Company Overview – April 2022

Profile

- ALMA Sistemi S.r.l. is an Italian SME providing high level consultancy and engineering in the space and defence market
- Established in 2005
- 15 employees (plus 2 permanent consultants)
- 1,26 M€ turnover in 2021 (provisional)
- Certified ISO 9001:2015
- RTD Projects and industrial contracts (MGSE)

Customer	Completed Projects	On going projects
EC FP7 – H2020	6	5*
MGSE	8	1**
Italian Space Agency	3	1**
National RTD Programs	2	2

* Of which 4 as coordinator / ** As coordinator

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Mission: Engineering at all levels

ALMA covers the inception, establishing and execution of RTD and industrial projects in the public (ESA, EU, ASI) and private space market covering:

- System engineering for satellite and payloads check–out equipment (Mechanical and Electrical Ground Segment Equipment) covering design, development and verification;
- Added-value services in the space market focusing on Earth Observation, Scientific data exploitation and navigation application;
- High level software development for aerospace applications with specific regard to remote sensing data and image processing;
- Support services: Project Management, Quality Assurance, CADM and documentation;
- Support to Market Analysis in the space science sector.

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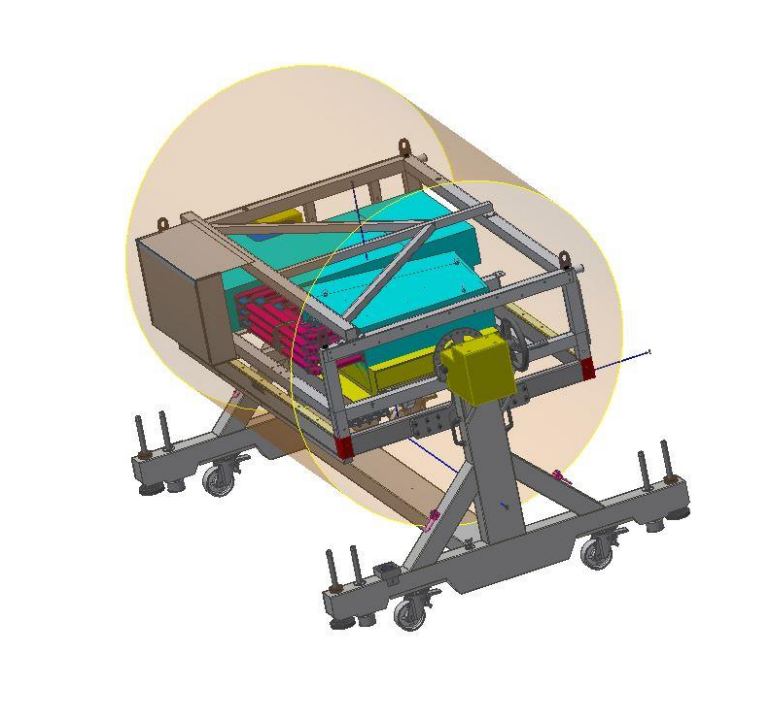
ALMA Sistemi Srl – MGSE accomplishments

