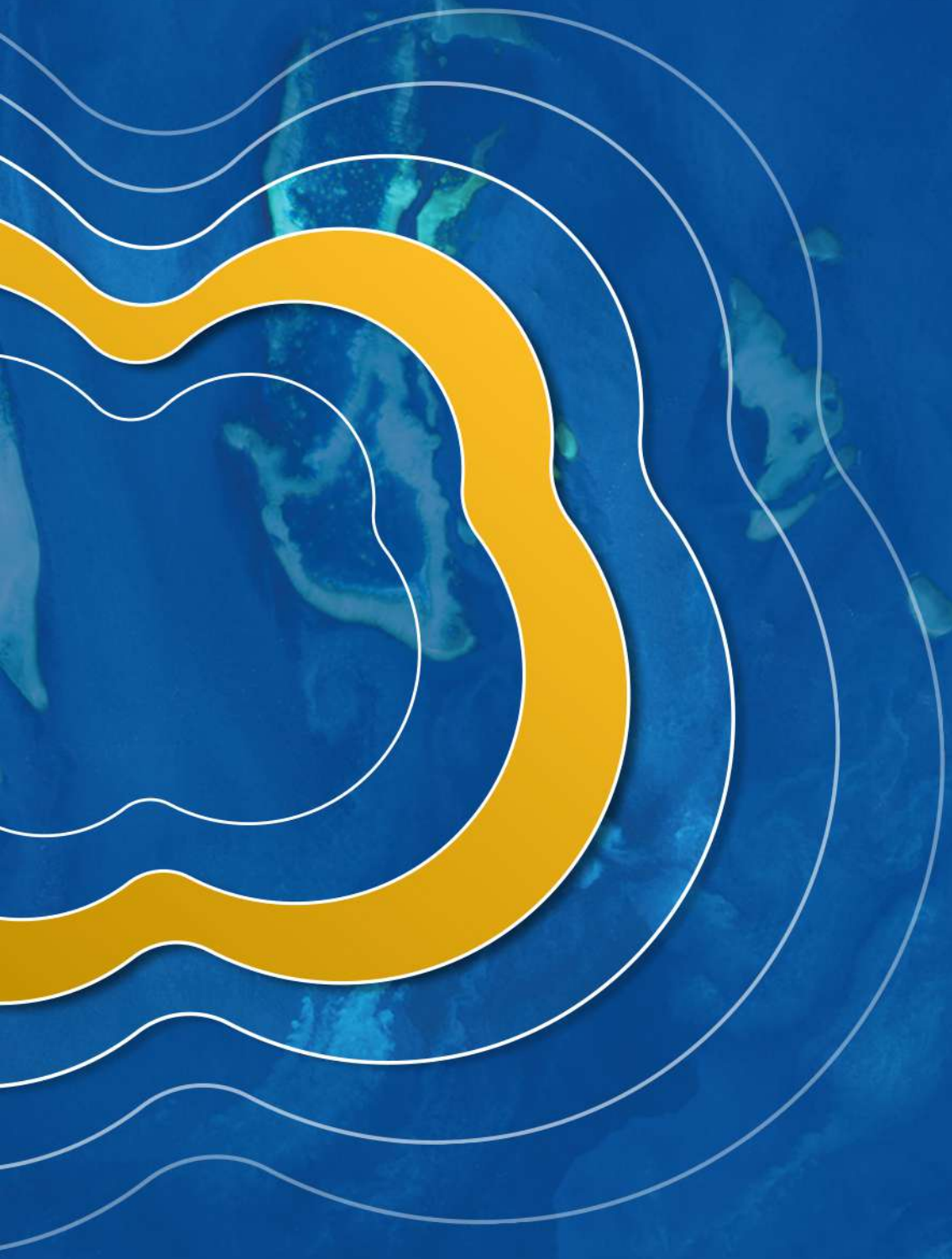
esa

living planet symposium

MILAN
13–17 May
2019



European Space Agency

CONTENTS

INTRODUCTION

This booklet contains organisation and programme information about the sessions and events scheduled for the ESA Living Planet Symposium 2019, 13-17 May 2019. For the most recent information please consult lps19.esa.int.

Venue

The event is held at the Mi.Co. – Milano Convention Centre, Gate 2, Viale Eginardo, 7, Milan. The venue is reached by Line M5 (purple line) of Milan underground, metro station "Portello".

Registration

Participants shall have registered online before the event. Badges can be collected upon arrival at the Registration Desk , located at the main entrance. In order to avoid long queues during the main registration, we kindly recommend to pre-register on Sunday 12 May. The desk will be open according to the following schedule:

Day	Opening Time
Sunday 12 May	15:00 to 18:00
Monday 13 May	07:30 to 19:00
Tuesday 14 May	07:30 to 19:00
Wednesday 15 May	07:30 to 19:00
Thursday 16 May	08:00 to 19:00
Friday 17 May	08:00 to 16:00

Detailed Programme & LPS19 App

The LPS19 is a certified green event, therefore there will be no printed programs. The latest version of the detailed programme can be visualized with the LPS19 App, for IOS or Android. Participants can use this app to search for specific authors or titles, prepare a personal programme, chat with other participants and contact directly exhibitors and sponsors of the Symposium. The App can be downloaded here:

Download on the App Store

ANDROID APP ON Google play

All registered participants have received a dedicated email on how to install the App.
Participants without smartphone or tablet can check the daily programme on the screen at the entrance of each meeting room or use the online programme available in this letter.

Social Events

Monday 13 May: from 18:15 to 20:00 Welcome event in the Mi.Co. Milano Convention Centre
Tuesday 14 May: from 17:20 to 19:00 Poster Session with refreshments in the Mi.Co. Milano Convention Centre
Wednesday 15 May: from 17:20 to 19:00 Poster Session with refreshments in the Mi.Co. Milano Convention Centre from 19:00 to 21:00 Night at the Museum event at Museum of Science and Technology Milan – Leonardo da Vinci (Via San Vittore, 21, 20123 Milan)
Thursday 16 May: from 17:20 to 19:00 Poster Session with refreshments in the Mi.Co. Milano Convention Centre
Friday 17 May: from 12:20 to 14:00 Poster Session with refreshments in the Mi.Co. Milano Convention Centre

ACTIVITIES

Agorà

Participants can join parallel talks that will be held in the ESA Agorà, Agorà Giardino and Agorà Metallica located in the exhibition area. The detailed programme is available here.

Training

On Sunday 12 May 2019, RUS will provide 3 different half day hands-on training sessions where participants will access a Virtual Machine from their own laptop to exploit the open source toolboxes available in the RUS environment to download and process Sentinel-1, Sentinel-2, Sentinel-3 and Sentinel 5-P data. More information can be found here. The training is restricted to accepted applicants of the Training. Late registrations cannot be accepted.

Poster Printing Service

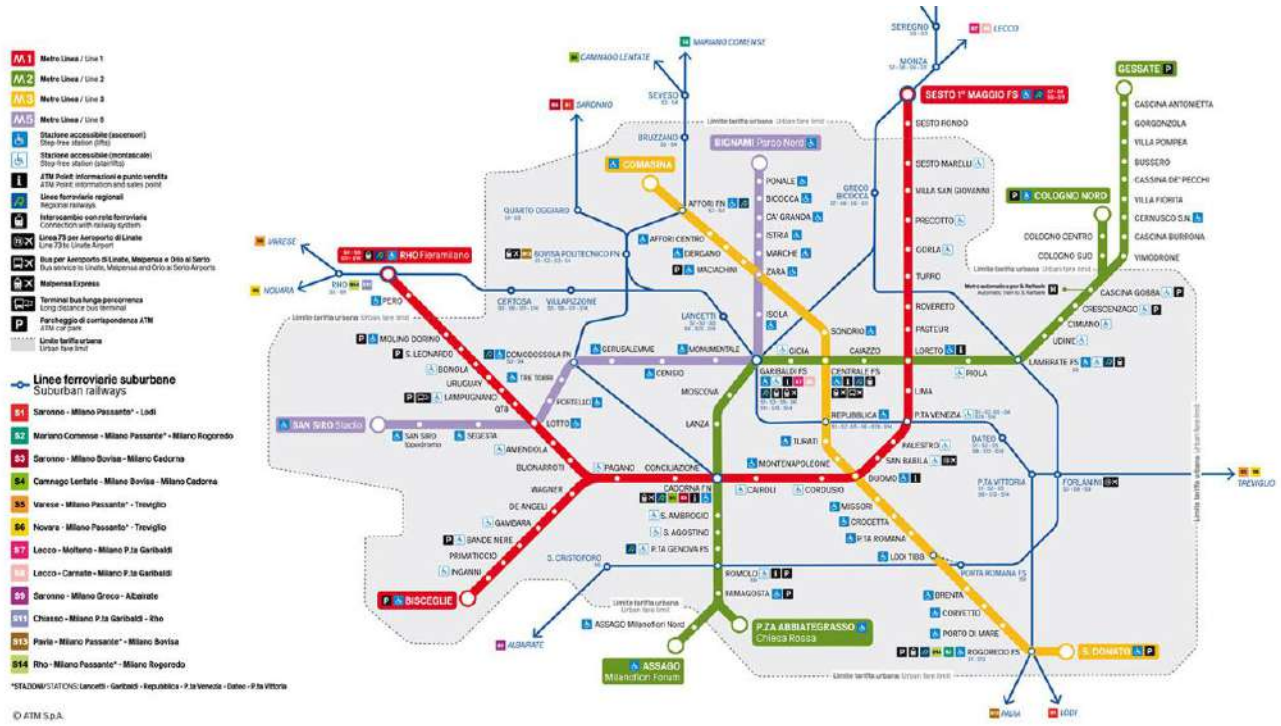
Participants will have the possibility to order the printing of their poster in advance with a pick up point at the venue. Further details are available here.

