

Friday 10

09:30 h | GNC for rendezvous and close proximity operations

Murray Kerr

Head of the Guidance, Navigation and Control Division (Spain)

10:30 h | GNC challenges in ADR with contact methods

Murray Kerr

11:30 h | Asteroid Retrieval Opportunities, the case of 2006

RH120

Hodei Urrutxua

Research Fellow, Space Dynamics Group

Universidad Politécnica de Madrid (Spain)

12:30 h | Ballistic Capture of asteroids in Earth Orbit

Francesco Toppo

Assistant Professor (at Politecnico di Milano)

Partner and founder (at Dinamica Srl) (Italy)

13:00 h | Close up

The problem of reducing the accumulation of Space Debris in Earth Orbit and the protection of Earth against the impact of threatening asteroids are among the most important topics of aerospace engineering and space technology today. Defunct manmade space objects orbiting the Earth need to be actively removed from crowded orbital regions to prevent impacts with other satellites. Similarly, asteroids that are found to be in collision course with the Earth may need to be actively manipulated to change their trajectory and prevent them from striking our planet. These kinds of space objects manipulations are technologically complex and require similar advances in guidance navigation and control, the development of several types of deflection methods and the management of uncertainties in the deflection process.

The school, as part of the European Community funded STARDUST Training Network will contain a number of talks and seminars devoted to these technological challenges. The school will provide the students with a series of lectures on proximity operations in space, deflection and deorbiting methods and advanced techniques to model and control deflection uncertainties. All lectures will be given by world experts on the subject.

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INFORMACIÓN GENERAL

→ Hasta el 12 de junio de 2015

Santander

Campus de Las Llamas
Avda. de los Castros, 42
39005 Santander
Tel. 942 29 87 00 / 942 29 87 10
Fax 942 29 87 27
informacion@sa.uimp.es

Madrid

C/ Isaac Peral, 23
28040 Madrid
Tel. 91 592 06 31 / 91 592 06 33
Fax 91 592 06 40 / 91 543 08 97
alumnos@uimp.es

Horario

de 9:00 a 14:00 h
de 16:00 a 18:00 h (excepto viernes)

PLAZOS

→ Plazo de solicitud de becas

Hasta el día 18 de mayo, para los cursos que comiencen antes del 17 de julio de 2015

Hasta el día 15 de junio, para los cursos que comiencen a partir del día 20 de julio de 2015



→ A partir del 15 de junio de 2015

Santander

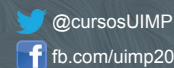
Palacio de la Magdalena
39005 Santander
Tel. 942 29 88 00 / 942 29 88 10
Fax 942 29 88 20

Horario

de 9:00 a 14:00 h
de 15:30 a 18:00 h (excepto viernes)

→ Apertura de matrícula

Desde el 8 de abril de 2015
(Plazas limitadas)



Transporte oficial



→ Código 62M7 | Tarifa: A | ECTS: 1

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Universidad Internacional
Menéndez Pelayo

Santander 2015

SEMINAR

Science and Technology Challenges of Space Debris Removal and Asteroid Deflection

Claudio Bombardelli
Juan Luis Cano González

Santander

Del 6 al 10 de julio de 2015

www.uimp.es

Sponsor



STARDUST
PUSHING THE BOUNDARIES OF
SPACE RESEARCH TO SAVE OUR FUTURE



Science and Technology Challenges of Space Debris Removal and Asteroid Deflection

Directors

Claudio Bombardelli

Research Associate, Space Dynamics Group
Universidad Politécnica de Madrid (Spain)

Juan Luis Cano González

Head of the Mission Analysis and Navigation Division,
Elecnor Deimos (Spain)

July 6-10, 2015

Monday 6

10:00 h | Inauguration

10:30 h | Asteroid deflection: overview and ESA activities

Andrés Gálvez

Head of the Science Simulation and Systems Support Unit,
European Space Agency, Headquarters (ESA / HQ), (France)

11:30 h | Deflecting asteroids with a Kinetic impactor

Juan Luis Cano González

12:30 h | The ion beam shepherd concept for asteroid deflection

Claudio Bombardelli

15:30 h | Nuclear Asteroid Deflection

Catherine S. Plesko

Research Scientist
Applied Physics, Theoretical Design Division
Los Alamos National Laboratory (EE.UU.)

