Project 5

- **Now that you have "completed" Projects 1 - 4 (hopefully), you are ready to parallelize a multi-block code using MPI**

- **Take your multi-block code that was developed under Project 3 and parallelize it using MPI across the node/CPU partitions created in Project 4**

Project 5

- **Due Monday, December 9 (Start on this NOW!)**
  - Overall description of heat conduction problem including governing equations, discretization scheme (recursion formulas), domain decomposition, processor mapping, parallel processing strategy, etc.
  - Demonstration that the parallel heat conduction code works on Wopr with:
    - For 501x501 grid using 10x10 decomposition with 4 processors, figures of
      - Grid
      - Converged solution
      - Convergence history (log(residual) vs iteration) comparison with single-block and multi-block serial codes. Plot 3 code results on single plot.
    - Plots of computational speed-up and efficiency vs number of processors for up to 10 processors for 501x501 grid using 10x10 decomposition
      - Show along with comparison with ideal (linear) and optimal (based on your load balance numbers in Project 4)
        - » Make sure you are the only one running on freed nodes when you are doing timing studies by using the qsub queuing system. Use MPI_Wtime for wall clock times in Project-5.
  - Listing of your parallel heat conduction code