

Space RAD Health

Newsletter

Vol. 1 No. 3 - December 2001 | Executive Editor: [Dr. Francis Cucinotta](#) | Contributing Editor: [Kay Nute](#)

A Special Issue of *Radiation Research* on the NASA Sponsored Workshop

An International Workshop, *Models for Evaluation of Radiation Risk Factors*, sponsored by the NASA Space Radiation Health Program, was held in Houston during November 12-15, 2000 at the Center for Advanced Space Studies. Selected and peer reviewed research papers from this workshop appeared as a special issue of [Radiation Research, An International Journal \(Vol. 156, No. 5, Part 2\)](#) with Dr. Cucinotta of NASA-JSC and Dr. Nikjoo of Oxford-UK as guest editors. The editors commented, "These papers review models of radiation risk estimation from epidemiological studies, animal studies, and physical and biological understanding. We hope this collection of papers will be another small step toward planning safer space travel." Other members of the scientific committee for this workshop included: Drs. Brenner, Carnes, Chatterjee, Goodhead, Ohtaki, Paretzke, Peterson, and Schimmerling.

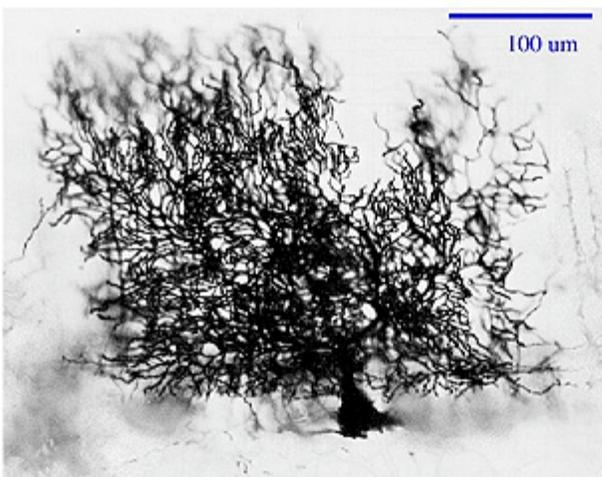
A total of 21 papers published in this special issue of *Radiation Research* are subdivided into four major categories: Initial Response of DNA to Ionizing Radiation (5 papers); Cellular and Molecular Response Models (9 papers); Human Genetic Studies (3 papers); and Risk Assessment Studies (4 papers). [A complete listing of authors and titles of these papers](#) with access to the abstracts is available.

Notes on the roundtable discussion held during the workshop on 'the future of risk assessment', moderated by Dr. Schimmerling of NASA-HQ, are available from an earlier SRHP Newsletter ([Vol-1, No.1](#)).



Neuroscience and Radiation Biology Workshop

Purkinje Cell



Segment of Iron Ion Track in Nuclear Emulsion



12/8/2000

Neuroscience & Radiobiology Workshop G Nelson

reducing the possible health effects from space radiation exposures. Much of the previous work has been devoted to establishing the risk of excess cancer, cataracts, and loss of fertility or transmission of genetic damage. One area of increasing concern is the risk to the central nervous system. Late effects of radiation exposure might lead to early onset of neurodegenerative disorders while acute effects might lead to performance decrements that affect mission outcome and safety."

Loma Linda University and the Space Radiation Health Project of NASA-JSC sponsored a workshop to address the potential injury by charged particles to the central nervous system (CNS). The workshop was held in Houston at the Center for Advanced Space Studies during December 5-6, 2000. [Nearly thirty recent peer reviewed research publications](#) were identified to serve as a basis for this workshop. Dr. Greg Nelson, Director of the NASA-Radiation Biology Program at the Loma Linda University Medical Center, and Dr. Philip Tofilon, Chief of Molecular Radiation Therapeutics Branch at the National Cancer Institute (NCI), organized the workshop and served as the editors for the workshop proceedings.

The [preface](#) to the workshop stated, "Astronauts are unavoidably exposed to ionizing radiation in space. Biological countermeasures are of interest for

Meeting participants were invited from several clinical and basic research backgrounds, and they were asked to

provide discussions on the potential damage to the central nervous system by unique radiation fields in space. [Invited participants](#) included twenty experts with expertise in space radiation track structure, radiation biology, neurological surgery, and neuropsychology. The participants represented NASA and DOE as well as national laboratories, institutions, and universities.

[A complete listing of all the presentations and discussions from this workshop are available.](#) The following questions were discussed at the workshop, and possible research strategies were prioritized:

- [What are the radiation exposure levels \(rate, quality, amount\) that result in CNS injury?](#)
- [What is the cellular/molecular basis for CNS injury after radiation exposure?](#)
- [Is the CNS response to subsequent insults compromised by radiation?](#)

A complete copy of the Neuroscience and Radiation Biology Workshop proceedings on a CD may also be obtained from the co-chair of the workshop, [Dr. Greg Nelson](#).

