an equal basis with men, Zonta International offers the Amelia Earhart Fellowship.

The Zonta International Amelia Earhart Fellowships were established in 1938 in honor of Amelia Earhart, famed pilot and member of the Zonta Clubs of Boston and New York. The fellowships are awarded annually to women pursuing Ph.D./doctoral degrees in aerospace engineering or space sciences.

Read to learn about Zonta International's 2023 Amelia Earhart Fellows.

2023 Amelia Earhart Fellow

Charlotte Bays

Citizenship: United Kingdom

Proposed Program: Astromaterials and Planetary Science at Royal Holloway, University of London, and the Natural History Museum (London), United Kingdom

Ms. Bays is a Ph.D. candidate at the Astromaterials Research Laboratory (Royal Holloway, University of London) and the Planetary Materials Group (Natural History Museum, London), for which she received a competitive NERC-ARIES DTP studentship. Her research primarily focuses on characterizing the effects of heat on organic matter and volatiles in astromaterials. This involves conducting heating experiments on meteorite samples and extracted organics using several laboratory setups, including a specialized high-vacuum heating system at Tohoku University, Japan, where she is a visiting researcher working with Professor Tomoki Nakamura (Principal Investigator, JAXA Hayabusa, Hayabusa2, and MMX missions).

Utilizing laboratory-based and synchrotron source analysis techniques Ms. Bays investigates the synthesis and evolution of extraterrestrial organic matter under different experimental conditions, providing insights into the history of the primitive, organic-rich asteroids from which the principal building blocks for life and water on Earth are believed to have derived. She is involved with several additional research projects, collaborating with scientists from the National Aeronautics and Space Administration (NASA) and the Japan Aerospace Exploration Agency (JAXA). Ms. Bays is also a member of the only UK-leading team selected by JAXA to analyze organic matter and water in asteroid 162173 Ryugu samples (Hayabusa2 mission).

Ms. Bays obtained a first-class bachelor's degree in geology and holds an elected position within the UK Fireball Alliance, which tracks and monitors meteors over the UK, and subsequently coordinates meteorite search and recovery operations. She hopes to one day undertake recovery expeditions in more challenging locations, such as Antarctica. Ms. Bays hopes to have a future in space exploration endeavours, particularly sample return missions and those with an astrobiological focus, where her research will contribute to the ongoing search for life in the universe. In her free time, Ms. Bays enjoys travelling, hiking, and reading her favourite author, Douglas Adams.

2023 Amelia Earhart Fellow

Maizey Benner

Citizenship: United States

Proposed Program: Planetary Sciences at the University of Arizona, USA

Ms. Benner is a Ph.D. student at the Lunar and Planetary Laboratory (LPL) at the University of Arizona. She is a member of the planetary materials research group, where she couples experimental cosmochemistry and computational thermodynamics to better understand the origins and evolution of moderately volatile elements in the early solar system. Ms. Benner uses electron microscopy techniques such as electron microprobe, focused-ion beam scanning-electron microscopy, and transmission electron microscopy to probe the chemistry and structure of materials from the micro- to nanoscale. In the computational space, she uses density functional theory to calculate the thermodynamic properties of materials for use in models of solar condensation. These two are linked by comparing experimental results to computational models of materials and iterating until they replicate the natural system.

Her current research focus is on the origin and evolution of phosphorus-bearing materials in ordinary and carbonaceous chondrites. These chondrite groups represent two reservoirs of material from the beginning of solar system history that are mostly unaltered since their formation. Probing these pristine materials allows her to evaluate the most primitive phosphorus-bearing materials and evaluate their thermodynamic conditions of formation for refinement of the solar condensation sequence.

Ms. Benner did her undergraduate education at Purdue University in Applied Physics Honors and Planetary Science, where she served as a teaching assistant and department student representative. She continues these service and teaching efforts at the University of Arizona, where she continues to teach introductory astronomy classes, serves as a co-organizer for the PLANETS organization for marginalized genders in space sciences, and a student member of the department life committee.

Ms. Benner is passionate about creating a supportive environment for marginalized genders at the University of Arizona and in the broader microscopy community. Outside of her studies, Ms. Benner enjoys practicing yoga, baking, and reading.

2023 Amelia Earhart Fellow

Grace Calkins

Citizenship: United States

Proposed Program: Aerospace Engineering at the University of Colorado Boulder, USA

Ms. Calkins is a Ph.D. student at the University of Colorado Boulder studying aerospace engineering. Her work focuses on trajectory optimization under uncertainty which enables autonomy on missions such as asteroid avoidance and rendezvous, uninhabited aerial on Earth and other planets, and human-class Mars landings. Her work is twofold: developing better uncertainty quantification methods and designing efficient and robust trajectory optimization processes.

Uncertainty – from sensors, the atmosphere, or thrusters – could cause a spacecraft to fail to achieve its mission. By developing computationally efficient methods for uncertainty quantification that consider nonlinearities, Ms. Calkins's work will enable rapid analysis of the impact of uncertainty on a spacecraft's performance. In addition, she has been developing efficient trajectory optimization processes that incorporate uncertainty in the objective. Optimal trajectories that are designed without considering uncertainty can fail to perform optimally in the real world. In her work, instead of minimizing just the nominal propellant usage for a given trajectory, she uses trajectory optimization under uncertainty to minimize the nominal propellant usage plus 3-sigma uncertainty to obtain a truly robust fuel-optimal trajectory.

Ms. Calkins will be funded for her Ph.D. as a NASA Space Technology Graduate Research Opportunities fellow. She graduated with her master's from the University of Illinois at Urbana-Champaign in 2023 and earned her bachelor's from the University of Texas at Austin in 2021. After concluding her Ph.D., Ms. Calkins would like to make an impact in the industry by working on interplanetary aeroassist missions to explore our universe. Then, she plans to return to academia to become a research professor and mentor other women in STEM. Besides aerospace engineering, she enjoys spending time in nature, riding horses, and building things.

