Mathematics in Imaging (MATH)

The MATH meeting focuses on the mathematical analysis of imaging methods using electromagnetic waves as well as the development algorithms for image and information retrieval.

Research presentations are encouraged that describe new developments in mathematical models for scattering, inverse scattering, superresolution and phase retrieval. Theoretical and algorithmic challenges include imaging in and through random or strongly scattering media, imaging from diffracted or scattered intensity data, lensless imaging, the exploitation of coherence and correlation measurements in image estimation, the use of novel coding or structured illumination schemes for information retrieval and inverse problems associated with structured light generation.

Topics range from fundamental information theoretic studies of space-bandwidth trade-offs in imaging to the creation of complex illuminating wave structures used as probes, such as unusual superoscillatory fields or 3-D point spread functions. Papers are also encouraged describing the development of numerical methods, such as nonlinear optimization methods that deal with limited noisy data and noise or that can effectively and reliably incorporate prior knowledge.

TOPIC CATEGORIES
- Inverse scattering, regularization, constraints, inversion in the multiple scattering regime
- Shape optimization
- Blind deconvolution
- Coherent imaging systems (holographic imaging, synthetic aperture radar ...)
- Phaseless imaging (X-ray imaging ...)
- 3-D imaging (tomographies, microscopy ...)
- Imaging through turbulent, random or highly scattering media
- Biomedical imaging and hybrid imaging
- Biomimetic imaging
- Superresolution
- Inverse problems related to design of metamaterials, metasurfaces, and cloaking

CHAIRS
Habib Ammari, ETH Zurich, Switzerland, General Chair
Anne Sentenac, Institut Fresnel, France, General Chair
Markus Testorf, Dartmouth College, US, General Chair