Erik L. Antonsen M.D., Ph.D.
Curriculum Vitae

I. Biographical Information

A. Personal

1. Full Name: Erik Antonsen, MD, PhD, MS
2. Citizenship: US Citizen

B. Education

1. Undergraduate Education
    - University of Illinois at Urbana-Champaign, B.S., 9/1993-5/1997
2. Graduate Education
    - University of Illinois at Urbana-Champaign, M.S., Aerospace Engineering, 5/1997-5/2001 (Advisor Dr. Rodney Burton)
    - University of Illinois at Urbana-Champaign, Ph.D., Aerospace Engineering, 5/2001-5/2004 (Advisor Dr. Rodney Burton)
3. Medical Education
    - University of Illinois at Chicago, M.D., 7/2004-6/2009
4. Post Graduate Training
    - Harvard Affiliated Emergency Medicine Residency, Emergency Medicine, 7/2009-6/2013

C. Academic Appointments

1. Faculty Positions
    a) Assistant Professor of Emergency Medicine, Department of Emergency Medicine, Baylor College of Medicine, 9/2013-4/2021
    b) Assistant Professor of Space Medicine, Center for Space Medicine, Baylor College of Medicine, 9/2013-4/2021
    c) Associate Professor of Emergency Medicine with tenure, Department of Emergency Medicine, Baylor College of Medicine, 4/2021-4/2024
    d) Associate Professor of Space Medicine with tenure, Center for Space Medicine, Baylor College of Medicine, 4/2021-4/2024
    e) Lecturer, Aeronautical and Astronautical Engineering Department, Massachusetts Institute of Technology, 2/2024-present
    f) Adjunct Professor of Emergency Medicine, Department of Emergency Medicine, Baylor College of Medicine, 4/2024-present
    g) Associate Physician, SPEAR Medicine Division, Department of Emergency Medicine, Massachusetts General Hospital, 5/2024-present

2. Academic Affiliations at Other Institutions
    a) Element Scientist for Exploration Medical Capabilities, NASA Human Research Program, 2/2015-5/2018
    b) Assistant Director for Human System Risk Management, NASA Johnson Space Center, Human Health and Performance Directorate, 5/2018-4/2021
    c) Visiting Research Scientist, TRISH/NASA, Human Health and Performance Directorate, 5/2021-12/2022

D. Other Advanced Training

1. Other Specialized Training/Experience
    a) Post-Doctoral Research Fellowship, Department of Nuclear, Plasma, and Radiological Engineering, University of Illinois at Urbana-Champaign, 2004-2006 (Advisor Dr. David Ruzic)
    b) Fogarty International Clinical Research Scholar, Center for Infectious Disease Research in Zambia, Lusaka, Zambia, 2007-2008 (Advisor Dr. Elizabeth Stringer)
    c) Johnson Space Center Aerospace Medicine Clerkship, NASA, 2011 (Advisor Dr. Ashot Sargsyan)
    d) Medicine in Extreme Environments Rotation – McMurdo Station, Antarctica, University of Texas Medical Branch/NASA Human Research Program/National Science Foundation, 2017

E. Other Information

1. Awards and Honors
    a) International Awards
    (1) Joe Kerwin Award, Aerospace Medical Association, 2018
    Established and sponsored by KBRWyle to honor Joseph Kerwin, astronaut and physician. It is given annually for advances in the understanding of human physiology during spaceflight and innovation in the practice of Space Medicine to support optimal human health and performance in space.

    b) National Awards
    (1) Fogarty International Clinical Research Scholarship, NIH, 2007
    (2) Gold Humanism in Medicine Honor Society, UIUC College of Medicine, 2008
    (3) Outstanding Mentor Award, Aerospace Medicine Student and Resident Organization, 2016
    (4) Special Commendation Award, NASA Human Research Program, 2017
    For Outstanding Performance in Shaping the Scientific Direction, Integration, and Team for the Exploration Medical Capability Element.
    (5) Outstanding Recent Alumnus Award, UIUC Department of Aerospace Engineering, 2017
    (6) Early Career Achievement Medal (Strategic Research Planning), NASA, 2017

For Exceptional Achievement in the development of an exploration medical capability enabling future human missions to Mars

(7) Antarctic Service Medal, National Science Foundation, 2017

(8) NASA Exceptional Service Medal, NASA, 2022

For Exceptional Achievement in the development of an exploration medical capability enabling future human missions to Mars

c) Regional Awards

(1) On the Spot Award, NASA Johnson Space Center, 2015

(2) Johnson Space Center Group Achievement Award, NASA Johnson Space Center, 2018

For Exceptional Achievement in bridging the capabilities gap to enable human exploration beyond Low Earth Orbit

d) Local Awards

(1) Northrup Scholarship, UIUC College of Engineering, 1993

(2) DuPont Outstanding Student in Aerospace Engineering, UIUC College of Engineering, 1994, 1995

(3) SURGE Fellowship, UIUC College of Engineering, 1997

(4) Sigma Gamma Tau Honor Society, UIUC Dept. of Aerospace Engineering, 1998

(5) Aerospace Illinois Fellowship, NASA, 2001

(6) University Fellowship, UIUC Medical Scholars Program, 2006

(7) Teacher Ranked as Excellent by their Students, UIUC Dept. of Molecular and Integrative Physiology, 2007

(8) Excellence in Medicine, UIUC College of Medicine, 2008

(9) Excellence in Emergency Medicine, UIUC College of Medicine, 2009

(10) Senior Student Clinical Research Award, UIUC College of Medicine, 2009

(11) Exemplary Emergency Medicine 4th year Resident Award, BWH Hospital Emergency Department Nurses, 2012

(12) Senior Resident Teaching Award, Harvard Emergency Medicine Residency, 2013

(13) Listed in 'Top Doctors' in Emergency Medicine, Houstonia Magazine, August 2017

(14) Norton Rose Fulbright Faculty Excellence Award for Teaching and Evaluation, May 2019

(15) Listed in 'Top Doctors' in Emergency Medicine, Houstonia Magazine, August 2019

2. Board Certified, American Board of Emergency Medicine, 2014

3. Other Non-Academic Positions

a) CU Aerospace, Research Engineer, 1999-2001

b) Spiral Technologies, Laboratory Engineer, 2001

c) Engineering Research Consultants Inc., Scientist II, 2002-2003

d) ADE Aerospace LLC, Owner, Chief Medical Officer, 2012-2017
e) ADE Medical PLLC, Owner, Executive Officer, 2013-2017
f) Field Medical Director, StratEx Project, 2013-2014
g) Antarch Consulting LLC, Owner and CEO, 2021-present

II. Research and Publication Information

A. National Scientific Participation

1. Journal Editorial Boards

a) Nature Partner Journals (NPJ) Microgravity, Acting Associate Editor, 2020

2. Review Panels

a) Nature Partner Journals Microgravity, Ad hoc reviewer
b) AIAA Journal of Propulsion and Power, Ad hoc reviewer
c) Wilderness and Environmental Medicine, Ad hoc reviewer
d) Reviews in Human Space Exploration, Ad hoc reviewer
e) Series Editor, The Practice Changing Studies. Publisher: Wolters Kluwer Health
f) Section Editor, Handbook of Lunar Base Design and Development, Section 4 – Crew Health and Performance for a Lunar Base. Publisher: Springer International

3. Professional Societies, Etc.

a) American Institute of Aeronautics and Astronautics (AIAA), Senior Member 1996-present
b) American Medical Student Association (AMSA), member 2004 – 2009
c) Society of Academic Emergency Medicine (SAEM), member 2009-2013
d) Emergency Medicine Residents Association, member 2009-2013
e) American College of Emergency Physicians (ACEP), Fellow 2009-present
f) American Academy of Emergency Medicine (AAEM), Fellow 2009-present
g) Aerospace Medical Association (AsMA), Associate Fellow, 2011-present
h) Society of NASA Flight Surgeons, member 2015 – present
i) Harris County Medical Society, member 2018 – present
j) Texas Medical Association, member 2018 - present

4. Invited Lectures, Presentations, Research Seminars

a) International

(1) **Dr. Erik Antonsen**, ExMC Element Content and Context, NASA Human Research Program Investigators Workshop, Galveston, TX, January 23, 2017
(2) **Dr. Erik Antonsen**, Medical Integration in Human Spaceflight, 33rd Space Symposium (INVITED Presentation and Panelist), Boulder, CO, April 5, 2017

(3) **Dr. Erik Antonsen**, Environmental hazards, human health and longevity: Data review and future directions, Space Medicine: Terrestrial Applications for Human Health, Performance, and Longevity, Bellagio II International Scientific Summit AsMA (INVITED International Panelist), Bellagio, Italy, September 2017

(4) **Dr. Erik Antonsen**, Autonomy and Human Machine Performance Challenges in Remote Environments, (INVITED Panelist) Space Commerce Conference and Exposition, Houston, TX, December 4-6, 2017.

(5) **Dr. Erik Antonsen**, Remote Medicine Workshop, (INVITED Moderator) Space Commerce Conference and Exposition, Houston, TX, December 4-6, 2017.

(6) **Dr. Erik Antonsen**, Changing Risk in Human Spaceflight: Drivers for Healthcare Automation and Vehicle Integration, (INVITED Keynote Speaker and Panelist) 2018 IEEE Aerospace Conference, Bozeman, MT, March 3-10, 2018

(7) **Dr. Erik Antonsen**, NASA Space Medicine Research for Exploration, (INVITED Speaker) 39th Annual International Gravitational Physiology Society Meeting, Noordwijk, Netherlands, June 18-22, 2018.

