



Consolato Generale d'Italia
Francoforte sul Meno



GALILEO GALILEI SCIENCE & SPACE FESTIVAL 14.06 - 17.06.2023 Frankfurt - Darmstadt

J. W. Goethe Universität, Campus Riedberg, Max-von-Laue-Str. – 60439 FFM

ESA-ESOC, Robert-Bosch-Str. 5, Press Centre – Building H – 64293 Darmstadt

Frankfurter Kunstverein, Markt 44 – 60311 FFM

Conferenze in italiano e inglese

Talks in Italian and English

Prenotazione obbligatoria per eventi in presenza entro il 9.06.2023

Reservation required for in-person events until 9.06.2023

francoforte.culturale@esteri.it



GSI Helmholtzzentrum für Schwerionenforschung



PROGRAMMA/PROGRAM

MERCOLEDÌ/WEDNESDAY 14.06.2023

ZOOM WEBINAR – LINK: <https://gsi-fair.zoom.us/j/67430481323>

H 18:45 – 18:50: Opening greeting, Consul General of Italy, Mr. Andrea Samà (in English & Italian)

H 18:45 - 20:00 – Prof. Giorgio Parisi (Univ. La Sapienza/Roma)

In a Flight of Starlings. The wonders of Complex Systems – In un volo di storni. Le meraviglie dei sistemi complessi (interview in English)

Introduction & moderation: Prof. Luciano Rezzolla, Prof. Alberica Toia (J.W. Goethe Univ/FFM)

GIOVEDÌ/THURSDAY 15.06.2023

J.W. GOETHE UNIVERSITÄT - CAMPUS RIEDBERG, Max-von-Laue-Str. – 60439 Frankfurt

H 17:45 – 18:00 – Greetings Consul General of Italy, Mr. Andrea Samà and Dean of the Faculty of Physic, Prof. Dr. Roger Erb (Univ. J. W. Goethe/Frankfurt)

H 18:00 – 19:30 – Prof. Luca Amendola (Univ. Karl Ruprecht /Heidelberg)

The World Algorithm - L'algorithmo del mondo

(lectio magistralis in English)

Introduction and moderation: Prof. Luciano Rezzolla (J.W. Goethe Univ/FFM)

VENERDÌ/FRIDAY 16.06.2023

FRANKFURTER KUNSTVEREIN, Markt 44 – 60311 FFM

Science & Book corner

H 18:30 – 20:00 – Dr. Paolo Ferri (autore e docente in scienza e tecnologia spaziale)

Le sfide di Marte – Storie di esplorazioni di un pianeta difficile (incontro/talk in IT-EN)

Moderazione - moderation: Isabella Bufacchi (IlSole24Ore), Michele Santoriello (uff.cultura)

SABATO/SATURDAY 17.06.2023

ESA – ESOC, Robert-Bosch-Straße 5, Press Centre, Building H – 64293 Darmstadt

H 16:30 – 16:45: Opening speeches/Saluti inaugurali (in English/in inglese)

H 16:45 – 17:45: Ing. Ian Carnelli (ESA)

Mission Hera - La Missione Hera

(talk in English)

Introduction and Moderation: Dr. Paolo Ferri

H 18:00 – 18:45: Dr. Francesca Luoni (GSI FAIR/Darmstadt)

Radiazione cosmica: l'ostacolo invisibile all'esplorazione spaziale

(conferenza in Italiano)

Introduzione e moderazione: Dr. Federica Capellino

H 18:45 – 19:15: Breaking News - Dr. Flavio Murolo (EUMETSAT/Darmstadt)

(talk in English)

H 19:30 – 20:15: Prof.ssa Sara Buson (Univ. Julius Maximilian/Würzburg)

Beginning a Journey across the Universe – L'inizio di un viaggio attraverso l'universo

(talk in English)

Introduction and Moderation: Prof. Silvia Masciocchi (GSI FAIR)

After the talks the Consulate General of Italy will offer a refreshments buffet with Italian products

Dopo il rinfresco il Consolato Generale d'Italia offrirà un rinfresco con prodotti italiani



Consolato Generale d'Italia
Francoforte sul Meno

Saluto del Console Generale d'Italia

Greetings by the Consul General of Italy

È con grande piacere che vi invito alla terza edizione del **"Galileo Galilei Space & Science Festival"**, una rassegna dedicata alla divulgazione di temi scientifici e alla valorizzazione della straordinaria rete di ricercatori italiani, presenti in Italia e all'estero. Questa rassegna vuole essere una testimonianza concreta del fatto che l'Italia è un grande Paese di scienza e di ricerca tecnologica. L'edizione di quest'anno del Festival si articola in quattro giornate, che vedranno come relatori scienziati e ricercatori italiani impegnati in università e centri di ricerca di primo piano, anche nella nostra circoscrizione consolare. A tutti loro, ai partner che ci hanno accompagnato nell'organizzazione di questo evento e al pubblico, va il mio personale ringraziamento.

