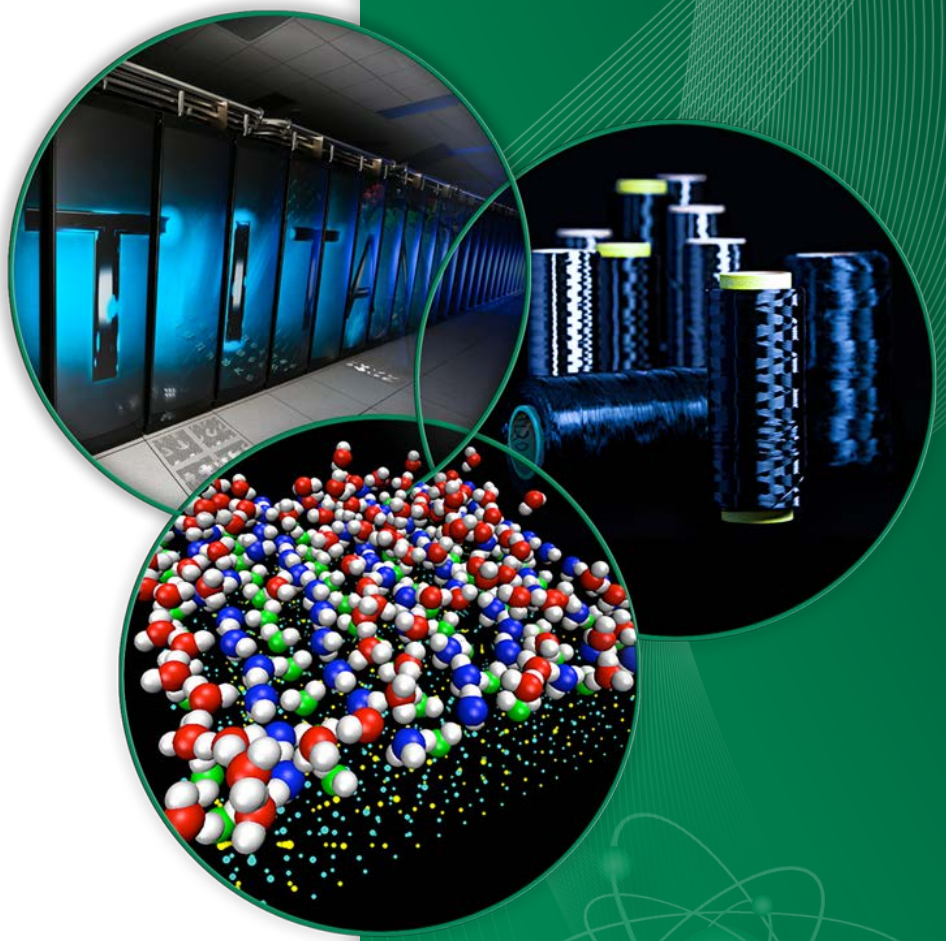
Session III: Application Software Panel



John A. Turner, chair

Group Leader
Computational Engineering and Energy Sciences
Chief Computational Scientist
Consortium for Advanced Simulation of Light-Water Reactors (CASL)

SOS18
18-20 Mar 2014
St. Moritz, Switzerland

Presentations

- "Towards a domain specific library for stencil methods on grids: An example from numerical weather prediction and regional climate modelling“
  - Oliver Fuhrer, ETH Zurich
- "Simulation Codes in the Human Brain Project (HBP)”
  - Felix Schürmann, EPF Lausanne
- "Everything You Know Is Wrong“
  - Robert Clay, Sandia National Laboratories
- “What will it take for HPC to make a revolution in chemistry? Possibilities, challenges and next-generation hardware needs from the software perspective.”
  - Erik Lindahl, Stockholm University & KTH

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE U.S. DEPARTMENT OF ENERGY

Considerations...

- what would a system specific to your application look like?
  - how would it be different from platforms currently using?
- libraries like Trilinos and PETSc, which encapsulate functionality and insulate complexity from application developers have been extremely successful - some incorporate architecture-specific algorithms/implementations
  - to what extent do your applications use libraries?
  - what has been your experience w.r.t. performance portability?
- are proxy apps / mini-apps available for your application?
  - if so, how successful have the been for
    - perf. analysis and opt. / tuning - have analyses and optimizations carried over to full app?
    - porting / re-implementation on new platforms / architectures - have there been challenges in merging mods back into mainline code?
  - if not, do you have plans to develop proxy-apps / mini-apps?
- evolution vs. re-factor vs. total re-write
  - codes have always lived longer than platforms / systems
  - architectures are changing faster than applications can adapt, and in such divergent ways that performance portability is extremely challenging
  - what is the status of your code (or application area) w.r.t. evolution vs. re-factor vs. re-write?
    - role of libraries, programming model, DSLs in re-factor / re-write?