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

**Unit 11: Domain Science: Astrophysical Fluid Dynamics**

**Lesson 1: Introduction to Domain Science**

**Sample Assessment**

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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)

1. Name at least three reasons why we need supercomputing simulations in science?
2. What is the main difference in how force interactions are treated by DFT vs MD/MC?
3. What is the main difference between MD & MC as far as how the atom trajectories are calculated?
4. Describe the difference in the mechanism between the two different mesoscopic modeling approaches?
5. What is the Continuity Assumption and why is it important?
6. How are top down (e.g., machine-learning) methods different from physics-based approaches?