YSP Projects and Application Information

We have now launched the online application for the 2025 BMSIS YSP! You can find the application form and further information on how to apply below. Also, please take your time in reviewing the available projects to determine if you might be a good applicant before submitting your application.

BMSIS provides opportunities for college students and those who've completed undergraduate degrees to participate as Research Associates with our institute, providing opportunities to participate in basic research and to learn about science communication, ethics, policy, and more. Our program is conducted entirely online, so there is no need for travel, and interns can take part from any nation on the globe (please note that there are some projects that have location requirements—we clearly state when this is the case).

YSP Research Associates (RAs) conduct supervised research under direct supervision by one or more BMSIS scientists and colleagues. The RA may work on-site or remotely, depending on the needs of the project, mentor, and RA. The program does not include payments/funding (unless otherwise noted for a specific project). Research Associate positions will last nominally three months, though some may last longer, especially those that are funded.

BMSIS Research Associates will write a written report of their work for the project. This report may be used in a variety of applications, including (but not limited to): undergraduate project/thesis, conference proceedings, peer-reviewed journals, magazine/newspaper articles, and writing samples for job applications. RAs will be expected to present the results of their work either internally (to an audience of BMSIS scientists and affiliates using virtual communication tools) or externally (to an audience at an academic conference, convention, or other meeting venue).

The Young Scientist Program includes required modules in **science communication** as well as **ethics and society** with guidance from project mentors and other research scientists at BMSIS.

RAs also will attend monthly BMSIS seminars and will have opportunities to participate in a variety of seminars and meetings held by professional researchers, science communicators, and more.

Upon successful completion of the Young Scientist Program and required modules, Research Associates shall receive a Certificate of Completion. Alumni from the Young Scientist Program may also receive requests for follow-up program evaluation.

Applications for the Young Scientist Program will be accepted from 1 March through 10 April with limited available positions, so interested applicants are encouraged to apply or contact us for more information.

Eligibility Requirements

• Currently seeking a degree at a 2-year, 4-year, or 5-year university or a community college (or the equivalent), or recently have completed an undergraduate degree and currently considering graduate school.

• Please Note: we do not accept graduate students. Those who have completed credits towards Masters or Doctoral degrees are not eligible for the program. Graduate students are encouraged to instead apply to our Visiting Scholars Program).

• For further questions on eligibility, please see the Frequently Asked Questions (FAQ) document.

• Able to dedicate at least 5 hours per week for the duration of the program (time requirements may depend on the project)

• Provide proof of eligibility to work in the country of the Young Scientist Program (note: this only applies to projects where the RA is working on-site. Applicants for the online program need only be capable of working within their country of residence)

• Also note: BMSIS cannot sponsor travel or work visas to the United States

• For further inquiries, please see our FAQ document. The FAQ document will be updated as needed during the application window.

Important Dates for the 2025 YSP

• **1 March 2025** – Applications will be open by 08:00 Pacific Time on this date

• **11 April 2025** – Applications close (applications will be accepted until 20:00 Pacific Daylight Time on the 11th)

• **5 May 2025** – Decisions communicated to applicants beginning on this date (due to the large number of applications we receive, some notifications may take longer)

• **1 June 2025** – YSP Begins

• **31 August 2025** – YSP Ends

Application Requirements

• Contact one or more BMSIS scientists expressing specific interests about listed projects (see list below) by sending inquiries to scientists at their email address listed in the table below. Please include a thoughtful message of introduction, but also be courteous of their time. We have some guidelines in the FAQ document as to how to best write your messages so as to be professional and polite.

• Satisfy any eligibility requirements specified by the BMSIS YSP and the "Required Skills" section of the project to be considered. Also, please note that some projects are only available to applicants from specific areas or regions (if there is a location requirement, it will be listed with the project—all other projects can accept applicants from anywhere on the planet).

