

2027 IEEE Conference on Computational Imaging Using Synthetic Apertures (CISA)

Advances in Theory, Engineering Practice, and Standardization

University of Maryland | College Park, MD | 1-3 June 2027



Seeing Beyond Limits

The University of Maryland, IEEE USA, and the IEEE Synthetic Aperture Standards Committee invite you to College Park, MD for the 4th annual Conference on Computational Imaging Using Synthetic Apertures (CISA). CISA is a unique gathering of researchers and engineers interested in exploring the connections between remote sensing applications and computational imaging (CI). CI refers to the use of novel theory, data acquisition methods, and computational algorithms that leverage the forward imaging model to enable image reconstruction performance better than what is conventionally capable by a sensor/hardware system. Synthetic apertures (SA) are often leveraged in CI systems to sample propagating wavefields or environmental parameters through the motion of an antenna, transducer, or optical sensor. At the foundation of CI and synthetic aperture formation are the physics-based models that are exploited in computational procedures to provide accurate and robust estimates in the presence of measurement noise, system-level nonlinearities, or limited and irregular sampling patterns. The physical models and computational approaches for synthetic aperture imaging have become ubiquitous in a wide range of applications, including synthetic aperture radar (SAR), sonar (SAS), SA radiometry, and Fourier ptychography, as well as techniques that relate measurements to k-space samples, such as computed tomography, radio astronomy, seismology, MRI, and ultrasound. Some specific topics are suggested below.

Special session and tutorial proposals due: December 1
Initial 4+1 page submissions due: January 29
Climate and natural environment submissions due: January 29
Paper acceptance notification: February 19
Advance registration deadline: March 5
Camera-ready 4+1 page paper due: May 7

SAR: Automotive, mmWave, and THz SAR, Polarimetric, Interferometric, and Tomographic SAR, ISAR, 3-D imaging, Image reconstruction methods, Novel front-end sensors

Radar: Weather radar, Phased array radar

Sonar: Micro-navigation, Bathymetry, Wideband regimes

Optics: Fourier ptychography and SA microscopy, SA holography, Coded diffraction and coded aperture imaging, Single photon cameras, LED or VCSEL array imaging

Seismology: Wave migration and localization techniques

K-space modeling and reconstruction techniques: Black-hole imaging, Radio astronomy, Low magnetic field MRI

Scientific imaging: Inverse problems with physical meaning

Tomography: X-ray and Doppler techniques

Synthetic aperture radiometry: Earth observation, Environmental monitoring, Planetary imaging

Super-resolution: Methods that exploit the physics of sensing

Time-of-flight imaging: SAs via multi-aperture, multi-camera setups, 3D imaging, Optical and sub-optical wavelengths

GNSS reflectometry: Soil moisture, Vegetation, Sea ice

Model-based deep reconstruction: Plug-and-play methods, Diffusion models for image priors, Physics-informed neural networks, Doppler radiance fields

Point cloud processing: SA LiDAR (SAL), 4D mmWave SAR

Magnetic field cameras: Industrial and medical applications

Compressed sensing: Sub-Nyquist data acquisition, sparsity

Climate: Remote sensing of Earth's natural environment

Prospective authors should visit <http://cisa-conference.org/> to submit manuscripts. The 2027 CISA conference will be an in-person event and authors must present their papers live at the University of Maryland to be published in IEEEXplore. For additional questions, please send an email to info@cisa-conference.org.