

Programme for Maths4DL Conference on Inverse Problems and Deep Learning

7-9 July 2025, University of Bath

Day 1 – Monday 7 July

Time	Session
10:30	Registration
10:55	Welcome and introduction
11:00	Keynote 1 – Audrey Repetti <i>Learning approaches for solving monotone inclusion problems in imaging</i>
11:45	Contributor talk – Pablo Arratia <i>Enhancing Dynamic CT Image Reconstruction with Neural Fields and Optical Flow</i>
12:10	Lunch
13:10	Contributor talk – Nathan Buskulić <i>Implicit Regularization of the Deep Inverse Prior via Inertial Gradient Flow</i>
13:35	Keynote 2 – Gabrielle Steidl <i>Telegrapher's Generative Model via Kac Flows</i>
14:20	Contributor talk – Jakiw Pidstrigach <i>Conditioning Diffusions Using Malliavin Calculus</i>
14:45	Poster session with coffee
16:15	Contributor talk – Anime Othmane <i>Identification of cost functionals and stabilizing feedback laws in optimal control problems</i>
16:40	Contributor talk – Christian Offen <i>Structure-preserving identification of equations of motions with provable convergence and UQ</i>
17:05	Contributor talk – Hong Ye Tan <i>Dataset Distillation as Pushforward Optimal Quantization</i>
17:30	Drinks reception (open to all)

Day 2 - Tuesday 8 July

Time	Session
09:30	Keynote 3 – Ozan Oektem <i>Structured learning: Bespoke deep learning approaches for operator learning</i>
10:15	Poster session with coffee
11:45	Contributor talk – Tomás Soto <i>Wide α-stable neural networks: Sample regularity, functional convergence and Bayesian inverse problems</i>
12:10	Contributor talk – Bart Smets <i>Equivariant PDE-based Neural Networks: Strong geometric priors for deep learning with images</i>
12:35	Contributor talk – Pierre Weiss <i>Blind inverse problems and learned priors</i>
13:00	Lunch
14:00	Keynote 4- Youssef Marzouk <i>Optimizing dynamic transport schemes for sampling</i>
14:45	Contributor talk – Mahadevan Ganesh <i>Regularity Analysis of Neural Network Approximations for Inverse PDE Problems in Unbounded Domains</i>
15:10	Coffee break
15:30	Contributor talk – Zakhar Shumaylov <i>Lie algebra canonicalization: equivariant neural operators under arbitrary lie groups</i>
15:55	Contributor talk – Tristan van Leeuwen <i>The Reversible Simulator - a data-driven approach for solving linear forward and inverse problems.</i>
16:20	Contributor talk – Marta Betcke <i>Neural operators for fast forward computations in ultrasound imaging</i>
16:45	Finish
19:00	Conference Dinner (pre-booked only)

Day 3 - Wednesday 9 July

Time	Session
9:30	Keynote 5 – Silvia Villa <i>Implicit regularization: from iterative to reparametrization approaches</i>
10:15	Poster session with coffee
11:45	Contributor talk – Hok Shing Wong <i>A primal-dual algorithm for variational image reconstruction with learned convex regularizers</i>
12:10	Contributor talk – Youzou Lin <i>Advancing Computational Wave Imaging through Deep Learning and Wave Physics Integration</i>
12:35	Contributor talk – Paola Causin <i>Manifold learning: is this a way to tackle inverse problems in biomedical imaging?</i>
13:00	Lunch
14:00	Keynote 6 – Sebastian Neumeyer <i>Learning Regularizers for Inverse Problems in Imaging</i>
14:45	Contributor talk – Dirk Lorenz Bilevel Learning of Tikhonov Regularization
15:10	Contributor talk - Zeljko Kereta <i>Plug and Play for Ptychography</i>
15:35	Conference close

Poster sessions

All posters will be available for viewing throughout the conference. Poster presenters have been allocated a session when they will be available to talk through their poster with delegates.

Monday (poster session 14.45-16.15)

- Rinki Goyal (University of Bath): *Data-driven Ultrasound tomography from simulated data to in-vivo human lung imaging*
- Vighnesh Alavani (BITS Pilani Goa): *A Regularization for Time-Fractional Backward Heat Conduction Problem with Inhomogeneous Source Function*
- Jona Klemenc (TU Munich): *Trade-off Invariance Principle for minimizers of regularized functionals*
- George Webber (Kings College London): *Personalisation and likelihood-scheduling for PET image reconstruction with score-based generative models*
- Patrick Fahy (University of Bath): *Greedy Learning to Optimise with Convergence Guarantees*
- Alexandra Koulouri (University of Bath): *Inversion and Data Assimilation for Advection-Reaction Transport Equation*

Tuesday (poster session 10.15-11.45)

- Amin Sabir (University of Bath): *Plug-and-Play methods with infimal convolution for*
- Cristian Tudosie (UCL): *Learned Single-Pixel Fluorescence Microscopy*
- Perla Mayo (University of Bristol): *Reconstruction of Accelerated Magnetic Resonance Fingerprinting with Physics-guided Denoising Diffusion Models*
- Naveen Gupta (IIT Delhi): *Functional linear regression under general regularization and the computational complexity of kernel-based methods*
- James Petticrew (Barcelona Supercomputing Centre): *Inverse estimation of pollutant emissions using a variational autencoder*

Wednesday (poster session 10.15-11.45)

- Lars Stietz (Hamburg University of Technology): *Bayesian Inference for Bathymetry Reconstruction*
- Thanos Polychronou (QMUL): *Task-oriented data-driven image restoration: Robustifying deep feature-based wildlife re-identification methods against image degradations*
- Axel Janson (KTH): *A Bayesian Approach to Multireference Alignment with Plug-and-Play Priors*
- Asma Farooq (L'Aquila Italy): *New Advance Algorithms to Solve Non-Linear Least Square Problems*
- Elliot Macneil (UCL): *A Hybrid Gaussian Beam-FNO approach for efficiently solving the PAT Inverse Problem*