NATIONAL WIND TUNNEL FACILITY

NWTF FORUM · 2026

AI-Enabled Wind Tunnel Experiments Forum

Monday 14 September 2026 · Imperial College London

Department of Aeronautics, South Kensington Campus

PROGRAMME

The NWTF AI-Enabled Wind Tunnel Experiments Forum brings together researchers working at the interface of artificial intelligence — digital twins, control and autonomous decision-making — and experimental fluid mechanics. Across four sessions, a panel discussion and a poster programme, the Forum sets out to identify emerging opportunities in AI-enabled experimental campaigns, autonomous wind-tunnel testing, real-time sensing and actuation, and data-driven approaches that accelerate aerodynamic discovery.

ORGANISED BY

Dr Georgios Rigas — Department of Aeronautics, Imperial College London

Dr Sean Symon — School of Engineering, University of Southampton

nwtf.ac.uk/event/nwtf-ai-enabled-wind-tunnel-experiments-forum

AT A GLANCE

Programme Summary

TIME	ACTIVITY	LOCATION
08:30–09:30	*Registration Arrival Refreshments: Coffee, Tea & Pastries*	CAGB Foyer
08:30–09:30	*Arrival Refreshments: Coffee, Tea & Pastries*	CAGB 309
09:30–09:45	**Welcome & Vision for AI-Enabled Experimental Facilities**	CAGB 300
09:45–10:50	**Session 1 — AI-Enabled Experimental Measurements & Flow Reconstruction**	CAGB 300
10:50–11:10	*Coffee Break*	CAGB 309
11:10–12:15	**Session 2 — AI for Intelligent Experiments & Digital Twins**	CAGB 300
12:15–12:35	**Poster Flash Talks (2 minutes each)**	CAGB 300
12:35–14:05	*Lunch, Poster Expo & Networking*	QTR
14:05–14:45	**Panel Discussion — The Next Generation of AI-Enabled Experimental Facilities**	CAGB 300
14:45–15:50	**Session 3 — AI for Engineering Discovery & Control**	CAGB 300
15:50–16:10	*Coffee Break*	CAGB 309
16:10–16:50	**Session 4 — Physical AI & Autonomous Experimentation**	CAGB 300
16:50–17:15	**General Discussion, Future Opportunities & Closing Remarks**	CAGB 300

Contributed talks are allocated 13 minutes: a 10-minute presentation plus questions and speaker changeover. Poster flash talks are 2 minutes with no questions; presenters then staff their posters for the expo at QTR over lunch.

VENUES

CAGB 300	Main lecture room — all sessions, panel and flash talks
CAGB 309	Arrival refreshments and coffee breaks
CAGB Foyer	Registration desk
QTR	Queen's Tower Rooms — lunch, poster expo and networking

FULL DETAIL

Detailed Programme

08:30–09:30	*REGISTRATION* · **CAGB Foyer**
08:30–09:30	*ARRIVAL REFRESHMENTS* · **CAGB 309**
09:30–09:45	**Welcome & Vision for AI-Enabled Experimental Facilities** · **CAGB 300** Dr Georgios Rigas (Imperial College London) and Dr Sean Symon (University of Southampton)

09:45–10:50 SESSION 1 — AI-Enabled Experimental Measurements & Flow Reconstruction

CAGB 300

09:45–09:58	**PIGLET: Physics-Informed Gaussian Process Regression for the Learning and Estimation of Turbulence** J. M. Lawson *University of Southampton* Presented by **John Lawson**
09:58–10:11	**Development and Application of Omnidirectional PIV Measurements for Wind Tunnel Testing** A. Nila, A. Charogiannis, T. Rockstroh, O. Erdogdu, A. Khojasteh, E. Overmars, J. Westerweel, I. Fumarola, K. Gouder *LaVision UK · TU Delft · Imperial College London* Presented by **Alex Charogiannis**
10:11–10:24	**Efficient Mean Flow Reconstruction of Sparse Experimental Data** U. Cadambi Padmanaban, B. Ganapathisubramani, S. Symon *University of Southampton* Presented by **Uttam Cadambi Padmanaban**
10:24–10:37	**Physics-Informed Neural Networks for Super-Resolution of PIV Data and Flow Reconstruction** R. Klopsch, Y. Patel, G. Rigas *Imperial College London* Presented by **Roman Klopsch**
10:37–10:50	**Physics-Defined Generative Priors for Real-Time Wind-Tunnel Flow Field Estimation** P. Seshadri, A. B. Duncan, P. Yatsyshin, H. Lee, J. Rauleder *Hendon AI · Imperial College London · Georgia Institute of Technology* Presented by **Pranay Seshadri**

10:50–11:10	*COFFEE BREAK* · **CAGB 309**

SESSION 2

11:10–12:15 AI for Intelligent Experiments & Digital Twins

CAGB 300

11:10–11:23 **Machine Learning for Data Assimilation**

J. N. Kutz
Autodesk Research, London, UK
Presented by **Prof. J. Nathan Kutz**

11:23–11:36 **Development of a Wind Tunnel Digital Twin with Predictive Capability of Aerodynamic Data**

C. A. Toomer, R. Hendry, S. Annapureddy, A. Pontillo
University of the West of England
Presented by **Ruth Hendry**

11:36–11:49 **A Data-Driven Framework for Optimal Pressure Sensor Placement in Wind-Tunnel Testing**