Milan Info Point

For information about the City of Milan, attractions or taxi requests, an info point will be at disposal in the registration area during the Symposium.

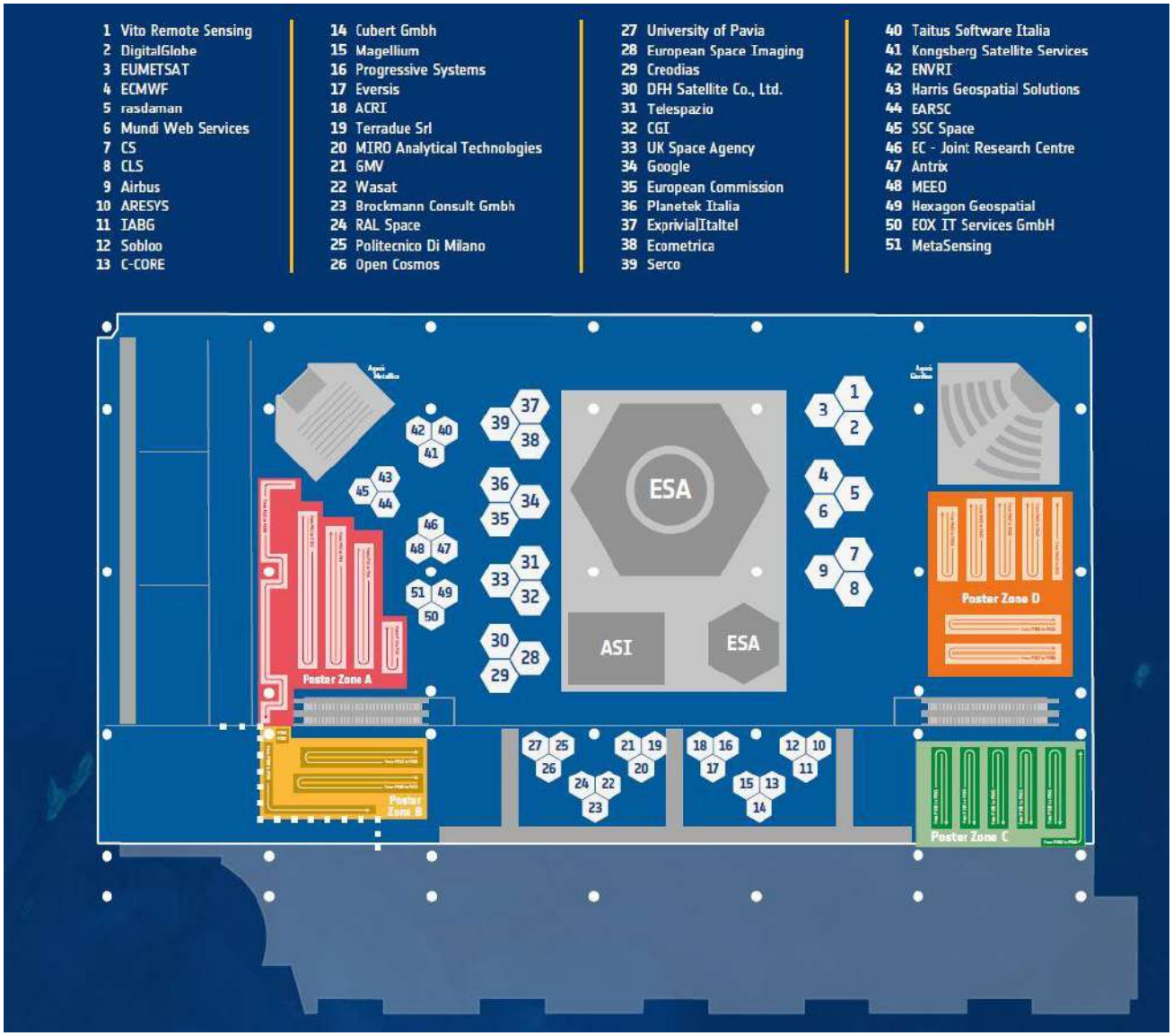
Here you can find a map of the area nearby the Symposium venue.

Milan Underground Map



EXHIBITION AREA

Starting from Monday at 12:00 a daily exhibition from ESA, ASI, Industry and Research centers will be held up to Friday lunch time in the South Hall on Floor 0. Please find here the list of stands:



INFORMATION FOR AUTHORS

Oral presenters

- A Speaker Ready Area equipped with computers with the same configuration of the session rooms is available for the oral speakers to upload and check their presentations in the Registration area.
- Please bring your presentation on a USB stick (make a folder if not a single file), name it LastnameInitial.type (e.g., PresenterA.ppt) and make sure your presentation has been copied to the computer in the Speaker Ready Area well before the start of your session. Presentations which are uploaded in the Speaker Ready Area will be automatically also available in the session rooms. Presentations from personal laptops are not allowed, to ensure a smooth programme running and to minimise the transition time between presentations
- Presenters should be in their session room 20 minutes before the session begins to meet with the session chairs, who should be near the stage/lectern. Late uploads shall be avoided if possible; LPS19 assistants will be available to indicate where eventual last-minute-uploads can be done.
- Presentations should be in MS PowerPoint or Acrobat pdf.
- Presenters shall respect the allocated time for presentations as per preliminary programme. Chairs will give a 2-minute warning to wrap-up. Eventual questions will be made at the end of the session. Each session room is equipped with a video projector 16:9, a microphone, a lectern with screen, and a pointing device. The software installed on the computer includes: Windows 10, MS Office 2016 Professional (Power Point, Word), Adobe Acrobat Reader, Windows Media Player 12
- The media player is only available with standard codecs. Use of standard True Type fonts is suggested for PowerPoint presentations. In the case that a ppt contains a video or animation, please ensure that both files (Power Point and video - MPG AVI) are in the same folder.
- Please take into account that the meeting room is quite large, the presentations should contain clear information with appropriate font (and image) size that is legible from the back of the conference rooms.

Poster presenters

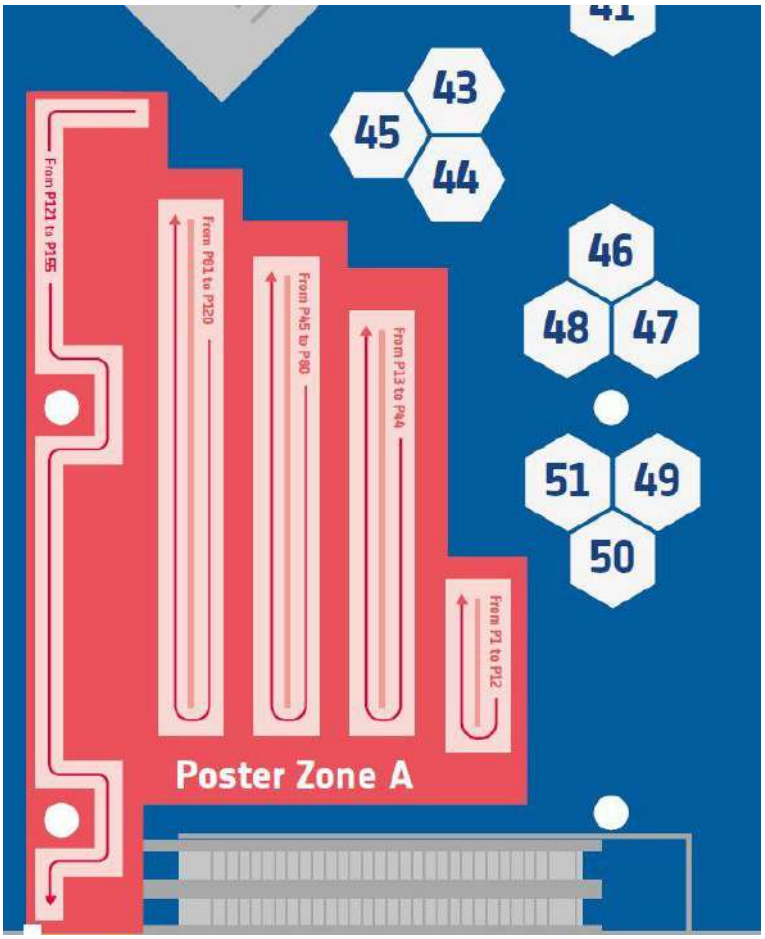
- Presenters at the poster sessions shall bring their own printed posters. The maximum poster size is A0 (ca. 84.1 x 118.9cm), **Portrait orientation**. Authors are strongly encouraged to produce a "proper" full-size poster rather than using multiple smaller (e.g. A4) sheets.
- Posters shall be **mounted and dismounted autonomously** by the Poster Presenter as per the following schedule. Posters which are not dismounted in due time will be **removed and trashed by the staff**. Posters shall be mounted only on the day of their display. Posters which are not mounted on the correct day will be removed.

