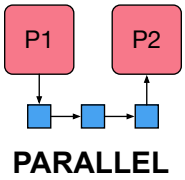
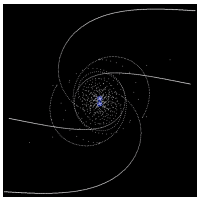


CISC 372: Parallel Computing

University of Delaware, Spring 2022

HW 8



*This assignment is due at noon on **Monday, May 23**. Topics: Hybrid programming, n-body problems.*

1. Instructions

The goal of this assignment is to make the fastest possible hybrid parallel version of `nbody.c`. You must use at least two of the following three technologies: (1) CUDA, (2) threads (OpenMP or Pthreads), and (3) MPI.

You will also need to create new, interesting universes (initial configurations) that are much larger than the ones we have been using, in order to test and time your code. This gives you an opportunity to be creative—-you can make up some interesting very large configurations and/or find some interesting existing data and port it for use in nbody.

Use Bridges-2. Try to use the full resources (CPU cores, GPUs) on one or more nodes. You will have to find a way to divide up the work effectively among these computational resources to get the best performance.

Include your code, a Makefile, and a brief writeup (in any format you wish). The writeup should include a basic description of your approach and the technologies used, the input data used in the experiments, any instructions needed to run the experiments, and the experimental results (times). Some tables and/or graphs for time, speedup and efficiency are welcome. All artifacts necessary to run the experiments should be committed.

Commit your work in `hw/hw08` in your personal repository.

You will be graded on (1) code correctness, (2) speedup/efficiency, (3) quality of experiments (diverse interesting and large inputs), (4) clarity, completeness, and precision of your writeup.