C. A. M. Dias Filho, Y. G. A. Chance, J. P. Eguea, L. T. L. Pereira
University of São Paulo, Brazil · Delft University of Technology, The Netherlands
Presented by **Caio Augusto Dias**

11:49–12:02 **Optimal Experimental Design: Wind-Tunnel-in-the-Loop Bayesian Optimisation for Vehicle Aerodynamics**

I. Fumarola, J. Zhang, K. Roman, G. Rigas
Imperial College London
Presented by **Isabella Fumarola**

12:02–12:15 **Catesby Tunnel — Exploiting High-Quality Experimental Data for AI at Catesby Tunnel**

J. Paton, R. Lewis
Catesby Projects Ltd · TotalSim Ltd
Presented by **Jon Paton**

POSTER FLASH TALKS

12:15–12:35 Two Minutes Each

Presenters staff their posters during the expo at QTR · **CAGB 300**

12:15–12:17 **Cluster-Based Dynamic Stall Detection Using Time-Delay Embedding**

E. Curran, A. Bertolin, T. Haines, S. Bull
University of Bath
Presented by **Eimear Curran**

12:17–12:19 **Fast Flow Reconstruction from Sparse Data**

Y. Zhou, Z. Wang, X. Meng
University of Edinburgh
Presented by **Yuanye Zhou**

12:19–12:21 **From Kinematics to Flow Fields: A POD-LSTM Reduced-Order Model for Dynamic Stall**

C. Toma, B. Ganapathisubramani, S. Symon
University of Southampton
Presented by **Christian Toma**

12:21–12:23 — **Aerodynamic Load Reconstruction of an Aeroplane Wing Using Limited Pressure Sensors**

T. E. Makuni, Z. Sharif-Khodaei
Imperial College London
Presented by **Tafara Makuni**

12:23–12:25 — **AI-Enabled Monitoring for Wind-Tunnel Experiments**

G. M. Eriş, M. Perçin, O. Uzol
Middle East Technical University (METU), Ankara, Türkiye
Presented by **Görkem Mahir Eriş**

12:25–12:27 — **Unsupervised Rediscovery of Dynamic Stall Regimes from Pressure Data**

L. Schneeberger, G. Y. Cornejo Maceda, A. Ianiro, S. Discetti
Universidad Carlos III de Madrid, Leganés, Spain
Presented by **Lucas Schneeberger**

12:27–12:35 — *Introductions, changeovers and transition to QTR*

12:35–14:05 — ***LUNCH, POSTER EXPO & NETWORKING*** · **QTR**

14:05–14:45 — **Panel Discussion** · **CAGB 300**

What should the next generation of AI-enabled experimental facilities look like? — A moderated discussion with panellists from academia, national facilities and industry.

14:45–15:50 — SESSION 3

AI for Engineering Discovery & Control

CAGB 300

14:45–14:58 — **Giving Wind Farms a Power-Up with AI**

C. Thompson, K. Gouder, M. Graham
Imperial College London
Presented by **Craig Thompson**

14:58–15:11 — **Data-Driven Predictions of Unsteady Flows: From Visualising Forces Using Tufts to Optimal Foil Manoeuvres**

B. Ganapathisubramani
University of Southampton
Presented by **Bharathram Ganapathisubramani**

15:11–15:24 — **Deep Reinforcement Learning Discovers a Novel Control Algorithm for Mitigating Flow-Induced Vibrations in Underactuated Tandem Cylinders**

H. Sababha, M. Daqaq
NYU Abu Dhabi, UAE · Tandon School of Engineering, New York, USA
Presented by **Hussam Alhussein**

15:24–15:37 — **Autonomous Real-Time Control for Turbulent Systems**

J. Zhang, G. Rigas
Imperial College London
Presented by **Junjie (Jacky) Zhang**

15:37–15:50 — **Data-Driven Modelling of Flight Trajectories Through Wind Tunnel Measurements**

O. Marxen, O. Wastell, M. Placidi
University of Surrey
Presented by **Olaf Marxen**

15:50–16:10 — *COFFEE BREAK* · **CAGB 309**

16:10–16:50 — SESSION 4

Physical AI & Autonomous Experimentation

Chair: TBC · **CAGB 300**

16:10–16:23 — **Robotic Wind Tunnel Experiments: Learning to Fly**

Y. Goodwin, G. Rigas, J. F. Morrison
Imperial College London
Presented by **Yekaterina (Katya) Goodwin**

16:23–16:36 — **Coachable Agents for Interactive Gameplay and Directions for Flow Control**

R. Capobianco, H. van Seijen, N. D. Bard, N. Burch, F. Davelouis, J. Davidson, A. Devlic, Y. Du, I. Durugkar, S. Gangapurwala, D. Hernandez, G. Z. Holland, S. Jain, K. Kawamoto, R. Kumaraswamy et al.
University of Cambridge
Presented by **Shruti Mishra**

16:36–16:50 — **Active Operator Learning and Data Strategy for Large Physics Models**

G. Vidanes, N. Simmonds, J.-M. Leahy, M. Michaelides
PhysicsX, Research

16:50–17:15 — **General Discussion, Future Opportunities & Closing Remarks** · **CAGB 300**

Open floor: research priorities, shared datasets and benchmarks, facility access, and routes to funding and collaboration — followed by closing remarks from the organisers.

Programme correct at time of publication. Timings and speakers are subject to change.