Torin K. Clark, Ph.D.

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Smead Aerospace Engineering Sciences
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ACADEMIC APPOINTMENTS

2015 – present UNIVERSITY OF COLORADO – BOULDER (Boulder, Colo.)
Associate Professor, Smead Aerospace Engineering Sciences (2023-present)
Faculty Member, Biomedical Engineering Program (2019-present)
Assistant Professor, Smead Aerospace Engineering Sciences (2016-2023)
Faculty Affiliate, BioServe Space Technologies (2016-present)
Faculty Affiliate, Biomedical Engineering Program (2019-present)
Visiting Assistant Professor (2015-2016)

2013 – 2016 MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Cambridge, Mass.)
Research Affiliate, Man Vehicle Laboratory

2013 – 2015 HARVARD MEDICAL SCHOOL (Boston, Mass.)
National Space Biomedical Research Institute First Award (Post-doctoral) Fellow
Jenks Vestibular Physiology Laboratory, Massachusetts Eye and Ear Infirmary, Otology and Laryngology

EDUCATION

2008 – 2013 MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Cambridge, Mass.)
Doctor of Philosophy, August 2013
Humans in Aerospace Engineering, Department of Aeronautics and Astronautics
Minor Area: Control of Autonomous Systems
Master of Science, June 2010
Department of Aeronautics and Astronautics

2004 – 2008 UNIVERSITY OF COLORADO – BOULDER (Boulder, Colo.)
Bachelor of Science, May 2008
Department of Aerospace Engineering Sciences, Summa Cum Laude
Minor in Applied Mathematics

RESEARCH EXPERIENCE

2023 – Present UNIVERSITY OF COLORADO – BOULDER (Boulder, Colo.)
Associate Professor – Bioastronautics Laboratory, SmeadAerospace Engineering Sciences

2015 – 2023 UNIVERSITY OF COLORADO – BOULDER (Boulder, Colo.)
Assistant Professor – Bioastronautics Laboratory, Smead Aerospace Engineering Sciences

2013 – 2015 HARVARD MEDICAL SCHOOL (Boston, Mass.)
Post-doctoral Fellow – Jenks Vestibular Physiology Laboratory, Massachusetts Eye and Ear Infirmary, Otology and Laryngology
Mentor: Prof. Daniel M. Merfeld (Mass. Eye and Ear Infirmary, currently at Ohio State)

2010 – 2013 MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Cambridge, Mass.)
Research Assistant – Man-Vehicle Laboratory & Charles Stark Draper Laboratory
Thesis Title: Human Perception and Control of Vehicle Roll Tilt in Hyper-Gravity
Committee: Prof. Laurence R. Young (MIT), Dr. Charles M. Oman (MIT), Prof. Daniel M. Merfeld (Massachusetts Eye and Ear Infirmary), Dr. Kevin R. Duda (Draper)

2008 – 2010 MASSACHUSETTS INSTITUTE OF TECHNOLOGY (Cambridge, Mass.)
Research Assistant – Man-Vehicle Laboratory & Charles Stark Draper Laboratory
Thesis Title: Human Spatial Orientation Perception during Simulated Lunar Landing

Advisors: Prof. Laurence R. Young (MIT), Dr. Kevin R. Duda (Draper)

2006 – 2008 UNIVERSITY OF COLORADO – BOULDER (Boulder, Colo.)
Undergraduate Research Assistant, Microfluidics Laboratory
Advisor: Prof. Kamran Mohseni (Univ of Colorado, currently at Univ of Florida)

AWARDS & RECOGNITION

2022 Outstanding Junior Faculty, Smead Aerospace Engineering Sciences Department
2022 Summer Faculty Research Senior Fellow for the Office of Naval Research (ONR)
2018 Summer Faculty Research Fellow for the Office of Naval Research (ONR)
2018 Outstanding Mentor Award from the CU Undergrad Research Opportunities Program
2016 – 2017 National Academies' Forum for New Leaders in Space Science
2014 Stanley Roscoe Award for Best Doctoral Thesis (Aerospace Human Factors Association)
2013 – 2015 NSBRI First Award Fellowship Recipient
2013 MIT Aero-Astro Technical Communication Competition Finalist (2nd place)
2012 – 2013 MIT Aero-Astro Boeing Fellow
2011 – 2013 MIT Graduate Student Council Executive Committee
2008 – 2013 Charles Stark Draper Laboratory Fellow
2009 – 2010 Graduate Association of Aeronautics and Astronautics Executive Committee
2005 – 2008 Tau Beta Pi – Engineering Honor Society
2005 – 2008 Sigma Gamma Tau – Aerospace Honor Society

Security clearance, Secret level – 2018 (expires 2028)

RESEARCH

AIAA – American Institute of Aeronautics and Astronautics
IEEE – Institute of Electrical and Electronics Engineers
RSS – Robotics: Science and Systems
ASME – American Society of Mechanical Engineers

PUBLICATIONS

Students/mentees denoted in italics.

Journal Articles (refereed)

1. **Clark, T.K.**, Young, L.R., Stimpson, A.J., Duda, K.R., Oman C.M. "Numerical Simulation of Human Orientation perception during Lunar Landing" Acta Astronautica 2011, 69(7-8): 420-428. doi: 10.1016/j.actaastro.2011.04.016.
2. **Clark, T.K.**, Stimpson, A.J., Young, L.R., Oman, C.M., Duda, K.R., Natapoff, A. "Human Spatial Orientation Perception during Simulated Lunar Landing Motions" AIAA Journal of Spacecraft and Rockets 2014, 51(1): 267-280. doi: 10.2514/1.A32493.
3. **Clark, T.K.**, Newman, M.C., Oman, C.M., Merfeld, D.M., and Young, L.R. "Human Perceptual Overestimation of Whole-Body Roll Tilt in Hyper-Gravity" Journal of Neurophysiology 2015, 113(7): 2062-77. doi: 10.1152/jn.00095.2014.
4. **Clark, T.K.**, Newman, M.C., Oman, C.M., Merfeld, D.M., and Young, L.R. "Human Manual Control Performance in Hyper-Gravity" Experimental Brain Research 2015, 233: 1409-1420. doi: 10.1007/s00221-015-4215-y.
5. **Clark, T.K.**, Newman, M.C., Oman, C.M., Merfeld, D.M., and Young, L.R. "Modeling Human Dynamic Perception of Orientation in Altered Gravity" Frontiers in Systems Neuroscience Special

Topic: A Multidisciplinary Approach to Designing Sensorimotor Adaptation Countermeasures for Space Exploration Missions 2015, 9. doi: 10.3389/fnsys.2015.00068.

6. Merfeld, D.M., **Clark, T.K.**, Yue, L.M., and Karmali, F. "Dynamics of Individual Perceptual Decisions" Journal of Neurophysiology 2016, 115(1):39-59. doi: 10.1152/jn.00225.2015. Highlighted as "Featured Article" on the Journal of Neurophysiology homepage.
7. *Bermudez Rey, M.C.*, **Clark, T.K.**, Wang, W., Leeder, T., Bian, Y., Merfeld, D.M. "Vestibular Perceptual Thresholds Increase above the Age of 40" Frontiers in Neurology 2016, 7:162. doi: 10.3389/fneur.2016.00162.
8. Diaz-Artiles, A., Priesol, A., **Clark, T.K.**, *Sherwood, D.*, Oman, C., Young, L.R., Karmali, F. "The Impact of Promethazine on Human Whole-Body Motion Perceptual Thresholds" Journal of the Association for Research in Otolaryngology 2017, 18(4):581-590. doi: 10.1007/s10162-017-0622-z.
9. **Clark, T.K**., Young, L.R. "A Case Study of Human Roll Tilt Perception in Hypogravity" Aerospace Medicine and Human Performance 2017, 88(7):682-687(6). doi: 10.3357/AMHP.4823.2017.
10. Karmali, F., *Bermudez-Rey, M.C.*, **Clark, T.K.**, Wang, W., and Merfeld, D.M. "Multivariate Analyses of Balance Test Performance, Vestibular Thresholds, and Age" Frontiers in Neurology 2017, 8:578. doi: 10.3389/fneur.2017.00578.
11. *Bermudez-Rey, M.C.*, **Clark, T.K.**, and Merfeld, D.M. "Balance Screening of Vestibular Function in Subjects Aged 4 Years and Older: A Living Laboratory Experience" Frontiers of Neurology 2017, 8:631. doi: 10.3389/fneur.2017.00631.
12. **Clark, T.K.**, Yi, Y., Galvan-Garza, R.C., Bermudez Rey, M.C., and Merfeld, D.M. "When uncertain, does human self-motion decision-making utilize optimal or suboptimal inference?" Journal of Neurophysiology 2018, 119:1485-1496. doi: 10.1152/jn.00680.2017.
13. *Galvan-Garza, R.C.*, **Clark, T.K**., Mulavara, A.P., and Oman, C.M. "Exhibition of Stochastic Resonance in Vestibular Tilt Motion Perception" Brain Stimulation 2018, 11(4):716-722. doi: 10.1016/j.brs.2018.03.017.
14. Anderson, A.P., *Butterfield J.*, Subramanian, P.S., and **Clark, T.K.** "Intraocular Pressure and Cardiovascular Alterations Investigated in Artificial Gravity as a Countermeasure to Spaceflight Associated Neuro-ocular Syndrome" Journal of Applied Physiology 2018, 125(2):567-576. doi: 10.1152/japplphysiol.00082.2018.
15. *Vincent, G.*, Gruber, J., Newman, M.C., and **Clark, T.K.** "Analysis of Artificial Gravity Paradigms using a Mathematical Model of Spatial Orientation" Acta Astronautica 2018, 52:602-610. doi: 10.1016/j.actaastro.2018.09.010.
16. Rosenberg, M., *Galvan-Garza, R.C.*, **Clark, T.K.**, *Sherwood, D.*, Young, L.R., and Karmali, F. "Human Manual Control Precision Depends on Vestibular Sensory Precision" Journal of Neurophysiology 2018, 120(6):3187-3197. doi: 10.1152/jn.00565.2018.
17. *Galvan-Garza, R.C.*, **Clark, T.K**., *Sherwood, D.*, Diaz-Artiles, A., Rosenberg, M.J.F., Natapoff, A., Karmali, F., Oman, C.M., and Young, L.R. "Human Perception of Whole-Body Roll Tilt Orientation in Hypo-Gravity: Underestimation and Adaptation" Journal of Neurophysiology 2018, 120(6):3110-3121. doi: 10.1152/jn.00140.2018.
18. *Bretl, K.N., McCusker, A.T., Sherman, S.O., Mitchell, T.R., Dixon, J.D.,* and **Clark, T.K.**, "Tolerable Acclimation to the Cross-Coupled Illusion through a 10-day, Incremental, Personalized Protocol" Journal of Vestibular Research, 2019, 29(2-3):97-110. doi: 10.3233/VES-180656.
19. *Dixon, J.D.*, Etgen, C., Horning, D., **Clark, T.K.**, and Folga, R. "Integration of a Vestibular Model for Disorientation Research Device Motion Algorithm Application" Aerospace Medicine and Human Performance, 2019, 90(10):901-907. doi: 10.3357/AMHP.5416.2019 (Dixon awarded the AsMA Fellows Scholarship for paper, 2nd place).
20. *Bretl, K.N.*, *Sherman, S.O., Dixon, J.B., Mitchell, T.R.,* and **Clark, T.K.**, "A Standardized, Incremental Protocol to Increase Human Tolerance to the Cross-Coupled Illusion" Journal of Vestibular Research, 2019, 29(5): 229-240. doi: 10.3233/VES-190673.

21. *Dixon, J.*, and **Clark, T.K.** "Sensorimotor Impairment from a New Analog of Spaceflight-altered Neurovestibular Cues" Journal of Neurophysiology, Advances in Vestibular Research: A Tribute to Bernard Cohen, MD special issue, 2020, 123:209-233. doi: 10.1152/jn.00156.2019.
22. Rahnev, D., Desender, K., Lee, A.L.F., Adler, W. T., Akdogan, B., Arbuzova, P., Atlas, L., Balci, F., Bang, J.W., Birnev, D.P., Brady, T.F., Calder-Travis, J., Chetverikov, A., **Clark, T.K.**, Davranche, K., Denison, R.N., Dildine, T., Double, K.S., Duyan, Y.A., Faivre, N., Fallow, K., Filevich, E., Gajdos, T., Gallagher, R., de Gardelle, V., Haddara, N., Hainguerlot, M., Hu, X., Hsu, T., Jaquiery, M., Kantner, J., Konishi, M., Kob, C., Koculak, M., Kvam, P., Kwok, S.C., Lo, C.M., Lebreton, M., Lempert, K.M., Luo, L., Maniscalco, B., Massoni, S., Matthews, J., Martin, A., Mazancieux, A., Merfeld, D.M., O'Hora, D., Palser, E.R., Paulewicz, B., Pereira, M., Peters, C., Pfuhl, G., Prieto, F., Rausch, M., Recht, S., Reyes, G., Rouault, M., Sadeghi, S., Samaha, J., Seow, T.X.F., Shekhar, M., Sherman, M.T., Siedlecka, M., Skora, Z., Song, C., Soto, D., van Boxtel, J.J.A., Sun, S., Wang, S., Weidemann, C.T., Weindel, G., Wierzchon, M., Xu, X., Ye, Q., Yeon, J., Zou, F., Zylberberg, A. "The Confidence Database" Nature Human Behavior, 2020, 4: 317-325. doi: 10.1038/s41562-019-0813-1.
23. *Pinedo, C., Dixon, J., Zuzula, E., Davis, E.,* and **Clark, T.K.** "Development of an Achievability Fuel Limit Algorithm for a Piloted, Planetary Lander" AIAA Journal of Spacecraft and Rockets, 2020, 57(3): 484-495, doi: 10.2414/1.A34438.
24. *Suri, K.* and **Clark, T.K.** "Human Vestibular Perceptual Thresholds for Pitch Tilt Are Slightly Worse than for Roll Tilt Across a Range of Frequencies" Experimental Brain Research, 2020, 238(6): 1499-1509, doi: 10.1007/s00221-020-05830-x.
25. *Bretl, K.N.* and **Clark, T.K.** "Improved Feasibility of Astronaut Short-Radius Artificial Gravity through a 50-day Incremental, Personalized, Vestibular Acclimation Protocol" npj Microgravity, 2020, 6(22), doi: 10.1038/s41526-020-00112-w.
26. **Clark, T.K.** and Merfeld, D.M. "Statistical Approaches to Identifying Lapses in Psychometric Response Data" Psychnomic Bulletin and Review 2021, 28(5), 1433-1457, doi: 10.3758/s13423-021-01876-2.
27. *Voros, J.,* Sherman, S., Rise, R., Kryuchkov, A., Stine, P., Anderson, A.P. **Clark, T.K**. "Galvanic Vestibular Stimulation Produces Cross Modal Improvements in Visual Thresholds" Frontiers of Neuroscience 2021, 31, doi: 10.3389/fnins.2021.640984.
28. *Kravets, V., Dixon, J.D.,* Ahmed, N.R.*,* and **Clark, T.K.** "COMPASS: Computations for Orientation and Motion Perception in Altered Sensorimotor States" Frontiers in Neural Circuits special issue Brains in Space: Effects of Spaceflight on the Human Brain and Behavior 2021, 15: 757817, doi: 10.3389/fncir.2021.757817.
29. *Putman, E.,* Galvan-Garza, R.C., and **Clark, T.K.** "The Effect of Noisy Galvanic Vestibular Stimulation on Learning of Functional Mobility and Manual Control Nulling Sensorimotor Tasks" Frontiers of Human Neuroscience special issue Women in Neuroscience 2021, 15:756674, doi: 10.3389/fnhum.2021.756674.
30. *Bretl, K.N.* and **Clark, T.K.** "Predicting Individual Acclimation to the Cross-Coupled Illusion for Artificial Gravity" Journal of Vestibular Research 2021 (published online ahead of print), doi: 10.3233/VES-210019
31. *Bretl, K.N.* and **Clark, T.K.** "Quantitative Analysis of Artificial Gravity Parameters to Mitigate Spaceflight-Relevant Physiological Deconditioning" Acta Astronautica 2022, 194:202-215, doi: 10.1016/j.actaastro.2022.01.042.
32. *Voros, J., Rise, R.,* Sherman, S., *Durell, A.,* Anderson, A.P., and **Clark, T.K.** "A Novel Machine Learning-Based Approach to Identifying Stochastic Resonance in Perceptual Thresholds" Journal of Neuroscience Methods, 2022, 374, 109559, doi: 10.1016/j.jneumeth.2022.109559.
33. *Dixon, J.B.,* **Clark, T.K.**, and Endsley, T. "Towards a Flexible and Generalizable Computational Model-Based Framework for Mitigation of Spatial Disorientation in Sensory-Deprived Environments" The Journal of Space Safety Engineering 2022, 9(4):561-570, doi: 10.1016/j.jsse.2022.05.001.

