

## ELIZABETH KAY NEWTON, PH.D.

*An Executive Leader Passionate About Innovation and Helping Organizations and People Achieve Their Full Potential*

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### EMPLOYMENT HISTORY

**The Ohio State University [OSU]** **Columbus, OH**  
**Battelle Center for Science, Engineering, and Public Policy**

**Executive Director** — Leading a turn-around of the center to focus on complex system problems important for national security, particularly in aerospace/aviation, energy, and bio-security. Directs research and experiential learning programs that create a 400+ student talent pool for public sector STEM agencies and grow students' ability to innovate and be systems-thinkers. Conducts professional development workshops and connects dozens of students directly to national security employers. Created and serves as lead instructor of OSU's best-loved multi-disciplinary capstone course *Rapid Innovation for Public Impact*, in which student teams learn human-centered design, lean innovation, and agile development while tackling complex government problems, including those supplied by the Office of the Under Secretary of Defense through its Defense Innovation Unit's National Security Innovation Network *Hacking for Defense* program. Popular student coach, trainer, and speaker. (Dec. 2016-Present)

**Strategy Consultant** to corporate, economic development, nonprofit, and government clients

**HudsonAlpha Institute for Biotechnology** **Huntsville, AL**

**Vice President for Research Affairs** — Established this early-stage genomics institute's processes for: facilitating intellectual property commercialization; proposing and executing sponsored research programs (\$38M/year); negotiating partnerships; overseeing regulatory compliance; and organizing international science conferences. Led the development of institute's first long-range plan and was instrumental expanding work in pediatric genomics and breast cancer research. (Nov. 2012 - March 2015)

**Center for System Studies, University of Alabama in Huntsville** **Huntsville, AL**

**Director of Policy and Programs** — Led space policy analyses and workshops, and taught Space Policy in this center established by former NASA Administrator. Engaged in space policy advocacy and major proposals for complex systems analysis resulting in the Center's securing more funding than the Colleges of Science or Engineering. Authored the region's economic development proposal to recruit the National Solar Observatory. (2009-Nov. 2012)

**NASA Marshall Space Flight Center** **Huntsville, AL**

**Strategic Planning and Integration Manager** — Created and led the center's first strategic planning office, contributing to the center's stabilization following the Space Shuttle Columbia accident. Designed and directed a new center governance system which subsequently served as the agency's template for strategic decision-making and led a revitalization of the center's technology investment program. Responsible for executive communication, business base forecasts, competitive assessments, stakeholder analyses, and strategic communication planning. (Sept. 2005 - April 2009)

**Strategic Services Manager** — As a contractor with Analytical Services, Inc., re-oriented management of multi-million dollar, at-risk program serving government executives and captured the follow-on contract. Designed new products and services to provide situational awareness or cost-savings to government executives, strengthen front-line communication, and clarify strategic choices. (July 2003 - Sept. 2005)

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### Möbular Technologies

Huntsville, AL

**Co-Founder and Vice President of Operations** — Authored business plan securing \$10M angel and Series A equity investments from Deutsche Bank Alex Brown Ventures in its first private equity investment in Alabama. Closed first major deals, including Fortune 500 client. Delivered 300+ product deployments while driving margins up 300%, achieving 98% on-time deliveries and excellent customer satisfaction scores. Established co-located customer data center supporting multi-million email campaigns. (Nov. 1999 - July 2003)

### NASA Marshall Space Flight Center

Huntsville, AL

**Senior Scientist** — Proposed and conducted original scientific research in solar physics, including with Naval Research Laboratory. (June 1998 - Sept. 2000)

### Dynetics, Inc.

Huntsville, AL

**Project Manager and Section Supervisor** — Led group analyzing electromagnetic signatures for US Army National Missile Defense Program Office. (Sept. 1996 - June 1998)

### ANSER, Inc.

Arlington, VA

**Space Analyst** — Performed space policy analyses for clients like National Space Council, USAF Space Systems, and NASA headquarters. (Nov. 1990 - Jan. 1992)

