

Tara M Ruttlely, PhD

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EDUCATION:

Master of Arts (M.A.), Anthropology-Archaeology, University of Houston, 2018

Doctorate of Philosophy (Ph.D.), Neuroscience, University of Texas Medical Branch, 2007

Master of Science (M.S.), Mechanical Engineering, Colorado State University, 2001

Bachelor of Science (B.S.), Biology, Colorado State University, 1998

CAREER EXPERIENCE:

National Aeronautics and Space Administration

Johnson Spaceflight Center

02/2009 - Present

International Space Station (ISS) Associate Program Scientist

Represents the office of the International Space Station (ISS) Chief Scientist by providing scientific leadership at the highest level through performing scientific assessments and developing technical workforce capabilities across all disciplines of ISS research. Provides strategic and tactical research recommendations to NASA Headquarters (HQ), ISS Program Managers and Congress, develops methods to assess and promote knowledge transfer of ISS utilization, and collaborates with ISS international stakeholders on joint utilization and communications strategies. Manages budget and performs technical performance assessments of the ISS Program Science Office contractor team for award fee assessments and provides inputs for performance enhancement.

Accomplishments:

-Led the development of the highly-visible ISS research repository at www.nasa.gov/iss-science. This is now a database of technical knowledge about ISS research, and serves as the trusted source of the content for ISS research communication products.

-Led the initiation, development, and implementation of the "Biomedical Basics" and "Generic Rodent Skills" training programs for ISS crewmembers. The result increased core competency for astronauts performing science on ISS.

-Led the development of a training program called "ISS Ambassadors," training hundreds of NASA's workforce on how to optimally communicate about ISS benefits with various stakeholders.

-Served as a formal mentor for the Johnson Space Center Mentoring program, leading to improved career and leadership opportunities for the mentee.

-Represents the agency and the ISS program domestically and internationally by giving presentations about highly-technical ISS research progress in a way that is relevant and compelling. This has included presentations at NASA Flight Readiness Reviews, the NASA Advisory Committee, Members of the United States Congress and staffers, international conferences and workshops, NASA press briefings, media interviews, podcasts, panels, videos, newspapers, magazines, and blog articles.

-Assisted in the development of the ISS Science Communication Strategic Plan that resulted in secured financial resources and increased workforce development and resulting major improvements in the way ISS communicates about the value of its science activities to the public.

-Actively develops relationships to foster domestic and international collaboration with researchers in academia, other government agencies, and industry, resulting in signed agreements that have increased the impact of ISS research activities and sharing of results.

-Technical Monitor and Contracting Officer's Representative (COR) for external contracts designed to assess the value of ISS research, resulting in new communication tools and reports for presentation to senior leadership and government oversight bodies.

-Coordinated staff recruitment and hiring and managed the office budgets to grow the ISS Program Science Office according to the ISS Chief Scientist's vision. The result is the organization of a critical centralized office consisting of recognized ISS science experts within the large ISS Vehicle program.

-Served as the NASA ISS representative at international working groups, including the ISS Program Science Forum, the International Space Life Sciences Working Group, and the International Microgravity and Strategic Planning Working Group.

National Aeronautics and Space Administration

Headquarters

06/2018 - Present

Associate Chief Scientist for Microgravity Research

Serves as technical advisor to NASA's Chief Scientist for NASA's microgravity research activities, fosters science integration and cooperation, disseminates appropriate and practical microgravity science information for widest impact, and communicates with and coordinates internally and externally with NASA's science community. Serves as a key interface with the Executive Office of the President (EOP)- Office of Science and Technology Policy (OSTP) for NASA's Scientific Collection activities. Represents the Office of the Chief Scientist at agency-level boards and panels.

