

May 2009

## Welcome to DSLS!

Over the past few weeks, several new scientists joined the DSLS ranks.

Welcome, everyone!

In early April, **Dr. Hatem Nounu** joined the



*Hatem N. Nounu, PhD*

team. Dr. Nounu received his B.S. and M.E. in electrical engineering from the University of Houston, TX in 1993 and 1995, respectively. He worked for PDF Solutions, San Jose, CA, as a consulting engineer for the semiconductor industry before earning his Ph.D. in electrical engineering from the University of Houston in 2005. Between 2005 and 2007, he worked as a senior research scientist at the Electrical Engineering Department of the University of Houston on the development of research programs in nanofabrication technology, focusing on the fabrication of nanoscale atom beam lithography masks and the development of radiation-resistant coatings. In 2007, he moved to the Space Radiation Project at NASA JSC to work on the 3-D modeling of spacecrafts for radiation shielding quantification. He now serves as a Senior Scientist for the Space Radiation Program Element, where he will continue his research in radiation analysis software development.

**Dr. Thomas Albrecht** joined DSLS in late April as a Senior Scientist. He received his doctoral degree from the Pennsylvania State University College of Medicine in Microbiology and Biochemistry. He was a Research Fellow in the Department of Tropical Public Health of Harvard University under the guidance of Dr. Thomas H. Weller. At Harvard he studied the interactions of human herpes virus with cultured cells of the central nervous system. Dr. Albrecht then joined the University of Texas Medical Branch in



*Thomas B. Albrecht, PhD*

Galveston where he serves as a Professor in the Department of Microbiology and Immunology and as the Director, Infectious Disease and Toxicology Optical Imaging Core.

**Dr. Frank M. Sulzman**, who joined DSLS in late April, received a B.S. in Biology from Iona College in New Rochelle, NY in 1967 and a Ph.D. in Molecular and Cell Biology from the State University of New York at Stony Brook in 1972 where he was an NIH pre-doctoral fellow. He was an NIH post-doctoral fellow in the Biological Laboratories at Harvard University from 1972 to 1974, and a National Academy of Sciences Exchange Scientist at Moscow State University from 1974 to 1975.

From 1975 to 1979 he was a Physiology Instructor in the Department of Physiology at Harvard Medical School. In 1979 he joined the Department of Biological Sciences of the State University of



*Frank M. Sulzman, PhD*

New York at Binghamton as an Assistant Professor, as an Associate Professor in 1982, and as Director of the graduate program in 1983. His research during this time involved basic and applied studies on circadian rhythms, and various aspects of space physiology.

Dr. Sulzman joined NASA Headquarters in 1985 as Manager of the Biomedical Research Program and was appointed to the Senior Executive Service in 1987. He served in a number of leadership positions at NASA Headquarters before retiring from NASA in 2000. Subsequently, from 2003 to 2009, he served in the NASA Space Radiation Program at the Department of Energy's Brookhaven National Laboratory, overseeing operations of the NASA Space Radiation Laboratory. Dr. Sulzman is currently a USRA Senior Fellow and the NASA Space Radiation Project Executive. Dr. Sulzman married Patricia Hojnacki Sulzman in 1969 and they reside in Islip, NY.

*(Continued on page 2—Welcome)*

UNIVERSITIES SPACE RESEARCH ASSOCIATION

# DSL S Newsletter



# Professional Development Seminar



## “The Complete Guide to Poised and Powerful Public Speaking”

Presented by Skillpath On-Site Training

Learn how to:

- ◆ Organize your thoughts into a flawless presentation;
- ◆ Build a relationship with your audience;
- ◆ Develop your own speaking style; and
- ◆ Use the latest presentation technologies to create strong visual statements.

May 20, 2009  
USRA Lecture Hall

8:15—9:00 Registration

9:00—4:00 Seminar

(Includes approx. 1 hour for lunch.)

As an option, a Jason's Deli box lunch & soft drink may be ordered at registration time for \$10/person).

USRA—Division of Space Life Sciences  
3600 Bay Area Boulevard (at Middlebrook)  
Houston, TX 77058

To enroll, send email to Dagmar Morgan  
[Morgan@dsls.usra.edu](mailto:Morgan@dsls.usra.edu).



