



SAPIENZA
UNIVERSITÀ DI ROMA

DIMA **DEPARTMENT OF MECHANICAL AND** **AEROSPACE ENGINEERING**

Newsletter - April 2018



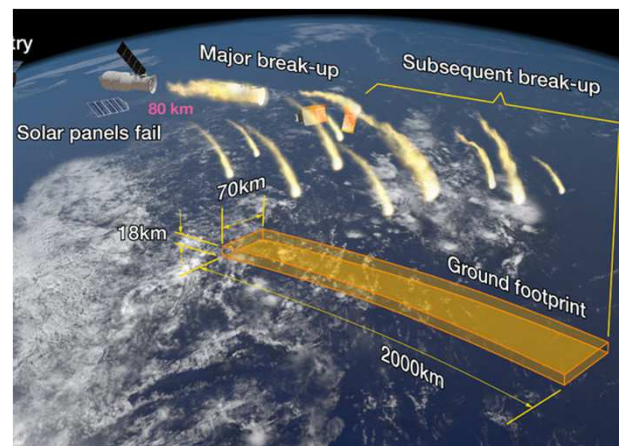
HIGHLIGHTS

China's Tiangong-1 Space Station Falls To Earth

It is planned for the Easter Eve the return of the Chinese Space Station Tiangong 1: the estimates of Agenzia Spaziale Italiana (ASI) during the meeting of technical panel, which met in the afternoon in the headquarters of the civil protection department. The possible date of return could therefore be the first April 2018 at 19:03 UTC (Universal Coordinated Time).

The Chinese space station Tiangong1 has lost control of the structure and has begun to "tumble" or to "tombolare", as the experts say there to turn irregular so that astrophysical calculations throughout the world are made difficult, which they pursue in these hours with telescopes and radar. On the computer, the layout of the Chinese Tiangong 1 space station was reconstructed thanks to an algorithm developed in Italy at Sapienza University in Rome, based on light curves measured by a network of optical telescopes. The result is not easy to maintain as the presence of the panels prevents the vehicle from behaving like a rigid body, which is the responsibility of the group of the Department of Mechanical and Aerospace Engineering of Sapienza University of Rome, coordinated by Fabrizio Piergentili.

The reconstruction of the structure of Tiangong 1 originates from optical telescopes located mainly in central Italy. The ultimate goal is to refine the observation and calculation techniques to make the forecast more accurate in the future and to gradually reduce the uncertainty margin. "What interests us is to find the way in the future where such objects are more and more understood in advance and with ever greater precision," says Piergentili. The observation of the Chinese space station, for example, helps to "understand", the expert said, "All the measurements the telescopes can perform these days are fundamental, since the orientation of the Tiangong 1 space station affects their interaction with the atmosphere, and thus the resistance and, indirectly, the trajectory".





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NEWS FROM DIMA

Ingegneria R&D 2018

Friday, May 11th from 10.00 AM to 16.00 PM will take place the 2018 edition of Ingegneria R&D. The results of the research activities of Sapienza Engineering Departments will be presented in the Cloister of the Faculty. Professors and researchers will illustrate and discuss the most relevant results and the best opportunities for exchanges and collaborations. For DIMA there will be 4 student teams: Sapienza Corse, Sapienza Gladiator, Sapienza Flight Team, Sapienza Space Team, in order to increase the visibility of young people who represent the department in various international competitions.



Seminars with Adrien Bussonnière

On Thursday 12 April, at 12:00 AM and at 3:00 PM, in the Videoconference Hall of DIMA, two seminars will be held by Dr. Adrien Bussonnière, Institut de Physique de Rennes.

The title of morning seminar is "Investigation of the long-time stability of cavitation nuclei", whereas the second one is entitled "The acoustic signature of soap bubble bursting".

Altran Opportunities

Recently at DIMA there was a meeting on job opportunities with Marco Gregnanin, currently aerospace engineer, software developer, ICT administrator, project manager and commercial director of Altran.

Altran group, a French multinational, is a world leader in engineering and industrial consulting, supports companies with engineering solutions, disruptive technologies and R&D.

The acoustic signature of soap bubble bursting

Adrien Bussonnière
Institut de Physique de Rennes

Many familiar events feature a distinctive s crumpling or tearing, squeaking doors, rain dru ground or the characteristic bubbling sound of Though hardly noticeable in our daily enviro common place sounds carry a profusion of about the fleeting physical processes at the root of acoustic emission. In this talk we investigate the popping sound emitted by a bursting soap bubble seen as a paradigm of violently evolving liquid interfaces ; by making use of sensitive antennas and high speed cameras and labo

Investigation of the long-time stability of cavitation nuclei

Adrien Bussonnière
Institut de Physique de Rennes

The low cavitation threshold of water observed experimentally has been attributed to the presence of pre-existing tiny bubbles stabilized by impurities. However, the origin and stability of these cavitation nuclei remain unresolved. Here we investigate the cavitation probability of water seeded with micron-sized silica particles over a long period of time (several hours). Experimentally, cavitation is induced by a High-Intensity Focused Ultrasound and subsequently detected by monitoring the backscattered sound. Degassed or aerated solutions of different concentrations are subjected to several thousand



**OPPORTUNITIES FOR RESEARCH, NETWORKING AND
INTERNATIONALIZATION**

- 10 million in a **Call for proposals** to verify the innovative potential of research projects of institutions and universities: professors, researchers and research staff employed by institutions who have received European or national funding for research projects can participate at this call. Through this announcement, MIUR will give them the opportunity to verify, with the technical support of public institutions, the innovative potential of the ideas and knowledge developed in their research projects (Proof of concept). Application can be presented within 5 July. For further information follow this link: <http://www.miur.gov.it/-/ricerca-bando-da-10-milioni-per-verificare-il-potenziale-innovativo-dei-progetti-di-enti-e-universita>



- **Clean Sky** is the largest European research programme developing innovative, cutting-edge technology aimed at reducing CO₂, gas emissions and noise levels produced by aircraft. Funded by the EU's Horizon 2020 programme, Clean Sky contributes to strengthening European aero-industry collaboration, global leadership and competitiveness. The eighth Call for Proposals - CfP08 - is open since 12 April 2018 in H2020 Participant Portal. Partners are selected through open Calls for Proposals. The topics for each call are proposed by the Steering Committee of each Technology Platform and reviewed. Subsequently, the call is published and applications can be received and evaluated. For further information follow this link: <http://cleansky.eu/calls-for-proposals>



- The Marie Skłodowska-Curie Actions (MSCA) 2018 call for **Individual Fellowships** (IF) under Horizon 2020 is now open! The EU provides a record 273 million EUR to support experienced researchers of any nationality. Individual Fellowships (IF) are a great option if you are an experienced researcher looking to give your career a boost by working abroad. Marie Skłodowska-Curie Individual Fellowships provide opportunities for experienced researchers to acquire and transfer new knowledge and to work on research and innovation in a European context (EU Member States and Associated Countries) or outside Europe. For further information follow this link: <http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/m-sca-if-2018.html>