Poster Session	Mount	Dismount
Monday 13 May 2019	Monday afternoon coffee break 15:10h	Monday 19.00h
Tuesday 14 May 2019	Tuesday morning from 08.00h	Tuesday 19.00h
Wednesday 15 May 2019	Wednesday morning from 08.00h	Wednesday 19.00h
Thursday 16 May 2019	Thursday morning from 08.00h	Thursday 19.00h
Friday 17 May 2019	Friday morning from 08.00h	Friday 14.00h

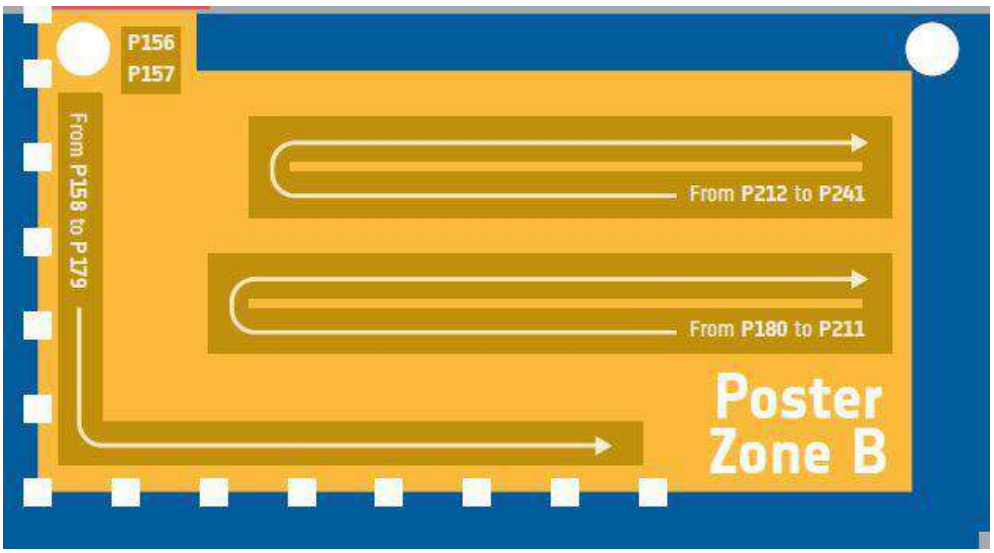
- Poster numbers (according to the conference programme) will be noted on the poster panels. Poster presenters shall verify on the app or in the programme the poster panel they have been assigned to.