(8) **Dr. Erik Antonsen**, New Frontiers in Space Medicine (INVITED Panelist), International Space Medicine Summit, Rice University's Baker Institute for Public Policy, Houston, TX, October 26, 2018

(9) **Dr. Erik Antonsen**, Rural Doctor for Mars: Medicine in the Final Frontier (INVITED Keynote Speaker), WONCA World Rural Health Conference, Albuquerque, NM, October 12, 2019

(10) **Dr. Erik Antonsen**, NASA's Human Systems Risk Management, Needs-Based Implementation of Space Health Innovation (INVITED Speaker), Space Health Innovation Conference, San Francisco, CA, November 2, 2019

(11) **Dr. Erik Antonsen**, Prevention and Preparation (INVITED Speaker), Space Health Innovation Conference, San Francisco, CA, November 2, 2019

(12) **Dr. Erik Antonsen**, Risk and Analogs in Human Spaceflight (INVITED Speaker), Space Analogue Workshop, Commonwealth Scientific and Industrial Research Organization (CISRO), Adelaide, Australia, February 20, 2020

(13) **Dr. Erik Antonsen,** Human System Risks and Genomics (INVITED Speaker), Festival of Genomics and Biodata (Virtual), London, United Kingdom, January 28, 2021

(14) **Dr. Erik Antonsen**, Lifetime Surveillance (INVITED Panelist), International Space Medicine Summit, Rice University's Baker Institute for Public Policy, Houston, TX, November 19, 2021

(15) **Dr. Erik Antonsen**, Introduction to Space Medicine (INVITED Speaker), Institute for Transfusion Medicine and Immunohematology, Goethe University, Frakfurt, Germany, March 2, 2022

(16) **Dr. Erik Antonsen**, Maintaining Health and Performance in Spaceflight (INVITED Panelist), Humans to Mars Summit, National Academy of Sciences, Washington DC, May 17, 2023

(17) **Dr. Erik Antonsen**, Development of a Dedicated Space Medicine Fellowship Pathway (Panelist), Aerospace Medical Association Annual Scientific Meeting, New Orleans, May 25, 2023

(18) **Dr. Erik Antonsen**, Risk and Systems Medicine in Human Space Exploration (INVITED Speaker), Building a Spacefaring Civilization, The Menarini Foundation, Florence, Italy, September 14, 2023

(19) **Dr. Erik Antonsen**, Challenges of Health in Long Duration Spaceflight (INVITED Panelist), International Workshop on AI Powered Space, The Ion, Houston, TX, November 13, 2023

(20) **Dr. Erik Antonsen**, Human Risk and Systems Integration for Spaceflight (INVITED Panelist), AIAA SciTech Conference, Orlando, FL, January 8, 2024

(21) **Dr. Erik Antonsen**, AI, Modeling and Prediction (INVITED Speaker), Human Research Program for Civilians in Spaceflight and Space Habitation, Tulsa, OK, January 24, 2024

(22) **Dr. Erik Antonsen**, Network Analytic Approaches for HSRB DAG Development, NASA Investigators Workshop, Galveston, TX, February 14, 2024

b) National

(1) **Dr. Erik Antonsen**, Space Matters in Health – Defining the Future of Health Care Environments, Health and Human Services/NASA/DOD Medical Care (INVITED Panelist), University of Texas Medical Branch, Galveston, TX, April 12, 2016

(2) **Dr. Erik Antonsen**, The Integrated Medical Model, Committee on Aerospace Medicine and Medicine in Extreme Environments, National Science Academy (INVITED Lecture), Washington, DC, December 21, 2016

(3) **Dr. Erik Antonsen**, NASA Exploration Medical Capabilities, Enhancing Medical Training Technologies for Combat Workshop, Department of Defense (INVITED Lecture), Washington, DC, November 2-3, 2016

(4) **Dr. Erik Antonsen**, Medicine and Engineering in Human Spaceflight, University of Illinois at Urbana-Champaign Medical Scholars Program (INVITED Lecture), Urbana, IL, 2016

(5) **Dr. Erik Antonsen**, Telemedicine at NASA, NASA Headquarters (INVITED Lecture), Washington, DC, May 10, 2017

(6) **Dr. Erik Antonsen**, Cross Pollinization of Federal Trans-Agency Efforts to Measure Human Performance and Disease, Precision Objective Measures for Cancer: Remote Medicine and Discovery (INVITED Panelist), National Cancer Institute, Rockville, MD, September 14-15, 2017

(7) **Dr. Erik Antonsen**, Jumping from the Edge of Space: Supporting the Stratos and StratEx Missions, (INVITED Speaker), Gateway to Space Lecture Series, NASA Johnson Space Center, Houston, TX, August 17, 2018

(8) **Dr. Erik Antonsen**, Precision Medicine in Exploration Spaceflight, (INVITED Speaker), Health Law in Space Symposium, University of Houston Health Law and Policy Center, November 2, 2018

(9) **Dr. Erik Antonsen**, Enhancing Crew Health and Performance at NASA (INVITED Speaker), Human Performance and Biosystems Summit, Defense Strategy Institute, Alexandria, VA, August 13, 2019

(10) **Dr. Erik Antonsen**, Impact of Distance from Earth on the Human System, Mars Integration Group, NASA Johnson Space Center, November 14, 2019

(11) Dr. Erik Antonsen, CHMO Radiation Health Update, NASA Headquarters, Washington DC, December 18, 2019

(12) Dr. Erik Antonsen, CHMO Radiation Health Update, Human System Risk Board, NASA Johnson Space Center, Houston, TX, December 19, 2019

(13) Dr. Erik Antonsen, Human Risks in Space (INVITED Speaker), American Telemedical Association (ATA) 2020 Conference, Online, June 22, 2020

(14) Dr. Erik Antonsen, Flight Operations Radiation Risk Update (Invited Speaker), Flight Operations Directorate, NASA Johnson Space Center, Houston, TX, September 30, 2020

(15) Dr. Erik Antonsen, Health and Medical Risk Characterization at NASA, Assessment of Strategies for Managing Cancer Risks Associated with Radiation Exposure During Crewed Exploration Missions, National Academies of Science, Engineering and Medicine Committee (Virtual), Washington, DC, January 25, 2021

(16) Dr. Erik Antonsen, Human System Risk 101 (Invited Speaker), Flight Operations Directorate Control Board, NASA Johnson Space Center, Houston, TX, January 27, 2021

(17) Dr. Erik Antonsen, Risk Network and DAG Development (Invited Speaker), Human System Risk Board, NASA Johnson Space Center, Houston, TX, April 1, 2021

(18) Dr. Erik Antonsen, Radiation in the Context of Human System Risks in Exploration Spaceflight (Invited Speaker), National Council on Radiation Protection and Measurements 57th Annual Meeting, Virtual, April 19, 2021

(19) Dr. Erik Antonsen, Updates to the Risk of Adverse Health Outcomes and Decrements in Performance due to In-flight Medical Conditions, Human System Risk Board, NASA Johnson Space Center, May 20, 2021

(20) Dr. Erik Antonsen, Unique Challenges in Microgravity, Tri-Service American College of Physicians Scientific Meeting (Invited Plenary Lecture), September 8, 2021

(21) Dr. Erik Antonsen, Effects of Spaceflight on the Human Body (Invited Plenary Lecture), American Association of Neuromuscular and Electrodiagnostic Medicine, Aurora, CO, October 15, 2021

(22) Dr. Erik Antonsen, Functional Challenges in Human Spaceflight (Invited Plenary Lecture), American Association of Physical Medicine and Rehabilitation, Virtual, November 11, 2021

(23) Dr. Erik Antonsen, Systems Medicine for Spaceflight (Invited Panelist), American Johns Hopkins Engineering, Bioastronautics Mini-Symposia Series, November 15, 2021

(24) Dr. Erik Antonsen, Safe Human Expeditions Beyond LEO (Invited Panelist), NASA Engineering & Safety Center (NESC) Review Board, January 20, 2022

(25) Dr. Erik Antonsen, Space Medicine at NASA (Invited Speaker), Wilderness Medicine Institute Winter Conference, Jackson, WY, March 1, 2022

(26) Dr. Erik Antonsen, Humans and Mars, How Safe is Safe Enough? (INVITED Speaker), Achieving Mars X Workshop, Explore Mars Foundation, Washington, DC December 7, 2023

c) Regional

(1) **Dr. Erik Antonsen**, Medical Challenges in a Mars Mission, WISE Lecture Series (INVITED Lecture), KBR Wyle, Houston, TX, January 31, 2017

(2) **Dr. Erik Antonsen**, Medicine at the End of the Earth: ExMC in Antarctica, WISE Lecture Series (INVITED Lecture), KBR Wyle, Houston, TX, January 30, 2018

B. Publications

1. Full Papers

a) Peer Reviewed Publications in print or other media

(1) **Antonsen EL**, Spanjers, GG, Burton, RL, Engelman, SF. Herriott cell augmentation of a quadrature heterodyne interferometer. *Rev Sci Instrum* 2003;74(1):88-93

(2) **Antonsen EL**, Spanjers, GG, Burton, RL, Engelman, SF. Herriott cell interferometry for millimeter scale plasma measurements. *Rev Sci Instrum* 2003;74(1):1609-1612

(3) Keidar, M, Boyd, ID, **Antonsen, EL**, Gulczinski, FS, Spanjers, GG. Propellant Charring in micro-Pulsed Plasma Thrusters. *J Prop Power* 2004; 20(6):978-984

(4) Keidar, M, Boyd, ID, **Antonsen, EL**, Spanjers, GG. Electromagnetic Effects in the Near Field Plume Exhaust of a micro-Pulsed Plasma Thruster. *J Prop Power* 2004; 20(6):961-969

(5) **Antonsen, EL**, Burton, RL, Reed, GF, Spanjers, GG. Effects of Post Pulse Surface Temperature on Micro-Pulsed Plasma Thruster Operation. *J Prop Power* 2005; 21(5):877-883

(6) Keidar, M, Boyd, ID, **Antonsen, EL**, Burton, RL, Spanjers, GG. Optimization Issues for a Micro-Pulsed Plasma Thruster. *J Prop Power* 2006; 22(1):48-55

(7) Jaworski, MA, Jurczyk, BE, **Antonsen, EL**, Ruzic, DN. Direct Current Magnetic Insulation of an Immersed RF Antenna. *Plasma Sources Sci and Technol* 2006; 15:474-478

(8) Thompson, KC, **Antonsen, EL**, Hendricks, MR, Jurczyk, BE, Williams, M, Ruzic, DN. Experimental test chamber for optics exposure testing and debris characterization of a Xenon discharge produced plasma source for extreme ultraviolet lithography. *Microelectron Eng* 2006; 83(3):474-486

(9) **Antonsen, EL**, Thompson, KC, Hendricks, MR, Alman, DA, Jurczyk, BE, Ruzic, DN. Ion Debris Characterization from a Z-Pinch Extreme Ultraviolet Light Source. *J Appl Phys* 2006; 99(6), 063301

(10) Qui, H, Thompson, KC, Srivastana, SN, **Antonsen, EL**, Alman, DA, Jurczyk, BE, Ruzic, DN. Optical exposure characterization and comparisons for discharge produced plasma Sn extreme ultraviolet system. *J Microlithog, Microfab, and Microsys*, 2006; 5(3), 033007

(11) Qui, H, Alman, DA, Thompson, KC, Spencer, JB, **Antonsen, EL**, Jurczyk, BE, Ruzic, DN, Spila. Characterization of collector optic material samples before and after exposure in laser produced plasma and discharge produced plasma EUV sources. *J Microlithog, Microfab, and Microsys,* 2006; 5(3), 033006

(12) **Antonsen, EL**, Burton RL, Reed, GF, Spanjers, GG. Fast Surface Temperature Measurements of Teflon Propellant in Pulsed Ablative Discharges using HgCdTe Photovoltaic Cells. *Rev Sci Instrum* 2006; 77(10), 103107

