

Binary Burning in Globular Clusters

Principal Investigator: Prof. Joel N. Bregman

Institution: University of Michigan

Electronic Mail: jbregman@umich.edu

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Abstract

In globular cluster evolution, binary stars are destroyed (burned) through close stellar encounters over several dynamical relaxation times, a process that delays the onset of core collapse. Dynamical interactions plus mass segregation causes the binary fraction to rise in the core but fall at larger radii. These changes in the binary fraction properties with time can be tested because some clusters have undergone only a few relaxation times while others are core collapse systems. The presence of binaries thickens the Main Sequence in a color-magnitude diagram, a technique used to measure the binary fraction in 4 globular clusters, with surprising results. For example, one core collapse system has a large binary fraction (25%) while the other has only a upper limit ($< 5\%$). We propose to use the archival data of about two dozen clusters to determine their binary properties and test whether they evolve as models predict.

Investigators:

	Investigator	Institution	Country
PI	Prof. Joel N. Bregman	University of Michigan	USA/MI
CoI	Dr. Mario L. Mateo	University of Michigan	USA/MI
CoI	Dr. Patrick O. Seitzer	University of Michigan	USA/MI

Number of investigators: 3