

**Research Advisory Committee  
Meeting Minutes  
September 7th, 2011**

Attendees: Siegel, Potter, Beard, Laituri, Paschal, Stroub, Ghosh, Rusty Scott (for Scott Baily), Wang, France, Haynes, Zhou  
Guest: Pat Burns

- 1. Welcome and introductions**
- 2. Member profile - Robert France**
- 3. Update on Front Range Consortium for Research Computing (FRCRC) Symposium**
  - a. September 23 – 24, School of Mines
  - b. Saturday affinity groups (below)
  - c. [www.frcrc.org](http://www.frcrc.org)
- 4. FA11 member profile schedule**
  - a. October 5 – Sid Suryanarayanan
  - b. November 2 - Melinda Laituri
  - c. **December 7**
- 5. NREL Supercomputer Initiative**
  - a. Burns presented to the Committee the role of CSU in helping NREL to define needs and opportunities for use of a supercomputer
  - b. Will partner to lobby Congress
  - c. Asked for identification of Faculty that may have need for highly computational requirements of energy related research
  - d. Enjoin corporate entities (CableLabs re DVRs?)
  - e. Could lead to joint research projects with NREL?
- 6. Data Center survey**
  - a. Burns introduced the Potential Data Center Survey that seeks to determine possibilities of consolidation of existing centers
  - b. 50 data centers previously defined on campus
    - i. Definition of administrative v research capabilities?
    - ii. HPC – large data sets difficult across networks
    - iii. Facilities issues
      1. Energy use, space issues
    - iv. Privacy
    - v. Preservation
  - c. Retreat Topic? Open Forum?
    - i. Cloud?
  - d. Questions?
    - i. Topics and speakers?

**RAC Fall Semester Meeting Schedule:**

**October 5**

**November 2**

**December 7**

## **Front Range Consortium for Research Computing (FRCRC) Affinity Groups Saturday, September 24**

### **Next Generation Networking Affinity Group Session**

**Marla Meehl, Manager of Network Engineering and Telecommunications  
National Center for Atmospheric Research/University Corporation for Atmospheric Research  
(NCAR/UCAR)**

This session will explore current advanced networking infrastructure provided by the Front Range GigaPoP, operated by the networking section at NCAR. The presentation will begin with an overview of the FRGP, including connections to the commodity internet, and the Internet2 and National Lambda Rail national Research and Education networks, then continue with regional infrastructure for advanced networking, including the BiSON, Western Regional Network, SCONE, and EagleNet networks, and conclude with plans for delivering advanced networking to the NCAR-Wyoming Supercomputer Center being built in Cheyenne, Wyoming. After brief introductions to each topic, participants will be encouraged to share experiences with networking and networking needs at their institutions.

Marla Meehl is the Manager for Network Engineering and Telecommunications at NCAR/UCAR and has been operating the shared FRGP networking activity for over ten years. She participates in numerous national networking venues, and ensures that networking of the very highest quality is delivered by the FRGP to its participants.

### **Data Management**

#### **Affinity Group Session**

**Dawn Paschal, Assistant Dean for Digital Library and ePublishing Services  
Colorado State University Libraries**

This session will explore recent developments in federally mandated requirements for making data sets available for reuse. An overview of the portfolio of data management activities will be provided. This will be followed by a discussion of models for institutional support for data management, including the potential for shared data management services. The session will conclude with a discussion how to structure operations and support (including funding models) for managing data sets, including how to deal with size of data sets, duration of maintenance, and issues associated with preservation of data sets. After brief introductions to each topic, participants will be encouraged to share experiences at their institutions.

Dawn Paschal is the Assistant Dean for Digital Library and ePublishing Services at Colorado State University Libraries, and is responsible for the digital repository that is a shared service between CSU and the CU campuses. She has developed data management templates for faculty to use in their proposals and is responsible for oversight of the institutional data management activity at CSU. She has more than 10 years of experience in this area.

**Earth System Sciences**  
**Affinity Group Session**  
**Dr. Richard Loft, Director of Technology Development**  
**National Center for Atmospheric Research (NCAR)**

The Earth System sciences attempt to study our planet as an integrated system. This interdisciplinary field is at a nexus of several critical societal problems such as climate change, severe weather, and energy production. The increasing availability of high-performance cyberinfrastructure offers the Earth System science community a golden opportunity to dramatically advance our understanding of the Earth as a system. Challenges abound here. The increasing parallelism of each successive generation of systems present particular scalability challenges for the long-running, low-resolution applications such as climate models. Second, some applications have stringent validation and verification procedures. Finally, beyond the ever-expanding demand for computing cycles in this field, there is also a need for persistent and integrated data storage systems and technologies that enable large and often heterogeneous data sources to be integrated in order to facilitate scientific discovery. This session will be facilitated by Dr. Richard Loft, Director of Technology Development in the Computational and Information Systems Laboratory at the National Center for Atmospheric Research.