(13) Alman, DA, Qiu, H, Spila, T, Thompson, KC, **Antonsen, EL**, Jurczyk, BE, Ruzic, DN. Characterization of collector optic material samples exposed to a discharge-produced plasma extreme ultraviolet light source. *Journal of Micro/Nanolithography, MEMS, and MOEMS* 2007; 6(1), 013006

(14) Ruzic, DN, Thompson, KC, Jurczyk, BE, **Antonsen, EL**, Srivastava, SN, Spencer, JB. Reduction of ion energies from a multi-component z-pinch plasma. *IEEE Transactions on Plasma Science* 2007; 35(3):606-613

(15) Srivastava, SN, Thompson, KC, **Antonsen, EL**, Qiu, H, Spencer, JB, Papke, D, Ruzic, DN. Lifetime measurements on collector optics from Xe and Sn extreme ultraviolet (EUV) sources. *J Appl Phys* 2007; 102, 023301

(16) Stringer, ES, **Antonsen, EL**. Hormonal Contraception and HIV Disease Progression *Clinical Infectious Diseases* 2008; 47(7):945-951

(17) Nusbaum, DM, **Antonsen, EL**, Bockhorst KH, Easley RB, Clark, JB, Brady KM, Kibler KK, Sutton JP, Kramer L, Sargsyan AE. Optic Nerve Sheath Diameter Measurement Techniques: Examination Using a Novel Ex Vivo Porcine Model. *Aviation, Space, and Environmental Medicine*, Vol 85, No. 1, Jan 2014 pp. 50-54

(18) Blue RS, Norton SC, Law J, Pattarini JM, **Antonsen EL**, Garbino A, Clark JB, Turney MW., "Emergency Medical Support for a Manned Stratospheric Balloon Test Program", *Prehosp Disaster Med*., 2014 Oct;29(5):532-7. PMID: 25191748

(19) Ahmed, AS, **Antonsen, EL** Immune and Vascular Dysfunction in Diabetic Wound Healing, *Journal of Wound Care*, North American Supplement, July 2016; 25 Suppl 7:S35-46

(20) Garbino A, Nusbaum DM, Buckland DM, Menon AS, Clark JB, **Antonsen EL**. Emergency medical considerations in a space-suited patient. *Aerospace Med Hum Perform*. 2016; 87(10): 1 – 5

(21) Ahmed, AS, Chavarria, J, Brenneman, T, Johnson, K, **Antonsen, EL**, Rosenfeld, S, Osteogenic Induction of Human Mesenchymal Stem Cells by Cold Atmospheric Argon Plasma, *Plasma Medicine*, 6(2), 193-207, 2016

(22) Menon, AS, Jourdan, D, Nusbaum, DM, Garbino, A, Buckland, DM, Norton, S, Clark, J, **Antonsen, EL** Crew Recovery and Contingency Planning for a Manned Stratospheric Balloon Flight – the StratEx Program. *PreHospital and Disaster Medicine,* 2016, 31 (4): 1-8

(23) Galdamez, LA, Clark, JB, **Antonsen, EL**, Point of Care Ultrasound Utility and Potential for High Altitude Crew Recovery Missions, *Aerospace Med Hum Perform*. 2017; 88(2) pp.128-136

(24) **Antonsen, EL,** Mulcahy, RA, Rubin, D, Blue, RS, Canga, MA, Shah, R, Prototype Development of a Tradespace Analysis Tool for Spaceflight Medical Resources, *Aerospace Med Hum Perform.*, 2018; 89(2):108-114

(25) Johansen, B, Blue, R, Castleberry, T, **Antonsen, EL**, Van Der Plough, J, Point of Care Ultrasound for Pulmonary Concerns in Remote Spaceflight Triage Environments, *Aerospace Med Hum Perform* 2018; 89(2):122-129

(26) Ramachandran, V, Wang, R, Ramachandran, SS, Ahmed, AS, Phan, K, **Antonsen, EL**, Effects of Spaceflight on Cartilage: Implications on Spinal Physiology, *J Spine Surg*, 2018 Jun;4(2):433-445

(27) Ahmed, AS, Ramakrishnan, R, Ramachandran, V, Ramachandran, SS, Phan, K, **Antonsen, EL**, Ultrasound Diagnosis and Therapeutic Intervention in the Spine, *J Spine Surg*, 2018 Jun;4(2):423-432

(28) Reed, RD, **Antonsen, EL**, Should NASA Collect Astronauts Genetic Information for Occupational Surveillance and Research?, *AMA Journal of Ethics*, Sept 2018; 20(9):E849-856

(29) Doarn CR, Travis TW, Currie-Gregg NK, Nicogossian AE, Weyland M, Shepanek M, Null C, Buckland D, Miller S, Liskowsky D, Fuller D, Francisco D, Walton M, **Antonsen E**, Rochlis J, Witt EG, Williams RS. Engineering, Life Sciences, and Health/Medicine Synergy in Aerospace Human Systems Integration: The Rosetta Stone Project: An Executive Summary. *New Space*. 2019;7(2):110-13. ePub – December 13, 2018

(30) Blue RS, Chancellor JC, **Antonsen EL**, Bayuse TM, Daniels VR, Wotring VE. Limitations in predicting radiation-induced pharmaceutical instability during long-duration spaceflight. *npj Microgravity*. 2019 Jun 6;5(1):15

(31) Blue, RS, Bayuse, T, Daniels, V, Wotring V, Suresh, R, Mulcahy R, **Antonsen, EL**, Supplying a Pharmacy for Exploration Spaceflight: Challenges and Current Understanding, *npj Microgravity*. 2019 June 13;5:14

(32) Nowak, E, Reyes, DP, Bryant, BJ, Cap, AP, Kerstman, E, **Antonsen, EL**, Blood Transfusion for Deep Space Exploration, *Transfusion*, October 2019 59(10):3077-3083; doi:10.1111/trf.15493

(33) Blue, RS, Chancellor, JC, Suresh, R, Carnell LS, Reyes, DP, Nowadly CD, **Antonsen, EL**, Challenges in Clinical Management of Radiation Induced Illnesses in Exploration Spaceflight, *Aerosp Med Hum Perform.* 2019; 90(11):966–977. PMID 31666159.

(34) **Antonsen, EL**, Reed, RD, Policy Considerations for Precision Medicine in Human Spaceflight, 19 *Hous. J. Health L. & Pol'y 1* (2019).

(35) Steller JG, Blue RS, Burns R, Bayuse TM, **Antonsen EL**, Jain V, Blackwell MM, Jennings RT. Gynecologic risk mitigation considerations for long-duration spaceflight. *Aerosp Med Hum Perform* 2020; 91(7): 543-564

(36) Reyes, DP, Carroll, DJ, Walton, ME, **Antonsen, EL**, Kerstman, EL, Probabilistic Risk Assessment of Prophylactic Surgery before Extended Duration Spaceflight, *Surg Innov*, December 12, 2020, epub ahead of print, DOI: 10.1177/1553350620979809

(37) Sides, MB, Smith, SL, Sirek, A, Lee, PH, Blue, RS, **Antonsen, EL**, Basner, M, Douglas, GL, Epstein, A, Flynn-Evans, EE, Gallagher, MB, Hayes, J, Lee, SMC, Lockley, SW, Monseur, B, Nelson, NG, Sargsyan, A, Smith, SM, Stenger, MB, Stepanek, J, Zwart, SR, The Bellagio II Team, Bellagio II Report: Terrestrial Applications of Space Medicine Research, *Aerosp Med Hum Perform* 2021; 92(8): 650-669

(38) **Antonsen, EL**, Myers, JG, Boley, LA, Arellano, JD, Kerstman, EL, Kadwa, BK, Buckland, DM, Van Baalen, M, Estimating Medical Risk for Human Spaceflight, *npj Microgravity* **8,** 8 (2022). https://doi.org/10.1038/s41526-022-00193-9

(39) David P. Reyes, Kseniya S. Masterova, Marlei Walton, Eric L. Kerstman, and **Erik L. Antonsen**. Assessment of Sex-Dependent Medical Outcomes During Spaceflight. Journal of Women's Health. Aug 2022.1145-1155. https://doi.org/10.1089/jwh.2021.0636

(40) Reynolds, RJ, Scott RT, Turner RT, Iwaniec, UT, Bouxein, ML, Sanders, LM, **Antonsen, EL**, Validating Causal Diagrams of Human Health Risks for Spaceflight: An Example Using Bone Data from Rodents, *Biomedicines*, 10(9), 9/2022, https://www.mdpi.com/2227-9059/10/9/2187

(41) Scott, RT, **Antonsen, EL**, Sanders, LM, et al., Beyond Low Earth Orbit: Biomonitoring, Artificial Intelligence and Precision Space Health, *Nature Machine Intelligence,* Vol. 5, March 2023, https://doi.org/10.1038/s42256-023-00617-5

(42) Sanders, LM, Yang, JH, Scott, RT, …, **Antonsen, EL**, … et al., Beyond Low Earth Orbit: Biological Research, Artificial Intelligence and Self Driving Labs, *Nature Machine Intelligence,* Vol. 5, March 2023, https://doi.org/10.1038/s42256-023-00618-4

(43) Meer, E, Grob, S, **Antonsen EL**, Sawyer, A, Ocular Conditions and Injuries, Detection and Management in Spaceflight, *npj Microgravity*, (2023) 9:37; https://doi.org/10.1038/s41526-023-00279-y

(44) **Antonsen, E.L.,** Connell, E., Anton, W. *et al.* Updates to the NASA human system risk management process for space exploration. *npj Microgravity* **9**, 72 (2023). https://doi.org/10.1038/s41526-023-00305-z

(45) Ward, J, Reynolds, RJ, Connell, E, Anton, W, Monti, A, Charvat, J, Narty, N, Marotta, K, Abukmail, A, Buckland, DM, Van Baalen, M, **Antonsen, EL**, Levels of evidence for human system risk evaluation. *npj Microgravity* **10**, 33 (2024). https://doi.org/10.1038/s41526-024-00372-w

(46) **Antonsen, EL**, Reynolds, RJ, Charvat, J, Connell, E, Monti, A, Petersen, D, Narty, N, Anton, W, Abukmail, A, Marotta, K, Van Baalen, M, Buckland, DM, Causal diagramming for assessing human system risk in spaceflight. *npj Microgravity* **10**, 32 (2024). https://doi.org/10.1038/s41526-024-00375-7

b) Accepted for Publication

(1) Reynolds, RJ, Shelhamer, M, **Antonsen, EL**, Carpentier, W, Characterizing Dehydration in short-term Spaceflight using evidence from project Mercury, *npj Microgravity*, Accepted, March 2024

c) Submitted for Publication

(1) Ortiz, D, Apisa, L, Chao, K, Canepa, CA, Hirzallah, MI, Padaki, A, Nelson, A, Kamine, T, **Antonsen, EL**, Levin, DL, A Preliminary Assessment of Educational Needs in Space Medicine, *Aerospace Med and Human Perf*, Submitted Feb 2024

2. Other Full Papers

a) Published without Review by Peer Group

(1) Bushman, SS, Burton, RL, **Antonsen, EL**. Arc Measurements and Performance Characteristics of a Coaxial Pulsed Plasma Thruster. AIAA Paper No. 98-3660, *34th Joint Propulsion Conference*, July 1998.

