Modelling the luminosity and spatial distributions of young stellar clusters

Javier Olivares*[1], Herve Bouy[2], Estelle Moraux[3], Luis Manuel Sarro Baro[4], Angel Berihuete , and Phillip Galli[5]

[1]Laboratoire d'Astrophysique de Bordeaux – Université de Bordeaux – France
[2]Centro de Astrobiología (CAB) – INTA-CSIC, PO Box 78, 28691, Villanueva de la Cañada, Madrid, Spain
[3]IPAG – CNRS : UMR5274 – France
[4]Dpt. de Inteligencia Artificial – UNED, Juan del Rosal, 16, 28040, Madrid, Spain
[5]Laboratoire d'Astrophysique de Bordeaux (LAB) – Université de Bordeaux (Bordeaux, France) – France

Abstract

Statistical models of young stellar clusters enable us to compare model predictions to observations while incorporating the particularities of the data, like heteroscedastic uncertainties, missing values, zero point callibrations, and a variety of correlations.

I will present two Bayesian hierarchial models that were designed to infer diverse properties of young stellar clusters. One of them takes dataset of hundreds of thousands of sources in a possible highly extincted sky region and simultaneously identify both cluster members and the cluster luminosity distribution. The second model is desinged to simultaneously infer the 3D structure of a stellar cluster and the individual positions of it stars. This model has been tailored to fit the Gaia data and deals with the uncertainties and the parallax spatial correlations.

Keywords: Statistical models, 3D structure of stellar clusters, Gaia data, embedded stellar clusters

---

*Speaker