TRISH IND 2022 Pre-Proposal Webinar

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Baylor College of Medicine

TRANSLATIONAL RESEARCH INSTITUTE FOR SPACE HEALTH™

Agenda

- The TRISH Mission and what does TRISH fund?
- Why the Industry Solicitation?
- Research Topics
- Timeline
- FAQs

The primary objective is to share more details about the solicitation such as eligibility criteria, proposal requirements, timelines, and where to submit a proposal.

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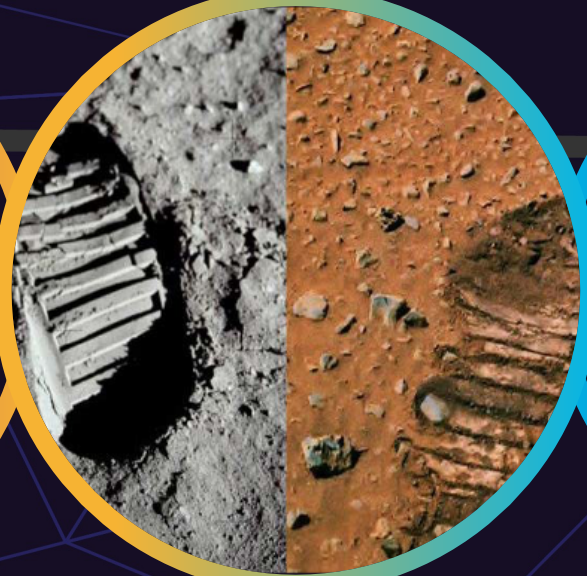
TRISH MISSION

Relentlessly seek and support high-impact scientific, technological, clinical, and psychological advances that will enable any human to explore space safely.

WE COMPLEMENT NASA'S EFFORTS

NASA

Steady Progress in reducing space health risks



TRISH

Risk-taking for potential GIANT LEAPS

Baylor College of Medicine

Massachusetts Institute of Technology

Caltech

WHAT DOES TRISH FUND?

TRISH provides non-dilutive federal grant funding

TRISH supports the development of health technologies and knowledge for:

- NASA's Missions to the Mars system
- NASA's Artemis Program
- Commercial Spaceflight Support