(2) **Antonsen, EL**, Burton, RL, Rysanek, F. Energy Measurements in a Coaxial Electromagnetic Pulsed Plasma Thruster. AIAA Paper No. 99-2292, *35th Joint Propulsion Conference*, June 1999.

(3) **Antonsen, EL**, Burton, RL, Engelman, SF, Spanjers, GG. Herriott Cell Interferometer for Unsteady Density Measurements in Small Scale Length Thruster Plasmas. AIAA Paper No. 2000-3431, *36th Joint Propulsion Conference,* July 2000.

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(6) **Antonsen, EL**, Burton, RL, Spanjers, GG. High Resolution Laser Diagnostics in Millimeter-Scale Micro Pulsed Plasma Thrusters. *27th Intl Electric Propulsion Conference, IEPC Paper 2001-157,* Pasadena, CA 2001.

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(9) **Antonsen, EL**, Spanjers, GG, Burton, RL, Spores, RA. Time-resolved surface temperature measurement for pulsed ablative thrusters. *28th Intl Electric Propulsion Conference*, IEPC Paper 2003-292, Toulouse, France, March 2003.

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(18) Thompson, KC, Srivastava, SN, **Antonsen**, **EL**, Ruzic, DN. Debris mitigation techniques for a Sn- and Xe- fueled EUV light source. *Proc. Of SPIE*, Vol. 6517, 65173L, 2007

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(26) **Antonsen, EL**, Don't Panic: A Risk Custodians Handbook for the Human System Risk Board, NASA Johnson Space Center, NASA/SA-HDBK-001, May 2019

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(31) **Antonsen, EL**, Van Baalen, M, Kadwa, B., et al, Comparison of Health and Performance Risk for Accelerated Mars Mission Scenarios, National Aeronautics and Space Administration February 2021, TM: NASA/TM-20210009779

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(33) **Antonsen, EL**, Reynolds, R, Abukmail, A., et al, Directed Acyclic Graph Guidance Documentation, National Aeronautics and Space Administration, June 2022, NASA/TM-20220006812

(34) **Antonsen, EL**, Monti, A, Charvat, J, et al, Directed Acyclic Graphs: A Tool for Understanding the NASA Human Spaceflight Risks, National Aeronautics and Space Administration, June 2022, NASA/TM-20220015709

3. Abstracts given during the last 3 years

a) **Antonsen, EL**, Reynolds, RJ, Anton, W, Connell, EC, Abukmail, AA, Monti, AM, Charvat, JM, Petersen, DK, Marotta, K, Buckland, DM, Directed Acyclic Graph Development for Risk Management, NASA Human Research Program Investigator Workshop, 2022, Virtual Conference

b) **Antonsen, EL**, Reynolds, RJ, Connell, EC, Scully, R, Abukmail, AA, Monti, AM, Charvat, JM, Van Baalen, M, Buckland, DM, Human System Risk Communication: Directed Acyclic Graphs, NASA Human Research Program Investigator Workshop, 2023, Galveston, TX

c) Alwood, JS, **Antonsen, EL**, Dev, SI, Nelson, GA, Reynolds, RJ, Shahid, A, DAG Studies for the Behavioral Medicine Risk, NASA Human Research Program Investigator Workshop, 2024, Galveston, TX

d) Alwood, JS, **Antonsen, EL**, Dev, SI, Nelson, GA, Reynolds, RJ, Shahid, A, DAG Studies for the Behavioral Medicine Risk, NASA Human Research Program Investigator Workshop, 2024, Galveston, TX

4. Books

a) Books Edited

(1) Aaronson, EL, **Antonsen, EL**, Venkatesh, AK, Walls, RM, Adler ,JN (Eds.) Emergency Medicine Evidence: The Practice Changing Studies, Philadelphia, PA, Wolters Kluwer Health, 2014

(2) Carter, LP, Eiken, MGA, Vandana, LM, Aaronson, EL, **Antonsen, EL**, Venkatesh, AK, (Eds.) Pediatric Evidence: The Practice Changing Studies, Philadelphia, PA, Wolters Kluwer Health, 2016

(3) Katz JT, Loscalzo, J, Aaronson, EL, **Antonsen, EL**, Venkatesh, AK, (Eds.) Internal Medicine Evidence: The Practice Changing Studies, Philadelphia, PA, Wolters Kluwer Health, August 2017

(4) Brizzi, K, Batra, A, Salinas, J, Wang N, Aaronson, EL, **Antonsen, EL**, Venkatesh, AK, (Eds.) Neurology Evidence: The Practice Changing Studies, Philadelphia, PA, Wolters Kluwer Health, September 2017

(5) Shelhamer, MJ, **Antonsen, EL**, (Eds.) Systems Medicine for Human Spaceflight, Singapore, World Scientific Publishing Co. Pte. Ltd., In Publication, May 2024 *https://www.worldscientific.com/worldscibooks/10.1142/13713#t=aboutBook*

b) Book Chapters Written

(1) Burton, RL, Rysanek, F, **Antonsen, EL**, Wilson, MJ, and Bushman, SS. Pulsed Plasma Thruster Performance for Microspacecraft Propulsion. AIAA Progress Series, Vol. 187, Micropropulsion for Small Spacecraft, M. Micci, ed., Chapter 13, pp. 337-352, 2000.

(2) Walton, ME, **Antonsen, EL**, Chapter 8: The Integrated Medical Model: A Case Study in Communication. Engineering, Life Sciences, and Health/Medicine Synergy in Aerospace Human Systems Integration, The Rosetta Stone Project, NASA SP-2017-633.

(3) **Antonsen, EL**, Orford, RA, Pinkston, BA, Taddeo, T, 'Risk Management and Aeromedical Certification' in Davis, JR, Stepanek, J, Fogarty, JA, Blue, RS (Eds.) Fundamentals of Aerospace Medicine, Fifth Ed. (Ch 16), Lippincott, Williams

and Wilkins Publishers, Philadelphia, PA, 2021

(4) Deyle, D, **Antonsen, EL**, Reed, RD, 'Precision Medicine – Aerospace Medical Considerations' in Davis, JR, Stepanek, J, Fogarty, JA, Blue, RS (Eds.) Fundamentals of Aerospace Medicine, Fifth Ed. (Ch 15), Lippincott, Williams and Wilkins Publishers, Philadelphia, PA, 2021

(5) **Antonsen, EL**, (2022) Human System Risk in Lunar Exploration. In: Eckart P., Aldrin A. (eds) Handbook of Lunar Base Design and Development. Springer, Cham. https://doi.org/10.1007/978-3-030-05323-9_1-1

(6) Mulcahy, R., Douglas, G., McCoy, T., **Antonsen, EL.** (2022). Physiological Requirements of a Lunar Base Crew. In: Eckart, P., Aldrin, A. (eds) Handbook of Lunar Base Design and Development. Springer, Cham. https://doi.org/10.1007/978-3-030-05323-9_2-1

(7) Picano, J., Holland, A., Landon, L.B., Antonsen, E.L. (2022). Psychological Requirements of a Lunar Base Crew. In: Eckart, P., Aldrin, A. (eds) Handbook of Lunar Base Design and Development. Springer, Cham. https://doi.org/10.1007/978-3-030-05323-9_7-1

(8) Reilly, J, Buckland, D, **Antonsen, EL**, 'Operational Paradigms: Low Earth Orbit and Beyond', in Shelhamer, M, Antonsen, EL (Eds.) Systems Medicine for Human Spaceflight,(Ch 4), Singapore, World Scientific Publishing Co. Pte. Ltd., May 2024, https://doi.org/10.1142/13713

(9) Zahalka, R, Iwry, J, **Antonsen, EL**, 'Risk and Liability in Systems Medicine for Spaceflight', in Shelhamer, M, Antonsen, EL (Eds.) Systems Medicine for Human Spaceflight,(Ch 9), Singapore, World Scientific Publishing Co. Pte. Ltd., May 2024, https://doi.org/10.1142/13713

(10) **Antonsen, EL**, Reynolds, RJ, Charat, J, Connell, E, Hyuhn, K, Abukmail, A, 'Networks and Analytics', in Shelhamer, M, Antonsen, EL (Eds.) Systems Medicine for Human Spaceflight,(Ch 11), Singapore, World Scientific Publishing Co. Pte. Ltd., May 2024, https://doi.org/10.1142/13713

(11) Shelhamer, M., Reynolds, RJ **Antonsen, EL**, 'Predictive Modeling of Spaceflight Medical Issues, in Shelhamer, M, Antonsen, EL (Eds.) Systems Medicine for Human Spaceflight,(Ch 12), Singapore, World Scientific Publishing Co. Pte. Ltd., May 2024, https://doi.org/10.1142/13713

c) Theses

(1) **Antonsen, EL**, Herriott Cell Interferometry for Pulsed Plasma Density Measurements, MS Thesis, University of Illinois at Urbana-Champaign, 2001.

(2) **Antonsen, EL**, Propellant Surface Temperature and Plume Characteristics of Micro-Pulsed Plasma Thrusters, Ph.D. Dissertation, University of Illinois at Urbana-Champaign, 2004.

