

SPOTLIGHT ISSUE: CALL FOR PAPERS

Breaking the Resolution Barrier in Ultrasound

Submission Deadline: May 31, 2024

Super-resolution ultrasound imaging, broadly defined as any methodologies that overcome the resolution limit of ultrasound, has been rapidly emerging as a new frontier of biomedical ultrasound in the past decade. Catalyzed by recent advances in ultrafast ultrasound, deep learning, and ultrasound contrast agents, super-resolution ultrasound is poised to become a transformative imaging technology that allows basic scientists and clinicians to visualize tissue microstructure and measure their functions at a spatial scale that has never been achieved before.

To showcase the state-of-the-art in super-resolution imaging, a Spotlight Issue entitled “*Breaking the Resolution Barrier in Ultrasound*” is being organized by the *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*. This issue aims to collect original research, tutorials, full-length reviews, and perspective papers (mini reviews) to promote the publication and dissemination of a wide range of technical knowledge on the theme of super-resolution imaging and its associated preclinical and clinical applications. Original research manuscripts submitted to this Spotlight Issue are expected to be full-length articles that report new and significant research advances. Specific topics of interest include, but are not limited to, the following:

- 1) **Advanced algorithms in super-resolution ultrasound imaging:** deep learning-based methods, contrast-free techniques, advanced beamforming, functional imaging, image quality assessment and image analysis, phase aberration correction, transcranial imaging through intact skull, etc.
- 2) **3D super-resolution imaging:** novel instrumentations such as array transducer and hardware innovations, advanced beamforming and post-processing techniques, etc.
- 3) **Novel contrast agents:** enhanced and augmented imaging capabilities for super-resolution ultrasound based on innovations in contrast microbubbles, nanobubbles, nanodroplets, targeted contrast agents, etc.
- 4) **New tools for super-resolution imaging validation:** new simulation tools, tissue-mimicking and micro-vessel phantoms, and *ex vivo* or *in vivo* tools that support the development and validation of new and existing super-resolution imaging techniques.
- 5) **Preclinical and clinical applications of super-resolution ultrasound imaging:** basic research on animal models, clinical human studies, etc.
- 6) **Technical and clinical reviews and perspectives of super-resolution ultrasound:** full-length and mini reviews of recent clinical and technical advances and perspectives of super-resolution imaging.

All contributions must be submitted online via <https://mc.manuscriptcentral.com/tuffc-ieee>, the Manuscript Central system of *IEEE Transactions on UFFC*. When submitting, authors must select the manuscript type as “Spotlight.” The authors need to distinguish their manuscript from a regular submission. In the “Cover Letter” section, authors should state that the submission is intended for the Spotlight Issue on “*Breaking the Resolution Barrier in Ultrasound*”, and they should highlight how their manuscript is topically aligned with at least one of the sub-themes described above.

All manuscripts will be peer-reviewed. The submission deadline is May 31, 2024, with an expected publication date in the 4th quarter of 2024. Potential contributing authors are encouraged to contact the guest editors to propose specific submission topics that are aligned with the scope of this Spotlight Issue. The Guest Editors are:

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