

# Lynge Lauritsen, PhD

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## PROFILE

Data Scientist at the Alan Turing Institute with a Ph.D. in astrophysics and machine learning, and over a decade of Python experience. First and co-author of 6 peer-reviewed publications — including a first-author MNRAS paper with 17 citations — spanning deep learning, astrophysics, and AI for air traffic control. At Project Bluebird I build data pipelines, design cloud infrastructure on Azure, and apply machine learning to real-world problems.

## EDUCATION

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|------------------------------------------------------------------|-------------|
| <b>The Open University</b> Ph.D. Astrophysics & Machine Learning | 2019 – 2025 |
| <b>University of Copenhagen</b> MSc Astrophysics                 | 2016 – 2018 |
| <b>Durham University</b> BSc Physics                             | 2012 – 2016 |

## SKILLS

**Programming:** Python (10+ years), SQL  
**Key libraries:** pandas, scikit-learn, NumPy, matplotlib, TensorFlow, Keras, data visualisation  
**Machine learning:** Supervised & unsupervised ML, Deep Learning (CNNs, Autoencoders), Large Language Models (LLMs) and NLP  
**Mathematics:** Statistics, numerical & statistical modelling, data manipulation & analysis  
**Infrastructure:** Microsoft Azure, Cloud & HPC computing (Azure (ML, ADF, VMs), university clusters), Cloudflare, Docker Compose, Self-hosted infrastructure (TrueNAS Scale, Tailscale VPN)  
**Tools & platforms:** Git / GitHub, Azure Data Factory, Windows, Linux, MacOS  
**Languages:** Danish & English (native/bilingual), German, Swedish, Norwegian (working)

## EXPERIENCE

### DATA SCIENTIST 2023 – Present

*The Alan Turing Institute, Project Bluebird | London*

- Led the ML analysis of output from BLADE (Building Live Airspace for Distributed Environment) — a digital-twin platform developed by NATS (the UK's leading air traffic control provider) for Air Traffic Control (ATC) trainee recruitment and assessment:
  - Applied T-SNE and clustering to candidate performance data, revealing two risk patterns invisible to traditional scoring: strong scorers with weak underlying methodology, and weak scorers whose methodology was sound but execution lacking.
  - Co-delivered an automated PDF feedback prototype, now of active interest to both NATS HR and the NATS training college.
- Consolidated 4 disparate airspace sectorisation datasets into a single coherent product underpinning the project's probabilistic digital twin; documented the underlying data quality issues in a formal report for NATS.
- Built data pipelines and cloud infrastructure on Microsoft Azure, processing ~6 years of historical ATC data.
- Ran a proof-of-concept for virtually air-gapping the project's Azure environment; concluded it was workable but operationally costly, and the team adopted the finding.
- Mentored a PhD student intern (Nov 2025 – Feb 2026) whose outputs are still actively used on the project; upskilled a NATS colleague in collaborative GitHub workflows.

### INTERN 2022 – 2023 (6 months)

*The Alan Turing Institute, Project Bluebird | London*

- Built ATC complexity metrics from NATS en-route datasets; applied PCA, Random Forests and Neural Networks to study correlations with conflict detection outputs — results used to select scenarios for the project's 6-week AI agent trials (summer 2023).
- Applied trajectory similarity algorithms using mathematical trajectory distances (like Fréchet, DTW, Hausdorff) to group aircraft trajectories and identify comparable routes through ATC sectors.
- Offered a permanent contract on the strength of this work, before PhD funding concluded.

### PH.D. RESEARCHER 2019 – 2025

*The Open University | Milton Keynes*

Used convolutional neural networks to super-resolve images from the Herschel Space Observatory, generating higher-resolution information from archival image data using a denoising autoencoder. Further work clustered and combined the enhanced dataset with legacy observations to identify candidate sources for potential follow-up observation. Project: 'Super-resolving Herschel SPIRE images using Convolutional Neural Networks', supervised by Prof. Stephen Serjeant, Dr. Jane Bromley and Dr. Hugh Dickinson. Completed while working full time as a Data Scientist.

## INFRASTRUCTURE CREATION AND MAINTENANCE

- Built and maintain a TrueNAS Scale server (with offsite backup and Tailscale VPN for secure remote access)
- Running Ubuntu-Server VM with a passthrough GPU as a locally hosted LLM server using docker compose. This setup is used in my coding, writing and CAD workflows.
- Uses Cloudflare Tunnels to expose the server when away from home, with full API token and 2FA security setup.
- Running Home Assistant OS as a VM to manage a smart home network of lights, power meters, and environmental sensors.
- Built a custom touch interface using a Raspberry Pi and touchscreen, and designed a friction-fit bookcase mount in Fusion 360.

## PUBLICATIONS

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### First author

- *Lauritsen LRB*  
**"Super-resolving Herschel SPIRE images using Convolutional Neural Networks"**  
Ph.D. thesis, The Open University, 2025
- *Lauritsen L, Dickinson H, Bromley J, Serjeant S, et al.*  
**"Superresolving Herschel imaging: a proof of concept using Deep Neural Networks"**  
MNRAS, 507(1), 1546–1556, 2021 | 17 citations
- *Lauritsen L*  
**"Dust reverberation mapping of AGN in the local universe"**  
MSc thesis, University of Copenhagen, 2018

### Co-author

- *Koopmans D, Wang L, Margalef-Bentabol B, ... Lauritsen L, et al.*  
**"Super-resolving Herschel — a deep learning based deconvolution and denoising technique"**  
arXiv preprint, 2025
- *Pepper N, Keane A, Hodgkin A, ... Lauritsen L, et al.*  
**"A Probabilistic Digital Twin of UK En Route Airspace for Training and Evaluating AI Agents"**  
arXiv:2601.03113, 2025
- *Zhou D, Greve TR, Gullberg B, ... Lauritsen L, et al.*  
**"RAGERS: Evidence of an anisotropic distribution of submillimeter galaxies in the 4C 23.56 protocluster at z=2.48"**  
Astronomy & Astrophysics, 690, A196, 2024

## CONFERENCES & PRESENTATIONS

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- UK AI Research Symposium (UKAIRS 2025), Northumbria University, Newcastle
- Farnborough International Airshow 2024
- National Astronomy Meeting 2023
- Seminar at Hertfordshire University, 2021
- ML-IAP 2021: Debating the potential of ML in astronomical surveys — Institut d'Astrophysique de Paris, Sorbonne University
- Royal Astronomical Society: "ML and AI applied to astronomy 2", 2021