# The History of the Animal Care Program at NASA Johnson Space Center





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# The Animal Care Program

- Johnson Space Center is committed to the ethical and humane care and use of animals and each person must share responsibility in meeting that commitment.
- Our role in the care and use of animals carries the responsibility to effectively meet the needs of the animals in our charge while actively seeking and employing methods that embody respect for the life of animals.

*- JSC Animal Care & Use Handbook, JSC29259*

STS-3
Insect Flight Motion Study

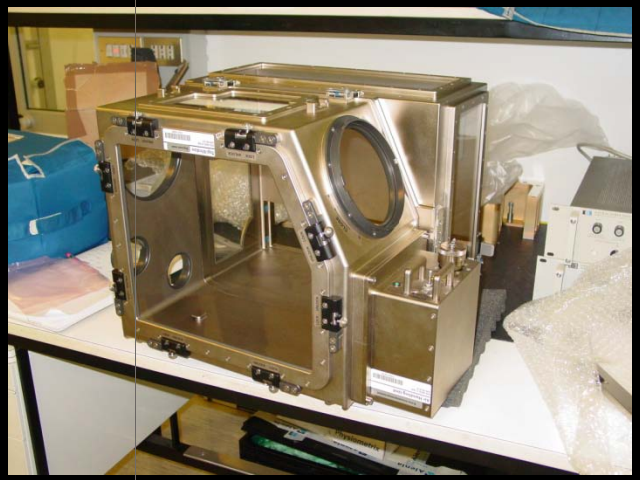
# December 1959

Wallops Island, VA

Rhesus Monkey “SAM”

# MDS – Mice Drawer System

- Study bone loss – long duration
- ACP provided training on animal handling and euthanasia
- 100- 150 days housing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# Actual Animals in Space…

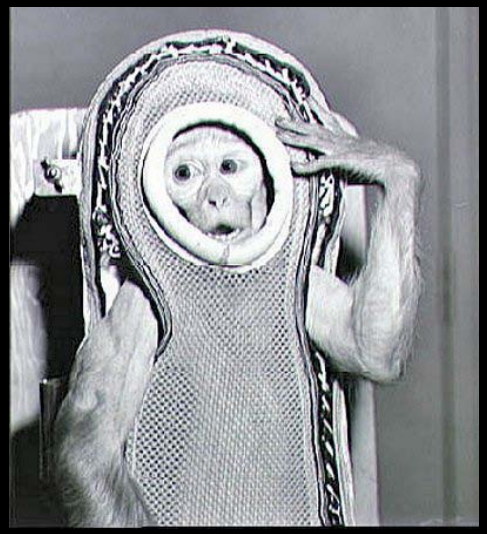
Dog: Laika in Sputnik II

Chimpanzee: Enose
Mercury Atlas 5

Before humans actually went into space, one of the prevailing theories of the perils of space flight was that humans might not be able to survive long periods of weightlessness. American and Russian scientists utilized animals - mainly monkeys, chimps and dogs - in order to test each country's ability to launch a living animal into space and bring it back alive and unharmed.

Scientists want to know how the body reacts to microgravity. Many experiments can be conducted on humans while they work aboard the Space Shuttle or International Space Station (ISS), but many others interfere with daily activities; that's where the animals come into play. And while scientists may not really care how a rat reacts to space conditions, animal data can transfer to human models and help prevent or solve physical issues people face today.

Mercury-Redstone 2
Ham the Chimpanzee



Monkey: Albert I in 1948

Animals go into space to help conduct scientific research only when absolutely necessary. Researchers prefer to research with computer models, or by involving the astronauts directly. For some experiments, however, only animals will work. Sometimes the situations need to be closely controlled-such as a monitored diet. Human astronauts generally aren't willing to agree to eat the same amount and type of food, so this experiment would be a burden to them. Animals, however, always have monitored feedings.

