

Seminari Informal de Matemàtiques de Barcelona

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Data: dilluns, 12 de maig de 2014.
Horari: 17:45, *coffee break*; 18:00, xerrada.
Lloc: Aula IMUB (al terrat), Facultat de Matemàtiques de la UB.

Títol: Asteroids: Fear and lure of rocks of outer space.

Resum:

As remnants of the formation of our solar system, asteroids and comets provide a precious opportunity to unveil the mysteries of the solar system formation, evolution and composition. More recently, however, the airburst over the Russian city of Chelyabinsk has reminded us that these small objects hit the Earth periodically. Asteroid impacts range from mass extinction events such as the Cretaceous-Tertiary impact that resulted on the extinction of the dinosaurs, to much more modest impacts such as the Chelyabinsk meteor. As of late, there has also been a lot of speculation about the riches held by these objects. Some argue, for example, that an orbital neighbour such as 3554 Amun, a 2.5 km wide metallic asteroid, contains resources valued in \$20 trillion dollars in Earth's commodity markets. Among all the asteroid population, near Earth objects, such as 3554 Amun, are of particular interest because they can be easily reached from Earth, many being even easier to reach than the Moon.

This presentation will first explore the fear of rocks of outer space by discussing impact risk and current technological capability to mitigate this risk by deflecting an asteroid from its Earth impacting trajectory. However this capability to nudge away asteroids from their original trajectories for planetary defence, bring as a consequence the realisation that asteroids' orbit may potentially be modified to serve other purposes, such as space science or resource exploitation. Hence, secondly, the presentation will explore the potential for asteroid retrieval missions enabled by invariant manifold dynamics. An asteroid retrieval mission envisages a spacecraft that rendezvous with an asteroid, lassos it and then hauls it back to Earth neighbourhood. This type of mission, albeit arguably ambitious, is now receiving serious consideration by NASA, and 105 million dollars have been dedicated solely to this mission concept in FY 2014.

Qui som? El SIMBa és un seminari jove organitzat per estudiants de doctorat de matemàtiques. Està dirigit a estudiants de doctorat, de màster i, fins i tot, dels darrers cursos de grau. El nostre objectiu és donar a conèixer la recerca que estem fent, així com adquirir coneixements d'altres àrees de les matemàtiques diferents de la pròpia. Més informació a www.ub.edu/simba.