Poster Areas

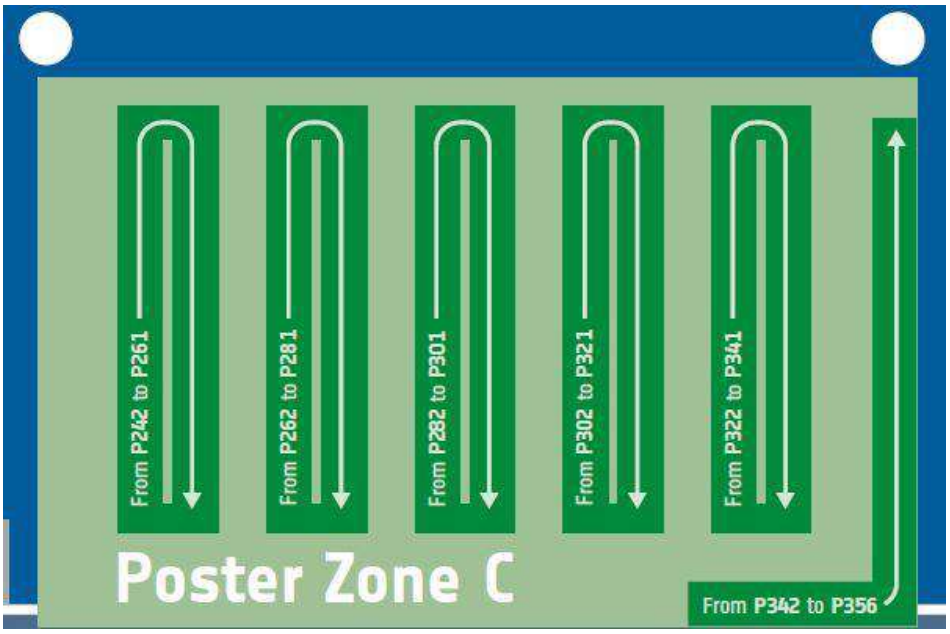
Poster Zone A - from P1 to P155



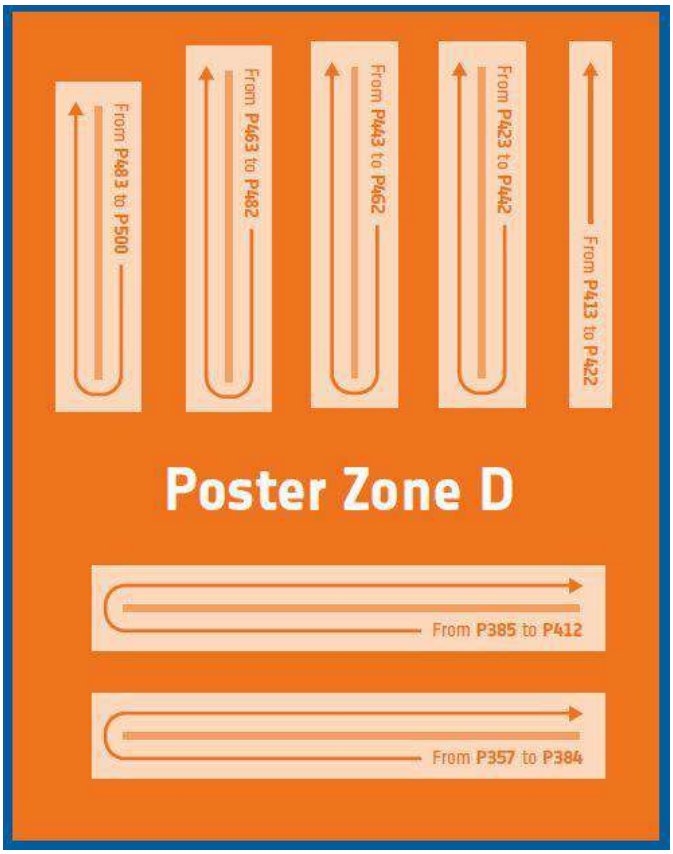
Poster Zone B – from P156 to P241



Poster Zone C – from P242 to P356

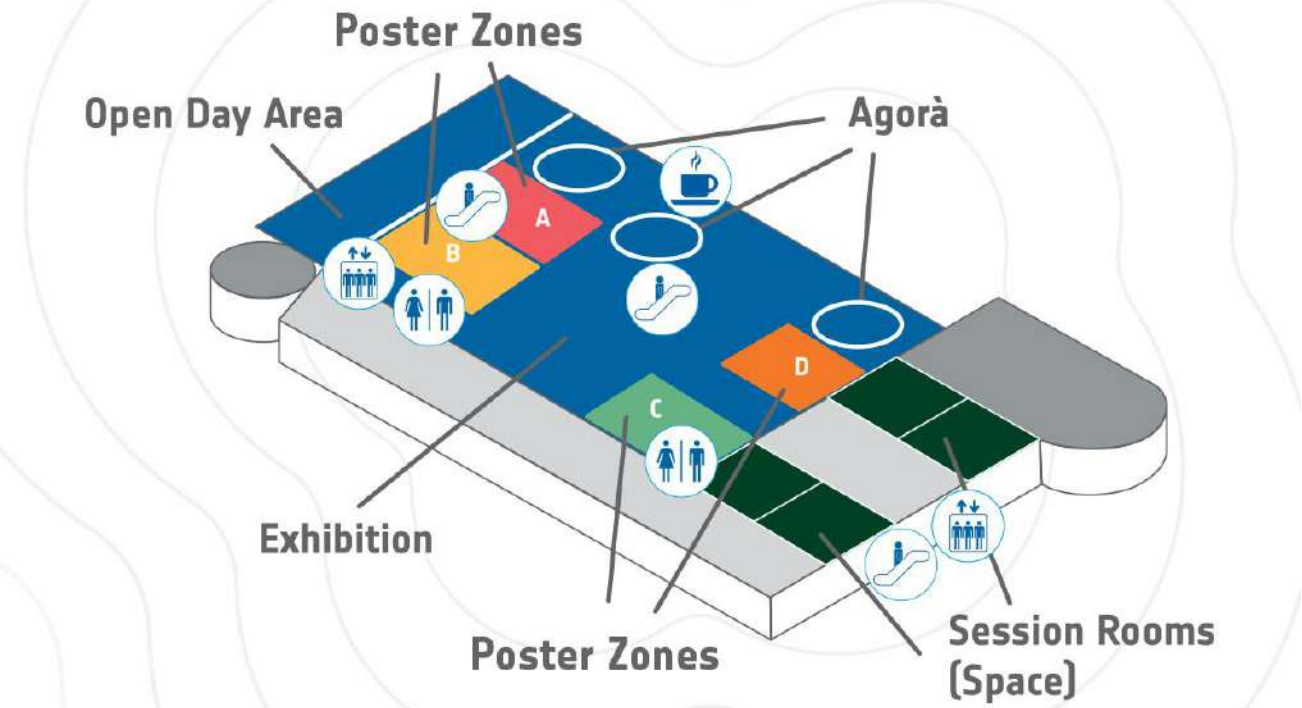


Poster Zone D – from P357 to P500



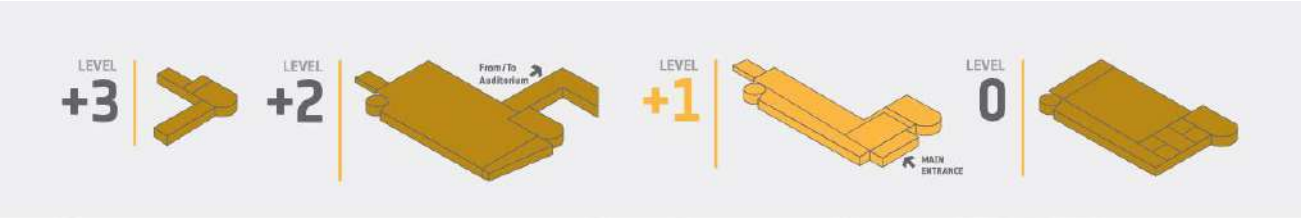
FLOORPLAN

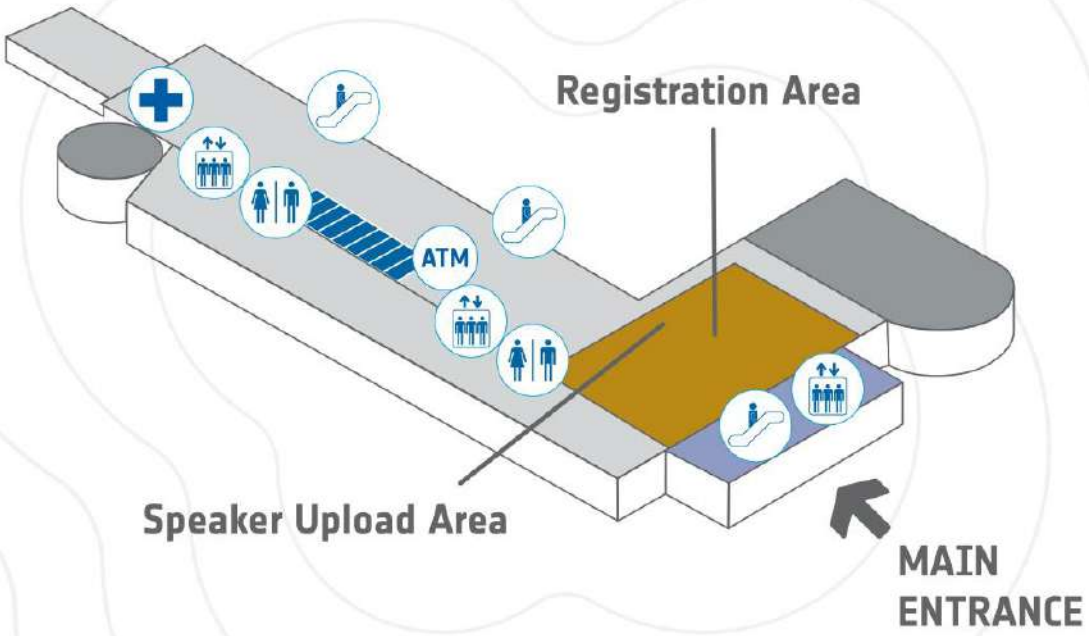
Level 0



LEVEL 0

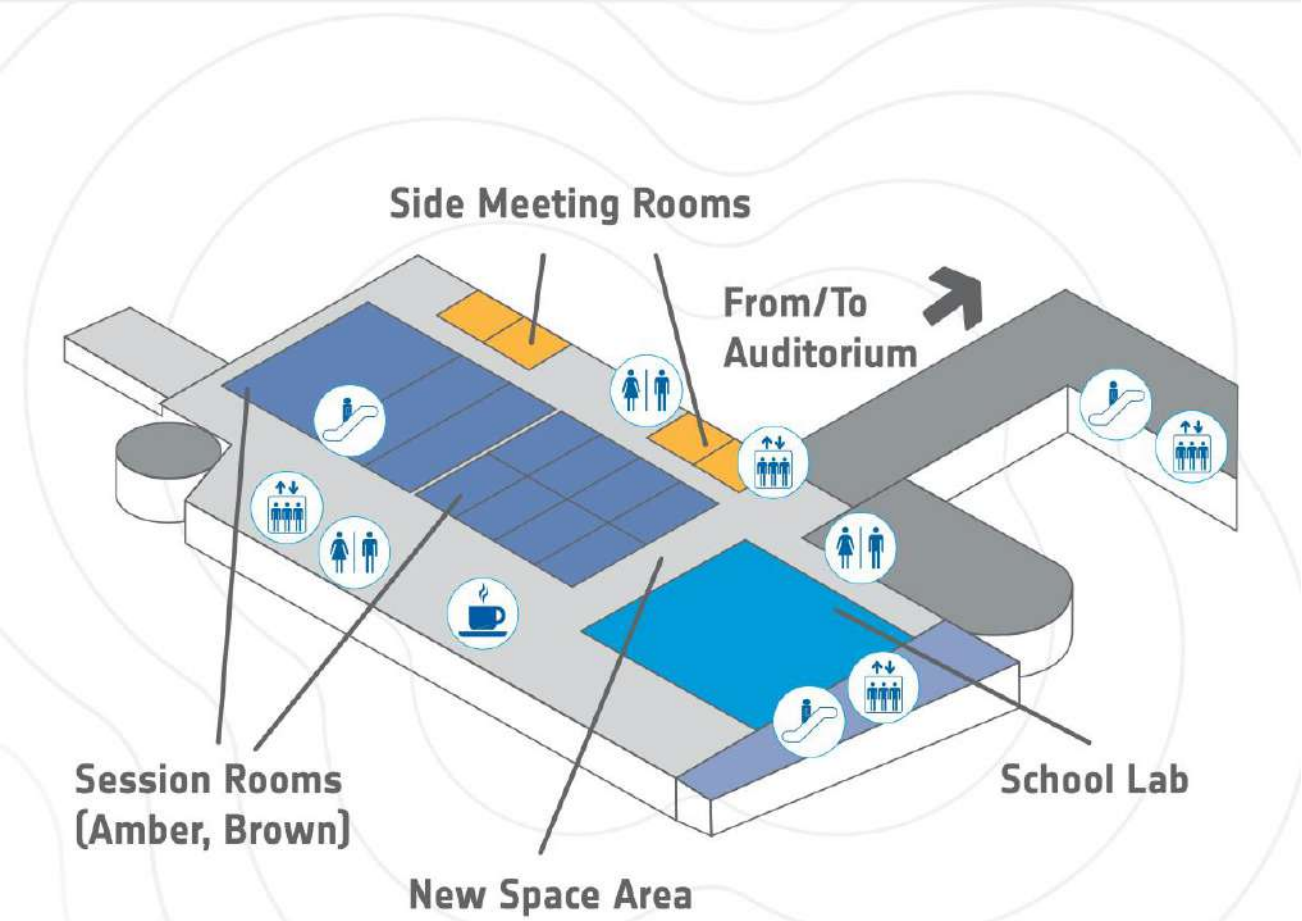
Level 1





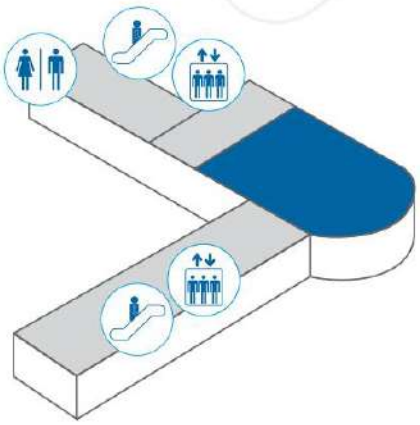
LEVEL +1

Level 2



LEVEL +2

Level 3



AUDITORIUM

Opening Session

LEVEL +3

PROGRAMME OVERVIEW

Sunday

15:00 18:00	Pre-registration

Monday

07:30	Registration
09:00 11:50	Opening Session

	Brown 1	Brown 2	Brown 3	Amber 1-2	Amber 3-4	Amber 5-6	Amber 7-8	Space 1	Space 2	Space 3	Space 4
13:30 15:10	B1.01: 10 Years of SMOS	A4.12: HR Soil Moisture #1	B1.03: EE 8 FLEX	B6.08 Sentinel-5 P #1	A2.08: Cryosphere Altimetry #1	A5.01: Geodetic Missions #1	B5.02: Heritage Missions	A3.02: EO for Biodiversity #1	C2.04: New Atmospheric Radar	B4.01: International EO Cooperation	A4.05: Marine Wind and Wave #1
	Coffee Break										
15:40 17:20	B3.01: Meteo Satellites	A4.12: HR Soil Moisture #2	A3.11: RS of Fluorescence	B6.08 Sentinel-5 P #2	A2.08: Cryosphere Altimetry #2	A5.01: Geodetic Missions #2	B5.01: AVHHR	A3.02: EO for Biodiversity #2	C3.01: Space 4.0 Security	B4.05: National Missions	A4.05: Marine Wind and Wave #2
19:00	Poster Session										
18:15 20:00	Icebreaker										

Tuesday

	Brown 1	Brown 2	Brown 3	Amber 1-2	Amber 3-4	Amber 5-6	Amber 7-8	Space 1	Space 2	Space 3	Space 4
08:30 10:10	A4.06: Sea Surface Salinity #1	A4.11: EO for Hydro models #1	B4.04: PRISMA	A1.08: Troposphere and Air Quality #1	A2.07: Polar MW Radiometry	A5.02: Solid Earth #1	D2.02: EO for SDGs #1	A3.01: RS for Ecosystem Models #1	D2.09: GEOGLAM #1	B4.02: Future SAR Missions #1	B2.03: S-6/Jason-CS
	Coffee Break										
10:40 12:20	A4.06: Sea Surface Salinity #2	A4.11: EO for Hydro models #2	C2.02: Hyperspectral Advances	A1.08: Troposphere and Air Quality #2	A2.09: Sea-Ice #1	A5.02: Solid Earth #2	D2.02: EO for SDGs #2	A3.01: RS for Ecosystem Models #2	D2.09: GEOGLAM #2	B4.02: Future SAR Missions #2	A4.02: Ocean Surface Currents
	Lunch Break										
13:30 15:10	A4.01: Marine Litter Detection	B1.05: EE9 FORUM and SKIM	A3.07: From Proba-V to S-3	A1.08: Troposphere and Air Quality #3	A2.09: Sea-Ice #2	A5.02: Solid Earth #3	D2.02: EO for SDGs #3	A3.01: RS for Ecosystem Models #3	A3.17: Agriculture: Precision Farming	A6.04: Supporting the Science of Climate Change	A4.14: Ocean Circulation #1
	Coffee Break										
15:40 17:20	A4.03: Sea Targets with S-1	A4.13: EO for Hydrological Events	A5.05 EO for Soils	A1.04: Stratosphere and Mesosphere	A2.09: Sea-Ice #3	B1.09: SWARM	B4.03: ESA-NASA cooperation in EO	B2.04: S3A/B Tandem Results	A3.17: Agriculture: Yield Modelling	A6.04: Climate from Space: Today's Reality	A4.14: Ocean Circulation #2
19:00	Poster Session										

Wednesday

	Brown 1	Brown 2	Brown 3	Amber 1-2	Amber 3-4	Amber 5-6	Amber 7-8	Space 1	Space 2	Space 3	Space 4