2023 Amelia Earhart Fellow

Martina Caussi

Citizenship: Uruguay

Proposed Program: Earth and Environmental Sciences at the University of Illinois Chicago (UIC), USA

Ms. Caussi is a Ph.D. candidate at the University of Illinois Chicago, specializing in planetary geophysics. She is interested in the physical processes that govern the evolution of planetary bodies. Her current research focuses on the internal mechanics and evolution of key bodies in the Solar System, specifically seeking to understand the surfaces and interiors of the ocean worlds orbiting Jupiter: Europa, Ganymede, and Callisto.

After obtaining her engineering degree in Uruguay, she relocated to the U.S. to pursue her doctorate. Using her engineering background as a foundation, she employs finite element simulations to investigate the origins of large impact features on Ganymede and Callisto. She aspires to understand the unique geophysical factors causing these icy moons to exhibit a broad range of unusual impact crater morphologies that are rarely seen elsewhere in the Solar System.

Furthermore, she investigates the conditions within Europa's interior using gravity data, in the context of NASA's Europa Clipper mission. Europa has the highest potential for alien life in the Jovian System due to its warm interior and its subsurface ocean with a bedrock bottom. By analyzing anomalies in Europa's gravitational field, using velocity data from Europa flybys and point-mass models, her research aims to shed light on the thermal state of the interior and estimate the likelihood of seafloor volcanism.

After completing her Ph.D., she plans to further her research career in the field of planetary geophysics. In her free time, she enjoys surfing, painting planetary landscapes in oil, flying model rockets, and actively participating in outreach.

2023 Amelia Earhart Fellow

Kaylee Champion

Citizenship: United States

Proposed Program: Aerospace Engineering Sciences at the University of Colorado Boulder, USA

Ms. Champion is pursuing her Ph.D. in aerospace engineering at the University of Colorado Boulder in the Autonomous Vehicles Systems (AVS) lab. Her research focuses on enabling touchless potential sensing of neighboring spacecraft in cislunar space.

As spacecraft travel through plasma, charge accumulates on the surface. This charge may have detrimental impacts, such as arc discharges during docking, or may be taken advantage of through electrostatic actuation. The first step to account for or take advantage of the electrostatic properties of a neighboring spacecraft is to identify the surface potential. To do so, a servicing spacecraft uses an electron beam to emit secondary electrons and x-rays from a target spacecraft. The measured emissions are used to determine the potential of the target with respect to the servicer. This has previously been investigated in the Geosynchronous region, and as cislunar region missions increase, this technology may be extended there as well. However, the moon alters the ambient plasma conditions and travels through a range of plasma environments, which presents novel advantages and challenges. Ms. Champion uses spacecraft-plasma interaction codes and experiments in the AVS lab's vacuum chamber to explore how the cislunar plasma environment may hinder or be leveraged for touchless potential sensing.

Currently, Ms. Champion is funded through the NSTGRO fellowship and will gain experience at the NASA Goddard Space Flight Center. After earning her Ph.D., Ms. Champion intends to join a research center, such as NASA, to continue to research spacecraft-plasma interactions and develop tools and methods to measure and use these interactions. In her free time, Ms. Champion enjoys skiing, hiking, and playing with her cat.

2023 Amelia Earhart Fellow

Gaia Letizia Civardi

Citizenship: Italy

Proposed Program: Aerospace Engineering at Politecnico di Milano, Italy

Ms. Civardi is a Ph.D. candidate in aerospace engineering at Politecnico di Milano, specializing in the field of autonomous visual navigation for proximity operations around uncooperative space objects. Conventional vision-based navigation techniques rely on images captured in the visible spectrum, which are characterized by a high sensitivity to adverse illumination conditions. To overcome this challenge, her research focuses on the integration of a thermal infrared imager into the navigation chain, leveraging its robustness to external illumination conditions.

Ms. Civardi works on developing image-based navigation algorithms capable of working across different spectra, towards a smart exploitation of the on-board sensors. Her aim is to create a more resilient and flexible optical navigation chain, enabling autonomous close proximity operations with uncooperative space objects. By achieving these advancements, her work will contribute to the realization of new mission concepts that can achieve higher levels of autonomy and successfully execute complex tasks previously deemed unattainable.

Outside the realm of academia, Ms. Civardi particularly enjoys outdoor activities such as rock and ice climbing, and she is becoming an instructor at the Club Alpino Italiano of Milano. She is interested in photography and photo editing, as well as taking care of her six turtles.

2023 Amelia Earhart Fellow

Jennifer Colborn

Citizenship: United States

Proposed Program: Mechanical Engineering at Pennsylvania State University, USA

Ms. Colborn is a Ph.D. candidate in mechanical engineering at Pennsylvania State University. Her research is focused on heat transfer in gas turbine combustor liners. Current gas turbine combustors have firing temperatures higher than the melting point of the materials used, requiring complex cooling schemes, and leading to uneven wall heating through the combustor. Understanding the heat transfer to the wall is imperative for combustor design, as new designs with smaller cores will lead to higher heat fluxes.

Her research is focused on quantifying the effects of different combustor flow features on convective and radiative heat transfer. Using a simplified combustor, many important flow features of gas turbine combustors are simulated including wall impingement, recirculation, and boundary layer recovery. Heat transfer measurements are made in these different flow features and compared against simulations to determine the necessary fidelity of simulations for accurate modeling of heat transfer. Experimental results will be compiled in a database for simulation validation.

Upon completion of her degree, Ms. Colborn looks to continue research supporting development of next-generation propulsion systems. In her free time, she enjoys baking, swimming, hiking, and performing with the Penn State Concert Band.

2023 Amelia Earhart Fellow

Niyati Desai

Citizenship: United States

Proposed Program: Aerospace Engineering at the California Institute of Technology, USA

Ms. Desai is a Ph.D. candidate working in the Exoplanet Technology Lab at Caltech. She completed her master's at Caltech and her bachelor's degrees in aerospace engineering and physics from MIT. Her Ph.D. research is about designing and testing astronomical instruments for the direct imaging of exoplanets.

