S3-5: Families of Periodic Orbits in the Sun - Jupiter - Trojan Asteroid System

K. Papadakis (University of Patras)

We study, numerically, families of simple non-symmetric periodic orbits of the restricted four-body problem where the three primary bodies lie at the apices of an equilateral triangle while a fourth massless body is moving under the Newtonian gravitational attraction of the primaries. More precisely, the primary bodies Sun, Jupiter and a Trojan Asteroid are set in the stable Lagrangian equilateral triangle configuration and as a massless fourth body we consider a spacecraft. The problem admits eight non-collinear equilibrium points. Four of them are close to Asteroid, two are stable and two are unstable. The network of the families of the simple periodic solutions using their characteristic curves in the (x, C) plane is presented. The linear stability of each periodic solution is also studied. Special generating planar horizontal and vertical critical periodic orbits of each family are calculated. We found a large number of various types of orbits and two families which consist of stable (horizontally and vertically) retrograde non-symmetric periodic orbits around Jupiter (the first family) and the Trojan Asteroid (the second one) with obvious practical interest.

S4: Stars, Our Galaxy and the Local Group - Oral Presentations

Monday, 5th of September

Low mass star-formation: new insights from Herschel

O. Dionatos (STARPLAN & NBI)

Recent results from the Herschel/DIGIT GT-KP on star formation will be presented. In particular, the interpretation of the highly excited gas observed will be discussed in conjunction with observations ranging from the infrared to sub-millimeter wavelengths as well as numerical models. The presentation will conclude focusing on the necessity and limitations of high angular resolution (interferometric) observations and the expected contribution of ALMA in star formation studies.

Filaments in Orion: A first look of the Integral Shaped Filament with Herschel

D. Polychroni (INAF-IFSI)

We present here the first maps of the Integral Shaped Filament in Orion A Molecular Cloud as mapped by the Herschel guaranteed time key program Gould Belt. The two tiles, mapped in parallel mode (PACS/SPIRE), are located just below the L1641N star forming region in the southern most regions of the Integral Shaped Filament. In this first study of the region we focus on the abundant filamentary structure apparent in the tiles. We have detected over 400 compact sources and derived their temperature distribution and the Core Mass Function (Msolar =~0.1~10s). We find that the spatial distribution of the identified sources follows closely the pattern of the filaments, strengthening arguments where filaments are the preferred location of star formation in molecular clouds. We have identified such filaments in the maps and derived their physical properties (i.e. column densities etc.). We will discuss here the relation between the physical properties of the sources and their parent filament.

The Herschel view of nebulae around evolved massive stars

C. Vamvatira-Nakou (University of Liege), P. Royer (Katholieke Universiteit Leuven, Belgium) D. Hutsemekers (Universite de Liege, Belgium) Y. Naze (Universite de Liege, Belgium), G. Rauw (Universite de Liege, Belgium), K. Exter (Katholieke Universiteit Leuven, Belgium), C. Waelkens (Katholieke Universiteit Leuven, Belgium), & M. Groenewegen (Royal Observatory of Belgium)

The detailed study of the nebulae ejected from Luminous Blue Variables and the circumstellar bubbles around Wolf-Rayet stars, which radiate strongly in the IR due to the heating of dust, is crucial for understanding the massive stars evolution. With Herschel, the largest telescope ever flown in space, we are able to study the gas and the dust in these circumstellar environments in the full far-infrared waveband. In the context of 'Mass-loss of Evolved StarS' Herschel guaranteed time key programme, we have obtained imaging and spectroscopic observations of nebulae associated with Luminous Blue Variable and Wolf-Rayet stars using PACS, one of the three instruments onboard Herschel. A description of these observations and first results of the data analysis are presented.