NOW

Orbital and ISS

3–10 day missions

2020s

Lunar Vicinity

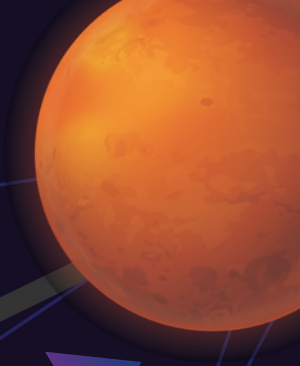
10-20 day missions

2030s

Reaching Mars Orbit

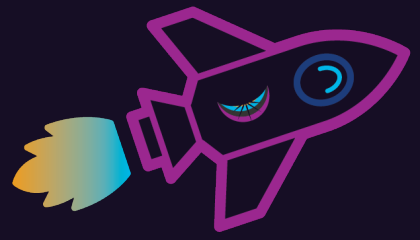
2.5-year mission

Very limited mass, power and volume



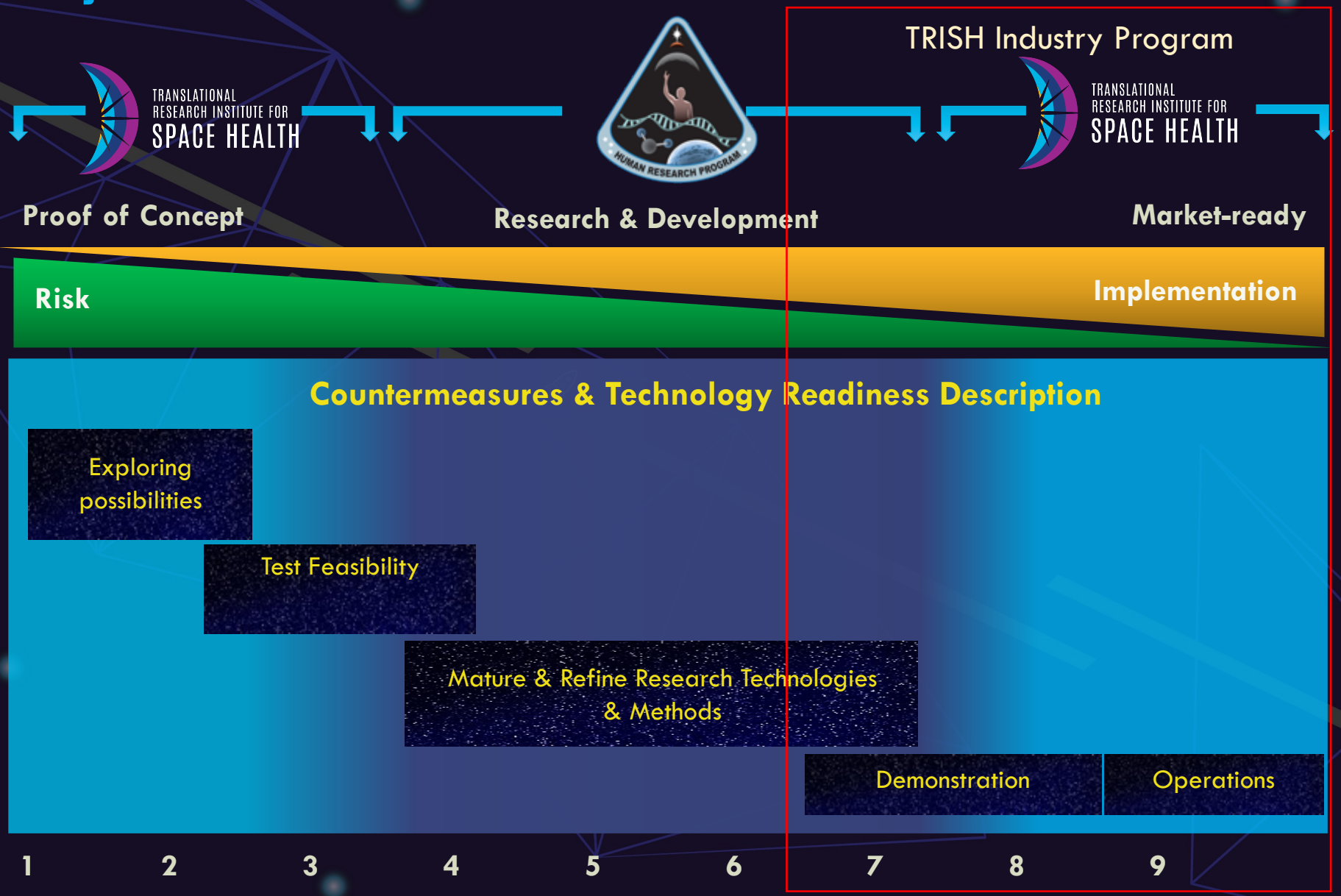
Advancing technologies, discovery and creating economic opportunities

TRISH Focuses on Innovation



- Research with a **large potential impact**
- **Disruptive ideas** are a plus
- Risk is *not* necessarily bad
- New approaches and perspectives
- **Multidisciplinary** and **multi-outcome**
- Avoid incremental proposals

TRISH Industry Focus



How will this benefit my company?

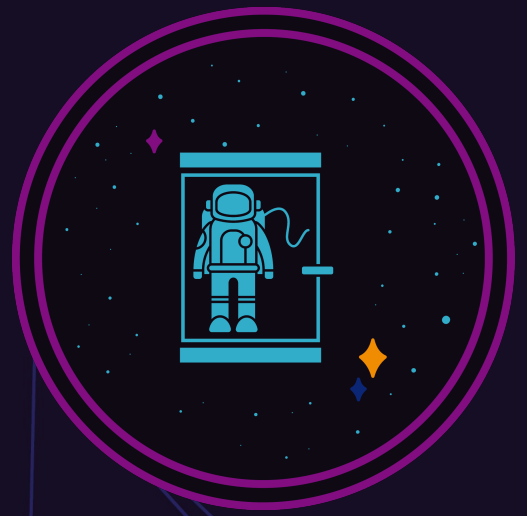
- Providing **non-dilutive capital**;
- Providing access to larger funding communities;
- Providing access to subject matter experts and NASA personnel;
- Encouraging research and development risk beyond traditional funding sources;
- **Increasing credibility** within fundraising and science communities;
- Increasing company and product visibility;
- Retaining the Intellectual Property with the Principal Investigator (PI);
- Supporting technology optimization and validation for space flight operations, which often makes the product suitable for **broader Earth based markets**;
- Providing a path to product testing and validation through flight on the International Space Station or on commercial spaceflights; and
- Providing a **path to future NASA and other government opportunities.**