Of the more than 5,000 exoplanets that have been detected, less than 2% have ever been directly imaged. Since exoplanets are approximately 10 billion times fainter than their host stars, future telescopes require extremely precise and well-designed optics to achieve such high contrast imaging. Ms. Desai's thesis work focuses on designing, fabricating and testing new types of coronagraphs to suppress starlight at these high contrasts for NASA's upcoming Habitable Worlds Observatory space telescope.

Most recently Ms. Desai completed an internship at NASA's Jet Propulsion Laboratory developing and testing wavefront control algorithms on their coronagraph testbench. Prior to this she was an organizer of the 2022 Caltech Space Challenge and enjoys volunteering with Caltech Astronomy Outreach and with Caltech's Women in Engineering and Applied Science organizations. When not in the lab or on campus, she is often found at the soccer field or volleyball court. She is dedicated to pursuing a career in academia and hopes to inspire many future students and the public through her passion for science and engineering.

2023 Amelia Earhart Fellow

Holly Dinkel

Citizenship: United States

Proposed Program: Aerospace Engineering at the University of Illinois Urbana-Champaign, USA

Ms. Dinkel is a Ph.D. candidate and NSTGRO fellow in aerospace engineering at the University of Illinois Urbana-Champaign. She is interested in the role of robotic systems in enabling the exploration, development and habitation of extreme environments. Her thesis work develops algorithms to perceive and manipulate deformable objects with robotic arms. Examples of this for humans are reaching for a cable to plug in or unpacking a briefcase; people perform these actions using active sensing. Humans use their hands to find grasp points and their eyes to obtain real-time feedback on the object's state. Her goal is to give robots these skills to prepare them to care for human habitats. She focuses on deformable linear objects, for instance cables, because they are ubiquitous in space and on Earth; cable maintenance is paramount to safe exploration of extreme environments.

Ms. Dinkel's research in robotic perception and manipulation is for NASA's free-flying Astrobee robots in collaboration with the NASA Ames Research Center Intelligent Robotics Group and for NASA's humanoid Valkyrie robots in collaboration with the NASA Johnson Space Center Dexterous Robotics Laboratory. Prior to beginning her doctoral studies, she completed a master's degree in aeronautics and astronautics and a certificate in entrepreneurship at Stanford University, where she researched robotic manipulation and distributed spacecraft autonomy, and was named a Threshold Ventures Fellow. Ms. Dinkel previously worked as a risk analyst for the Space Launch System rocket at NASA Marshall Space Flight Center, in radiochemistry at Argonne National Laboratory, in accelerator physics at Fermi National Accelerator Laboratory, and in nuclear energy at the University of Missouri, where she also earned undergraduate degrees in chemical engineering and music. In her free time, she enjoys studying Mandarin Chinese and Russian, mentoring students in STEM, and brainstorming and realizing her dreams for the future.

2023 Amelia Earhart Fellow

Grace Genszler

Citizenship: United States

Proposed Program: Aerospace Engineering at Cornell University, USA

Ms. Genszler is a Ph.D. student in aerospace engineering at Cornell University. She is interested in solving trajectory design and mission planning problems. Her research in the Space Imaging and Optical Systems Laboratory is focused on mission design for direct imaging exoplanet missions with space-based telescope-starshade observatories. Ms. Genszler's mission simulation work supports starshade technology readiness level advancement and the Habitable Worlds Observatory program. Variables such as fuel usage and target star observation conditions can be used to tune optimization algorithms when selecting which target start to observe next in order to maximize the number of exoplanet detections and characterizations.

In addition to her graduate research, Ms. Genszler interned at Virgin Orbit as a Matthew Isakowitz Fellow in 2022. She supported trajectory design for the air launched LauncherOne rocket. Additionally, she built a physics-based model of the nitrogen gas budget for LauncherOne's second stage. Ms. Genszler is interning with Slingshot Aerospace during the 2023 summer. She will support development of the Digital Space Twin, a space domain awareness tool aimed at accelerating space sustainability. Ms. Genszler was part of a dual-degree engineering program for her undergraduate studies. She earned a Bachelor of Arts in physics from Wheaton College in Massachusetts in 2018 and a Bachelor of Engineering with a concentration in computational sciences from the Thayer School of Engineering at Dartmouth College in 2019.

Ms. Genszler spends her free time doing gymnastics and finding new vegan recipes to meal prep. Her favorite book series is Math Girls by Hiroshi Yuki. Additionally, Ms. Genszler is dedicated to educational outreach initiatives that make higher education more accessible. She has mentored students in various STEM programs and has served as a scholarship selection committee chair.

2023 Amelia Earhart Fellow

Chloe Gentgen

Citizenship: France

Proposed Program: Aeronautics and Astronautics at the Massachusetts Institute of Technology, USA

Ms. Gentgen is a French Ph.D. Candidate in the Department of Aeronautics and Astronautics at the Massachusetts Institute of Technology in the United States. As a Research Assistant in the Engineering Systems Lab with Professor Olivier de Weck, her research focuses on space systems engineering, mission architecture, and multi-disciplinary optimization applied to deep-space robotic exploration. For her Ph.D., Ms. Gentgen studies mission concepts to explore ocean worlds and Uranus, focusing on the intersection between science, systems engineering, and technology road mapping.

In addition to her Ph.D. research, Ms. Gentgen participated in multiple mission architecture projects, including NASA RASC-AL competitions, the Caltech Space Challenge, and the NASA Planetary Science Summer School. She interned at NASA's Jet Propulsion Laboratory (JPL) as a formulation systems engineer on mission concepts for Enceladus and Uranus. Ms. Gentgen graduated with her Master of Science in aeronautics and astronautics from Massachusetts Institute of Technology in 2022. Her master's thesis studied tradespace exploration and design optimization of propulsion systems for small satellites.

In France, Ms. Gentgen received a Bachelor of Science and Master of Science in engineering from Ecole Centrale Paris and interned for Flying Whales and Thales Alenia Space.

2023 Amelia Earhart Fellow

Vedasri Godavarthi

Citizenship: India

Proposed Program: Mechanical Engineering at the University of California Los Angeles, USA

Ms. Godavarthi is a Ph.D. student in mechanical engineering at the University of California Los Angeles. Her research focuses on developing reduced-order models and control strategies for unsteady fluid flows. Unsteady fluid flows are widely prevalent in engineering applications and hence efficient flow control strategies are required to modify the fluid flow to achieve enhanced aerodynamic performance, such as lift enhancement over an aircraft or to mitigate any instabilities that can be detrimental to the system.