### NASA Jet Propulsion Laboratory

Pasadena, CA

**Soviet Space Analyst** — Performed open-source strategic research and analysis for JPL Flight Projects Office and NASA headquarters and facilitated US-Soviet planetary science collaboration as a contractor. (Aug. 1989 - Nov. 1990)

### United Nations Economic Commission for Europe, Secretariat

Geneva, Switzerland

**Intern** — Analyzed East-West joint technology ventures and supported the Secretariat's activities. (July 1987 - Aug. 1988)

## INSTRUCTION

**The Ohio State University, Columbus, OH** *Rapid Innovation for Public Impact*, a multi-disciplinary engineering capstone working problems from the Defense Innovation Unit's National Security Innovation Network (NSIN) Hacking for Defense program and other agencies. Also will teach *Contemporary Issues in Science, Engineering, and Public Policy* (2019 - Present)

**University of Alabama in Huntsville** *U.S. Space Policy* (2011)

## BOARDS & COMMITTEES

Strategy Consultant & Facilitator for College of Engineering's *Re-imagining Buckeye Engineering for 2030*, The Ohio State University, Present

Advisory Board, Engineering Education Department, The Ohio State University, 2017-Present

Advisory Board, Materials Science & Engineering Department, Ohio State University, 2018-Present

Ohio State ADVANCE Board of Advisors, The Ohio State University, 2018-Present

Ohio Aerospace & Aviation Council's Committee on Education & Workforce Development, 2019

Strategic Planning Working Group for Research, The Ohio State University, 2019

Strategic Planning & Budget Committee, John Glenn College of Public Affairs, The Ohio State University, 2017-2018

President of the Board, Girls, Inc. of Huntsville, 2012-2015; Member of Board, 2009-2012

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Strategic Communications Committee, Randolph School, 2013-2015  
Cornell University Alumni Ambassadors Admissions Network, 1996-2014

<b>EDUCATION</b>	B.A.	Government	Cornell University	1988
	Certificate	International Relations	l'Institut de hautes etudes internationales, Switz.	1988
	M.A.	Political Science/Soviet Studies	University of California, Berkeley	1989
	M.S.	Physics	University of Alabama in Huntsville	1994
	Ph.D.	Physics	University of Alabama in Huntsville	1996

<b>HONORS &amp; AWARDS</b>	NASA Center Director's Achievement Award 2007
	Outstanding Graduate Woman, PEO Scholar Award 1995
	Naval Research Laboratory Fellowship 1993-1996
	Congressional Jacob K. Javits Fellowship 1988-1989
	Cornell National Scholar, 1984-1988
	Phi Beta Kappa 1988
	Maryland Distinguished Scholar, 1984
Salutatorian, Atholton High School, Howard County, Maryland, 1984	

