



Universidad  
Andrés Bello

Santiago, 5 June 2015

Dear Colleagues,

Attached please find our research project for the China-CONICYT Joint Postdoctoral Fellowship 2015, using the format that you requested.

Please confirm reception of this research project, and do not hesitate to contact me if you require further information regarding this project.

Sincerely,

Dante Minniti

Professor  
Facultad de Ciencias Exactas  
Universidad Andrés Bello  
Email: [dante@astrofisica.cl](mailto:dante@astrofisica.cl)  
Telephone: +56 2 2661 8716

cc: Prof. Licai Deng, National Astronomical Observatories, Chinese Academy of Sciences

**1) Title**

Open Cluster Studies Based on 50BIN and VVV

**2) Host names and hosting institutions**

**For Chile:** Dante Minniti, Universidad Andres Bello

**For China:** Licai Deng, National Astronomical Observatories, Chinese Academy of Sciences

**3) Keywords indicating research areas**

Stars, Planets, Milky Way

**4) Project abstract**

VISTA Variables in the Vía Láctea (VVV) is a public ESO near- infrared (near-IR) variability survey aimed at scanning the inner Milky Way (Minniti, D., et al. 2010, *New Astronomy*, 15, 433). The observations are acquired with the VISTA 4m telescope at ESO Paranal Observatory. The VVV survey covers an area of 562 sqdeg in the inner Galaxy, containing more than a billion point sources in total. The VVV database now contains multicolor (ZYJHKs) photometry, and multiple epochs in the Ks-band, monitoring more than a billion sources in total (Saito, R., et al. 2012, *A&A*, 537, A107). The Ks-band observations continue, and the variability light curves so far span from 2010 to 2015.

This large database enables a number of studies of different variable sources and also star clusters in the Milky Way (Hempel, M., et al. 2014, *Messenger*, 155, 29). We have discovered hundreds of new star clusters, and started to characterize them using the VVV Survey infrared data in the fields towards the Galactic inner disk and bulge.

On the optical side, the 50BIN is planned to have a node in Chile soon, with the possibility to expand to include a 1-meter SONG system. 50BiN will commit a large field multi-color photometry of know Galactic open clusters, and a simultaneous two color time-domain observations of a small sample of clusters. 50BiN surveys carried out at the Chilean node will target brighter objects in the optical, and as such it is complementary to the VVV Survey. In this project we propose to study a few selected star clusters in common, for a complete characterisation of the physical parameters (ages, masses, sizes, distances, reddenings, luminosities, and chemical compositions).