In the earlier days of space exploration, nobody knew if people could survive a trip away from Earth, so using animals was the best way to find out. In 1948, a rhesus macaque monkey named Albert flew inside a V2 rocket. In 1957, Russians sent a dog named Laika into orbit. Both of these flights showed that humans could survive weightlessness and the effects of high gravitational forces. After several more flights, the number of animals sent into space decreased. Most experiments could be conducted in space without involving animals.

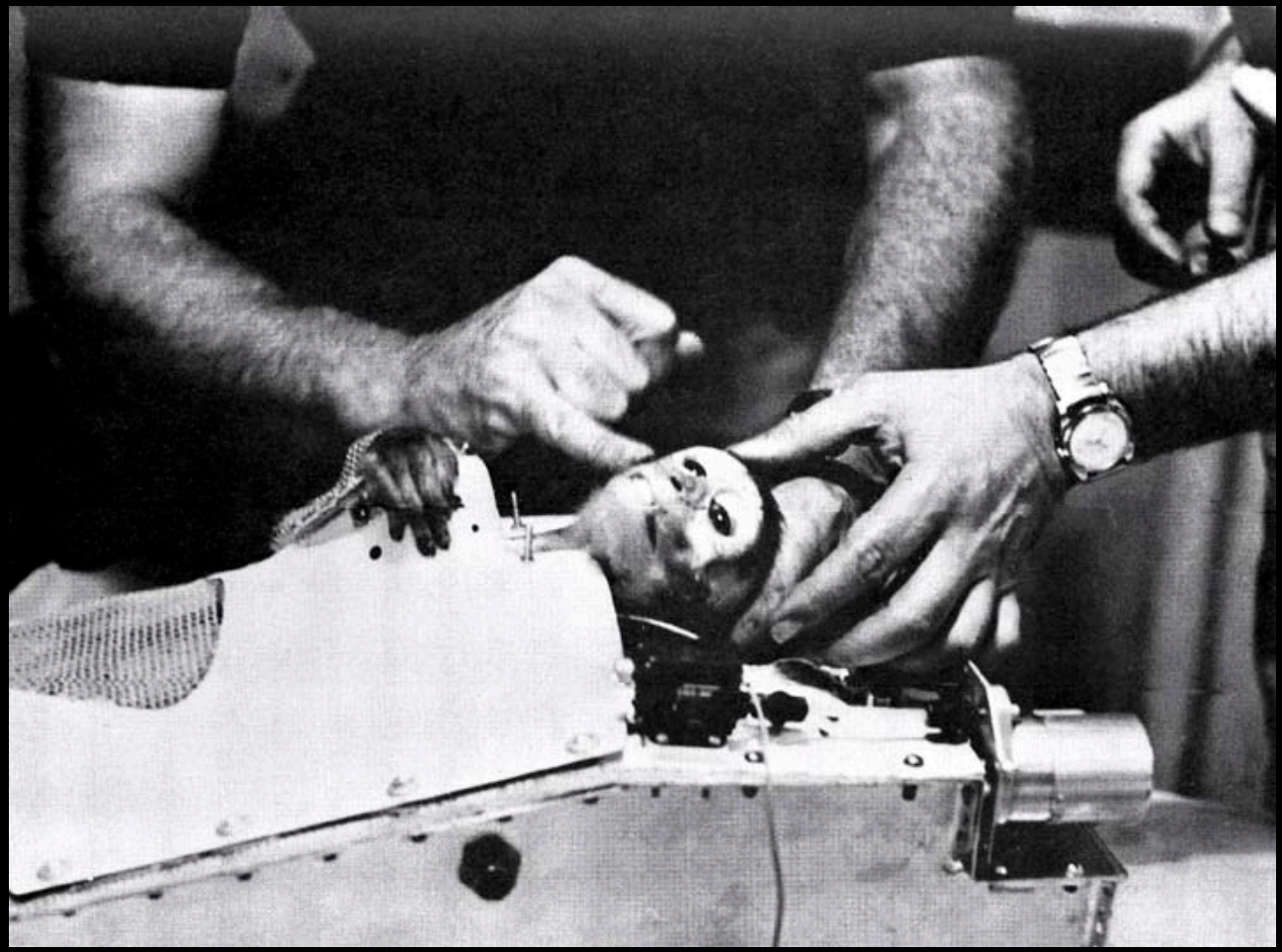
In 1973, however, a Skylab space project studied circadian rhythm. This experiment used several mice. From there, the Space Shuttle program evolved, which included a more suitable environment for animals.

