HPC Activity Group Meeting 10/9/24

Attendance: Michael Kirby, Matt Koslovsky, Corey Broeckling, Frances Davenport, Wolfgang Bangerth, Anne Mook, Brandon Shanks

Ideas of HPC needs for campus and curriculum:

- In statistics, more intrigue into HPC with students and Linux understanding
- More learning opportunities for students with focus on computation
- Students generally need more help with Linux

Most pressing needs in curriculum updates

- Students can't program and won't get into HPC without programming knowledge
- Eventually students will need to program in their careers, so it will be a useful skill to acquire in university
- How to prepare students for more advanced classes in computation and programing
- Coding at all levels, not just graduate but also undergraduate levels as well
- GS510 has been taught for years, but has needed improvement and people to offer the course
- Idea could be starting with basics, getting on to a system, and creating a track that will lead to proficiency on multiple HPCs.

Core concepts for teaching the introduction course

- Subject of pipelines (tools for doing it and understanding)
- Idea of reproducible research
    - A lot of funding opportunities require the research to be reproducible, should be being taught for students who will be working in those areas
- Mapreduce (lot of large scale databases use this mapping)
- Design patterns, knowledge of what things are called for computing
- Getting a better understanding of what is used in the professional world
- Shared vs. distributed memory systems
    - Thinking about where the data is
- KoKKOS system out of national labs and used by major packages
    - Makes it easy to map where things are run
- What are the underlying concepts that we can teach because things (OpenAC) will become obsolete in the future?
- You can take the perspective of teaching how to write software for HPC or the perspective of how to use HPC and introductions to what it can be
- Applications course (no prerequisites) and programming course to follow

How do you teach / offer a GS course?

The HPC activity group is excited to gain more input about HPC courses at CSU