## PUBLICATIONS & PRESENTATIONS

1. Long, N.A., Wyant, R., Khamees, R., **Newton, E.K.**, Horack, J.M. (2019) Applying Multiple Streams **Policy Analysis** to Historic and Current **Nuclear Thermal Propulsion**. Presented at the 69th International Astronautical Congress 2019. IAC-19A54A-D2.8 Paper ID 51447
2. Schwartz, M., Horack, J.M., **Newton, E.K.** (2019) Assessing the Effects of Radiation on **GaN Semiconductors** for COTS Space Applications. Presented at the 69th International Astronautical Congress 2019. IAC-19C2.6 Paper ID 51275
3. Klein, L., Hixon, N., Van de Water, D., Work, J., Zoloty, Z., Horack, J.M., **Newton, E.K.** (2019) An Analysis and Simulation of Interplanetary Trajectories for the Jesse Owens **Nuclear Thermal Propulsion** Spacecraft. Presented at the 69th International Astronautical Congress 2019. IAC-19A54A-D2.8 Paper ID 51406
4. Byers, H., Margevich, T., Partin, C., Horack, J.M., **Newton, E.K.** (2019) Integration of a **Reaction Wheel System** into a Sounding Rocket to Increase Stability and Performance. Presented at the 69th International Astronautical Congress 2019. IAC-19C2.7 Paper ID 51359
5. Gula, N., Lombardo, J., Schell, T., Doejode, S., Noe, J., **Newton, E.K.**, Horack, J.M. (2019) An Effective **Piston Pressurization System for Spacecraft Bipropellant Tanks**. Presented at the 69th International Astronautical Congress 2019. IAC-19D2.5 Paper ID 51473
6. Ahn, B.J., Joosten, K., Ault, W., Braun, J., Fingers, R., Ijaz, M., O'Donnell, Z., Horack, J.M., Newton, E. (2019) Design and Development of a **Low-Cost Multispectral Imager** for Data Fusion with Hyperspectral Imagers. Presented at SPIE Remote Sensing 2019, Strasbourg, France. In Proceedings Volume 11151, Sensors, Systems, and Next-Generation Satellites XXIII; 111511Z (10 October 2019) Society of Photo-Optical Instrumentation Engineers. <https://doi.org/10.1117/12.2532285>
7. Malloy, S. S., Horack, J. M., **Newton, E. K.**, Batchu, D. & D. Abernathy (accepted, pending publication). **Space-based Waterborne Disease Surveillance** in Coastal Communities: Actionable Risk Assessment of Enteric Pathogens in a Changing Climate. To appear in Acta Astronautica. Also presented at 69th International Astronautical Congress 2018. IAC-18-B1.5.6 Paper ID 46483.

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8. Malloy, S. S., Horack, J. M., Lee, J., & **Newton, E. K.** (2019). **Earth observation for public health: Biodiversity change and emerging disease surveillance.** July 29, 2019. *Acta Astronautica*, 160, 433-441. <https://doi.org/10.1016/j.actaastro.2018.10.042>
9. Shen, Y., Goldberg-Miller, S. B., & **Newton, E.K.**(2019) Visualizing the Confluence of Human Innovation and Natural Forces. AIGA Design Educator's Conference.
10. Kearby, H.E., Horack, J.M. & **Newton, E.K.** (2018) "Leviathan Lite" Towards a **Global Stewardship Organization for Space Domain Awareness**, Conduct, and Remediation. Colloquium on the Law of Outer Space. In Proceedings of the 61st Colloquium on the Law of Outer Space, International Institute of Space Law (IISL), 2018, 823-834. Also presented at 69th International Astronautical Congress 2018. IAC-18-E7.7-B3.8.2 Paper ID 45448.
11. Malloy, S. S., Horack, J. M. & **Newton, E.K.**(2018). Targets for **Satellite-based Emerging Disease Surveillance: Ecological Change and Zoonotic Bat Viruses.** 69th International Astronautical Congress 2018. IAC-18-B1.IP.47531.
12. Gordon, K., Cao, R., Horack, J. M. & **Newton, E.K.**(2018). **Risk Analysis and Mitigation Framework** in Support of Sino-American Cooperative Space Projects. 69th International Astronautical Congress 2018. IAC-18-E3.6.11, Paper ID 45064.
13. Salamon, N., Grimm, J. M., Horack, J. M., & **Newton, E. K.** (2018). Application of **Virtual Reality for Crew Mental Health** in extended-duration space missions. May 2018, *Acta Astronautica*, 146, 117-122. Also presented at 68th International Astronautical Congress 2017. IAC-17-A1.IP.10 Paper ID 39876.
14. Salamon, N. et al. (2018). Preliminary **Nozzle Design** for a Nuclear Thermal Propulsion Test Mission. 69th International Astronautical Congress 2018. IAC-18-C4.7-C3.5.3 Paper ID 46425.
15. Strimbu, Z. et al. (2018). Mission Architecture for a Proof-of-Concept **Nuclear Thermal Propulsion Interplanetary Mission.** 69th International Astronautical Congress 2018. IAC-18-C4.7-C3.5.10 Paper ID 46419.
16. Huneycutt, T. et al. (2018). An Analysis and Selection of **Launch Windows and Orbital Trajectories** for the JESSE OWENS Thermonuclear Propulsion Interplanetary Spaceflight Mission. 69th International Astronautical Congress 2018. IAC-18-D2.8-A5.4.4, Paper ID 46366.
17. Clark, J., Horack, J. M. & **Newton, E.K.**(2018). **Analysis of Manned Missions** Enabled by Bimodal Nuclear Propulsion Technologies. 69th International Astronautical Congress 2018. IAC-18-C4.6.8, Paper ID 45369.
18. Perlmutter, K., Horack, J. M., **Newton, E.K.**, Eckardt, A. (2018). Potential **Applications for the Hyperspectral Imager DESIS.** 69th International Astronautical Congress 2018. IAC-18-B1.5.10, Paper ID 44974.
19. Scott, D., Horack, J. M., **Newton, E.K.**, Boazzo, M. (2018). Analysis of **Nuclear Thermal Propulsion-Enabled Solar-Oberth Maneuvers** and Inner Planetary Gravity Assist. 69th International Astronautical Congress 2018. IAC-18-D2.8-A5.4.5, Paper ID 44792.
20. Dannemiller, K. et al. (2018). Evaluating the **Microbial Environment aboard ISS** to Enable an Optimized Microbiome for Deep Space Human Exploration. 69th International Astronautical Congress 2018. IAC-18-A2.7.13. Paper ID 43974.
21. Malloy, S., Horack, J., **Newton, E.K.** (2017). **Earth Observation for One Health: A Decision-making Guide.** 68th International Astronautical Congress 2017. IAC-17-B1.5.11. Paper ID 41759.

