

Mark J. Shelhamer, Sc.D.

Professor, Department of Otolaryngology – Head & Neck Surgery
The Johns Hopkins University, School of Medicine

B.S.	1982	Drexel University, Philadelphia PA	Electrical Engineering
M.S.	1982	Drexel University, Philadelphia PA	Electrical Engineering
Sc.D.	1990	M.I.T., Cambridge MA	Biomedical Engineering
PostDoc	1992	Johns Hopkins University	Ophthalmology/BME

Lab Technician	Drexel University, Philadelphia PA	1978-1979
Research Assistant	Ultrasonics International, Trevese PA	1979-1980
Lab Technician	Temple University, Philadelphia PA	1980-1982
Volunteer Instructor	NASA Life Sciences Training Program	1985
Research Assistant	Man-Vehicle Laboratory, MIT, Cambridge MA	1982-1990
Postdoctoral Fellow	Department of Ophthalmology, JHU School of Medicine	1990-1992
Research Associate	Department of Biomedical Engineering, JHU School of Medicine	1992-1994
Assistant Professor	Department of Otolaryngology, JHU School of Medicine	1994-2002
Assistant Professor	Department of Biomedical Engineering, JHU School of Medicine	1994-2002
Associate Professor	Department of Otolaryngology, JHU School of Medicine	2002-2020
Associate Professor	Department of Biomedical Engineering, JHU School of Medicine	2002-2017
Chief Scientist	NASA Human Research Program, Johnson Space Center	2013-2016
Consultant	NASA Crew Health and Safety & Human Research Program	2019-
Adjunct Assoc Prof	George Washington University, School of Med & Health Sciences	2019-
Faculty Fellow	FAA, Volpe Center, Department of Transportation	2019-
Professor	Department of Otolaryngology, JHU School of Medicine	2020-

Peer-reviewed Original Science Research (most relevant out of ~100 publications)

Young LR, Shelhamer M, Modestino S. M.I.T./Canadian vestibular experiments on the Spacelab-1 mission: 2.

Visual vestibular tilt interaction in weightlessness. *Exp Brain Res*, 1986, 64:299.

Shelhamer M, Zee DS. Context-specific adaptation and its significance for neurovestibular problems of space flight. *J Vestibular Res*, 2004, 13:345.

Shelhamer M. Sequences of predictive saccades are correlated over a span of ~2 s and produce a fractal time series. *J Neurophysiol*, 2005, 93:2002.

Shelhamer M. Sequences of predictive eye movements form a fractional Brownian series - implications for self-organized criticality in the oculomotor system. *Biol Cybern*, 2005, 93:43.

Karmali F, Shelhamer M. The dynamics of parabolic flight: flight characteristics and passenger percepts. *Acta Astronaut*, 2008, 63:594.

Wong AL, Shelhamer M. Exploring the fundamental dynamics of error-based motor learning using a stationary predictive-saccade task. *PLoS ONE*, 2011, 6:e25225.

Shelhamer M. Trends in sensorimotor research and countermeasures for exploration-class space flights. *Front Syst Neurosci*, 2015, 9:115.

Shelhamer M. A call for research to assess and promote functional resilience in astronaut crews. *J Appl Physiol*, 2016, 120:471.

Shelhamer M. Parabolic flight as a spaceflight analog. *J Appl Physiol*, 2016, 120:1442.

Beaton KH, Wong AL, Lowen SB, Shelhamer M. Strength of baseline inter-trial correlations forecasts adaptive capacity in the vestibulo-ocular reflex. *PLoS ONE*, 2017, 12:e0174977.

Mindock J, Lumpkins S, Anton W, Havenhill M, Shelhamer M, Canga M. Integrating spaceflight human system risk research. *Acta Astronautica*, 2017, 139:306.

Shelhamer M. Why send humans into space? Science and non-science motivations for human space flight. *Space Policy*, 2017, 42:37.

Carpentier WR, Charles JB, Shelhamer M, Hackler AS, Johnson TL, Domingo CM, Sutton JP, Scott GB, Wotring VE. Biomedical findings from NASA's Project Mercury: a case series. *npj Microgravity*, 2018, 4:6.

Szocik K, Abood S, Shelhamer M. Psychological and biological challenges of the Mars mission viewed through the construct of the evolution of fundamental human needs. *Acta Astronaut*, 2018, 152:793.

Shelhamer M, Bloomberg J, LeBlanc A, Prisk GK, Sibonga J, Smith SM, Zwart SR, Norsk P. Selected discoveries from human research in space that are relevant to human health on Earth. *npj Microgravity*, 2020, 6:1.

Szocik K, Abood S, Impey C, Shelhamer M, Haqq-Misra J, Persson E, Oviedo L, Capova KA, Braddock M, Rappaport MB, Corbally C. Visions of a Martian future. *Futures*, 2020; 117:102514.

Books/Chapters

Shelhamer M. *Nonlinear Dynamics in Physiology: A State-Space Approach*. Singapore: World Scientific, 2007.

Shelhamer M. Enabling and enhancing human health and performance for Mars colonies: smart spacecraft and smart habitats. In: K Szocik (ed.), *The human factor in a mission to Mars*. New York: Springer, 2019.

Shelhamer M. Maintaining crew & mission health & performance in ventures beyond near-earth space. In: L Johnson, R Hampson (eds.), *Homo Stellaris*. Baen, 2019.

Reynolds RJ, Shelhamer M. Research methods for the next 60 years of space exploration. In: R Reynolds (ed.), *Beyond LEO – Human Health Issues for Deep Space Exploration*. IntechOpen, 2020.

Cocco D, Bogle JN, Herold N, Shelhamer M. Otolaryngology and vestibular function in aerospace medicine. In: J Davis, J Stepanak, J Fogarty, R Blue (eds.), *Fundamentals of Aerospace Medicine, 5th Edition*. Wolters Kluwer, 2021.

Shelhamer M. Human enhancements: new eyes and ears for Mars. In: K Szocik (ed.), *Human Enhancements for Space Missions*. Springer, 2020.

Shelhamer M, Scott GBI. Section editor (Future Human Exploration Challenges) *Encyclopedia of Bioastronautics*. Springer, 2020.

Advisory Committees, Review Groups/Study Sections

NASA Neurolab grant review panel (1994)

NIH Special Emphasis Panel (1997-2000)

NASA Neurobiology grant review panel (2000-2002)

NIH Communication Disorders Review Committee, ad hoc reviewer (2000)

NSF grant review panel (2003)

NIH/NIBIB site visit panel for USC project grant (2003, 2008)

NIH Special Emphasis Panel (2009-2012, 2017)

NASA HRP Cognitive-Behavioral-Sensorimotor Technical Interchange Meeting, co-chair (2020)

NASA HRP Sensorimotor Standards Technical Interchange Meeting, co-chair (2020)

Professional Societies

Institute of Electrical and Electronics Engineers (IEEE): Senior Member, EMBS

Consultantships

NASA/NSBRI Workshop on Human Vestibular Adaptation (1999)

NASA Artificial Gravity Workshop (1999)

NASA Neurovestibular Integrated Product Team (1999-2002)

NASA Clinical Status Evaluation working group (2004)

Commercial Spaceflight Federation (CSF) – Suborbital Applications Researchers Group

Army advisory panel, Noninvasive Neuroassessment Devices (2015-2016)

Awards, honors

NASA Group Achievement Award, for Life Sciences Experiments on Spacelab-1 (1984)

Award for outstanding contributions to the MIT Man-Vehicle Laboratory (1989)

NASA JSC “On the Spot” Award, for reducing ISS crew time requirements (2015)