Specifically, Ms. Godavarthi works on modeling and controlling flow over a cavity, which is seen during landing gears of aircraft, sunroofs in cars and weapon bays. Flows over a cavity cause a lot of high fluctuations that cause structural damage to the system and contribute significantly to noise pollution. Specifically, she uses phase-based analysis that identifies the right timing to perform control to reduce the fluctuations and leads to transient modification of flow physics. This approach has significant potential to be applicable to a wide variety of unsteady flow fields.

After completing her doctoral studies, Ms. Godavarthi envisions joining academia and continuing research efforts in the fields of fluid flow modeling and control that promote the development of efficient technologies in automotive and aircraft industries.

Outside of research Ms. Godavarthi is a member of the Graduate Society of Women Engineers at the University of California Los Angeles to promote and encourage participation of women in STEM fields. She enjoys hiking, reading and solving puzzles.

2023 Amelia Earhart Fellow

Michaela Hemming

Citizenship: United States

Proposed Program: Aerospace Engineering at The University of Alabama in Huntsville, USA

Ms. Hemming is a Ph.D. candidate in aerospace engineering at The University of Alabama in Huntsville (UAH) in the United States. Her research involving advanced combustion propulsion devices is conducted at UAH's Propulsion Research Center. Ms. Hemming's dissertation research is on propellant injection design for rotating detonation rocket engines for use in interplanetary missions. More specifically, she is investigating the parameters of injectors that result in fast and mutual recovery of propellants in the wake of a detonation wave. This work is a collaborative effort with NASA Marshall Space Flight Center's Combustion Devices group and is funded through a NASA Space Technology Graduate Research Opportunities fellowship.

Ms. Hemming completed her Bachelor of Science in aerospace engineering with two minors in nondestructive testing and political science at Iowa State University. She then obtained her Master of Science in aerospace engineering at UAH. In addition to an interest in advanced propulsion research, Ms. Hemming is also interested in space policy which she gets to employ in the occasional congressional visit with the American Institute of Aeronautics and Astronautics (AIAA) and Citizens for Space Exploration.

After graduation, Ms. Hemming intends to continue research and development of advanced space propulsion either with private industry or with a government institution like NASA or AFRL. She has always been interested in creative problem solving and will be fulfilled working wherever the tough problems that slow space travel efforts arise. Her dream job would be to lead and guide the research and development of an advanced propulsion program.

While she's not working on her Ph.D., Ms. Hemming volunteers her time in STEM outreach and mentorship positions within AIAA, Women in Aeronautics and Astronautics, and the Brooke Owens Fellowship Program. In her free time, she enjoys baking, crocheting, and hiking with her two dogs.

2023 Amelia Earhart Fellow

Franziska Hild

Citizenship: Germany

Proposed Program: Aerospace Engineering at the University of Stuttgart, Germany

Ms. Hild is a doctoral student with the Institute of Space Systems at the University of Stuttgart. Her research focuses on multi-scale modeling of thermo-chemical gas mixture flows. In general, numerical modeling is required across a wide range of flow regimes for various applications such as atmospheric entry of spacecraft or electric propulsion systems. Despite the many advances in this field in recent years, there is still no efficient method to simulate gas mixtures in transition regions between continuum and non-equilibrium flows.

In her doctoral research, Ms. Hild contributes to finding a solution for this problem by implementing particle-based continuum methods such as the Bhatnagar-Gross-Krook and Fokker-Planck approaches in the open-source code PICLas. These methods are approximating the Boltzmann equation and can easily be coupled to well-established non-equilibrium methods to enable multi-scale simulations. For this, Ms. Hild extends different mathematical models for the handling of gas mixtures while specifically including rotational and quantized vibrational energies of polyatomic molecules. Furthermore, she will derive chemical reaction models for both mentioned approaches in the future, enabling multi-scale simulations of chemically reactive gas mixture flows. Prior to the doctoral program, Ms. Hild received her bachelor's and master's degrees in aerospace engineering at the University of Stuttgart in 2019 and 2021. Her master's thesis focused on drag reduction methods for satellites in very low Earth orbits. During her studies, she spent a semester abroad in the USA and a month at Samara University in Russia.

In her free time, Ms. Hild is passionate about swimming, hiking, yoga and reading. She volunteers as a lifeguard with the German Life Saving Association. Additionally, she supports the small satellite student society KSat e.V., which she co-chaired for two years and where she worked on space projects during her studies.

2023 Amelia Earhart Fellow

Swarnalatha Kathalagiri Vasantha Kumar

Citizenship: India

Proposed Program: Aerospace Systems Engineering at The University of Alabama in Huntsville, USA

Mrs. Kathalagiri Vasantha Kumar's Ph.D. research aims to provide linear and nonlinear theoretical models for the combustor acoustics needed to predict the instabilities in the Liquid Rocket Engines, implement a novel large eddy simulation (LES) model for combustion dynamics within the Loci-CHEM fluid dynamics combustion code, and perform quantitative CFD code validation through comparison of improved code predictions with the bench-scale results produced by the experiments.

Thus far, she has developed the theoretical model and the CFD code that simulate the Large Eddies in a duct for various inhomogeneous mean properties. Her research article, "Coupled Nonlinear Dynamics of Acoustic Modes in a Quasi 1-D Duct with Inhomogeneous Mean Properties and Mean Flow", is published in the prestigious Journal of Sound and Vibration and "Multiple Scales Analysis of the Nonlinear Dynamics of Coupled Acoustic Modes in a Quasi 1-D Duct" is under review at another prestigious journal, Nonlinear Dynamics. Her most recent discovery of analytical occurrence of triggered instabilities with and without the nonlinearities arising from the acoustic–combustion interactions is taking shape into an exceptional journal article. With this expertise, she aims to develop the most generic combustion acoustic models that aid study of the instabilities in rocket engines.

