



2022 Amelia Earhart Fellow

# Adriana Mitchell



**Citizenship:** United States and Brazil

**Proposed Program:** Aerospace engineering at Massachusetts Institute of Technology, USA

Ms. Mitchell's Ph.D. research at the Massachusetts Institute of Technology (MIT) combines her optical and aerospace backgrounds by focusing on visual navigation for autonomous planetary landings under variable illumination conditions. Current algorithms used for visual navigation have difficulty recognizing landmarks when illumination of the landing site during a planetary landing differs from orbital imagery taken for navigation. Nighttime landings, for example, will differ significantly from daylight images, affecting spacecraft landing safety. Landing accuracy will be critical to the success of manned missions to Mars or other planetary bodies that require pre-positioning of vital life-sustaining supplies for following astronauts.

Ms. Mitchell is developing a "smart" solution to the visual navigation problem with NASA Jet Propulsion Laboratory by using machine learning to perform visual navigation across different image types, including visual images, thermal images and RADAR images of potential future planetary lander candidates, like Mars, Titan and even Venus, where only RADAR can penetrate the thick atmosphere to image the surface. Her results will help give future missions access to new locations currently unreachable by current visual navigation techniques as well as helping to continue to improve landing accuracy on Mars and the Moon.

Most recently, Ms. Mitchell spent six months researching at Politecnico di Milano in Milan, Italy where she worked on the European Space Agency (ESA) asteroid characterization CubeSat M-ARGO. Prior to that, she worked at the Japan Aerospace Exploration Agency (JAXA) in Sagami-hara, Japan, on their asteroid sample-return mission, Hayabusa2. Ms. Mitchell received her master's in aerospace engineering in 2021 at MIT and her bachelor's in optical sciences and engineering from the University of Arizona in 2019. Ms. Mitchell enjoys karaoke and fashion history and is an avid traveler. She anticipates participating in international and eventually interstellar collaborations throughout her career.