National Aeronautics and Space Administration

Headquarters

10/2014-10/2015

Staff Scientist

Served as a detailed staff scientist within NASA's Office of the Chief Scientist (OCS) at Headquarters. Led and participated in research and technical analysis for special projects, served as key interface with the Executive Office of the President (EOP)- Office of Science and Technology Policy (OSTP) for NASA policy development, interacted with the Office of Management and Budget (OMB) on special assignments, served as expert advisor and consultant in International Space Station (ISS) science activities relative to the agency's science workforce portfolio, communicated the societal impact and breadth of NASA science and technical workforce investments, and fostered communications and coordination internally and external to the NASA science community. Represented the OCS at Baseline Performance Reviews as necessary to provide OCS with critical feedback in the assessments of the health of the scientific missions and technical capabilities. Coordinated with NASA Headquarters Public Affairs and Outreach Office and outside media for Chief Scientist appearances and communications products.

Accomplishments:

- Developed an integrated NASA Policy Directive (NPD) 7100 that established NASA's policy for curation and sharing of institutional scientific samples. This required inter-center collaborations with the relevant NASA centers and NASA Mission Directorates to evaluate current archiving practices of unique space materials. Interaction with other government agencies such as the National Institutes of Health and the National Science Foundation fostered sharing of knowledge that ensured a level of consistency of implementation across agencies. The end result was a product that was approved by the Executive Office of the President (EOP) via the Office of Science and Technology Policy (OSTP).

-Facilitated the design, learning strategies, and implementation of a new agency-wide scientific communications leadership development course to educate the NASA technical workforce on how to effectively communicate complicated research. This required interfacing with NASA Human Resources, Office of the Chief Information Officer, and various NASA centers, as well as consulting with external training experts. The result was the successful development of application materials for prospective students, coordination of a highly-competitive application process, development of course materials, and course website development that has led to the training of nearly 200 students to date.

- Promoted the agency's vision for diversity and inclusion by coordinating with NASA HQ's Public Affairs Office to develop the NASA Administrator's specific request for a "Women In STEM" panel during Women's History month. The timing of the event was strategically set to take advantage of an international female crew set on ISS during that period. I also participated as a panelist, reaching an estimated broadcasted audience of thousands to encourage female participation in STEM activities and careers.

- Initiated ISS participation in Citizen Science discussions with OCS, resulting in an integrated focus for ISS on an agency initiative and increased potential for public participation in NASA technical challenges.

-Initiated and coordinated external relations activities, such as the NASA Chief Scientist's participation in World Science Festival and Earth Day activities. I also served as an invited panelist for the "Women in STEM" panel for the World Science Festival.

-Served as NASA interface to various other government agencies for the Interagency Working Group on Scientific Collections, with the goal of sharing knowledge of and access to NASA's scientific collections.

-Facilitated science strategic collaborations between the United States Department of Agriculture and the NASA centers to promote shared research goals and leverage resources.

-Developed training modules and a new nasa.gov website for NASA-funded researchers to promote knowledge sharing of NASA's new science data and publication policy, as mandated by OSTP.

- Participated as an invited member for the Science mission Directorate's Europa Instrument Steering Committee, resulting in the selection of an instrumentation package for scientific study of Europa in a manner that is aligned with the agency's strategic plans and missions.

National Aeronautics and Space Administration
Johnson Spaceflight Center
02/2007 - 2009
Lead Engineer for the ISS Human Research Facility

Performed engineering management for the Human Research Facility (HRF) flight hardware on the International Space Station (ISS). Coordinated with scientists and engineers within the ISS Medical Project (ISSMP) and within the ISS Program to develop requirements used for ISS research implementation using astronauts as human test subjects.

Accomplishments:

- Implemented hardware development, testing, configuration management, and certification of the HRF hardware components for ISS, resulting in the availability of high-performing, high-quality research hardware used in experiments on the ISS.
- Coordinated with international partners on a systems engineering approach to hardware development and sharing, resulting in the development of many successful international partner investigations for ISS.

National Aeronautics and Space Administration

Johnson Spaceflight Center

02/2001 - 2007

Lead Engineer for the ISS Crew Health Maintenance System

Led the systems engineering, development, testing, certification, and sustaining engineering of the critical Crew Health Maintenance System suite of hardware and software for ISS crewmembers. Implemented NASA hardware design, manufacturing, configuration control, quality assurance and safety procedures for both flight hardware and ground support equipment. Coordinated with flight surgeons to develop engineering requirements for the medical equipment for the Constellation Program and Orion capsule. Maintained oversight for a team of five contractors and ensured technical competency and implementation of NASA engineering work instructions for flight hardware development.