## Research Grant Proposals Submitted

Byerly D, Arndt D, Kulkarni A, **Sognier M**, submitted “Seal and heal: Emergency wound treatment for exploration missions,” to NASA for a Focused Investment Group (FIG) grant.

Byerly D, Arndt D, **Sognier M**, submitted “Microwave treatment for bacterial and fungal infections,” to NASA for a Focused Investment Group (FIG) grant.

**Ploutz-Snyder L**, Trappe S, Spiering B, **Ploutz-Snyder R**, Guilleams M, Martin D, Garcia Y, submitted “Integrated Resistance and Aerobic Training Study (iRATS)” to NASA for non-advocate review.

Carpenter D, Bloomberg JJ, Frassetto L, Hawkins RA, Lang TF, **Mulavara AP**, Mulligan K, Streeper T, submitted

“A novel exercise device for improving mobility, balance, and muscle composition in the elderly,” to the University of California San Francisco Clinical and Translational Science Institute for a Translational Technology Development Award.

Smith SM, **Zwart SR**, Kala G, submitted Mission Operation Request (MOR) “Evaluation of oxidative damage during CAMRAS/CCSIT testing,” to the NASA Flight Analogs Project.

Smith SM, **Zwart SR**, Perchonok M, Kloeris V, Lupton J, Heer M, submitted Mission Operation Request (MOR) “Multinutrient nutrition countermeasure (using NEEMO 14 as a model),” to the NASA Flight Analogs Project.

## Welcome *(cont. from page 1)*

DSLS also welcomed back an already familiar face: **Lealem Mulugeta**. Lealem holds a M.Sc. in Space Studies from the International Space University (ISU), and a B.Sc. in Mechanical Engineering (Aerospace Option) from the University of Manitoba.



*Lealem Mulugeta, M.Sc.*

While attending ISU, Lealem focused his academic work in EVA research, and completed an internship with USRA DSLS and the NASA EVA Physiology, Systems and Performance group. He currently supports the documentation of the Quantitative Human Physiology (QHP) model, which is the backbone for the NASA Digital Astronaut Project.

## Awards and Honors

**Megumi Hada** and **Sara Zwart** received the JSC Group Achievement Award for contributions to the 2007 JSC Biennial Research and Technology Development Report. The full report can be found at



[http://ston.jsc.nasa.gov/collections/TRS/\\_techrep/TM-2007-214769.pdf](http://ston.jsc.nasa.gov/collections/TRS/_techrep/TM-2007-214769.pdf).

At the Society of Toxicology's 48th Annual Meeting in Baltimore, **Chunli Quan** was elected postdoctoral representative for the Inhalation and Respiratory Special Section. As such, she performed duties at the Postdoc Assembly and the Student/Postdoc Mixer.



*Jeff Ryder, PhD*

**Jeff Ryder** was appointed Adjunct Assistant Professor in the Department of Internal Medicine/Division of Endocrinology at the University of Texas Medical Branch.

## Research Grants Awarded!

In a press release dated April 20, 2009, NASA announced that HRP and NSBRI will fund a dozen proposals to help investigate questions about astronaut health and performance on future space exploration missions. The selected proposals, representing 11 institutions in eight states, will receive a total of almost \$16 million during a three to four-year period.

**DSLS is proud to announce that of those 12 meritorious winners, two are USRA employees!**

**Scott Wood** was awarded an HRP grant for “Effect of Sensorimotor Adaptation Following Long-Duration Spaceflight on Perception and Control of Vehicular Motion.”



*Scott Wood, PhD*



**Ajitkumar Mulavara** will receive funding from NSBRI to research the “Development of Countermeasures to Aid Functional Egress from the Crew Exploration Vehicle Following Long-Duration Spaceflight.”

*Ajitkumar Mulavara, PhD*

The complete press release can be found at [http://www.nasa.gov/home/hqnews/2009/apr/HQ\\_09-086\\_NSBRI\\_Health\\_Studies.html](http://www.nasa.gov/home/hqnews/2009/apr/HQ_09-086_NSBRI_Health_Studies.html).

