

- 1) Title: Large surveys: Time-dome study of star clusters.
- 2) Host name(s) and the hosting institution(s): Prof. Jura Borissova, Prof. Michel Cure, Institute de Astronomia, UV
- 3) Keywords indicating research areas (e.g. Planets, Stars, Interstellar Medium, Galaxies, Cosmology, and Instrumentation)
Galaxy: star clusters and associations, massive stars
- 4) Project abstract (< 500 words)

The large near-infrared surveys "VISTA Variables in the Via Lactea" (VVV), "UKIRT Galactic Plane Surveys" (UKIRT GPS) and APOGEE 2 (SDSS IV) opened the new era of the galactic star clusters research allowing us to investigate a large sample of previously undiscovered, deeply embedded in gas and dust, practically invisible in the optics clusters. We plan to use this unique, wide field-of-view, unprecedented deep infrared observations of the Galaxy's bulge and disk, complemented with follow-up spectroscopy by APOGEE 2, to investigate the infrared variability of galactic star cluster members. The time-domain data, which is now being obtained by the VVV Survey has already led to some exciting results, including the discovery of many nova candidates, asteroids, eclipsing binaries, pulsating variable stars, microlenses, and other transient events. Using VVV data, in the coming 2 years we will focus on distance determinations based on RR Lyrae, Cepheid, and eclipsing binaries. The upper region of the Hertzsprung- Russell diagram (HRD) contains different types stars, including Wolf-Rayet stars, luminous blue variables, and B[e] stars. These represent different phases in the evolution of massive stars, often characterized by extreme mass loss and explosive outbursts. VVV and follow-up spectroscopic observations (e.g., APOGEE-South project) will help constrain models of massive star evolution, providing prescriptions for their time-dependent properties. Such a project represents a colossal amount of work that will demand a lot of highly-qualified manpower. Thus we are proposing to hire a new PostDoc in collaboration with Dr. Richard de Grijs, Professor of Astrophysics, Kavli Institute for Astronomy and Astrophysics, Peking University, China. The candidate should also perform observations on Las Campanas Observatory for 10 night every 2 months in order to help APOGEE 2 Survey. This will help to strength the Chile - China collaboration, bringing a person to University of Valparaiso, as well as will benefit directly Chinese astronomy providing access to these large surveys.

We are offering an interested person to apply for Chile – China Postdoctoral fund. The deadline is 15.07.2015 and the postulations are by Sistema de Conicyt:

<http://www.conicyt.cl/astronomia/2015/06/08/china-conicyt-fund-2nd-call-application-form-joint-postdoctoral-fellowship/>

We are looking for a person to work on the star clusters/ massive stars topic with emphasis on the photometric and spectroscopic observational research. The candidate should also perform observations on Las Campanas Observatory for 10 night every 2 months in order to help APOGEE 2 Survey. The corresponding person from UV are Dr. Michel Cure and Jura Borissova and in collaboration with Dr. Richard de Grijs.