

# IET Radar, Sonar & Navigation Call for Papers

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## Special Issue on: Radar Systems and Processing Methods for Space Situational Awareness

The space environment around planet Earth comprises a variety of nonhomogeneous and nonstationary fluxes of natural and man-made junk. Accordingly, governments, space agencies, and armed forces sustain the design and development of novel surveillance capabilities to detect, track, and classify hyper-velocity debris which may collide with strategic orbital infrastructure, jeopardize the space economy, and pose a severe threat to the Homeland Protection (HP). To this end, large ground-based radars and optical telescopes allow monitoring debris populations by forming fence coverage areas along with a gruelling data fusion for orbit estimation while coping with limits related to temporal and spatial observation constraints, atmospheric hindrances, and detection performance (especially with respect to small-size targets).

Recently, research efforts have also been devoted to contriving an active space-based debris detection and tracking capability in the microwave region to complement current surveillance assets for an improved Space Situational Awareness (SSA). Within this framework, submissions are solicited that report recent progress in either ground based or in-situ remote sensing assets (e.g., radio frequency and microwave-based radars) along with signal processing methods and data fusion techniques to augment suitable inference for SSA.

### Topics of interest include, but are not limited to:

- Ground-based and in-situ radar systems for SSA.
- Detection and tracking of hyper-velocity targets for SSA.
- Channel and target phenomenology for SSA.
- Space weather characterization and debris environmental scenarios for SSA.
- Motion models and orbit determination for SSA.
- Ontologies and catalogues for SSA.
- Multi-object estimation algorithms, data fusion concepts, and network systems for SSA.
- Surveillance mission analysis and end-to-end system operations for SSA.
- Antenna technology and electromagnetic models for SSA.
- Optronics, RF, and microwave enabling components for SSA.
- System-on-chip and system-on-package miniaturization processes for SSA.
- VLSI signal processing architectures, hierarchical memories, high-speed interfaces, and many-core processors for SSA.
- Time series analysis, ISAR imaging, classification and automatic target recognition for SSA.
- Satellite-based proximity radars for SSA.
- Cognitive radars, multi-static radar, waveform design, diversity, algorithms and optimization methods for SSA.

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