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ACADEMIC APPOINTMENTS

- 2015 – present** UNIVERSITY OF COLORADO – BOULDER (Boulder, Colo.)
Assistant Professor, Smead Aerospace Engineering Sciences (2016-present)
Faculty Affiliate, BioServe Space Technologies (2016-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

- 2015 – Present** 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

2018	Selected as a Summer Faculty Research Fellow for the Office of Naval Research (ONR)
2018	Outstanding Mentor Award from the CU Undergrad Research Opportunities Program
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 (2 nd 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

RESEARCH

PUBLICATIONS (*mentees*)

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/jappphysiol.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., Jaquier, 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 Behaviour*, 2020 (accepted). Preprint: <https://psyarxiv.com/h8tju>
23. *Pinedo, C., Dixon, J., Zuzula, E., Davis, E., Bretl, K., and Clark, T.K.* “Development of an Achievability Fuel Limit Algorithm for a Piloted, Planetary Lander” *AIAA Journal of Spacecraft and Rockets*, 2020 (accepted).

Under Review or Responding to Reviewers

24. **Clark, T.K.** and Merfeld, D.M. “Statistical Approaches to Identifying Lapses in Psychometric Response Data” *Psychonomic Bulletin and Review*, 2020 [under review].
25. *Suri, K.* and **Clark, T.K.** “Human Vestibular Perceptual Thresholds are Worse for Pitch Tilt than Roll Tilt” *Experimental Brain Research*, 2020 [under review].

Book Chapters (refereed) 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. Merfeld, D.M., **Clark, T.K.** “Canal-Otolith Interactions” Reference Module in Neuroscience and Biobehavioral Psychology 978-0-08-045046-9.
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. 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.

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.

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: Kinetically 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. *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, 28 Oct-1 Nov, 2019 (**won “Most Innovative Student Research Award”**).

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., Kreuzberg, 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., Artilles, 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. **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.
50. *Miller, N.*, *Gutierrez-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.
51. 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.

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, Daejeon, 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.*, *Raffi, 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., *Syedmadani, 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.

Current Projects

1. Co-PI, “**Performance Enhancement Through Multi-Modal Stochastic Resonance**”, Translation Research Institute for Space Health, with PI Allison Anderson, 1/1/2019-6/30/2021.
2. 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.
3. 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, James Nabity, and Bobby Braun at CU, and other external Co-Is, 9/1/2019-8/31/2024.
4. Co-I and Institutional PI “**Identifying Adverse Modes via Human-Machine Cybernetic Modeling**” Office of Naval Research Multi-University Research Initiative (N00014-18-S-F006), with PI Daniel Merfeld at The Ohio State University and 8 other external Co-Is, 3/1/2020(est)-2/28/2024.
5. PI, **Charles Stark Draper Laboratory fellowship** for Jordan Dixon, PhD student, 8/15/2018-8/15/2021(est).
6. PI, “**A Conceptual Design and Concept of Operations for Intermittent Short-Radius Centrifugation for Artificial Gravity**”, training grant for Katherine Bretl, PhD student, NASA Space Technology Research Fellowship (NSTRF), 8/1/2016-7/31/2021.
7. Co-I and Institutional PI, “**Sensorimotor Predictors of Postlanding Functional Task Performance**”, NASA Human Research Program, with PI Ajitkumar Mulavara at NASA JSC (and other external Co-Is), 11/1/2018-undefined.
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, 12/23/2019-7/22/2020.
9. Co-I and Institutional PI, “**Galvanic Vestibular Stimulation as a Novel, Hands-Free, and Intuitive Interface Modality**”, DARPA SBIR program HR001119S0035-10 Phase I, with PI Abhishek Datta at Soterix Medical and co-I Cody Burkhart at NASA JSC, 2/15/2020-2/14/2021.

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.
2. Co-I, Institutional and Science PI “**Turbolift: the Linear Sled Hybrid Artificial Gravity Concept**”, NASA Innovative and Advanced Concepts (NIAC) Phase I, 5/15/2017-2/14/2018.
3. PI, “**Design of an Artificial Gravity Centrifuge for Crewed Space Exploration**”, Boeing Corporation, 10/10/2017-5/31/2018.
4. PI, “**Identifying Biomarkers Relevant to Spaceflight**”, RIO SEED Grant, with co-I Robin Dowell (MCDB), 7/1/2016-12/31/2018.
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, 3/1/2019-11/30/2019.
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.

