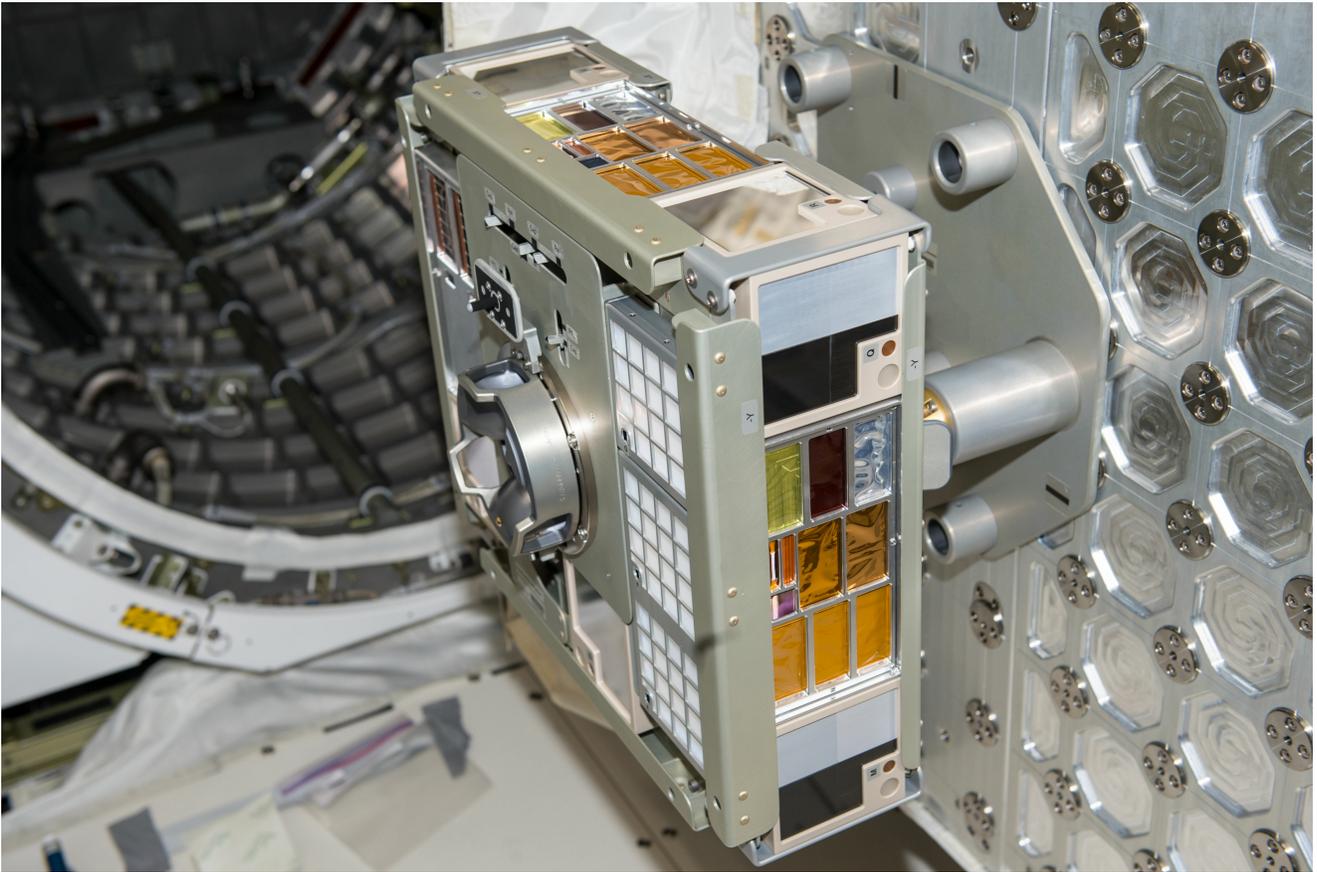


# ExHAM-Radiation Shielding

 [nasa.gov/mission\\_pages/station/research/experiments/explorer/Investigation.html](https://nasa.gov/mission_pages/station/research/experiments/explorer/Investigation.html)



## Category

Technology Development and Demonstration

## Also Known As info

ExHAM-Radiation Shielding; ExHAM-Radiation Shielding;

## OpNom:

## Principal Investigator(s)

Nilgun Baydogan, Ph.D.  
Istanbul Technical University, Istanbul, Turkey

## Co-Investigator(s)/Collaborator(s)

Tayfun Bel, Ph.D.  
Istanbul Technical University, Istanbul, Turkey

---

#### Developer(S)

Istanbul Technical University  
Istanbul, Turkey

---

#### Sponsoring Space Agency



Japan Aerospace Exploration Agency (JAXA)

---

#### Sponsoring Organization

Japan Aerospace Exploration Agency

---

#### ISS Expedition Duration

February 2018 — October 2019

---

#### Expeditions Assigned

- 55/56
  - 57/58
  - 59/60
- 

#### Previous Missions

---

#### Media links

---

#### ISS Science for Everyone

---

#### Science Objectives for Everyone

The ExHAM-Radiation Shielding investigation exposes samples of polymer materials to the space environment for the "verification experiment of radiation shielding material for spacecraft equipment". In this investigation, proposed by the Istanbul Technical University, polymer materials with self-repairing properties against damage caused by

radiation exposure are installed on the ExHAM facility attached to the outside of the Japanese Experiment Module Kibo's Exposed Facility on the space station, and exposed to the space radiation environment for about one year. After this exposure period, the materials are examined for their potential use in future space exploration applications.

## Science Results for Everyone

The following content was provided by Kunihiro Matsumoto, and is maintained in a database by the ISS Program Science Office.

## Experiment Description

---

### Research Overview

- Further research is needed to understand the mechanism of how the radiation environment of space affects the mechanical and chemical properties of polymer materials with self-repairing properties.
- The ExHAM Radiation Shielding investigation exposes polymer materials to the space environment outside of the International Space Station for a duration of about one year. The materials are proposed for use as radiation shielding against cosmic rays, gamma rays, X-rays and other types of ionizing radiation in future spacecraft.
- Upon return to Earth, the samples are evaluated for changes in their properties following exposure to the space environment.

### Description

[back to top](#)

### Applications

---

#### Space Applications

This investigation supports development of materials that can repair damage caused by radiation, which could contribute to safer and longer-lasting spacecraft and equipment.

#### Earth Applications

This investigation could lead to better ways to protect spacecraft and equipment from space radiation. This may help improve communication satellite technology, essential in many settings on Earth. The self-repairing materials may have potential application in harsh environments on Earth as well.

[back to top](#)

Operations

---

Operational Requirements and Protocols

[back to top](#)

Decadal Survey Recommendations

---

[back to top](#)

Publications

---

Results Publications

Ground Based Results Publications

ISS Patents

Related Publications

[back to top](#)

Related Experiments

---

[back to top](#)