Accomplishments:

- Collaborated with ECLSS engineers to develop a hydrazine detection system to determine levels of contamination on crewmembers' Extravehicular Activity (EVA) suits, resulting in decreased risk of exposure to the toxic chemical.
- Developed new procedures and certified the ISS cycle ergometer (exercise bike) to use in EVA prebreathe activities, resulting in a decreased amount of time required to prepare for an ISS EVA.
- Initiated, secured funding for, and established the development the first and only Engineering Directorate-sponsored mission in the NASA Extreme Environment Mission Operations (NEEMO) program (NEEMO-6), resulting in the evaluation of the performance of ten potential future biomedical hardware projects for ISS, and increased external relations with media and the University of North Carolina and Rice University.
- Established and maintained NASA Engineering workforce policies and procedures to repair and re-certify the life-critical defibrillator unit on ISS, resulting in decreased costs to NASA for developing a new unit, and the ability to continue to meet ISS medical requirements.
- Managed costs and schedules for critical ISS medical hardware development and sustaining projects.

University of Houston
College of Natural Science
2009-2013

Adjunct Professor

Taught as adjunct professor for the University of Houston's undergraduate Human Physiology course and the undergraduate Biology Research Seminar course for fall and spring semesters.

Accomplishments:

- Developed course content, teaching materials, and prepared student examinations for class sizes of approximately 60 students per semester for each course.
- Collaborated with university professors on course planning and content, resulting in a design for an effective learning program for challenging undergraduate courses.
- Advised approximately 500 students on the design and implementation of their degree programs, resulting in numerous successful student admissions into competitive medical, dental, and research graduate programs.
- Promoted student programs such as internships and mentorships (both NASA-related and non-NASA related), resulting in several student placements that matured their educational experience and advanced their career development.
- Designed and implemented a curriculum that taught students how to implement academic research projects that included literature review, applying for competitive research grants, project management, writing and publishing professional research papers, presenting at technical and research conferences, and documenting lessons learned and sharing knowledge from their research experiences. The result of these efforts enabled the development of a new generation of a technically competent and talented workforce.

The Grocery Station
Houston, TX
8/2011- Present
Owner

Owner and President of The Grocery Station, a personal grocery shopping and delivery service for residents and businesses in Houston, Texas.

Accomplishments:

- Developed and opened the first virtual grocery shopping and delivery service in Houston, resulting in the creation of jobs and local economic growth in greater Houston.
- Managed contract negotiations for our clients, resulting in contracts worth over \$250,000 annually.
- Managed finances (accounts receivables, payables, and payroll) for the business, which averages \$750,000 in revenue annually.
- Managed a team of 10 shoppers (independent) and marketing personnel, resulting in business growth to over residential and business 5,000 customers in the greater Houston area and voted the best grocery delivery service by KHOU News in Houston in 2014.

**Colorado State University
Mechanical Engineering Department
Fort Collins, CO**

08/1998 - 12/2000

Graduate Research Assistant

Performed research on the design and evaluation of a Constant Force Resistive Exercise Unit (CFREU) that I developed for use as a countermeasure for microgravity-induced muscle atrophy.

Accomplishments:

- Developed proposals for parabolic flight analysis of the CFREU for NASA's KC-135 Flight Opportunities for Undergraduates Program.
- Developed the procedures and led the systems engineering, design, development and in-flight testing of the CFREU for parabolic flight experimentation for NASA's KC-135 Flight Opportunities for Undergraduates Program.
- Served as key interface between NASA and academia in the development of Institutional Review Board (IRB) review of protocols for human test subjects for the KC-135 flight program.
- Developed and received a United States Utility Patent for my CFREU design
- Led the external relations component of the KC-135 program for interested university, local, and national media, including The New York Times.

**Heska Laboratories
Loveland, CO**

09/1995 - 08/2000

Flea Dissector

Flea dissector (yes, you read that right!). Performed micro-dissection of salivary glands and ovaries to support research for flea bite vaccination development. Required good deal of patience, a sense of humor and steady hands!

