



2021 IATA FACE UP! Thesis Competition

Winner announcement

The **IATA FACE-UP! competition** gave recent graduates worldwide the opportunity to showcase their thesis to industry executives during the [2021 World Cargo Symposium \(WCS\)](#) in Dublin, Ireland.

The voting was launched during the closing plenary, and delegates had 48 hours to submit their votes. The WCS attendees selected **Martina Brysch**, from the University of Groningen, as the winner of the 2021 edition for her thesis, "Air Cargo in the Physical Internet." Her research focused on the Physical Internet, a new logistics concept based on modular and autonomous PI-containers, full automation, the openness of the system, and decentralization, which may create a novel solution for current problems across air cargo.

The two runner-ups are:

- **Tereza Bartlová**, Brno University of Technology: "Performance Possibilities of VTOL Unmanned Aerial Vehicle"
- **Craig Neal**, University of New South Wales: "Demand for Cargo Airships in Australia: An analysis of mode choice decision making by logistics professionals."

The winner and runner-ups will benefit from an opportunity to expand their industry knowledge through the Air Cargo Business Development diploma. They will receive a free voucher for the nine live virtual classroom courses, providing them with an in-depth exploration of the fundamentals and foundation of business management strategy, skills and development tools for air cargo.

Since the competition's launch in August 2019, IATA has received 27 entries from students and researchers worldwide. The jury panel has decided to reward a broad spectrum of ideas, from Unmanned Aerial Vehicles (UAVs) to digitalization to aircraft alternatives.

The entries have been evaluated by an independent jury comprising industry experts, academics, and executives of leading logistics companies. They have based their assessment upon the innovative, transforming, and visionary nature of the content, as well as the quality of the solution presented in the thesis.

IATA would like to thank the five members of the Jury for their hard work and detailed and honest feedback. It was not an easy task, but they demonstrated their commitment and passion for our air cargo industry and innovation.

- **Olivier Chabin**, Head of Digital Innovation, Cargolux
- **Vivien Lau**, Managing Director, Hacia & Executive Director, Hactl
- **Mikael Lind**, Senior Strategic Research Advisor, Research Institute of Sweden
- **Sara Van Gelder**, Cargo Community Solution Manager, Nallian
- **Janet Wallace**, Director Cargo Transformation, Air Canada

Winner submission

Martina Brysch – University of Groningen

“Air Cargo in the Physical Internet”

The air cargo traffic is continuously growing while cargo rates are shrinking. Besides, problems such as the slow adaptation of novel technologies, high complexity, or lack of transparency do not facilitate a quick change in the air cargo industry. The Physical Internet (PI) is a new logistics concept based on modular and autonomous PI-containers, full automation, the openness of the system, and decentralization, which may create a novel solution for current problems across all transportation modes. Multiple research studies and industrial pilots have focused on PI development; however, only the air transportation mode has not been included in any past or current PI studies. Therefore, the lack of possible PI implementation in air freight is a relevant gap in research. By using Design Science Research and the multiple case study methodology, the current and future PI air cargo handling process was reverse engineered and respectively re-designed. Requirements, physical and operational constraints based on the air cargo industry were added and a PI implementation road map for airlines was proposed. Moreover, a validated hybrid PI air cargo process design solution with two PI-container implementation options at airports, air cargo hubs, ground handling agents and combination carriers was introduced.”

Finalist submissions

Tereza Bartlová – Brno University of Technology

“Performance Possibilities of VTOL Unmanned Aerial Vehicle”

Manufacturing companies face huge penalties for late deliveries. This thesis offers a new solution to avoid late deliveries by transporting crucial parts with Vertical Take-off and Landing (VTOL) Unmanned Aerial Vehicle (UAV), which can save up to 48 % of the delivery time compared to on-road transportation. The first part of the thesis describes the cargo delivery mission and specifies performance requirements for the UAV. The second part is focused on quick and easy analyses that evaluate the performance requirements and estimates the power required for the UAV. The third part of the thesis focuses on the chosen configuration of the aircraft and hybrid propulsion system.

Craig Neal – University of New South Wales

“Demand for Cargo Airships in Australia: An analysis of mode choice decision making by logistics professionals.”

The thesis examines the economic feasibility of the cargo airship mode in Australia by undertaking a demand analysis of the freight market in Australia. The research results proved that there is a significant market in Australia for the cargo airship mode, with the potential to capture up to 25% of the total freight share depending on the model of a cargo airship.

This research proved that the majority of cargo doesn't need jet speeds and that a slower, cheaper form of air transportation (cargo airship) has the potential to capture a significant market share of the Australian domestic freight market.