It is an honour to invite you to the third edition of the **"Galileo Galilei Space & Science Festival"**, an event aimed at promoting scientific culture through the extraordinary network of Italian scientists active in Italy and abroad. This Festival is meant to underline the fact that Italy is a great country of science and technological research. This year's edition of the Festival is divided into four days, featuring Italian scientists and researchers working in leading universities and research centres, including those in our consular district. My personal thanks go to all the speakers, to the partners who co-organized this event and to the public.

Andrea Esteban Samà (Console Generale d'Italia a Francoforte s. M. – Consul General)

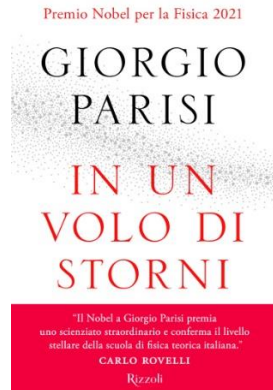


MERCOLEDÌ/WEDNESDAY 14.06.2023

Zoom webinar – Link: <https://gsi-fair.zoom.us/j/67430481323>

Interview in English – Interviewer: Prof. Luciano Rezzolla and Prof. Alberica Toia

Link Webinar:



H 18:45 - 20:00 – Prof. Giorgio PARISI (Univ. La Sapienza - Rome)

In a Flight of Starlings. The wonders of Complex Systems

Moving from Prof. Giorgio Parisi's recent book *In a Flight of Starlings. The Wonders of Complex Systems*, Alberica Toia and Luciano Rezzolla, professors of physics at the “Johann Wolfgang Goethe” University in Frankfurt am Main, will ask the Physics Nobel Prize Laureate some questions that will enable listeners to understand what the main characteristics of complex systems are and what impact they have on our daily lives. At the end of the interview the online audience will have the opportunity to ask some questions.

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Giorgio PARISI graduated from “La Sapienza” University in Rome in 1970 and worked as a researcher at the Frascati National Laboratories from 1971 to 1981. In 1981 he was appointed professor of Theoretical Physics at the University of Rome II “Tor Vergata” and later of Quantum Theories at “La Sapienza”. Since 1988 he has been a member of the Accademia Nazionale dei Lincei (of which he was president and is now vice-president), since 1992 of the American National Academy of Sciences, since 1993 of the French Académie des Sciences, and since 2013 of the American Philosophical Society. In October 2021, he received the Nobel Prize in Physics “for the discovery of the interplay between disorder and fluctuations in physical systems from the atomic to the planetary scale” He published countless scientific papers, but also books aimed at a wider audience: *La chiave, la luce e l’ubriaco. Come si muove una ricerca scientifica* (Di Renzo Editore 2006); *In un volo di storni. Le meraviglie dei sistemi complessi* (Rizzoli 2021; English Version *In a Flight of Starlings. The Wonders of Complex Systems*, Penguin 2023; German version ***Der Flug der Stare. Das Wunder komplexer Systeme, S. Fischer 2022***), and, together with Giorgio Paterlini, *Gradini che non finiscono mai. Vita quotidiana di un premio Nobel* (La nave di Teseo, 2022).

GIOVEDÌ/THURSDAY 15.06.2023

J.W. GOETHE UNIVERSITÄT, CAMPUS RIEDBERG, Max-von-Laue-Str. – 60439 FFM

Lectio magistralis in English – Introduction and moderation Prof. Luciano Rezzolla

Prenotazione obbligatoria/Book now: francoforte.culturale@esteri.it

(codice prenotazione/booking code: Amendola01)



H 17:45 - 19:30 – Prof. Luca AMENDOLA (Univ. Ruprecht Karl - Heidelberg)

The World Algorithm

Science now seems to possess the fundamental laws of the universe, based on Einstein's gravitation and quantum theories, and no phenomenon appears to be in clear contradiction with them. With the discovery of gravitational waves, the theoretical picture appears complete: we have unveiled the world's algorithm. But the essential questions remain: why does our universe follow mathematical laws, instead of plunging into endless chaos, and why these and not others? Can we still increase our knowledge by building more and more powerful telescopes and accelerators, or have we now reached the limits of our resources? Do we live in the only possible universe, or are we just one experiment of nature among many?