MetOp-2G Scatterometer MGSE

Airbus Defence & Space GmbH, Friderishafen, DE



Multy-Purpose Trolley: CAD model

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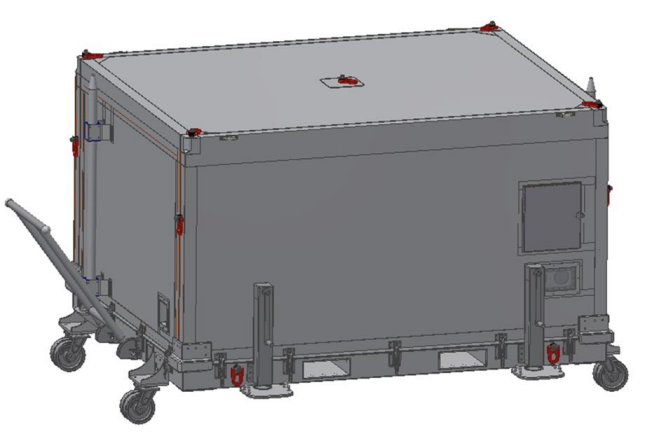
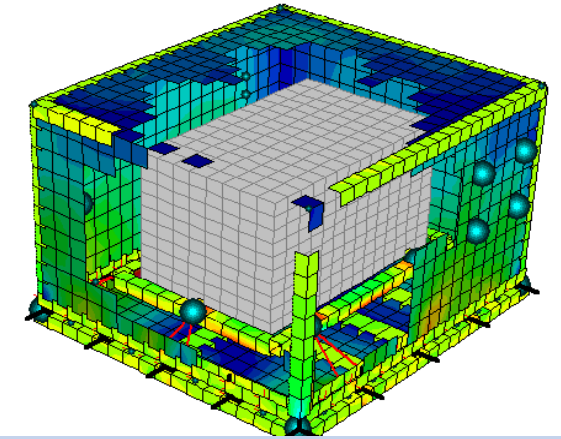
ALMA Sistemi Srl – MGSE accomplishments

MetOp-2G Scatterometer MGSE Transport container

Airbus Defence & Space GmbH, Friedrichshafen, DE





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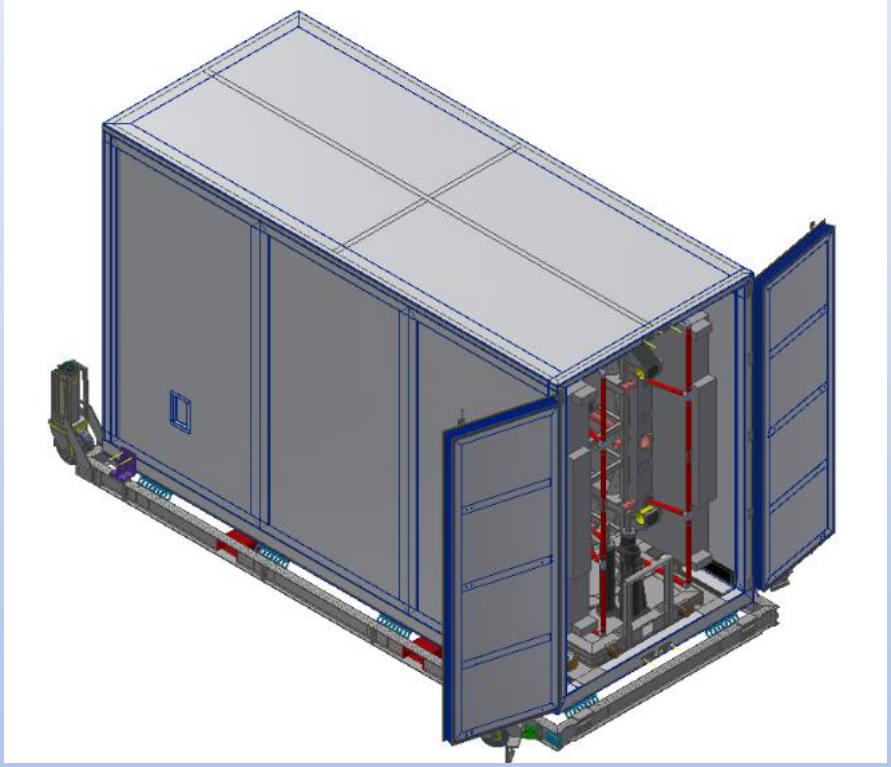
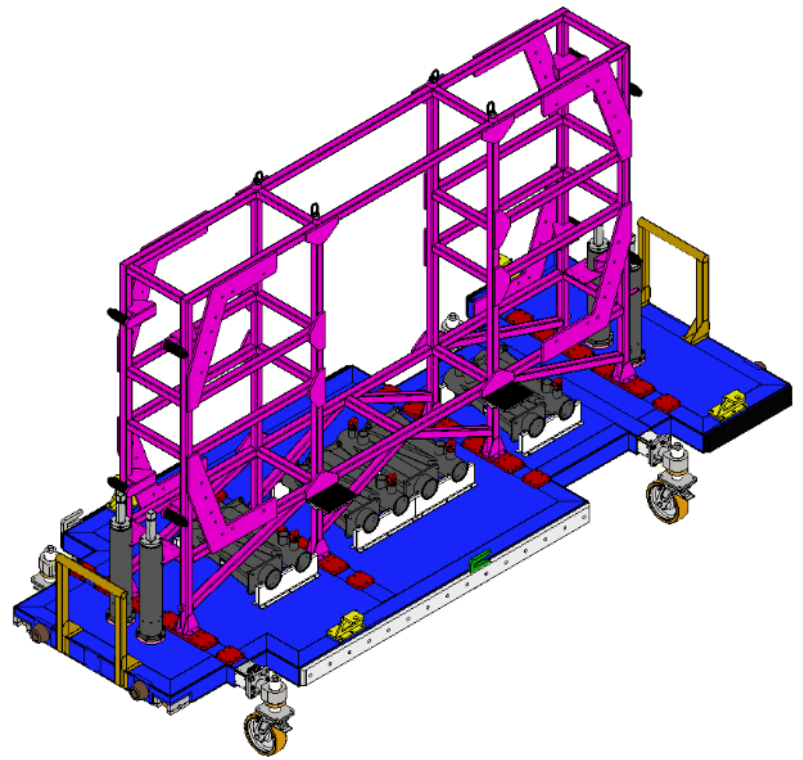
ALMA Sistemi Srl – MGSE accomplishments