Due to the housing needs and the practicalities of space travel, the lowest form of life is most suitable for space travel. Often, experiment results using snails and fish can be applied to human conditions: inner ear exams can be done in a snail rather than a highly evolved mammal, and genetic studies can be conducted in fish. While there is not a one-to-one transfer, the similarities are enough to gain necessary knowledge.

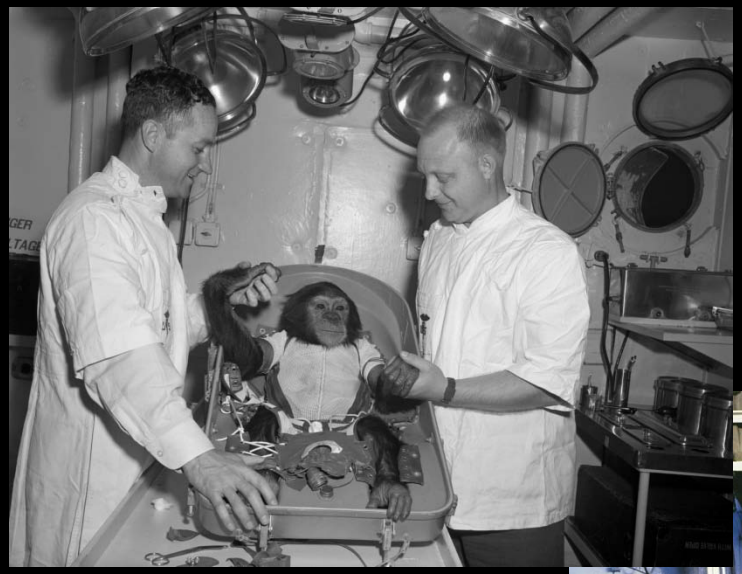
*- NASA.gov Animals in Space*

S73-30856 (29 June 1973) --- John Boyd observes a bag with two “brackish water” minnows known as “Mummichog Minnows” which will be on board Skylab 3 with Astronauts Alan L. Bean, Owen K. Garriott and Jack R. Lousma. The fish were added to the flight at the request of Scientist-Astronaut Dr. Owen K. Garriott, science pilot. Fifty eggs from the minnows will also be included in the bag. The objective of this experiment is to show what disorientation the fish will experience when exposed to weightlessness. Many fish have vestibular apparatus quite similar to man. Even though they live in an environment usually considered to resemble weightlessness, they do perceive a gravity vector. An aquarium of the Minnows, caught of the coast of Beaufort, North Carolina, is in the background.

# Able –Rhesus Monkey



# Ham- Chimpanzee astronaut





Mercury-Redstone 2
Ham the chimp

- January 31, 1961 - Launch Complex 5/6 Kennedy Space Center

# Animals working at NASA

Mercury Atlas 5

- Enos the chimp
- November 29, 1961, Cape Canaveral, FL
- the first chimp to orbit the earth

# Frogs & Tadpoles in Spacelab

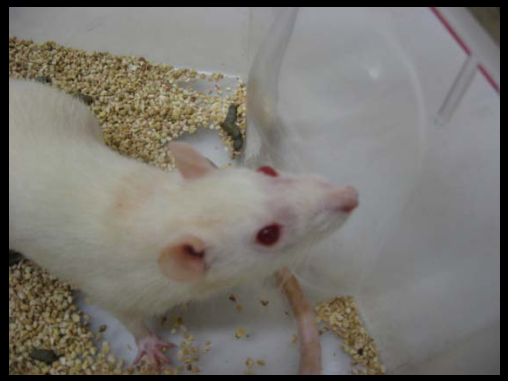
# Frog Environmental Unit


STS107-306-024 (16 January – 1 February 2003) --- Astronaut Michael P. Anderson, STS-107 payload commander, reads a checklist for the Fundamental Rodent Experiments Supporting Health (FRESH-2) Experiment in the SPACEHAB Research Double Module (RDM) aboard the Space Shuttle Columbia. In front of Anderson is the Miniature Satellite Threat Reporting System (MSTRS) (locker FC02), FRESH Animal Enclosure Modules (AEM) and Muffler (lockers FC04 and FC07) and Experiment Data System Management Unit (EDSMU) (locker FC06).

