

# Clusters to Supercomputers

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Presented for  
Chris Schenk's CSCI 4113  
Unix System Administration



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# Outline

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- Motivation
  - My other computer is a ...
- Parallel Computing
  - Processors
  - Networks
  - Storage
  - Software
- Grid Computing
  - Software
  - Platforms

# James Demmel's Reasons for HPC

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- ❑ Traditional scientific and engineering paradigm
  - ❑ Do theory or paper design
  - ❑ Perform experiments or build system
  
- ❑ Replacing both by numerical experiments
  - ❑ Real phenomena are too complicated to model by hand
  - ❑ Real experiments are:
    - ❑ **too hard**, e.g., build large wind tunnels
    - ❑ **too expensive**, e.g., build a throw-away passenger jet
    - ❑ **too slow**, e.g., wait for climate or galactic evolution
    - ❑ **too dangerous**, e.g., weapons, drug design