Neosat Solar Array Transport Container

ThalesAleniaSpace Cannes SA





SATC External and internal view

SATC overall dimension are 6000x 2438 x 3500 (L x W x H)

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ALMA Sistemi Srl – MGSE accomplishments

SpaceBus NEO Solar Array Transport Container

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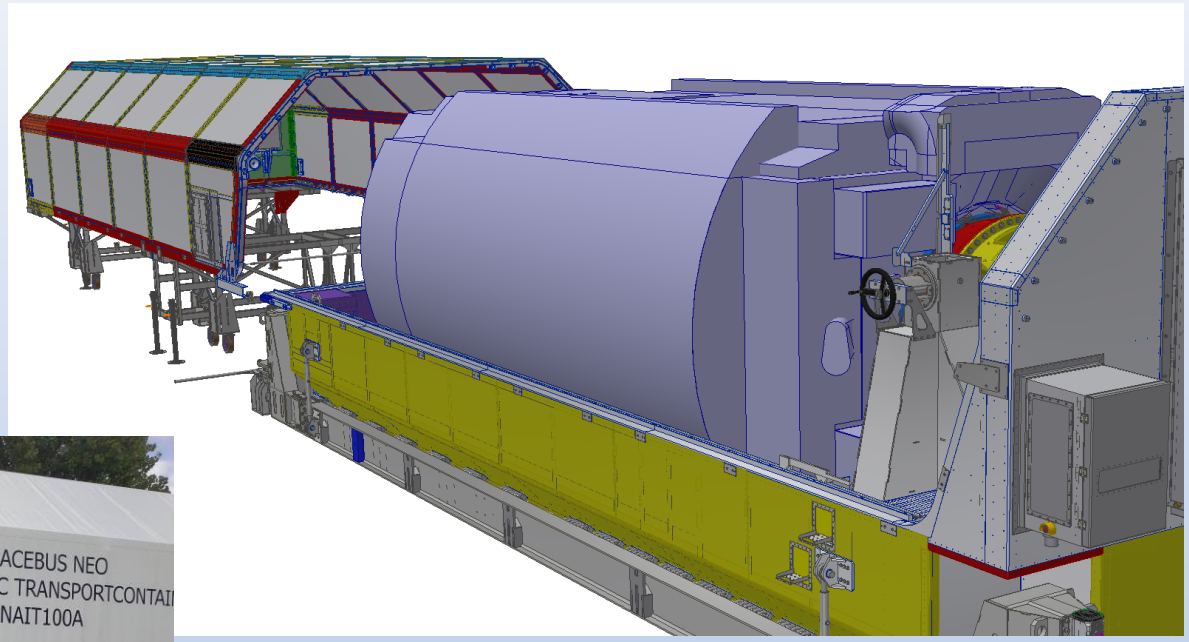
ALMA Sistemi Srl – MGSE