Mrs. Kathalagiri Vasantha Kumar was awarded 'Dr R.N SHETTY Gold medal' for her academic excellence in the mechanical engineering undergraduate degree at RNSIT, Bengaluru, India. She completed a Master of Science in aerospace systems engineering at UAH with a thesis - 'Experimental Investigation of Spray Characteristics for Different Geometrical Misalignment Cases of Like Doublet Impinging Injector,' which is published in AIAA Propulsion and Energy Form, 2020. She was awarded Outstanding Graduate Student in the department of Mechanical and Aerospace Engineering from The University of Alabama in Huntsville during the 2022 National Engineers Week.

Besides her academics, she is active in the student outreach activities at the university, and she is also a trained Bharatanatyam dancer.

2023 Amelia Earhart Fellow

Nandita Kumari

Citizenship: India

Proposed Program: Geosciences/Planetary Sciences at Stony Brook University, USA

Ms. Nandita Kumari is a student member of the ongoing Lunar Reconnaissance Orbiter Diviner Lunar Radiometer Experiment (LRO-Diviner) mission team and a Ph.D. candidate in the Department of Geosciences at Stony Brook University. Her research is focused on (1) proposing and characterizing landing sites for crewed missions to the lunar surface to maximize scientific output and detect hazards, and (2) using machine learning techniques that combine laboratory measurements and remote sensing data to identify and quantify mineralogy for in-situ resource identification and utilization (ISRU) purposes.

Her doctoral thesis is geared towards enabling a sustainable presence of humans on the lunar surface as part of NASA's Artemis program. She uses orbiter data (imaging, multispectral, and hyperspectral) and modelling to characterize sites and identify and quantify geologic materials. This helps the scientific community identify landing sites that are well suited to answer longstanding questions about the formation and evolution of the Moon. A related project that she is working on incorporates spectral (composition) data collected in a laboratory simulated lunar environment to model the data collected by the Diviner mission. She has designed a highly accurate and fast machine learning model to identify and quantify different minerals found on the Moon. This model trained on lab data and deployed on the orbiter data, has displayed promising and accurate results for the lunar surface and is the first of its kind.

Ms. Kumari also actively works on recruiting and retaining more women in the STEM workforce by mentoring undergraduate students. In addition, she does local outreach at schools and science fairs for primary and high school students.

2023 Amelia Earhart Fellow

Beatrice Latini

Citizenship: Italy

Proposed Program: Aeronautical and Space Engineering at Sapienza University of Rome, Italy

Ms. Latini is a Ph.D. student in aeronautical and space engineering at Sapienza University of Rome, Italy. Her academic research activity is devoted to the study of liquid rocket engines cooling systems via computational fluid dynamics numerical simulations, with particular attention on roughness effects on the fluid flow and heat transfer.

Her study is motivated by the modern metal additive layer manufacturing techniques which allow the realization of cooling channels of increasing complexity and efficiency with advantages in terms of production costs and times. However, they can lead to high relative surface roughness which can deeply influence pressure loss and heat transfer.

The main outcome of her research project is to investigate and expand the still quite unexplored field of roughness effects on heat transfer in order to develop numerical tools to improve predictive capabilities of heat flux and wall temperature distributions in the context of the next launchers engine generation.

In her work, Ms. Latini combines the use of experimental data, high fidelity CFD tools and simplified models. She will also experience a three month period abroad at the Technical University of Munich.

Besides her research activity, Ms. Latini is one of the Ph.D. student representatives and is an active part of the department council. Additionally, she is a member of the project “Engineering Woman 4 Woman” , which aims to help and encourage women to pursue careers in STEM fields.

In her free time, she likes running and playing sports, reading and spending time with family and friends.

2023 Amelia Earhart Fellow

Ying Luo

Citizenship: Australia

Proposed Program: Aeronautics at California Institute of Technology, USA

Ms. Luo is a Ph.D. student in aeronautical engineering at the California Institute of Technology. She is part of the Caltech Hypersonics Group, where her research focuses on discerning the impact of real gas effects on the behavior exhibited by the near-wake separation region behind blunt hypersonic bodies. Understanding the flow physics behind these hypersonic bodies is crucial in the development of entry vehicles for interplanetary exploration, due to its significant impact on aft body heat loads, vehicle aerodynamics, and control. A range of experimental optical techniques, including schlieren imaging, focused laser differential interferometry, and planar laser-induced fluorescence, will be employed in hypersonic facilities to unravel the complex influence of high-temperature thermochemistry on the near-wake separation region of blunt bodies.

Prior to her Ph.D. at Caltech, Ms. Luo obtained a master's in aeronautical engineering from California Institute of Technology in 2020, a bachelor's in aerospace engineering from the University of Sydney in 2016, and a bachelor's in law from the University of Sydney in 2019.

Beyond research, she enjoys hiking, traveling, and spending time with her cat Bernie.

2023 Amelia Earhart Fellow

Trupti Mahendrakar

Citizenship: India

Proposed Program: Aerospace Engineering at Florida Institute of Technology, USA

Ms. Mahendrakar completed her Bachelor of Science in aerospace engineering with a focus on astronautics from Embry-Riddle Aeronautical University in 2019. During her undergraduate studies, she interned at the National Aerospace Laboratories in Bangalore, India, and Aptus Engineering Inc. Following that, she worked full-time as an Avionics Component Engineer at Delta Air Lines. Later, she earned a Master of Science in aerospace engineering from the Florida Institute of Technology in 2021.

She is currently a Ph.D. candidate in aerospace engineering and works part-time as a Systems Engineer Intern at Collins Aerospace on the Iridium NXT program. As part of her research, she is developing generalized edge algorithms to detect components of non-cooperative spacecraft. These detections are then fed into an artificial potential field guidance algorithm to enable fully autonomous close-proximity operations with a distributed swarm system to detumble and de-orbit the non-cooperative spacecraft. This type of technology plays a significant role in performing on-orbit servicing and debris removal. Her research also involves hardware-in-the-loop testing to demonstrate and prove the concept of her algorithms.