National Resource Ecology Laboratories

Colorado State University

Fort Collins, CO

05/1996 - 05/1998

Research Assistant

Performed sterile soil microbial research, including field soil sampling, radioactive isotope labeling, soil pH analyses, microbial glucose uptake measurements, and analyses for soil carbon, nitrogen, and hydrogen.

Accomplishments:

- Principal Investigator for independent research project investigating growth yield efficiencies of bacteria and fungi in soil, resulting in the determination that soil that is not tilled will provide a more productive growing environment for agricultural crops than tilled soil.

RELEVANT TRAINING:

Conflict Management (2018)
Planning Performance Appraisals (2011, 2018)
Establishing a Positive Work Environment (2018)
Aligning Goals and Priorities to Manage Time (2018)
Strategic Listening Skills (2018)
FAC- Contracting Officer Representative Training (2017)
LMD- Science Communications at NASA (2015)
Inclusion and Innovation (2014)
The 7 Habits of Highly Successful People (2013)
NASA Seminar In Leadership course (Jan 2012)
Inside Congress: Understanding Congressional Operations (2012)
NASA Developing People (2011)
Federal Budget Process Overview (2010)
NASA Media Training (March 2009, 2015)
NASA's Influencing Others: The Leader's Toolkit (2008)
NASA Lean Six Sigma Training (2005)
Stress Management at NASA (2004)
NASA Negotiation Skills (2016)
Licensed Emergency Medical Technician - Basic (2002, 2006, current)
Reduced Gravity Flight Certified (2009)
Situational Leadership (2002)

AFFILIATIONS:

Women In Aerospace
Historical Archaeology Society
American Society for Gravitational and Space Biology
Colorado State University College of Engineering - Biomedical Engineering Degree Program Advisory Committee Member

PROFESSIONAL PUBLICATIONS:

Ruttley, T. (2018). African American Resistance, Social Control, and the Spiritual Alteration of the Physical Environment (Masters Thesis).

Ruttley, Tara M., Julie A. Robinson, and William H. Gerstenmaier. "The International Space Station: Collaboration, Utilization, and Commercialization." *Social Science Quarterly* 98.4 (2017): 1160-1174.

Ruttley, T. M., Robinson, J. A., Tate-Brown, J., Perkins, N., Cohen, L., Marcil, I., & Karabadzahak, G. (2016). International Research Results and Accomplishments From the International Space Station. WWW.NTRS.NASA.GOV

Mulavara, A., Ruttley, T., Cohen, H., Peters, B., Miller, C., Brady, R., Merkle, L., Bloomberg, J. Vestibular- somatosensory convergence in head movement control during locomotion after long-duration space flight. *Journal of Vestibular Research*. 22(2):153-66, 2012.

Ruttley, T., Harm, D., Evans, C., Robinson, J. International utilization at the threshold of “assembly complete” – science returns from the International Space Station. *Acta Astronautica*. 67(3-4):513-519.2010.

Thumm, T., Robinson, J., Ruttley, T., Johnson-Green, P., Karabadzak, G., Nakamura, T., Sorokin, I., Zell, M., Sabbagh, J. The Era of International Space Station Utilization Begins: Research Strategy, International Collaboration, and Realized Potential. 61st International Astronautical Congress, Prague, CZ. 2010. IAC-10-B3.1.4.

Ruttley, T., Evans, C., Robinson, J. The importance of the International Space Station for life sciences research: past and future. *Gravitational and Space Biology*. 22(2):67-81, 2009.

Kaufman, G., Weng, T., Ruttley, T. A rodent model for artificial gravity: VOR adaptation and Fos expression. *Journal of Vestibular Research*. 15(3):131-47, 2005.

Mulavara, A., Richards, J., Ruttley, T. Exposure to a rotating virtual environment during treadmill locomotion causes adaptation in heading direction. *Experimental Brain Research*. 166: 210-219, 2005.

Kaufman, G., Ruttley, T., Weng, T. Fos Expression and Video-oculography during Cross-coupling Training in the Gerbil. Association for Research in Otolaryngology 2004 Mid-Winter Research Meeting, Abstract #270.