• **Complete the online application form for the project(s).** If you have questions about the application form, please read the FAQ document. The application form will include essay sections where you must describe why you are interested and a good fit for the project to which you are applying as well as how you see the YSP impacting your future. We require a resume/CV of no more than three pages in length as well as your educational transcripts. **(Note: The application form only becomes available once the application window opens)**

• Have two letters of recommendation sent to ysp_letters@bmsis.org. For more information about the letters of recommendation, please read the FAQ document. Please note: your application will not be considered complete unless we receive two letters of recommendation on your behalf.

• There is a $20 USD fee for applying to the program.

Here are the projects that are available for 2025:

Search:

Project Mentor(s)	Project Title	Description	Required Skills	Skills the Interns will Acquire
Rafael Loureiro, Luke Concollato, Sam Humprey, & Chad Vanden Bosch rafael@bmsis.org, lukeconcollato@gmail.com, sara.humphrey@bmsis.org, chad.vandenbosch@bmsis.org	**The Space Agriculture Laboratory Analysis Database (SALAD)**	The Space Agriculture Laboratory Analysis Database (SALAD) Project is looking for research assistants to help search the scientific literature for all published and unpublished work related to plant research for space applications. Assistants who join this project will have an opportunity to choose a certain subset of "plants in space" research to specialize in, and contribute summaries of these papers to the database we are building. SALAD will be a	Fluent in the English language; strong reading comprehension for technical papers on plant biology; coding experience (Python) *A pre-acceptance assessment will be conducted with each finalist on their skill levels in each one of the categories listed above. The SALAD team reserves the right to dismiss any candidate based on their assessment	Utilize appropriate research methods and techniques to analyze and summarize research papers; Understand the interactions between plant omics and plant phenotype data; Compare and contrast different approaches and

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		free, searchable database online for researchers and space entrepreneurs to use to learn the state of knowledge on space agriculture to inform experiments and technology development	scores. Being pre-accepted is not a guarantee for any candidate to participate in the project.	methodologies used in space agriculture research; Contribute to the development of a valuable resource for researchers and space entrepreneurs in the field of space agriculture.
Siddharth Pandey sidd@bmsis.org	**Identification and characterization of terrestrial analogue sites in India to support Moon and Mars missions**	The successful candidate will work closely with a team of analogue researchers who are preparing an overview catalogue of terrestrial analogue sites in India. The work will involve studying various maps, reviewing geology data and characterization of astrobiology/geomorphology targets (e.g. hot springs, saline lakes, deposits, outcrops) and correlating with similar identified sites at other global locations. The work will result in a review paper and an online talk at a national/international conference.	Students with an appreciation of the different kinds of terrestrial analogues that exist and what functions they serve with respect to science, engineering, mission development are ideal. Students with geology, microbiology, planetary sciences, geochemistry backgrounds are preferred.	Student will gain a deeper understanding of how terrestrial analogues shape scientific studies and technology development for missions to Moon and Mars. Student will get an opportunity to work alongside field researchers and those who have been involved in identifying India's analogue environments to help the global planetary community.
Aubery Zerkle & Craig Walton aubrey.zerkle@bmsis.org	**Video SciComm for the people**	Short-format videos are one of the most popular and effective ways to distribute knowledge. As such, producing science content on platforms like Instagram or TikTok is becoming an increasingly powerful way to reach wide audiences and educate people. This YSP project seeks a scicomm-	Strong motivation to communicate science, willingness to apply skills across scientific disciplines, some experience producing video content is preferable, creativity is a must	Science writing and communication, video production, social media marketing