34. *Smith, K.J.,* Datta, A., Burkhart, C., and **Clark, T.K.** "Efficacy of Galvanic Vestibular Stimulation as a Display Modality Dissociated from Self-Orientation" Human Factors and Ergonomics 2022 (published online ahead of print), doi: 10.1177/00187208221119879.
35. *Kintz, J.R.,* Banerjee, N.T., Zhang, J.Y., Anderson, A.P., and **Clark, T.K.** "Estimation of Subjectively Reported Trust, Mental Workload, and Situation Awareness Using Unobtrusive Measures" Human Factors and Ergonomics in Space Exploration special issue 2022, 65(6):1142-1160, doi: 10.1177/00187208221129371.
36. Groen, E.L., **Clark, T.K.**, Houben, M.M.J., Bos, J.E., and Mumaw, R.J. "Objective Evaluation of the Somatogravic Illusion from Flight Data of an Airplane Accident" Safety 2022, 8(4):85, doi: 10.3390/safety8040085.
37. *Allred, A.* and **Clark, T.K.** "Vestibular Perceptual Thresholds for Rotation about the Yaw, Roll, and Pitch Axes" Experimental Brain Research, 2023, 241(4):1101-1115, doi:10.1007/s00221-023-06570-4.
38. Sherman, S.O., *Greenstein, M.,* Basner, M., **Clark, T.K.**, and Anderson, A.P. "Effects of Additive Sensory Noise on Cognition" Frontiers in Human Neuroscience, 2023, 17:1092154. doi: 10.3389/fnhum.2023.1092154.
39. Sherman, S., *Jonsen, A.*, Lewis, Q., *Schlittenhart, M.*, Szafir, D., **Clark, T.K.,** and Anderson, A.P. "Training Augmentation using Additive Sensory Noise in a Lunar Rover Navigation Task" Frontiers in Neuroscience, section Perception Science, special topic Brains in Space: Effects of Spaceflight on the Human Brain and Behavior – Volume II, 2023, 17:1180314. doi: 10.3389/fnins.2023.1180314.
40. *Allred, A., Kravets, V.*, Ahmed, N., and **Clark, T.K.** "Modeling Orientation Perception Adaptation to Altered Gravity Environments with Memory of Past Sensorimotor States" Frontiers in Neural Circuits special topic Brains in Space: Effects of Spaceflight on the Human Brain and Behavior – Volume II, 2023, 17. doi: 10.3389/fncir.2023.1190582.
41. Sherman, S.O., *Shen, Y., Gutierrez-Mendoza, D., Schlittenhart, M., Watson, C.,* **Clark, T.K.**, and Anderson, A.P. "Additive Sensory Noise Effects on Operational Performance in a Landing Simulation" Aerospace Medicine and Human Performance 2023, 94(10):770-9.
42. *Allred, A.* and **Clark, T.K.,** "A Computational Model of Motion Sickness Dynamics During Passive Self-Motion in the Dark" Experimental Brain Research Motion Sickness Its Causes, Neural Mechanisms, and Treatments' Topical Collection, 2023, doi: 10.1007/s00221-023-06684.
43. *Lonner, T.L., Allred, A.R., Bonarrigo, L., Gopinath, A., Smith, K., Kravets, V.,* Groen, E., Oman, C., DiZio, P., Lawson, B.D., and **Clark, T.K.** "Virtual Reality as a Countermeasure for Astronaut Motion Sickness during Simulated Post-flight Water Landings" Experimental Brain Research, Motion Sickness Its Causes, Neural Mechanisms, and Treatments' Topical Collection, 2023, doi: 10.1007/s00221-023-06715-5.
44. *Allred, A.,* Weiss, H., **Clark, T.K.**, and Stirling, L. "A Hand-Eye Based Post-Spaceflight Sensorimotor Impairment Assessment using Augmented Reality" Aerospace Medicine and Human Performance 2024, 95(2):68-78, doi: 10.3357/AMHP.6313.2024.
45. *Voros, J., Kravets, V., Smith, K.,* and **Clark, T.K.**, "Humans Gradually Integrate Sudden Gain or Loss of Visual Cues into Spatial Orientation Perception" Frontiers of Neuroscience: Section Visual Neuroscience, 2024, 17:1274949, doi: 10.3389/fnins.2023.1274949.

Under Review or Responding to Reviewers

46. **Clark, T.K.**, *Galvan-Garza, R.C.*, Bermudez-Rey, M.C., Yi, Y., and Merfeld, D.M. "Intra-Individual Consistency of Vestibular Perceptual Thresholds" Attention, Perception, & Psychophysics [under review].
47. *Pinedo, C.*, *Dixon, J., Zuzula, E., Davis, E.,* and **Clark, T.K.** "Human-in-the-loop Validation of an Algorithm to Predict the Achievability of a Lunar Lander" Aerospace Medicine and Human Performance [responding to reviewers].

48. *Bretl, K.N.* and **Clark, T.K.** "Consistent Cross-Coupled Illusion Acclimation and Tolerability Across Head Tilt Planes, Rotation Axes" Aerospace Medicine and Human Performance [responding to reviewers].

Book Chapters and Other Publications

1. Scott-Conner, C.E.H., Masys, D.R., Bailey, S.E., Bloomfield, S.A., **Clark, T.K.**, Feinberg, A.P., Goel, N., Hei, T.K., Pawelczyk, J.A., Satcher, R.L.Jr., Stein, M.B., Turner, R.E., Yates, B.J. "Review of NASA's Evidence Reports on Human Health Risks: 2016 Letter Report" National Academies of Science Press 2017. Primarily contributed to review of the "Risk of Impaired Control of Spacecraft/Associated Systems and Decreased Mobility due to Vestibular/Sensorimotor Alterations Associated with Space Flight".
2. **Clark, T.K.** and Merfeld, D.M. "Canal-Otolith Interactions" Reference Module in Neuroscience and Biobehavioral Psychology, Elsevier, 2018, ISBN: 978-0-08-045046-9, doi: 10.1016/B978-0-12-809324-5.02877-7.
3. **Clark, T.K**. "Effects of Spaceflight on the Vestibular System" In: Pathak, Y., Araujo dos Santos, M., Zea, L. (eds) Handbook of Space Pharmaceuticals 2019, ISBN: 978-3-030-05525-7. Springer, Cham. doi:10.1007/978-3-319-50909-9_2-1.
4. **Clark, T.K.**, Newman, M.C., Karmali, F., Oman, C.M., and Merfeld, D.M. "Chapter 5 - Mathematical Models for Dynamic, Multisensory Spatial Orientation Perception" Progress in Brain Research, Volume - Mathematical Modelling in Motor Neuroscience: State of the Art and Translation to the Clinic. Ocular Motor Plant and Gaze Stabilization Mechanisms, 2019, 248:65-90, doi: 10.1016/bs.pbr.2019.04.014.
5. **Clark, T.K.**, *Voros, J.*, Merfeld, D.M., and Williams, H.P. "Extending the Observer Model for Human Orientation Perception to Include In-Flight Perceptual Thresholds" DTIC Technical Report NARMU-D-21-035, 2021.
6. Groen, E.L., Houben, M.J.J., and **Clark, T.K.** "Comparison of Two Vestibular Models for Predicting Spatial Disorientation (V1917 & V2050)" TNO 2022 R12628 Intern Report, 2022.

Conference Papers (refereed)

1. **Clark, T.K.**, Stimpson, A.J., Young, L.R., Oman, C.M., Duda, K.R. "Analysis of Human Spatial Perception during Lunar Landing" IEEE/AIAA Aerospace Conference. Big Sky, MT, 6-13 Mar, 2010.
2. Stimpson, A.J., **Clark, T.K.**, Young, L.R., Duda, K.R., Oman, C.M. "Effects of an Achievability Display during Simulated Lunar Landings" IEEE/AIAA Aerospace Conference. Big Sky, MT, 6-13 Mar, 2011.
3. **Clark, T.K**., Young, L.R., Duda, K.R., Oman, C.M. "Simulation of Astronaut Perception of Vehicle Orientation during Planetary Landing Trajectories" IEEE/AIAA Aerospace Conference. Big Sky, MT, 3-10 Mar, 2012.
4. **Clark, T.K.**, Newman, M.C., Merfeld, D.M., and Young, L.R. "Pilot Control and Stabilization of a Rate-Controlled Vehicle in Hyper-Gravity" IEEE Aerospace Conference. Big Sky, MT, 1-8 Mar, 2014.
5. Karmali, F., Diaz, A. *Galvan-Garza, R.C.*, **Clark, T.K.**, *Sherwood, D.P.*, Young, L.R. "Development of a Countermeasure to Enhance Sensorimotor Adaptation to Altered Gravity" IEEE Aerospace Conference, Big Sky, MT, 5-12 Mar, 2016.
6. *Bretl, K.N., Mitchell, T.R., Sherman, S., McCusker, A., Dixon, J.,* and **Clark, T.K.** "Retention of Cross-Coupled Illusion Training to Allow for a Shorter-Radius Space Centrifuge" IEEE Aerospace Conference, Big Sky, MT, 3-10 Mar, 2018.

7. *Zuzula, E., Dixon, J., Davis, E., Bretl K.N., Pinedo, C.,* and **Clark, T.K.** "A Numerical Algorithm to Estimate an Achievability Limit for Crewed Planetary Landing" IEEE Aerospace Conference, Big Sky, MT, 3-10 Mar, 2018.
8. McGuire, S., Walker, M., *McGinley, J.*, Ahmed, N., Szafir, D., and **Clark, T.K.** "TRAADRE: Trust in Autonomous Advisors for Robotic Exploration" RSS 2018 Workshop: Autonomous Space Robotics, Pittsburgh, PA, 29-30 Jun, 2018.
9. *Dixon, J.D.*, Endsley, T., and **Clark, T.K.** "A Mathematical Model-based Metric of Spatial Disorientation for Use in Triggering Active Countermeasures" Human Factors and Ergonomics Society International Annual Meeting, Seattle, WA, 8 Oct-1 Nov, 2019 (**won "Most Innovative Student Research Award"**). doi: 10.1177/1071181319631027.
10. *Voros, J.*, Sherman, S., *Rise, R., Callas, M., Kryuchkov, A*., *Stine, P*., *Rizkallah, J.*, Anderson, A., and **Clark, T.K.** "Multi-modal Stochastic Resonance to Enhance Astronaut Perceptual Performance: Experimental Design" (conference paper and presentation) IEEE Aerospace Conference, Big Sky, MT, 7-14 Mar, 2020.
11. *Voros, J.*, *McGinley, J.*, McGuire, S., Walker, M. Karki, P., Ahmed, N., Szafir, D., and **Clark, T.K.** "Trust in an Autonomous Guidance System for a Planetary Rover Task" (conference paper and presentation) IEEE Aerospace Conference, Big Sky, MT, 7-14 Mar, 2020.
12. *Kravets, V.G.,* Ahmed, N., and **Clark, T.K.** "A Rao-Blackwellized Particle Filter for Modeling Neurovestibular Adaptation to Altered Gravity" (conference paper and presentation) 51st International Conference on Environmental Systems (ICES), Saint Paul, MN, 10-14 July, 2022.
13. *Voros, J.*, *McGinley, J.,* McGuire, S., Walker, M., Karki, P., Ahmed, N., Szafir, D., and **Clark, T.K.** "Trust in an Autonomous Guidance System and Resulting Behavior for a Planetary Rover Task" IEEE Aerospace Conference, Big Sky, MT, 4-11 Mar, 2023, doi: 10.1109/AERO55745.2023.10115675
14. *Voros, J.* and **Clark, T.K.** "Human Orientation Perception during Transitions in the Presence of Visual Cues" IEEE Aerospace Conference, Big Sky, MT, 4-11 Mar, 2023, doi: 10.1109/AERO55745.2023.10115644
15. *Lonner, T.* and **Clark, T.K.** "The Efficacy of Virtual Reality as a Countermeasure for Astronaut Motion Sickness during Post-Flight Water Landings" IEEE Aerospace Conference, Big Sky, MT, 4-11 Mar, 2023, doi: 10.1109/AERO55745.2023.10115577.
16. *Smith, K.*, **Clark T.K.**, and Endsley, T. "Physiological Correlates of Objective Situation Awareness Measurements" IEEE Aerospace Conference, Big Sky, MT, 4-11 Mar, 2023, doi: 10.1109/AERO745.2023.10115788
17. *Kintz, J.R.,* Shen, Y., *Buchner, S.L.*, Anderson. A.P., and **Clark, T.K.** "A Simulated Air Revitalization Task to Investigate Remote Operator Human-Autonomy Teaming with Communication Latency" 52nd International Conference on Environmental Systems, Calgary, CA, 16-20 July, 2023.
18. *Kintz, J.R., Buchner, S.,* Anderson, A.P., and **Clark, T.K.** "Predicting Operator Cognitive States for Supervisory Human-Autonomy Teaming" IEEE International Conference on Systems, Man, and Cybernetics (SMC), Maui, HI, 1-4 Oct, 2023.

Conference Papers (not refereed)

1. **Clark, T.K**., Krieg, M., Mohseni, K., "Flow Visualization for Pulsatile Vortex Ring Thrusters" ASME International Mechanical Engineering Congress and Exhibition, IMECE2008-68030, Boston, MA, 31 October – 6 Nov, 2008.
2. **Clark, T.K**., Klein, P., Lake, G., Lawrence-Simon, S., Moore, J., Rhea-Carver, B., Sotola, M., Wilson, S., Wolfskill, C., Wu, A. "KRAKEN: Kinematically Roving Autonomously Controlled Electro-Nautic" 47th AIAA Aerospace Sciences Meeting Including The New Horizons Forum and Aerospace Exposition, Orlando, FL, 5-8 Jan, 2009.

3. Young, L.R., Stimpson, A.J., **Clark, T.K.**, Duda, K.R., Oman, C.M. "Sensorimotor Control and Displays for Safe and Precise Lunar Landing" 61st International Astronautical Congress. Prague, Czech Republic. 27 Sep – 1 Oct, 2010.
4. Engle, J., Dharmaraj, R., and **Clark, T.K**., "Artificial Gravity for Low Earth Orbit (ISS) & Deep Space Exploration" AIAA SPACE Conference, Long Beach, CA, 13-16 Sep, 2016.
5. Young, L.R., Karmali, F., *Galvan-Garza, R.C.*, and **Clark, T.K.** "Changing Gravity Levels – Manual Control and Spatial Orientation Adaptation during Hypo-Gravity Centrifugation", 67th International Astronautics Congress, Mexico City, MX, 26-30 Sep, 2016.
6. Engle, J. and **Clark, T.K.** "An Approach for Development and Deployment of Artificial Gravity in Deep Space Exploration Architectures" AIAA Space Conference, Orlando, FL, 12-14 Sep, 2017.
7. *Seyedmadani, K*., *Vincent, G*., Gruber, J.An., Gruber, J.Al., Cooper, V., and **Clark, T.K.** "The Linear Sled "Hybrid" Approach to Artificial Gravity as a Countermeasure for Crewed Long-Duration Space Exploration Missions" AIAA Space Conference, Orlando, FL, 12-14 Sep, 2017.
8. Simón, X.D., Engle, J., and **Clark, T.K.** "An Architecture of Artificial Gravity System Configurations Informed by Physiological Spin-Tolerance Research" AIAA SPACE Conference, Orlando, FL, 17-19 Sep, 2018.
9. *Dixon, J.B.,* and **Clark, T.K.** "Wheelchair Head Immobilization Paradigm: A Ground-Based Analog for Post-Spaceflight Astronaut Sensorimotor Impairment" 69th International Astronautical Congress, Bremen, Germany, 1-5 Oct, 2018.
10. Thomas, C., Truong, D., **Clark, T.K.**, Datta, A. "Understanding Current Flow in Galvanic Vestibular Stimulation: A Computational Study" (conference paper and presentation) Annual International Conference IEEE Engineering in Medicine and Biology Society, 20-24, Jul, 2020, 2442-2446, doi: 10.1109/EMBC44109.2020.9176716.
11. *Bretl, K.N.* and **Clark, T.K.** "Using Survival Analysis and Acclimation Training to Develop a Tolerability Metric for Centrifuge Design and Spaceflight Artificial Gravity Implementation" (conference paper and presentation) 71st International Astronautical Congress, Virtual, 12-16, Oct, 2020.
12. Anderson, A.P., **Clark, T.K.**, and Kong, Z. "Adaptive Autonomy for Future Spacecraft Habitats" (conference paper and presentation) Human Robot Interaction for Space Robotics ICSR 2020 Workshop, Virtual, 14-15 Nov, 2020.
13. Valter, Y., Moreno, J., Nazim, K. Gabay, E. Cohen, S., **Clark, T.K.**, Datta, A. "Galvanic Vestibular Stimulation Headset balancing robust and simple administration with subject comfort: An Usability Analysis" (conference paper and presentation) 43rd Annual International Conference IEEE Engineering in Medicine and Biology Society (EMBC), 31 Oct – 4 Nov, 2021.
14. Galvan-Garza, R.C., *Putman, E.,* **Clark, T.K**., Ziegler, M. "Galvanic Vestibular Stimulation for Training" (extended abstract and poster) Neuroergonomics Conference, Munich, German, 11-16 Sep, 2021.
15. *Dixon, J.B.*, **Clark, T.K.**, and Endsley, T. "A Computational Model-Based Framework for Holistic Mitigation of Spatial Disorientation in Sensory-Deprived Environments" (conference paper and presentation) International Astronautical Congress (IAC), Dubai, United Arab Emirates, 25-29 Oct, 2021.
16. **Clark, T.K.** "Sensorimotor Challenges for Crewed Lunar Surface Missions, Analogs, and Countermeasures" (paper and presentation) AIAA SciTech Forum, San Diego, CA, 3-7 Jan, 2022, doi: 10.2514/6.2022-0579.
17. *Putman, E.J.,* Boppana, A., **Clark, T.K.,** Anderson, A.P. "Adaptive Training Using Virtual Reality for Entry, Descent, and Landing During Long Duration Exploration Missions" (paper and presentation) 73rd International Astronautical Congress (IAC), Paris, France, 18-22 Sep 2022.

