

Research Collaboration Workshop, “Randomized Numerical Linear Algebra” (RNLA)

AUGUST 11 - 15, 2025

Scientific Overview

Research Collaborations in Randomized Numerical Linear Algebra (RNLA) focuses on developing efficient and practical algorithms for solving problems using numerical linear algebra via randomized techniques. Such methods have gained significant interest in the last 20 years due to the availability of large-scale data, and the challenges that arise when working with it. While computational capabilities have witnessed substantial growth, memory latency constraints persist. This one-week workshop aims to bring together researchers working in RNLA and closely related areas to discuss and initiate collaborations on open problems. The workshop will focus on three subtopics: (i) randomization in algorithms, (ii) randomized multilinear algebra, and (iii) applications to machine learning and inverse problems.

This week-long workshop engages researchers in in-depth discussions and hands-on problem-solving within RNLA, and the format of the program is modeled after the successful sequence of Association of Women in Math (AWM) research network collaborations. Our primary aim is cultivating new, long-lasting collaborations among mathematicians and researchers in this specialized field. Participants typically range from graduate students to senior faculty members and professional researchers in government and industry labs. We intend to leverage this one-week workshop as an inaugural platform, creating a productive environment for participants to convene in person, explore problems of mutual interest, exchange expertise, and network, paving the way for sustained collaboration and innovation.

Participation

Additional information about this workshop including application information can be found on the webpage listed below. Encouraging the careers of women and minority mathematicians and scientists is an important component of IPAM’s mission, and we welcome their applications.



Organizers

Malena Español (Arizona State University)
Jamie Haddock (Harvey Mudd College)
Anna Ma (University of California, Irvine (UCI))
Deanna Needell (University of California, Los Angeles (UCLA))

Research Projects and Leads

Randomized algorithms for solving inverse problems in X-ray science

Lead: Sherry Li, Lawrence Berkeley National Laboratory

Co-Lead: Wendy Di, Argonne National Laboratory

Structure-aware randomization for linear algebra

Lead: Tammy Kolda, Math Sci.ai

Co-Lead: Riley Murray, Sandia

Randomized Krylov Methods for Large-scale Inverse Problems

Lead: Julianne Chung (Emory University)

Co-Lead: Silvia Gazzola (University of Pisa, Italy)

Randomization in transformer models

Lead: Laura Grigori (EPFL)

Co-Lead: Alice Cortinovis (University of Pisa)



For more information, visit the program webpage:
www.ipam.ucla.edu/RNLA2025