Ambasciata d'Italia
Berlino

GIORNATA NAZIONALE DELLO SPAZIO

Consiglio Nazionale delle Ricerche

Italian National Space Day 2021

Inward bound: exploring the inner region of the Solar System

17 December 2021, 3.00-4.30 PM, on-line

Register at: https://attendee.gotowebinar.com/register/1854535686833756939

To celebrate the first Italian National Space Day, memorializing the launch of the first Italian satellite "San Marco 1" on 15 December 1964, this event will discuss the flight missions BepiColombo and SolarOrbiter.

BepiColombo, an ESA mission being conducted in cooperation with Japan, will explore Mercury, the planet closest to the Sun. Mercury is a poorly explored planet: so far, only two spacecraft have visited it. Some of the scientific questions BepiColombo will try to answer are: What can we learn from Mercury about the composition of the solar nebula and the formation of the planetary system? Why is Mercury's normalized density markedly higher than that of all other terrestrial planets, Moon included? Is the core of Mercury liquid or solid? Is Mercury tectonically active today?

The mission presents enormous challenges. Mercury's proximity to the Sun makes it difficult for a spacecraft to reach the planet and to survive in the harsh environment found there. All of ESA's previous interplanetary missions have been to relatively cold parts of the Solar System. BepiColombo is the Agency's first experience of sending a spacecraft to a region even hotter than Venus.

Solar Orbiter, a joint ESA-NASA project, is the most complex scientific laboratory ever to have been sent to the Sun. Solar Orbiter will take images of the Sun from closer than any spacecraft before and for the first time look at its uncharted polar regions. Scientists hope to find answers to some profound questions: What drives the Sun's 11-year cycle of rising and subsiding magnetic activity? What heats up the upper layer of its atmosphere, the corona, to millions of degrees Celsius? What drives the generation of the solar wind? What accelerates the solar wind to speeds of hundreds of km/s? And how does it all affect our planet?

PROGRAM

15.00 – 15.10 Greetings
H.E. Armando Varricchio, Ambassador of Italy to Germany
Prof. Maria Chiara Carrozza, President of CNR

15.10 – 15.40 Talks
Johannes Benkhoff (ESA): *ESA's BepiColombo mission to Mercury - Overview and first results*
Barbara Negri (ASI, Italian Space Agency): *The Italian contribution to the science of the inner planets: Mercury and Venus*

15.40 – 16.30 Panel discussion, moderated by Paolo Ferri (ESA)
Participants: the speakers, Vania Da Deppo (CNR), Silvano Fineschi (INAF), Nicola Tosi (German Aerospace Center), Hauke Hussmann (German Aerospace Center).

Biosketches of the participants

Dr. **Johannes Benkhoff**
is the project scientist of the joint ESA-JAXA BepiColombo mission to Mercury. He is planetary physicist working in the field of computational modeling the physics and chemistry of "surface – interior" interactions of small bodies in the Solar System (comets, moons, Mars and Mercury) for over years. He got his PhD in 1992 at University of Münster and worked as post-doc at the SwRI institute in Texas, USA, with a German Science Foundation (DFG) scholarship. After that he became a research scientist at the German Aerospace Centre, DLR, before he moved to ESA in 2004. He was co-investigator of VIRTIS (Orbiter Instrument) and MUPUS (Lander Instrument) on ESA Rosetta mission, of VIRTIS on Venus Express, and on MERTIS and SIMBIO-SYS on BepiColombo.

Dr. **Vania De Deppo**
is a senior research at the CNR-Institute for Photonics and Nanotechnologies in Padova (Italy). Since 1998, she has been working on the optical design, realization, test and calibration of many instruments for space applications, such as the WAC for the Rosetta mission, SIMBIO-SYS on-board the BepiColombo spacecraft, the Metis coronagraph for the Solar Orbiter, ARIEL and other on-going and future ESA missions. She is the principal investigator of the EnVisS camera for the recently selected Comet Interceptor ESA mission. Within the SIMBIO-SYS instrument, conceived to study Mercury, she has been responsible for the design and calibration of the optical head of the stereocamera STC, whose goal is the three-dimensional reconstruction of the entire surface of Mercury.

Dr. **Paolo Ferri**
studied theoretical physics in Italy, and joined ESA at the European Space Operations Centre in 1984 as visiting scientist, then moved to mission operations, working on several scientific missions. In 2006 he became Head of the Solar and Planetary Missions division, and from 2013 to 2020 Head of ESA's Mission Operations Department. He is member of the International Academy of Astronautics and is currently active in training, education and outreach. He received numerous awards and was inducted in 2015 into the Hall of Fame of the International Astronautical Federation. In 2020 he wrote a book on his life experience on the Rosetta mission.

Dr. **Silvano Fineschi**
is the Director of the INAF-Astrophysical Observatory of Torino (Italy). He has over 30 years of experience in space instrumentation for UV and visible-light spectroscopy and polarimetry, and has been involved in several solar space missions (e.g., SOHO, Solar Orbiter). He is currently INAF Scientific Responsible for the Italian Payloads aboard the Solar Orbiter. He is Principal Investigator (PI) of the sounding-rocket coronagraphic experiment aboard a NASA sub-orbital mission, and PI of the balloon-borne CorMag experiment within the Hemera project. He is the Lead Co-Investigator for Italy's contribution to ASPIICS coronagraph aboard the ESA formation-flying mission PROBA-3.

Dr. **Hauke Hussman**
(PhD 2003 in Planetary Physics at Uni Münster) he is acting head of the Department of Planetary Geodesy at the DLR Institute of Planetary Research in Berlin. His expertise is laser altimetry and interior structure and evolution of planets and satellites. He is Co-Principal Investigator (Co-PI) of the Bepicolombo Laser Altimeter BELA. He is also Principal Investigator (PI) of the Ganymede Laser Altimeter GALA on ESA's JUICE mission and Co-Investigator on the radar and gravity science teams of NASA's Europa Clipper mission.

Dr. **Barbara Negri**
(MSc in Mathematics at Sapienza University Rome, MSc Space Systems Engineering at Uni Delft) is head of ASI (Italian Space Agency) programs for Human Flight and Scientific Instruments. Previously, she was responsible for developing Science Satellites and Payloads, Space Technologies, Ground Stations and scientific experiments on stratospheric balloons. She is Head of Delegation to the ESA Science Programme Committee and ASI focal point towards NASA for collaborations in Astrophysics and Solar System missions. She authored many scientific publications in the field of Space Science and Payload Technologies.

Dr. **Nicola Tosi**
is research scientist in the Planetary Physics department of the German Aerospace Center (DLR) in Berlin. His research focuses on the interior structure and evolution of rocky bodies of the solar system and of extrasolar planets. He is interested in developing numerical models to simulate the dynamics and thermal evolution of planetary interiors with the goal of interpreting geological and geophysical observations made by spacecraft missions. He is currently a member of the science team of the NASA mission InSight to Mars, of the ESA mission BepiColombo to Mercury, and of the ESA mission PLATO for the detection of transiting exoplanets.