5 Hazards of Spaceflight

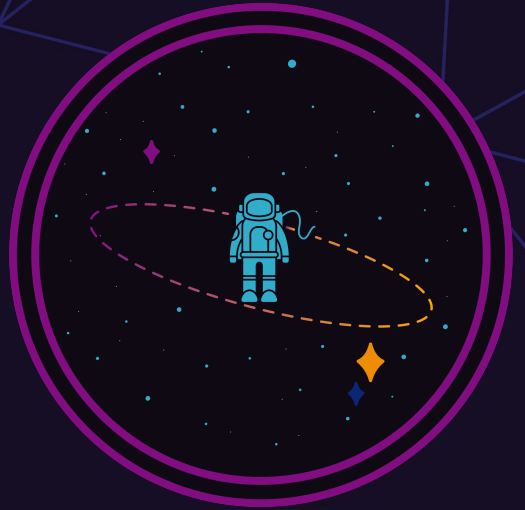
Radiation

Distance from Earth

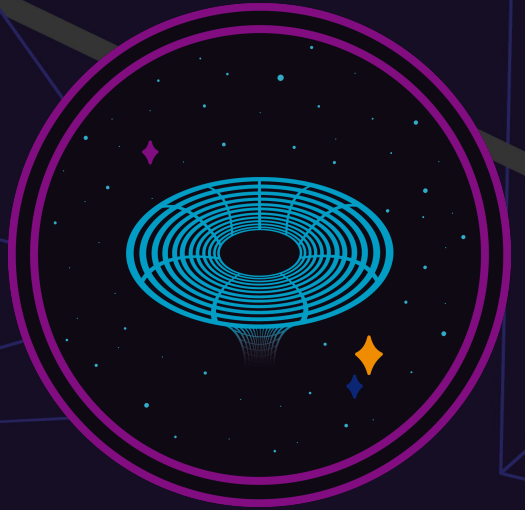
Hostile/Closed Environments



Isolation



Gravity



http://humanresearchroadmap.nasa.gov

Solicitation Approach and Risks Addressed

TRISH is seeking novel approaches to address NASA's risks of

1. Adverse health outcomes and decrements in performance due to medical conditions that occur in mission; and

2. Long term health outcomes due to mission exposures and the risk of injury and compromised performance due to extra-vehicular activity (EVA) operations.

Research Topics

Research Topic 1: Use a mixed reality platform to develop the capability for a "**doctor over-the-shoulder**" that allows a human medical expert to real-time guide and annotate medical tasks and procedures to an astronaut on lunar missions.

Research Topic 2: Develop **minimally obtrusive** ingestible, implantable, or contactless **medical monitoring capabilities** with ideal technical characteristics for lunar missions and lunar surface activities (including spacewalks) without any real-time support from Earth or mission control.

Research Topic 1 Background

Current medical training for astronauts relies heavily on didactic, classroom instruction months before their mission bring into question medical knowledge and skill retention. Up to 40 hours of medical training is provided to ISS crewmembers.

The ultrasound remote guidance paradigm successfully demonstrated **the capability of having a remote subject matter expert verbally guide a minimally trained operator** to acquire anatomical targets with ultrasound. The remote subject matter expert needs real-time video of the ultrasound and an audio loop to communicate directions.

This topic is looking to **augment remote guidance into the content-rich visualization platform of mixed reality**. This increases the digital tools that can be used to annotate direction and guide the operator in accomplishing medical tasks. This gives the subject matter expert visualization of the medical scenario and better situational awareness to better communicate with the operator.

Research Topic 2 Background

The remote and austere nature of human spaceflight puts a premium on upmass, stowage space, power usage, communication, and crew time resources. The collection of health vital and physiological data costs a certain amount of the above resources to acquire. While likely trivial on Earth, use of these resources is a trade off against other mission needs and objectives.

