



# NSBRI Explorer

National Space Biomedical Research Institute • August 2007

## NSBRI Science on Devon Island

NSBRI participated in the Houghton Mars Project (HMP) this summer. HMP is an international interdisciplinary field research project centered on the scientific study of the Houghton Crater impact area and surrounding terrain on Devon Island in the high Arctic of northern Canada. The polar desert provides an excellent analog to an exploration mission base with its isolation, dust, rocky terrain and lack of vegetation. The base camp is located on the edge of the Houghton Crater much as one would imagine a lunar or Mars habitat.

Participants included Jeffrey P. Sutton, M.D., Ph.D., NSBRI Director, Marcelo Vazquez, M.D., Ph.D., NSBRI Space Radiation Liaison, Vincent Pisacane, Ph.D., of the Technology Development Team (U.S. Naval Academy), and Astronaut Leroy Chiao, Ph.D., NSBRI User Panel Chair.

NSBRI participated in a radiation survey, to quantify the exposure levels from natural radiation sources, and in medical simulations. There was also a 10 km walkback activity, wherein physiologic and metabolic parameters were monitored, biosensors were tested, and biometrics and ergonomics were evaluated during simulated geologic tasks. There were also educational activities related to HMP research and Challenger Learning Centers. ♦

## NASA/NSBRI Joint Research Announcement

On August 10, NASA and NSBRI released a joint research solicitation, NNJ07ZSA002N, entitled Research and Technology Development to Support Crew Health and Performance in Space Exploration Missions. The announcement solicits ground-based, bed-rest definition and flight definition proposals for the Human Research Program and NSBRI.

Proposals are being solicited through a two-step process. Only Step-1 proposers determined to be relevant with respect to the solicited research will be invited to submit full Step-2 proposals. Step-1 proposals are due September 14. The full announcement is available on the [NSPIRES website](#). ♦

## Aoki Wins Young Investigator Award

Hirofumi Aoki, Ph.D., NSBRI Postdoctoral Fellow on the Sensorimotor Adaptation Team (Massachusetts Institute of Technology), received the Jeff Myers Young Investigators Award from the Space Medicine Association of the Aerospace Medical Association (AsMA). The competition is for investigators making their first major effort into aerospace medicine research. To win, the project's findings must have potential applicability to space medicine.

Selected from a group of seven finalists chosen from a field of 177 contestants, Aoki's paper was entitled "Virtual Reality Based 3D Navigation Training for Emergency Egress of a Spacecraft" (*Aviat Space Environ Med.* 2007 Aug;78(8):774–83). He wrote all of the software programs for the training program and plans to test the system on a future flight.

Contestants must be making their first presentation of a scientific paper or poster at an AsMA meeting, must appear as first author, and must submit a manuscript for judging. Finalists are interviewed, and their presentations undergo further evaluation. ♦

## Ansari's Global Education Initiative Includes NSBRI Participants

On August 1-2, Anousheh Ansari hosted a unique and innovative team of individuals and organizations to collaborate on enhancing the state of global education. The Mind over Matter Global Education Initiative's mission is to effectively bring about positive change in the way our youth are educated, encourage imagination, and increase their interest in science and a variety of technical topics.

NSBRI participants included Jeanne L. Becker, Ph.D., NSBRI Associate Director, Sonia Rahmati Clayton, Ph.D., NSBRI Postdoctoral Fellowship Coordinator (Baylor College of Medicine), Scott Dulchavsky, M.D., Ph.D., of the Smart Medical Systems Team (Henry Ford Health System), and Astronaut Leroy Chiao, Ph.D., User Panel Chair.

During the meeting, participants introduced projects they are involved with or programs they believe are effective. Through collaborative and web-based efforts, the Initiative hopes to share valuable ideas and projects with a global community. Next steps include development of goal-driven focus groups and an online education resource database. ♦

## MSM/NSBRI Programs Reach Middle School to College Students

Six college students participated in the Morehouse School of Medicine (MSM)/NSBRI Summer Research Program. Students spend a research-intensive summer doing biomedical science working with MSM and NSBRI scientists. One student worked in Harvard Medical School's Sleep, Circadian and Respiratory Neurobiology Program directed by Charles A. Czeisler, Ph.D., M.D., Human Performance Factors, Sleep and Chronobiology Team Leader.