Theses

1. **Clark, T.K.** "Human Spatial Orientation Perception during Simulated Lunar Landing" S.M. Thesis in Aeronautics and Astronautics, Massachusetts Institute of Technology: Cambridge, MA, 2010.
2. **Clark, T.K.** "Human Perception and Control of Vehicle Roll Tilt in Hyper-Gravity" Ph.D. Thesis in Aeronautics and Astronautics, Massachusetts Institute of Technology: Cambridge, MA, 2013. Won **Stanley N. Roscoe Award for Best Doctoral Dissertation** in 2013-2014 for research related to aerospace human factors from the Aerospace Human Factors Association.

Presentations

1. Duda, K.R., Young, L.R., Oman, C.M., Liu, A.M., Stimpson, A.J., and **Clark T.K.** "Evaluation of Sensorimotor Performance during Lunar Landing" (abstract) Aviation, Space, and Environmental Medicine, 80(3), Mar, 2009.
2. Duda, K.R., Young, L.R., Oman, C.M., Liu, A.M., Stimpson, A.J., and **Clark, T.K.** "Sensorimotor Displays and Controls to Enhance the Safety of Human/Machine Cooperation during Lunar Landing" The Aerospace Medical Association 80th Annual Scientific Meeting, Los Angeles, CA, 4 May, 2009.
3. Young, L.R., Duda, K.R., **Clark, T.K**., Stimpson, A.J., and Oman, C.M. "Sensorimotor Interaction with Vehicle Displays and Control to Enhance Human-Machine Cooperation during Precision Lunar Landing" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Houston, TX, 2-4 Feb, 2010.
4. **Clark, T.K**., Young, L.R., Stimpson, A.J., Duda, K.R., Oman, C.M., and Natapoff, A. "Astronaut Spatial Orientation Perceptions during Simulated Lunar Landing" (abstract and presentation) Journal of Vestibular Research Special Issue 2011, 21: 79, Eighth Symposium on the Role of the Vestibular Organs in Space Exploration, Houston, TX, 8-10 Apr, 2011.
5. Young, L.R., Oman, C.M., **Clark, T.K**., Tritchler, S.E., Duda, K.R., Wood, S.J., and Estrada, A. "Sensorimotor Interaction with Vehicle Displays and Controls to Enhance Human-Machine Cooperation during Precision Lunar Landing" (abstract and presentation), NASA Human Research Program Investigator's Workshop, Houston, TX, 13-16 Feb, 2012.
6. Young, L.R., **Clark, T.K.**, Estrada, A. and Tritchler, S. "Lunar Dust Challenges to Astronaut Landing" (abstraction and presentation) Dust, Atmosphere, and Plasmas: Moon and Small Bodies Workshop, Boulder, CO, 6-8 Jun, 2012.
7. Young, L.R., Oman, C.M., **Clark, T.K.**, Tritchler, S.E., Duda, K.R., Wood, S.J., and Estrada, A. "Sensorimotor Interaction with Vehicle Displays and Controls to Enhance Human-Machine Cooperation during Precision Lunar Landing: Project Review" (abstract and presentation), NASA Human Research Program Investigator's Workshop, Galveston, TX, 11-14 Feb, 2013.
8. **Clark, T.K.**, Newman, M.C., and Young, L.R. "Effect of Hyper-Gravity on Human Perception of Vehicle Roll Tilt" (abstract and presentation), 19th IAA Humans in Space, Cologne, Germany, 8-12 July, 2013.
9. Young, L.R., *Beckers, N.W.M.*, Karmali, F., and **Clark, T.K.** "Countermeasures to Reduce Sensorimotor Impairment and Space Motion Sickness Results from Altered Gravity Levels" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 11-13 Feb, 2014.
10. **Clark, T.K.** "Predicting Sensorimotor Adaptation to Altered Gravity by Measuring Vestibular Perceptual Thresholds" (presentation) NSBRI Symposium: Designing for the Future: Remote Rehabilitation and Integration of New Technologies in Spaceflight, Houston, TX, 6-7 May, 2014.
11. **Clark, T.K.** "Predicting Sensorimotor Adaptation to Altered Gravity by Measuring Vestibular Perceptual Thresholds" (presentation) NSBRI Summer Bioastronautics Institute, invited lecture, Houston, TX, 29 May, 2014.
12. **Clark, T.K.** "Why we aren't designed for space: the physiological and psychological challenges of humans living in space and what can be done about them" (presentation) Space Nerds of Boston, invited lecture, Boston, MA, 30 Sep, 2014.

13. Hackler, A.S., Deymier-Black, A., **Clark, T.K.**, Lawley, J., Simon, J., Bokhari, R., LaPelusa, M., and McNeel, R. "Innovation by a New NSBRI Generation" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 13-15 Jan, 2015.
14. Diaz, A., *Beckers, N.W.M.*, **Clark, T.K.**, *Sherwood, D.,* Oman, C., Young, L.R., and Karmali, F. "Development of a Countermeasure to Enhance Sensorimotor Adaptation to Altered Gravity Levels" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 13-15 Jan, 2015.
15. Diaz, A., **Clark, T.K**., *Sherwood, D., Galvan-Garza, R.C*., *Beckers, N.W.M.*, Natapoff, A., Oman, C.M., Young, L.R., and Karmali, F. "Development of a Countermeasure to Enhance Sensorimotor Adaptation to Altered Gravity Levels" (presentation) NSBRI Symposium: Towards Integrated Countermeasures for Deep Space Exploration: Vestibular Function for Balance and Beyond, Houston, TX, 7-8 May, 2015.
16. **Clark, T.K.** "Predicting Individual Differences in Sensorimotor Adaptability to Altered Gravity using Measures of Sensory Noise: Validation and Operational Considerations" (presentation) NSBRI Symposium: Towards Integrated Countermeasures for Deep Space Exploration: Vestibular Function for Balance and Beyond, Houston, TX, 7-8 May, 2015.
17. Mulavara, A.P., De Dios, Y.E., Gadd, N.E., Caldwell, E.E., Batson, C.D., Goel, R., Seidler, R.D., Oddsson, L., Zanello, S., **Clark, T.K.**, Peters, B., Cohen, H.S., Reschke, M., Wood, S., and Bloomberg, J.J. "Behavioral, Brain Imaging and Genomic Measures to Predict Functional Outcomes Post-Bed Rest and Spaceflight" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 8-11 Feb, 2016.
18. Karmali, F., *Galvan-Garza, R.C*., *Sherwood, D.*, Rosenberg, M.J.F., **Clark, T.K.**, Oman, C., and Young, L.R. "Development of a Countermeasure to Enhance Sensorimotor Adaptation to Altered Gravity Levels" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 8-11 Feb, 2016.
19. Young, L.R., and **Clark, T.K.** "The Human Pilot – Physiology and Manual Control in Space" (presentation) NSBRI Human Factors and Performance Team Focused Scientific Meeting – Piloting Spacecraft: Guidance and Control of Human Space Vehicles, Houston, TX, 21-22 Sep, 2016.
20. *Vincent, G.*, Gruber, J., Reed, B., Newman, M.C., and **Clark, T.K.**, "Observer Model Analysis of Orientation Perception during Artificial Gravity Stimulation via Centrifugation versus Linear Sled" (abstract and presentation) 32nd American Society for Gravitational and Space Research Conference, Cleveland, OH, 26-29 Oct, 2016.
21. **Clark, T.K.** "Human Orientation Perception and Control are Impaired by, but Adapt to, Exposure to Altered Gravity Environments" (invited abstract and presentation) Forum for New Leaders in Space Science, Beijing, China, 2-3 Dec, 2016.
22. Mulavara, A.P., Peters, B., De Dios, Y.E., Gadd, N.E., Caldwell, E.E., Batson, C.D., Goel, R., Oddsson, L., Kreutzberg, G., Zanello, S., **Clark, T.K.,** Oman, C.M., Cohen, H.S., Wood, S., Seidler, R.D., Reschke, M., and Bloomberg, J.J. "Behavioral, Brain Imaging and Genomic Measures to Predict Functional Outcomes Post-Bed Rest and Spaceflight" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 23-26 Jan, 2017.
23. Young, L.R., Karmali, F., *Galvan-Garza, R.C*., Rosenberg, M.J.F, Artiles, A.D., Oman, C.M., *Sherwood, D.*, Natapoff, A., Kenyon, R., and **Clark, T.K.** "Spatial Orientation and Manual Control in Reduced Gravity" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 23-26 Jan, 2017.
24. *McCusker, A.*, *Bretl, K.*, *Dixon, J.*, and **Clark, T.K.** "A Protocol to Eliminate the Cross-Coupled Illusion during Centrifuge Artificial Gravity" (abstract and presentation) Aerospace Medical Association 88th Annual Scientific Meeting, Denver, CO, 30 Apr-4 May, 2017.
25. **Clark, T.K.** "Quantifying, Understanding, and Predicting Individual Differences in Human Sensorimotor Adaptive Responses to Altered Gravity Environments" (invited presentation) Forum for New Leaders in Space Science, Woods Hole, MA, 16-17 May, 2017.

26. **Clark, T.K.**, *Seyedmadani, K.*, and Gruber J. "Turbolift – A Linear Sled Hybrid Approach to Artificial Gravity" (presentation) NASA Innovative and Advanced Concepts Symposium, Denver, CO, 25-27 Sept, 2017.
27. **Clark, T.K.** "Human Perception of Orientation in Hyper-Gravity: Experiments and Modeling" (presentation) T32 Research Seminar Series, University of Colorado Anschutz Medical Campus, Aurora, CO, 28 Sept, 2017.
28. **Clark, T.K.** "Human Perception of Orientation in Hyper-Gravity" (presentation) Invited research lecture, Wright-Patterson Air Force Base, Naval Medical Research Unit, Dayton, OH, 20 Nov, 2017.
29. **Clark, T.K.** "Human Perception of Orientation in Altered Gravity" (presentation) Invited research presentation, Front Range Neuroscience, Fort Collins, CO, 6 Dec, 2017.
30. **Clark, T.K.** and Young, L.R. "Reduced Ocular Torsion and Tilt Perception in Hypo-Gravity" (abstract and presentation) Next-Generation Suborbital Researchers Conference, Broomfield, CO, 18-20, Dec, 2017.
31. Mulavara, A.P., Peters, B., De Dios, Y.E., Gadd, N.E., Caldwell, E.E., Batson, C.D., Goel, R., Oddsson, L., Kreutzberg, G., Zanello, S., **Clark, T.K.**, Waddington, G., Oman, C.M., Cohen, H.S., Wood, S., Seidler, R.D., Reschke, M.F., and Bloomberg, J.J. "Behavioral, Brain Imaging and Genomic Measures to Predict Functional Outcomes Post-Bed Rest and Spaceflight" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25 Jan, 2018.
32. **Clark, T.K.** "Human Performance Challenges and Countermeasures for Space Exploration" (invited Keynote presentation) IEEE Aerospace Conference, Big Sky, MT, 4-9, March, 2018.
33. *Bretl, K.N.*, *Mitchell, T.R., Sherman, S., McCusker, A., Dixon, J.,* and **Clark, T.K.** "Retention of Cross-Coupled Illusion Training to Allow for a Shorter-Radius Space Centrifuge" IEEE Aerospace Conference, Big Sky, MT, 3-10 Mar, 2018.
34. *Zuzula, E., Dixon, J., Davis, E., Bretl K.N., Pinedo, C.,* and **Clark, T.K.** "A Numerical Algorithm to Estimate an Achievability Limit for Crewed Planetary Landing" IEEE Aerospace Conference, Big Sky, MT, 3-10 Mar, 2018.
35. *Bretl, K.N., Metcalf, S.,* and **Clark, T.K.** "Extended Human Adaptation to the Coriolis Cross-Coupled Illusion for Artificial Gravity" (abstract and presentation) Aerospace Medical Association 89th Annual Scientific Meeting, Dallas, TX, 6-10 May, 2018.
36. *Dixon, J.B.*, and **Clark, T.K**. "Development and Functional Validation of a Ground-Based Analog for Post-Spaceflight Sensorimotor/Neurovestibular Impairment: the Wheelchair Head Immobilization Paradigm" (abstract and presentation) International Society of Gravitational Physiology & European Space Agency Life Sciences Meeting, Noordwijk, The Netherlands, 18-22 June, 2018.
37. **Clark, T.K.** "Human Perception of Spatial Orientation in Altered Gravity" (presentation) Invited research lecture, Ohio State, Otology Research Seminar, Columbus, OH, 6 Aug, 2018.
38. *Dixon, J.B.,* and **Clark, T.K.** "Wheelchair Head Immobilization Paradigm: A Ground-Based Analog for Post-Spaceflight Astronaut Sensorimotor Impairment" (abstract and presentation) 69th International Astronautical Congress, Bremen, Germany, 1-5 Oct, 2018.
39. *Bretl, K.N.*, and **Clark, T.K.** "Predicting the Capability of Individuals to Acclimate to the Coriolis Cross-Coupled Illusion for Artificial Gravity" (abstract and presentation) Aerospace Medical Association 90th Annual Scientific Meeting, Las Vegas, NV, 5-9 May, 2019.
40. **Clark, T.K.**, "Development and Validation of Multisensory Integration in a Spatial Orientation Perception Model" (abstract and panel presentation) Aerospace Medical Association 90th Annual Scientific Meeting, Las Vegas, NV, 5-9 May, 2019.
41. Rupert, A., Brill, C., **Clark, T.K.**, McGrath, B., and Mortimer, B. "Expansion of Mishap Perception Model Envelope to Include Helicopter Hover and Hover Transition" (abstract and panel presentation) Aerospace Medical Association 90th Annual Scientific Meeting, Las Vegas, NV, 5-9 May, 2019.
42. Etgen, C., **Clark, T.K.**, *Dixon, J.B.*, Horning, D., Folga, R., and Ellis, K. "Controlling The Kraken: Motion Washout and Vestibular Perception Model Development for the Disorientation Research

Device (DRD)" (abstract and presentation) Aerospace Medical Association 90th Annual Scientific Meeting, Las Vegas, NV, 5-9 May, 2019.