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		focused candidate interested in creating video content for the science news website and BMS initiative Sciworthy. The candidate will receive training in science writing following the Sciworthy house style and write at least one article on their topic of choice for publication on the website. Building from this knowledge base, the candidate will produce a series of short videos for their article and other Sciworthy articles, experimenting with different styles and formats to optimize audience engagement. Let's be creative!		
Jennifer Claudio & Lovorka Degoricija (Science Communications Lead, OSDR NASA Ames Research Center) jennifer.claudio@bmsis.org lovorka.degoricija@nasa.gov	**Science Communication for the Open Science Data Repository**	The NASA Open Science Data Repository (OSDR) houses publicly available datasets ranging from behavioral and phenotypic data to spaceflight omics data from model organisms. OSDR aims to promote transparency and collaboration in scientific discovery in space life sciences. The candidate selected for this project will learn about dataset and publication releases associated with OSDR, and will receive training on how to prepare drafts of social media posts for each release. The candidate will also learn how to conduct weekly searches through a publications list to identify OSDR-enabled publications. Additional work to support the goals of our Science Communication team may include supporting future science education plans by producing vector-based graphics to illustrate end-to-end practices and	A candidate must have the ability to read and understand scientific publications (articles, abstracts, papers). Ability to digest information and present it in informative yet engaging writing is also necessary, but will be further developed. Applicants do not need to have their own social media accounts. Background in biological sciences especially bioinformatics, omics, and space biology is strongly preferred. Additional skills that may enhance a candidate's application include: Familiarity with vector-based artwork (Photoshop,	Successful participants will gain skills in 1) interpreting space biology content and sharing with a general public, 2) communicating detailed information concisely and effectively, 3) navigating the Open Science Data Repository.

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		applications of OSDR. Other tasks as needed may be performed.	Illustrator, Inkscape, or equivalent), basic video editing (DaVinci/BlackMagic or Adobe Premiere). Software licenses cannot be provisioned to candidates.	
Lev Horodyskyj levh@sciencevoices.org	**Agavi: Teaching in Tech Deserts**	In this project, student(s) will be working with the Agavi platform team at the Science Voices nonprofit, which is working to develop an adaptive learning platform for use in low resource (power, bandwidth, funds) regions around the world. Potential work can involve developing surveys and focus group questions to better understand the digital literacy of teachers, or investigating student access to technology in tech deserts. The student(s) will work on synthesizing this information to help inform the Agavi platform team on features that can be added or modified in the platform to better meet the needs of its intended audience.	None	Education research methodologies, team work, developing community relationships
Lev Horodyskyj levh@sciencevoices.org	**Greenworks: Global Tropical Stingless Bee Network**	In this project, the student will be helping develop the Greenworks global environmental stewardship network, focusing specifically on the Beeworks project being developed in Brazil. Work may include networking with community groups working on native stingless bee education and research throughout South America and development of online exchange platforms.	Web programming skills, Portuguese and/or Spanish (for networking)	Team work, developing community relationships
Rolando Perez & Jessica Snyder rolando.perez@bmsis.org jessicasnyder@bmsis.org	**Biobased aircraft for green aviation** Note: This	Biobased aircraft for green aviation Swarms of drones are being tapped to do more work in the coming decades - in terms of fire suppression,	A willingness to learn these skills required, experience with some or many of these is a plus	Digitize a real-world part using computer aided design (take a part of an off-

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	project has location limitations.	Earth observation, and agriculture. Let's find out if we can make parts of those drones out of material made using fungus, instead of plastics. This project designs, builds, and tests a MycoHardware Growth Kit meant for citizen science to grow - as much as build - drop in replacement for the structural components of off-the-shelf drones. This work is an extension of a project funded by NASA Innovative Advanced Concepts to use fungal materials for off-planet habitats. **Participants must be US-based. Local to the San Francisco Bay Area is a plus. Remote participation within the US will be considered.**	Computer Aided Design - CAD (design molds that mimic structural components of an off-the-shelf drone. Parts like an impeller, chasis, ...) Prototyping (3D print, mold making) Culture of mycomaterials (load wood chips into the mold, add a few milliliters of solution spiked with fungal spores, keep the loaded cell-laden mold in a dark, humidified place to allow for the material to generate) Material Annealing (baking as a treatment to adjust materials properties, like strength and ductility, as well as stop biological activity of the material) Hardware assembly: Replace a original component of the drone with the myco-part replacement. Re-assemble the drone and test fly. All data is good data. Some parts cannot be substituted with a myco-part. Bioinformatics (phenotype the fungal species - dovetail with the Open Fung mission) Material testing	the-shelf drone and make a 3D model) Mold making (from the 3D model of a part, produce a negative mold) 3D printing (prototype the designed mold using PLA and other wood-based 3D printing materials) Design of mycomaterials (identify the fungal spore and woody pulp source to create the materials. Choose based on other work and local availability) Culture of mycomaterials (Load the biology (fungal spores), feedstock (woody pulp) into the mold. Keep humidified for 2 weeks, could be more or less. Bake the part. Bioinformatics to characterize the fungal species and influence of some proteins on the material performance, such as melanin.

