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

**Unit 5: MPI**

**Lesson 9: N-Body Mechanics in MPI**

**Sample Assessment**

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

* If a problem gets too small, it will stop scaling earlier. Take the existing MPI code, how does it scale for a problem that is only 1/10th the size (total number of bodies)
* How does the code scale for a problem 10 times larger?
* Rewrite the IO section such that all the data for a particular time is gathered to process 0 and then written with the usual C++ fwrite command. Is the IO faster or slower than MPI collective routines? By how much?



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*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)