2024 Amelia Earhart Fellow

Hamda Al-Ali

Citizenship: United Arab Emirates

Proposed Program: Aersospace Engineering at the Imperial College London, United Kingdom

Hamda Al-Ali is a Ph.D. candidate in the Imperial Plasma Propulsion Laboratory at Imperial College London. Her research focuses on the design and experimental qualification of a novel high-power plasma propulsion system: the Spherical Tokamak Thruster. This innovative technology is inspired by the operational principles of spherical tokamaks and magnetic confinement fusion. The thruster benefits from high propellant ionization and utilization rates and is compatible with a wide range of propellants, including molecular green propellants such as water. The electrodeless design of the Spherical Tokamak Thruster eliminates the issues associated with the presence of electrodes, such as electrode erosion and cathode poisoning, thereby extending its operational lifetime while providing a high specific impulse to increase the payload mass fraction and reduce spacecraft launch cost. These features and capabilities make it an attractive candidate for deep space exploration missions. This technology will enable efficient interplanetary space exploration and make interstellar travel more feasible.

Ms. Al-Ai holds a Bachelor of Engineering and Master of Science in aerospace engineering from the University of Manchester, where she was awarded the Overall Outstanding Academic Achievement Award and graduated as the top-ranked student in her cohort.

In addition to her passion for advanced space propulsion research, Ms. Al-Ali volunteers her time in STEM outreach activities. In her free time, she enjoys horseback riding and learning new languages.