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Luca AMENDOLA graduated in Physics at the University of Rome in 1989 and has a Ph.D. in Astronomy. He worked as a research associate at Fermi National Accelerator Laboratory and visiting professor at Dartmouth College in the USA, then, from 1994 to 2009 as researcher at the Osservatorio Astronomico di Roma and associate astronomer at the Astronomical Observatory of Rome, Italian National Institute of Astrophysics. Since 2009 he is a professor of physics at the Institute of Theoretical Physics in Heidelberg, Germany. His area of research is Cosmology and Astrophysics. He is currently working mainly on topics related to Dark Energy, Large Scale Structure, Cosmic Microwave Background, Statistics. He published more than 180 scientific articles, but also works aimed at a wider audience: *Il Cielo infinito* (Sperling & Kupfer 2000) e *L'altra faccia dell'Universo* (Il Mulino 2018), described by him as "two non-technical texts on cosmology" e *L'algoritmo del Mondo* (Il Mulino 2022).

He has a website: <https://lucaamendola.wordpress.com/>

VENERDÌ/FRIDAY 16.06.2023

Frankfurter Kunstverein, Markt 44 – 60311 FFM

Science & Book corner

Incontro con l'autore (in italiano e inglese) – Book presentation (in Italian and English)

Moderazione - Moderation: Isabella Bufacchi (IlSole24Ore) - Michele Santoriello (uff. culturale)

Prenotazione obbligatoria/Book now: francoforte.culturale@esteri.it

(codice prenotazione/booking code: Ferri02)



H 18:30 - 20:00 – Dr. Paolo FERRI (autore e docente in scienza e tecnologia spaziale)

Le sfide di Marte – Storie di esplorazione di un pianeta difficile (Raffaello Cortina, 2023)

Il libro ripercorre la storia dell'esplorazione spaziale marziana, spiegando perché Marte rappresenti un obiettivo così ostico, al punto da far fallire la metà delle missioni che lo hanno affrontato. Tutto è raccontato dal punto di vista dell'autore, che ha vissuto in prima persona le missioni europee verso Marte, con aneddoti personali, attraverso i quali il lettore rivive le emozioni, i successi e i fallimenti vissuti da Ferri e dai suoi collaboratori nelle sale controllo sulla Terra.

Paolo FERRI è un fisico che ha lavorato per quasi quarant'anni per l'Agenzia Spaziale Europea (ESA) a Darmstadt. È stato a capo del dipartimento di operazioni spaziali dell'Agenzia e responsabile di varie missioni spaziali, tra cui Rosetta, Mars Express e ExoMars. Questo è il suo terzo libro divulgativo, dopo *Il cacciatore di comete* (2020) e *Il lato oscuro del sole* (2022), Laterza editori.

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The book goes through the history of Martian space exploration, explaining why Mars represents such a difficult objective, to the extent that half of the space missions sent to it have failed. The stories are told from the point of view of the author, who has experienced firsthand the flight operations of all European missions to Mars, with many personal anecdotes, through which the reader is exposed to the emotions, successes and failures experienced by Ferri and his team in the control rooms on Earth.

Paolo FERRI is a physicist who worked for almost forty years for the European Space Agency (ESA) in Darmstadt. He headed the Agency's Mission Operations Department and was responsible for various space missions, including Rosetta, Mars Express and ExoMars. This is his third book for the general public, after *The Comet Hunter* (2020) and *The Dark Side of the Sun* (2022), both published in Italy by Laterza.

**FRANKFURTER
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SABATO/SATURDAY 17.06.2023

ESA – ESOC, Robert-Bosch-Straße 5, Press Centre, Building H – 64293 Darmstadt

Talk in English

Introduction and Moderation: Dr. Paolo Ferri

Prenotazione obbligatoria/Book now: francoforte.culturale@esteri.it

(codice prenotazione/booking code: Carnelli03)



H 16:45 – 17:45 – Ing. Ian CARNELLI (ESA)

Mission Hera - La Missione Hera

As a part of the world’s first test of asteroid deflection, Hera will perform a detailed post-impact survey of the target asteroid, Dimorphos – the orbiting Moonlet in a binary asteroid system known as Didymos. Now that NASA’s DART mission has impacted the moonlet, Hera will turn the grand-scale experiment into a well-understood and repeatable planetary defence technique. Demonstrating new technologies from autonomous navigation around an asteroid to low gravity proximity operations, Hera will be humankind’s first probe to rendezvous with a binary asteroid system and Europe’s flagship Planetary Defender. Hera is due to launch in October 2024.

