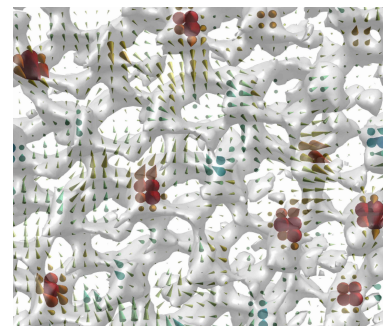


Workshop I: Diffractive Imaging with Phase Retrieval

October 10 - 14, 2022



Scientific Overview

For centuries, lens-based microscopy has played an important role in the evolution of modern science and technology. In 1999, a new form of microscopy, termed coherent diffractive imaging (CDI) or lensless imaging, was demonstrated and transformed our traditional view of microscopy, in which the diffraction patterns of a non-crystalline specimen or a nanocrystal were measured and then directly phased to obtain high-resolution images. The well-known phase problem (that is, how to recover a function from the magnitude of its Fourier transform) was solved by combining redundant measurements with iterative algorithms. For the past twenty years, various CDI methods such as plane-wave CDI, Bragg CDI and ptychography have been broadly implemented using synchrotron radiation, X-ray free electron lasers, high harmonic generation, light and electron microscopy. The goal of this workshop is to bring together leading CDI experts, applied mathematicians, physicists, materials scientists, engineers and biologists to disseminate results, exchange ideas and debate future perspectives of this rapidly growing cross-disciplinary field.

Long Program Schedule

This workshop is part of the long program on "Computational Microscopy"

- Computational Microscopy Opening Day : September 12, 2022
- Computational Microscopy Tutorials : September 13-16, 2022
- **Workshop I: Diffractive Imaging with Phase Retrieval : October 10-14, 2022**
- Workshop II: Mathematical Advances for Multi-Dimensional Microscopy : October 24-28, 2022
- Workshop III: Cryo-Electron Microscopy and Beyond : November 14-18, 2022
- Workshop IV: Multi-Modal Imaging with Deep Learning and Modeling : November 28 - December 2, 2022
- Computational Microscopy Culminating Retreat at Lake Arrowhead : December 11-16, 2022

Participation

Additional information about this workshop including links to register and to apply for funding, 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

Tetsuya Ishikawa (RIKEN), **John Miao** (UCLA), **Margaret Murnane** (University of Colorado Boulder), **Stanley Osher** (UCLA), **Ian Robinson** (Brookhaven National Laboratory), **Laura Waller** (UC Berkeley).

Speakers

Richard Baraniuk (Rice), George Barbastathis (MIT), Alberto Bartesaghi (Duke), Katie Bouman (Caltech), Mathew Cherukara (Argonne), Albert Fannjiang (UC Davis), Jason Fleischer (Princeton), Manuel Guizar-Sicairos (Paul Scherrer Inst), Ross Harder (Argonne), Tetsuya Ishikawa (RIKEN SPring-8 Center), Chris Jacobsen (Argonne/Northwestern), Hyungjung Kim (Sogang Univ.), Stefano Marchesini (SLAC National Accelerator Laboratory), John Miao (UCLA), Margaret Murnane (Colorado Boulder), Stanley Osher (UCLA), Aydogan Ozcan (UCLA), Demetri Psaltis (EPFL), Marie-Ingrid Richard (ESRF), Monika Ritsch-Marte (Innsbruck), Ian Robinson (Brookhaven), Tim Salditt (Georg-August-Universität), Guillermo Sapiro (Duke), Anne Sentenac (Fresnel), Sebastian Seung (Princeton), Oleg Shpyrko (UCSD), Changyong Song (Pohang Univ. of Sci & Tech), Ju Sun (Minnesota), Yukio Takahashi (Tohoku), Ivan Vartaniants (Deutsches Elektronen-Synchrotron), and Laura Waller (UC Berkeley)



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For more information, visit the program webpage:
www.ipam.ucla.edu/CMSWS1