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			(compare the strength of the original vs. myco-part)	Presentation of technical information as expected during group meetings Open source science - the process and output will be shared publicly to invite broader participation into creating myco-part replacements
Anna Simpson anna.simpson@bmsis.org	**Microbial ecology of Bristol Dry Lake - Testing Arid Transformation of Organics** Note: This project has location limitations.	TATOOINE is a NASA P-STAR project investigating the formation and preservation, in salty, arid environments, of kerogen and humic substances, which are key targets in the search for life elsewhere in the solar system. As part of this project, we are monitoring the microbial communities of different sets of salt deposits in the Mojave Desert, California. I'm seeking an intern to assist in summer field work, helping to dig soil pits and collect soil samples using sterile technique for DNA extraction, as well as potential field lab tests and bioinformatics analysis of results (the latter can be done remotely). **In-person required (Southern California).**	Experience with desert outdoor activities (hiking, camping); background in microbiology, biology, or geological sciences; basic use of Python, R, and/or command line; basic sterile technique	Desert field work experience; soil sample collection; bioinformatics analysis; DNA extraction optimization; potential Nanopore sequencing
Jen Blank jen@bmsis.org	**Explore Biominerals in Lava Tubes**	Lava tubes on Earth contain mineral deposits created by the interaction of microbial life and dissolved minerals carried in to the caves by dripping water. These subtle features, often overlooked, could serve as potential	Familiarity with Google Workspace tools. No other specific skills are required, but you must have an interest in learning about astrobiology,	careful attention to detail in selecting and describing photographic images, scientific

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		biomarkers on Mars or other planetary bodies where life may have once existed. Working in lava tubes over several years, our research team has compiled thousands of images documenting these biomineral formations, categorizing them based on their distinct morphologies. As an intern, you'll help select a subset of these images and contribute to the creation of an illustrated educational booklet showcasing these unique formations. This booklet will be distributed to the US National Park Service and the International Cave Research Foundation, helping to raise awareness of biominerals in caves and their potential astrobiological significance. This internship offers hands-on experience in scientific communication, visual storytelling, and planetary analog research. Join us in bringing the hidden world of lava tube biominerals to a wider audience!	microbiology, and geochemistry, and lava tubes - as well as working one-on-one with a BMSIS astrobiology scientist to create an educational booklet.	communication, visual storytelling, and planetary analog and astrobiology research
Jen Blank jen@bmsis.org	**Designing Future Human Habitats on the Moon and Mars**	Are you passionate about visualizing the future of human space exploration? Join us in shaping the future of space habitation through art and innovation! This internship offers a unique opportunity to create realistic and imaginative planetary illustrations for education and outreach. Together, we'll explore planetary architecture by analyzing depictions from movies, concept art, international design competitions, and scientific research. We'll also examine the technical requirements	This internship would be most suited for an undergraduate with skills in art and graphic design -- and interest in space, planetary science, and human habitats. Familiarity with simple drawing platforms (e.g., Canva) and AI image generation (e.g., Dall-E 3, MidJourney, Stable Diffusion) is desirable. As is an interest in discussion of habitat	This is an opportunity for creativity with a dash of technological restraint! I have evaluated space habitat competitions for many years and, as a Subject Matter Expert for NASA, know a lot about considerations for human life support in Space and on