Ms. Mahendrakar is a core member of Technetium Engineering, LLC, a researcher at the Autonomy lab and the NeTS lab, and she was also the student lab director of the ORION research lab at the Florida Institute of Technology. After completing her Ph.D., she plans to continue working on engineering solutions for on-orbit servicing, debris removal, and Space Domain Awareness.

In addition to her research, Ms. Mahendrakar enjoys mentoring middle school and high school students who are interested in the STEM field. She volunteers at schools as a science fair judge. She regularly enjoys running, exploring, and biking on Florida trails.

2023 Amelia Earhart Fellow

Riley McGlasson

Citizenship: United States

Proposed Program: Planetary Sciences at Purdue University, USA

Ms. McGlasson is a Ph.D. candidate in planetary science at Purdue University. Her dissertation work is focused on investigating the climate record contained in the substantial ice caps located at Mars' north and south poles. Mars' polar ice caps have been built up over time as water and ice gets deposited at the poles, along with any dust that may become trapped within. The deposition and subsequent erosion of this ice records a history of Mars' past climate, much like we see in observations of ice cores here on Earth.

To unveil the climate record within these ice deposits, Ms. McGlasson uses the Shallow Radar (SHARAD) instrument currently orbiting Mars to investigate the full vertical extent of these ice deposits. Orbital radar, like SHARAD, reveals interfaces deep within the ice deposit that may indicate locations where there is a sharp compositional contrast, perhaps due to different amounts of dust trapped within the ice. Periodic changes in composition in these ice deposits can be linked to changes in Mars' orbit and incoming solar radiation through time. These observations are supplemented by computer modeling, as well as small-scale laboratory measurements of constructed ice and dust stratigraphies, with the goal of better understanding the orbital radar data we get from Mars.

In her free time, Ms. McGlasson enjoys exploring the outdoors, as well as competing on her local roller derby team under the pseudonym "Mars Madness."

2023 Amelia Earhart Fellow

Andrea Nóvoa

Citizenship: Spain

Proposed Program: Engineering at the University of Cambridge, United Kingdom

Ms. Nóvoa holds an M.Phil. in energy technologies from the University of Cambridge and a bachelor's degree in energy engineering from the University of Vigo, Spain. She previously worked as a research assistant on two European-funded projects at the University of Vigo, and at NTNU/SINTEF Laboratories, Norway.

Ms. Nóvoa's research aims at developing methods that statistically combine physically low order models, experimental data, and machine learning tools, which can be deployed for real-time prediction of engineering systems. Specifically, Ms. Nóvoa is focusing on the prediction of nonlinear thermoacoustic instabilities, which are a major problem faced by hydrogen-based gas-turbine and rocket manufacturers. Her Ph.D. is funded by the EPSRCDTP, the Commonwealth European and International Cambridge Trust, and Rolls Royce.

During her Ph.D., Ms. Nóvoa has worked as a supervisor of "Thermofluid mechanics", a first-year module in the Bachelor of Science in engineering. Further, Ms. Nóvoa is active in a variety of research activities and is co-chair of the "Data-driven methods in thermoacoustics" session at the International Conference in Sound and Vibration (ICSV19).

Besides academia, Ms. Nóvoa has been a first-team athlete at the Cambridge University Athletics Club, where she was also the pole vault training squad leader.

2023 Amelia Earhart Fellow

Sierra Ramsey

Citizenship: United States

Proposed Program: Geology/Planetary Sciences at the University of Nevada, Las Vegas, USA

Ms. Ramsey is a Ph.D. student in the Department of Geosciences at the University of Nevada, Las Vegas (UNLV). She is a geologist and planetary scientist studying magmatic processes and volcanism on Mars. Her work focuses on understanding how Martian meteorites formed and were emplaced at or near the surface of Mars, which is critical to expanding the current knowledge about the geologic evolution of Mars, and ultimately, how the solar system and planets formed. As part of her Ph.D. research, she will be using well-established 2D and 3D analytical techniques, as well as testing whether approaches developed for terrestrial systems are applicable to Mars.

Before starting her Ph.D., Ms. Ramsey received her bachelor's degree with honors in geology from Western Carolina University in 2018 and her master's degree in geology with a focus on planetary science from the University of Georgia in 2020. Her master's entailed completing a thesis that used high-precision mineral analyses to explore the geochemical sources formation temperatures for a suite of 13 Martian meteorites. Ms. Ramsey is involved with the student government at UNLV as the representative for her department in the Graduate and Professional Student Association. She also engages in various outreach events within the Las Vegas Valley and across the United States to encourage young women to pursue STEM research and careers.

Following completion of her Ph.D., Ms. Ramsey wishes to continue in academia, teaching and researching at the collegiate level., She aims to focus on creating opportunities for undergraduates to engage with planetary research, something which is not traditionally available outside of graduate studies.

In her free time, Ms. Ramsey loves to bake and enjoys exploring the geology of the United States.

2023 Amelia Earhart Fellow

Aspen Reyes

Citizenship: United States

Proposed Program: Industrial and Manufacturing Engineering at Florida Agricultural & Mechanical University, USA

Ms. Reyes is a third year Ph.D. student in industrial and manufacturing engineering at the FAMU-FSU College of Engineering, a joint college of engineering between Florida State University and Florida A&M University. She performs research at the High-Performance Materials Institute, where she develops novel nanocomposites for extreme conditions, such as high temperature and radioactive environments in deep space. She is also a Sandia National Laboratories intern and characterizes ceramic materials for a variety of aerospace applications.

Currently, Ms. Reyes is focused on boron nitride nanotubes (BNNTs) and their polymer-matrix composites. Although BNNTs possess outstanding mechanical and thermal properties, these often do not translate to bulk material due to inter-tube and tube-matrix interactions. By gaining a deep understanding of these interactions, she hopes to improve the manufacturing processes, resulting composite material properties, and physics-based simulations that aid in rapid prototyping and aerospace materials certification. Her recent project studied BNNT/carbon fiber polymer-matrix composites exposed to a propane flame and a jet plume to simulate the high-temperature, high-pressure environment of atmospheric entry. The resulting microstructures indicate that BNNTs form interesting, protective crystal structures under these conditions, which is promising for thermal protection systems on reentry vehicles.