United States Utility Patent: Paul Colosky, Jr. and Tara Ruttley. Constant Force Resistive Exercise Unit, s/n: 09/931,142 (issued Feb. 2004).

Ruttley, TM, Colosky PE Jr., James, SP. A gravity-independent constant force resistive exercise unit. *Biomed. Sci. Instrum*. 2001; 37:87-93.

Dhutia, M., Ruttley, T., Rajulu, S. Elbow Strength in Reference to Various Shoulder Positions. 31st International Conference on Environmental Systems. 2001. 2001-01-2148. DOI 10.4271/2001-01-2148.

NASA Small Business Innovative Research Contract Award (2001): \$69,000 for exercise in microgravity research.

NASA Graduate Student Research Program Fellowship (2000-2001): \$23,000

RELEVANT SKILLS AND ACTIVITIES:

-2013 Astronaut Candidate Selection Finalist

-Inflatable Antarctic habitat project at McMurdo Research Station (Jan 2008):Project engineer and back-up expeditionary team member for the development and deployment of the inflatable habitat located at

the McMurdo Research Station. This project is a joint NASA-NSF project that investigates feasibility of inflatable habitat design in a space analog environment.

-Motivational speaker to undergraduate students within the Council for Opportunity in Education TriO programs (2005-present): TriO programs support under-represented students (low income, minority, first generation) and encourage these students to pursue post-graduate education and professional careers. Such programs include the Ronald E. McNair Scholars program, Upward-Bound, Outward Bound, and Student Support Services.

-“Aquanaut” research participant for the NASA Extreme Environment Mission Objectives (NEEMO) Program (July 2004): Lead Principal Investigator for a series of NASA, NOAA, and UTMB extreme environment life science and engineering experiments that was performed during 10 day stay in an underwater habitat with astronaut participants in, “Aquarius,” on the Conch Reef off of the coast of the Florida Keys.

-Mars Desert Research Station (MDRS) Research Participant (Utah Desert) (January 2003): Principal Investigator for a series of medical monitoring experiments performed during an extended stay in the Utah desert to evaluate the MDRS extreme habitat as a potential space analog.

-Colorado State University Undergraduate KC-135 Research Team Lead (1998,1999):Team lead for the first undergraduate team from Colorado State University to participate in the NASA Reduced Gravity Flight Opportunities for Undergraduates program. Evaluated resistive exercise countermeasures and techniques during parabolic flight.

NASA AWARDS AND RECOGNITION:

- 03/15/2019 –
- 08/19/2016 841 - GROUP ACHIEVEMENT AWARD
- 06/07/2015 988 - NASA HONOR AWARD: GROUP ACHIEVEMENT AWARD ISS RESEARCH EXPLORER APP TEAM
- 01/07/2015 989 - INSTALLATION HONOR AWARD, JSC DIRECTOR'S INNOVATION GROUP ACHIEVEMENT AWARD DESTINATION STATION
- 09/28/2014 988 - NASA HONOR AWARD: GROUP ACHIEVEMENT AWARD LIFE SCIENCE SKILLS TRAINING TEAM
- 09/19/2014 989 - INSTALLATION HONOR AWARD: JSC GROUP ACHIEVEMENT AWARD UNIVERSITY RESEARCH-1 TEAM
- 07/22/2013 988 - NASA HONOR AWARD GROUP ACHIEVEMENT AWARD: ISS RESEARCH WEB AND SOCIAL MEDIA TEAM
- 07/21/2013 988 - NASA HONOR AWARD: GROUP ACHIEVEMENT AWARD ISS BENEFITS FOR HUMANITY TASK TEAM
- 02/07/2012 989 - INSTALLATION HONOR AWARD JSC GROUP ACHIEVEMENT AWARD: DESTINATION STATION 2011
- 08/13/2011 988 - NASA HONOR AWARD GROUP ACHIEVEMENT AWARD INTERNATIONAL SPACE STATION WEB TIGER TEAM
- 04/17/2009 988 - NASA HONOR AWARD GROUP ACHIEVEMENT AWARD GAS DELIVERY SYSTEM CONTAMINATION RESOLUTION TEAM

