

**PHYSICS AND ASTRONOMY SEMINAR
SPRING 2009**

**INVESTIGATING THE
EFFECTIVENESS OF GENETIC
ALGORITHMS WHEN MODELING
GALAXY COLLISIONS**

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Substantial evidence shows galaxy evolution is directly influenced by gravitational interactions between galaxies. To further understand this process, previous researchers have constructed an automatic galaxy collision code, which merges a restricted 3-body interaction code with a genetic algorithm and a pattern matching routine. Using the interacting pair NGC 7714/7715 (Arp 284), this work intends to test the feasibility of using genetic algorithms when modeling galaxy collisions. For the interacting pair being studied, several different methods of interaction are proposed. Furthermore, estimates in the uncertainties in the interaction parameters as well as uncertainties in the pattern matching routine are proposed. The results of these test runs and the effectiveness of the automatic code are compared to two previous non-automated interaction models of Arp 284, one which also used a restricted 3-body code and a second which used a full N-body code that includes gas hydrodynamics, star formation, and heating of the interstellar gas.

Monday, April 27, 2009, 4:00 pm
Brown Hall 261

Refreshments served at 3:45 pm