Pending Proposals

1. PI, “**Human Orientation Perception and Manual Control in Hypo-Gravity using Parabolic Flight**” NASA Human Research Program Appendix A, with co-Is Tristan Endsley and Pooja Bovard at Draper Laboratory, co-I Laurence Young at MIT, co-I Paul DiZio at Brandeis University, 8/15/2020(est)-8/14/2022.
2. Co-I, “**Vestibular Thresholds: Predicting Functional Performance as a Function of G-Level**” NASA Human Research Program Appendix A, with PI Marissa Rosenberg and co-I Scott Wood at NASA JSC, 9/1/2020(est)-8/31/2022.
3. PI, “**A Bayesian Computational Model for Sensorimotor Adaptation to Altered Gravity**” NASA Human Research Program Appendix B, with Nisar Ahmed at CU, 8/15/2020-8/14/2021.

TEACHING

Courses Taught

Undergraduate

ASEN 2004 Aerospace Vehicle Design and Performance (space) – 2016, 17, 19, 20

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

ASEN 5519 Experimental Methods and Statistical Analysis* – new course, co-developed 2018

ASEN 5158 Space Habitat Design* – 2016

ASEN 5849/6849 Independent Study – various years, 2 students total

* offered for distance MS program

Other

Guest lecture, ASEN 5016 Space Life Sciences – 2017, 18

Guest panelist, ASEN 6519 Extravehicular Activity – 2018

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 link for FCQ data (Student Evaluations): https://fcq.colorado.edu/instr_summary.htm

Thesis Students

PhD Thesis Advisor – current

1. Katherine Bretl, Aerospace PhD student (entered program Aug 2016, prelim exam Sep 2017, comprehensive exam Nov 2019)
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
2. Jordan Dixon, Aerospace PhD student (entered program Aug 2016, prelim exam Sep 2017)
Research Topic: Pilot Spatial Disorientation Countermeasure using a Mathematical Model of Orientation Perception
Funding/Recognition: Discretionary 2016; ASEN 2004 TA 2017; RIO Seed Grant 2017; Naval Medical Research Unit 2018; Charles Stark Draper Laboratory Fellowship 2018-present; 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.
3. Carlos Pinedo, Aerospace PhD student (entered program Aug 2017, prelim exam Sep 2018)
Research Topic: Novel Displays, Controls, and Interfaces for Crewed Planetary Landing
Funding: US Air Force
4. Jamie Voros, Aerospace PhD student (entered program Aug 2018)
Research Topic: Astronaut Trust in Autonomous Intelligent Systems for Deep Space Exploration
Funding: ASEN TA 2018; Translational Research Institute for Space Health 2019-2020; Office of Naval Research 2020-present
5. Rachel Rise, Aerospace PhD student (entering program Aug 2019)
Research Topic: Multi-Modal Stochastic Resonance to Enhance Astronaut Perception and Performance
Funding: Dean's Assistantship Fellowship 2019; Translational Research Institute for Space Health 2019-present
6. Jacob Kintz, Aerospace PhD student (entering program Aug 2019)
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 2018

PhD Thesis Committee Member – current

1. 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 (comps Nov 2017)
2. Luke (Charles) Burks, Aerospace PhD candidate (advisor N. Ahmed)
Research Topic: Active Collaborative Sensing, Learning, and Planning in Human-Robot Teams (comps Aug 2018)
3. Katya Arquilla, Aerospace PhD candidate (advisor A. Anderson)
Research Topic: Wearable Sensor Systems (comps Dec 2019)

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. Nability)
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

MS Thesis Advisor, MS Committees – current

1. **Advisor** for Jamie Voros, Aerospace MS Apr 2020 (est)
Research Topic: Galvanic Vestibular Stimulation and Cross-Modal Stochastic Resonance
2. **Advisor** for Esther Putnam, Aerospace MS Dec 2020 (est)
Research Topic: Long-term Effects of Galvanic Vestibular Stimulation on Functional Performance

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

Undergraduate Research Supervised

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. Carson Brumley (AES Soph-Sr.), *Balance Belt for Elderly Individuals; Human Eccentric Rotator Device*, 2017-2018 **UROP**

