

Travel Grant Report – 12th European Combustion Meeting (ECM 2025)

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I would like to express my sincere gratitude to Eötvös Loránd University for awarding me the travel grant that enabled my participation in the 12th European Combustion Meeting (ECM), held from April 7th to 10th, 2025, in Edinburgh, Scotland. This opportunity greatly enriched my academic development and significantly increased the international visibility of my research.

At ECM, I presented a poster titled “Testing of $\text{NH}_3/\text{CH}_3\text{OH}$ Combustion Mechanisms Based on a Large Amount of Experimental Data.” This study applies a data-driven methodology and the Optima++ simulation framework to assess combustion mechanisms involving ammonia and methanol—fuels of growing interest for sustainable energy applications. My presentation attracted substantial attention from researchers working in combustion modelling and alternative fuels.

The conference was an ideal setting to exchange ideas and foster collaborations. One of the most valuable outcomes was initiating a joint effort with a team from the University of Brighton, who have developed a functional engine operating on ammonia and methanol. Our planned collaboration includes exchanging simulation and experimental data to mutually validate and refine our approaches.

I also had the opportunity to speak with Dr. Xinlu Han, the developer of one of the mechanisms evaluated in my work. Her insights into the design and performance limitations of the mechanism were particularly helpful and will influence the direction of my future model development.

Furthermore, a stimulating conversation with researchers from King Fahd University of Petroleum and Minerals introduced me to the use of artificial intelligence in combustion research. Their innovative perspective inspired me to consider incorporating AI techniques into my future work—a new and promising direction I am now eager to explore.

Beyond these direct interactions, attending a wide range of technical sessions—covering topics such as sustainable fuel pathways, optical diagnostics, and laminar flame speed measurements—helped me place my work in a broader scientific context and sparked new ideas for interdisciplinary research.

In summary, my participation in ECM 2025 was a highly rewarding experience that provided valuable technical insights, fostered new collaborations, and expanded my academic and professional network. I am truly thankful to ELTE for the financial support that made this possible.

Thank you once again for your generous support and commitment to supporting international research engagement.

Sincerely,

Siyabonga Blessing Nxumalo

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