5. Other works communicating Research to scientific colleagues

a) *Figure 1 on 1 Web Feature* ***Dr. Erik Antonsen,*** Live Q&A session with the Global Healthcare Community Online, Reached 20,800 users in 165 countries, August 11, 2016

6. Other works communicating Research to general public

a) *WebMD Interview, Surviving Mars: The Martian Gets Put to the Test,* October 1, 2015, http://www.webmd.com/a-to-z guides/news/20151001/martian-test-matt-damon#1

b) *Houston, We Have a Podcast, Episode 59: Hazard 3 – Distance From Earth,* ***Dr. Erik Antonsen,*** NASA Public Affairs Office Production, August 24, 2018*:* https://www.nasa.gov/johnson/HWHAP/hazard-3-distance

c) *Exploration Medicine Podcast:* ***Dr. Erik Antonsen*** *on the Future of Space Medicine,* July 8, 2019, https://www.explorationmedicine.com/podcast/2017/10/2/episodeone-x2x7d-pngg9-fswsk-345e4-ga9kd-egzsp-222p7-ns6wx-sxytg-53dp2-k5g96-hyl8y-nrhfw

d) *Emergency Mind Podcast EP 39: Understanding the Human System with* ***Dr. Erik Antonsen,*** April 13, 2021, *https://www.youtube.com/watch?v=7nWVc6wiITA*

III. Teaching Information

A. Educational Leadership Roles

1. **Aerospace/Extreme Environment Medicine Track Director**, Department of Emergency Medicine, 2014-2019
   - Responsible for 1-2 residents per year providing mentorship and research guidance
   - Creation of 1-month research rotation opportunities at NASA Johnson Space Center

2. **Space Medicine Fellowship Director**, Department of Emergency Medicine and Center for Space Medicine, Baylor College of Medicine, 2023 – present

3. **Committee Chair**, Education and Training Committee, Aerospace Medical Association, 2022 - present

B. Didactic Course Work

1. Courses Taught at Current Institution
   a) Emergency Medicine Resident Didactic Lectures
      (1) **Dr. Erik Antonsen**, Burn Care, June 11, 2014
      (2) **Dr. Erik Antonsen**, Environmental Medicine Review, February 4, 2015
      (3) **Dr. Erik Antonsen,** Emergency Medicine Literature Review: COPD Exacerbation, March 15, 2017
      (4) **Dr. Erik Antonsen**, Pediatric Supraventricular Tachycardia Simulation, April 24, 2019
      (5) **Dr. Erik Antonsen**, Airway Management and Simulation, June 8, 2022
      (6) **Dr. Erik Antonsen**, Introduction to Space Medicine, June 14, 2023

   b) Introduction to Human Space Exploration and Medicine (MESPM 610)
      (1) **Dr. Erik Antonsen***, Exploration Medical Capabilities in Human Spaceflight*, Space Medicine Course (INVITED Lecture), Baylor Center for Space Medicine, October 12, 2017
      (2) **Dr. Erik Antonsen***, Human Systems Risk in Spaceflight*, Space Medicine Course (INVITED Lecture), Baylor Center for Space Medicine, November 29, 2018
      (3) **Dr. Erik Antonsen***, Human Systems Risk in Spaceflight*, Space Medicine Course (INVITED Lecture), Baylor Center for Space Medicine, October 17, 2019
      (4) **Dr. Erik Antonsen***, Human Systems Risk in Spaceflight*, Space Medicine Course (INVITED Lecture), Baylor Center for Space Medicine, October 16, 2020
      (5) **Dr. Erik Antonsen***, Exploration Medical Capabilities in Human Spaceflight*, Space Medicine Course (INVITED Lecture), Baylor Center for Space Medicine, April 12, 2023
      (6) **Dr. Erik Antonsen***, Exploration Medical Capabilities in Human Spaceflight*, Space Medicine Course (INVITED Lecture), Baylor Center for Space Medicine, Feb 14, 2024

c) *Patient, Physician and Society Course (PPS I-II)*

(1) Preceptor for Daelon Morais, MS-1 Fall 2020 (2 hours/month effort x 4 mos)

2. Courses Taught at Other Institutions

a) Medical Physiology, Teaching Assistant, UIUC COM, 2006-2009

b) History, Physical and Diagnosis, Teaching Assistant, UIUC COM, 2009

c) Basic Airway Course, Brigham and Women's Hospital, 2011

d) Anatomy and Physiology Laboratory, Professional EMS, 2011

e) Advanced Cardiac Life Support, Massachusetts General Hospital, 2011-2012

f) Wilderness Medicine, Instructor, Wilderness Medicine Institute, 2013

g) University of Texas Medical Branch Aerospace Medicine Short Course

(1) Dr. Erik Antonsen, Exploration Medical Capabilities for Mars, University of Texas Medical Branch, Aerospace Medicine Short Course (INVITED Lecture), July 10, 2017

(2) Dr. Erik Antonsen, Exploration Medical Capability (INVITED Lecture), Aviation and Space Medicine Course, University of Texas Medical Branch Aerospace Medicine Residency Program, July 3, 2018

h) Aerospace Medicine Clerkship, NASA Johnson Space Center

(1) Dr. Erik Antonsen, Future Exploration and Forward Work: Human System Risk for the Aerospace Medicine Clerkship, (INVITED Speaker), Aerospace Medicine Clerkship, NASA Johnson Space Center, Houston, TX, October 25, 2018

(2) Dr. Erik Antonsen, Human System Risk in Spaceflight, (INVITED Speaker), Aerospace Medicine Clerkship, NASA Johnson Space Center, Houston, TX, October 23, 2019

(3) Dr. Erik Antonsen, Human System Risk in Spaceflight, (INVITED Speaker), Aerospace Medicine Clerkship, NASA Johnson Space Center, Houston, TX, October 19, 2020

i) NASA Johnson Space Center, Health and Medical Technical Authority

(1) Organize and coordinate twice annual Risk Custodian Education Sessions to educate over 60 NASA and KBR scientists, physicians and engineers on Risk Management approaches and processes.

(2) Multiple monthly Risk Custodian Orientation Sessions to initiate human system risk reviews and updates and educate on the needs for specific risks to human spaceflight.

j) NASA Chief Medical Officer's Primer on Human Spaceflight, Aerospace Medical Association Scientific Meeting, April 2019

(1) Dr. Erik Antonsen*,* Module 6: On-Orbit Care and Management of Mission Medical Risk

k) Data Science for Business: Building a Data Driven Organization Short Course, Rice University Online Curriculum, September 4, 2019, Course Contributor for NASA, https://www.youtube.com/watch?v=_hC2bHKovzA

l) Aerospace Physiology and Life Support Systems Engineering, AeroAstro Department 16.423, HST.515, IDS.337, February 6 – May 16, MIT, Cambridge, MA

C. Curriculum Development Work

1. Course: Human System Risk Management, NASA Johnson Space Center, August 2018 – 2021
    - Role in course/curriculum development – asked by NASA Health and Human Performance Directorate to develop curriculum for educating on the needs, approaches and processes for Human System Risk Management at NASA
    - Audience for course/curriculum development – NASA managers, Health and Medical Technical Authority Representatives, and Risk Custodians

2. Course: Risk Custodian Orientation and Process, NASA Johnson Space Center, August 2018-2021
    - Role in course/curriculum development – Asked by NASA Health and Medical Technical Authority to develop training for Risk Custodian teams engaged in updates to risk products for Continuous Risk Management
    - Audience for course/curriculum development – Scientists, physicians, epidemiologists, and engineers assigned to Risk Custodian duties by the Health and Medical Technical Authority at NASA.

3. Fellowship Curriculum: Space Medicine Fellowship Curriculum
    - First Director of Space Medicine Fellowship at BCM as a joint venture between Department of Emergency Medicine and the Center for Space Medicine.
    - Partnered with the Department of Emergency Medicine at Massachusetts General Hospital in Boston, MA,
    - Co-developed first curriculum for acute care Space Medicine.
    - Worked extensively with the American Board of Emergency Medicine and the American Board of Medical Specialties to establish a separate board certification process for Space Medicine.

4. Course: Human System Risk Management
    - Role in course/curriculum development – Instructor: needs, approaches and processes for Human System Risk Management at NASA and in the space industry in general.
    - Audience for course/curriculum development – Space Medicine Fellows at Baylor COM and Massachusetts General Hospital.

D. Non-didactic Teaching

1. Resident Training

a) Clinical: Baylor College of Medicine Department of Emergency Medicine, 126 residents

Ben Taub General Hospital Supervising Attending

(1) 80 hours/month engaged in direct resident education (Emergency Department) at Baylor College of Medicine, 2013-2015

(2) 22.4 hours/month engaged in direct resident education (Emergency Department) at Baylor College of Medicine, 2015-2018

(3) 28 hours/month engaged in direct resident education (Emergency Department) at Baylor College of Medicine, 2018-2022

(4) 100 hours/month engaged in direct resident education (Emergency Department) at Baylor College of Medicine, 2023-present

b) Research Mentorship

Aerospace/Extreme Environmental Medicine Academic/Leadership Track, Baylor Emergency Medicine Residency

(1) Dr. Alex Garbino, BCM Emergency Medicine Resident, 2013-2014
Project Title: High-Altitude Medical Support, StratEx Mission
Role: Space Medicine Research Mentor, PI for project, assisted in medical support capabilities selection, evaluation, testing and implementation, manuscript preparation
Hours Spent: 8 hours per month x 1 year
Current Position: EM Faculty, University of Colorado, Denver, and Research Scientist at NASA Johnson Space Center
Publications/Presentations:

(a) Garbino A, Nusbaum DM, Buckland DM, Menon AS, Clark JB, **Antonsen EL**. Emergency medical considerations in a space-suited patient. *Aerospace Med Hum Perform*. 2016; 87(10): 1 – 5

(b) Menon, AS, Jourdan, D, Nusbaum, DM, Garbino, A, Buckland, DM, Norton, S, Clark, J, **Antonsen, EL** Crew Recovery and Contingency Planning for a Manned Stratospheric Balloon Flight – the StratEx Program. *PreHospital and Disaster Medicine,* 2016, 31 (4): 1-8

(c) Garbino, A, Medical Monitoring in Near Space, Presentation, 86th Aerospace Medical Association Scientific Meeting, May 11, 2015

(d) Garbino, A, Stabilization of Human Freefall by Drogue, Presentation, 86th Aerospace Medical Association Scientific Meeting, May 11, 2015

(e) Antonsen, EL, Emergency Management of a Space Suited Patient, Presentation, 86th Aerospace Medical Association Scientific Meeting, May 11, 2015

(2) Dr. Michelle Chen, BCM Emergency Medicine Resident, 2015
Project Title: Medical Trade Space Quantification
Role: NASA Research Mentor, assisted with development of alternative mathematical and relational models for medical capabilities prioritization for Mars missions
Hours Spent: 3 hours per week x 1 month
Current Position: Flight Surgeon, Axiom Space

(3) Dr. Laura Galdamez, BCM Emergency Medicine Resident, 2016
Project Title: Remote Ultrasound Training, StratEx Mission
Role: PI for project, assisted subject recruitment, data analysis, and manuscript preparation.
Hours Spent: 3-5 hours per month x 6 months
Current Position: EM Attending, Memorial Hermann, Woodlands, TX

(4) Dr. Chris Haas, BCM Internal Medicine Resident, 2016
Project Title: Medical Scenario Development
Role: Research mentor at NASA, supervised role in Clinicians Working Group with concept of operations scenario development for Mars medical capabilities prioritization and interface with systems engineering teams
Hours Spent: 1-4 hours per week x 1 month
Current Position: NASA Flight Surgeon, Johnson Space Center