SpaceBus NEO Satellite Transport Container

ThalesAleniaSpace Cannes SA



Alma-Sistemi MGSE team is able to develop all the design phases of all **MGSE** different typologies, starting from the proposal up to the Critical Design Review according to ESA ECSS standards.

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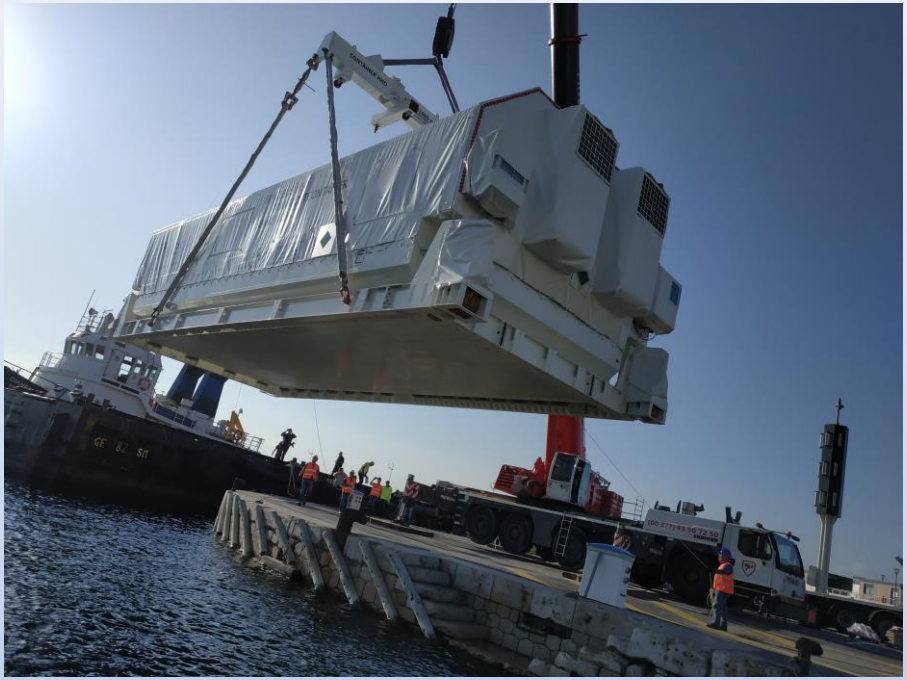
ALMA Sistemi Srl – MGSE accomplishments



Arrival at TAS-F premises in Cannes

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ALMA Sistemi Srl – MGSE accomplishments