In addition, the following grants were awarded recently:

**Sognier M**, Texas Regional Collaborative, Texas Education Agency, Supplemental Grant Award of \$40,000 to assist teachers in Galveston County devastated by Hurricane Ike.

**Sognier M**, Galveston County Regional Collaborative K-12 Teacher Professional Development, awarded \$111,000 by the Texas Education Agency.

Holly JE, **Wood SJ**. Human spatial disorientation and misperception of self-motion in three dimensions, awarded by the NIH, R15 Academic Research Enhancement Award, to Colby College, Maine, for funding July 2009 through June 2012.

Serrador JM, **Wood SJ**. Role of cerebral blood flow in nausea and motion sickness, awarded by the NIH, R21, to Beth Israel Deaconess Medical Center, July 2009 through June 2011.

## New Publications by DSLS Scientists



Franklin RM, **Ploutz-Snyder LL**, Kanaley JA. 2009. Longitudinal changes in abdominal fat distribution with menopause. *Metabolism Clinical and Experimental* 2009; 58:3 311-315.

Reitz G, Berger T, Bilski P, Facius R, Hajek M, Petrov V, Puchalska M, **Zhou D**, Bossler J, Akatov Y, Shurshakov V, Olko P, Ptaszkiwicz M, Bergmann R, Fugger M, Vana N, Beaujean R, Burmeister S, Bartlett D, Hager L, Pálfalvi J, Szabó J, O’Sullivan D, Kitamura H, Uchihori Y, Yasuda N, Nagamasu A, Tawara H, Benton E, **Gaza R**, McKeever S, Sawakuchi G, Yukihara E, Cucinotta F, Semones E, Zapp N, Miller J, Dettmann J. 2009. Astronaut’s organ doses inferred from measurements in a human phantom outside the International Space Station 2009; *Radiation Research* 171(2):225-235.

Roller CA, Cohen HS, Bloomberg JJ, **Mulavara AP**. 2009. Improvement of

obstacle avoidance on a compliant surface during transfer to a novel visual task after variable practice under unusual visual conditions. *Perceptual and Motor Skills* 2009;108:173-190.

Smith SM, Gardner KK, Locke J, **Zwart SR**. 2009. Vitamin D supplementation during Antarctic winter. *Am J Clin Nutr* 2009;89:1-7.

Hu S, **Kim M-HY**, McClellan GE, Cucinotta FA. 2009. Modeling the acute health effects of astronauts from exposure to large solar particle events. *Health Physics Journal* 2009; 96(4), 465-476, April 2009.

**Kim M-HY**, George KA, Cucinotta FA. 2009. Chapter 2.5 Radiation. Chapter 2.51 Ionizing Radiation. In: Musgrave G, Larsen A, Sgobba T (eds.), *Safety Design for Space Systems*. ISBN-13: 978-0-7506-8560-1. Elsevier: Butterworth Heinemann, March 2009.

Xie H, Holmes AL, Young JL, Qin Q, Joyce K, Pelsue SC, Peng C, Wise SS, Jeevarajan AS, **Wallace WT**, Hammond D, Wise Sr. JP. 2009. Zinc chromate induces chromosome instability and DNA double strand breaks in human lung cells. *Toxicol Appl Pharm* 2009; 234(3), 293-299.

**Zhou D**, O’Sullivan D, Semones E, **Gaza R**, **Roed Y**, Zapp N. 2009. Radiation measured during ISS-Expedition 13 with different dosimeters. *Advances in Space Research* 43 (2009), 1212-1219.

**Zwart SR**, Wolf M, Rogers A, Rodgers S, Gillman PL, Hitchcox K, Ericson KL, Smith SM. 2009. Stability of analytes related to clinical chemistry and bone metabolism in blood specimens after delayed processing. *Clin Biochem* 2009; online February 26, 2009.

## DSLS Scientific Presentations at the HRP Workshop



Bloomberg JJ, Feeback DL, Feiveson AH, Lee SMC, **Mulavara AP**, Peters BT, Platts SH, Reschke MF, **Ryder J**, Spiering BA, Stenger MB, **Wood S**, Lawrence E, Arzeno N. Physiological factors contributing to postflight changes in functional performance.

