



NB DEADLINE SUBMISSION EXTENDED TO FEBRUARY 15, 2025 AT 2359 PST



**INTERNATIONAL INSTITUTE FOR ASTRONAUTICAL SCIENCES
FLIGHT OPPORTUNITIES PROGRAM
IIAS-02 PAYLOAD SOLICITATIONS & CALL FOR SCIENCE
NOVEMBER 2024**



**International Institute for Astronautical Sciences Flight Opportunities Program
IIAS-02 Internal/External Payload Solicitation & Call for Science**

Dear Scientific Community:

In the weeks following the announcement of the second International Institute for Astronautical Sciences (IIAS) suborbital research spaceflight, IIAS-02, and the establishment of our scientist astronaut corps / payload specialist program through the IIAS Flight Opportunities Program (FOP), we have seen and heard the science community's desire to be a part of our IIAS-02 research flight. We are very much committed to maximizing the scientific return from IIAS-02 and subsequent research missions, and as such, are delighted to open our first-ever payload solicitation and call for science to our colleagues within IIAS and the wider science community.

Our research priorities within IIAS to date have encompassed a breadth of science, from biomedical and technological innovations supporting human spaceflight, to physical and materials science, to aeronomy research. For our upcoming suborbital mission on Virgin Galactic's Delta class suborbital spacecraft, our priority areas include, but are not limited to:

- Biomedical sciences supporting
 - Women's health, and sexuality and reproductive health
 - Neuroscience
 - Accessibility in space
 - Biomarkers of astronaut health
- Technologies supporting human spaceflight (e.g. biomonitoring devices, AI-driven health tech, etc)
- Physical sciences
- Materials science

As such, we are issuing a call for science and payloads, to maximize the scientific returns from our flight. As you will see, we are open to proposals for wearables, active-tended payloads, rack-mounted payloads, and science that can make use of the pre, post- and in-flight periods.

Historically, our collaborations have prioritized science that will help support future human spaceflight, demonstrate scientific/technological innovation and advancement, and promise positive impacts for Earth. Moreover, our collaborators are enthusiastic, passionate, and move mountains to make science happen. We are keen on continuing that tradition, and look forward to reviewing your payload proposals. Applications during this FOP solicitation will be evaluated based on scientific merit, technical merit,



mission fit, societal impact, proposer experience, mission compatibility, and crew preference. Lastly, while the current solicitation focuses on scientific returns for suborbital flight, we host many testbeds at IIAS, including parabolic flight, gravity offset, neutral buoyancy, high-G research aircraft, a hypobaric chamber, suborbital and orbital flight simulators, and it may be that your proposal is a better fit for those testbeds. We are equally keen to help you realize your science for all of our testbeds, and may be in touch to advance your proposal for those testbeds, if appropriate.

The application deadline for the current payload solicitation closes on **January 31, 2025 at 23:59 PST (NB DEADLINE SUBMISSION EXTENDED TO FEBRUARY 15, 2025 AT 2359 PST)**. We will also hold a virtual community brief to answer your questions on **December 18, 2024 at 0900 PST**. Please register [here](#) to attend. We will advise the community of future payload solicitation opportunities as they arise; a payload solicitation opportunity may or may not be released in 2025. While IIAS will cover the expense of human-tending your experiment during spaceflight, researchers are responsible for securing their own funding to develop, transport and otherwise support their payloads, as well as any additional funds required for payload lockers. **Please note that payload submissions need to pass both IIAS FOP approvals and Virgin Galactic's payload safety review. Receiving preliminary IIAS payload approval does not guarantee clearance for suborbital spaceflight.**

We very much look forward to reviewing your science and working together to realize novel, impactful science - for spaceflight, and for Earth. **Please send any questions, and your completed submission to flightopportunities@astronauticsinstitute.org. Questions regarding this payload solicitation are not guaranteed a response if received after 23:59PST December 18, 2024.**

Sincerely,

Shawna Pandya & Kellie Gerardi

Dr. Shawna Pandya,

Executive Director, IIAS Flight Opportunities Program,

Astronaut 002,

IIAS-02 Mission

Kellie Gerardi,

Director of Human Spaceflight Operations, IIAS Flight Opportunities Program,

Astronaut 001,

IIAS-01 & IIAS-02 Missions



DEMOGRAPHIC INFORMATION

1. First Name:
2. Last Name:
3. Institution:
4. Email:
5. Phone Number:
6. Citizenship:

7. Are you proposing this payload as a member of the IAS community? If yes, please provide your AST 101 graduation date.

8. Please list any participating foreign nationals within your team (name / country / role):

9. Please name additional team members, co-primary investigators, co-investigators, etc.

Please note that both the Virgin Galactic Payload User Guide is available [here](#) and IAS Payload User Guide is available [here](#), and it is highly recommended that you review both to facilitate your payload submission.

