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## 2002-2003 Monthly Seminar Series on Space Research

3<sup>rd</sup> Thursday MAE297

### ***Free Flyers for Biological Research***

***Kenneth A. Souza***

Fundamental Space Biology Program, NASA Ames Research Center

Date: 17 April 2003\_Thursday Time: 3:10-4:00 pm Location: 1065 Engineering II

Refreshments will be provided at 3:00 p.m.

#### **ABSTRACT**

The first significant scientific studies of the biological effects of spaceflight began in the 1960's using automated recoverable satellites called, "biosatellites", part of a broader class of satellites more generically referred to as, "free flyers". Three pioneering biosatellite flights were conducted by NASA in which much was learned scientifically across a broad range of biological species. In addition, lessons were learned on how, and how not to, do research in the unique environment of space. Unfortunately, NASA, after whetting the appetite of the bioscience community, terminated its biosatellite program after the flight of Biosatellite III leaving the biological research community with little access to space. In the early 1970's a joint agreement was signed between NASA and the Institute of Biomedical Problems of the USSR that provided opportunities for US scientists to participate in a series of biosatellites called "Cosmos" or "Bion". The Russian satellites were designed to accommodate a variety of biological payloads, to launch at two year intervals and to fly in low Earth orbit for periods of 2-3 weeks. From 1970-97 US scientists flew over 100 experiments on nine collaborative missions. During this same period, NASA's Space Shuttle came on line leading to additional flight opportunities including research on the developing International Space Station. This presentation will provide some of the free flyer history, and also an overview of what we've learned scientifically as well as some of the engineering challenges and considerations in supporting biological research in space. NASA is currently considering a new free flyer program that will complement the research that can be done on the ISS. A brief description of what this new program may entail and the science it will support will also be presented.

#### **ABOUT THE SPEAKER**

Kenneth A. Souza is the Director for Research and Development and Secretary/Treasurer of the Governing Board of the Girvan Institute of Technology. Before joining the Girvan Institute, Mr. Souza spent 35 years with NASA's Ames Research Center pioneering the field of space biology and medicine. Under his leadership over 400 experiments were flown on a variety of spacecraft including US and Russian biosatellites, the Space Shuttle, Mir, and the ISS. These experiments greatly expanded our understanding of the role and influence of gravity on living systems. As a research scientist he conducted pioneering research in exobiology and developmental space biology. His flight experiment aboard the Space Shuttle in 1992 demonstrated, for the first time, that a vertebrate species, an amphibian, could undergo ovulation, fertilization, and early development in the absence of gravity. He has received both national and international awards for his management and scientific achievements.

***For more information about SpaceED program or the seminars please contact  
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Members of the campus community and visitors from the region are welcome to attend the seminar series. Sign-in is required at the event. SpaceED seminar will replace MAE297 seminar on 3<sup>rd</sup> Thursdays.

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