Marlene Y. MacLeish, Ed.D., K-16 Education Team Leader, leads the summer program which encourages women and minority-group students to pursue careers in science. Participants complete the experience with a poster presentation. Since 1997, 27 students have participated.

MSM and NSBRI also sponsored a field trip to Kennedy Space Center for 40 students from the Ronald E. McNair School, a NASA Explorer School in DeKalb County, Georgia. The students are part of the MSM/NSBRI after school education program, *Mars on the Horizon*. ♦

## International Space Medicine Summit

The International Space Medicine Summit was held, May 4-6, in Houston. The event brought together leading physicians and space biomedical scientists from the space-faring nations for high-level discussions of the medical and biomedical challenges astronauts and cosmonauts experience in long-duration flights. The Summit was designed to foster increased communication, cooperation and collaboration among the world's top physicians and scientists in the space life sciences. Webcasts of the Summit are available on the [Rice University Information Technology Site](#). ♦

## Recent Publications

Dean DA II, Fletcher A, Hursh SR, Klerman EB. Developing mathematical models of neurobehavioral performance for the "real world." *J Biol Rhythms*. 2007 Jun;22(3):246-58. (Human Performance Factors, Sleep and Chronobiology Team) ♦

Dorfman TA, Levine BD, Tillery T, Peshock RM, Hastings JL, Schneider SM, Macias BR, Biolo G, Hargens AR. Cardiac atrophy in women following bed rest. *J Appl Physiol*. 2007 Jul;103(1):8-16. (Cardio-vascular Alterations Team) ♦

Fischer U, McDonnell L, Orasanu J. Linguistic correlates of team performance: Toward a tool for monitoring team functioning during space missions. *Aviat Space Environ Med*. 2007 May;78(5 Suppl):B86-95. (Neurobehavioral and Psychosocial Factors Team) ♦

Heinemeier KM, Olesen JL, Haddad F, Langberg H, Kjaer M, Baldwin KM, Schjerling P. Expression of collagen and related growth factors in rat tendon and skeletal muscle in response to specific contraction types. *J Physiol*. 2007 Aug 1;582(Pt 3):1303-16. (Muscle Alterations and Atrophy Team) ♦

Soller BR, Hagan RD, Shear M, Walz JM, Landry M, Anunciacion D, Orquiola A, Heard SO. Comparison of intramuscular and venous blood pH, PCO<sub>2</sub> and PO<sub>2</sub> during rhythmic handgrip exercise. *Physiol Meas*. 2007 Jun;28(6):639-49. (Smart Medical Systems Team) ♦

Uchakin PN, Stowe RP, Paddon-Jones D, Tobin BW, Ferrando AA, Wolfe RR. Cytokine secretion and latent herpes virus reactivation with 28 days of horizontal hypokinesia. *Aviat Space Environ Med*. 2007 Jun;78(6):608-12. (Nutrition, Physical Fitness and Rehabilitation Team) ♦

Wood SJ, Reschke MF, Sarmiento LA, Clément G. Tilt and translation motion perception during off-vertical axis rotation. *Exp Brain Res*. 2007 Jun 13; Epub. (Sensorimotor Adaptation Team) ♦

## Accolades

**David F. Dinges, Ph.D.**, Neurobehavioral and Psychosocial Factors Team Leader (University of Pennsylvania School of Medicine), was awarded the NASA Distinguished Public Service Medal for outstanding contributions to improving the health, safety, and performance of human spaceflight in the behavioral health and performance area. The medal is the highest honor NASA awards to a non-government individual. ♦

## Calendar Update

**NASA/NSBRI Step-1 Proposals Due**  
September 14 ♦

**NSBRI Board of Directors Meeting**  
September 20, Houston ♦