

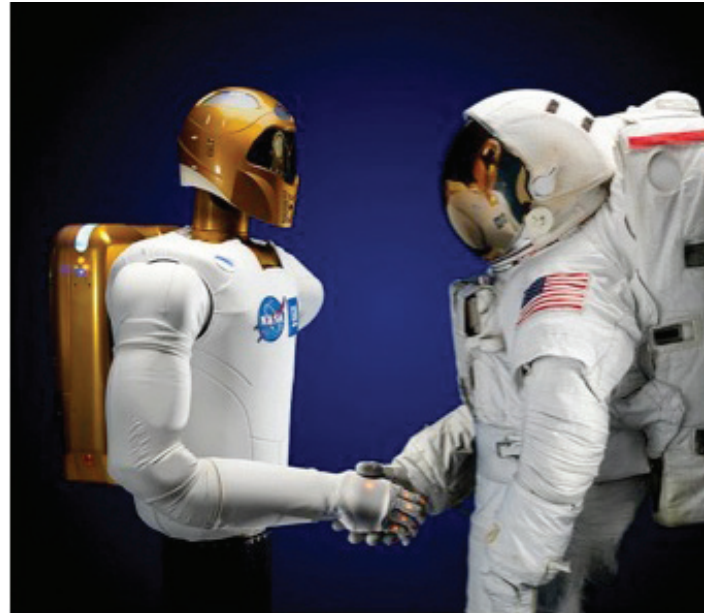
## International Space Station Testbed for Analog Research (ISTAR)

### *Environment: Low Earth Orbit*

The International Space Station (ISS) offers a unique platform to test future exploration systems and operations because it provides a long-duration, zero-gravity space environment and the opportunity to evaluate many factors not available in other analog missions. NASA will use the ISS as a test site for long-duration missions to identify the risks and challenges to astronaut health and safety, prepare for crew autonomous operations needed for handling communication time delays, exercise ground elements training and technology development, and evaluate new exploration systems and capabilities as they become available.

ISTAR will challenge the astronauts to work progressively longer periods unassisted by mission control—just as would be expected on a mission to Mars or a near Earth asteroid. Future ISTAR missions could last as long as six months and would use ISS confinement and zero-gravity to simulate crew activities during long-duration flights and crew arrival at an exploration destination.

One example of space station research examines how humans and robots work together to overcome technical challenges. These human-robotic partnerships will be tested with the addition of Robonaut 2 (R2) at the ISS. The conditions in the space station will provide an ideal test setting for robots to work in close proximity to humans, while also working in a zero gravity environment. The plan is to evolve the system with new software uploads and subsystems, such as legs or mobility aids, to eventually allow R2 to work outside of the space station. This evolution will allow R2 handlers to better understand how the system will work in the vacuum of space, helping them prepare for future space missions.



*Robonaut 2, now onboard the International Space Station, shakes hands with an astronaut.*

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NASA's plans to extend the human presence beyond low Earth orbit will require many technological advances and a greater understanding of how to use the systems to explore effectively. To meet these challenges, scientists and engineers must conduct hands-on analog tests and research here on Earth and the International Space Station.

NASA has not yet confirmed the technologies that will be used in future space exploration missions, but with the successful testing of analog systems and procedures in simulated and extreme environments on Earth and the International Space Station, humans move one step closer to a sustainable human presence in space.

For more information about NASA analog missions, please visit: <http://www.nasa.gov/exploration/analog>s

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NF-2011-04-534-HQ