08:30 10:10	A3.03: Resilience of Forest Canopy #1	A6.02: Earth's Radiation Budget	C7.05: EO Toolboxes and Apps	A1.09: Greenhouse Gases #1	A2.05: Greenland & Antarctic Ice-sheet #1	A7.03: Space Weather	C4.02: Big EO Data Architecture	A5.03: Geology and Geomorphology	A3.17: Agriculture: Water Use	B1.06: EE 10 Mission Candidates	A4.04: Coastal Zone from Space #1
	Coffee Break										
10:40 12:20	A3.03: Resilience of Forest Canopy #2	A6.01: RS of Energy Budget	C7.01: EO Education	A1.09: Greenhouse Gases #2	A2.05: Greenland & Antarctic Ice-sheet #2	A7.01: Geospace System Science #1	C4.01: Big EO Data Analytics #1	A5.04: Monitoring of Infrastructures	A3.17: Agriculture: CAP Monitoring	B2.01: Copernicus Present and Future	A4.04: Coastal Zone from Space #2
	Lunch Break										
13:30 15:10	C2.07: SAR Tomography	C2.09: Land Surface Temperature #1	C7.03: Satellite and Citizen Observations	A1.05: Aerosols and Clouds #1	A2.04: Glaciers and Ice-caps #1	A7.01: Geospace System Science #2	C4.01: Big EO Data Analytics #2	D1.03: DRR for Developing Countries #1	A3.17: Agriculture: Innovative Practices	B2.02: Copernicus HPC Missions #1	A4.04: Coastal Zone from Space #3
	Coffee Break										
15:40 17:20	C2.06: Multi Frequency SAR	C2.09: Land Surface Temperature #2	C7.02: Collaboration for Open Research	A1.05: Aerosols and Clouds #2	A2.04: Glaciers and Ice-caps #2	A6.03: Land-Climate Interactions	C4.01: Big EO Data Analytics #3	D1.03: DRR for Developing Countries #2	A3.17: Agriculture: Wide Area Monitoring	B2.02: Copernicus HPC Missions #2	A4.04: Coastal Zone from Space #4
19:00	Poster Session										
21:00	Night at the Museum (@Museum of Science and Technology Milan, from 19:00)										

Thursday

	Brown 1	Brown 2	Brown 3	Amber 1-2	Amber 3-4	Amber 5-6	Amber 7-8	Space 1	Space 2	Space 3	Space 4	
08:30 10:10	C8.04: EO Services Commercialisation	B6.07: ESA Campaigns	A3.04: Global Forest Biomass Monitoring #1	B1.08: EARTHCARE	A2.10: Arctic and Southern Oceans	D2.08: In-Situ Collection for Agriculture	C1.02: Deep Learning in RS #1	D1.01: Climate Change and Adaptation	A3.10: Large Area Land Change	A4.10: Inland Water Bodies #1	A4.04: Coastal Zone from Space #5	08:30 10:10
	Coffee Break											
10:40 12:20	C5.01: Small Satellites Constellations	C6.01: Unmanned Aircraft #1	A3.04: Global Forest Biomass Monitoring #2	A1.03: Winds and Cloud Dynamics	B1.02: CRYOSAT	A3.15 Land Surface Phenology #1	C1.02: Deep Learning in RS #2	D1.02: International Risk Reduction	A3.08: Land Cover Regional to Global	A4.10: Inland Water Bodies #2	C2.08: Coastal & Inland Water Quality #1	10:40 12:20
	Lunch Break											
13:30 15:10	C5.02 Trains and Tandem Missions	C6.01: Unmanned Aircraft #2	A3.05: NRT Forest Monitoring #1	B1.07: AEOLUS #1	A2.03: Snow in Earth Climate System #1	A3.15 Land Surface Phenology #2	C1.01: AI and Data Analytics #1	D1.04: Natural Hazard #1	C2.05: Next Generation Land Monitoring #1	A4.09: Wetlands	C2.08: Coastal & Inland Water Quality #2	13:30 15:10
	Coffee Break											
15:40 17:20	B6.02: Satellite EO Operations	C6.02: HAPS and Space 4.0	A3.05: NRT Forest Monitoring #2	B1.07: AEOLUS #2	A2.03: Snow in Earth Climate System #2	A3.14: Grassland Dynamics	C1.01: AI and Data Analytics #2	D1.04: Natural Hazard #2	C2.05: Next Generation Land Monitoring #2	B6.05: Radiative Transfer Modeling	C2.08: Coastal & Inland Water Quality #3	15:40 17:20
19:00	Poster Session											19:00

