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Time: Wednesday 2:30PM, Dec. 17 Location: A601 NAOC

The formation and dynamical evolution of free-floating planets in star clusters

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Dr. M.B.N. (Thijs) Kouwenhoven is an astronomer at the Kavli Institute for Astronomy and Astrophysics at Peking University. He obtained his undergraduate degree from Leiden University (the Netherlands) and subsequently earned his Ph.D. degree in astrophysics from the University of Amsterdam. After spending several years as a research associate in the United Kingdom, he joined Peking University as a Bairen Research Professor in 2009. His research goals are to explore the dynamical evolution and habitability of planetary systems and binary/multiple stellar systems in star clusters, which are the birth places of most of the stars and planets we currently detect in the Solar neighborhood.

Abstract

The recent discovery of a large population of exoplanets in the Galactic field has provided a wealth of information that helps us understand how planetary systems form and evolve. Exoplanet surveys targeting star clusters, on the other hand, have been less successful: only a hand full of exoplanets have been discovered in these regions. This may be attributed to the frequent encounters experienced by star cluster members, and possibly by a difference in the formation process. The presence of multiple planets in a system (such as our own Solar system) can substantially increase the possibility of planet ejections, which may explain the absence of close-in planets, such as hot Jupiters, that would normally be unaffected by stellar encounters. This talk focuses on the dynamical fate of multi-planet systems in dense stellar systems and on the evolution of the free-floating planet population in star clusters resulting from destabilized planetary systems. Since most of the planet-hosting stars in the Galactic field (and probably even our own solar system) are thought to have formed in clustered stellar environments, this places limits on the properties of the star clusters they may have formed in.

All are welcome! Tea, coffee, biscuits will be served at 2:15 P.M.