3D Printed Optics and Additive Photonic Manufacturing III (PE106)

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3D printing technologies are revolutionizing today’s fabrication methods, from research prototypes to individualized mass-production. This trend is accelerated by a growing number of available printing materials, including optical materials and metals. Photonics plays a major double role here: first, optical techniques are the key enablers in most additive printers, and secondly, 3D printed micro and nano-optical components offer whole new applications.

For example, femtosecond two photon-polymerization enables manufacturing of optical components in the sub-micrometer scale, allowing the printing of tiny optical freeform surfaces, metasurfaces or metamaterials. Such elements are the key for novel printed optical systems, which find applications in miniaturized cameras, sensors, or endoscopes.

Additive manufacturing at such high precision and micro-scale however requires adequate optical metrology systems for scanning the originals, or testing the printed results. The printing system has to maintain a high focus quality, accuracy and high power within a large writing volume. Also at the macro scale many innovative technologies in additive fabrication depend on optics and photonics to meet various challenges. New fields of activities are being opened, requiring new developments in simulation and materials science. Contributions are therefore also welcome that open new fields for printing optical components in which high precision is either required or where bigger dimensions are also possible.

This conference puts emphasis on techniques that either explore the limits and applications of printed optical components, or push the limits of 3D additive technologies via photonic techniques. The topics include, but are not limited to:

**3D PRINTED OPTICS**
- 3D printing technologies for micro- and macro-optics
- femtosecond laser two- or multiphoton polymerization
- optical design and simulation of printed optics
- novel materials for 3D printed optics
- alternative techniques for printing optics
- printed plasmonics and metasurfaces
- printed photonic crystals, metamaterials, and/or optical antennas
- printed fiber optics and interconnects

**ADDITIVE/SUBTRACTIVE 3D PHOTONIC MANUFACTURING**
- additive fabrication techniques (metallic, polymers, molding...)
- 3D lithography (nano- and micro-scale)
- optical systems for additive manufacturing
- 3D high-precision metrology systems
- laser metal deposition (nano- and micro-scale)
- selective laser melting/sintering (nano- and micro-scale)
- multi-material printing and linked additive fabrication
- 3D etching technologies
- polymer coatings, conversion to other materials (Au, Ni, SiO2, Si...)
- stereo lithography
- mechanical/physical properties of constituent materials
- between design/graphics program and machine program

**APPLICATIONS**
- applications of printed micro- and nano-optical systems
- imaging applications for printed optics
- applications 3D printed prototypes in the life sciences
- functional micro- and nano-optics
- printed optical elements for lighting and fibers optics
- micro-robotics system with 3D printed elements
- new metamaterials
- 3D printing of living tissue
- microfluidics and lab-on-chips
- photonic chip applications

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Present your research at SPIE Photonics Europe

Below are abstract submission instructions, the accompanying submission agreement, conference presentation guidelines, and guidelines for publishing in the Proceedings of SPIE on the SPIE Digital Library. Submissions subject to chair approval.

Important dates

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<td>Abstracts due</td>
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<td>Registration opens</td>
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*Authors must register prior to uploading their manuscript.

What you will need to submit

- Title
- Author(s) information
- 500-word abstract for technical review
- 300-word summary for the program
- Keywords used in search for your paper (optional)
- Check the individual conference Call for Papers for additional requirements (for example, some conferences require 2- to 3-page extended summary for technical review, or have instructions for award competitions)

Note: Only original material should be submitted. Commercial papers, papers with no new research/development content, and papers with proprietary restrictions will not be accepted for presentation.

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- Follow the steps in the submission wizard until the submission process is completed.

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- Attend the meeting.
- Present at the scheduled time.

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