

Dear Colleagues,

Multiscale modeling and simulations are very important and challenging in studying the structural materials and mechanics at different length scales, and paves the way for the future research in large-scale materials that are of both scientific and industrial importance. We cordially invite you to participate in the Asia Pacific Congress on Computational Mechanics (APCOM) 2013 and give a talk in our minisymposium MS99 entitled “Multiscale Modeling: from quantum to continuum”. The Congress will be held in Singapore, from December 11 to 14, 2013. The abstract is due on Apr 30th 2013.

### **Abstract**

Nowadays, state-of-art supercomputers can perform atomic simulations with billions of atoms and reach the length scale of micrometers. However, it is very unlikely in near future that such brutal force atomistic modeling can solve those scientific and engineering problems in which physical phenomena happen at the length-scale of hundreds of micrometers or even larger, such as fracture. Finite element modelings are lack of atomistic resolution. Atomistic simulations including quantum mechanics calculations are too computational expensive to treat such large length scale. Multiple length scale modeling is then required to couple finite element modelings and atomistic simulations. This minisymposium (number: MS\_99) is dedicated to multiscale (both length scale and time scale) modeling and simulations in solids, with focuses on the applications of concurrent multi-length scale modeling in computational mechanics and the development of theories and algorithms, such as quasi-continuum method, coupled atomistic and discrete dislocation method, concurrent atomistic-continuum method, multiscale coarse-graining method, super-atom method, dissipative particle dynamics, coarse-grained molecular dynamics, micromorphic theory, and atomistic field theory. The multi-time scales modeling will also be covered.

Topics of interest include but not limited to:

1. Multiscale modeling from finite element methods (meshed or meshless, including XFEM, SPH, EFG, HMM, QC, etc) to atomistic simulations.
2. Quantum mechanics/molecular mechanics methods.
3. Full spectrum multiscale couplings (FEM/MM/QM and more).
4. Phase field models.
5. Multi-time scale modeling.

All methodologies and applications related to multiscale modeling in solid are welcome. Contributions that integrate both experimental and computational approaches in mechanics and materials are particularly encouraged.

Important dates:

Abstracts due: Apr 30, 2013. (Please submit via <http://www.apcom2013.org>)

Acceptance notification: June 30, 2013

Early registration: Sept 1, 2013

conference dates: Dec 11 – 14, 2013

We look forward to your participation at apcom3013.

Best Regards,

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