(5) Dr. Nathan Vafaie, BCM EM research and career mentor, 2017
Project Title: Aerospace Medicine Introduction
Role: Research mentor at NASA, supervised introductory research project at ExMC supporting medical capabilities selection, prioritization, and interface with systems engineering teams
Hours Spent: 2 hours per week x 1 month
Current Position: EM Attending, Medical City, Dallas TX

(6) Dr. Salil Ojha, BCM EM research and career mentor, 2023
Project Title: Renal Stone DAG Updates
Role: Research mentor at BCM, supervised research into directed acyclic graphs as applied to renal stone formation in spaceflight
Hours Spent: 2 hours per week x 1 month
Current Position: EM Resident, Baylor College of Medicine

University of Texas Medical Branch Aerospace Medicine Residency Special Projects

(7) Dr. Dana Levin, UTMB Aerospace Medicine Resident Research Mentor, 2018
Project Title: Medical Data Architecture Informatics
Role: Research mentor at NASA, supervised clinical advisory role embedded at NASA Ames Research Center for spacecraft medical software and data architecture development
Hours Spent: 2 hours per week x 1 month
Current Position: Medical Director, Vast Space, Los Angeles, CA

University of Texas Medical Branch Aerospace Medicine Residency Capstone Committees

(8) Dr. Benjamin Johansen, UTMB Aerospace Medicine Resident Mentor, 2015
Project Title: Pulmonary Ultrasound Applications for Aerospace Medicine
Role: Capstone Project Committee Member and NASA research mentor
Hours Spent: 3-5 hours per month x 1 year
Current Position: NASA Flight Surgeon, Johnson Space Center, TX
Publications/Presentations:

(a) Johansen, B, Blue, R, Castleberry, T, Antonsen, EL, Van Der Plough, J, Point of Care Ultrasound for Pulmonary Concerns in Remote Spaceflight Triage Environments, *Aerospace Med Hum Perform* 2018; 89(2):122-129

(9) Dr. Chris Haas UTMB Aerospace Medicine Resident Mentor, 2018
Project Title: OmicsSpace: A Proposed Omics Data Plan for NASA Human Research and Clinical Investigations
Role: Capstone Committee Member and NASA research mentor
Hours Spent: 3-5 hours per month x 1 year
Current Position: NASA Flight Surgeon, Johnson Space Center, TX
Publications/Presentations:

(a) Haas, CT, Fogtman, A, Wotring, V, Antonsen, EL, Omics Programs and Applications for Astronaut Research and Clinical Investigations, Submitted to *Aerospace Med Hum Perform* April 2019, in review

(10) Dr. Col. Michael Rhodes, UTMB Aerospace Medicine Resident Mentor, 2021
Project Title: Policy Survey Regarding the Use of Genetic Information among Aerospace/Space Operations Organizations
Role: Capstone Committee Member and NASA Mentor
Hours Spent: 3-5 hours per month x 1 year
Current Position: USAF Colonel

Aerospace Medicine Clerkship, NASA Johnson Space Center (Residents and Fellows)

(11) Dr. Dan Buckland, George Washington University Emergency Medicine Resident, 2015
Project Title: Medical System Risk Quantification
Role: Supervisor, clinical input and review to probabilistic risk assessment models, face validation
Hours Spent: 2 hours per week x 1 month
Current Position: Faculty in Emergency Medicine and Mechanical Engineering, Duke University, NC and Deputy Assistant Director for Human System Risk Management, Human Health and Performance Directorate, Johnson Space Center, Houston, TX

(12) Dr. Elizabeth Sarah Nowak, Med-Peds Resident Metro Health Center, 2017
Project Title: Blood Transfusion for Deep Space Exploration
Role: NASA Research Mentor, coordinated with US Army and UTMB Polar Medicine experts to review literature relevant to blood transfusion options in deep space. Assisted with manuscript preparation.
Current Position: Resident Internal Medicine/Pediatrics, Metro Health, Case Western Reserve, Cleveland, OH
Publications/Presentations:

(a) Nowak, E, Reyes, DP, Bryant, BJ, Cap, AP, Kerstman, E, **Antonsen, EL**, Blood Transfusion for Deep Space Exploration, *Transfusion*, September 2019;9999;1–7; doi:10.1111/trf.15493

2. Medical Student Research Training

Space Medicine Research (MESPM 615), Center for Space Medicine, BCM

(1) Dr. Laura Galdamez, BCM medical student, 2014
Project Title: Ultrasound Field Applications, StratEx Mission
Role: PI for project, assisted in medical support algorithm creation and implementation, manuscript preparation
Hours Spent: 3-5 hours per month x 1 year
Current Position: EM Attending, Memorial Hermann, Woodlands, TX
Publications/Presentations:

(a) Galdamez, LA, Clark, JB, **Antonsen, EL**, Point of Care Ultrasound Utility and Potential for High Altitude Crew Recovery Missions, *Aerospace Med Hum Perform*. 2016; 88(2) pp.128-136

(2) Dr. Adil Ahmed, BCM Medical Student, 2014
Project Title: Plasma Medicine Applications
Role: Space Medicine Research Mentor, supervised literature review for implications of diabetes and wound healing in spaceflight.
Hours Spent: 3-5 hours per month x 1 year
Current Position: Resident Orthopedic Surgery, University of South Florida, FL
Publications/Presentations:

(a) Ahmed, AS, Chavarria, J, Brenneman, T, Johnson, K, **Antonsen, EL**, Rosenfeld, S, Osteogenic Induction of Human Mesenchymal Stem Cells by Cold Atmospheric Argon Plasma, *Plasma Medicine*, 6(2), 193-207, 2016

(3) Dr. Rahuul Ramakrishnan, BCM Medical Student, 2014
Project Title: Spinal Ultrasound Applications in Spaceflight
Role: Space Medicine Research Mentor, supervised literature review for spinal ultrasound applications in spaceflight.
Hours Spent: 3-5 hours per month x 1 year
Current Position: Director and Solution Lead at Clarify Health
Publications/Presentations:

(a) Ahmed, AS, Ramakrishnan, R, Ramachandran, V, Ramachandran, SS, Phan, K, Antonsen, EL, Ultrasound Diagnosis and Therapeutic Intervention in the Spine, *J Spine Surg*, 2018 Jun;4(2):423-432

(4) Dr. Andrew Holt, BCM Medical Student, 2015
Project Title: *Telementoring & Ultrasound Guidance in Lumbar Puncture by Inexperienced Personnel*
Role: PI on project, supervised laboratory setup, experimental protocol, IRB application, recruitment of subjects, and collection and analysis of data.
Hours Spent: 3-5 hours per month x 1 year
Current Position: Resident, Orthopedic Surgery, University of Tennessee Health Science Center, Memphis, TN

(5) Dr. Adil Ahmed, BCM Medical Student, 2014
Project Title: *Spaceflight Immunologic Implications for Terrestrial Diabetes*
Role: Space Medicine Research Mentor, supervised literature review for implications of diabetes an wound healing in spaceflight.
Hours Spent: 3-5 hours per month x 1 year
Current Position: Assistant Professor Orthopedic Surgery, Baylor College of Medicine, Houston, TX
Publications/Presentations:

(a) Ahmed, AS, Antonsen, EL Immune and Vascular Dysfunction in Diabetic Wound Healing, *Journal of Wound Care*, North American Supplement, July 2016; 25 Suppl 7:S35-46

(b) Ahmed, AS, Wang, R, Ramachandran, V, Antonsen, EL, *Immune Dysfunction in Spaceflight and Diabetes Mellitus: Translating Space Observations to Terrestrial Disease*, McGill Journal of Medicine, 07 Sept 2019, Published Online, https://www.mjmmed.com/article?articleID=54

Aerospace Medicine Clerkship, NASA Johnson Space Center (Medical Students)

(6) Dr. Shane Walker, UCSF Medical Student, 2016
Project Title: Trade Space Quantification for Medical Systems
Role: Supervisor, one month project providing clinical input and review to clinical relational database models for spaceflight medical capabilities development
Hours Spent: 2 hours per week x 1 month
Current Position: Family Medicine Resident, Natividad Medical Center, Salinas, CA

(7) Kseniya Masterova, UTMB MD/PhD Student, 2017
Project Title: Sex and Gender Effects for Medical Care in Spaceflight
Role: NASA Research Mentor, summer research project using PRA analysis to assess sex and gender differences in spaceflight medical condition incidence
Hours Spent: 5 hours per week x 3 month
Current Position: MD/PhD Student at University of Texas Medical Branch, Galveston, TX

(8) Dr. Cathleen Chen, University of North Texas Health Sciences Center Medical Student, April 2019
Project Title: *Precision Medicine for Human Spaceflight*
Role: NASA Research Mentor, supervised project assessing pharmacogenomic mapping to medications needed to treat exploration spaceflight medical conditions
Hours Spent: 3 hours per week x 1 month
Current Position: Resident Physician, Texas Institute of Graduate Medical Education and Research, San Antonio, TX
Publications/Presentations:

(a) Chen, C, Antonsen, EL, Precision Medicine in Human Spaceflight, *Poster*, NASA Johnson Space Center, April 2019

(9) Alex Svoronos, Yale University, April 2021
Project Title: Venous Thromboembolism Directed Acyclic Graphing

Role: NASA Research Mentor, supervised project creating the VTE directed acyclic graph for risk assessment
Hours Spent: 3 hours per week x 1 month
Current Position: MD/PhD student, Yale University, New Haven, CT

(10) Travis Lambert, American University of the Caribbean School of Medicine, April 2021
Project Title: Celestial Dust Directed Acyclic Graphing

Role: NASA Research Mentor, supervised project creating the celestial dust directed acyclic graph for risk assessment
Hours Spent: 3 hours per week x 1 month

Current Position: MD student, American University of the Caribbean, St. Maarten

(11) Jessica Ward, American University of the Caribbean School of Medicine, April 2021
Project Title: Sleep and Workload Risk Directed Acyclic Graphing

Role: NASA Research Mentor, supervised project creating the sleep and workload risk directed acyclic graph for risk assessment
Hours Spent: 3 hours per week x 2 months
Current Position: Emergency Medicine resident, Beth Israel Deaconess Medical Center, Boston, MA

(12) Jessica Ward, American University of the Caribbean School of Medicine, May 2022
Project Title: Levels of Evidence for Human System Risk Management

Role: NASA Research Mentor, supervised project creating the sleep and workload risk directed acyclic graph for risk assessment
Hours Spent: 3 hours per week x 2 months
Current Position: Emergency Medicine resident, Beth Israel Deaconess Medical Center, Boston, MA

(13) Merwan Faraj, VCOM, Carolinas, October 2022
Project Title: Development of a Directed Acyclic Graph for Renal Stone Formation in Spaceflight

Role: NASA Research Mentor, supervised project creating the renal stone directed acyclic graph for risk assessment
Hours Spent: 3 hours per week x 1 month
Current Position: MD student

