

# Introducing IPYA: the Inverse Problems Young Academy

EMYA column regularly presented by Jesse Railo

Giovanni Covi, Nataliia Kinash and Rommel Rabongue Real

IPYA, the Inverse Problems Young Academy, is the official international association of young researchers working in inverse problems. It has been founded on 1 August 2025 by IPIA, the Inverse Problems International Association, on the occasion of the conference AIP 2025 on applied inverse problems, held in Rio de Janeiro, Brazil.

IPYA's mission consists in engaging early-career researchers in the field of inverse problems and amplifying their voices within the scientific community. It aims to promoting scientific activities of interest to early-stage researchers, by organising opportunities to develop research and academic skills, and facilitating connections among young researchers.

At the moment of writing, IPYA consists of 21 members, representing the young inverse problems community in 12 countries and 4 continents (North America, Europe, Africa, and Asia). Membership lasts 3 years, and one new cohort of about 20 members is planned to join the Academy every year.

The philosophy of IPYA is one of democracy: all members get a vote in all major decisions. Moreover, all concerns, projects and opinions of members find an open space for discussion. To achieve its goals, IPYA has given itself an official statute modelled on that of EMYA – the European Mathematical Society Young Academy. In order to realise the plans decided by its members, IPYA has given itself a committee, whose members are elected by the general assembly of the Academy. The work of the IPYA committee consists in taking concrete action towards the achievement of IPYA's goals. The current Chair and Secretary of IPYA are Giovanni Covi (University of Jyväskylä, Finland) and Pu-Zhao Kow (National Chengchi University, Taiwan).

## 1 Activities

The flagship activity of IPYA is its online seminar series, *Frontiers in inverse problems: theory, algorithms, and applications*, run biweekly on Thursdays at 13:00 GMT. The series launched in November 2025 and is curated by a scientific committee comprising Ping Liu, Pu-Zhao Kow, Suman Kumar Sahoo, and Yaohua Zang. Each session features a single 30–60 minute talk, with a primary focus on early-career speakers, although senior researchers are warmly

invited to contribute as well. Talks held to date span the full breadth advertised in the series' title, including nonlocality and the fractional Calderón problem (G. Covi), inverse problems for the prescribed mean curvature equation (J. Nurminen), the geometrisation of elasticity and ray tomography (A. Kykkänen), heuristic parameter-choice rules for Tikhonov and Landweber regularisation (R. R. Real), physics-informed generative neural operators for PDE-based inversion (Y. Zang), convergence of the Levenberg–Marquardt method under Hölder stability (A. Ishida), and Bayesian contraction rates for inverse source problems (P.-Z. Kow). Talk announcements are communicated through the seminar's public repository.<sup>1</sup> Beyond the seminar, IPYA holds regular general meetings to coordinate its scientific agenda, and is actively exploring further initiatives such as special sessions at conferences and special issues in journals, alongside outreach to the early-career sections of sister societies including the EMS and AMS. We stress that all IPYA scientific activities are open to the entire community of young researchers in inverse problems, and are by no means restricted to IPYA members.

## 2 The path to the founding of IPYA

On 22 February 2025, the Executive Committee of the Inverse Problems International Association (IPIA) released the first call for applications for the Inverse Problems Young Academy (IPYA). The goal of installing IPYA was to attract early stage researchers to the field of Inverse problems and give them a voice in the scientific community. During June of the same year, the 21 founding members from different countries were informed, and on 8 July 2025, they had their first-ever online meeting presided over by the IPIA president Barbara Kaltenbacher. IPYA held its first official General meeting on 28 July 2025 in hybrid format, some of the members having met at the international conference AIP 2025 held in Rio de Janeiro, Brazil. As a result, it was decided that the official foundation of IPYA would be on 1 August 2025.

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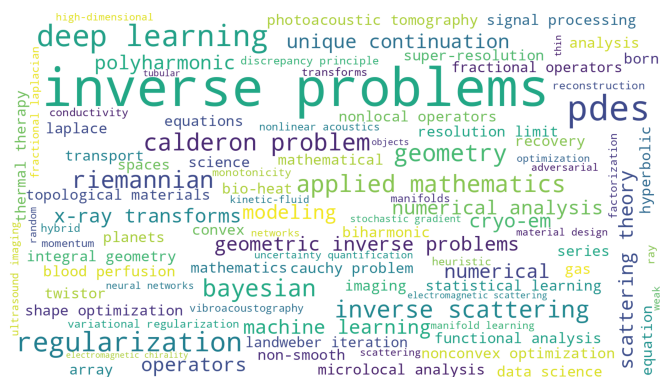
<sup>1</sup> [https://github.com/IPYA-site/IPYA\\_seminar](https://github.com/IPYA-site/IPYA_seminar)

### 3 Members

**Career stage.** Reflecting the Academy's commitment to *young* researchers, the largest group is postdoctoral fellows (9 members), followed by assistant professors (5), PhD students (2), lecturers (2), and one associate professor. The average career age is 2.3 years post-PhD, confirming that the Academy is firmly anchored in the early stages of an independent research career.