Friday

	Brown 1	Brown 2	Brown 3	Amber 1-2	Amber 3-4	Amber 5-6	Amber 7-8	Space 1	Space 2	Space 3	Space 4	
08:30 10:10	B4.06: Missions and Data Quality	C2.01: GNSS Reflectometry	B1.04: BIOMASS	A1.07: Water Vapour	A2.02: Alpine Snow	A3.13: Savannah Vegetation	C8.01: Commercial EO in Operations	D1.04: Natural Hazard #3	A3.09: Next Generation Land Cover Monitoring	B6.04 Optical Cal/Val #1	A4.07: Ocean Colour #1	08:30 10:10
	Coffee Break											
10:40 12:20	D2.05: Cultural & Natural Heritage #1	A4.08: Ocean Surface and Lower Atmosphere	D2.10: REDD+	A1.02: GNSS and SAR for NWP Models #1	A2.01: Permafrost #1	A3.16 South African Ecosystems	B6.03: Analysis Ready Data #1	D1.04: Natural Hazard #4	D2.04: EO for Resilient Cities #1	B6.04 Optical Cal/Val #2	A4.07: Ocean Colour #2	10:40 12:20
	Poster Session over lunch time											
14:00 15:40	D2.05: Cultural & Natural Heritage #2	A3.06: EO for Carbon Cycle Science	B6.01: Precise Orbit Determination	A1.02: GNSS and SAR for NWP Models #2	A2.01: Permafrost #2	A1.01 Atmospheric Assimilation	B6.03: Analysis Ready Data #2	D1.04: Natural Hazard #5	D2.04: EO for Resilient Cities #2	B6.04 Optical Cal/Val #3	A4.07: Ocean Colour #3	14:00 15:40

Atmosphere	Biosphere	Climate	Cryosphere	Geosphere	Methods	Missions	Risks	Sea	Space 4.0

PARTNERS AND SPONSORS

Main Partners

Agenzia Spaziale Italiana

European Commission

PATROCINIO
Comune di Milano

The following companies sponsored the LPS19

The European Commission's science and knowledge service
Joint Research Centre

The **Joint Research Centre** (JRC) is the science and knowledge service of the European Commission. The JRC supports EU and national policy-makers with independent scientific evidence and works with them on policy solutions that are effective, efficient, fair and sustainable.
About 2000 scientists at six locations in Europe work to ensure that policy-makers have the best available evidence when taking important decisions that have an impact on the daily lives of European citizens. The JRC also provides direct support to national authorities in areas ranging from disaster response, food safety and air quality to nuclear safeguards and security.
Our scientists work in cutting-edge research facilities which are also open to scientists from Member States working on policy relevant research.
The JRC works with more than 1000 research partners worldwide: with EU Member States and International Organisations, such as the European Space Agency, United Nations, the Organisation for Economic Co-operation and Development (OECD) and the World Bank.

TELESPAZIO
a LEONARDO and THALES company

Telespazio, a joint venture between Leonardo (67%) and Thales (33%), is one of Europe's leaders and one of the world's main players in satellite solutions and services. The company has its headquarters in Rome, Italy, and is supported by a staff of approximately 2500 people. Telespazio operates worldwide through numerous companies, and has a wide international network of space centres and teleports.

Mundi Web Services is a Copernicus Data and Information Access Services (DIAS).
The European Commission (EC) has launched an initiative to develop the DIAS that facilitate access to Copernicus data and information from the Copernicus services. By providing data and information access alongside processing resources, tools and other relevant data. This initiative is expected to boost user uptake, stimulate innovation and the creation of new business models based on Earth Observation data and information.
Mundi Web Services combines real-time Earth Observation data from Copernicus with data from several sources and turns them into products for companies through easy cloud functions and support.

Advanced Computer Systems ACS S.r.l. is an EXPRIVIA S.p.A. Company.
Exprivia / ITALTEL is an international group currently employing about 3700 professionals capable of enabling the digital transformation processes through solutions that involve the entire value chain.
By the end of 2018 Exprivia will finalise the fusion of all the controlled companies, including ACS. ACS will become the Exprivia Market Innovation Unit and Digital Factory dedicated to Aerospace and Defence Customers.

Google Earth Engine combines a multi-petabyte catalog of satellite imagery and geospatial datasets with planetary-scale analysis capabilities and makes it available for scientists, researchers, and developers to detect changes, map trends, and quantify differences on the Earth's surface.

Ecometrica is the global leader in downstream space information solutions. We turn the vast and growing streams of observation data from space, air and land into actionable insights for business, government and society.

The **European Centre for Medium-Range Weather Forecasts** (ECMWF) is an independent intergovernmental organisation supported by 34 states.
ECMWF is both a research institute and a 24/7 operational service, producing and disseminating numerical weather predictions to its Member States.
ECMWF has been entrusted by the European Union to implement two key parts of the Copernicus, Europe's flagship Earth Observation programme - the Copernicus Atmosphere Monitoring Service and the Copernicus Climate Change Service, to bring a consistent standard to the measurement, forecasting and predicting of atmospheric conditions and climate change.
The Copernicus Atmosphere Monitoring Service provides daily forecasts detailing the makeup composition of the atmosphere from the ground up to the stratosphere. The Copernicus Climate Change Service routinely monitors and analyses 22 essential climate variables to build a global picture of our climate, from the past to the future, as well as developing customisable climate indicators in relevant economic sectors.

CGI is a 75,000+ members' ICT global company, providing service and solutions from 400 offices in 40 countries worldwide. CGI is active in the space domain for 40 years, providing a range of upstream and downstream services. CGI is currently involved in a number of key ESRIN projects, including PDGS, exploitation platforms and industry growth in the oil and gas sector.

Airbus is a global leader in aeronautics, space and related services. In 2017 it generated revenues of € 59 billion restated for IFRS 15 and employed a workforce of around 129,000. Airbus offers the most comprehensive range of passenger airliners from 100 to more than 600 seats. Airbus is also a European leader providing tanker, combat, transport and mission aircraft, as well as one of the world's leading space companies. In helicopters, Airbus provides the most efficient civil and military rotorcraft solutions worldwide.

Terradue is a leading Earth Science Cloud Services provider with current developments focusing on empowering researchers in curating and delivering scientific information, and to create Cloud marketplaces for environmental data analytics. Terradue addresses the Earth Sciences research & education sector, with core competencies aimed at providing Cloud Platform services and inter-connecting distributed systems.
Terradue supports international organizations, research institutes and commercial companies with cutting-edge tools to integrate Earth Observation services and deploy production-ready apps onto their preferred Cloud.

GMV is a trusted partner of leading Satellite Operators, Satellite Manufacturers and Space Agencies worldwide. Since 1984, we provide engineering, software development and systems integration in the areas of mission analysis, GNC, satellite control, flight dynamics, data processing, mission planning, navigation, on board software and applications. Involved in more than 500 satellite missions and having a GMV's portfolio of flight proven products for satellite operations, today running in more than 270 satellites.

Esri applies The Science of Where in every organization. We pioneer real world-world problem solving using geographic information systems (GIS). Using this powerful platform to reveal deeper insights in their data, Esri users are creating the map that run the world.

Based in Munich, Germany and established in 2002, **European Space Imaging** is the leading premium supplier of global very high-resolution (VHR) satellite imagery and derived services to customers in Europe, North Africa and CIS countries. With over 15 years' experience, European Space Imaging has developed a reputation for expert and personalized customer service and an unbeatable track record for supplying tailored very high-resolution imagery solutions to meet the diverse projects and requirements of their customers.
Furthermore, European Space Imaging is the only European satellite data provider to supply imagery at true 30 cm resolution and who own and operate their own multi-mission dedicated ground station for direct satellite tasking and local data downlink.

EUMETSAT is an intergovernmental organisation and was founded in 1986. Our purpose is to supply weather and climate-related satellite data, images and products – 24 hours a day, 365 days a year – to the National Meteorological Services of our Member States in Europe, and other users worldwide.

DFH Satellite Co., Ltd. is a world's leading aerospace company that provides solutions and service of high-performance satellite for earth observation, space communication, and space science experiment and new technology demonstration. By now we have successfully deployed around 90 satellites in orbit. We possess the absolute advantage in this domain.

CloudFerro (CLFR) is a Polish technological company established at the beginning of 2015 by a group of managers with over 20 years of experience in the ICT business.

ARESYS is a Politecnico di Milano spin-off company, operating since 2003 in the field of digital signal processing with particular focus on remote sensing and geophysics. ARESYS offers ad-hoc innovative solutions to space-borne, air-borne and ground based remote-sensing problems.

From our spacecraft to our APIs, we engineer our hardware and software to service the largest fleet of Earth-imaging satellites in orbit and scale our 7+ petabyte imagery archive, growing daily. **Planet** is an integrated aerospace and data analytics company that operates history's largest commercial fleet of satellites, collecting daily, high resolution imagery of everywhere on earth. Planet's daily snapshot captures a massive amount of information about our changing planet, and is delivered with the software and analytics users need to make critical business decisions. To learn more visit http://www.planet.com.

Thales Alenia Space, a joint venture between Thales (67%) and Leonardo (33%), is a key European player in space Telecommunications, Navigation, Earth Observation, Science & Exploration, Orbital Infrastructures & Space Transport. The company also teams up with Telespazio to form the "Space Alliance", which offers a complete range of services and solutions. Thales Alenia Space posted consolidated revenues of about 2,6 billion euros in 2017, and has 8,000 employees in 8 countries.