43. Merfeld, D.M., **Clark, T.K.**, Oman, C.M., Newman M.C. "Modeling Multi-Sensory Integration of Understand Spatial Disorientation" (abstract and presentation) 20th International Symposium on Aviation Psychology, Dayton, OH, 7-10 May, 2019.
44. *Bermúdez Rey, M.C.*, Karmali, F., Wang, W., **Clark, T.K.**, Beylergil, S.B., Merfeld, D.M. "Quantifying the Links between Age, Vestibular Function, and Balance" (abstract and presentation) Vestibular Oriented Research Meeting, Dayton, OH, 19-22 May, 2019.
45. *Dixon, J.B., Brazell, V.,* **Clark, T.K.** "A Novel Ground-Based Analog of Spaceflight Neurovestibular Stimulation Produces Sensorimotor Impairment" (abstract, presentation, and poster) Vestibular Oriented Research Meeting, Dayton, OH, 19-22 May, 2019.
46. *Dixon, J.B.,* Ahmed, N., **Clark, T.K.** "Modeling Neural Adaptation of Spatial Orientation Perception in Humans to Altered Gravity" (abstract and presentation) Vestibular Oriented Research Meeting, Dayton, OH, 19-22 May, 2019.
47. *Suri, K.* and **Clark, T.K.** "Comparison of Vestibular Perceptual Thresholds in Pitch versus Roll Tilt" (abstract and presentation) Vestibular Oriented Research Meeting, Dayton, OH, 19-22 May, 2019.
48. *Bretl, K.* and **Clark, T.K.** "A Novel Protocol for Tolerable Human Acclimation to the Cross-Coupled Illusion for Artificial Gravity" (abstract and presentation) Vestibular Oriented Research Meeting, Dayton, OH, 19-22 May, 2019.
49. *Dixon, J.D.*, Endsley, T., and **Clark, T.K.** "A Mathematical Model-based Metric of Spatial Disorientation for Use in Triggering Active Countermeasures" (presentation) Human Factors and Ergonomics Society International Annual Meeting, Seattle, WA, 8 Oct-1 Nov, 2019 (**won "Most Innovative Student Research Award"**).
50. **Clark, T.K.,** Anderson, A.P., Nabity, J.A., Braun, R., Banerjee, N.T., Eshima, S.P., *Kintz, J.R.*, Rollock, A.E., Zaccarine, S., Pischulti, P.K., and Klaus, D.M. "Smart Technology Infusion for Deep Space Exploration Habitats" (abstract and presentation) 8th AIAA-RM Annual Technical Symposium, Boulder, CO, 19 Nov, 2019.
51. *Miller, N., Gutierez-Mendoza, D., Boender, N., Seedorf, J., Pinedo, C.,* **Clark, T.K.** "Human Pilot Detection of Vehicle Failures during Planetary Landing" (abstract and presentation) 8th AIAA-RM Annual Technical Symposium, Boulder, CO, 19 Nov, 2019.
52. Anderson, A., *Rise, R.*, Sherman, S., *Voros, J., Callas, M., Kryuchkov, A., Stine, P.,* and **Clark, T.K.** "Performance Enhancement Through Multi-Modal Stochastic Resonance" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
53. **Clark, T.K.** and Young, L.R. "A Gravity-Dose Response: Human Spatial Orientation Perception in Hypo-Gravity" (abstract and presentation) Next-Generation Suborbital Researchers Conference, Broomfield, CO, 2-4 Mar, 2020.
54. Alexander, W., Kraft, A., Widjaja, M., Simon, E., *Pinedo, C*., **Clark, T.K.**, and Galvan-Garza, R.C. "Operator Physiological and Interaction Signals as Predictors of System Failures during a Simulated Spacecraft Landing Task" (abstract and presentation) 11th International Conference on Applied Human Factors and Ergonomics, San Diego, CA (virtual presentation), 16-20 July, 2020.
55. *Bretl, K.N.* and **Clark, T.K.** "Establishing Human Tolerability of Fast-Rotation Centrifugation to Improve the Feasibility of using Artificial Gravity as a Spaceflight Countermeasure" (abstract and presentation) AIAA ASCEND Conference, Virtual, 16-18 Nov, 2020.
56. **Clark, T.K.** "Human Vestibular Modeling and Galvanic Vestibular Stimulation" (invited presentation) 2020 Lockheed Martin Human Machine Symbiosis Workshop, 23 Nov, 2020.
57. **Clark, T.K.**, Sherman, S., *Rise, R., Voros, J., Durell, A., Greenstein, M., Gutierrez Mendoza, D., Jonsen, A., Kryuckov, A., Schlittenhart, M., Watson, C.*, and Anderson, A.P. "Cross-Modal and Multi-Modal Stochastic Resonance to Enhance Crew Perception as a Countermeasure for Performance Degradation" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.

58. **Clark, T.K.** and Dixon, J.B. "Sensorimotor Performance is Impaired Following A New Analog of Spaceflight-Altered Neurovestibular Cues" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
59. Wood, S.J., De Dios, Y.E., Koppelmans, V., Peters, B.T., Beltran, N.E., Caldwell, E.E., Rosenberg, M.J., **Clark, T.K.**, Seidler, R.D., Oddsson, L., Theriot, C.A., Reschke, M.F., Feiveson, A.F., Mercaldo, N.D., and Bloomberg, J.J. "The Relationship between Behavioral, Neuroimaging and Genetic Measures and Post-Landing Sensorimotor Functional Task Performance" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
60. *Voros, J., Rise, R.,* Sherman, S., Anderson A.P., and **Clark, T.K.** "Noisy Galvanic Vestibular Stimulation Improves Visual Perceptual Thresholds" (abstract and presentation) Vestibular Oriented Research Meeting, Virtual, 16-17 Feb 2021.
61. *Dixon, J.B., Kravets, V.,* Endsley, T., and **Clark, T.K.** "A Computational Tool for Real-Time Detection of Astronaut Spatial Disorientation during Piloted Gravitational Transitions" (abstract and presentation) 41st Annual International Society for Gravitational Physiology (ISGP) Meeting, Organized by College Station, TX, 24-27 May, 2021 (**Dixon awarded Young Investigator Award for presentation).**
62. *Pinedo, C., Seedorf, J.* and **Clark, T.K.** "Improved Human Performance through Control Response Type for a Piloted Lunar Lander" (abstract and presentation) 41st Annual International Society for Gravitational Physiology (ISGP) Meeting, Organized by College Station, TX, 24-27 May, 2021.
63. *Pinedo, C.*, *Seedorf, J.*, and **Clark, T.K.** "A Real-time Achievability Limit Display for a Propellant-Constrained, Piloted, Planetary Lander" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
64. *Kintz, J.*, Banerjee, N., Anderson, A., and **Clark, T.K.** "Estimation and Prediction of Operator Cognitive States based on Embedded Measures of Trust, Mental Workload, and Situation Awareness" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021. (**winner of the 2021 Ross McFarland award for the best student research paper at AsMA from the Life Science and Biomedical Engineering Branch**)
65. *Dixon, J.B.*, Endsley, T., and **Clark, T.K.** "Development and an Experimental Validation Method for a Model-Based System to Detect Pilot Spatial Disorientation in Real-Time" (abstract and panel presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
66. *Dixon, J.B.*, Endsley, T., and **Clark, T.K.** "Pilot Interview Reports of Spatial Disorientation Experiences and Mitigation" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
67. Zhang, J., Banerjee, N., *Kintz, J.,* **Clark, T.K.**, and Anderson, A.P. "Validation and Estimation of Human Cognitive State through Psychophysiological Signal Analysis for Aerospace Systems" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
68. *Voros, J.*, Williams, H.P., Merfeld, D.M., and **Clark, T.K.** "Adding Perceptual Thresholds to the Observer Model of Orientation Perception" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
69. Anderson, A.P., *Butterfield, J.,* Subramanian, P.S., and **Clark, T.K.** "Countermeasures for Spaceflight Associated Neuro-Ocular Syndrome: an Investigation of Artificial Gravity" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
70. *Bretl, K.N.* and **Clark, T.K.** "A Meta-Analysis to Inform Artificial Gravity Conceptual Designs to Mitigate Spaceflight-Induced Physiological Deconditioning" (abstract and presentation) Aerospace Medical Association Annual Scientific Meeting, Denver, CO, 29 Aug-3 Sep, 2021.
71. *Dixon, J.*B., **Clark, T.K.,** and Endsley, T. "A Computation Model-Based Framework for Holistic Mitigation of Spatial Disorientation in Sensory-Deprived Environments" (abstract and presentation)

72nd International Astronautical Congress, Dubai, UAE, 25-29 Oct, 2021 and NASA Day in conjunction with the 72nd IAC, virtual, 28 Oct, 2021.

72. **Clark, T.K.** "Galvanic Vestibular Stimulation is a Novel Approach to Alter Human Perception" (abstract and invited presentation) ATLAS Colloquium, 1 Feb, 2022.
73. Anderson, A.P., Sherman, S., *Jonsen, A.*, *Durell, A.*, *Gutierrez Mendoza, D.*, Lewis, Q., *Schlittenhart, M.*, *Watson, C.*, Basner, M., and **Clark, T.K.** "Investigating Stochastic Resonance as a Countermeasure for Human Performance Degradation in Spaceflight" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
74. Wood, S.J., De Dios, Y.E., Beltran, N.E., Caldwell, E.E., Koppelmans, V., Macaulay, T.R., Peters, B.T., Rosenberg, M.J., **Clark, T.K.**, Seidler, R.D., Oddsson, L., Theriot, C.A., Reschke, M.F., Feiveson, A.F., Bloomberg, J.J. "Sensorimotor Predictors: Examining the Relationship between Measures of Post-Landing Sensorimotor Functional Task Performance" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
75. *Voros, J.* and **Clark, T.K.** "Human Orientation Perception during Transitions in the Presence of Visual Cues" (abstract and presentation) 92nd Annual Scientific Meeting of the Aerospace Medical Association, Reno, NV, 22-26 May, 2022.
76. *Dixon, J.B.,* Endsley, T.*,* and **Clark, T.K.** "Experimental Ratings of Spatial Disorientation for Tuning and Assessment of a Real-Time Computational Detection Method" (abstract and presentation) 92nd Annual Scientific Meeting of the Aerospace Medical Association, Reno, NV, 22-26 May, 2022.
77. Merfeld, D.M., **Clark, T.K.**, *Voros, J.*, Folga, R., Pettijohn, K., Robinson, E., Sestito, M., and Sherwood, S. "Head on Neck Tilt Perception is Modulated by Body Tilt" (abstract and presentation) 92nd Annual Scientific Meeting of the Aerospace Medical Association, Reno, NV, 22-26 May, 2022.
78. Anderson, A.P., Boppana, A., Putman, E., Lewis, Q., Peterson, B., and **Clark, T.K.** "Trinity Virtual Reality Training Environment an Adaptive Training Algorithm for Long Duration Human Spaceflight" (abstract and presentation) 92nd Annual Scientific Meeting of the Aerospace Medical Association, Reno, NV, 22-26 May, 2022.
79. **Clark, T.K.,** *Kintz, J.R., Buchner, S.L.*, and Anderson, A.P. "Unobtrusively Estimating Operator Cognitive States in Real-Time to Enable Adaptive Autonomous Systems" (invited seminar) Human, Artificial Intelligence, and Robot Teaming (HART) Technical Group (TG) within the Human Factors and Ergonomics Scoiety (HFES), 28 June, 2022.
80. Buchner, S., *Kintz, J.R.*, Zhang, J. Banerjee, N., **Clark, T.K.**, and Anderson, A.P. "Simultaneous Estimates of Mental Workload and Situation Awareness through Biosignal Monitoring in Human-Autonomy Teaming" (abstract and presentation) International Applied Human Factors and Ergonomics Conference, New York, NY, 24-28 Jul, 2022.
81. **Clark, T.K.** and Pinedo C. "Evaluation of a Novel Display Element and Control Mode for Improving Piloted Lunar Landing" (abstract and presentation) International Applied Human Factors and Ergonomics Conference, New York, NY, 24-28 Jul, 2022.
82. Putman, E.J., Boppana, A., **Clark, T.K.,** and Anderson A.P. "Adaptive Training Using Virtual Reality for Entry, Descent, and Landing During Long Duration Exploration Missions" (abstract and presentation) International Astronautical Congress (IAC), Paris, France, 18-22 Sep, 2022.
83. **Clark, T.K.** "Predicting Impaired Human Performance in Aerospace Environments using an Estimation Theory-Based Computational Model" (abstract and invited presentation) Aerospace Control and Guidance Systems Committee, Colorado Springs, CO, 25-28 Oct, 2022.
84. Pradeep, P., Boecking, B., Gisolfi, N., *Kintz, J.*, **Clark, T.K.**, and Dubrawski, A. "Ordinal Programmatic Weak Supervision and Crowdsourcing for Estimating Cognitive States" (abstract and presentation) The 37th AAAI Conference on Artificial Intelligence, Washington DC, 7-14 Feb, 2023.
85. Moudy, S.C., Peters, B., **Clark, T.K.**, Schubert, M., Bishop, M., Young, M., and Wood, S. "Development of a Sensorimotor Ground Analog for Astronaut Post-Flight Experience" (abstract and

presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.

86. Wood, S.J., De Dios, Y.E., Macauley, T.R., Peters, B.T., Beltran, N.E., Koppelmans, V., **Clark, T.K.**, Seidler, R.D., Oddsson, L., Theriot, C.A., and Bloomberg, J.J. "Assessing the Relationships between Sensorimotor Biomarkers and Post-Landing Functional Performance" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
87. Anderson, A.P., Putman, E., Rees, W., Peterson, B., McVey, C., Verniani, A., Schlittenhart, M., Mayali, M., Szafir, D., and **Clark, T.K.** "Trinity: Multi-Environment Virtual Trainer for Long During Exploration Missions" (abstract and presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
88. **Clark, T.K.** "Lessons Learned from Research Studies with Commercial Crews" (invited panelist presentation) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
89. **Clark, T.K.** "Current models Univ of Colorado & ONR MURI (Multi University Research Initiative)" (invited presentation) Spatial Orientation Modeling Expert Workgroup (SOMEW) II, Pensacola, FL, 22-24 Mar, 2023.
90. **Clark, T.K.** "Short-Radius Centrifugation for Spaceflight Artificial Gravity" (invited presentation) Students for the Exploration and Development of Space (SEDS) Yuri's Night event, Boulder, CO, 12 Apr, 2023.
91. **Clark, T.K.** "Spaceflight Motion Sickness: Modeling & Ground Experiments" (invited presentation) SpaceX Symposium, Hawthorne, CA, 18 Apr, 2023.
92. **Clark, T.K.** "Technologies and Computational Modeling Tools for Human Vestibular Performance in Aerospace Environments" (invited presentation) B-SURE Writing Opportunity Workshop, Houston, TX, 1 Aug, 2023.
93. *Kravets, V., Allred, A.,* and **Clark, T.K.** "Modeling Vestibular Adaptation to Gravity Transitions" (abstract and presentation) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.
94. *Lonner, T.L., Allred, A., Gopinath, A., Bonnarigo, L.,* and **Clark, T.K.** "Using Virtual Reality as a Countermeasure for Astronaut Motion Sickness and Sensorimotor Impairment in Post-Flight Water Landings" (abstract and presentation) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.
95. Nazifi, M.M., Nibhanupudy, T.J., López-Contreras Gonzalez, E., Love, K., Reissman, M.E., Reissman, T., **Clark, T.K.**, Rah, Y.C., and Karmali, F. "Pilot-vehicle Closed-Loop Computational Models" (abstract and presentation) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.
96. *Allred, A.* and **Clark, T.K.** "A Computational Model of Motion Sickness Driven by Sensory Conflict from Spatial Orientation Perception" (abstract and presentation) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.
97. *Voros, J.* and **Clark, T.K.** "Modeling Orientation Perception During Sudden Transitions in Visual Cue Availability" (abstract and presentation) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.
98. Verniani, A., Putman, E., Peterson, B., Boppana, A., Tredinnick, S., Galvin, E., **Clark, T.K.**, Vance, E., and Anderson, A.P. "Efficacy of Adaptive Algorithms for Training in Virtual Reality" (abstract and presentation) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.

99. *Dixon, J.B.,* Endsley, T. and **Clark, T.K.** "Novel Methodology and Experimental Ratings for Real-Time Computational Detection of Pilot Spatial Disorientation" (abstract and presentation) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
100. *Allred, A.R., Austin C., Boggess, N., Temple, D., Klausing, L., Skylar, E.,* and **Clark, T.K.** "Modeling the Impact of Galvanic Vestibular Stimulation of Human Self-Orientation Perception in the Presence of Physical Stimuli" (abstract and presentation) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
101. *Temple, D.R.* and **Clark, T.K.** "Assessing noisy Galvanic Vestibular Stimulation Capabilities for Inducing Stochastic Resonance in Lateral Translation Vestibular Perceptual Thresholds" (abstract and presentation) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
102. *Voros, J.L.* and **Clark, T.K.** "Model of Motion Perception Following Sudden Transitions in Visual Cue Availability" (abstract, presentation, and poster) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
103. Groen, E.L., **Clark, T.K.**, Houben, M.M.J., Bos, J.E., Mumaw, R.J. "Perception-Model Analysis for the Somatogravic Illusion in an Airplane Accident" (abstract and presentation) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
104. Nazifi, M., Nibhanupudy, T., López-Contreras Gonzalez, E., Love, K., Rah, Y., Karmali, F., Reissman, M., Reissman, T., and **Clark, T.K.** "Computational Models of Active Human Motion Control" (abstract and presentation) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
105. Karmali, F., Love, K., Nazifi, M., Nibhanupudy, T.J., **Clark, T.K.**, Rosenberg, M., Galvan-Garza, R.C., Reissman, M., Reissman, T., Rah, Y.C., López-Contreras Gonzalez, E. "The Role of Sensory Noise in Closed-Loop Sensorimotor Control" (abstract and presentation) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.
106.

