IET Travel Award Report

Event: *American Institute of Aeronautics and Astronautics (AIAA) SciTech Forum 2026*
Location*: Orlando, Florida, USA*
Recipient*: Beth Probert - PhD Student, University of Strathclyde, UK*

Background

The American Institute of Aeronautics and Astronautics (AIAA) SciTech Forum is the world's largest event for aerospace research, development and technology, bringing together an international community of over 6000 students and professionals from academia, industry, and government each year. SciTech's 2026 theme of 'Breaking Barriers Together: Boundless Discovery' encouraged participants to focus on global collaboration and explore how innovative research can reshape the traditional conventions of the aerospace sector.

Research was presented in various formats, ranging from technical paper presentations to panel discussions, broader plenary talks, and exhibits in the Forum's Expo Hall. Participants were also able to engage further with the AIAA by attending networking receptions and AIAA committee meetings, which covered themes from international activities to journal editing. Held in Orlando, Florida, from 12–16 January 2026, the forum provided a crucial platform for me to disseminate my PhD research and engage with the wider aerospace community. It was the ideal environment to help take my work from a lab-based proof-of-concept towards real-world application, helping me bridge the gap between theoretical software and operational reality.

Technical Focus and Paper Presentation

The primary focus of my travel was to present my technical paper, titled 'Cooperative Orbit Determination for Trusted, Autonomous, and Decentralised Satellite Operations'.

My research addresses a critical challenge in the modern space sector: the rapid proliferation of satellite constellations in Low Earth Orbit (LEO). As these constellations grow, the traditional model of centralised ground control is becoming a bottleneck. My work proposes a shift towards autonomous, decentralised satellite networks using distributed ledger technologies. However, removing a central authority introduces the challenge of establishing trust between satellites in a zero-trust environment.

In my presentation, I introduced the *Autonomous Cooperative Consensus Orbit Determination* framework. This architecture is designed to securely integrate consensus-based validation with cooperative orbital determination. At its core is a novel consensus mechanism I developed called 'Proof of Inter-Satellite Evaluation', which is specifically tailored for resource-constrained space systems unlike power-hungry mechanisms used in terrestrial blockchain systems. Crucially, I presented this as an open-source project. By sharing the code with attendees, I aimed to foster contributions

from other researchers to improve its maturity, aligning with the IET's mission to promote openness and shared innovation.

Conference Participation and Key Learnings

The wider technical programme offered a wealth of knowledge. SciTech commenced with a keynote plenary by astronaut Peggy Whitson, who is now the Vice President of Human Spaceflight at Axiom Space. She spoke eloquently about the future of space as an increasingly commercial domain, a perspective that reinforces the relevance of my work on decentralised, scalable satellite operations.

I also attended the 2026 Durand Lecture for Public Service, delivered by Dr Brian Argrow. He detailed his work on building aerial robots to understand Tornado genesis. While my work focuses on orbital applications, seeing how remote systems are applied to severe weather monitoring provided a fascinating parallel regarding sensor reliability in hazardous environments.

Another highlight was hearing from Arbi Karapetian, the Director of Innovation and Technology at Formula 1. As a former engineer at NASA's Jet Propulsion Laboratory, he drew compelling parallels between the high-stakes engineering of spacecraft and F1 racing cars. His insights on rapid innovation cycles and data-driven decision-making were inspiring for an early-career engineer.

Networking and Professional Development

The networking opportunities at SciTech allowed me to build connections across the US and UK aerospace sectors. I had the pleasure of meeting professors from the University of Glasgow and Embry-Riddle Aeronautical University, as well as a researcher from Howard University, who have invited me to attend upcoming workshops on satellite operations, and investigate opportunities for research collaboration. On the industry side, I held a productive discussion with the CEO of Vicillion, gaining insight into the commercial appetite for distributed ledger technologies in the space sector.

A significant outcome of my attendance was my engagement with the AIAA governance structure. I attended the International Activities Group (IAG) meeting to understand how the AIAA fosters global collaboration. As a direct result of this meeting, I have taken on the role of International Student Representative. This position will allow me to help shape how international students engage with the AIAA and ensure diverse voices are heard in future forums. Additionally, I connected with the AIAA Young Professionals committee and have provided my details to support their future meetings and events.

Sustainable Travel Practices

In line with the IET's commitment to sustainability, I took several conscious steps to minimise the environmental impact of my attendance:

- **Accommodation and Transport:** I selected the conference hotel for my accommodation. This allowed me to walk to the venue every day, eliminating the need for daily taxis or buses.
- **Flight Optimisation:** When booking my travel to Orlando, whilst flying was unavoidable, I prioritised an itinerary that minimised flight transfers, thereby reducing the high fuel consumption associated with take-offs and landings.
- **Local Travel:** On the occasions where vehicle transport was unavoidable (such as airport transfers), I used ride sharing options to maximise vehicle occupancy.

Contribution of the IET Travel Award

The IET Travel Award has been instrumental in my professional development. Attending AIAA SciTech Forum has not only allowed me to present my PhD research on an international stage but has also integrated me into the global aerospace community through my new role as the IAG International Student Representative.

Moving forward, I plan to leverage the connections made to pursue new collaborations for my open-source code project, ensuring the framework I have built can be tested and improved by the wider community. The feedback received during my presentation is already shaping the direction of my next journal paper, specifically regarding the robustness of orbit determination filters against intelligent spoofing.

I am sincerely grateful to the Institution of Engineering and Technology for this support, which has accelerated my career and research impact.