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		and in-situ resource utilization necessary for sustaining human communities on the Moon and Mars. As an intern, you'll develop your own original habitat design—and a community that could support 100 people—integrating both surface and subsurface structures on these rocky worlds. Using graphic design software and AI-generated imagery, you'll bring your vision to life. Final design(s) will be showcased on the NASA Communications website and printed as posters for distribution at the Chabot Space & Science Center in Oakland, California.	architecture with a NASA scientist.	the Moon. We'll inspire one another and you'll generate some interesting illustrations guided by scientific and engineering parameters as we know them today. You'll also have the opportunity to showcase your work to a larger public (not a requirement).
Jen Blank & Shelli Brunswick (SB Global, LLC) jen@bmsis.org	**Intern with the G100 Leadership Network**	The Global 100 (G100) is an international network of 100 influential women leaders dedicated to driving awareness and impact across governments and global organizations. This initiative is structured into 100 specialized Wings, each focused on a distinct theme. Join BMSIS Scientist Jen Blank, the USA Country Chair for the Space Technology & Aviation (STA) Wing, in an exciting internship opportunity. Working alongside STA Wing Global Chair Shelli Brunswick, you will play a key role in enhancing the Wing's online presence and strengthening its global network. Through this experience, you'll connect with professionals across the space sector—including experts in satellite technology, UN space policy, governance, and scientific research—from diverse countries. You'll also gain	Familiar with Google Workspace tools, comfortable writing to and speaking with senior colleagues in a formal and polite manner, good organizational and teamwork skills.	You'll gain experience connecting with an international community of space professionals, women from different cultural backgrounds and experience. You'll also join a network dedicated to promoting and advocating for next-generation space leaders, so this is a great opportunity if you think you may want to pursue a career in some area (very broad!) of the space sector.

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		insights into their career paths, expanding your knowledge of space-related industries and international collaboration.		
Mark Neyrinck mark.neyrinck@bmsis.org	**Where are the filaments around the Milky Way?**	We know that neighboring galaxies in the Universe are typically connected by filaments, which are columns of dark matter, gas and dwarf galaxies. But we don't know for sure which neighbors our Milky Way is connected to, beyond probably our nearest neighbor, Andromeda. Conveniently, the nearest dozen or so galaxies are in an unusually flat arrangement called the Local Sheet. In this project, we will estimate where the filaments are in the Local Sheet. If practical, you will perform, photograph and analyze petri-dish experiments with a slime-mold organism, Physarum polycephalum. If not, computational techniques are possible.	Python programming and image-analysis skills will be useful, and ideally, particular experience with photography (could just be with a phone camera). Written and general communication skills are desirable, as well.	You will develop skills for controlled experiments, image and data analysis, and knowledge of cosmology and cosmic structure formation. We aim to write up this project as a paper eventually, so you will gain some skills in scientific writing as well.
Mike Simmons mikesimmons@bmsis.org	**Supporting organizations worldwide using astronomy to improve lives in marginalized communities**	Astronomy for Equity seeks a candidate interested in joining a team that supports organizations worldwide that introduce STEM, inspire girls, and otherwise include marginalized communities in education and outreach programs using astronomy. Projects include sharing resources to introduce hands-on science in developing countries and rural communities where science facilities are lacking and sharing resources and methods for including blind and low-vision people in existing astronomy outreach programs. The Big Impact Astronomy video podcast that tells the stories of	Good communications skills and the ability to work with a diverse team are required. Helpful skills include organization and project coordination, writing, and video editing. Cross-cultural experience is helpful while cultural sensitivity is essential.	The intern will gain experience with people and organizations in different countries and cultures, improve communication skills (written and oral), and learn other skills depending on the project(s) they work on.

