Invitation to a minisymposium (MS 315):

Peridynamic theory and multiscale methods for complex material behavior

@ WCCM XIII and PANACM II, in New York, U.S.A., July 22-27, 2018
http://www.wccm2018.org/MS_315

Organizers:

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Simulation of complex material behavior presents huge challenges in computational science and engineering nowadays. Overcoming those challenges requires the development of novel mathematical models and computational methods. Examples of such challenges in classical solid mechanics include the characterization of the microstructure dependence of the material response, as well as the simulation of material failure and damage; similarly, the description of coupling multi-scale behaviors represents a challenge in classical theories. Peridynamics, as a new nonlocal theory, offers an alternative approach that avoids difficulties arising in classical local theories in the description of complex material behavior. Additionally, peridynamics as a nonlocal continuum model can be applied to coarse-grained molecular dynamics, potentially for bridging the atomistic scale to the continuum scale. Computational implementations of a peridynamic model, however, cause huge computational cost and incompatibility with tractions-like boundary conditions. Multiscale coupling strategies that bridge local and nonlocal models seem to provide a solution to both the computational expense and the boundary treatment. Multiscale coupling methods, in general, refer to the class of mathematical and computational techniques for the problems that exhibit characteristic features at multiple scales. Several of these methods have been proposed in past years for the effective prediction of the material response in, e.g., composites and heterogeneous media. This mini-symposium invites contributions on recent developments on peridynamic theory and multiscale coupling modeling for the simulation of complex material behavior.

Topics of interest

- Peridynamics
- Atomistic-continuum coupled models and algorithms
- Multiscale coupling methods to the simulation of complex material behavior
- Numerical analysis of peridynamic models and multiscale coupling methods
- Discretization schemes and software implementation for peridynamic models and multiscale coupling methods
- Interface representation methods of composite materials
- Material damage, fracture and failure

- Coupled multi-physics problems
- Fiber-reinforced composites, concretes and other heterogeneous systems
- Practical engineering applications

Abstract Submission

Abstract submission will open October 15, 2017 and close December 31, 2017.
Online address: http://www.wccm2018.org/abstract-submission

Important Dates

October 15, 2017 - December 31, 2017:	Call for abstracts
January 1, 2018 - March 31, 2018:	Early registration
February 28, 2018:	Abstract notification deadline
April 1, 2018 - June 15, 2018:	Regular registration
June 16, 2018 - July 27, 2018:	Late/on-site registration
July 22, 2018 - July 27, 2018	Congress dates

Accommodations

The congress will take place at the **Mariott Marquis**, located in **Times Square** in New York City.