Abstracts and Posters

1. Young, L.R., Duda, K.R., Oman C.M., Wood, S., Estrada, A., **Clark, T.K**., Stimpson, A.J., and Mateus, J. "Two Spatial Disorientation Projects: Artificial Gravity and Lunar Landing" (abstract and poster) NASA Human Research Program Investigators' Workshop. League City, TX, 2-4 Feb, 2009.
2. Young, L.R., Duda, K.R., Oman, C.M., Liu, A.M., Stimpson A.J., and **Clark, T.K.** "Critical Factors Affecting Lunar Landing Supervisory Control Performance" (abstract) 60th International Astronautical Congress, Daejong, Korea, 12-16 Oct, 2009.
3. Newman, M.C., Oman, C.M., **Clark, T.K.**, Mateus, J., and Kaderka, J.D. "Pseudo-Coriolis Effect: A 3D Angular Velocity Phenomenon Described by a Left-Hand Rule" (abstract and presentation) Journal of Vestibular Research Special Issue 2011, 21: 70-71, Eighth Symposium on the Role of the Vestibular Organs in Space Exploration, Houston, TX, 8-10 Apr, 2011.
4. Stimpson, A.J., Young, L.R., **Clark, T.K.**, Duda, K.R., and Oman, C.M. "Effects of an Achievability Display on Pilot Decision Making and Behavior in Simulated Lunar Landings" (abstract and poster) 18th IAA Humans in Space Symposium, Houston, TX, 11-15 Apr, 2011.
5. **Clark, T.K.** and Newman M.C., "Human Perception of Roll Tilt in Hyper-Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Houston, TX, 13-16 Feb, 2012.
6. **Clark, T.K.** and Newman M.C. "Human Perception of Roll Tilt in Hyper-Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 11-14 Feb, 2013. **Poster selected as a NSBRI Dr. David Watson Student Fellow Poster Award Winner.**
7. *Galvan, R.C.*, Bloomberg, J.J., Mulavara, A.P., **Clark T.K.**, Merfeld, D.M., and Oman, C.M. "Improving Sensorimotor Function and Adaptation using Stochastic Vestibular Stimulation" (abstract

and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 11-13 Feb, 2014.

8. *Beckers, N.W.M.*, Young, L.R., Karmali, F., and **Clark, T.K.** "Studying the Innate Capacity for Sensorimotor Adaptation to Altered Gravity Levels" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 11-13 Feb, 2014.
9. **Clark, T.K.** and Newman, M.C. "Human Manual Control of Vehicle Roll Tilt in Hyper-Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 11-13 Feb, 2014.
10. Newman, M.C. and **Clark, T.K.** "Methods for Studying Human Orientation Perception and Control in Hyper-Gravity" (abstract and poster) Aerospace Medical Association (AsMA) 85th Annual Scientific Meeting, San Diego, May 5-10, 2014.
11. **Clark, T.K.**, Newman, M.C., Oman, C.M., Merfeld, D.M., and Young, L.R. "Human Perception of Roll Tilt in Hyper-Gravity: Experiments and Modeling" (abstract and poster) XXVIIIth Barany Society Meeting, Buenos Aires, Argentina, 25-28 May, 2014.
12. **Clark, T.K.**, Yi, Y., *Galvan-Garza, R.C., Bermudez Rey, M.C.*, and Merfeld D.M. "How Many Decision Boundaries Contribute to Human Vestibular Decisions?" (abstract and poster) Society for Neuroscience Meeting, Washington, D.C., 15-19 Nov, 2014.
13. *Galvan, R.C.,* **Clark, T.K.**, Merfeld, D.M., Bloomberg, J.J., Mulavara, A.P., and Oman, C.M. "Improving Sensorimotor Function using Stochastic Vestibular Stimulation" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 13-15 Jan, 2015.
14. **Clark T.K.**, Newman, M.C., Oman, C.M., Merfeld, D.M., and Young, L.R. "Modeling Human Orientation Perception in Altered Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 13-15 Jan, 2015.
15. **Clark, T.K.**, *Galvan-Garza, R.C., Bermudez Rey, M.C.,* Yi, Y., and Merfeld, D.M. "Perceptual Noise and Sensorimotor Adaptation" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 13-15 Jan, 2015.
16. *Galvan-Garza, R.C.*, **Clark, T.K.**, Merfeld, D.M., Bloomberg, J.J., Oman, C.M., and Mulavara, A.P. "Exhibition of Stochastic Resonance in Vestibular Perception" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 8-11 Feb, 2016.
17. Rosenberg, M.J.F., *Galvan-Garza, R.C.*, **Clark, T.K.**, Sherwood, D.P., Young, L.R., and Karmali, F. "Sensory Precision Limits Vehicle Control Performance" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 8-11 Feb, 2016.
18. **Clark, T.K.**, Peters, B.T., Gadd, N.E., De Dios, Y.E., Wood, S.J., Bloomberg, J.J., Oman, C.M., and Mulavara, A.P. "Relationships between Vestibular Measures as Potential Predictors for Spaceflight Sensorimotor Adaptation" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 8-11 Feb, 2016.
19. **Clark, T.K.** and Merfeld, D.M. "Vestibular Perceptual Noise and Adaptation to an Altered Gravity Environment" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 8-11 Feb, 2016.
20. Rosenberg, M.J.F., *Galvan-Garza, R.C.*, **Clark, T.K**., *Sherwood, D.P.*, Young, L.R., and Karmali, F. "Sensory Precision Limits Behavioral Precision in a Manual Control Task" (abstract and poster) Society for Neuroscience Meeting, San Diego, CA, 12-16 Nov, 2016.
21. **Clark, T.K.** and Merfeld, D.M. "Does Adaptation to Tilt Perception to Altered Gravity Relate to Vestibular Perceptual Thresholds?" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 23-26 Jan, 2017.
22. *Dixon, J.B., Rafii, A.L., Bretl, K.N.,* and **Clark, T.K.** "A Ground-based Analog for Microgravity-Induced Sensorimotor Reinterpretation: Wheelchair Head Immobilization Paradigm" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 23-26 Jan, 2017.

23. *Bretl, K.N., McCusker, A.T., Dixon J.B*., and **Clark, T.K.** "Human Adaptation to the Coriolis Cross-Coupled Illusion for Artificial Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 23-26 Jan, 2017.
24. Gruber, J.An., *Seyedmadani, K.*, *Vincent, G.*, Reed, B., Gruber, J.Al., and **Clark, T.K.** "A Novel Linear Sled "Hybrid" Artificial Gravity Countermeasure for Microgravity-Induced Physiological Deconditioning" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 23-26 Jan, 2017.
25. *Zuzula, E.*, *Dixon, J.*, *Bretl, K.*, and **Clark, T.K.** "Design and Development of an Algorithm for an Achievability Limit Display for Crewed Planetary Landing" (abstract and poster) Aerospace Medical Association 88th Annual Scientific Meeting, Denver, CO, 30 Apr-4 May, 2017.
26. *Dixon, J.B.,* and **Clark, T.K.** "Preliminary Validation of the Wheelchair Head Immobilization Paradigm as an Analog for Post-flight Sensorimotor Impairment" (abstract and poster, **won 1st place in the student poster competition**) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25, Jan, 2018.
27. *Seyedmadani, K.*, Gruber, J.A., *Vincent, G.*, and **Clark, T.K.** "Linear Sled-Hybrid Artificial Gravity as a Comprehensive Countermeasure for Astronaut Physiological Deconditioning" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25, Jan, 2018.
28. *Bretl, K.N., Sherman, S.O., Mitchell, T.R., Dixon, J.B.,* and **Clark, T.K.** "Personalized and Non-Personalized Protocols for Human Adaptation to the Coriolis Cross-Coupled Illusion for Artificial Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25, Jan, 2018.
29. *Pinedo, C., Dixon, J.B., Davis, E., Zuzula, E.,* and **Clark, T.K.** "A Numerical Algorithm to Estimate an Achievability Limit for Crewed Planetary Landing" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25, Jan, 2018.
30. Anderson, A.P., *Butterfield, J.*, Subramanian, P., and **Clark, T.K.** "Artificial Gravity as a Countermeasure for Spaceflight Associated Neuro-Ocular Syndrome" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25, Jan, 2018.
31. *Seyedmadani, K.*, Gruber, J.A., and **Clark, T.K.** "The Linear Sled "Hybrid" Approach for Artificial Gravity as a Countermeasure for Crewed Deep Space Gateway Missions" (abstract and poster) Deep Space Gateway Science Workshop, Denver, CO, 27 Feb-1 Mar, 2018.
32. *Pinedo, C.*, *Davis, E.*, and **Clark, T.K.** "An Algorithm to Estimate the Instantaneous Achievable Limit of a Fuel-Constrained, Piloted, Planetary Lander" (abstract and poster) Aerospace Medical Association 89th Annual Scientific Meeting, Dallas, TX, 6-10 May, 2018.
33. *Dixon, J.D.*, *Brazell, V.*, and **Clark, T.K.** "Validation of a New Ground-based Analog for Post-Spaceflight Astronaut Neurovestibular Impairment: The Wheelchair Head Immobilization Paradigm" (abstract and poster, **won 1st place in the student poster competition**) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25 Jan, 2019.
34. *Pinedo, C., Dixon, J., Davis, E., Zuzula, E. Meer, B.,* and **Clark, T.K.** "Evaluation of an Achievability Limit Display for a Fuel-Constrained, Piloted, Planetary Lander" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25 Jan, 2019.
35. *Voros, J.*, *McGinley, J.*, McGuire, S., Walker, M., Karki, P., Ahmed, N., Szafir, D., and **Clark, T.K.** "Trust in an Autonomous Intelligent System for Navigational Guidance on a Planetary Rover Task" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25 Jan, 2019.
36. *Suri, K.* and **Clark, T.K.** "Comparison of Vestibular Perceptual Thresholds in Roll Tilt and Pitch Tilt" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25 Jan, 2019.
37. *Bretl, K.N.* and **Clark, T.K.** "Extended Human Acclimation to the "Coriolis" Cross-Coupled Illusion for Artificial Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 22-25 Jan, 2019.

38. *Kryuchkov, A., Suri, K.,* and **Clark, T.K.** "Human Thresholds of Self Roll vs. Pitch Tilt" (abstract and poster) National Conference on Undergraduate Research, Kennesaw, GA, 10-13 Apr, 2019.
39. *Pinedo, C., Zuzula, E., Davis, E., Baker, M., Dixon, J.D.*, and **Clark, T.K.** "Impact of Pilot-Model Time Delay on an Achievability Limit Display for a Fuel-Constrained, Piloted, Planetary Lander" (abstract and poster) Aerospace Medical Association 90th Annual Scientific Meeting, Las Vegas, NV, 5-9 May, 2019.
40. *Dixon, J.D.*, Etgen, C., **Clark, T.K.**, and Folga, R. "Optimizing the Kraken: Integration of a Vestibular Model and State Estimator for Disorientation Research Device (DRD) Motion Algorithm Application" (abstract and poster) Aerospace Medical Association 90th Annual Scientific Meeting, Las Vegas, NV, 5-9 May, 2019 (**Dixon awarded the AsMA Fellows Scholarship for poster presentation, 2nd place**).
41. Wood, S.J., De Dios, Y.E., Peters, B.T., Beltran, N.E., Caldwell, E.E., Rosenberg, M.J., Koppelmans, V**., Clark, T.K.**, Seidler, R.D., Oddsson, L., Theriot, C.A., Reschke, M.F., Feiveson, A.F., and Bloomberg, J.J., "Sensorimotor Predictors of Postlanding Functional Task Performance" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
42. Sherman, S., *Kryuchkov, A., Stine, P.,* **Clark, T.K.,** and Anderson, A. "Auditory Stochastic Resonance to Improve Perceptual Thresholds" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
43. *Voros, J., Callas, M.,* Anderson A., and **Clark, T.K.** "Galvanic Vestibular Stochastic Resonance to Improve Perceptual Thresholds" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
44. *Rise, R., Voros, J.,* Anderson, A., and **Clark, T.K.** "Using Simulation to Improve Sensory Threshold Estimation on Two-Interval Stochastic Resonance Tasks" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
45. *Pinedo, C., Baker, M.*, and **Clark, T.K.** "Evaluation of Pilot-Model Time Delay on an Achievability Limit Estimate during Piloted Lunar Landings" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
46. *Kintz, J.R.* and **Clark, T.K.** "Unobtrusive Measurement and Autonomous Estimation of Human Internal Cognitive States" (abstract and poster, **won 1st place in the student poster competition**) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
47. **Clark, T.K.** and *Dixon, J.B.* "A New Analog of Spaceflight-Altered Neurovestibular Cues Impairs Sensorimotor Performance" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 27-30 Jan, 2020.
48. **Clark, T.K.** "Differences in Vestibular Perceptual Thresholds Between Roll, Pitch, and Yaw Axes" (abstract in proceedings, conference cancelled) Vestibular Orientation Research Meeting, Toronto, ON, 1-3 May, 2020.
49. *Pinedo, C.*, *Seedorf, J.*, and **Clark, T.K.** "Evaluation of an Achievability Limit Display on Human Performance during Pilot Lunar Landings" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
50. *Putman, E.*, Galvan-Garza, R., and **Clark, T.K.** "Investigating the Role of Galvanic Vestibular Stimulation on Operational Performance in Manual Control and Functional Mobility Tasks" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
51. *Kintz, J.R.* and **Clark, T.K.** "Validation of Embedded Measures of Trust, Mental Workload, and Situation Awareness" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
52. *Voros, J.L.* and **Clark, T.K.** "Modeling Perception of Spatial Orientation in Dynamic Transitions of Visual Conditions" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
53. *Bretl, K.N.* and **Clark, T.K.** "Comprehensive Summary of Cross-Coupled Illusion Acclimation Investigation Results" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.

54. *Smith, K.J.*, Datta, A., Truong, D.Q., Burkhart, C., and **Clark, T.K.** "Investigating the Efficacy and Acceptability of using Galvanic vestibular Simulation and a Display Modality" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
55. *Rise, R.*, *Jonsen, A., Durell, A.,* Anderson A., and **Clark, T.K.** "Identifying Stochastic Resonance in Perceptual Threshold Estimation Performance" (abstract and poster, **won 2nd place in the student poster competition**) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
56. *Kravets, V.G., Dixon, J.B.,* Ahmed, N., and **Clark, T.K.** "A Bayesian Computational Model for Neurovestibular Adaptation to Altered Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
57. Sherman, S., *Greenstein, M.,* **Clark, T.K.**, and Anderson A.P. "Cognitive Performance Enhancement with Stochastic Resonance" (abstract and poster) NASA Human Research Program Investigator's Workshop, Virtual, 1-4 Feb, 2021.
58. Anderson, A.P., Putman, E., Boppana, A., **Clark, T.K.** "Trinity: Multi-Environment Virtual Trainer for Long Duration Exploration Missions" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
59. *Kintz, J.R.,* Buchner, S.L., *Wheeler, C.D.,* Shen, Y., Peterson, B.E., Anderson A.P., and **Clark, T.K.** "An Adaptive Autonomous System Utilizing Estimated Operator Cognitive States in Moderate Communications Latency Scenario" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
60. **Clark, T.K.**, *Lonner, T., Allred, A., Drecksler, S., Poole, N.*, Oman, C.M., Lawson, B.D., Groen, E., Lackner, J., DiZio, P. "Development of a Countermeasure Suite for Motion Sickness Induced by Post-Flight Water Landings" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
61. *Kravets, V.G., Dixon, J.B.,* Ahmed, N.R., and **Clark, T.K.**, "A Bayesian Approach for Estimating the Internal Model of Gravity" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
62. Sherman, S., *Greenstein, M.,* **Clark, T.K.,** Basner, M., and Anderson A.P. "Investigating Cognitive Enhancement with Stochastic Resonance" (abstract and lightning talk, **won 2nd place in the student presentation competition**) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
63. Putman, E.J., Boppana, A., **Clark, T.K.**, and Anderson, A.P. "Multi-Environment Adaptive Virtual Reality Training as a Potential Countermeasure for Spaceflight Associated Neuroplasticity" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
64. Boppana, A., Putman, E., **Clark, T.K.,** and Anderson A.P., "Dynamic Virtual Reality Training Algorithm for Long Duration Exploration Missions" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
65. *Temple, D.R.*, Datta, A., Breen, P., Serrador, J., and **Clark, T.K.** "Development of a Portable Galvanic Vestibular Stimulator for Mimicking Post-flight Spatial Disorientation" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
66. *Temple, D.R.,* Antonucci, G., Hauter, A., Salgado, E., Harrison, J., Morton, Q., Taylor, N., Foehr, B.D., *Wheeler, C.*, Timko, I.D., and **Clark, T.K.** "Development of a Gravity Offloading and Tethering Somatosensory Enhancement System (GOATSES) to Preserve Somatosensory Balance Cues" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
67. *Allred, A.* and **Clark, T.K.** "A Galvanic Vestibular Stimulation-Based Countermeasure for Motion Sickness in Astronauts" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.

