

Getaway Special G-782 Payload Bay

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Overview

The G-782 payload, or Aria-1 as it is known to its sponsors, is an educational project to give elementary and high school students in the St. Louis area an opportunity to be involved in hands-on space science and perhaps steer them toward science, engineering and technology careers. Aria-1 is a joint project of the School of Engineering and Applied Science of Washington University in St. Louis and the Cooperating School Districts, an educational consortium of 47 school districts in the greater St. Louis metropolitan area.

More than 300 students from eight St. Louis schools prepared hypotheses, designed experiments, collected materials, and prepared flight articles under the guidance of their teachers. After the flight, the students will compare flight samples with ground controls to determine the effects of microgravity, radiation, magnetism, and other possible phenomena experienced in the low Earth orbit environment of the Shuttle mission.

The student experiments are housed in a standard 5-cubic-foot getaway special canister that is attached to the sidewall of Atlantis' payload bay. The payload is completely passive and requires no crew action.

Aria-1 Schools and Experiments

Bristol Elementary School

For this experiment, 50 first graders each drew pictures on two pieces Shrinky Dink plastic that are about 5 inches square. This plastic shrinks about 50% when it is exposed to high heat. One set of 50 plastic pieces will be heated in a toaster oven on Earth so the students can see the effects of heat in gravity. After the mission, the students will examine their Shrinky Dinks that flew on Aria-1 to determine if they were exposed to high temperatures. Each student will also get a souvenir—a piece of plastic that has flown on the Space Shuttle.

Marissa Junior/Senior High School

Fourteen Marissa High School students are sending 18 different kinds of garden, flower, and crop seeds into space on Aria-1. They want to find out if the increased ultraviolet radiation and extreme temperature changes found in space will change how the seeds grow and the appearance of the plants. The experimenters will plant the seeds exposed to space alongside control seeds that remained on Earth and observe any differences in the plants.

Glenridge Elementary School

Eight Glenridge students are investigating the reactions of everyday objects to the unique environment of space. They are studying the chewability of Bubblacious Bubble Gum, the spin patterns and the rate of germination of maple seeds, the ability of mold on bread to survive in space, the effects on dry cement mix and its hardening rate, and the ability of active dry yeast to rise.

Ladue Junior High School

Twelve students have devised experiments whose results may have practical applications in space travel. One experiment will gauge the effect of space on the cleaning power of moist towelettes. Another will study whether space causes toothpaste to become hard and lose its flavor and color. One group of students would like to find out whether microgravity, air pressure, and temperature changes will cause sticky tack to lose its stickiness. In a related experiment, a student will test his hypothesis that glue exposed to microgravity will become thinner and less sticky. An experiment labeled rubberball physics by its developers will try to determine whether space has any lasting effects on a rubber ball. Finally, a student is sending a floppy disk into space to see if the data encoded on it will be affected by zero gravity.

Hazelwood West High School

Hazelwood West High School students have several experiments on Aria-1. One will examine the effects of space flight on the ability of copper and superglue to withstand changes in gravity, temperature, and radiation. Bacteria spores will be studied to determine whether space exposure alters microorganisms. Finally, the experimenters will investigate crystal growth in frozen red beet cells. They want to know if changing the concentration of salt in a solution containing these cells will affect the growth of crystals and cell damage.

Mary Institute Country Day School

The MICDS Middle School Science Club is sending brine shrimp, dry yeast, and two floppy disks into space to determine how the microgravity, temperature extremes, and various atmospheric pressures of space affect them. If the organisms withstand these conditions and "reanimate" when they return to Earth, it may suggest that simple life forms might exist elsewhere in the universe. If the disks retain their ability to read and write data, it may mean that personal computers could be used on the International Space Station and Shuttle missions, which would help make space exploration more economical.

Center for Creative Learning

Fourth and fifth graders designed 13 experiments to answer questions about how different types of materials and organisms react to exposure to space because they realize the importance of these answers as humans move into space to live and build. Their experiments include studying human blood for mutations, observing changes in the growth patterns of bulbs, examining carrot slices infected with agrobacterium tumefacians for any changes in their nuclei, and studying material reactive to airborne particles for changes.

Sacred Heart Elementary School of Florissant

Students from Sacred Heart School will study the effects of space on the decomposition of various items, specifically the rate of decomposition. Samples of seeds, toothpaste, moldy bread, rotting hamburger, hair, soil, water from the Meramec River, and brine shrimp will be sent into space in sealed vials. After the mission, the students will compare the amount of decomposition of the samples exposed to space with that of control samples that remained on Earth. The results of this experiment could lead to a better system of waste reduction than traditional landfills and ultimately promote better stewardship of our environment.

More information on Aria-1, including a list of participating schools and experiment descriptions, is available at http://www.aria.cec.wustl.edu/Aria1.

History/Background

STS-106 is the 36th Shuttle mission to participate in NASA's Getaway Special program. The GAS program was designed as an inexpensive way for educational, international, commercial, and U.S. government users to place a payload on the Space Shuttle. Since the program began, 157 payloads have been flown.

Each payload must meet specific safety criteria and be screened for its propriety as well as its educational, scientific, and technical objectives. These guidelines preclude commemorative items that are intended for sale as objects that have flown in space.

The Goddard Space Flight Center's Wallops Flight Facility, Wallops Island, Va., manages the program. More information on the Getaway Special program can be found at http://www.wff.nasa.gov/~sspp/gas/gas.html.



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