(14) Kenny Chao, SUNY Downstate School of Medicine, October 2022
Project Title: Bridging Directed Acyclic Graphs to NASA Technical Standards for Microbial Risk

Role: NASA Research Mentor, supervised project

Hours Spent: 3 hours per week x 1 month
Current Position: Space Medicine Fellow, Massachusetts General Hospital, Boston, MA

NASA Pathways Internship, NASA Johnson Space Center (Medical Students)

(15) Charlotte Brown, 2021
Project Title: *Directed Acyclic Graph Development*
Role: Supervisor, summer internship project providing guidance and teaching on graph theory and risk networks.
Hours Spent: 4 hours per week x 3 months
Current Position: Computer Science Undergraduate Student, University of Michigan Ann Arbor, MI

(16) Kristina Marotta, September 2021- May 2022
Project Title: *Directed Acyclic Graph Development*
Role: Supervisor, fall internship project providing guidance and teaching on graph theory and risk networks.
Hours Spent: 4 hours per week x 4 months
Current Position: Owner, Aesthetic Alchemy

(17) Kitan Abidemi Akinoshi, 2021
Project Title: *Causal Flow in Acoustics Risk in Human Spaceflight*
Role: Supervisor, fall internship project providing guidance and teaching on graph theory and risk networks.
Hours Spent: 4 hours per week x 4 months
Current Position: Emergency Medicine resident, Beth Israel Deaconess Medical Center, Boston, MA

(18) Kevin Hyuhn, University of Pittsburgh School of Medicine, June 2023
Project Title: Network Science for Human Systems Risks: From Insight to Action on Risk of Renal Stone Formation

Role: NASA Research Mentor, supervised project

Hours Spent: 3 hours per week x 1 month
Current Position: Medical Student, University of Pittsburgh

3. Medical Student COVID Group Projects

As part of the Ben Taub Emergency Department early response to COVID I organized Baylor Medical Students from the Emergency Medicine Interest Group into teams to support the department in achieving three goals: 1. Decrease viral transmission opportunities, 2. Protect health care workers and patients, and 3. Preserve and provide valuable PPE.

a) *Electronic PPE Team (March – June 2020)*

Ryan Richardson MS-3 Group Leader, Team Members: Madhushree Zope, Andrew Thorsen, Raj Reddy, Joseph Pecha, Katie Jones, Anna Poliner and Erica Ding
Role: Organized and coordinated student group efforts to research and provide in-room software approaches to minimize patient transmission opportunities using iPads. Co-faculty advisor with Dr. Farzad Soleimani.
Hours Spent: 5 hours per week x 3 months
Outcomes: Student group solicited 17 iPad donations and worked with Harris Health IT to set up software compliant with Harris Health Requirements. Created a quick start guide for physicians, nurses and consultants. Developed a protocol for Facetime calls for in-room telemedicine, did testing and trouble-shooting with iPads in rooms. Procedures are now standard for psychiatry consultation with patients in the EC Respiratory Distress Unit.

b) Health Note Team (March – June 2020)

Lauren Taylor MS-3 Group Leader, Team Members: Saira Alex, Elliot Baerman, Joshua Chakranarayn, Lucia Guerrero, Maneesha Julakanti, Sophie Lin, Anna Poliner, Lauren Taylor, Erica Valdes, Anna Poliner, Ricardo Najera, Andrew Yang, Vedika Agrawal, Jason Xu
Role: Organized and coordinated student group efforts to evaluate Health Note software and provide site-specific advising to software development company. Co-faculty advisor with Dr. Farzad Soleimani.
Hours Spent: 5 hours per week x 3 months
Outcomes: The team worked with the company Health Note to develop and mature their survey software as a method to use patient phones to allow self-screening into either the Respiratory Distress Unit or the non-covid area of the EC. This is an innovative use of their software which has not been used for Emergency Medicine purposes before. Team developed patient flow approaches and tested them with in-hospital nursing and physician teams.

c) Outpatient Telemed Team (March – June 2020)

Hunter Bechtold MS-3 Group Leader, Team Members: Saira Alex, Sophie Lin, Jake Fields, and Joann Pan
Role: Organized and coordinated student group efforts to investigate how faculty who are recovering from or require accommodation for Covid can still

contribute to patient care in the EC. Co-faculty advisor with Dr. Farzad Soleimani.
Hours Spent: 5 hours per week x 3 months
Outcomes: They created and tested processes, provided telemedicine training sessions to EC providers including faculty and APPs, reviewed publications on legal requirements and outlined documentation and smartphrase improvements for EPIC. Team provided training to 48 faculty, residents, and APPs for iPad and Facetime use for patient care in the EC while working from home.

d) PPE Donation Drive Team (March – June 2020)

Melissa Kok MS-3 Group Leader, Team Members: Peter Yun, Savannah Bryce, Maria Vigil-Malletter, Sarah Durbin, Soumia Gogia, Rachel Miller, David Farrier, Eric Wei, Samantha Morgan, Linfeng Lu, Lacey Stribling, Mary Robichaux, Erica Ding, Arin Drtil, Allen Hu, Laura Keenahan, Paige Killelea, Gillean Kelly, Jeremy Brown, Lorna Min, Kevin Kiang, Sidra Deen
Role: Organized and coordinated student group efforts to create and run a personal protective equipment donation drive for Baylor College of Medicine. Co-faculty advisor with Dr. Frank Peacock and Dr. Jennifer Carnell.
Hours Spent: 5 hours per week x 3 months
Outcomes: Organized the logistics for a PPE donation drive. Received BCM official support and sponsored publicity. Began with a smaller friends and family donation drive and later upscaled to a broad student-based social medica outreach and BCM-sponsored outreach to collect donations throughout Harris County. Collected over 11,600 items of PPE from over 30 individuals, companies and organizations.

4. Clinical Fellow Training
    a) *MGH-BCM Space Medicine Fellowship 2022-present*
        (1) Dr. Luke Apisa – MGH Campus, current fellow
        (2) Dr. Carlo Canepa – BCM Campus, current fellow
        (3) Dr. Kenny Chao – MGH Campus, current fellow

    b) *ExMC Special Projects, NASA Ames Research Center*
        (1) Dr. Elijah Bell, Medical Informatics Fellow, UCLA Emergency Medicine, 2017
        Project Title: Clinical Informatics in Spaceflight Data Architecture
        Role: NASA Special Projects Research Mentor, supervised clinical advisory role embedded at NASA Ames Research Center for spacecraft medical software and data architecture development
        Hours Spent: 1-2 hours per week x 3 months
        Current Position: Faculty Emergency Medicine, UCLA and Physician Informaticist, UCLA Health

5. Graduate Student Training
    a) *Aerospace Medicine Clerkship, NASA Johnson Space Center*
        (1) Connor Cullinane, PhD Candidate, MIT, 2016
        Project Title: Medical Monitoring in Extravehicular Activity
        Role: NASA Space Technology Research Mentor, supervised subject matter expert survey generation, implementation and reporting
        Hours Spent: 3-5 hours per week x 1 month
        Current Position: Founder, President and CEO at Pirouette Medical LLC
        Publications/Presentations:
        (a) Cullinane, CR, Suited Exploration SME Consultation Results – NASA-STD-3001 Vol. 2 Updates, Exploration Medical Capabilities Forum, Johnson Space Center, October 26, 2016

6. Other Teaching and Mentorship
    a) Baylor Global Health Institute Hack-a-Thon, Faculty Mentor, 2015
    b) Texas Two Step CPR Education, Faculty Participant, 2016
    c) Baylor Global Health Institute Hack-a-Thon, Faculty Mentor, 2017
    d) Johns Hopkins Space Medicine Journal Club (Invited Contributor), August 24, 2020
    e) Carnegie Mellon University Student Team Talos for Human Computer Interactions - NASA Consultant, Spring Semester 2020

7. Non-didactic Teaching at BCM
    a) Baylor Emergency Medicine Journal Club Faculty Participant, October 2013
    b) Baylor Emergency Medicine Journal Club Faculty Participant, February 2014
    c) Baylor Emergency Medicine Journal Club Faculty Lead, May 2016
    d) Baylor Emergency Medicine Journal Club Faculty Lead, January 18, 2017
    e) Baylor Emergency Medicine Journal Club Faculty Lead, March 21, 2018

f) Baylor Emergency Medicine Journal Club Faculty Host, March 18, 2019
g) Baylor Emergency Medicine Journal Club Faculty Co-Host, September 21, 2020
h) Baylor Emergency Medicine Resident Conference Faculty Host, October 7, 2020
i) Baylor Emergency Medicine Journal Club Faculty Co-Host, October 18, 2021
j) Baylor Emergency Medicine Journal Club Faculty Co-Host, October 24, 2022
k) Baylor Emergency Medicine Journal Club Faculty Co-Host October 17, 2023

E. Lectures

1. International

a) Dr. Erik Antonsen, *Remote Medicine in Human Spaceflight* (INVITED Lecture), Scott Base, New Zealand Antarctic Program, Antarctica, November 22, 2017
b) Dr. Erik Antonsen, *On-Orbit Care and Management of Mission Medical Risk* (INVITED Lecture), NASA Chief Medical Officer's Primer on Human Spaceflight, Aerospace Medical Association Scientific Meeting, Las Vegas, NV, May 5, 2019
c) Dr. Erik Antonsen, *The Space Medicine Field* (INVITED Lecture), Aerospace Medicine Student and Resident Organization Annual Meeting, Aerospace Medical Association Scientific Meeting, Las Vegas, NV, May 7, 2019