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22. Martinez Gonzalez, A., Griffin, R., **Newton**, E.K., Horack, J. (2017). **Space Based Remote Sensing** to Help Measure Effectiveness of Farm Policies on Agricultural Productivity and Income Distribution. 68th International Astronautical Congress 2017. IAC-17-B1.5.12. Paper ID 41855.
23. Grimm, J., Salamon, N., Horack, J., **Newton**, E.K. (2017). Commemoration of the late U.S. Senator and Astronaut John Glenn. 68th International Astronautical Congress 2017. IAC-17-E4.1.4. Paper ID 40840.
24. Grimm, J., et al. (2017). Preliminary Design for **Modular SEP Tug** Utilizing Dream Chaser Cargo Module. 68th International Astronautical Congress 2017. IAC-17-D2.4.11. Paper ID 39925.
25. Zank, G. P., **Newton**, E. K., Fry, C., Adams, Jr, J. H., Li, G., Verkhoglyadova, O. & Falconer, D. (2012, November). The radiation, interplanetary shocks, and coronal sources (RISCS) toolset. In AIP Conference Proceedings (Vol. 1500, No. 1, pp. 165-173). AIP.
26. **Newton**, E. K., & Griffin, M. D. (2011). United States **Space Policy** and International Partnership. In Space Policy, 27(1), 7-9.
27. **Newton**, E. K. & M. Khan (2011). International Cooperation for the Next Generation Decision-making and Analysis System. 62nd International Astronautical Congress, South Africa. IAC-11-B1.1.6.
28. **Newton**, E. (2011) Engineering the Tools to Couple Science & Policy Sense: Sensors and Models for Sustainable Development, Center for System Studies Workshop report, University of Alabama in Huntsville.
29. Atkins, C. & **Newton**, E.(2010). Take the Chaos out of U.S. Space Policy, In Space News, May 10, 2010.
30. **Newton**, E. (2010) Developing Sustainable Human Space Exploration Policy, Center for System Studies Workshop report, University of Alabama in Huntsville.
31. Share, G. H., Murphy, R. J., & **Newton**, E. K. (2001). Limits on Radiative Capture  $\gamma$ -Ray Lines and Implications for Energy Content in Flare-Accelerated Protons. **Solar Physics**, 201(1), 191-200.
32. **Newton**, E. K., & Giblin, T. (2000). The Spectral Evolution of Solar Flare Hard X-Ray Emission Observed with BATSE. NASA Technical Report. Document ID 20000039376.
33. Miller, J. A., **Newton**, E. K., & Mariska, J. (2000, October). Spatially-Dependent Stochastic Acceleration in Solar Flares. In Bulletin of the American Astronomical Society (Vol. 32, p. 1291).
34. **Newton**, E. K., & Woods, P. (2000, May). Investigating the Possibility of Associations between X-Ray Spectral Evolution and Eruptive Phenomena. In Bulletin of the American Astronomical Society (Vol. 32, p. 820).
35. **Newton**, E. K., & Giblin, T. (1999). The Observed Spectral Evolution of Solar Flare Hard X-Ray Emission. In Bulletin of the American Astronomical Society. Vol. 31, 80-10.
36. **Newton**, E. K., & Miller, J. A. (1999). Anticipating HESSI's View of Spectral Evolution in Flare Hard X-Ray Emission. NASA Technical Report. HESSI Workshop, Greenbelt, MD. Document ID 19990068041.
37. Adams, M., Simmons, E., Hagyard, M. J., **Newton**, E. K., & Bero, E. (1999). Education and Public Outreach to Support the HESSI Mission: Raising Public Awareness. In Bulletin of the American Astronomical Society (Vol. 31, p. 1527).
38. Emslie, A. G., Mariska, J. T., Montgomery, M. M., & **Newton**, E. K. (1998). Hydrodynamic Modeling of the Response of the Solar Atmosphere to Bombardment by a Beam of Nonthermal Protons. **The Astrophysical Journal**, 498(1), 441.