SpaceBus NEO Satellite Transport Container

ThalesAleniaSpace Cannes SA

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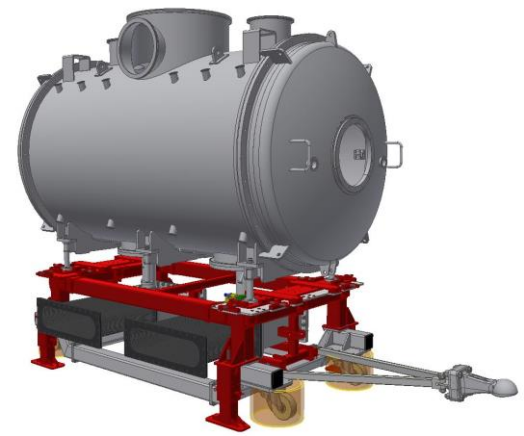
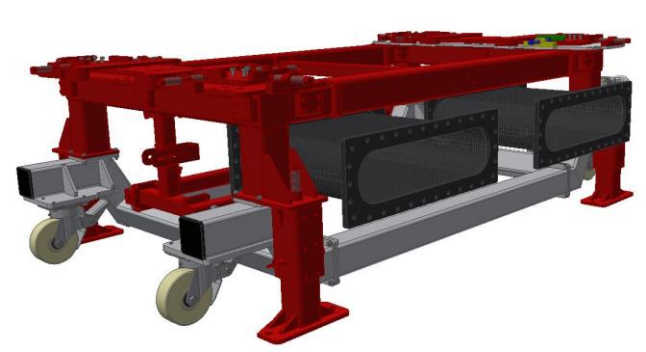
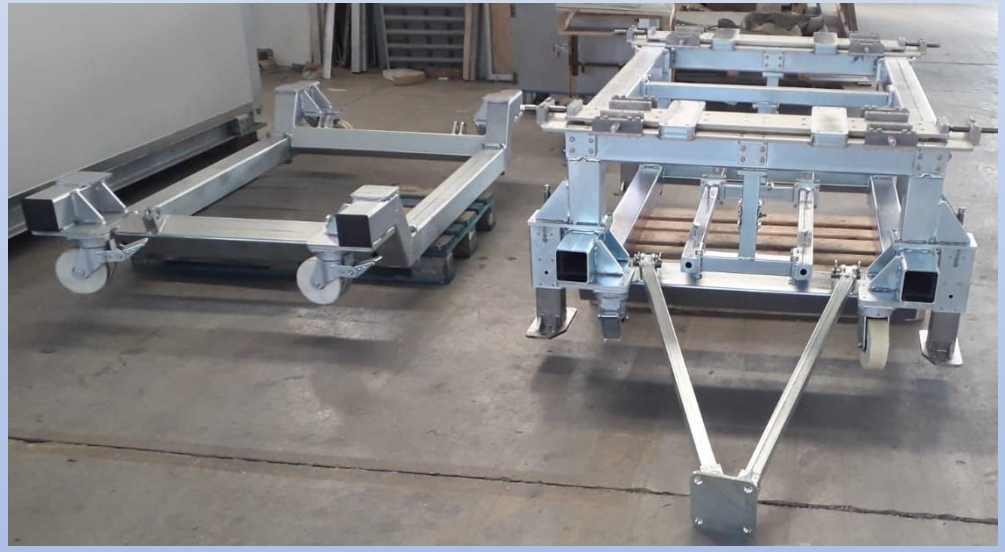
ALMA Sistemi Srl – MGSE accomplishments