2. National

a) Dr. Erik Antonsen, *Emergency Management of a Space Suited Patient,* 86th Annual Aerospace Medicine Association Meeting, StratEx Panel Member, May 13, 2015
b) Dr. Erik Antonsen, *Exploration Medical Capabilities Gap Restructuring*, NASA Human Research Program Science Management Panel, Johnson Space Center, August 20, 2015
c) Dr. Erik Antonsen, *Ground Control to Major Peacock: Emergency Crew Recovery for High Altitude and Commercial Spaceflight Applications,* Emergencies in Medicine Conference, March 8, 2016
d) Dr. Erik Antonsen, *Exploration Medical Capability,* NASA Engineering Pursuit Forum, Johnson Space Center, March 28, 2016
e) Dr. Erik Antonsen, *Exploration Medical Data Architecture* (INVITED Lecture), Big Data Big Think Forum, NASA Johnsons Space Center, April 6, 2016
f) Dr. Erik Antonsen, *How I Failed and Turned it into Success,* (INVITED Lecture), Innovation Garage, University of Illinois at Urbana-Champaign, September 11, 2016
g) Dr. Erik Antonsen, *Medicine and Engineering in Human Spaceflight, Medical Scholars Program Grand Rounds* (INVITED Lecture), University of Illinois Urbana-Champaign, September 12, 2016
h) Dr. Erik Antonsen, *Planning for Mars: An Exploration Overview,* Johns Hopkins Applied Physics Laboratory (INVITED Lecture), November 4, 2016
i) Dr. Erik Antonsen, *Medicine at the End of the Earth: ExMC in Antarctica,* (INVITED Lecture) NASA Health and Human Performance Management Meeting, NASA Johnson Space Center, March 1, 2018
j) Dr. Erik Antonsen, *Challenges in Medicine and Engineering in Human Spaceflight* (INVITED Seminar Lecture), AE 590 Seminar, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, March 26, 2018

k) Dr. Erik Antonsen*, Human System Risk Assessment,* (INVITED Lecture) NASA and DOD, NASA Johnson Space Center, July 25, 2018

l) Dr. Erik Antonsen*, Jumping from the Edge of Space: Supporting the Stratos and StratEx Missions,* (INVITED Lecture), Illinois Space Society, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, September 20, 2018

m) Dr. Erik Antonsen*, Introduction to Space Medicine,* (INVITED Speaker), Grand Rounds, Brooke Army Military Medical Center, Department of Medicine, San Antonio, TX, October 12, 2018

n) Dr. Erik Antonsen*, Red Cross for a Red Planet,* (INVITED Speaker), Conversations in Medicine Lecture Series, Johns Hopkins University, Baltimore, MD, April 1, 2019

o) Dr. Erik Antonsen*, Engineering a Medical System for Human Spaceflight, (INVITED Speaker)* EHS 6227, Introduction to Human Health in Space, George Washington University Medical School, April 1, 2019

p) Dr. Erik Antonsen*, Human System Risk for Spaceflight* (INVITED Speaker), Howard Hughes Medical Institute Fellows Program Annual Meeting, MD Anderson Cancer Center, Houston, TX, April 28, 2019

q) Dr. Erik Antonsen*, Careers in Medicine – Space Medicine* (INVITED Speaker), National Student Leadership Conference for Medicine and Healthcare, Rice University, Houston, TX, July 12, 2019; *https://rice.nslcleaders.org/2019/07/13/dr-erik-antonsen-guest-speaker/*

r) Dr. Erik Antonsen*, Getting to Mars: Medical Planning for the Red Planet* (INVITED Speaker), Grand Rounds, Department of Medicine, Uniformed Services University, Walter Reed Hospital, Washington, DC, July 26, 2019

s) Dr. Erik Antonsen*, Aerospace Engineering and Medicine* (INVITED Speaker), Aerospace Engineering High School Summer Camp, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, Urbana, IL, July 24, 2020

t) Dr. Erik Antonsen, *The Evolving Future of Human Spaceflight* (INVITED Speaker), Grand Rounds, Dept. of Emergency Medicine, University of Colorado Anschutz Campus, Aurora, CO, December 2, 2020

u) Dr. Erik Antonsen, *The Changing Field of Space Medicine* (INVITED Speaker), Grand Rounds, Harvard Affiliated Emergency Medicine Residency Program, Massachusetts General Hospital, September 28, 2021

v) Dr. Erik Antonsen, *The Changing Field of Space Medicine* (INVITED Speaker), *IDPT 8059: Human Spaceflight Factors & Medical Risk Assessment,* University of Colorado Anschutz Campus, Aurora, CO, October 4, 2021

w) Dr. Erik Antonsen, *The Changing Field of Space Medicine* (Invited Speaker), Grand Rounds, Mt. Sinai Department of Emergency Medicine, Mt. Sinai Hospital, NY, NY, January, 11, 2023

x) Dr. Erik Antonsen, *Introduction to Space Medicine* (Invited Speaker), Grand Rounds, Mayo Clinic Department of Critical Care, Mayo Clinic, Phoenix, AZ, December 14, 2023

3. Regional

a) **Dr. Erik Antonsen**, *Planning for Mars: An Exploration Medicine Overview,* University of Texas Medical Branch Aerospace Medicine Grand Rounds (INVITED lecture), October 11, 2016

b) **Dr. Erik Antonsen**, *The Human Spaceflight Business*, Professional Science Master's Seminar (Invited Lecture), Rice University Business School, March 17, 2021

4. Local

a) **Dr. Erik Antonsen**, *Introduction to Space Medicine*, Space Medicine Interest Group (INVITED Lecture), Baylor College of Medicine, August 14, 2014

b) **Dr. Erik Antonsen**, *The Intersection of Emergency and Space Medicine,* Emergency Medicine Interest Group (INVITED Lecture), Baylor College of Medicine, September 23, 2015

c) **Dr. Erik Antonsen**, *Spaceflight Medicine Careers* (INVITED Speaker), DeBakey High School for Health Professions, Baylor College of Medicine, Houston, TX, April 19, 2018

d) **Dr. Erik Antonsen**, *Human System Risk in Spaceflight* (INVITED Lecture), Grand Rounds, Department of Physical Medicine and Rehabilitation, Baylor College of Medicine, Houston, TX, July 24, 2019

e) **Dr. Erik Antonsen**, *Space Medicine and Risk in Human Spaceflight*, Space Medicine Interest Group (INVITED Lecture), Baylor College of Medicine, September 17, 2019

F. Visiting Professorships and Boards

1. Alumni Academic Board, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, 2018-2020

IV. Patient Care and Clinical Contributions

A. Patient Care Responsibilities

1. Department of Emergency Medicine

a) Emergency Medicine Attending, Ben Taub General Hospital

(1) 20 hours/week Emergency Medicine, 2013-2015

(2) 5.6 hours/week Emergency Medicine, 2015-2018

(3) 7 hours/week Emergency Medicine, 2018-2023

(4) 24 hours/week Emergency Medicine, 2023-present

B. Clinical Leadership or Business Development (describe roles and documented outcomes)

1. Assistant Director, Human Health and Performance at NASA Johnson Space Center – Role includes chairing the Human System Risk Board at NASA, leading Risk analysis for the Human Health and Performance Directorate at Johnson Space Center, and acting as a Health and Medical Technical Authority delegate for Risk Management.

a) *Innovated new approaches to Human System Risk Management including guiding the creation of risk Directed Acyclic Graphs for formalized cross-risk analysis capabilities, updating quantitative risk management, and updating levels of evidence requirements for risk interpretation.*

b) *Recruited two physician scientists for NASA that received multi-year Federal IPA contracts.*

c) *In 2018 secured $300k in first time funding for Risk Custodian teams to perform formal risk analysis as a partnership between research and operations cohorts at NASA.*

d) *In 2019 secured $100k in funding for quantitative Risk Analysis approaches using the Integrated Medical Model for board held Design Reference missions.*

e) *In 2019 secured $633k for evaluating and updating Risk Management Software approaches for the Human System Risk Board.*

C. Voluntary Health Organization Participation

1. Aid for Ecuador, Co-founder, Treasurer, 2004-2006
2. HeRMES Free Clinic, Student Volunteer 2006-2009
3. Kalingalinga Foundation, Fundraiser, Volunteer, 2007-2008
4. Bienestar: Medical Students Against Health Disparities, Board Member, 2006-2012
5. Wings over Houston Medical Support, 2011
6. Red Bull Stratos Mission Medical Support, 2012
7. Rice Business Plan Competition, NASA Judge – Health Technologies Section, April 2019

D. Contributions to Health and Science Policy (institutional, regional, state, or federal level)

1. Chair, Human System Risk Board, NASA Johnson Space Center (Federal Level), May 2018 – present

a) *HSRB is responsible for establishing the human system risk posture for NASA and assisting with policy related to risk mitigation for human crews in spaceflight.*

b) *Chair weekly board meetings that are decisional for the Health and Medical Technical Authority at NASA and affect resource allocation for operational, research, clinical, and occupational surveillance activities at NASA.*

c) *Evaluate and recommend updates to NASA Standards and to Operational Technology acceptance for human spaceflight programs.*

2. Organizer and Panelist, Health Law and Policy in Space Symposium, University of Houston Health Law and Policy Institute, November 2, 2018 (Regional Level)

3. Organized and facilitated NASA Radiation Risk Panel, August 21, 2020 (Federal Level)
    a) *Brought together clinical and epidemiologic experts from across the nation to review and provide input on NASA radiation risk approaches and exposure limits for astronauts*
    b) *Resulted in modification of NASA radiation standard for astronauts that increase permissible time in space across the astronaut corps.*
4. Co-Chair, Achieving Mars X Workshop, Explore Mars Inc, December 2023 (Federal Level)
    a) *Led an integrated workshop designed to bring together planetary scientists, human health and performance experts, and engineering architects and designers to develop interdisciplinary design recommendations to NASA for Mars Exploration.*

V. Service Contributions

A. Administrative Assignments and Committees

1. Department Committees
    a) Faculty Promotions Committee, Department of Emergency Medicine, Baylor College of Medicine, 2022-2023

2. Institution-wide or Administration, Committees, etc.
    a) Educational Policy Committee, UIUC School of Medicine, 2009
    b) Journal Club Committee Member, Harvard Affiliated Emergency Medicine Residency, 2010-2011
    c) Journal Club Committee Chairman, Harvard Affiliated Emergency Medicine Residency, 2011-2012
    d) Aerospace Medical Association Science and Technology Committee member, 2012-2016
    e) Aerospace Medical Association Education and Training Committee member, 2016-2020
    f) Aerospace Medical Association Education and Training Committee Chair, 2022 - present
    g) NASA Human Research Program Investigators Workshop, Steering Committee Member, January 2017
    h) NASA Human Research Program Investigators Workshop, Steering Committee Member, January 2018

B. National, Regional or Local Participation in Professional or Voluntary Organizations

a) American Institute of Aeronautics and Astronautics (AIAA), Senior Member 1996-present
b) American Medical Student Association (AMSA), member 2004 – 2009
c) Society of Academic Emergency Medicine (SAEM), member 2009-2013

d) Emergency Medicine Residents Association, member 2009-2013
e) American College of Emergency Physicians (ACEP), Fellow 2009-present
f) American Academy of Emergency Medicine (AAEM), Fellow 2009-present
g) Aerospace Medical Association (AsMA), Associate Fellow, 2011-present
h) Society of NASA Flight Surgeons, member 2015 – present
i) Harris County Medical Society, member 2018 – present
j) Texas Medical Association, member 2018 – present
k) Aerospace Engineering Alumni Curriculum Board Member, Department of Aerospace Engineering, University of Illinois at Urbana-Champaign, 2018-2020

C. Other Pertinent Information (not given above, including community service)

1. Wings over Houston volunteer medical support, October 2021 and 2023. Faculty co-sponsor for Baylor Emergency Medicine Residency participation in volunteer medical support for the event.