

CSM 1 – Molecular Cloud

Client

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Background

A molecular cloud is a collection of particles in space. The density of particles stimulates the formation of molecules. Over time the molecules condense to form stars, solar systems, and binary star formations.

The cloud that will initially be used in this project is NGC-1333. It is located in the constellation Perseus and is 300 parsecs away from earth. The data provided show that NGC-1333 contains 93 clusters. These clusters could potentially form stars; our mission is to find out what happens to these clusters over a few million years.

As of today we have the equations we will need to determine star formations, star life spans and all other necessary equations needed to model the cloud. The direction we plan to take involves using Java for a GUI interface. The plan is to use a language that will allow us to use parallel programming to compute how the particles will evolve, such as JOGL. We will then tie the GPU language to Netbeans, which we will use to create a visual representation of the cloud over time. Computers on campus will be used for this project.

Project Goals

- Model the cloud's evolution over time
- A visual simulation of the evolution of the cloud
- Possibility to model other molecular clouds given new data

Desired Skills

- Good Java skills
- Basic Algorithms knowledge to implement different physics equations
- Java GUI skills
- Understanding of parallel programming is preferable
- Understanding or familiarity with million particle problems

Location

On campus