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39. **Newton**, E. K. (1997). Investigating "Precursor Flows" in Solar Flares. **The Astrophysical Journal**, 484(1), 455.
40. **Newton**, E. K., Emslie, A. G., & Mariska, J. T. (1996). Dynamical Response of the Solar Atmosphere to Flare Heating. In **Magnetodynamic Phenomena in the Solar Atmosphere** (pp. 559-560). Springer, Dordrecht.
41. **Newton**, E. K., Emslie, A. G., & Mariska, J. T. (1996). Testing the Impulsiveness of Solar Flare Heating through Analysis of Dynamic Atmospheric Response. **The Astrophysical Journal**, 459, 804.
42. Emslie, A. G., Hénoux, J. C., Mariska, J. T., & **Newton**, E. K. (1996). The viability of energetic protons as an agent for atmospheric heating during the impulsive phase of solar flares. **The Astrophysical Journal Letters**, 470(2), L131.
43. **Newton**, E. K. (1996). Tests for electron-dominant heating in impulsive solar flares. In *Astronomical Society of the Pacific Conference Series* (Vol. 111, pp. 222-227).
44. Emslie, A. G., Henoux, J. C., Mariska, J. T., & **Newton**, E. K. (1996, May). Energetic Protons as a Form of Energy Transport During The Impulsive Phase of Solar Flares?. In *Bulletin of the American Astronomical Society* (Vol. 28, p. 857).
45. **Newton**, E. K., Emslie, A. G., & Mariska, J. T. (1995). The Velocity Differential Emission Measure: Diagnostic of Bulk Plasma Motion in Solar Flares. **The Astrophysical Journal**, 447, 915.
46. **Newton**, E. K., Emslie, A. G., & Mariska, J. T. (1995, March). The Velocity Differential Emission Measure-A Diagnostic of Mass Motions in the Impulsive Phase of Solar Flares. In *Bulletin of the American Astronomical Society* (Vol. 27, p. 983).
47. **Newton**, E. K. (1990). A Preliminary Study of the **Soviet Civil Space Program**. Volume 1: Organization and Operations. NASA Technical Report. NASA-CR-190306, NAS 1.26:190306, JPL-D-7513
48. **Newton**, E. K., & Alvelda, P. (1989). Asynchronous Nonlinear Holonomic Simulation: Methodologies in Modeling International Relations. In *Proceedings of the Fifth IASTED International Symposium: Expert Systems and Neural Networks, Theory & Applications: Honolulu, Hawaii, August 16-18, 1989* (p. 7). ACTA Press.