Cryostat trolley for particle accelerometer

European Spallation Source



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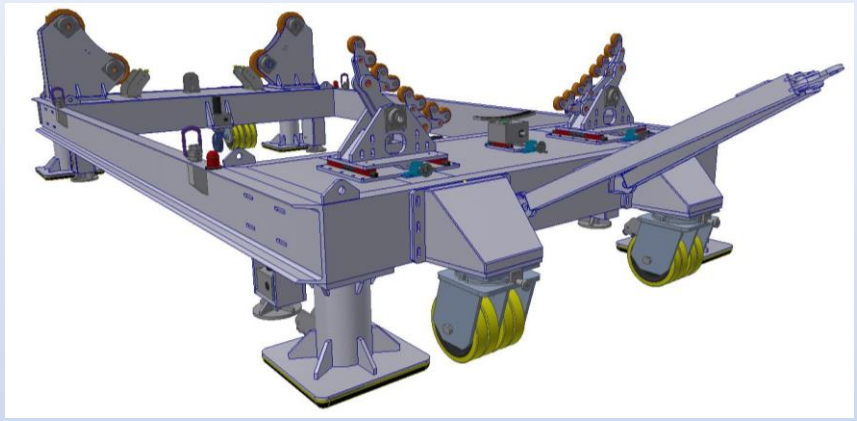
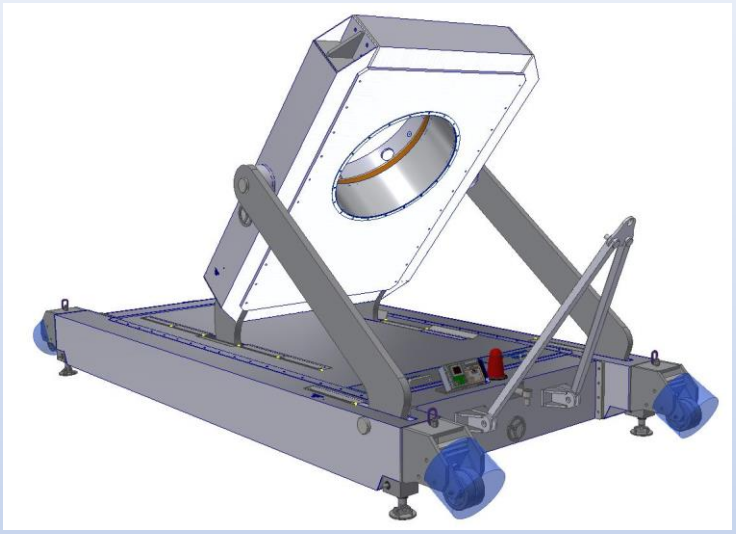
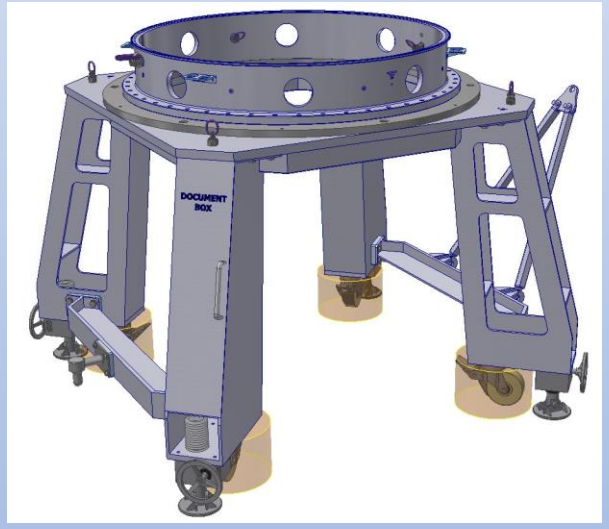
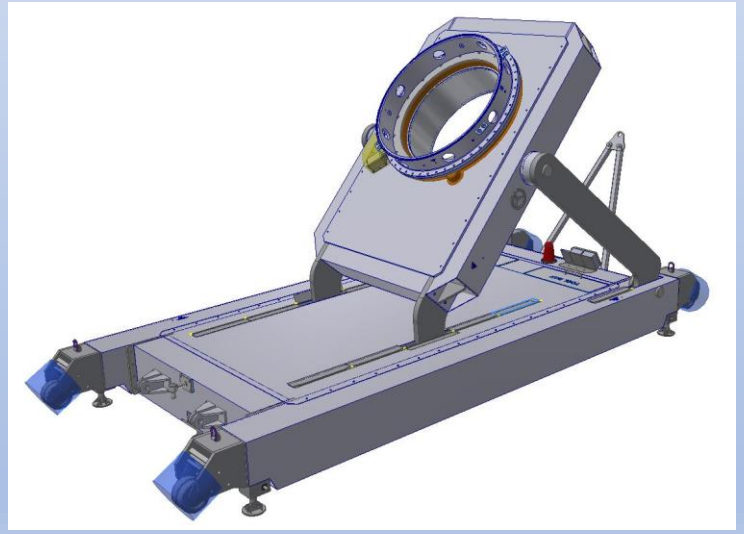
ALMA Sistemi Srl – other MGSE









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RTD Projects major achievements (completed)

