



My name is Tara Ruttley, and I am the Lead Hardware Engineer for the Health Maintenance System that's up on the International Space Station (ISS). In other words, I lead a team of engineers whose job it is to provide reliable medical equipment that will keep the astronauts healthy on orbit! I was born in Houma, Louisiana and raised in Lafayette, La before obtaining a BS degree in Biology and an MS in Mechanical Engineering, emphasis in Biomedical Engineering from Colorado State University (CSU). I am also currently pursuing a PhD in Neuroscience (expected 2006) from University of Texas Medical Branch. I came to work for NASA in Jan 2001, where I began my career as a project engineer for the exercise bicycle that's currently on the ISS. I've always wanted to work for the US Space Program, particularly for the Johnson Space Center, where the focus is on human presence in space and manned missions. Since I've always loved Biology and Physiology, I began heading for a career in Life Sciences. There is something very unique about the microgravity environment that causes distinct

changes in human physiology from the systems level, all the way down to the cellular level. Learning about these changes as a student taught me that our very body designs are a direct result of our development in a 1-G gravity environment...how thought-provoking!

At CSU, I became involved with the Colorado Space Grant Consortium and the student branch of the American Institute of Aeronautics and Astronautics as an undergraduate, and through my participation in student design conferences, I became more interested in the hardware aspects of maintaining optimal crew health in space. There are so many design challenges that are unique to spaceflight when considering hardware that should be used to keep crewmembers in top shape on orbit, such as minimizing noise from the hardware, limiting vibration (if any) from the hardware, designing it to withstand certain radiation levels, and just designing the equipment to be easy to use in a microgravity environment, when things usually tend to "float away" from you. Even more exciting is how we can apply such hardware designs to be used in an Earth-based setting, such as in physical therapy clinics and hospitals. I soon began to realize the importance of an interdisciplinary approach to designing hardware for crew health, so I pursued my Master's Degree in Mechanical Engineering, where my thesis was the testing of a novel gravity-independent resistive exercise device. Designing a "weight lifting" exercise device for use in space is a real challenge, since there is no "weight" in space. Imagine that you can lift 1 ton weight in space with just one finger!

I was really excited to have been offered such a position upon graduation here in the Biomedical Systems Division that allowed me to practice everything that I had gone to school for, combining engineering and science in a way that would further the goals of the US Space Program...AND I'd get PAID for it! To top it all off, NASA has recognized the importance of a commitment to education, and has supported my journey in obtaining my PhD in Neuroscience for the past 2 years. My job here is pretty incredible! I'm never bored since I interact daily with other engineers, scientists, physicians, astronaut trainers, and astronauts. I'm most excited at work when our team has successfully solved on-orbit hardware malfunctions in a way that can return the hardware to its best performance.

When I am not at the Johnson Space Center or studying for school, I enjoy scuba diving, cooking, home-improvement projects, eating good food, and being with my husband and our friends. I also like training to meet a new physical challenge, such as bike riding from Houston to Austin for the MS150 (a fundraising event for the National Multiple Sclerosis Society), or learning new swim skills for this NEEMO mission. Next year I may shoot for a triathlon! During the NEEMO 6 mission, I will represent the JSC Engineering Directorate and will be in charge of leading the hardware experiments. I'm looking forward to working with my team to accomplish our mission objectives, and challenging myself in such a unique environment.