DOE-NASA Annual Workshop - 2001

A joint workshop of the [Department of Energy Office of Biological and Environmental Research](#) and the [NASA Office of Biological and Physical Research](#) was held in Washington, DC from June 27-29, 2001. The two workshops, DOE's 2nd Low Dose Radiation Research Workshop and NASA's 12th Annual Space Radiation Health Investigator's Workshop, were combined. [The DOE/NASA Workshop was divided into twelve different panel sessions with seven major categories.](#) Each panel consisted of a group of experts who have been supported by NASA and DOE research grants. Panelists presented overviews of research areas and recent results. The workshop's scientific and program committee included Drs. Brooks, Cucinotta, Frazier, Katz, Metting (chair), Schimmerling, and Thomassen. [A complete list of presented papers and abstract are available from SRHP and ORAU.](#)

2001 DOE/NASA Radiation Investigators' Workshop

NASA's Space Radiation Health Investigators Workshop - March 2002

The [13th NASA Annual Space Radiation Health Investigators' Workshop](#) will be held in conjunction with the [2nd International Workshop on Space Radiation Research in Nara, Japan, from March 11-15, 2002](#). The scientific committee includes Drs. Abe (HYUGO, Japan), Amaldi (TERA, Italy), Belli (ISS, Italy), Cucinotta (NASA-JSC, USA), Dicello (Johns Hopkins Univ., USA), Miller (LBNL, USA), Nakamura (Tohoku Univ., Japan), Ohnishi (Nara Med. Univ., Japan), Reitz (DLR, Germany), Schimmerling (NASA-HQ, USA, Chairman), Sekiguchi (NASDA, Japan), Tsujii (NIRS, Japan), and Yano (RIKEN, Japan).

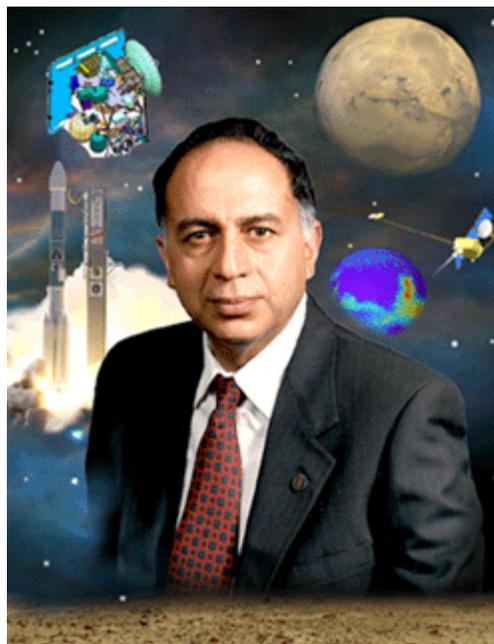
The 2nd International Workshop on Space Radiation Research — Toward a Permanent Human Presence in Space — March 11 (Mon) - 15 (Fri), 2002, Nara, Japan

With
The 13th Annual NASA Space Radiation Health Investigators' Workshop
The 3rd NIRS Int'l Workshop on Dose-Effect Relationship of Particulate Radiation

SRHP Featured Investigator: Dr. Gautam Badhwar (1940 - 2001)

The Space Radiation Health Project deeply regrets the sudden demise of Dr. Gautam Badhwar on August 28, 2001. Dr. Badhwar was a highly acclaimed and world-renowned scientist as well as a true friend of the Space Radiation Health Project. His scientific contribution to the NASA's human space exploration will not only be utilized and implemented during the current ISS era, but it will also be considered and evaluated for safe human exploration of other planets, including Mars. It remains a daunting task to compile his research and scientific contributions representing nearly three decades of dedicated work at NASA-JSC. These memories will be preserved from [numerous research publications](#) and from [several prestigious awards](#) which were bestowed in his honor even after his death. One colleague remarked, "*Gautam is dearly missed by all of us who were lucky to be his friend.*" [A brief description of his scientific work was part of the shared epitaph.](#)

NASA paid special tribute to Dr. Badhwar by recognizing him on the [NASA Human Space Flight Web](#) page during October 2001 for his contributions to the International Space Station and the Mars programs. The citation read, "Dr. Gautam Badhwar was the chief scientist for Space Radiation at the NASA Johnson Space Center in Houston, Texas. He was the principle investigator for several experiments, including most recently the International Space Station Phantom Torso and the [Martian Radiation Environment Experiment](#) or MARIE. Dr. Badhwar died on August 28, 2001, just weeks before MARIE is scheduled to reach its destination aboard the 2001 Mars Odyssey spacecraft." More information on the MARIE instrument appeared in an earlier SRHP Newsletter ([Vol-1, No.-2](#)). "[Organ Dose Measurements Using Phantom Torso](#)" is part of the current, on-going research work of Dr. Badhwar that is supported by the Space Radiation Health Project.



This collage of Dr. Badhwar includes the launch of the Delta rocket that carried the Odyssey spacecraft which is currently orbiting Mars with the MARIE radiation instrument, a photograph of Mars, and a close-up view of the Martian soil. This collage exemplifies his dream of future human exploration to the red planet. This picture is dedicated to his memory and to that dream.

NASA Announces New Radiation Research Opportunities

As part of the [Office of Biological and Physical Research \(Code U\)](#) of NASA's Biological and Physical Research Enterprise, NASA is soliciting proposals for '[Multiple Opportunities for Ground-Based Research in Space Life Sciences](#)' and '[Fundamental Space Biology - Ground Based Research](#).' These research opportunities include the use of NASA's radiation accelerator facilities managed by SRHP. The deadline for these solicitations is January 31, 2002.