Material Technologies and Applications to Optics, Structures, Components, and Sub-Systems IV

This conference has an open **call for papers:**

SUBMIT AN ABSTRACT
(SIGN IN REQUIRED)

Submission guidelines for Authors and Presenters

Important Dates

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Abstract Due:
30 January 2019

Author Notification:
8 April 2019

Manuscript Due Date:
17 July 2019

Conference Committee

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Call for Papers

Development of space based, airborne, and ground based optical systems relies critically on selection and application of optical and structural materials which are best suited to address challenging requirements of the application.

The Materials Technologies and Applications Conference is complementary to the other conferences within the Optomechanics and Optical Manufacturing Track, providing a forum where fabrication techniques, test results and end-application of advanced materials technologies can be discussed.

A foundation to the conference are papers which introduce or update state-of-the-art material fabrication processes, with emphasis on providing an up-to-date materials properties database for optical substrates and precision support structures, including a discussion of joining and bonding techniques for optical assemblies and instruments. Papers relating to test results can cover in-process inspection techniques of interest to manufacturers, or relate material properties to optical performance against a range of operational requirements (e.g., mechanical properties to address launch dynamics, thermal properties for cryogenic or high heat load applications, radiation tolerance for space use, etc).

Of particular interest are papers which describe the end-use of these precision materials and/or processes. The advantages of any material are best demonstrated by component and/or sub-system testing. The conference provides a forum to present end-use/application of these materials in order to advance their adoption by the community and to get feedback from end-users to researchers and technologists working these advanced material development/characterization fields.

Papers are solicited on materials for reflective and transmissive optics and for reaction and support structures in the following areas:

- ceramic materials including silicon carbide, silicon nitride, and SiOC for optics and structures
- metals including beryllium, aluminum, and Be/Al alloys, for optics and structures
- low-expansion ceramics and glasses for reflective and/or refractive optics
- carbon fiber materials for mirror substrates or structural applications
- composite materials (metal matrix, aluminum/SiC, nanolaminates, syntactic, etc.)

- hierarchical nanocomposites
- silicon and other infrared optics (reflective and transmissive)
- advanced materials for windows, fibers, and domes (calcium fluoride, zinc selenide, zinc sulfide, sapphire, ALON, spinel)
- gradient index (GRIN) refractive materials
- properties of thin film materials.

New developments for forming optical substrates and joining optics and reaction or support structures are also solicited. Interests include:

- frits
- adhesives
- epoxies
- braze/solder alloys
- sintering/ceramic fusion
- additive manufacturing.

Test results updating material properties for use in fabricating and/or designing optical components, subassemblies, and assemblies are also solicited. In particular material properties which effect operation in space environments (e.g., UV, atomic oxygen), solar environments (e.g., high proton, electron and neutron flux), cryogenic environments (e.g., deep space), and launch environments are a strong area of interest for the community. Performance related material properties include:

- mechanical properties (strength, fracture toughness, modulus of elasticity, Poisson's)
- thermal properties (coefficient of thermal expansion, thermal conductivity, specific heat, thermal stability)
- optical properties (index of refraction, dispersion)
- reliability/Weibull testing
- long-term dimensional stability/moisture absorption
- radiation testing.

Finally, lessons-learned case studies of recent projects are of particular interest. The goal here is to generate a dialogue between the people developing and the people applying these advanced materials. These may include:

- manufacturing of complex athermal optical systems
- mirror/structure design rules for advanced materials
- characterization of components or sub-systems to mechanical or thermal environmental stresses (gravity sag, launch dynamics, solar loading)
- development of telescope designs and optical support structures utilizing advanced materials
- scan/pointing mirror systems with high acceleration/settling requirements.

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