Bloomberg JJ, **Mulavara AP**, Peters BT, Brady R, Audas C, Ruttley TM, Cohen HS. Enhancing functional performance using sensorimotor adaptability training programs.

**Cromwell RL, Buccello-Stout RR, Yarbough PO**. Use of NASA platforms and facilities: NEEMO, Haughton-Mars, Antarctica and Flight Analogs Research Unit.

Baker KS, Amin S, **Sibonga J**. Monitoring bone health after spaceflight: Data mining to support an epidemiological analysis of age-related bone loss in astronauts.

**Cromwell RL**, Summers R, Cavanagh P, **Yarbough PO, Buccello-Stout RR**. Lunar Analog Development.

Young LR, Duda K, Oman CM, **Wood S**, Estrada A, Clark T, Stimpson A, Mateus J. Two spatial disorientation projects: artificial gravity and lunar landing.

**Hada M**, Wu H, Cucinotta FA. mBAND study of radiation-induced chromosome aberrations in human epithelial cells: Radiation quality and dose rate effects.

**Kim M-HY, Hu S, Nounu HN**, Cucinotta FA. Probabilistic Risk Assessment for Organ Doses and Acute Health Effects for Astronauts on Lunar Missions.

**Plutz-Snyder L**. Exercise Prescriptions for Evaluation on ISS.

Serrador JM, Black FO, Schlegel TT, Lipsitz LA, **Wood SJ**. Vestibular loss is associated with greater cerebral hypoperfusion when upright.

**Wood SJ**, Harm DL, Reschke MF, Rupert AH, Clément GR. Sensorimotor adaptation following exposure to ambiguous inertial motion cues.

**Shea C**, Slack KJ, Leveton LB, Palinkas LA, Keeton, K. Antarctica meta-analysis – psychosocial factors related to long duration isolation and confinement.

Smith SM, Locke JP, **Zwart SR**. Vitamin D: Spaceflight, Antarctic, and JSC.

Smith SM, **Zwart SR**, Heer M, Ericson K, Coburn SP, Booth SA, Jones JA, Lupton J. Nutritional Status Assessment on ISS.

**Wallace WT**, Jeevarajan AS. Lunar Dust and Lunar Simulant Activation, Monitoring, Solution, and Cellular Toxicity Properties.

**Wood SJ**, Clarke AH, Harm DL, Rupert AH, Clément GR. Ambiguous tilt and translation motion cues after space flight and otolith assessment during post-flight re-adaptation.

**Zwart SR**, Perchonok M, Braby LA, Kloeris VA, Smith SM. Assessment of Nutrient Stability in Space Foods.

## Education and Public Outreach

**Billy Wallace** acted as Science Fair mentor for John and Jerome Jeevarajan and mentored intern Rasheen Imtiaz.

**Jason Boyd** reviewed manuscripts for the Journal of Clinical Pharmacology.

**Roni Cromwell** led a tour of the Flight Analogs Research Unit, UTMB Galveston, for NASA HRP Workshop attendees; for Dr. Adrian LeBlanc and USRA President Dr. Fred Tarantino; and for Dr. John Charles and HRP Program Scientists. She was also interviewed by a Houston Chronicle reporter at the Flight Analogs Research Unit.

**Ajitkumar Mulavara** reviewed a manuscript for Aviation Space and Environmental Medicine.

**Megumi Hada** translated a DSLS brochure into Japanese.

**Susi Zanello** participated in the Houston Hispanic Forum as a NASA Education Outreach volunteer in the NASA panel. She also judged the Clear Creek Intermediate School Science Fair.

**Patrice Yarbough** contributed an 8' x 10' display on Herman Barnett, MD, former Tuskegee Airman and 1953 graduate of UTMB School of Medicine, for the Texas Aviation Hall of Fame Gala in February. The display will remain on view at the Lone Star Flight Museum in Galveston, TX, through May 2009. She also met with the Assistance Superintendent of the Galveston Independent School District to propose a collaboration with NASA JSC to expose students to careers in science and healthcare, and a science teacher professional develop-

ment opportunity through participation in JSC bed rest studies.

**Johnny Conkin** is mentoring a team of MIT students with their term project on decompression models used by NASA for EVA. He further helped Natalee Lloyd develop a series of questions for high school AP Biology students.

