

Roger Cohen
University of Florida
Dept. of Astronomy

Search for Exoplanets using the Exoplanet Tracker

The vast majority of the ~126 extrasolar planets currently known have been discovered through costly observations of individual stars. I propose to use a new type of instrument called Exoplanet Tracker (ET), together with its developers, J. Ge and collaborators, to expand by orders of magnitude the quantity of known exoplanets. The single-object prototype of this instrument is presently operational (see Ge 2002, Van Eyken et al. 2004) and has already demonstrated efficiency beyond more traditional search methods.

A multi-object version, capable of observing at least 25 stars simultaneously, is currently in development and will be tested in April 2005. This instrument is scheduled to observe at the Sloan telescope beginning in late 2005, ultimately yielding more than 10,000 new planets based on current statistics, at least two orders of magnitude beyond what is currently being studied. We are currently using both photometric and spectroscopic techniques to select targets for this survey as efficiently as possible and developing the software necessary to handle the data reduction and analysis for such a sample. With a statistical base this large, we will be able to closely examine constraints on correlations among planets and their parent stars with respect to many physical properties such as mass, radius, age, semi-major axis, period and composition, as well as follow up on unusual individual systems in even greater detail. This will provide a powerful means with which we can truly place each solar system in context for the first time, with the goal of ultimately being able to elucidate the origin of our own Earth.