- 02/10/2008 989 - INSTALLATION HONOR AWARD JSC GROUP ACHIEVEMENT AWARD: 2007 JSC BIENNIAL RESEARCH & TECHNOLOGY DEV REPORT

RELEVANT AWARDS AND RECOGNITION:

- Department of Energy's Women In Stem Recognition: Visionary Women: Champions for Peace and Nonviolence (2019)
- US Space Camp Hall Of Fame Inductee (2018)
- Graduate of the Last Decade Award: Colorado State University College of Engineering (2008);
- TRIO National Achiever Award (2007);
- Who's Who Among American Colleges and Universities (2006);
- NASA Tech Brief Award (2005);
- TRIO Regional Achiever Award (2004);
- Rescue SCUBA Diver Certified (2004);
- Recipient of the 2003 Graduate School of Biomedical Sciences Associates Scholarship, University of Texas Medical Branch (2003);
- NASA Going The Extra Mile (GEM) Award (2003);
- Emergency Medical Technician Basic Certification (2002);
- Recipient of the NASA Graduate Student Researcher's Program Fellowship (2000-2001);
- Recipient of the Colorado State University Space Grant Fellowship (1999-2000);
- Advanced Open Water SCUBA certified (2002);
- KC-135 flight certified (1999,2002, 2009);
- Aerospace Medicine Association Annual Symposium, Life Sciences and Biomedical Engineering Branch: Ross McFarland Student Award Winner for innovative life sciences research and development methodology employing biomedical engineering (2001);
- Colorado Space Grant Consortium (1999): First Place Undergraduate Technical Paper Competition;
- AIAA Regional Student Design and Technical Paper/Oral Presentation Competition (1998): 3rd Place Undergraduate;
- ASGSB Annual Conference (1998): 2nd place for student design and poster presentation;
- Ronald E. McNair scholar (1997)

MEDIA APPEARANCES (NOT INCLUSIVE):

- The Weather Channel
- [IBMD](#)
- [Visionary Women: Champions of Peace and Non-Violence \(2019\)](#)
- [US Space Camp Hall of Fame Induction \(2018\)](#)
- [Houston, We Have a Podcast: Science on the International Space Station \(2017\)](#)
- [SpaceX launch to the International Space Station News Conference \(2017\).](#)
- [What's On Board Next Space Station Supply Mission \(2017\)](#)
- [What's on Board the Next SpaceX Mission to the Space Station \(2017\)](#)
- [Space Apps NYC 2015 - Tara Ruttlely - Hacking Away at Gravity on the ISS \(2015\)](#)
- [The World Science Festival NYC: Spotlight Women In Science Panel \(2015\)](#)

- [Future Tense/Slate Magazine Panel: A Day in Deep Space \(2015\)](#)
- [Women In STEM at NASA: STEM in the Global Science Community \(2015\)](#)
- [International Space Station: Top Benefits in the First 15 years \(2015\)](#)
- [KPRC News Segment: Houston Grocery Delivery Services Put to the Test \(2014\)](#)
- [NASA NOW: What do astronauts do on the International Space Station? \(2013\)](#)
- [NASA's Aspire to Inspire: Women in Science \(2013\)](#)
- [Nickelodeon's Take Me To Your Mother: Andrea Takes Off \(Season 1: Episode 13, 2013\)](#)
- [Students speak to the first NASA engineer to live underwater with astronauts for 10 days \(2013\)](#)
- [NASA Scientist Explains the Importance of Science In Space to students from Mission Control \(2013\)](#)
- [TedX Houston Presentation: Importance of Science Communication \(2013\)](#)
- [Students speak with NASA Scientist about experiments from NASA Mission Control \(2012\)](#)
- [NASA ISS Associate Program Scientist Tara Ruttley Talks About the Power of the Student Spaceflight Experiments Program for STEM Education \(2012\)](#)
- [NASA Scientist Talks about space station experiments on its way to ISS \(2012\)](#)
- [Amateur Skeptics Podcast: Science in Space \(2012\)](#)
- [Japan's fish tank on the Space Station \(2012\)](#)
- [ISS Update: Science Aboard the Station from Mission Control \(2012\)](#)
- [Aquarius Habitat: Analog to the International Space Station \(2011\)](#)