

A UROP perspective by Jimmy van de Worp

Summer 2023 (undertaken in the Department of Mechanical Engineering)

Jimmy was a year 3 undergraduate at Imperial College London in 2022-2023: MEng Mechanical with Nuclear Engineering, Department of Mechanical Engineering.

UROP title: A Multiphysics Simulation Analysis of Nuclear Propulsion Space Rockets using Machine Learning

My journey into the world of research through the Undergraduate Research Opportunities Programme (UROP) at Imperial College London has been nothing short of transformative. As a lifelong enthusiast of space exploration and nuclear technology, the opportunity to engage in a research project in the field of nuclear propulsion felt like a dream come true.

My fascination with space exploration and nuclear technology has been a constant driving force in my life. It was during my early years that I was captivated by the idea of humans venturing beyond our planet and the immense potential of harnessing nuclear energy. This passion led me to pursue studies in the field of nuclear engineering.

My path to participating in the UROP here at Imperial College London began with a guest lecture by Prof. William Emrich Jr., hosted by the Imperial College Space Society (ICSS), on the captivating subject of space nuclear thermal rockets. The engaging talk left me eager to delve deeper into this area, prompting me to conduct extensive research on the topic. This led me to discover Bill's textbook and the related work being conducted within the Mechanical Engineering department at Imperial. It was from this that I approached an academic to explore the possibility of contributing to their research, and in due course they agreed.

My motivation for participating in UROP was multifaceted. Firstly, it offered a unique opportunity to gain practical experience and develop a deeper understanding of the complexities and challenges associated with nuclear propulsion. It was a chance to bridge the gap between theory and real-world applications, a journey I was eager to embark upon. Moreover, this research project aligned perfectly with my long-term career aspirations. It provided a platform to explore various aspects of nuclear engineering, from reactor physics to thermal hydraulic analysis. This exposure would be invaluable in making informed decisions about my future specialization and career path.

Preparation for this research project involved familiarizing myself with relevant software tools and literature in the field of nuclear propulsion. It was crucial to develop a foundational understanding of the subject matter before diving into the research. Additionally, I honed my critical thinking and problem-solving skills, preparing to tackle complex challenges.

One of the most enriching aspects of this experience has been the opportunity to collaborate with talented researchers and PhD students. This has not only expanded my technical skills but also enhanced my ability to work in a team and communicate effectively within a research setting.

My UROP experience has already left a profound impact on both my personal and professional growth. It has solidified my passion for space exploration and nuclear technology while equipping me with invaluable skills and experiences.

Looking ahead, this research project will significantly influence the remainder of my course and my future career pathway. It has clarified my aspirations and deepened my commitment to contributing to the advancement of space exploration and nuclear propulsion technology. Whether I choose to continue in research, academia, or venture into the industry, the foundation I have built during this UROP experience will undoubtedly serve as a guiding light.

In closing, my UROP journey has been a remarkable adventure into the world of space propulsion and nuclear engineering. It has reinforced my belief in the power of research and innovation to shape the future of space exploration. I am immensely grateful for the opportunity to be part of this project and excited about the contributions we will make to this fascinating field.