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Ian CARNELLI is Hera Project Manager at European Space Agency – ESA. An aerospace engineer, he has been involved for the last 12 years designing several space mission projects for the diversion of potentially dangerous asteroids. Since 2015 he is leading a team of scientists and engineers within the Hera Planetary Defence Mission and Asteroid Impact Mission, an interplanetary probe project to test a deviation technique called “kinetic impact”, conducted in collaboration with the NASA.



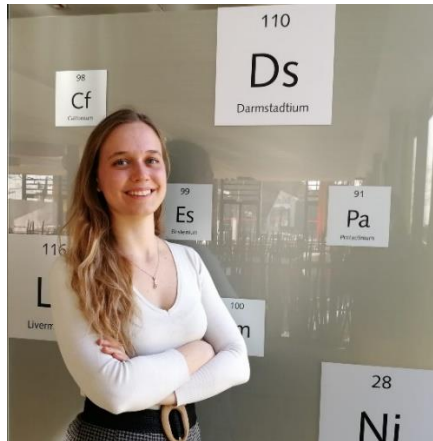
SABATO/SATURDAY 17.06.2023

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Conferenza in italiano

Prenotazione obbligatoria/Book now: francoforte.culturale@esteri.it

(codice prenotazione/booking code: Luoni04)



H 18:00 – 18:45 – Dr. Francesca LUONI (GSI-FAIR - DARMSTADT)

Radiazione cosmica: l'ostacolo invisibile all'esplorazione spaziale

Espandere la presenza umana nel sistema solare è un obiettivo comune a 14 agenzie spaziali. Tuttavia, uno degli ostacoli principali all'esplorazione umana dello spazio profondo è la radiazione spaziale, la quale è in grado di penetrare i tessuti umani e causare danni al DNA che, se non riparati correttamente dai meccanismi biologici interni alle nostre cellule, possono causare l'insorgenza di cancro o di sindrome acuta da radiazione, che ha colpito, ad esempio, i pompieri di Chernobyl. Francesca Luoni ci guiderà attraverso la scoperta delle diverse sorgenti di radiazione nello spazio, delle strategie per proteggere gli esploratori spaziali, e di come la ricerca condotta presso acceleratori di particelle quali il GSI contribuisce a rendere l'esplorazione dello spazio più sicura.

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Francesca LUONI, dopo essersi diplomata al liceo classico, spinta dal suo amore per la fisica, ha intrapreso la carriera universitaria al Politecnico di Milano. Dopo la laurea triennale in Ingegneria Fisica nel 2015, ha conseguito la magistrale in Ingegneria Nucleare per avvicinarsi alla fisica delle alte energie. Ha concluso i propri studi in ingegneria con una tesi all'Agenzia Aerospaziale Tedesca (DLR) a Monaco di Baviera su uno studio dell'attività delle particelle Giano (Janus particles) nei plasmi, presso il gruppo di Fisica dei Plasmi Complessi. Ha poi conseguito il dottorato di ricerca presso la Technische Universität Darmstadt e il dipartimento di Biofisica del GSI con un progetto sulla radioprotezione nello spazio: la sua tesi è stata premiata con il Giersch Award for Outstanding Doctoral Thesis 2022 e l'Award for Outstanding Scientific Performance for the Best Physics PhD thesis in 2022. Attualmente lavora come ricercatrice presso lo stesso GSI-FAIR. Francesca Luoni è anche attivamente impegnata nella divulgazione scientifica, sia in Germania sia in Italia, diretta a studenti di ogni età e al grande pubblico ed è una guida ufficiale per visitatori del GSI.

SABATO/SATURDAY 17.06.2023

ESA – ESOC, Robert-Bosch-Straße 5, Press Centre, Building H – 64293 Darmstadt

Talk in English

Prenotazione obbligatoria/Book now: francoforte.culturale@esteri.it

(codice prenotazione/booking code: Murolo05)



H 18:00 – 18:45 - Dr. Flavio Murolo (EUMETSAT - DARMSTADT)

Breaking News with EUMETSAT

On December 14th 2022, MTG-I1 satellite was successfully launched from the European Spaceport in Guyana with an Ariane-5 rocket.