*International mobility.* Comparing each member's PhD country with their current institution, nine of seventeen members with a known PhD country (53%) currently work in a different country than the one in which they were trained, illustrating the strongly international character of the inverse problems community.

**Research themes.** The unifying thread is naturally inverse problems, which appear in every member's research statement. However, the members' expertise and interests reach much further than this – and indeed the members were selected in order to grant representation to all the main subfields of inverse problems. See Figure 3 for a taste of the full extent of IPYA members' research topics.



## 4 Get involved

Participation in IPYA seminars, meetings, and all other initiatives is open to all young researchers: IPYA membership is not required, and we warmly encourage interested colleagues to follow the seminar series and to engage with us through the IPYA website.<sup>2</sup> On the webpage it is also possible to find the list of all IPYA members, most of whom provide a link to a personal webpage and an email address. New members join annually through a joint call with IPIA.

<sup>2</sup> <https://ipia.site/wp/about-ipya/>

In order to apply:

- *Check your eligibility:* Early-stage researchers, from their third PhD year up to five years post-PhD as of the application deadline, are welcome to apply to become a member of the Academy by answering to the yearly open call. You do not need to be a member of IPIA in order to apply – rather, you will automatically become one when you will be selected as an IPYA member!
- *Prepare your application materials:* You will need a motivation letter, a CV, and the names of two referees. The referees will usually be IPIA members themselves.
- *Pay attention to the deadline:* The most recent call closed on 15 April 2026. The next call is expected to open in 2027, and information about this will become available on the IPIA website.<sup>3</sup> It is of course beneficial for all prospective members to join our activities even before the call!
- *Selection process:* Approximately 20 new members are chosen per year by a selection committee appointed by the IPIA Executive Committee, on the basis of scientific excellence (relative to academic age) and commitment to advancing the aims of IPYA, with attention to gender, regional, and mathematical diversity. Two members of IPYA also take part in the selection committee, which ensures that the decision process respects the will of the Academy. The second IPYA cohort is expected to be announced during summer 2026.

If you believe that IPYA would be a good match for you, please consider contacting us: we would love to hear from you!

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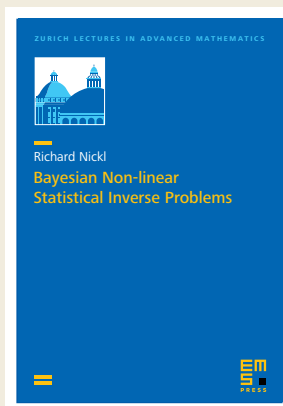
Rommel Rabongue Real is an associate professor at the University of the Philippines Mindanao, Philippines. He earned his PhD from the Mathematical Sciences Institute of The Australian National University in 2021. He focuses on regularisation methods for inverse problems, with particular interest in their convergence analysis and applications across sciences.

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<sup>3</sup> <https://ipia.site>

## EMS Press title



### Bayesian Non-linear Statistical Inverse Problems

Richard Nickl  
(University of Cambridge)

Zurich Lectures in Advanced  
Mathematics

ISBN 978-3-98547-053-2  
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2023. Softcover. 171 pages.  
€39.00\*

The present book presents a rigorous mathematical analysis of the statistical performance, and algorithmic complexity, of Bayesian methods based on Gaussian process priors in a natural setting of non-linear random design regression.

Due to the non-linearity present in many of these inverse problems, natural least squares functionals are non-convex and the Bayesian paradigm presents an attractive alternative to optimisation-based approaches. This book develops a general theory of Bayesian inference for non-linear forward maps and rigorously considers two PDE model examples arising with Darcy's problem and a Schrödinger equation. The focus is initially on statistical consistency of Gaussian process methods, and then moves on to study local fluctuations and approximations of posterior distributions by Gaussian or log-concave measures whose curvature is described by PDE mapping properties of underlying 'information operators'. Applications to the algorithmic runtime of gradient-based MCMC methods are discussed as well as computation time lower bounds for worst case performance of some algorithms.

*\*20% discount on any book purchases for individual members of the EMS, member societies or societies with a reciprocity agreement when ordering directly from EMS Press.*

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