68. *Edwards, S.,* **Clark, T.K.,** and *Temple, D.R.* "Perception of Physical Roll Tilt using Galvanic Vestibular Stimulation" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
69. *Smith, K.J.*, *Temple, D.R., Ramirez, L.J.,* Datta, A., Burkhart, C., and **Clark, T.K.** "A Vestibular Interface: Using Galvanic Vestibular Stimulation as a Display Modality" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
70. *Lonner, T.L.* and **Clark, T.K.** "Evaluating Virtual Reality as a Countermeasure for Astronaut Motion Sickness during Post-Flight Water Landings" (abstract and lightning talk) NASA Human Research Program Investigator's Workshop, Virtual, 7-11 Feb, 2022.
71. *Smith, K.J., Temple D.R., Ramirez, L.J.,* Datta, A., Burkhart, C., and **Clark, T.K.** "An Experimental Evaluation of Galvanic Vestibular Stimulation as a Display Modality" (abstract and poster) 92nd Annual Scientific Meeting of the Aerospace Medical, Reno, NV, 22-26 May, 2022.
72. Valter, Y., **Clark, T.K.**, Truong, D., Brunye, T., *Smith, K., Hogoboom, B.*, Datta, A. "Galvanic Vestibular Stimulation as a Novel Form of Information Transfer" (abstract and poster) Defense TechConnect, National Harbor, MD, 27-29 Sep, 2022.
73. Anderson, A.P., *Buchner, S., Kintz, J.,* and **Clark, T.K.** "Estimating the Trust, Mental Workload, and Situation Awareness of Human Spaceflight Operators in Human-Autonomy Teaming" (abstract and presentation) First International Workshop on Interdisciplinary Paradigms for Semi-Autonomous Deep-Space Habitation, San Antonio, TX, 13-14 Oct, 2022.
74. Love, K., Rosenberg, M.J., Galvan-Garza, R., **Clark, T.K.**, and Karmali, F. "The Role of Vestibular Noise in Closed-loop Self-Orientation Control" (abstract and poster) Society for Neuroscience, San Diego, CA, 12-16 Nov, 2022.
75. **Clark, T.K.**, *Lonner, T.L., Allred, A., Gopinath, A., Bonarrigo, L.,* Oman, C.M., Lawson, B.D., Groen, E.L., Lackner, J., and DiZio, P. "Countermeasures to Reduce Sensory Conflict and Mitigate Motion Sickness from Ground-Based Analogs of a Gravity Transition and Sea State Motion" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
76. *Smith, K.J.*, Endsley, T.C., and **Clark, T.K.** "Uncovering Unobtrusive Correlates of Operator Situation Awareness" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
77. *Sherman, S., Jonsen, A.*, Lewis, Q., *Schlittenhart, M.*, **Clark. T.K.,** and Anderson, A.P. "Investigating the Long-Term Effects of Stochastic Resonance" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
78. *Temple, D.R.* and **Clark, T.K.** "Systematic Assessment of Noisy Galvanic Vestibular Stimulation as a Sensorimotor Countermeasure" (abstract and poster, **won 2nd place in the postdoctoral poster competition**) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
79. *Allred, A.* and **Clark, T.K.** "A Computational Model of Motion Sickness Driven by Sensory Conflict from Spatial Orientation Perception" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
80. *Kintz, J.R., Meiser, M.,* and **Clark, T.K.** "Investigating an Adaptive Autonomous System Informed by Time-Series Estimates of Operator Cognitive States" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
81. *Lonner, T.L., Gopinath, G., Bonarrigo, L.,* and **Clark, T.K.** "The Effect of Virtual Reality on Motion Sickness and Balance in Astronauts during Post-Flight Water Landings" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.

82. *Klausing, L.N., Voros, J., Roberts, F., Alla, S.,* and **Clark, T.K.** "Virtual Reality as an Experimental Apparatus for Assessing the Role of Visual-Vestibular Integration in Spatial Orientation Perception" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
83. Nazifi, M.M., Nibhanupudy, T.J., López-Contreras Gonzalez, E., Love, K., Reissman, M.E., Reissman, T., **Clark, T.K.**, Rah, Y.C., and Karmali, F. "Computational Models of Human-Vehicle Systems" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
84. *Diaz, M.M., Bretl, K.N.,* and **Clark, T.K.** "No Evidence of Cross-Coupled Illusion Acclimation Transfer Across Head Tilt Planes: Findings and Implications for Improved Tolerability of Spaceflight Artificial Gravity" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
85. *Austin, C.R., Yan, C.*, Datta, A., Valter, Y., Serrador, J., and **Clark, T.K.** "Galvanic Vestibular Stimulation Postflight Sensorimotor Training Device" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
86. *Putman, E.J.,* Boppana, A., Peterson, B., **Clark, T.K.**, and Anderson A.P. "Immersive and Adaptive Training with Virtual Reality for Long Duration Exploration Missions" (abstract and poster) NASA Human Research Program Investigator's Workshop, Galveston, TX, 7-9 Feb, 2023.
87. Nazifi, M.M., Nibhanupudy, T.J., López-Contreras Gonzalez[1], E., Love, K., Reissman, M.E., Reissman, T., **Clark, T.K.**, Rah, Y.C., and Karmali, F. "Computational Models of Active Human Motion Control" (abstract and poster) Association for Research in Otolaryngology 46th Annual MidWinter Meeting, Orlando, FL, 11-15 Feb, 2023.
88. Sherman, S., Greenstein, M. Basener, M., Clark, T.K., and Anderson, A.P. "Investigating External Sensory Noise Effects on Cognition" (abstract and poster) 2023 Cognitive Neuroscience Society 30th Anniversary Meeting, San Francisco, CA, 25-28 Mar, 2023.
89. *Austin, C.R., Yan, C.,* and **Clark, T.K.** "Galvanic Vestibular Stimulation Postflight Sensorimotor Training Device" (abstract and poster) 93rd Annual Scientific Meeting of the Aerospace Medical, New Orleans, LA, 21-25 May, 2023.
90. *Klausing, L.N., Temple, D.R., Hogoboom, B., Pepper, S.,* and **Clark, T.K.** "Galvanic Vestibular Stimulation as an Alternative Display Modality: Directional Sensitivity and Visual Dual Tasking" (abstract and poster) Vestibular Oriented Research Meeting, Boulder, CO, 25-29 Jun, 2023.

Current Projects

1. PI, "**A Non-Pharmacological Countermeasure Suite for Motion Sickness Induced by Post-Flight Water Landings"**, NASA Human Research Program, with co-Is: Paul DiZio and James Lackner at Brandeis University, Charles Oman at MIT, and Eric Groen at TNO Defense, 1/1/2021-12/31/2023, $749,809 total, CU fraction: $414,745, my share: $414,745, with $335,064 subcontract to Brandeis through CU/Clark.
2. Co-I "**Habitats Optimized for Missions of Exploration (HOME)**", NASA Space Technology Research Institute for Deep Space Habitat Design, with PI Stephen Robison at UC-Davis, Institutional PI David Klaus, co-Is Allison Anderson, and James Nabity at CU, and other external Co-Is, 9/1/2019-8/31/2024, $15M total, CU fraction $3.5M, my share: $667,982.
3. Co-I and Institutional PI "**Identifying Adverse Modes via Human-Machine Cybernetic Modeling**" Office of Naval Research Multidisciplinary University Research Initiative (N00014-18-S-F006), with PI Daniel Merfeld at The Ohio State University and 8 other external Co-Is, 5/1/2020-4/30/2025 (first phase ends 4/30/2023), 7.5M total, CU fraction $879,810, my share: $879,810.
4. Co-I and Institutional PI, "**Sensorimotor Predictors of Postlanding Functional Task Performance**", NASA Human Research Program, with PI Scott Wood (original PI Ajitkumar

Mulavara) at NASA JSC (and other external Co-Is), 11/1/2018-undefined, unfunded collaborator on NASA internal, directed research project.

5. Co-I and Institutional PI, "**Galvanic Vestibular Stimulation as a Novel, Hands-Free, and Intuitive Interface Modality**", DARPA SBIR program HR001119S0035-10 Phase I and Phase II (also called "Advancing GVS as a Novel, Hands-Free, and Intuitive Interface Modality"), with PI Abhishek Datta at Soterix Medical and co-I Cody Burkhart at NASA JSC, 2/15/2020-8/1/2023. Phase I: $225,000 total, CU fraction: $41,694, my share: $41,694. Phase II: $2.25M total, CU fraction: $251,349, my share: $251,349.
6. Co-I, "**Multi-Environment Virtual Training for Long Duration Exploration Missions**", NASA Human Research Program, with PI Allison Anderson and co-I Stephen Robinson at UC-Davis, co-I Dan Szafir at UNC-Chapel Hill, 5/15/2021-5/14/2025, $1.4M total, CU fraction: $1.4M, my share: $154,000.
7. Co-I and Institutional PI, "**Galvanic Disorientation Simulation Trainer (GDST)**", NASA SBIR Phase I and Phase II (also called "Advancing and Validating Galvanic Disorientation Simulation Trainer (GIST)"), with PI Abhishek Datta at Soterix Medical and co-I Jorge Serrador at Western Sydney University, 5/15/2021-5/31/2024, Phase I: $125,000 total, CU fraction: $14,992, my share: $14,992. Phase II: $750,000 total, CU fraction: $280,000, my share: $280,000.
8. PI, **Charles Stark Draper Laboratory fellowship** for Kieran Smith, PhD student, 8/15/2021-8/14/2025(est), $156,000 total (est), my share: $0 (fellowship).
9. PI, "**A Validated Tool to Model Astronaut Neurovestibular Adaptation to Altered Gravity**", training grant for Victoria Kravets, PhD student, NASA Space Technology Graduate Research Opportunity (NSTGRO), 8/15/2021-8/14/2025, $306,816 total(est), my share: $20,000(est, fellowship).
10. PI, "**A Galvanic Vestibular Stimulation-based Countermeasure to Motion Sickness in Astronauts**", training grant for Aaron Allred, PhD student, NASA Space Technology Graduate Research Opportunity (NSTGRO), 8/1/2020(transferred to Clark 8/1/2021)-7/31/2024, $306,816(est), my share: $20,000(est, fellowship).
11. PI, "**Detecting Pilot Spatial Disorientation to Trigger Active Countermeasures during Lunar Landing"**, NASA Human Research Program, with co-I Eric Vance in Applied Math, co-I Tristan Endsley and co-I Sherrie Holder at Draper Laboratory, 12/23/2022-12/22/2025, $800,000 total, CU fraction: $350,000, my share: $350,000, with $450,000 subcontract to Draper through CU/Clark.
12. PI, **"Systematic Assessment of Noisy Galvanic Vestibular Stimulation as a Sensorimotor Countermeasure"**, Postdoctoral Fellowship for David Temple, Translation Institute for Space Health, 9/1/2022-8/31-2024, $160,000 total, my share: $0 (fellowship).
13. Co-I and Institutional PI, "**Development of Sensorimotor Fitness for Duty Assessments Using Ground Analogs**", NASA HRP Directed Project, with PI Sarah Moudy (original PI Marissa Rosenberg) at NASA JSC and other external co-Is, 10/1/2022-9/30/2025, $952,800 total, CU fraction: $48,278, my share: $48,278.
14. Co-I, "**Metrics and Models for Real Time Inference and Prediction of Trust in Human-autonomy Teaming**", US Air Force Office of Scientific Research (AFOSR), with PI Zhoadan Kong at UC-Davis and co-I/Institutional PI Allison Anderson, 11/25/2022-11/24/2025, $899,818 total, CU fraction: $499,966, my share: $229,769.
15. Co-I, "**Postural Orthostatic Tachycardia Syndrome in Persons with Milt Traumatic Brain Injury: Vestibular-mediated Mechanisms and Brain Biomarkers**", ABNexus Program, with PI Jeff Hebert at CU-Anschutz and Institutional PI Allison Anderson at CU-Boulder, 7/1/2023-6/30/2024, $50,000 total, CU-Boulder fraction: $12,628, my share: $12,034.
16. PI, "**Validating Motion Algorithms using a Model for Spatial Orientation Perception**" (Augmentation of Detecting Pilot Spatial Disorientation to Trigger Active Countermeasures during Lunar Landing), NASA Human Research Program, 7/1/2023-9/30/2025, $277,232 total, CU fraction: $277,232, my share: $277,232.

Completed Projects

1. PI, "**The Effect of Altered Gravity on Human Orientation Perception**", Burroughs Wellcome Fund Collaborative Research Travel Grant, 8/1/2016-12/31/2017, $10,000 total.
2. Co-I, Institutional and Science PI "**Turbolift: the Linear Sled Hybrid Artificial Gravity Concept**", NASA Innovative and Advanced Concepts (NIAC) Phase I, 5/1/2017-8/8/2018, $124,649 total, CU share $41,079, my share: $41,079.
3. PI, "**Design of an Artificial Gravity Centrifuge for Crewed Space Exploration**", Boeing Corporation, 10/10/2017-5/31/2018, $20,000 total, my share: $20,000.
4. PI, "**Identifying Biomarkers Relevant to Spaceflight**", RIO SEED Grant, with co-I Robin Dowell (MCDB), 7/1/2016-12/31/2018, $49,997, my share $21,472.
5. Co-I and Institutional PI "**User Signals for Evaluation of Reliability**" Lockheed Martin Internal Research and Development, with PI Raquel Galvan-Garza at Lockheed Martin, 3/1/2019-11/15/2019, $50,000 total, my share: $50,000.
6. Co-I and Institutional PI, "**Developing and Validating a Virtual Sensorimotor Analog and Countermeasures**" with PI Millard Reschke and co-I Marissa Rosenberg at NASA JSC, 2/1/2019-12/1/2019, unfunded collaborator on NASA IRAD project.
7. Co-I and Institutional PI "**Mathematical Model of Spatial Orientation**" US Army Research SBIR, with PI Michael Newman and 2 other external Co-Is, 5/22/2015-2/28/2020, $1M total, CU faction: $47,606, my share: $47,606.
8. Co-I and Institutional PI, "**Treatment of Vestibular Impairment of Service Members after Traumatic Brain Injury through Use of an Individualized, Portable Neuromodulation Device**", DoD SBIR program DHA 192-002 Phase I, with PI Abhishek Datta at Soterix Medical and co-I Jeffrey Hebert at CU-School of Medicine, 1/21/2020-7/20/2020, $249,961 total, CU fraction: $14,000, my share: $6,999.
9. Co-I and Institutional PI, "**Stimulation Application for Human Improvement and Retained Enhancement**", Lockheed Martin Internal Research and Development, with PI Raquel Galvan-Garza at Lockheed Martin, 11/25/2019-11/29/2020, $75,000 total, my share: $75,000.
10. PI, "**A Conceptual Design and Concept of Operations for Intermittent Short-Radius Centrifugation for Artificial Gravity**", training grant for Kathrine Bretl, PhD student, NASA Space Technology Research Fellowship (NSTRF), 8/15/2016-8/14/2021, $306,816 total(est), my share: $20,000(est, fellowship)
11. Co-PI, "**Performance Enhancement Through Multi-Modal Stochastic Resonance**", Translational Research Institute for Space Health, with PI Allison Anderson, 4/1/2019-12/31/2021, $800,000 total, my share: $380,000.
12. Co-I, "**Network-based Neurophysiological and Psychophysiological Metrics of Human Trust Dynamics when Teamed with Autonomy**", Air Force Office of Scientific Research (AFOSR) DURIP, 3/15/2021-3/14/2022, $109,203 total, CU fraction: $57,109, my share: $14,277.
13. PI, **Charles Stark Draper Laboratory fellowship** for Jordan Dixon, PhD student, 8/15/2018-5/31/2022, $209,718, my share: $0 (fellowship).

External Funding Awarded (since 2016), my share (as PI/co-I, not including fellowships to my advisees, but counting subcontracts for projects I am the PI on): **$5,037,991**. My share not including subcontracts for projects I am the PI on: $4,262,927. Since tenure review (2023): $507,001.