12. Alan Tett, Justin Fay, and Tim Barentine (AES/App Math Jr.), *Plant Artificial Gravity*, 2017-2018 **UROP**
13. Dylan Reed (AES Sr.), *Tilt-Translation Sled Software*, 2018
14. Jamison McGinley (AES Soph), *Trust in Autonomous Advisors for Robotic Exploration*, 2018-2019
15. Sebastian Metcalf (MechE Sr.), *Artificial Gravity Centrifuge*, 2017-2018 **DLA**
16. David Grestle (MechE Sr.), *Wheelchair Head Immobilization Paradigm*, 2017-2018 **DLA** (poster finalist)
17. Priyanka Karki (Tech, Arts & Media, co-advised with Dan Szafir CS/ATLAS), *Trust in Autonomous Advisors for Robotic Exploration*, 2018
18. Marcos Mejia (AES Jr.), *Cross-Coupled Adaptation*, 2018 **UROP**
19. Varun Seth (Neuroscience Sr.), *Cross-Coupled Adaptation*, 2018 **UROP**
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 (Integrative Physiology Jr-Sr.), *Wheelchair Head Immobilization Paradigm*, 2017-2019 **BSI**
24. Alexander (Sasha) Kryuchkov (AES Soph-Jr.), *Tilt Vestibular Perceptual Thresholds; Multi-Modal Stochastic Resonance*, 2018-2020 **UROP**
25. Ponder Stine (AES Soph-Jr., co-advised with Allie Anderson), *Multi-Modal Stochastic Resonance*, 2019-2020 **SPUR**
26. Daniel Guitierrez Mendoza (AES Soph-Jr.), *User Signals for Evaluation of Reliability*, 2019
27. Nicholas Miller (AES Jr.), *User Signals for Evaluation of Reliability*, 2019-2020 **UROP**
28. Benjiman Smith (AES Jr.), *Tilt-Translation Sled*, 2019 **UROP**
29. Dominic Dougherty (AES Jr.), *Visual Disorientation through Virtual Reality*, 2019 **UROP**
30. James (Jimmy) Rizkallah (AES Sr., co-advised with Allie Anderson), *Stochastic Resonance Experimental Design*, 2019 **UROP**
31. Maria Callas (AES Jr., co-advised with Allie Anderson), *Tactile Stochastic Resonance*, 2019
32. Nicholas Dembiczak (AES Jr.), *Human Vestibular Rotation Thresholds*, 2019 **UROP**
33. Anna Jonsen (AES Soph., co-advised with Allie Anderson), *Multi-Modal Stochastic Resonance*, 2019-2020
34. Nicholas Boender (AES Jr.), *User Signals for Evaluation of Reliability*, 2019
35. Joshua Seedorf (Engineering Plus Jr.), *Control Modes for Future Crewed Planetary Landing*, 2019-2020 **DLA**
36. William (Hunter) Daboll (AES Soph), *Artificial Gravity to Mitigate Visual Impairment in Astronauts*, 2019-2020 **DLA**
37. Nicholas Zellman (AES Sr.), *Pilot Perception and Control of Vehicle Tilt and Translation*, 2019 **DLA**
38. Anna Sophia Warren (AES Fr.), *Space Cockpit Simulator*, 2020, **YOU'RE@CU**

SERVICE

National / Professional

Member, American Institute for Aeronautics and Astronautics (AIAA)

Member, Aerospace Medical Association (AsMA)

Member, American Physiology Society (APS)

Member, Human Factors and Ergonomics Society (HFES)

Technical Groups: Aerospace Systems, Human Performance Modeling

Member, Texas A&M University Centrifuge Advisory Board, 2019-present

Member, National Space Biomedical Research Institute Sensorimotor Adaptation Team, 2013-16

Member, National Space Biomedical Research Institute Society of Fellows, 2013-2015
Member of the National Academies of Science, Engineering, and Medicine Committee to Review
NASA's Evidence Reports on Human Health Risks, 2016

University of Colorado – Boulder

Undergraduate Research Opportunities Program Review Panel, 2017, 18
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

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, 2016-2018
AES Strategic Vision Committee Member (**Climate and Diversity co-lead**) 2017-18, 2020-present
AES Undergraduate Committee for Curriculum Member, 2018-present
AES BOLD Liaison, 2018-present
AES Alumni Committee Member, 2018-present
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
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
IEEE Aerospace Conference
Neuroscience Letters

Proposals

NASA Postdoctoral Program 2016-18
NASA Translational Research Institute Postdoctoral Fellowship Review Panel Member, 2018
NASA Space Technology Research Fellowship, 2017-18

Other

The Cambridge Aerospace Engineering Series book proposal review: Design for Humans in Space: Architecture Development and System Modeling

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)