Have you read the IAS Payload User Guide? YES /NO



Have you read the Virgin Galactic Payload User Guide? YES /NO



PAYLOAD INFORMATION

1. What are you proposing? Please comment on the following (max 2500 characters):

- Background and context
- Novelty of the science being proposed
- Hypothesis
- Objectives (including scientific, engineering, educational, other)
- Justification for suborbital spaceflight as a platform



2. Briefly describe the technical elements of your payload. Please note that exceeding the technical specifications as laid out in the Virgin Galactic Payload User Guide may render your payload incompatible for suborbital flight: (max 2500 characters)

- Overall dimensions, mass
- Rack-mounted, wearable, actively-tended, or other
- Power requirements (voltages, currents, watts for nominal and peak draw conditions)
- Hazardous materials
- G-tolerances, if previously tested
- Liquids/Powders (Liquids or powders require two levels of containment)
- Use of batteries and their types
- Potential for electromagnetic/radio frequency interference
- Lowest and highest operating temperature range
- Pressurization/vacuum or venting requirements
- Access to windows, transmissivity requirements
- Lasers and type
- Proposed mounting methods and requirements





3. Describe planned activities and research objectives for each phase of flight (e.g. pre-flight, post-flight, microgravity, etc)? (max 1000 characters)

4. If making use of the pre and post-flight periods, please comment if your science requires more than the immediate pre and post flight periods (e.g. L-1, L0, L+1). (max 500 characters)



5. Please comment as to whether this payload is an active or a passive human-tended payload, or an autonomous payload not requiring a human operator. If an active or passive human-tended payload, what is the nature of the interaction and how many operators are required to operate the payload? (max 1000 characters)

6. For active human-tended payloads, describe the anticipated training requirements to become proficient with operating the payload (e.g. number of sessions, duration of sessions, virtual training, on-site training, parabolic flight training, repeated parabolic flight training). (max 1000 characters)



7. Why is this payload best suited to suborbital flight, as opposed to parabolic flight, orbital flight or other microgravity testbeds? Please comment on whether your payload needs microgravity, or hypergravity as well. (max 1500 characters)

8. Has the proposed payload flown in microgravity before? If so, describe the duration and platform used (drop tower, parabolic flight, etc.) (max 1000 characters)



9. What quality of microgravity do you need ($1\text{ g} = 9.81\text{ m/s}^2$), and why? (max 500 characters)

10. Will negative g be problematic? If so, explain how. (max 500 characters)

11. What is the minimum continuous time (in seconds) of near weightlessness that your payload will need to collect meaningful data? How will the data be collected? (Parabolic flights can provide ~20 seconds, whereas suborbital flights can provide ~180 seconds) (max 500 characters)



12. Does the payload need to free float untethered? If so, how would it be secured prior to and after free-float? How would it be released into free float? Please explain the free float requirement. (max 500 characters)

13. What is the current [technology readiness level](#)/space-readiness of your payload? What TRL do you hope to achieve after completion of this proposed spaceflight mission? (max 500 characters)

14. Can this be done with rack space only? YES /NO

- a. If yes, what size locker?
- b. What power requirement?
- c. Weight?
- d. Specific mounting locations or requirements?
- e. Human actuation or other support?