This topic is looking to:

- **Investigate unconventional vectors** (e.g., contactless, implantable, ingestible) **for acquiring health vital and physiological data beyond the conventional skin surface interface.**
- Push the envelope for how lightweight, small, low power, fully inclusive, and easy-to-use the biosensor can be.
- Determine if these are applicable for use inside a **space suit environment**.

Examples

Topic 1

- Development of software and digital assets for use on Microsoft's HoloLens2 platform that improves medical task and procedure performance.

Topic 2

- Fully passive and contactless monitoring of subjects' health vitals periodically as subjects go about their day (e.g., smart mirror during daily grooming).
- Ingestible device with long pass-through time that use the GI system to determine required health vitals.
- Small, self-powered, implantable device viable for the duration of the mission to continuously monitor the subject. Insertion and removal would be done on Earth before and after the mission.

Why these topics? Why Now?

TRANSLATIONAL RESEARCH INSTITUTE FOR SPACE HEALTH

The convergence of technology is making precision medicine available at scale.

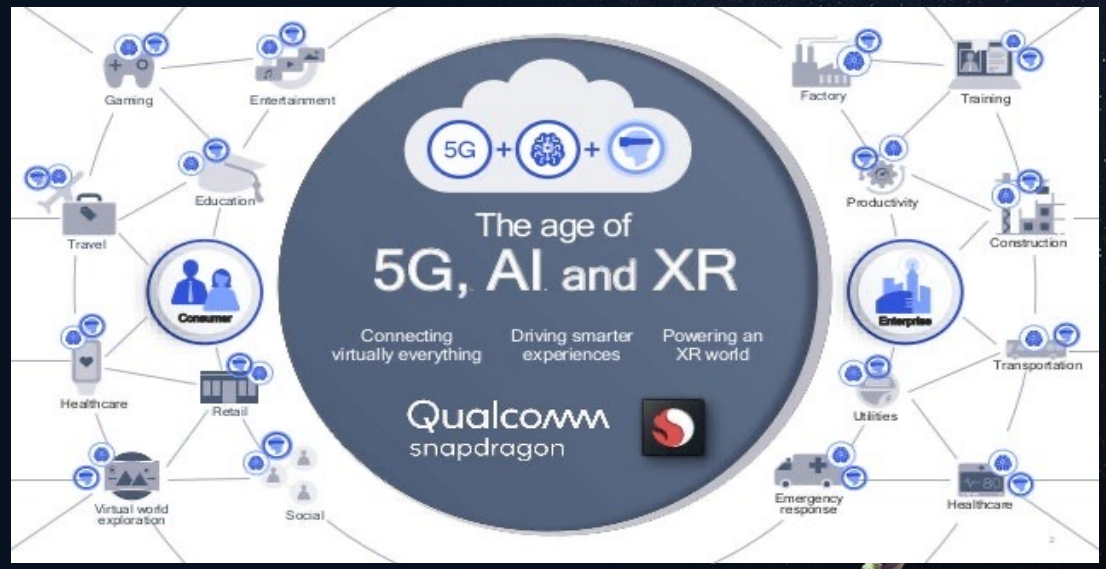
"While precision medicine has been a talking point for several years now, gaps in technology and inefficiencies in harnessing Big Data have prevented it from becoming a reality. However, a confluence of technologies—including sensors, remote patient monitoring devices, the Internet of Things (IoT), electronic health records (EHRs), genetic databases, ML, and cloud computing—is helping advance the state of precision medicine applications."
2022 Emerging Technology Outlook, Pitchbook

Artemis Missions:

- Artemis 1 in 2022
- Artemis 3 (w/ Astronauts) in 2024

Commercial Spaceflight Missions:

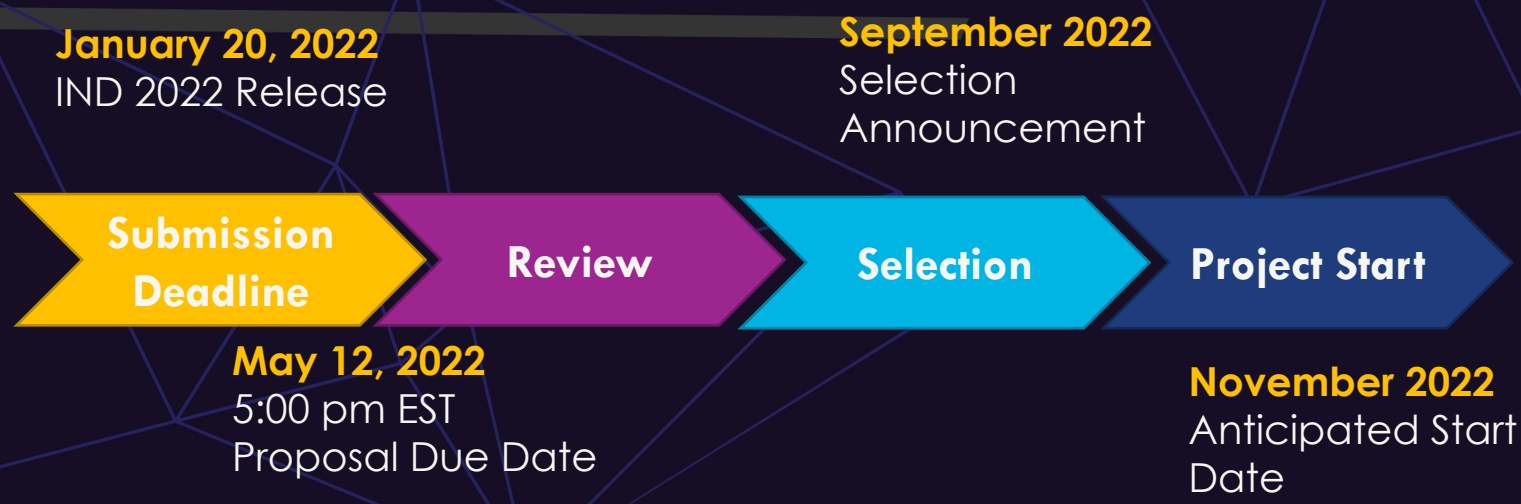
- Upcoming Axiom Space and Space X flights in 2022



Solicitation Timeline

Award information	Awards between $100,000 to $500,000 for one year. Recipients are required to match TRISH funding with 100% cost-share from a non-federal source.
Announcement Type	IND-2022 will be funded as an Industry Grant.
Eligibility	Personnel employed by US-based companies may apply.

Schedule



Contact Contact SpaceHealth-info@bcm.edu if you have any questions regarding this solicitation.

Frequently Asked Questions

Q. When will the funding decisions, regarding proposals, be made?

A. Announcement of awards will be made in September 2022.

Q. Can non-U.S. companies apply to this opportunity?

A: This solicitation is open to all U.S.-based companies. Additional information regarding international participation can be found here: http://spacehealth.bcm.edu/res/p/applicationfaq/.

Q. What is covered under cost-sharing?

A: Cost-share must be from a non-federal funding source.

- Salaries & benefits.
- Value of additional % effort contributed by PI.
- Equipment purchases.
- Supplies.
- Travel.
- Tuition fees.
- Indirect costs.
- Value of volunteer services towards the project

Frequently Asked Questions

Q. Can I request an extension for submitting my application?

A. Extensions will not be given. It is strongly suggested that you begin your application preparation early and familiarize yourself with the solicitation and TRISH GRID.

Q. Is there a required format for biographical sketches?

A: A NIH or NSF biosketch format is acceptable, but there is no required format. A template has been provided alongside the solicitation for the proposer's convenience. Regardless of the format used, please take careful note of the 2-page limit for biographical sketches.

Q. I cannot find the answers to my questions in the solicitation documents, the guidebook, or the FAQ. Who can I ask for assistance?

A: Please ensure that you read both the TRISH Industry Program (TRISH-IND-2201), and the FAQ in their entirety before contacting TRISH with questions. Additional technical information and contact SpaceHealth-info@bcm.edu.

Q. Can TRISH provide us with astronaut data?

A. TRISH does not provide access to astronaut data. It is not encouraged to request this type of data from NASA's Life Sciences Data Archive (LSDA) or Lifetime Surveillance of Astronaut Health (LSAH) for this short-duration project.

Connect with TRISH

bcm.edu/spacehealth

spacehealth-info@bcm.edu

Orbit Community:
trish.force.com

Monthly Newsletter:
bit.ly/TRISHNewsletter

@bcmspacehealth