The satellite is currently undergoing an intense phase of *in-orbit commissioning* and preparation to the routine operations, which is planned to last until the end of 2023.

In the meantime, some significant milestones have been already achieved; the most notable of all is the acquisition and processing of the first Operational Images of the MTG-I1 satellite, a world premiere.

In this breaking news we have the pleasure to present the excellent results achieved by this new generation of satellites built with the collaboration of EUMETSAT-ESA-Thales-OHB and Leonardo.

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Flavio MUROLO graduated in Aerospace Engineering at the University of Naples in 1999. Until 2004, he worked at Alenia Space in Rome as Attitude and Orbit Control responsible for several missions, like Cosmo-SkyMed, P.R.I.M.A. and Radarsat-2. Later he moved to ESA/ESOC in Darmstadt as the Principal Operations AOCS Engineer for the deep space mission Herschel-Plank. In 2007, he joined EUMETSAT as Instrument Operations Engineer for the MetOp mission and founded his own consultancy company to provide high skilled specialists to both GEO and LEO missions. In 2009, he joined EUMETSAT as staff member for the Meteosat 1st and 2nd Generation satellites MTP and MSG and since then he has been the EUMETSAT manager for several projects like the Launch and Early Operations of MSG-3 and MSG-4 and the establishment of a new mission over the Indian Ocean with the MSG satellites. Since 2018 he is the Operations Manager for all the Geostationary satellites of EUMETSAT, including both routine operations of the Meteosat satellites and for the S/C operations preparation for launch of the Meteosat third generation satellites (MTG). He published more than 20 scientific papers focussing on Operations of satellites and space systems, space debris and spacecraft reliability.



SABATO/SATURDAY 17.06.2023

ESA – ESOC, Robert-Bosch-Straße 5, Press Centre, Building H – 64293 Darmstadt

Talk in English

Prenotazione obbligatoria/Book now: francoforte.culturale@esteri.it

(codice prenotazione/booking code: Buson05)



H 19:30 – 20:15 – Prof. Sara BUSON (Univ. Julius Maximilian - Würzburg)

Beginning a Journey across the Universe – L’inizio di un viaggio attraverso l’Universo

Cosmic rays are charged subatomic particles that hit Earth from deep in outer space. They can be extraordinarily powerful and reach energies up to 100 million times greater than any human-attained particle accelerator. Their origin represents a century-old mystery. Their birthplaces are thought to be the most violent astrophysical environments known in our Universe, e. g. flows of particles blasted/swallowed by supermassive black holes at the centers of active galaxies (AGN). The same elusive astrophysical "monsters" capable of continuously and efficiently accelerating particles at extreme energies produce neutrinos. Neutrinos are nearly massless "ghostly" particles that rarely interact with matter and are very challenging to detect. What makes them challenging to catch, makes them special: they can travel throughout the universe almost unimpeded: while cosmic rays are deflected, neutrinos point straight to their origin and can be used to trace the intergalactic space back. By following the journey of astrophysical neutrinos across the universe, billions of light years away from our galaxy, we have revealed their factories.

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Sara BUSON is an astrophysicist interested in multi-messenger astrophysics with strong focus on high-energy astrophysics and astro-particle physics. Since 2018 she is a junior professor at the Institut für Theoretische Physik und Astrophysik at the Julius-Maximilian" Universität Würzburg.

She has been the convener of the Active Galactic Nuclei working group and time-domain group of the Fermi-LAT (Large Area Telescope) Collaboration. Previously she has worked at the NASA Goddard Space Flight Center (USA) and at the University of Padova (IT).

On Dec. 27 2020 Sara Buson was appointed Ufficiale dell’Ordine al Merito della Repubblica Italiana (Officer of the Order of Merit of the Italian Republic) for her contributions in the field of multimessenger astrophysics. Her website is www.sarabuson.com



Informazioni e ringraziamenti

Information and thanks

Si ringraziano per la collaborazione/We thank the following for their cooperation



CIRCOLO CULTURALE ITALIANO
ITALIAN CULTURE CLUB **ESOC**



GSI Helmholtzzentrum für Schwerionenforschung



Physikalischer Verein
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