Outside of her research, Ms. Reyes currently serves as the FAMU-FSU Society for the Advancement of Materials and Process Engineering (SAMPE) student chapter president. Materials engineering is crucial to safely bringing humans to space and beyond the planet's protective magnetic field. She is passionate about using SAMPE to teach students about the importance of materials in our everyday lives and introduce them to exciting and meaningful careers in the space industry beyond the coveted astronaut position.

Ms. Reyes loves to go hiking and explore new landscapes in her free time. While she loves science and technology, being outside connects her back to the Earth and reminds her to appreciate our home planet.

2023 Amelia Earhart Fellow

Sahar Rezapour

Citizenship: Iran

Proposed Program: Mechanical Engineering at École Polytechnique Fédérale de Lausanne, Switzerland

Ms. Rezapour is pursuing her Ph.D. in mechanical engineering. Her research primarily focuses on investigating the influence of complex airfoil kinematics on dynamic stall, a significant aerodynamic challenge encountered in various fields, including micro air vehicles, helicopter rotors, and wind turbines. Dynamic stall scenarios involve complex kinematic patterns, such as constant velocity or angle of attack variations, as well as following non-linear paths like curved trajectories. By analyzing the contribution of individual kinematics within complex systems, Ms. Rezapour aims to unfold the chain of events that lead to the growth and separation of the leading-edge vortex during dynamic stall. To gather data for her research, she employs experimental methods, including load measurements and particle image velocimetry. She hopes to enhance the physical understanding of dynamic stall and develop models that rely less on empirical parameters, enabling better prediction and control of this phenomenon under complex and realistic conditions.

Parallel to her research, Ms. Rezapour engages in educational activities at École Polytechnique Fédérale de Lausanne (EPFL), assisting in teaching courses and co-advising undergraduate and graduate students. She also seeks opportunities to communicate science with others. She is a committee member of a seminar series at EPFL, to encourage interactions and facilitate exchanges and collaborations among EPFL Mechanicians. She is particularly eager to participate in outreach programs aimed at promoting science education among young people. Currently, she is involved in writing an anthology for middle-school girls to encourage and inspire future STEM girls.

Outside of research, she enjoys cycling, yoga, Persian calligraphy, learning French, and gardening.

2023 Amelia Earhart Fellow

Renee Spear

Citizenship: United States

Proposed Program: Aerospace Engineering Sciences – Astrodynamics and Satellite Navigation at the University of Colorado Boulder, USA

Ms. Spear is a second-year Ph.D. student in aerospace engineering sciences – astrodynamics and satellite navigation at the University of Colorado Boulder. Her research focuses on developing a new approach to collision-free, optimal spacecraft trajectory design within a multi-body system. While heritage methods exist for this task in geocentric operations, they are insufficient for operations in cislunar space due to increased environment complexity and sensitivity. New approaches to safe trajectory design must enable the construction of feasible and optimal paths in complex dynamical regimes while also avoiding dynamic obstacles defined by paths of potential future hazards. Her research will use multidisciplinary approaches from the fields of robotics and data mining to enable safe travel amidst cislunar space traffic, supporting robust and agile space operations.

For the first component of her dissertation research, Ms. Spear is currently constructing a method for data-driven categorization of spacecraft motion with uncertainty. Lack of straightforward analytical expressions and space-based sensor networks, as well as larger distances, make object detection and path prediction challenging in complex environments, such as cislunar space. Her research addresses these challenges by furthering our understanding of the impact of uncertainty on spacecraft motion in multi-body systems, which is critical for successful future space missions and extending our space domain awareness and space traffic management capabilities in cislunar space. This knowledge will also support her ongoing work to construct collision-free spacecraft trajectories given potential motion of objects in the same region.

After graduation, Ms. Spear plans to pursue research and development in spacecraft trajectory design and optimization. Her goals include contributing to safe space operations and enabling further exploration of the solar system through rapid, robust trajectory design.

Outside of research, she enjoys hiking, backpacking, kayaking, and volunteering with trail maintenance crews.

2023 Amelia Earhart Fellow

Anne Theurkauf

Citizenship: United States

Proposed Program: Aerospace Engineering at the University of Colorado Boulder, USA

Ms. Theurkauf is currently a Ph.D. student at the University of Colorado, Boulder. After getting her undergraduate degrees at Lehigh University in physics and mechanical engineering, she got her start in engineering at Draper Laboratory working on precision navigation instruments like Interferometric Fiber Optic Gyroscopes (IFOGs). After a few years in the nuts and bolts (literally) of instrument prototyping and testing, she decided to move out to Boulder to pursue a Master of Science (MS) in aerospace engineering. Her work as an MS student stayed on theme with an atom-based inertial sensing project, but her contributions shifted to the controls side. She is now delighted to be exploring a new direction for her doctorate: robotics.

Ms. Theurkauf is working on planning for collaborative multi-agent systems and takes inspiration from the teams of robots that are already exploring space, especially the incredible pair Perseverance and Ingenuity on Mars. The future holds such exciting potential for teams of robots exploring extraterrestrial bodies; each robot's individual capabilities work together to push farther, enabling deeper and more meaningful exploration. Thus far, her work has focused on the balance between reducing uncertainty and increasing the probability of accomplishing tasks: typically to improve one we must sacrifice the other. She has published work in this area with a focus on managing communication of shared information between robots. Future research will explore the cooperative side of this problem: how can we design motion plans such that robots can aid each other in accomplishing tasks? In particular, she is interested in investigating cooperative localization.

In her free time, Ms. Theurkauf takes full advantage of the multitude of outdoor activities in Colorado, and can be found rambling around the mountains hiking, trail running, and (best of all) skiing.

2023 Amelia Earhart Fellow

Alicia Torres Gomez

Citizenship: Spain and United Kingdom

Proposed Program: Aeronautical and Aerothermal Engineering at the University of Cambridge, United Kingdom

Ms. Torres Gomez is pursuing her Ph.D. research at the Whittle Laboratory, University of Cambridge, in partnership with Mitsubishi Heavy Industries (MHI). Her project aims to improve the turbomachinery used for hydrogen liquefaction to achieve better cycle efficiency. Liquid hydrogen (LH2) fuel will be key to decarbonize aviation by 2050. Hence, larger and more efficient hydrogen liquefaction plants will be needed.

