**Blue Waters Petascale Semester Curriculum v1.0**

**Unit 4: OpenMP**

**Lesson 11: N-Body Mechanics in OpenMP**

**Exercise Instructions for Students**

*Developed by Justin Oelgoetz for the Shodor Education Foundation, Inc.*



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*Browse and search the full curriculum at*[*http://shodor.org/petascale/materials/semester-curriculum*](http://shodor.org/petascale/materials/semester-curriculum)

*We welcome your improvements! You can submit your proposed changes to this material and the rest of the curriculum in our GitHub repository at*[*https://github.com/shodor-education/petascale-semester-curriculum*](https://github.com/shodor-education/petascale-semester-curriculum)

*We want to hear from you! Please let us know your experiences using this material by sending email to* [*petascale@shodor.org*](mailto:petascale@shodor.org)

* Change the number of bodies (Nbodies) from 10000 to larger numbers (100000 or even 1000000)
  + Does the scaling on the parallel codes improve?
* Add scheduling to each of the parallel for loops.
  + Does the change improve performance?
* Investigate chunk size on the performance
  + What is the optimal chunk size.
  + Hypothesize as to why it is optimal.