TEACHING

Courses Taught

Undergraduate
ASEN 2004 Aerospace Vehicle Design and Performance (space) – 2016, 17, 19, 20, 22, 23
ASEN 2012 Experimental and Computational Methods in AES – co-revised 2018
ASEN 4018/4028 Senior Projects I/II – 2017/18

Graduate
ASEN 6519 Human Operation of Aerospace Vehicles* – new course, developed 2017, 20, 22
ASEN 5519 Experimental Methods and Statistical Analysis* – new course, co-developed 2018, 22
ASEN 5158 Space Habitat Design* – 2016
ASEN 5016 Space Life Sciences* - 2021, 23
ASEN 5849/6849 Independent Study – various years, 5 students total

* offered for distance MS program

Other
Customer/Point of Contact, ASEN 5018/6028 SHEDS (Semi-Autonomous Habitat for the Exploration of Deep Space) graduate project team, 2021
Guest lecture, ASEN 5016 Space Life Sciences – 2017, 18, 22
Guest panelist, ASEN 6519 Extravehicular Activity – 2018, 22
Invited lecture, Cornell (MAE 6850 Space Biomedical Engineering and Human Performance) – 2015
MIT 16.459 Bioengineering Journal Article Seminar – 2014
MIT/Harvard HST.514J/16.430J Sensory Neural-Systems – co-taught 2014
Invited lecture, NSBRI Summer Bioastronautics Institute – 2014
Invited lecture, MIT 16.470/ESD.756 Statistical Methods in Experimental Design – 2014

See links for FCQ data (Student Evaluations):
Up to F2019: https://public.tableau.com/app/profile/fcq.office/viz/FCQResultsViewer/FCQResultsViewer
F2020-present: https://viz-public.cu.edu/#/site/Boulder/views/BD_FCQ_Report/FCQCourse

Thesis Students

PhD Thesis Advisor – current
1. Jacob Kintz, Aerospace PhD student (entered program Aug 2019, prelim exam Sept 2020, comprehensive exam Dec 2022)
   Research Topic: Smart Habitats for Human Exploration of Deep Space
   Funding/Recognition: NASA Space Technology Research Institute 2019-present, 1st place NASA Human Research Program Student Poster competition 2020, winner of the 2021 Ross McFarland award for the best student research paper at AsMA from the Life Science and Biomedical Engineering Branch, winner of a 2023 Outstanding Mentor Award from the College of Engineering & Applied Science.
2. Aaron Allred, Aerospace PhD student (entered program Aug 2019, prelim Sept 2020, transitioned to our research group in Aug 2021, comprehensive exam May 2023)
   Research Topic: Galvanic Vestibular Stimulation to Mitigate Motion Sickness in Astronauts
   Funding/Recognition: NASA Space Technology Graduate Research Opportunity (NSTGRO) 2020-present
3. Kieran Smith, Aerospace PhD student (entered program Aug 2020, prelim exam Sept 2021, comprehensive exam Nov 2023)

Research Topic: Galvanic Vestibular Stimulation as an Alternate Display Modality
Funding/Recognition: Dean's Graduate Assistantship 2020-present; DARPA SBIR with Soterix Medical Inc. 2020-2021; National Science Foundation Graduate Research Fellowship Program (NSF GRFP) awardee 2021; Charles Stark Draper Laboratory Fellowship 2021-present

4. Victoria Kravets, Aerospace PhD student (entered program Aug 2020, prelim exam Sept 2021, comprehensive exam Apr 2023)
   Research Topic: Computational Model of Human Sensorimotor Adaptation to Altered Gravity
   Funding/Recognition: ASEN TA 2020; NASA Human Research Program 2021; NASA Space Technology Graduate Research Opportunity (NSTGRO) 2021-present
5. Taylor Lonner, Aerospace PhD student (entered program Aug 2021, prelim exam Sept 2022)
   Research Topic: Countermeasures for Mitigating Astronaut Motion Sickness Post-Landing
   Funding/Recognition: NASA Human Research Program 2021-present.
6. Caroline Austin, Aerospace PhD student (entered program Aug 2022, prelim exam Sept 2023)
   Research Topic: Galvanic Vestibular Stimulation System to Mimic Astronaut Post-Flight Sensorimotor Impairment
   Funding/Recognition: NASA SBIR Program Phase II (with Soterix Medical, Inc.) 2022-present; National Science Foundation Graduate Research Fellowship Program (NSF GRFP) awardee 2022
7. Nicole Rote, Aerospace PhD student (entered program Aug 2023)
   Research Topic: Aerospace Human Performance
   Funding/Recognition: National Science Foundation Graduate Research Fellowship Program (NSF GRFP) awardee 2023

PhD Thesis co-Advisor/secondary Advisor – current

8. Erin Richardson, co-Advised with Allison Anderson, Aerospace PhD student (entered program Aug 2022, prelim exam Sept 2023)
   Research Topic: Human Physiological Signals for Cognitive State Estimation
   Funding/Recognition: NASA Space Technology Research Institute 2022-present; 2nd place in the 2023 AIAA Intelligent Systems Workshop student poster competition.
9. Sarah Leary, co-Advised with Allison Anderson, Aerospace PhD student (entered program Aug 2021, prelim exam Sept 2023)
   Research Topic: Metrics and Models for Real Time Inference and Prediction of Trust in Human-autonomy Teaming
   Funding/Recognition: Air Force Office of Scientific Research (AFOSR) RTA2 Trust and Influence Program 2022-present
10. Jayce Cuberovic, co-Advised with Allison Anderson, Aerospace PhD student (entered program Aug 2020, prelim exam Sept 2021, transitioned to our lab in Nov 2022, on leave beginning Mar 2022)
    Research Topic: Metrics and Models for Real Time Inference and Prediction of Trust in Human-autonomy Teaming
    Funding/Recognition: Air Force Office of Scientific Research (AFOSR) RTA2 Trust and Influence Program 2022-present
11. Valetin Siderskiy, co-Advised with Jorge Serrador (Rutgers University and Western Sydney University), PhD student
    Research Topic: Visual-Vestibular Autonomic Influences on Cerebral Blood Flow
    Funding/Recognition: Office of Naval Research MURI 2020-present

PhD Thesis Advisor – completed

1. Carlos Pinedo, Aerospace PhD student (entered program Aug 2017, prelim exam Sep 2018, comprehensive exam Nov 2020, defended Apr 2021)
   Research Topic: Novel Displays, Controls, and Interfaces for Crewed Planetary Landing
   Funding/Recognition: US Air Force, Lockheed Martin Advanced Technology Laboratories 2019, 2020 Smead Aerospace Graduate Student Award for Service

Employment: LtCol, Director of Education at the United States Air Force Test Pilot School

2. Kathrine Bretl, Aerospace PhD student (entered program Aug 2016, prelim exam Sep 2017, comprehensive exam Nov 2019, defended Apr 2021)
   Research Topic: Conceptual Design and Concept of Operations for Intermittent Short-Radius Centrifugation for Artificial Gravity
   Funding/Recognition: Discretionary 2016; NASA Space Technology Research Fellowship (NSTRF) 2017-present; Zonta Amelia Earhart fellowship 2018; Women Forward in Technology Scholarship Winner 2019; AIAA Neil Armstrong Graduate Award 2020.
   Employment: AAAS S&T Policy Fellow at the White House Office of Science and Technology Policy
3. Jordan Dixon, Aerospace PhD student (entered program Aug 2016, prelim exam Sep 2017, comprehensive exam Jan 2021, defended Mar 2022)
   Research Topic: Investigation of Mitigating Pilot Spatial Disorientation with a Computational Tool for Real-Time Triggering of Active Countermeasures
   Funding/Recognition: Discretionary 2016; ASEN 2004 TA 2017; RIO Seed Grant 2017; Naval Medical Research Unit 2018; Charles Stark Draper Laboratory Fellowship 2018-present; Aerospace Engineering Sciences Outstanding Teaching Assistant Award 2017; 1st place NASA Human Research Program Student Poster competition 2018 & 2019; Most Innovative Student Research award at Human Factors and Ergonomics Society conference 2019; Aerospace Medical Association (AsMA) Fellows Scholarship, 2nd place, 2019; Young Investigator Award for presentation at 41st Annual International Society for Gravitational Physiology conference, 2021; Smead AES Graduate Award for Professional Service, 2022.
   Employment: Charles Stark Draper Laboratory, Postdoctoral Associate and Temporary Instructor, University of Colorado-Boulder (2022)
4. Sage Sherman, co-Advised with Allison Anderson, Aerospace PhD student (entered program Aug 2018, prelim exam Sept 2020, comps Oct 2021, defended Jul 2023)
   Research Topic: Investigating Stochastic Resonance as a Countermeasure for Human Performance Decrement Associated with Spaceflight
   Funding/Recognition: Translational Research Institute for Space Health 2019-2021; ASEN TA 2022; Lead TA AY 2022/23; Smead Aerospace Vice Award 2022.
   Employment: Post-doctoral research associate, University of Colorado-Boulder
5. Jamie Voros, Aerospace PhD student (entered program Aug 2018, prelim exam Sept 2019, comprehensive exam Jan 2022, defended Aug 2023)
   Research Topic: Perception and Awareness of Spatial Orientation Following Transitions in the Availability of Visual Information
   Funding/Recognition: ASEN TA 2018; Translational Research Institute for Space Health 2019-2020; Office of Naval Research MURI 2020-present; Zonta Amelia Earhart fellowship 2021; TEDx talk on "The Role of Diversity in the Next Human Spaceflight Revolution": ted.com/talks/jamie_voros_the_role_of_diversity_in_the_next_human_spaceflight_revolution
   Employment: Afference (start up)
6. Esther Putman, co-Advised with Allison Anderson, Aerospace PhD student (entered program Aug 2019, prelim exam Sept 2022, comprehensive exam Apr 2023, defended Dec 2023)
   Research Topic: Adaptive Training with Virtual Reality for the Maintenance of Mission-Critical Skills in Long Duration Spaceflight
   Funding/Recognition: Lockheed Martin Advanced Technology Laboratories (2019-2021), National Science Foundation Graduate Research Fellowship Program (NSF GRFP) awardee 2020, NASA Human Research Program VNSCOR, Astronaut Scholar (2018), Brooke Owens Fellow (2018), Women in Aerospace Foundation Scholar (2018), AIAA Diversity Scholar (2018)
   Employment: SpaceX, Space Medical Engineer

PhD Thesis Committee Member – current

1. Michael Zero, Aerospace PhD candidate (advisor D. Klaus)
   Research Topic: Defining, Measuring, and Applying Spaceflight Crewmember Operational State (comps May 2023)
2. Eric Brighton, Aerospace PhD candidate (advisor D. Klaus)
   Research Topic: A Systems Engineering Approach to Holistically Evaluating Cockpit Design and Performance (comps Jan 2022)
3. Christine Escobar: Aerospace PhD candidate (advisor J. Nabity)
   Research Topic: Robust ECLSS Design Methodology for Deep Space Exploration (comps Oct 2022)
4. Sophie Zaccarine: Aerospace PhD candidate (advisor D. Klaus)
   Research Topic: Characterizing the Trade Space for Autonomous System Attributes in Deep-Space Habitats (comps Dec 2022)
5. Nicholas Conlon: Aerospace PhD candidate (advisor N. Ahmed and D. Szafir)
   Research Topic: Competency Self-Assessments for Human-Autonomy Teaming (comps Jun 2023)
6. Chadwick Healy: Biomedical PhD candidate (advisor A. Ahmed)
   Research Topic: The Interaction of Effort, Error, and Time Costs in Learning and Control of Movement (comps Apr 2023)
7. Andreas Brink: KTH Royal Institute of Technology (Sweden, advisor Ola Eiken)
   Research Topic: Roll Tilt Perception on Gondola Centrifuge ("half-time" exam Sep 2023)
8. Savannah Buchner: Aerospace PhD candidate (advisor A. Anderson)
   Research Topic: Immersive Virtual Reality Displays for Operations and Training in Various Control Modalities (comps Dec 2023)

PhD Thesis Committee Member – completed

1. Raquel C. Galvan-Garza, MIT Aeronautics and Astronautics PhD (defended May 2016)
   Research Topic: Enhancement of Perception with the Application of Stochastic Vestibular Stimulation
   Employment: Lockheed Martin Advanced Technologies Laboratory
2. Emily Matula, Aerospace PhD candidate (advisor J. Nabity)
   Research Topic: Characterization of Biological Closed-Loop Life Support Systems for Thermal Control and Revitalization of Spacecraft Cabin Environments (defended Jul 2019)
   Employment: NASA Johnson Space Center, ISS Flight Controller
3. Luke (Charles) Burks, Aerospace PhD candidate (advisor N. Ahmed)
   Research Topic: Active Collaborative Sensing, Learning, and Planning in Human-Robot Teams (defended Jul 2020)
   Employment: Aurora Flight Sciences
4. Michael Lotto, Aerospace PhD candidate (advisor D. Klaus)
   Research Topic: Assessing the Feasibility of using Co-electrolysis with Task-Specific Ionic Liquids to Produce Methane and Oxygen for Martian In-Situ Resource Utilization (defended Nov 2020)
   Employment: NASA Johnson Space Center
5. Katya Arquilla, Aerospace PhD candidate (advisor A. Anderson)
   Research Topic: Monitoring Behavioral Health in Extreme Operational Environments (defended Mar 2021)
   Employment: Post-doctoral associate, MIT
6. Abhishektha Boppana, Aerospace PhD candidate (advisor A. Anderson)
   Research Topic: Implementing Dynamic Foot Shape Models to Improve Spacesuit Boot Fit (defended Apr 2022)
   Employment: Meta Platforms, Inc.
9. Kipp Larson, Aerospace PhD candidate (advisor J. Nabity)
   Research Topic: Space Suit Thermal Control with a Gas-Gap Heat Switch (defended Jan 2023)
   Employment: Ball Aerospace
10. M.C. Dorbecker: Aerospace PhD candidate (advisor J. Nabity)

Research Topic: Modeling Human Performance Degradation from Radiation Exposure during Long-Duration Missions (defended Jan 2023)
Employment: University of Colorado-Boulder

11. Annika Rollock: Aerospace PhD candidate (advisor D. Klaus)
Research Topic: Guiding Principles for Prioritizing Use of Emergent Technology Toward Self-Reliant Deep Space Habitats (defended May 2023)
Employment: Aurelia Institute
12. Samuel Eshima: Aerospace PhD candidate (advisor J. Nabity)
Research Topic: Sensor Suite Optimization Process for Environmental Control and Life Support Systems the Utilize Machine Learning for Anomaly Detection and Diagnostics (defended Nov 2023)

MS Thesis Advisor, MS Committees – current

MS Thesis Advisor, MS Committees – completed

1. **Advisor** for Kadambari Suri, Aerospace MS Apr 2019
Research Topic: Vestibular Perceptual Thresholds in Pitch Tilt
Employment: KBRwyle/NASA JSC H3PO Laboratory
2. **Committee Member** for Sage Sherman, Aerospace MS/BS Apr 2019
Research Topic: Evaluating Enhanced Auditory Perception Augmentation via Stochastic Resonance
Grad School: CU PhD (advisor A. Anderson)
3. **Committee Member** for Roger Huerta, Aerospace MS Apr 2019
Research Topic: Feasibility and Analysis of a Hybrid Spacesuit Architecture for Planetary Surface Exploration
4. **Advisor** for Jamie Voros, Aerospace MS Apr 2020
Research Topic: Cross Modal Stochastic Resonance in Perceptual Thresholds with Galvanic Vestibular Stimulation
5. **Advisor** for Esther Putman, Aerospace MS Apr 2021
Research Topic: Operational Performance in Functional Mobility and Manual Control Tasks using Galvanic Vestibular Stimulation
6. **Advisor** for Rachel Rise, Aerospace MS Apr 2021
Research Topic: Identifying Stochastic Resonance in Perceptual Thresholds with Auditory and Vestibular White Noise
Funding/Recognition: Dean's Assistantship Fellowship 2019; Translational Research Institute for Space Health 2019-present; 2nd place NASA Human Research Program Student Poster competition 2021; NSF GRFP awardee 2019.
7. **Advisor** for Jacob Kintz, Aerospace MS Apr 2021
Research Topic: Estimating Operator Trust, Mental Workload, and Situation Awareness Through Embedded Measures for Human-Autonomy Teaming
8. **Advisor** for Ryan Griffith, Aerospace MS July 2021
Research Topic: Vestibular Perceptual Thresholds for Low-Frequency, Linear Translations in the Interaural and Sagittal Axes
9. **Advisor** for Aaron Allred, Aerospace MS Nov 2021
Research Topic: Vestibular Perceptual Thresholds for Angular Rotation about the Yaw, Roll, and Pitch Axes
10. **Advisor** for Saige Drecksler, Aerospace MS Apr 2022
Research Topic: Quantifying Motion Sickness Induced by Simulated Wave-Like Motion
11. **Committee Member** for Savannah L. Buchner, Aerospace MS Apr 2022
Research Topic: Multimodal Feature Selection to Unobtrusively Model Trust, Workload, and Situation Awareness
12. **Committee Member** for Peter Brehm, Aerospace MS Jul 2022
Research Topic: Model of Woven Electrode Designed for Long-Term Capture of Electrocardiograph

13. **Committee Member** for Alessandro Verniani, Aerospace MS May 2023
    Research Topic: Automated Individually-Adaptive Astronaut Training Algorithms in Virtual Reality for Deep Space Missions
14. **Advisor** for Caroline Dixon, Aerospace BAM Dec 2023
    Research Topic: An Engineering Demonstration of Model Based Triggering for Spatial Disorientation Countermeasures During Tilt-Based Lateral Motion

