

# Space Medicine Branch Report

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## The Life Sciences Program At Ames Research Center

The Life Sciences Directorate at Ames Research Center on Moffett Field, CA, is the major NASA center for conducting research in four major areas: (1) Exobiology, (2) Space-related biomedical research, (3) Life sciences space flight experiments, and (4) Aviation man-vehicle research. The following is a short description of each of these endeavors.

Our exobiology activities include laboratory and extramural research programs to better understand and investigate the origin, distribution, and early evolution of life in the universe, as well as the role of biological processes in the evolution of planets. Programs in this area include exploration of planets and their atmospheres for life or life-associated molecules; extraterrestrial measurements and theoretical studies of chemical precursors important to the origin of life forms; development and implementation of search strategies to discover evidence for extraterrestrial life; and development of truly advanced life support systems. This latter activity includes next generation EVA systems, controlled ecological life support systems, and air, water, and waste management techniques.

Our biomedical research efforts are primarily devoted to a better understanding of people's response to the space environment, so that, in the future, a larger and varied segment of our population can participate in space flights. A multi-year series of experiments is about to be completed wherein people, up to 65 years old, and of both sexes, have been studied in simulated weightlessness to help assess their cardiovascular systems' ability to cope with space flight and reentry stress. Other programs in our biomedical research area attempt to better understand, at both basic and pragmatic levels, the mechanisms underlying "space sickness," changes in bone and muscle metabolism, as well as the mechanisms of change in fluid, electrolyte, and hormonal balances.

Our biosystems group has the responsibility to help assure successful life sciences space flight experiments. They bring together the myriad details from the spacecraft engineers, data people, cost accountants, and biological scientists and integrate their needs to assure a safe flight which returns maximum scientific data. Currently, this group is engaged in the selection, development, and integration of biological experiments to be carried aboard Spacelab. Also, the group is in the final stages of developing hardware and U.S. experiments for delivery to the Soviet Union for launch in 1982 aboard a Cosmos spacecraft. This will make the fourth such cooperative effort be-

tween the United States and the Soviet Union since 1977.

The Ames life sciences research program on man-vehicle interactions is centered in aeronautics. Flight safety is the central theme which runs throughout all activities in this area (the Aviation Safety Reporting System was developed and is managed by this group). Their research into simulation technology dovetails nicely with a relatively new program designed to increase system effectiveness by studying the management of cockpit and system resources. All of this is done with a view to increasing air system safety since nearly 70% of all aircraft accidents can be traced to improper or poor management of information available to the air crew. The research program is not limited to fixed-wing aircraft, but includes programs specifically addressing heli-

copter-unique problems.

The life sciences efforts at Ames are strongly reinforced by strong academic and scholarly ties. For example, last year 180 university grants were supported from Ames; we hosted in our laboratories over 200 visiting researchers and scholars and held scientific seminars with speakers from 45 different universities in 1980 alone. In that same year, our scientists published in 60 different scientific journals. We are proud of our scientific environment and strive to maintain a center of scientific excellence. Future articles in this space will go into more detail of specific programs. If you have questions about life sciences programs at Ames, please do not hesitate to contact me.

**Joseph C. Sharp, Ph.D**  
Deputy Director of Life Sciences  
Ames Research Center.

## President's Message:

Each year, the month of May brings a new surge of Association activities in support of the Annual Scientific Meeting. At the meeting, we are all given the chance to be exposed to new developments in the field of aviation, space, and environmental medicine, to visit with old friends, and to meet new colleagues who have joined our Association.

By now, you have had the opportunity to see our "new" Space Medicine Branch News page in this journal. I hope that this page will encourage both wider readership and wider authorship and serve as a vehicle to communicate new developments in the field of space medicine. I also hope that you will be able to attend, at the forthcoming meeting, the international session on "Space Biology," which is cosponsored by our Branch. In addition, you will have the opportunity to make suggestions on the needs and means to further our activities at the annual luncheon meeting of the Space Medicine Branch.

As the end of the term of my presidency is approaching, I would like to express my gratitude for your support over the preceding year and thank you for the opportunity to serve you. My special thanks are given to Dr. Adrienne Whyte who helped implement this news page and to all its contributors who volunteered their valuable time.

**Arnauld Nicogossian, M.D.**  
President  
Space Medicine Branch

## NASA tests safer foam for seats and walls

NASA-Johnson Space Center, Houston, TX, has developed a polyimide resilient foam which, because of its light weight, fire resistance, and reluctance to "outgas" can provide much more protection in air crashes.

When spongy, the polyimide material can be made into airline seats which not only resist fire but only char and decompose when they finally are ignited at 800°F. When the ingredients are changed slightly, NASA says, the polyimide can be hardened for use in wallboard or floor panels.

All this could lengthen the time allowed passengers to leave a plane crash to 5 minutes. The evacuation time up to now has been 2 minutes.

Four polyimide double seats have been installed in an aircraft at the FAA's Technical Center, Atlantic City, NJ, where they will be subjected to testing.

## New jet lag study begins at Ames

Scientists at NASA-Ames Research Center, Moffett Field, CA, are undertaking a new study of how jet lag affects aircrew performance.

Included will be translating existing scientific knowledge into lay terms for dissemination to the aviation community; making a file study of rest, sleep, dietary, and drug use patterns of commercial airlines crews; and studying sleep and nutrition pattern simulations.