

Call for Papers
IEEE Photonics Journal
Special issue on 1st Carpathian Biophotonics Meeting (CBM 2025)

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Scope and Topics

The **1st Carpathian Biophotonics Meeting (CBM 2025)** is the inaugural edition of a conference series whose main objective is to explore the latest advancements in biophotonics—a rapidly evolving field at the intersection of optics, photonics, life sciences and advanced materials. CBM 2025 will be held between 8–12 September 2025 in Sinaia, Romania. It brings together international researchers, industry experts, and clinicians to discuss cutting-edge advancements in **biomedical imaging, optical diagnostics, laser-based fabrication, light-based sensing, and advanced photoactive biomaterials, among others.**

This special issue seeks to capture the vibrant discussions and latest findings showcased at CBM 2025, inviting in-extenso papers for all regular, invited and plenary contributions presented within this conference. This special issue will thus welcome comprehensive full-length original research, review, or perspective articles, inspired by conference presentations, seeking to highlight interdisciplinary innovations that span optics, life sciences, computational imaging, biomaterials, and AI.

Contributions will fall under one or more of the following thematic areas (not excluding others):

1. Advanced Optical Imaging & Microscopy

- Super-resolution and novel microscopy techniques such as single-molecule localization, pump & probe, photon-counting and tip-enhanced modalities
- OCT, Raman spectroscopy, TPEF, FLIM, SHG, THG, Brillouin microscopy, and their multimodal combined imaging platforms.
- Applications to 3D live imaging, focused on cells, tissues, organoids, tumor microenvironments, nano-bio interactions, etc.

2. Nonlinear, Ultrafast & Harmonic Optical Techniques

- Femtosecond laser systems for imaging, nanofabrication, and surgical applications across tissues and biomaterials
- Nonlinear optical microscopy (TPEF, SHG, THG, CARS), harmonic OCT, mid-infrared QPM, and adaptive optics techniques

3. Label-Free & Quantitative Phase Methods

- Label-free diagnostic tools: quantitative phase microscopy, impedance mapping, polarization-sensitive imaging in tissues

- Measuring functional/morphological biomarkers (e.g., mechano-chemical cues in disease models, neurovascular coupling in the retina, collagen structural analysis)

4. Optical Biosensing, Nanoparticles & Biophotonic Tools

- Nanoprobe-based sensing (SERS, Brillouin, transition-metal doped, DNA-stabilized, anisotropic plasmonic nanoparticles)
- Microfluidic cell sorting, dielectrophoretic systems, and near-field optical sensors

5. Computational, AI-Driven & Adaptive Techniques

- Integration of AI/ML (e.g., phasor analysis in FLIM, explainable AI for microscopy, adaptive optics) for image restoration and diagnostics
- Computational adaptive optics, nonlinear holographic methods, and plug-and-play model frameworks

6. Therapeutic Biophotonics & Biomaterials

- Light-based therapies: photodynamic interactions, laser-induced bioactive coatings, photothermal techniques, fiber-laser metabolic imaging
- Bioactive and photo-responsive materials: organic semiconductors, proteins, polymers, graphene composites, biomaterial–protein interfaces, 3D/4D printed scaffolds

7. Translational & Clinical Biophotonics

- Clinical and intraoperative imaging: biopsy assessment, cancer surgery margin detection, optoretinography, retinal/tissue diagnostics
- Platforms and instrumentation tailored for translation to clinic and industrial settings

Submission Guidelines

Submissions will be reviewed in accordance with the normal procedures of the Journal and papers must be formatted according to the Information for Authors found at:

<https://ieeephotonics.org/publications/photonics-journal/>

- Select the paper type **“Special Issue on the 1st Carpathian Biophotonics Meeting (CBM 2025)”**.
- Select technical topic **“06 – Focus Issue”**.

The journal’s standard Open Access Fees will apply.

Important Dates

Open for Submissions: August 8, 2025

Submission Deadline: December 11, 2025

Tentative Publication: March 2026

EARLY ACCESS: DOI-citable articles will be published online after acceptance upon submission of final files and rights selection – sometimes well in advance of issue publication.

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