**Managing HPC Systems**  
**Affinity Group Session**  
**Dr. Craig Tierney, HPC Technical Lead**  
**Cooperative Institute for Research in Environmental Sciences (CIRES)**

This session is intended for those HPC system specialists to have an open discussion as to the challenges of managing HPC systems of any size. The session will start with participant introductions and any major challenges they wish to mention. Example topics could include tips and tricks for managing particular HPC subsystems (Lustre), establishing batch queue fairness, system monitoring and metrics, or how to track down performance issues from bad codes. We hope to have participants pose questions like "How does everyone handle X?", and discussions follow.

Dr. Craig Tierney works for the Cooperative Institute for Research in Environmental Sciences as the technical lead of NOAA's HPC systems at the Earth Science Research Laboratory in Boulder, CO. He has been architecting, building, fixing, and using HPC systems for the last 15 years as both integrator and customer.

**Monte Carlo Methods  
Affinity Group Session  
Patrick J. Burns, Professor of Mechanical Engineering  
Colorado State University**

This session is intended for those doing Monte Carlo in any capacity to define their interests, share their activities, and explore whether synergies exist that may merit additional interactions. The session will begin with introductions and descriptions by participants of research and educational interests in the field of Monte Carlo. Applications discussed will be general, and desired to include general discrete event simulations, particle tracing, formulation and use of probability and cumulative distribution functions, accept/reject methods, implementation details, performance and 'gotchas' on various architectures, load imbalance, communication overhead, parallel IO, parallel random number generators and anything else the participants wish to discuss.

Patrick J. Burns, Professor of Mechanical Engineering at Colorado State University. Burns has been engaged in Monte Carlo (MC) simulation for more than two decades including over ten years of active research for Lawrence Livermore National Laboratory, mostly for particle tracing in large-scale enclosures. He has implemented parallel MC algorithms on a variety of old shared memory and new distributed memory architectures, and is currently working on a hybrid multi-threaded/distributed memory implementation on the Cray XT6m. He is well versed in parallel pseudorandom number generators, especially parallel Lagged Fibonacci Generators. He is always interested in meeting new colleagues and learning new things.

**Student Session  
Affinity Group Session  
Henry Neeman, Director of the OU Supercomputing Center for Education & Research (OSCER)  
University of Oklahoma**

This session is intended for students interested in computational science to network, share their computational activities, and exchange experiences about their computational science education. The session will begin with introductions and descriptions by the students about their computational interests and work. Discussion will center around educational experiences and career opportunities in computational science and engineering.

Henry Neeman is the Director of the OU Supercomputing Center for Education & Research (OSCER) and an adjunct professor in the School of Computer Science at the University of Oklahoma (OU). He has taught his HPC workshop series, "Supercomputing in Plain English," to over a thousand people at 166 institutions in 42 US states and territories plus 5 other countries, and regularly teaches at and host workshops for the National Computational Science Institute's annual summer workshop series. He also is serving as the Education Chair at the SC11 supercomputing conference. Dr. Neeman's research interests include high performance computing, scientific computing, parallel and distributed computing, and computer science education.

**Funding Opportunities for Computational Science Education  
Affinity Group Session  
Thomas Hauser, Director of Research Computing  
University of Colorado Boulder**

New information, communication, and computational technologies have had profound impacts on the practice of science (the term science includes the natural, mathematical, computing, and social sciences), engineering, and education. The systems, tools, and services emerging from these new technologies are linked to create a comprehensive cyberinfrastructure that is enabling individuals, groups, and organizations to advance research and education in ways that revolutionize who can participate, what they can do, and how they do it. Sustaining this revolution across all areas of science, engineering, and education requires the formation of a citizenry and workforce with the knowledge and skills needed to design and deploy as well as adopt and apply these cyber-based systems, tools and services over the long-term. This session is intended for those interested in training and professional development. The session will begin with introductions and descriptions of interests in education. Discussion will center how educational collaboration along the Front Range can be strengthened by exploring external funding opportunities.

Thomas Hauser is the Director of Research Computing at CU Boulder. Thomas Hauser earned his Ph.D. in mechanical engineering in computational fluid dynamics from the University of Technology in Munich, Germany. He has previously introduced a computational engineering minor in mechanical engineering at Utah State University. He is always interested in collaboration in educational efforts to related to computational science and engineering.