An Overview of the Chapel Parallel Programming Language

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What is Chapel?

- A new parallel programming language
  - Design and development led by Cray Inc.
  - Initiated under the DARPA HPCS program

- **Overall goal:** Improve programmer productivity
  - Improve the **programmability** of parallel computers
  - Match or beat the **performance** of current programming models
  - Support better **portability** than current programming models
  - Improve the **robustness** of parallel codes

- A work-in-progress
Chapel's Implementation

- Being developed as open source at SourceForge
- Licensed as BSD software
- **Target Architectures:**
  - multicore desktops and laptops
  - commodity clusters
  - Cray architectures
  - systems from other vendors
  - (in-progress: CPU+accelerator hybrids)
Today's Goals

- Introduce you to the Chapel language
  - project themes and status
  - central language concepts
- Demonstrate Chapel in an interactive manner
- Point you toward resources for future reference
- Get your feedback on Chapel
Who Are You?

**Type of Institution?**
- Academic, Industry, HPC Lab, Gov’t, …

**Role?**
- Student, postdoc, faculty, developer, researcher, …

**Favorite Languages?**
- Fortran, C, C++, Java, Matlab, Python, Perl, C#, …

**Parallel Programming Models?**
- MPI, OpenMP, Co-Array Fortran, UPC, pthreads, …
Ground Rules

- Please ask questions as we go
- Also feel free to ask me questions throughout CUG (I’ll be here M-W)
8:00 – Welcome
8:10 – **Background**
8:30 – Base Language*
9:00 – Data Parallelism*
9:25 – Break?
9:30 – Task Parallelism*
10:00 – Locality*
?:?? – Project Status (as time permits)
10:30 – Done!

* = I’ll try to wrap up these sections with a live demonstration
Today's Plan

8:00 – Welcome
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11:00 – **Done**!

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