15. Does this need Research Ethics Board (REB) and/or Institutional Research Board (IRB) review? If so, has this been submitted? Do you need help in obtaining ethics approval? (IIAS may be able to help obtain ethics review, depending on the nature of the request). (max 500 characters)

16. Is this project funded? If so, fully or partially? What funding sources are currently secured? If partially or not funded, describe your funding needs and your fundraising plan. (Notes: i) not being fully funded is not grounds for disqualification from consideration for payload down-select). ii) IIAS may be able to co-apply for grants and/or provide levels of support, depending on the nature of the request). (max 1000 characters)



17. Do you have experience preparing payloads for parabolic or spaceflight? YES /NO
- a. If yes, please describe. (max 1500 characters)
 - b. If you are submitting this as a member of the IIAS community:
 - i. Have you taken EDU 101 (Research Methods)? When?
 - ii. Have you taken AST 102 (Fundamentals of Microgravity Science)? When? Have you taken BIO 103 (Human Research Participants in Microgravity Research)? When?



18. Will you need help in documentation preparation, including, but not limited to, test equipment data package preparation, safety and hazards analysis, concept of operations, payload design review, success criteria? (Note: IIAS can assist with these if required; charges apply). (max 1500 characters)



19. Does your payload contain [ITAR or EAR controlled](#) components and is this regulated under ITAR/EAR? YES /NO . If yes, please explain. (max 1000 characters)

20. How will data be collected after the experiment (e.g. immediate return to PI post-flight on site? Ship to PI? Ship with temperature controls (e.g. dry ice))? (max 1000 characters)



21. Describe any special ground facilities, handling requirements (e.g. BL2 lab, cryogenic storage), and/or time-sensitive requests regarding late load/early unload (e.g. if the payload has organic material requiring refrigeration, please specify the duration of time the payload can remain unrefrigerated before the experiment is negatively impacted), and for what phases they will be required (pre vs. post flight vs. both). (max 500 characters)

22. Describe any special inflight facilities or handling requirements (e.g. does the payload require a biohood level 2, cryogenic storage, venting, etc). (max 500 characters)



23. If an external PI, do you need to be on site to support the payload? If so, how many people? Please note that IIAS-02 will have a ground crew for support. Can the IIAS ground crew be trained to become proficient with operating and troubleshooting the payload? (max 1000 characters)

24. Will this require repeat data over time? If so, why? (max 500 characters)

25. Describe the anticipated scientific return, societal impact, or benefit to humanity of your work. (max 500 characters)



26. IIAS FOP and IIAS are committed to disseminating the results of its science through outreach, education and publication. Are you interested in co-publication, if applicable? Do you plan to affiliate with IIAS in future publications? (max 500 characters)

27. IIAS FOP and IIAS are committed to increasing opportunities for taking part in the scientific process for its members. Are there opportunities for IIAS members to take part, either through data collection, analysis, writing or other? If yes, please describe? (max 1000 characters)

28. As a part of our commitment to open science, IIAS FOP and the NASA Open Science Data Repository work closely together to make biological and biomedical data available to future researchers for scientific application once your science is published. Are you interested in sharing your data to the NASA OSDR post publication? While submitting your data as early as possible to OSDR is best practice, you as the PI have control of your data's public release timeline via OSDR. It will not be released in OSDR until you are ready, usually when you publish results in a scientific journal. **YES** / **NO**



29. Please list your references.

30. Please include any relevant publications.



31. If not selected for the current suborbital solicitation, would you like your submission to be kept in our payload repository for consideration for future flights? YES /NO

32. If not appropriate for a suborbital platform, would you like your submission to be considered for other IAS testbeds, such as parabolic flight, gravity offset or neutral buoyancy? YES /NO

33. Have you worked with IAS before? If so, please describe. (max 500 characters)

34. Why do you want to work with the IAS-02 team? At the IAS FOP, we pride ourselves on passion for science and technical soundness, and we love working with PIs who are passionate about their science, collegial, available, driving their science forward, enthusiastic, and committed to “working the problem,” as challenges invariably arise. What draws you to our mission? (max 1500 characters)



35. Has this proposal or similar versions of it been submitted to flight opportunities other than IIAS-FOP? If so, list which opportunities and their status (approved, under review, rejected).

36. Is there anything else that you would like us to know that we haven't asked?



37. Attach a single PDF with additional information (sketches, photos, video links, etc.) if it will help to better describe your payload.

Thank you for your interest in working with us! Please email your completed submission to flightopportunities@astronauticsinstitute.org. We may be in touch with further questions to clarify your proposal.

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