Ms. Torres Gomez has developed a cycle analysis program in Python to compare different hydrogen liquefaction configurations and assess the benefit of improving different turbomachinery components on the overall cycle. This study highlighted the potential for improvement in the expansion process. She is now designing the hydrogen turboexpander itself. Ms. Torres Gomez also collaborates with the Aviation Impact Accelerator (AIA), an international group of academics developing interactive, open-source, evidence-based tools that will accelerate the journey to climate neutral aviation. This was presented by Professor Rob Miller of the Whittle Laboratory at COP26 and was key in guiding policymakers for the UK sustainable aviation fuels mandate. Ms. Torres Gomez's research is important to the AIA because it will help to understand the viability of LH2 as aviation fuel by quantifying the impact of hydrogen liquefaction and helping to identify technical improvements.

After moving to the United Kingdom from France at the age of 18, Ms. Torres Gomez completed a four-year integrated Master of Engineering degree and a Master of Research in Future Propulsion and Power from the University of Cambridge. Parallel to her research, she teaches undergraduate students in mathematical methods and fluid dynamics. She enjoys travelling and learning new languages —most recently Japanese— as well as playing badminton for her college's team. She wants to continue promoting engineering to young women through outreach initiatives.

2023 Amelia Earhart Fellow

Ariel Walter

Citizenship: United States

Proposed Program: Aeronautical Engineering at Rensselaer Polytechnic Institute, USA

Ms. Walter is an aeronautical engineering Ph.D. candidate at Rensselaer Polytechnic Institute at the Center for Mobility with Vertical Lift. Her research is focused on flight controls and handling qualities for large electric vertical take-off and landing (eVTOL) aircraft. A large variety of novel rotorcraft designs and prototypes are under development across the world for Urban Air Mobility and Advanced Air Mobility (UAM/AAM) applications that aim to develop sustainable electric aircraft for transport of both passengers and cargo, exemplified by NASA's AAM Mission. Ms. Walter's research into handling qualities and control strategies for these aircraft aims to inform the design of optimized control systems for these aircraft in order to ensure safe and efficient completion of UAM/AAM missions.

Ms. Walter received the U.S. Department of Defense's SMART scholarship sponsored by the U.S. Army Aviation and Missile Center in 2019. She works closely with both U.S. Army and NASA engineers and will continue her research with these groups after graduating.

Outside of her research interests, Ms. Walter is an avid rock climber and enjoys traveling to pursue her outdoor rock climbing interests. She also has a variety of artistic endeavors, including drawing, oil painting, pottery, and sculpture.

2023 Amelia Earhart Fellow

Minduli Wijayatunga

Citizenship: Sri Lanka

Proposed Program: Mechanical Engineering at the University of Auckland, New Zealand

Ms. Wijayatunga has been pursuing a Ph.D. at the Te Punaha Atea Space Institute in the University of Auckland, New Zealand since July 2021. Her research is on the development of technologies that enable autonomous spacecraft servicing and active debris removal missions.

In her research thus far, she has worked on improving indirect methods for trajectory optimization, as well as the development of preliminary mission design tools for enabling autonomous spacecraft guidance. She is currently working on utilizing model predictive control with convex optimization for spacecraft navigation and using angles only navigation for autonomous proximity operations. Alongside her research, she also works as a graduate teaching assistant in engineering design.

Ms. Wijayatunga received her B.Sc. and B.Eng. degrees in aerospace engineering, physics, and mathematics from the University of Sydney, Australia, in 2020. During this time, she worked as an engineer at Saber Astronautics and completed a research internship at the Australian Centre for Field Robotics. She also started the University's astronomy society in 2018, a thriving space for more than a thousand astronomy-minded students today.

After completing her doctoral degree, Ms. Wijayatunga envisions working for the Jet Propulsion Laboratory at NASA, pursuing her interest in autonomous spacecraft operations further. Her long-term goals involve making space accessible and of use to all communities in the world, while combating the racial and gender disparities that exist in the STEM space.

In her free time, she enjoys stargazing and hiking through New Zealand.

2023 Amelia Earhart Fellow

Zoë Wilbur

Citizenship: United States

Proposed Program: Planetary Science at the University of Arizona, USA

Ms. Wilbur is a Ph.D. candidate at the University of Arizona's Lunar and Planetary Laboratory. Her dissertation studies are funded through a NASA FINNEST Fellowship, Smithsonian Hevey Fellowship, and Philanthropic Education Organization Fellowship. During her final year of undergraduate study at the University of Nevada, Las Vegas, Ms. Wilbur began a senior thesis to study the formation of rare meteorite samples and assessed their relevance as analogues to the planet Mercury. She analyzed mineral chemistry within these meteorites at NASA's Johnson Space Center, where she interned and then worked as a contract employee. Working at NASA and being surrounded by Apollo samples and meteorites inspired her to learn more about the inner Solar System, and how planetary bodies formed and evolved.

Ms. Wilbur's Ph.D. research investigates the volcanic histories of Apollo 15 and Apollo 17 basalts. Of interest to her dissertation is an Apollo 17 basalt that was stored frozen and has been released for study for the first time after 50 years. This frozen sample is part of the "Apollo Next Generation Sample Analysis" Program. Ms. Wilbur and her advisor are the first researchers to study this sample since its return from the Moon. This frozen sample offers a direct comparison to other basalts curated using traditional methods at room temperature and gives the opportunity to search for volatiles (like water) using improved, 21st century techniques. To analyze this specially curated sample, Ms. Wilbur is utilizing a novel combination of 2D and 3D methods, including the measurements of water, chlorine, and fluorine in lunar minerals and 3D gas bubble structures.

She aims to understand the history of degassing (volatile loss) among the sample suites, how eruption dynamics are preserved in lunar basalts, and to what extent volatile behavior is dependent upon a basalt's chemical composition.