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		people and groups using astronomy for education in developing countries and for other marginalized groups. Placement will depend on the successful candidate's interests and the needs of the A4E team.		
Celia Blanco & Ricardo Cabrera (Universidad de Chile) celia.blanco@bmsis.org ricabrer@uchile.cl	**Revisiting the Order of Amino Acid Incorporation in Protein Evolution**	The chronological order in which amino acids were incorporated into the genetic code provides crucial insights into the origins of life and the evolution of proteins. This YSP 2025 project aims to examine potential timelines for the emergence of amino acids, integrating recent advancements in molecular biology, biosynthetic pathways, prebiotic chemistry, and the organic composition of planetary bodies. The candidate will conduct a comprehensive literature review to synthesize current knowledge and identify key factors that may have influenced the order of amino acid incorporation. The project will also involve basic statistical and comparative methods to construct a plausible chronology based on these findings.	Candidates must be able to search and read scientific literature. A background in evolutionary biology, molecular biology, or biochemistry is preferred.	Scientific literature review. Data collection and analysis. Science communication. Successful applicants might receive a stipend for this project, but this is not guaranteed.
Celia Blanco & Ricardo Cabrera (Universidad de Chile) celia.blanco@bmsis.org ricabrer@uchile.cl	**Comparative analysis of molecular complexity metrics**	Molecular complexity is a fundamental concept in astrobiology, relevant to both the origin of life and life detection, yet no universally accepted definition exists. Over the years, various metrics have been proposed, each capturing different molecular properties. However, their relationships and potential relevance remain unclear.	Candidates must be able to search and read scientific literature. Computational experience and knowledge of data science/data analysis is highly preferred.	Scientific literature review. Data collection and analysis. Science communication. Successful applicants might receive a stipend for this project, but this

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		This project aims to systematically evaluate and compare molecular complexity metrics across different classes of molecules relevant to prebiotic chemistry and biosignature detection. By examining how these metrics align or diverge, the study will clarify their theoretical and practical implications. The candidate will conduct a comprehensive literature review to catalog existing complexity metrics and their theoretical foundations. They will then compute these metrics for molecules of astrobiological significance, analyzing correlations and differences between them.		is not guaranteed.
Graham Lau grahamlau@bmsis.org	**Science Communication in the Age of AI: Writing, Speaking, and AI Prompt Engineering**	In an era where artificial intelligence is transforming communication, science communicators must not only develop strong writing and speaking skills but also understand how to responsibly and effectively use AI tools. This project will guide Research Associates through the fundamentals of science communication, while also exploring how AI chatbots and large language models (LLMs) can aid in writing, brainstorming, and conveying complex scientific ideas. Participants will learn how to craft compelling science narratives for broad audiences, engage in public speaking practice, and develop skills in AI prompt engineering. They will explore how to ensure accuracy and honesty when	· Strong writing skills are preferred but will also be developed during the project. · Ability to read and interpret scientific peer-reviewed literature and skills in critical thinking are helpful · Interest in AI applications for communication and a willingness to experiment with AI tools. · Applicants should have some familiarity with mainstream AI tools, especally ChatGPT, Perplexity, and Elicit.	· Effective science communication through writing and speaking. · AI prompt engineering for science communication. · Using AI responsibly for research, brainstorming, and writing. · Ethical considerations and best practices for AI-assisted work. · Engaging broad audiences with scientific topics

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		using AI in science writing, discuss the ethical use of AI and disclosure of AI-assisted work, and help build templates and structures to use AI as a tool to make scientific topics more accessible. The project will culminate in a final communication piece, which may take the form of an article, public talk, creative media, or an AI-enhanced creation. This project is ideal for scholars who are passionate about science, storytelling, and the evolving role of AI in communication.		through various media

Showing 1 to 16 of 16 entries

You can only submit your application by using the application form. Please review all of our advice on how to successfully apply in the FAQ document that we've linked in several places on this webpage.

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