*(Continued on page 6—EPO)*





## SPOTLIGHT ON: Myung-Hee Kim, PhD!

*Myung-Hee Kim, PhD, a Senior Scientist in the Space Radiation Laboratory, was recently interviewed for the Spotlight Article.*

Dr. Kim received her Ph.D. in Applied Science from the College of William and Mary in Virginia in 1995, and was awarded a National Research Council Research Fellowship as a postdoctoral fellow at NASA Langley Research Center in Hampton, VA, for three years. Prior to joining USRA, she was a Senior Scientist at Wyle and a Research Associate at NASA Langley Research Center and in the Department of Chemistry at the College of William and Mary.

Dr. Kim has published more than 60 scientific papers in peer-reviewed journals and book chapters in the field of space radiation research, and contributed more than 90 scientific presentations at national and international scientific meetings. She received the Group Achievement Award to Lunar Architecture Team in 2008 from

NASA Administrator, the Excellence in Science Award in 2004 from Wyle, the Certificate of Appreciation in 2004 from NASA Langley Research Center, and the Special Space Flight Achievement Award in 2003 from NASA Johnson Space Center.

**\* Tell us briefly about yourself and your family.**

My husband, Sung-Chan, is an oceanographer working for the Army Corps of Engineers. He enjoys traveling and learning about the history and culture of local communities. He also loves cooking (while I love tasting his delicious new culinary concoctions). We have a daughter, Jeeyun, who recently graduated from U Penn design school.

**\* What are you presently working on at JSC?**

I am currently working on the theoretical investigation of variable conditions of particle species and energy in space for the simulation of solar particle event (SPE) components using the extensive capabilities at

NASA Space Radiation Laboratory (NSRL). The results will guide in the defining of an optimal set of reference radiation fields for biological experiments for NASA's science discovery, risk projection model validation, and countermeasure testing goals.

**\* What is really important to you regarding your work at JSC?**

As each of us continues to work toward the enhancement of our understanding of science, it is exciting for me to have the opportunity of doing world-class research and application at JSC.

**\* What are your goals for this year?**

My goals for this year are to finish ongoing projects successfully and to prepare for journal papers and future works.

*Thank you for being our Spotlight Scientist for this edition of the DSLS newsletter, Myung!*



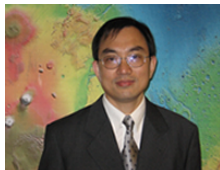
*Myung-Hee Kim, PhD*



## Recent Scientific Presentations

Beaton KH, Holly JE, Clément GR, **Wood SJ**. Effects of frequency and motion paradigm on perception of tilt and translation during periodic linear acceleration. Assoc for Research in Otolaryngology Mid-Winter Meeting, Baltimore, MD.

Radiation Biophysics Group Seminar, **Hu S**, "Computational Study on Full-Length Human Ku70 with Double Stranded DNA: Dynamics, Interactions, and Functional Implications," NASA JSC.



*Shaowen Hu, PhD*

Course lecture, **Boyd J**, UTMB Space Biology graduate students &

Aerospace Medicine residents, "Pharmacotherapeutics in Space," UTMB, Galveston, TX.

Invited talk, **Gaza R**, "Space Radiation Dosimetry Laboratory (SRDL) Day-to-Day Activities," NASA JSC.



*Ramona Gaza, PhD*

Invited talk for HRP management, **Cromwell R**, Neigt J, "Program, Planning Budgeting and Exception for the Flight Analogs Project," NASA JSC.

Radiation Biophysics Group Seminar, **Carra C**, "Merging the Wnt and TGF-b Pathways: An ODEs Approach," NASA JSC.

Radiation Biophysics Group Seminar, **Ponomarev A**, "New Data on chromosomal Aberrations and Modeling," NASA JSC.



*Artem Ponomarev, PhD*

**Ploutz-Snyder L**, "Neuromuscular Alterations and Disuse," University of Houston.



*Jean Sibonga, PhD*

**Sibonga J**, "Risk of Accelerated Osteoporosis in Long-Duration Crewmembers," NASA Headquarters, Washington, D.C.

Radiation Biophysics Group Seminar, **Jackson L**, "Statistical Flow Cytometry Analysis Methods," NASA JSC.

