BIOAM-2025 Workshop Program

Venue: Amphi Becquerel, Ecole polytechnique, Palaiseau, France
Dates: 1-3 September, 2025

September, 1st

08:00 – 09:00 | Registration & Welcome Coffee
09:00 – 09:10 | Opening Remarks

Session 1: Fundamentals and Beam Shaping

Chair: Igor Meglinski

- **09:10 – 09:40** Miguel Alonso – *Skyrmion-like polarization distributions*
- **09:40 – 10:10** Etienne Brasselet – *Skyrmionic beam shaping from structured anisotropic media*
- **10:10 – 10:40** Olga Korotkova – *Geometric structure of multi-state OAM carrying light beams*

10:40 – 11:00 | Coffee Break

Session 2: OAM Generation and Holography

Chair: Olga Korotkova

- **11:00 – 11:30** Goëry Genty – *Generation of tunable broadband OAM beams in large ring core multimode fibers*
- **11:30 – 12:00** Regina Gumenyuk – *High-power pure structured light for biomedical applications*
- **12:00 – 12:30** Qiwen Zhan – *Spatiotemporal hologram: from concept to applications*
- **12:30 – 13:00** Roman Novikov – *Recent mathematical advancements in holography*

13:00 – 14:00 | Lunch

Session 3: Quantum Structured Light

Chair: Tatiana Novikova

- **14:00 – 14:45** Andrew Forbes (Plenary) – *Probing biological systems with quantum structured light*
- **14:45 – 15:15** Rafael Barros – *Quantum frequency conversion driven by classically nonseparable light*
- **15:15 – 15:45** Sergey Skipetrov – *Dynamic quantum spin Hall effect for light*

15:45 – 16:15 | Coffee Break

Session 4: Instrumentation, Methods and Image Analysis I

Chair: Edik Rafailov

- **16:15 – 16:45** Ignacio Moreno – *Fourier transform Jones matrix approach for polarized structured light*
- **16:45 – 17:15** Marc Guillon – *Multiplexed Hartmann wavefront sensors for complex, broadband and vector wavefields*
- **17:15 – 17:45** Grigorii Sokolovskii – *Mid-infrared quantum-cascade lasers and some biomedical applications*

18:00-20:00 | Poster session and Welcome cocktail, Salon d'Honneur Ecole polytechnique

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Day 2, September, 2nd

Session 1: Instrumentation, Methods and Image Analysis II

Chair: Miguel Alonso

- **9:00 – 9:30** Edik Rafailov – *Photonics tools for biomedical applications: imaging, diagnostics and treatment*
- **9:30 – 10:00** Peter Kraus – *Ultrafast nanoscopy via optically-controlled high-harmonic generation from solids*
- **10:00 – 10:30** Chiara Stringari – *Polarization-resolved SHG imaging and modeling probes protein molecular structure*

10:30 – 11:00 | Coffee Break

Session 2: Biotissue imaging I

Chair: Regina Gumenyuk

- **11:00 – 11:30** Oriol Arteaga – *Limits of backreflection Mueller matrix polarimetry: lessons from quasi-transparent tissues*
- **11:30 – 12:00** Emmanuel Beaurepaire – *Polarized third-harmonic generation microscopy for the characterization of myelin and blood in brain tissue*
- **12:00 – 12:30** Alexander Bykov – *Hyperspectral polarimetric imaging for multi-scale label-free characterization and functional diagnostics of biotissues*
- **12:30 – 13:00** André Stefanov – *Backscattering polarimetric investigation of brain tissues*

13:00 – 14:00 | Lunch

Session 3: Instrumentation, Methods and Image Analysis III

Chair: Grigorii Sokolovskii

- **14:00 – 14:30** Elise Colin – *Multivariate speckle contrast for coherent polarimetric (radar) imaging*
- **14:30 – 15:00** Gleb Pogudin – *Efficiently checking physical realizability of experimental Mueller matrices*
- **15:00 – 15:30** Iago Pardo – *Depth-sensitive Mueller matrix imaging instrument*

15:30 – 16:00 | Coffee Break

Session 4: Biotissue Imaging II

Chair: Alexander Bykov

- **16:00 – 16:30** Christopher Hahne – *Physically consistent image augmentation for deep learning in Mueller matrix polarimetry*
- **16:30 – 17:00** Vaky Abdelsayed – *Quantitation of collagen structure and remodeling in the cervix during pregnancy using polarization-resolved SHG microscopy*
- **17:00 – 17:30** Jihad Zallat – *Towards topological imaging of skin lesions: Mueller polarimetry and future integration of structured light*

17:45 – 19:45 | Wine & Cheese Party, LPICM, Bat 408

Day 3, September, 3rd

Session 1: Clinical Applications I

Chair: Oriol Arteaga

- **8:30 – 9:00** Angel Lizana – *Characterizing Biological Samples through Polarization-Based Methods*
- **09:00 – 09:30** Omar Rodriguez-Nunez – *Towards clinical integration of Mueller polarimetry for intraoperative brain tissue characterization*
- **09:30 – 10:00** Igor Meglinski – *Non-invasive glucose monitoring using OAM phase memory*
- **10:00 – 10:30** Anna Yaroslavsky – *Rapid non-invasive subsurface imaging of human skin in vivo*

10:30 – 11:00 | Coffee Break

Session 2: Clinical Applications II

Chair: Igor Meglinski

- **11:00 – 11:30** Daniel Elson – *Wide-field polarimetric properties of surgical specimens*
- **11:30 – 12:00** Dmitry Pushin – *Quantitative biomedical diagnostics using polarized light and orbital angular momentum: from amyloid detection to macular health assessment*
- **12:00 – 12:30** Ilya Yaroslavsky – *Real-time tissue segmentation and differentiation using polarization imaging*
- **12:30 – 13:00** Eléa Gros – *Integrating Histological Ground Trouth for Dataset Generation and Validation of Polarimetric Imaging*

13:00 – 14:00 | Lunch

Session 3: Instrumentation, Methods and Image Analysis IV

Chair: Omar Rodriguez-Nunez

- **14:00 – 14:30** Fatima Khanom – *Structured Vortex Beams in Complex Media: Conical Refraction and OAM Memory*
- **14:30 – 15:00** Pascale Changenet – *Time-resolved circular dichroism for probing the conformational dynamics of (bio)molecules*
- **15:00 – 15:30** Simeng Qiu – *Polarization-Sensitive Imaging for Biological Specimens via Fourier Ptychography*

Session 4: Conference Closing

- **15:30 – 16:15** Panel Discussion: *Quantum & polarization optics in biomedicine – future directions*
- **16:15 – 16:30** Closing Remarks & Conference Adjournment