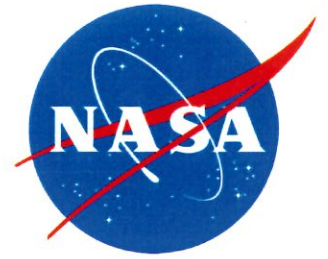


National Aeronautics and Space Administration



UNIVERSITY-LEVEL ENGINEERING DESIGN CHALLENGES

SPONSORED BY NASA & MANAGED BY THE NATIONAL INSTITUTE OF AEROSPACE

BE A PART OF NASA'S MISSION

**Solve Real-World
Aerospace Engineering Challenges**

**3 COMPETITIONS YOU WON'T
WANT TO MISS IN 2020**

**TAKE YOUR
ENGINEERING GAME
TO THE NEXT LEVEL**

**BIG IDEA CHALLENGE
RASC-AL COMPETITION
MOON TO MARS ICE & PROSPECTING CHALLENGE**

2019-2020

Breakthrough, Innovative, Game-Changing (BIG) Idea Challenge



Design, build, and test a low-cost payload targeted for one of the Commercial Lander Payload (CLPS) lunar missions. NASA seeks innovative ideas for a wide variety of concepts, systems, and technology demonstrations supported by solid engineering rigor that will address near-term technology capability requirements to support NASA's exploration objectives for the Permanently Shadowed Regions (PSRs) at the Lunar South Pole. Teams of students and their faculty advisors are invited to propose unique solutions in response to one of the following areas:

Lunar exploration ♦ Lunar ISRU ♦ Capabilities to explore PSRs

ELIGIBILITY

Teams of undergrad & grad students at accredited U.S.-based colleges & universities officially affiliated with their state's Space Grant Consortium. Non-Space Grant affiliated universities may partner with a leading Space Grant University.

<http://bigidea.nianet.org>

AWARD RANGE: \$50K - \$180K!

5 to 10 teams will be selected to build their ISRU, prospecting, or mobility systems payload.

IMPORTANT DATES

Notice of Intent Deadline: Sept. 27, 2019
Proposal Deadline: January 9, 2020
Selection Notifications: February 7, 2020
2020 BIG Idea Forum: Oct. 6-8, 2020

Revolutionary Aerospace Systems Concepts – Academic Linkage (RASC-AL) Competition

Develop new concepts that leverage innovations to improve our ability to operate in space and on other bodies by submitting proposals describing possible solutions to one of five themes:

- **South Pole Multi-Purpose Rover**
- **International Space Station (ISS) as a Mars Mission Analog**
- **Short Surface Stay Mars Mission**
- **Commercial Cislunar Space Development**
- **Autonomous Utilization and Maintenance for Science Payloads on the Gateway and/or Mars Deep Space Transport**

Up to 15 teams will be selected to present their concepts to a panel of NASA and industry judges during the 2020 RASC-AL Forum at Cocoa Beach, Florida in June 2020.

<http://rascal.nianet.org>



ELIGIBILITY

Teams of full-time undergrad & grad students attending accredited colleges/universities in the US (see website for full eligibility requirements).

IMPORTANT DATES

Notice of Intent Deadline: October 15, 2019
Proposal & Video Deadline: March 5, 2020
Selection Notifications: March 30, 2020
2020 RASC-AL Forum: June 15 – 18, 2020

\$6,000 TEAM STIPENDS!

Moon to Mars Ice & Prospecting Challenge

Design, build and test prototype systems that can extract water and assess subsurface density profiles from simulated Lunar and Martian subsurface ice. 8 to 10 teams will be selected to build and test their prototype system during a 3-day competition held at NASA's Langley Research Center in Hampton, VA in June 2020. In addition to the technology demonstrations, participation includes the submission of a technical paper and poster presentation to NASA and industry judges which details the team concept's "path-to-flight" (i.e. essential modifications required to operate their system on the Moon or Mars).

IMPORTANT DATES

Notice of Intent Deadline: October 4, 2019
Project Plan Deadline: November 21, 2019
Selection Notifications: December 13, 2019
2020 Challenge Forum: June 2 - 4, 2020

\$10,000 TEAM STIPENDS!

<http://specialedition.rascal.nianet.org>



ELIGIBILITY

Teams of full-time undergraduate & graduate students attending accredited colleges/universities in the US (see website for full eligibility requirements).