EDITOR'S NOTE: On February 1, 2003, the seven crewmembers were lost with the Space Shuttle Columbia over North Texas. *This picture was on a roll of unprocessed film later recovered by searchers from the debris.*

# ACP Facility Reviews

- AAALAS Accreditation
- Controlled Substance Reviews (2/year)
- IACUAC inspection (every 6 mos)
- Division & safety inspections



# ACP Responsibilities

- Organize and supervise animal care operations & activities (research, testing & demonstration).
- Maintain full accreditation by the International Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC)
- Ensure protocol compliance with IACUC recommendations
- Training astronauts for in-flight animal experiments
- Maintain accurate & timely records for all animal research testing approved by JSC IACUC
- Organize IACUC meetings and assist IACUC members
- Coordinate IACUC review of the Institutional Program for Humane Care and Use of Animals (every 6 mos).

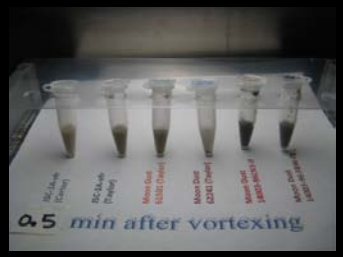

# ACP Responsibilities

- Provide tours and educational outreach to visiting guests within NASA and the general community. This includes working in outdoor environments with large animals, non-domesticated species, endangered species, etc.
- Arrange for animal safety presentations to the public (via schools, community groups, and organizations).
- Build and maintain positive working relationships with co-workers, other agencies, employees and the public using principles of good customer service
- Maintain responsibility for security of all Space Life Sciences controlled substances in centralized location (animal care facility) during emergency evacuation events.
- Encouraging awareness and understanding of emerging animal care issues

# ACP Responsibilities

*Maintain a state of the art inhalation facility to solve the unique life science and space toxicology problems that are distinct to spaceflight , space exploration &NASA ground operations*


- **Dr. Lam's laboratory is housed in the ACF. The 1st ever toxicity study of carbon nanotubes was conducted in our facility.**

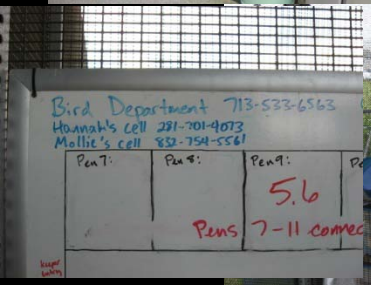



# Oversight

- Overseeing the Animal Care Facility, Longhorn Facility, Attwater Prairie Chicken facility and oversight of animal research conducted at Johnson Space Center including white-tail deer spaying program.
- Making Recommendations to ensure proper animal care, health and safety
- Assisting community partners with animal care programs and outreach.
- Maintaining appropriate oversight relationship in SAA's
- Attending Longhorn Board monthly meeting
- Providing routine oversight visits by attending veterinarian
- Assist with any off-nominal work or media issues