16:00 h | Round table on Near Earth Asteroid mitigation

Andrés Gálvez

Catherine S. Plesko

Moderated

Claudio Bombardelli

Juan Luis Cano González

17:00 h | WG presentations / ESR- ER presentations

19:00 h | El reto de descubrir asteroides
(Conferencia abierta al público)

Jaime Nomen Torres

Observatory Manager for the Deimos Sky Survey,
Elecnor Deimos (Spain)

Tuesday 7

09:30 h | The space debris problem: overview and ESA activities

Holger Krag

Head of the Space Debris Office, European Space Agency,
European Space Operations Centre, (ESA / ESOC) (Germany)

10:30 h | The space debris problem: main technology challenges

Holger Krag

11:30 h | Deorbiting space debris with drag/solar sails

Andrew Viquerat

Lecturer
Mechanical Engineering Sciences
Faculty of Engineering and Physical Sciences
University of Surrey (United Kingdom)

12:30 h | Removing space debris with ions beams

Claudio Bombardelli

15:00 h | From Space Debris observation to cataloguing

Noelia Sánchez Ortiz

Head of Space Situational Awareness Division,
Elecnor Deimos (Spain)

16:00 h | Round table on Space Debris

Andrew Viquerat

Holger Krag

Moderated

Claudio Bombardelli

Noelia Sánchez Ortiz

17:00 h | WG presentations / ESR- ER presentations

Wednesday 8

09:30 h | Fundamental of Space Robotics part 1

José de Gea Fernández

Senior Researcher. Team Leader «Intelligent Kinematics» DFKI
German Research Center for Artificial Intelligence,
Robotics Innovation Center (Germany)

10:30 h | Fundamental of Space Robotics part 2

José de Gea Fernández

11:30 h | The DEOS mission: status and future development

Detlef Reintsema

DEOS Mission Project Manager
German Aerospace Center DLR (Germany)

12:30 h | Collision Monitoring and Avoidance

Noelia Sánchez Ortiz

15:00 h | Managing Uncertainties with Differential Algebra:
Application to space Debris and Asteroids

Pierluigi di Lizia

Senior partner at Dinamica Srl
Assistant Professor at Politecnico di Milano (Italy)

15:30 h | Tutorial Lecture on Differential Algebra

Pierluigi di Lizia

17:00 h | Network meeting

Thursday 9

09:30 h | Asteroid Deflection with lasers

Massimiliano Vasile

Professor of Space Systems Engineering
Director of the Advanced Space Concepts Laboratory
Department of Mechanical & Aerospace Engineering
University of Strathclyde (United Kingdom)

10:30 h | Space debris mitigation with lasers

Massimiliano Vasile

11:30 h | Electrodynamic Tethers Fundamentals

Gonzalo Sánchez Arriaga

Assistant Professor
Grupo de Investigación en Ingeniería Aeroespacial
Universidad Carlos III, Madrid (Spain)

12:30 h | End of life disposal of spacecraft with
Electrodynamic Tethers

Gonzalo Sánchez Arriaga

15:00 h | Environment criticality of LEO Objects

Elisa Maria Alessi

Research Fellow, Istituto di Fisica Applicata «Nello Carrara»
Consiglio Nazionale delle Ricerche (Italy)

16:00 h | Space debris and asteroid activities by European
industries. Informative Session

17:00 h | WG presentations / ESR- ER presentations

19:00 h | Operaciones de proximidad en órbita: la visión del
astronauta (Conferencia abierta al público)

Pedro Duque Duque

Astronauta ESA