Post-doctoral Fellows/Associates Supervised and Other Supervision

1. David Temple, Postdoctoral Associate (started May 2021)
   Research Topics: Galvanic Vestibular Stimulation as a Display Modality to Alter Spatial Orientation Perception; Systematic Assessment of Noisy Galvanic Vestibular Stimulation as a Sensorimotor Countermeasure
   Funding/Recognition: Office of Naval Research 2021; NASA SBIR 2021-2022; Translation Research for Space Health Postdoctoral Fellowship 2022-present, NASA Human Research Program Investigators' Workshop Post-Doctoral Poster Competition 2nd place 2023.
2. Jordan Dixon, Postdoctoral Associate (started June 2022, left September 2022)
   Research Topics: Modeling Human Orientation Perception to Mitigate Pilot Spatial Disorientation
   Funding/Recognition: Office of Naval Research 2022; see above for recognition.
3. Lanna Klausing, Professional Research Assistant (started May 2022)
   Research Topics: Virtual Reality and Vestibular Cueing for Human Perception
   Funding/Recognition: Office of Naval Research 2022; DARPA SBIR 2022-2023; NASA SBIR 2023-present
4. Aadhit Gopinath, Professional Research Assistant (started July 2023)
   Research Topics: Motion Sickness Countermeasures
   Funding/Recognition: NASA HRP 2023-present

Undergraduate Research Supervised (and Highschooler or brief Graduate Supervision)

DLA – Discovery Learning Apprenticeship
UROP – Undergraduate Research Opportunity Program
SPUR – Summer Program for Undergraduate Research
BSI – Biological Sciences Initiative Scholar

1. David Sherwood (MIT Aero/Astro Sr.), *Human Orientation Perception in Altered Gravity*, 2013-2016 **UROP**
2. Rosemary Carter (Jenks Lab MEEI, Rochester Inst. of Tech. Ugrad.), *Vestibular Perceptual Thresholds*, 2015 **STEP-UP**
3. Sage Sherman (AES Soph-Sr.), *Human Eccentric Rotator Device*, 2016-2018 **UROP**
4. Thomas (T.R.) Mitchell (AES Soph-Jr.), *Human Eccentric Rotator Device*, 2016-2017 **UROP**
5. Grant Vincent (AES Sr.), *Computational Modeling of Human Orientation Perception*, 2016-2017
6. Elliot Davis (AES Fr-Jr.), *Planetary Landing Simulator*, 2016-2018 **DLA** (poster finalist) **UROP**
7. Nathan Yeo (AES Sr.), *Planetary Landing Simulator*, 2016
8. Azalee Rafii (AES Sr.), *Wheelchair Head Immobilization Paradigm*, 2016-2017 **DLA** (poster finalist)
9. Aaron McCusker (AES Sr.), *Centrifuge Artificial Gravity*, 2016-2017 **DLA** (poster finalist)
10. Edward (Ted) Zuzula (AES Soph-MS/BS), *Achievability Limit Algorithm for Planetary Landing*, 2017-2019 **DLA** (poster finalist)
11. Joseph Butterfield (AES MS), *Intraocular Pressure during Centrifugation*, 2017-2018
12. Kimia Seyedmadani (AES MS), *Linear Sled Hybrid Artificial Gravity*, 2017-2018
13. Carson Brumley (AES Soph-Sr.), *Balance Belt for Elderly Individuals; Human Eccentric Rotator Device*, 2017-2018 **UROP**

14. Alan Tett, Justin Fay, and Tim Barentine (AES/App Math Jr.), *Plant Artificial Gravity*, 2017-2018 **UROP**
15. Dylan Reed (AES Sr.), *Tilt-Translation Sled Software*, 2018
16. Jamison McGinley (AES Soph), *Trust in Autonomous Advisors for Robotic Exploration*, 2018-2019
17. Sebastian Metcalf (MechE Sr.), *Artificial Gravity Centrifuge*, 2017-2018 **DLA**
18. David Grestle (MechE Sr.), *Wheelchair Head Immobilization Paradigm*, 2017-2018 **DLA** (poster finalist)
19. Priyanka Karki (Tech, Arts & Media, co-advised with Dan Szafir CS/ATLAS), *Trust in Autonomous Advisors for Robotic Exploration*, 2018
20. Meer Baker (AES Sr.), *Planetary Landing Simulator*, 2018-2019 **DLA**
21. Jordan Lerner (AES Sr.), *Human Rotational Vestibular Perceptual Thresholds*, 2018-2019 **DLA**
22. Brian Clayton (AES MS), *Rotation Vestibular Perceptual Thresholds*, 2019
23. Victoria (Tori) Brazell (IPhy Jr-Sr.), *Wheelchair Head Immobilization Paradigm*, 2017-2019 **BSI**
24. Marcos Mejia (AES Jr.), *Cross-Coupled Adaptation*, 2018 **UROP**
25. Varun Seth (Neuroscience Sr.), *Cross-Coupled Adaptation*, 2018 **UROP**
26. Alexander (Sasha) Kryuchkov (AES Soph-Sr.), *Tilt Vestibular Perceptual Thresholds; Multi-Modal Stochastic Resonance*, 2018-2021 **UROP**
27. Ponder Stine (AES Soph-Jr., co-advised with Allie Anderson), *Multi-Modal Stochastic Resonance*, 2019-2020 **SPUR**
28. Daniel Gutierrez Mendoza (AES Soph-Sr.), *User Signals for Evaluation of Reliability; Cross-Modal Stochastic Resonance*, 2019-2021
29. Nicholas Miller (AES Jr.), *User Signals for Evaluation of Reliability*, 2019-2020 **UROP**
30. Benjiman Smith (AES Jr.), *Tilt-Translation Sled,* 2019 **UROP**
31. Dominic Dougherty (AES Jr.), *Visual Disorientation through Virtual Reality*, 2019 **UROP**
32. James (Jimmy) Rizkallah (AES Sr., co-advised with Allie Anderson), *Stochastic Resonance Experimental Design*, 2019 **UROP**
33. Maria Callas (AES Jr., co-advised with Allie Anderson), *Tactile Stochastic Resonance*, 2019
34. Nicholas Dembiczak (AES Jr.), *Human Vestibular Rotation Thresholds,* 2019 **UROP**
35. Anna Jonsen (AES Soph-Sr., co-advised with Allie Anderson), *Multi-Modal Stochastic Resonance*, 2019-2021
36. Nicholas Boender (AES Jr.), *User Signals for Evaluation of Reliability*, 2019
37. Joshua Seedorf (Engineering Plus Jr-Sr), *Control Modes for Future Crewed Planetary Landing*; *Estimating Human Operator Cognitive States,* 2019-2021 **DLA**
38. William (Hunter) Daboll (AES Soph), *Artificial Gravity to Mitigate Visual Impairment in Astronauts*, 2019-2020 **DLA**
39. Nicholas Zellman (AES Sr.), *Pilot Perception and Control of Vehicle Tilt and Translation*, 2019 **DLA**
40. Anna Sophia Warren (AES Fr., co-advised with Carlos Pinedo), *Space Cockpit Simulator*, 2020 **YOU'RE@CU**
41. Maya Greenstein (AES Soph-Jr, co-advised with Allie Anderson), *Cross-Modal Stochastic Resonance*, 2020-2021
42. Abigail (Abby) Durell (AES Soph-Jr, co-advised with Allie Anderson), *Cross-Modal Stochastic Resonance*, 2020-2021
43. Nora Drewno (MechE Soph-Jr), *Enhanced Learning and After-Effects of Galvanic Vestibular Stimulation*, 2020-2021, Zed Factor Fellowship Finalist
44. Cody Watson (AES Jr., co-advised with Allie Anderson), *Improving Astronauts' Performance through Multi-Modal Stochastic Resonance*, 2020-2021 **DLA**, Council of Undergraduate Research Engineering Division Student Research Video Contest winner, 2021.
45. Michael Schlittenhart (AES Jr., co-advised with Allie Anderson), *Investigation of Stochastic Resonance in a Spaceflight Analog*, 2020-2021 **DLA**

46. Skylar Edwards (AES Soph-Sr.), *Enhanced Learning and After-Effects of Galvanic Vestibular Stimulation & Effect of Galvanic Vestibular Stimulation on Tilt Perception*, 2020-2022, **DLA** (poster finalist), Brooke Owens fellowship winner, 2023.
47. Michelle Diaz (IPhy Soph.), *Transfer of Cross-Coupled Acclimation for Artificial Gravity ,* 2020-2022 **BSI, UROP**
48. Aria Mundy (MechE Soph.), *Enhanced Learning and After-Effects of Galvanic Vestibular Stimulation*, 2020-2021
49. Cody Wheeler (AES Jr.), *Pilot Spatial Disorientation Model and Countermeasure; Adaptive Automation for Space Habitats*, 2020-2022 **UROP, DLA**.
50. Jasmin Rivera (CS and Info Science, Jr.), *Closed-Loop Modeling of Human-Vehicle Cybernetic Systems*, 2021 **STEM Routes Uplift**
51. Nadine Poole (Physics and MCDB Fr-Soph), *Countermeasures of Motion Sickness Relevant to Post-Flight Water Landings*, 2021 **STEM Routes Uplift**
52. Saige Drecksler (AES MS), *Spaceflight-Relevant Task and Environment for Assessing Human Perception and Performance with Stochastic Resonance Noise Stimulation*, 2021 Independent Study.
53. Benjamin Hofstra (Eng. Plus Soph.), *Identifying Pilot Spatial Disorientation in order to Prevent Accidents*, 2021 **UROP**
54. Cameron Sprenger (Eng. Honors, MechE, Jr.), *Human Motion Device Development*, 2021
55. Levi Wood (AES Sr.), *Galvanic Vestibular Stimulation as an Alternative Display Modality*, 2021-2022 **McNair Fellowship**
56. Hannah Blanchard Oblosky (AES Jr.), *Tilt-Translation Sled for Motion Sickness Countermeasures*, 2021-2022
57. Fabrizio Roberts (AES Jr.), *Human Spatial Orientation Perception with Dynamic Visual Cues*, 2021-2022 **DLA, UROP**
58. Brady Hogoboom (AES Sr.), *Advancing Galvanic Vestibular Stimulation as an Alternative Display Modality*, 2022
59. Aadhit Gopinath (AES Sr.), *Countermeasures of Motion Sickness Relevant to Post-Flight Water Landings*, 2022-2023 **SPUR**
60. Nick Boggess (AES Jr.), *Vestibular Perceptual Thresholds for Horizontal Translation,* 2022-2023 **SPUR**
61. Sarah Pepper (MechE, Eng. Leadership Jr.), *Advancing Galvanic Vestibular Stimulation as an Alternative Display Modality*, 2022 **SPUR**
62. Luca Bonarrigo (AES Sr.), *Developing Countermeasures for Motion Sickness in Astronauts Post Water-Landing*, 2022-2023 **DLA**
63. Sweta Alla (AES Soph.), *Modelling Pilot's Perception of Orientation: Data Collection and Analytics*, 2022-2023 **DLA**, Brooke Owens fellowship winner, 2023.
64. Max Meiser (CS Soph.), *Software Engineering for Space Habitat Displays and Autonomy*, 2022-2023 **DLA**
65. James Perkins (AES Sr.), *Galvanic Vestibular Stimulation as an Alternative Display Modality*, 2022-2023 **DLA**
66. Yihao (Chris) Yan (AES Jr.), *Coupling Galvanic Vestibular Stimulation to Head Tilt for an Astronaut Post-Flight Analog* 2022-2023 **DLA**
67. Beteliham (Betty) Mamo (Boulder High Sr.), *Coupling Galvanic Vestibular Stimulation to Head Tilt for an Astronaut Post-Flight Analog* 2022-2023
68. Talie Stone (MCDB Jr.), *noisy Galvanic Vestibular Stimulation for Enhancing Motion Perception and Control* 2023 **UROP**
69. Sofia Ibarra (AES Soph-Jr), *Psychophysiological and Neurophysiological Measures to Predict Operator Situation Awareness* 2023 **DLA**
70. Liam Masias (Community College of Denver), *Software Engineering for Space Habitat Autonomous Systems* 2023 **SPUR**

71. Santiago Huertas (AES Jr.), *Software Engineering for Space Habitat Autonomous Systems* 2023 **SPUR**
72. Jared Dutton (CS Jr.), *Software Engineering for a Smart Space Habitat* 2023 **DLA**
73. Luc Willett (AES Soph.), *GVS as an Astronaut Training Tool* 2023 **DLA**
74. Tori Morgheim (AES Sr.), *Virtual Reality as a Countermeasure for Astronaut Motion Sickness* 2023 **DLA**

SERVICE

National / Professional

Conference Chair/Organizer, Vestibular Oriented Research Meeting, Boulder, CO, 2023
Member, American Institute for Aeronautics and Astronautics (AIAA)
Member, Aerospace Medical Association (AsMA)
Aerospace Human Factors Association (AsHFA)
Member, American Physiological Society (APS)
Member, Human Factors and Ergonomics Society (HFES)
Technical Groups: Aerospace Systems, Human Performance Modeling, Human-AI-Robotics-Teaming
Member, International Society for Gravitational Physiology (ISGP)
Member, National Space Biomedical Research Institute Sensorimotor Adaptation Team, 2013-16
Member, National Space Biomedical Research Institute Society of Fellows, 2013-15
Member of the National Academies of Science, Engineering, and Medicine Committee to Review NASA's Evidence Reports on Human Health Risks, 2016
Member, Texas A&M University Centrifuge Advisory Board, 2019-present
Chair, AIAA ASCEND Technical Session: Crew Health and Life Support Systems, 2020
Organizer for "Space Human Physiology and Countermeasures" session, IEEE Aerospace, 2022

University of Colorado – Boulder

Beverly Sears and Cynthia H. Schultz Graduate Research Grants Reviewer, 2022
Undergraduate Research Opportunities Program Review Panel, 2017, 18, 23
SEED Grant Program Reviewer, 2016, 18, 19
Faculty Advisor to Students for the Exploration and Development of Space (SEDS), 2016-present

College of Engineering and Applied Science

Science Writers Conference Tours, 2023
Biomedical Engineering Degree Proposal Committee Member, 2019
Faculty Review Panel for the CU Silver Medal, 2016
Dean's Advisor Council Member, 2017
Engineering Voices co-founder and co-organizer, 2017-present
Autonomous Systems Interdisciplinary Research Theme member, 2018-present

Smead Aerospace Engineering Sciences Department

AES Graduate Committee Member, 2016-18
AES Bioastronautics Focus Area Lead, 2016-18

AES Undergraduate Committee for Curriculum Member, 2018-21
AES Design and Systems Eng. Undergraduate Curriculum Group, co-Lead 2019-20, Lead 2020-21

AES Strategic Vision Committee Member (**Climate and Diversity co-lead**) 2017-18, 2020-21
AES BOLD Liaison, 2018-20

AES Alumni Committee Member, 2018-20
AES Space Domain Awareness graduate certificate committee; Interfaces, Human Factors, and Cognitive Science specialization area lead, 2020-present
AES Inclusive Culture Working Group Member, 2020

PEUC Reappointment (Voss), 2017
AES Instructor Search Committee, 2017
Aerospace Medicine Grand Rounds, co-organizer, 2017
Colorado Space Coalition Outreach Event, 2016

Peer Reviewer (ad hoc)

Manuscripts
Journal of Neurophysiology
Journal of Neuroscience
Experimental Brain Research
Journal of Vestibular Research
Frontiers in Physiology (section Environmental, Aviation and Space Physiology)
Frontiers in Systems Neuroscience
IEEE Access
Perception
International Symposium on Wearable Computers papers
Journal of Otology
PLOS ONE
Scientific Reports
IEEE Aerospace Conference
Neuroscience Letters
BMC Neuroscience
Journal of Space Safety Engineering
Applied Ergonomics
AIAA ASCEND Conference
Human Factors and Ergonomics Society

Proposals
NASA Postdoctoral Program 2016-18
NASA Translational Research Institute Postdoctoral Fellowship Review Panel Member, 2017, 18, 20
NASA Space Technology Research Fellowship, 2017-18
NASA Space Technology Graduate Research Opportunity Panel Review Member, 2022
NSF Perception, Action, and Cognition Program, 2020
Military Operational Medicine Research Program (MOMRP) on the Aviation and Vertical Lift-1, 2023

Other
The Cambridge Aerospace Engineering Series book proposal review: Design for Humans in Space: Architecture Development and System Modeling
Springer Nature book proposal review: Biomedical Engineering for Human Space Exploration

Continuing Education / Career Development

New Assistant Professor Program (NAPP), 2016-17
Leadership Education for Advancement and Promotion (LEAP) program, 2018
Inclusive Excellence – Be the Change, 2019
Faculty Teaching Excellence Program (FTEP)
Voluntary departmental "Unconscious Bias" Training, 2017, 19
Fostering Wellbeing for Your Graduate Student Mentees, 2020
Graduate Admission Committee Implicit Bias Training through NCWIT, 2020
Cultivating Inclusion in the Classroom Diversity Summit, 2020