# Oversight


Range Scar

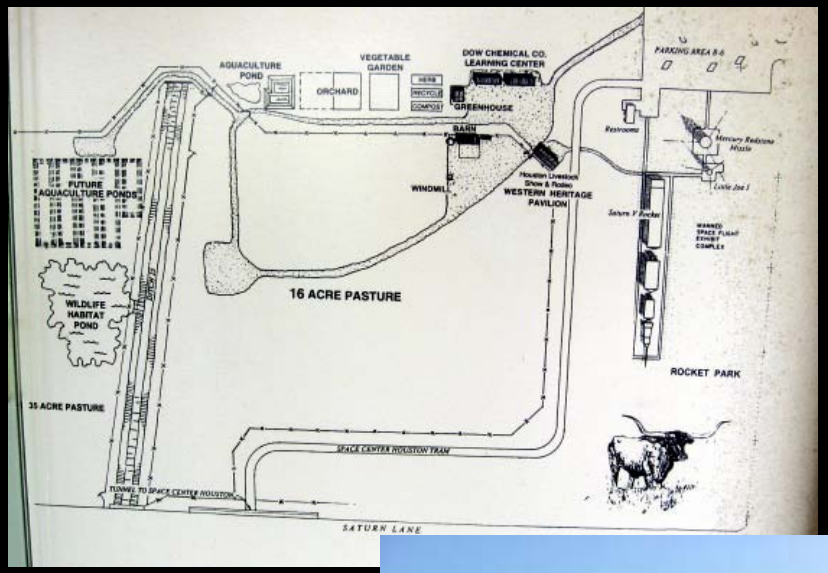

Bird Department 713-533-6563
Hannah's cell 281-701-9673
Mollie's cell 832-754-5561
Pen 7:
Pen 8:
Pen 9:
5.6
Pens 7-11 connec

# Outreach – Tours & Teaching

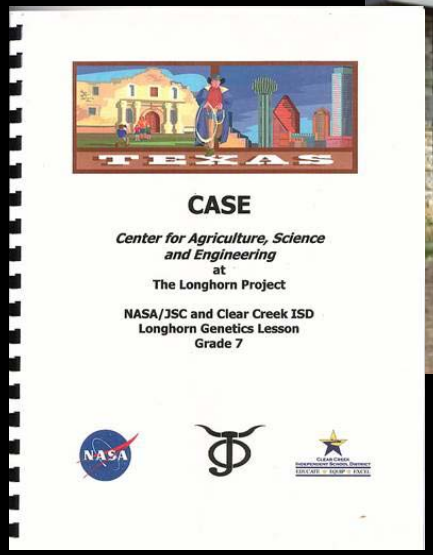


# Center for Agricultural Science & Engineering (CASE) Learning Laboratory - The Longhorn Project

The Longhorn Project, developed jointly by JSC, the Clear Creek Independent School District, the Houston Livestock Show & Rodeo and the Texas Longhorn Breeders Association of America, provides local high school students with a one-of-a-kind learning environment that combines Western heritage with state of the art technology.




- Private breeders loan animals to the program
- CASE – Center for Agriculture Science and Engineering Educational classes with 3rd & 7th grade CCISD students
- Courses offered: (1) ENVIRONMENTAL/ADAPTION (2) APOLLO/SATURN ROCKET PARK (3) BARN/ANIMAL SCIENCE (4) BIOLOGICAL SCIENCE.
- Expansion of course time planned for 2010-11 school year
- This year 7th grade: Sep- Dec ‘10 & Feb-April ‘11
- 3rd grade: May ’11
- 16 acre pasture, learning laboratory (microscopes, water testing), garden (nutrition genetics), Pavilion



# The Longhorn Facility

- New Plans to bring in HS students from other school districts
- Vet Med programs – receive a Veterinary Assistant certification (requires exam)
- Food genetics farm (all genetically engineered seeds/crops) & Aquaculture pond (various species)
- Potential Genetics breeding experiment: Longhorn mom & Angus bull mix
- Longhorn Development Board meets monthly – reps from NASA ACP & center Ops reps, Houston Livestock show, private breeders, CCISD, Texas Longhorn Breeders Gulf Coast Association (TLBGCA)









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# Attwater Prairie Chickens

- Captive breeding programs
- Prairie chicken breeding program, 0.5 acre
- SAA with Houston Zoo
- Houston Zoo collects eggs from JSC Attwater Prairie Chicken enclosure
- Eggs are incubated at Houston Zoo
- Some are tagged and released into wild