OHB Italia SpA is a leading company in Italy in the field of space systems design, development and integration. The company is a subsidiary of OHB SE, a European Space and Technology group that currently employs 2700 people in two Business Units: "Space Systems" and "Aerospace & Industrial products". OHB Italia core business is the design, the development and integration of satellites, payloads for scientific and application missions, space station facilities and Space Surveillance Awareness Telescopes. The company, founded in 1981, has headquarters in Milan and offices in Rome and Benevento. Thanks to a consolidated technical expertise, advanced technologies and highly qualified human resources, OHB Italia acts as prime contractor at system level and as supplier of subsystems, instruments and equipment for the space segment.

Sobloo is a DIAS, a cloud platform, build by a consortium (Airbus / Orange / Capgemini) to enable scientists, businesses and entrepreneurs to create business models and develop software and applications based on Copernicus Sentinel Earth Observation Data.

SAP is the market leader in enterprise application software, helping companies of all sizes and in all industries run at their best: 77% of the world's transaction revenue touches an SAP system. Our machine learning, Internet of Things (IoT), and advanced analytics technologies help turn customers' businesses into intelligent enterprises. Our end-to-end suite of applications and services enables our customers to operate profitably, adapt continuously, and make a difference. With a global network of customers, partners, employees, and thought leaders, SAP helps the world run better and improves people's lives.

SITAEL is the largest privately-owned Space Company in Italy and worldwide leader in the Small Satellites sector. With highly qualified employees and state-of-the-art facilities, SITAEL covers a wide range of activities in development of small satellite platforms, advanced propulsion systems and on-board avionics, providing turn-key solutions for Earth observation, telecom and science.

Leonardo is one of the world's top ten players in Aerospace, Defence and Security, a trusted long-term partner of choice for governments, institutions and private customers, delivering cutting-edge and dual-use technologies. Headquartered in Italy, Leonardo has over 46,000 employees and a significant industrial presence in four domestic markets, as well as strategic partnerships in the most important high potential international markets. Wherever air, sea, land and cyber- defence and security are needed, Leonardo's customers find effective solutions for their requirements through a complete and integrated offer covering every domain. For what Space in particular is concerned, Leonardo provides a full offer, which includes sensors, electro-optical payloads, advanced robotics systems and platform equipment. Through its affiliated and controlled companies Leonardo covers the full value chain, from design to development of integrated satellite systems, management of satellite communication networks and development of geo-information and earth observation applications.

Planetek Italia is an Italian SME, established in 1994, which employs 45 men and women, passionate and skilled in Geoinformatics, Space solutions, and Earth science. We provide solutions to exploit the value of geospatial data through all phases of data life cycle from acquisition, storage, management up to analysis and sharing. Application areas range from environmental and land monitoring to open-government and smart cities, and include engineering, defence and security, as well as scientific missions and planetary exploration. The main activity areas are:

- Satellite, aerial and drone data processing for cartography and geo-information;
- Design and development of SDIs for geospatial data archive, management and sharing;
- Design and development of real-time geolocation-based solutions, through positioning systems such as GPS/Galileo/GNSS and indoor location systems;
- Development of software for the satellite on-board data and image processing and for ground segment infrastructures.

DigitalGlobe is an industry leader in satellite imagery and geospatial intelligence, serving a spectrum of industries across government, non-profit, and commercial sectors. Our portfolio of imagery and analytics products simplifies access to critical information about our changing planet -- empowering customers to answer complex questions that impact environments, economies, and lives. As part of Maxar Technologies, DigitalGlobe is part of a family of integrated businesses that are accelerating the new space economy.

CS's expertise in mission critical applications and systems makes it the best partner in sectors with strong growth potential, such as defence, space and security, aeronautics, energy and transportation. With €200 million in revenues and 2000 employees worldwide, CS is an established provider, acknowledged by major customers for its expertise and commitment of service to customers. CS, European key player in satellite imaging and data processing, proposes innovative solutions for integrating and merging data (satellite data, telecommunications, information gathering & location, field surveys, meteorological data...) within a single system. By positioning itself along the entire value chain, from sensors to applications, CS is able to respond effectively to all its customers' requirements, from design studies & mock-up to operational tools, while meeting the challenges of interoperability and operational performance.

Serco Europe is a leading provider of professional, technology and management services and is part of an international service company with employees around the world.
For the Space sector we provide project matter experts and system engineering management support, delivering end-to-end services in support to our Customers and bringing innovative solutions.

UK Space Agency is responsible for all strategic decisions on the UK civil space programme and provide a clear, single voice for UK space ambitions.

Earth datacubes are seeing their breakthrough as enabler of analysis-ready, user-centric Big Data services. The pioneer datacube engine, **rasdaman**, is world-wide leading according to ESA and other experts, standing out through its performance, scalability, flexibility, security, and standards support, plus its capability for planetary-scale peer federations, shown on Petabyte satellite and climate data, with more than 1000x cloud parallelization. Rasdaman is the official reference implementation and blueprint for the OGC and ISO datacube standards.

CLS provides its clients - government administrations, institutions, teams of scientists, private companies, with a wide range of services and solutions to assist decision making based on a unique combination of remote satellite data, in situ data drones and modelling data as well as our employee's expertise.

As a part of **VITO**, an independent research and technology leader, VITO Remote Sensing offers expertise, knowledge, data, services and solutions in Earth observation to let you see and make use of the added value of remote sensing, a key enabler in our space economy. From user needs to technology and end-to-end EO support, VITO Remote Sensing provides the insights you need for diverse applications such as agriculture, vegetation, water & coast, climate, security and infrastructure.

ACRI is a group of independent SMEs developing worldwide, integrating scientific expertise and engineering skills to deliver innovative project management, design, development & operations of complex environmental systems. ACRI is an active member of communities involved in space and data sciences, physical and numerical modelling, high performance computing. ACRI serves: - Space Agencies: end-to-end space data simulators, data processing, archiving and mission performance assessment; - Space data users: environmental surveillance and forecast, marine and land planning; - Civil engineering market in hydraulic & coastal engineering.

MetaSensing BV is a Dutch/Italian SME which provides radar solutions. MetaSensing designs, manufactures and operates complete radar sensors (airborne and ground-based) at different frequencies for a large variety of applications. Those sensors are equipped with proprietary control, configuration, and processing and visualization software. MetaSensing' s sensors are compact, light-weight and high resolution providing the most cost-effective solutions for detection, mapping, surveillance and imaging to governments, universities and commercial companies. MetaSensing has offices in the Netherlands, Italy and Singapore.

Meteorological and Environmental Earth Observation - **MEEO S.r.l.** (www.meeo.it) is a privately-held company devoted to the implementation and development of products and services based on remote sensing of the Earth-Atmosphere system. The main expertise offered deals with implementation and operation of Earth Observation and geo-spatial data infrastructure tools, e-Collaborations and e-Research services, climate data services, Image information mining tools, satellite and ground data integration, change detection application, multi-source/multi-temporal analysis, WebGIS Applications development and implementation for private and public local administrations; standardization of processes and data storage / transmission tools (OGC, INSPIRE). MEEO has developed and operates ADAM (https://adamplatform.eu): ADAM is an efficient and robust system that allows managing the full data life-cycle through a so-called datacube approach: discovery, access, exploration, processing and visualization services are made available on top of the 3D virtual globe powered by ESA-NASA Web World Wind, the natural environment where the users (Earth Scientists, citizens, ...) find easy-to-use service functionalities to dynamically interact with Earth Observation products. ADAM provides also a Jupyter Notebook and a set of APIs for data access and processing to satisfy the needs of a large variety of users. Finally, a set of E-collaboration services (instant messaging, mailing, Forum, ...) facilitate the dynamic approach to collaborative working of the Virtual Research Community members.

IAGB is a leading European technology company, focused on future-oriented applications of high-technology and science. We plan, implement and operate. We develop solutions for Automotive, InfoCom, Mobility, Energy & Environment, Aeronautics, Space and Defence & Security customers. Through our Geodata Factory in Dresden we offer tailored services and solutions for our customers in the fields of geodata analysis, GIS, remote sensing and photogrammetry. This includes reference mapping and monitoring tasks for infrastructure, agriculture and forestry as well as analyses and scenarios in the context of disaster risk management and environmental management. In addition, we develop customized GIS applications for our customers to make their daily work more efficient. Quality and experience paired with state-of-the-art infrastructure and the use of the latest technologies in the fields of automatic image analysis (DeepLearning) characterize our Geodata Factory with its 60 specialists.

EOX IT Services GmbH is a privately held software engineering and consulting company and among the main ESA contractors in Austria.
It has a 10-year long record of space software projects building components of Earth Observation satellite payload ground segments most of them including (sophisticated) geospatial Web GUI implementations together with adequate server infrastructure functions.

Progressive Systems delivers IT solutions for Earth Observation data exploitation enabling Environmental Monitoring and Management. Such solutions, based on the one hand on scientific knowledge and on the other hand on specific competence in data management, operations and cloud computing, ease as well the management of processes related to the exploitation of Earth Observation data at any level of complexity.