## Recent Scientific Presentations (cont.)

Kozarev K, Schwadron NA, Townsend L, Desai M, Dayeh MA, Cucinotta F, **Kim MY**, Hassler D, Spence H. Earth-Moon-Mars radiation environment module: system overview and model validation, 2009 IEEE Aerospace Conference, Big Sky, Montana.



Chunli Quan, PhD

**Quan C**, Sun Q, Lippmann M, Chen LC, "Comparative Effects of Diesel Exhaust and Ambient Particles on Cardiovascular System," 48th Annual Meeting, Society of Toxicology, Baltimore, MD.

Sun Q, Kherada N, Wang A, Hong X, Zheng L, Deuliis J, **Quan C**, Kampfrath T, Chen L, Rajagopalan S, "Diesel Exhaust Particle Exposure Induces Angiogenesis," 48th Annual Meeting, Society of Toxicology, Baltimore, MD.

**Wallace WT**, Jeevarajan AS. Understanding lunar dust activation and solution properties for future lunar

habitation, Lunar and Planetary Science Conference, The Woodlands, TX.

Radiation Biophysics Group Seminar, **Patel Z**, "A Forward Chemical Genetic Screen Reveals an Inhibitor of the Mre11-Rad50-Nbs1 Complex: Literature Review," NASA JSC.



Zarana Patel, PhD

DSLS Brown Bag Seminar, **Ploutz-Snyder L**, "An Evidence-Based Approach to Exercise Prescriptions on ISS," USRA Houston.

Miller RL, Liu J, Ballaney M, Al-alem U, **Quan C**, Jim X, Perera F, Chen L, "Epigenetic changes in T helper genes affecting IgE production in vivo following combined inhaled diesel exhaust particles and allergen exposure," 48th Annual Meeting, Society of Toxicology, Baltimore, MD.

DSLS Brown Bag Seminar, **Wallace WT**, Understanding the Potential Toxic Properties of Lunar Dust, USRA Houston.

## EPO (cont. from page 4)

**Lori Ploutz-Snyder** reviewed drafts of Andrew Kelleher's Master's thesis and Summer Cook's dissertation for their May and July graduations from Syracuse University, and agreed to serve as Ph.D. dissertation research advisor for University of Houston student Meghan Everett. Lori further mentored NASA intern and Master's student Liz Redd from Baylor University on her internship presentation and project related to anaerobic threshold and space flight. Lastly, she collaborated with NASA educators on the "Train Like an Astronaut" program targeted at upper elementary students.

**Jean Sibonga** reviewed Bonnie Housh's master's thesis project protocol on the influence of probiotics on bone loss and provided recommendations on her bone assessments. She further participated in an NIH Special Emphasis Panel/Scientific Review Group 2009/05 ZRG1 F10-S (20) L in Bethesda, Maryland.

**Scott Wood** mentored Krystin Ramos, USRA College Career Exploration Program.

**Sara Zwart** is mentoring Cheryl Hart, UTMB student, for eight weeks, and led Nutrition Lab tours for two University of Florida faculty members. Further, she reviewed a manuscript for Medicine and Science in Sports and Exercise.

**Ramona Gaza** hosted, along with **Yvonne Roed** and **Dazhuang Zhou**, tours of the Space Radiation Dosimetry Laboratory for members of the Space Radiation Project and for members of the Space Radiation Analysis Group. As a member of the Technical Review Committee for the Prairie View University Research Center, she also reviewed recommendations for feedback derived from the Committee's site visit to the Research Center.



## Mark Your Calendar!

Hot dogs and chips, beer, soda, and pie -  
We're having a picnic, please come on by!

## DSLS Backyard Picnic

June 24, 2009  
4:30—6:30 p.m.

USRA Backyard & Great Room



Bring your family to the backyard picnic and let's  
celebrate summer and DSLS' accomplishments together.

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Dagmar Morgan—Editor

Division of Space Life Sciences  
Universities Space Research Association  
3600 Bay Area Boulevard, Houston, TX 77058



DSLS Newsletter

UNIVERSITIES SPACE RESEARCH ASSOCIATION



May 2009