The **European Association of Remote Sensing Companies** (EARSC) is a professional industrial body (trade association) with the mission to foster growth of the Earth-observation (EO) services sector.

Harris Geospatial Solutions continues to be the leading provider of software products that extract meaningful information from all types of remotely sensed data. An in-depth knowledge of geospatial analytics and a highly-tuned process for applying machine learning technologies let us deliver game-changing, enterprise-level solutions across industries.

SSC is a leading global provider of advanced space services. We are a full-service-provider of satellite ground segment and engineering services as well as launch services for sounding rockets, balloons and small satellites to commercial, defence and institutional customers.

KSAT is a provider of Ground Station Services for polar orbiting satellites from a global network of 160 antennas at 21 sites. Experienced provider of SAR-based sophisticated maritime monitoring services such as oil spill detection, vessel detection and ice information. Partner in KSAT gms - InSAR ground monitoring services.

Cubert develops innovative optical sensors for spectral analyses. Our hyperspectral snapshot cameras combine the advantages of a digital camera with the spectral resolution and accuracy of a spectrometer enabling real-time spectral imaging for a wide range of applications.

Antrix Corporation Limited, the commercial arm of the Indian Space Research Organisation (ISRO), markets the products and services emanating from the Indian Space Program. The Earth observation data generated by the Indian Remote Sensing (IRS) satellite program are marketed in Europe through a successful cooperation with GAF AG, a leading geo-spatial service provider. GAF is part of the Telespazio group and is generating, amongst other things, high-end digital elevation models based on optical (multi-) stereo satellite data. During this longstanding cooperation GAF has generated over 8 million km² of the 5 m resolution digital surface model Euro-Maps 3D, based on data from the Indian Cartosat-1 stereo satellite.

ENVRI is a European Community of 27 Environmental Research Infrastructures supporting the Global Earth System Science. The community contributes to in-situ component of global Earth observations by providing multidisciplinary data, services and access opportunities for researchers, private sector and policy-makers.

C-CORE is a Canadian Research and Development Corporation that creates value in the private and public sectors by undertaking applied R&D, generating knowledge, developing technology solutions and driving innovation. Established in 1975 to address challenges facing oil and gas development in ice-prone regions, C-CORE is now a multi-disciplinary R&D organization with world-leading capability in Remote Sensing, Ice Engineering and Geotechnical Engineering. Many complex projects require a multi-faceted approach; C CORE combines this expertise for a complete, end-to-end solution. C-CORE's capability in Remote Sensing combines expertise in Earth Observation with Radar and Vision Systems to provide operational services, product development and applied R&D to advance new technologies for harsh environments with industry and government applications in offshore O&G, onshore pipeline operations, surface mining, and security and environmental monitoring. C-CORE's Remote Sensing team has extensive experience in satellite monitoring and applications development. Since the launch of RADARSAT-1 in 1995, C-CORE has led or participated in over 100 Earth Observation projects, representing tens of millions in revenue for the corporation. To execute these projects, C-CORE's personnel master various software packages designed to analyse radar and optical satellite imagery, including PCI Geomatica, ARC-GIS and MATLAB. In addition, many of these individuals have had formal training and extensive project experience on the analysis of multi-polarization and polarimetric SAR data. C-CORE's expertise is significantly enhanced with the addition of LOOKNorth. LOOKNorth is a national Centre of Excellence for Commercialization and Research hosted by C-CORE. LOOKNorth's purpose is to validate and commercialize monitoring technologies that support responsible, sustainable development of Canada's Northern resources and to promote the use of EO technologies in environmental monitoring for northern stakeholder groups. C-CORE is ISO

9001:2015 certified, and all quality processes are prescribed within its ISO certified quality management system.

Magellium benefits from recognized skills in the fields of Earth observation, geographic information systems, geo-intelligence and vision-based embedded systems. These are the four departments of the company. Our offer includes scientific studies, algorithm and software system development, supply of turnkey products and services, as well as consulting services.

RAL Space at the Rutherford Appleton Laboratory (RAL) carries out an exciting range of world-class space research and technology development. With significant involvement in over 210 space missions, RAL Space is at the very forefront of UK space research. Its expertise covers a wide range of disciplines including: earth observation, atmospheric chemistry, astronomy, solar physics, planetary physics, fundamental physics and radio propagation. Engineering disciplines within RAL Space include space electronics, detector systems, thermal and mechanical engineering, optics design, software engineering and e-Science.

Wasat provides services based on satellite remote sensing, GIS and IT for clients in agriculture, environmental protection and archaeology sectors. The company develops innovative tools for satellite data processing and analysis. The new service to be presented at LPS'19 is Jupyteo.com that supports developers of satellite applications and EO scientists in building Jupyter notebooks in cloud environment.

Eversis Sp. z o. o. is a Polish technology company. The company's mission is to support customers' business by delivering the high quality and business-oriented technology solutions. We deliver tailor-made, advanced applications and software solutions which use the internet browser or mobile as the user interface.

MIRO Analytical Technologies has been founded to bring the latest mid-infrared gas sensing technology based on quantum cascade lasers (QCL) to the market. We are using newly developed multi-colour QCLs to build compact, yet very powerful, laser absorption spectrometers targeting gas sensing applications of small molecules. The instrument we developed is able to detect several air-pollutants and greenhouse gases simultaneously, directly, and with high precision.

Hexagon's Geospatial division helps you make sense of the dynamically changing world. Known globally as a maker of leading-edge technology, we enable our customers to easily transform their data into actionable information, shortening the lifecycle from the moment of change to action. Hexagon's Geospatial division provides the software products and platforms to a large variety of customers through direct sales, channel partners, and Hexagon businesses.
Hexagon is a global leader in digital solutions that create Autonomous Connected Ecosystems (ACE). Hexagon (Nasdaq Stockholm: HEXA B) has approximately 19,000 employees in 50 countries and net sales of approximately 3.5bn EUR. Learn more at hexagon.com and follow us @HexagonAB.

Brockmann Consult is offering consultancy and data information services for environmental data. The company is working with Earth Observation data to developer, produce and deliver services to private and public customers. ESA and non-ESA EO data play a central role for its service portfolio.

Taitus Software Italia Srl is a software development company specializing in advanced mission analysis, planning and simulation tools for space applications, with particular focus on Earth Observation. Taitus applications are powered by in-house-built technology that makes extensive use of modern 3D computer graphics, integrated with advanced user interfaces.

VisioTerra is a scientific Consulting for Earth Observation.

The **Climate and Cryosphere** (CliC) project is one of the core projects of the World Climate Research Programme (WCRP), serving as the focal point for climate science related to the cryosphere, its variability and change, and interaction with the broader climate system.

COSPAR is the Committee on Space Research established in 1958 by the International Science Council. Its activities cover all domains of space research, including all disciplines related to the Earth' atmosphere, ocean, surface, interior, ionosphere and space weather. COSPAR Assemblies gates several thousands of scientists every two years. Other COSPAR events include symposia in developing and emerging countries, capacity building workshops, and scientific publications and roadmaps.

The fields of interest of the **GRS Society** are the theory, concepts, and techniques of science and engineering as they apply to the remote sensing of the earth, oceans, atmosphere, and space, as well as the processing, interpretation and dissemination of this information.
Members of GRSS come from both engineering and scientific disciplinary backgrounds. Those with engineering backgrounds often support geoscientific investigations with the design and development of hardware and data processing techniques, thereby requiring of them familiarity in areas such as geophysics, geology, hydrology, meteorology, etc.
Conversely, discipline scientists find in GRSS a forum for the dissemination and evaluation of remote sensing related work in these areas. This fusion of geoscientific and engineering disciplines gives GRSS a unique interdisciplinary character and an exciting role in furthering remote sensing science and technology.

UNIVERSITÀ DI PAVIA

The **University of Pavia** is a Research University, founded in year 1361, offering a wide variety of disciplinary and interdisciplinary teaching organized in 18 Departments and has study programmes at all levels: Bachelor's degrees, single-cycle Masters degrees, research degrees, speciality schools and level I and II Masters degrees.

POLITECNICO MILANO 1863

Established in 1863, **Politecnico di Milano** is one of the most outstanding technical universities in Europe, and the largest Italian university in Engineering, Architecture, and Design, with nearly 45,000 students.
Research plays a central role in the university mission, aiming at providing the best standards in education. It is fuelled by strong links to corporate research, considerable European funds, and a set of well-equipped laboratories.
Politecnico di Milano offers innovative programmes at all academic levels. Almost the entire postgraduate academic offer is taught in English, thus attracting an ever-increasing number of international students, coming from more than 100 countries.

MACFAB

Macfab is a leading contract manufacturer of precision custom components and sub-assemblies used in four major industry sectors: analytical instruments, optics & photonics, defence & security, and satellites & space.
Serving customers across North and South America, the United Kingdom, Europe and Asia, Macfab supports early-stage product development as well as production volumes, and offers a complete suite of precision machining, finishing, cleaning and assembly solutions.

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