- **HORUS** – Heritage and Observation Retrieval Under Sand, in cooperation with Rovsing A/S (DK); customer European Space Agency - ESA.
- **PAGIS** – PlAnetary Geoscience Information System in cooperation with IRSPS (I); final customer Italian Space Agency - ASI;
- **WHERE** – World Heritage monitoring by Space, in cooperation with Nextant SpA (I); final customer: Italian Space Agency - ASI;
- **SIMONA** - Satellite assets Integration for Maritime situatiON Awareness in partnership with Engineering SpA (I). Customer ESA (ARTES-20).
- **Aphorism** – Innovative methods for ash plume and earthquake monitoring by remote sensing in partnership with INGV (I). Customer EU-FP7;
- **ITACA** – Innovative Technologies for Underwater archaeology by remote sensing in partnership with Planetek Hellas (GR). Customer EU-FP7.
- **PALADIN** – H2020 - SME Instrument phase 1 – Market Analysis for avionic plasma antenna. KO 01 July 2015, customer EU. Program completed.

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RTD Projects major achievements (completed)

- **STARLET** – Plasma antenna for satellite navigation. Contract signature, customer ASI.
- **CLIMA**– Cultural Landscape risk Identification, Management and Assessment; Joint-Program-Initiative Cultural Heritage (JPI-CH).

- **EVER-EST -** European Virtual Environment for Research - Earth Science Themes; (H2020 coordinated by European Space Agency).
- **LUMINO –** Luminescence dating instrument for planetary exploration. Coordinator. RTD program co-funded by Lazio Region.

- **M2P** – Plasma metamaterials for telecommunication. Coordinator. RTD program co-funded by Lazio Region.
- **PATH** - Plasma Advanced Technologies – Research Innovation Staff Exchange. Coordinator of a team including organizations from Italy, UK, Greece and China (www.path-project.eu).

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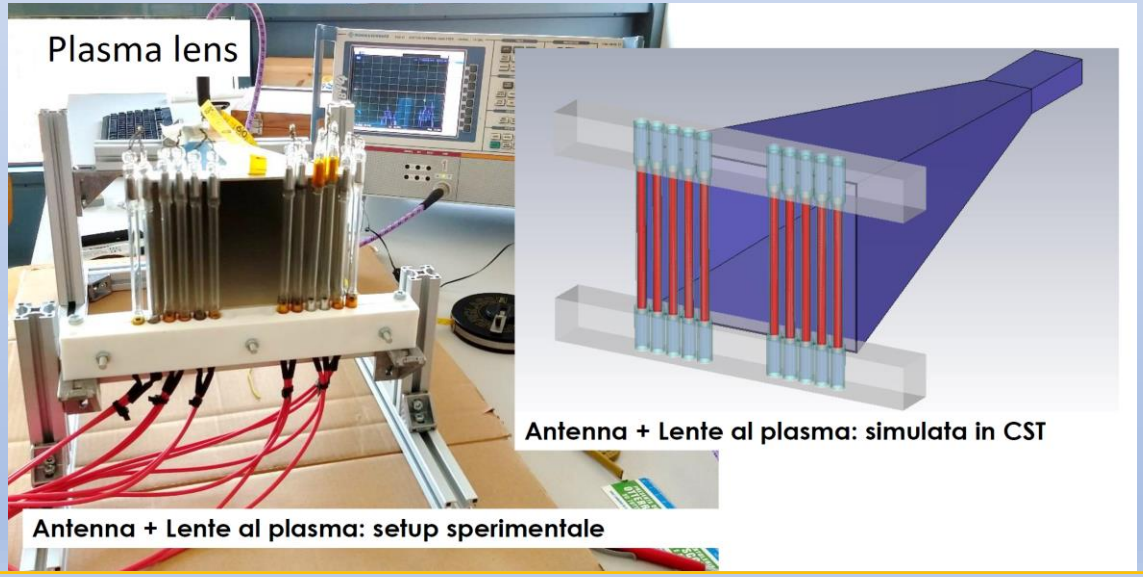
RTD Projects: Metamaterial & Plasma Antenna

The objective of the M2P project is to launch new technologies for telecommunication applications through the use of advanced materials. This is achieved by combining the innovative technology of meta-materials – structures with properties superior to ordinary materials – with the dynamic characteristics of the plasma for the realization of highly innovative communication structures, again non-existent at European level, applicable to the aerospace sector.



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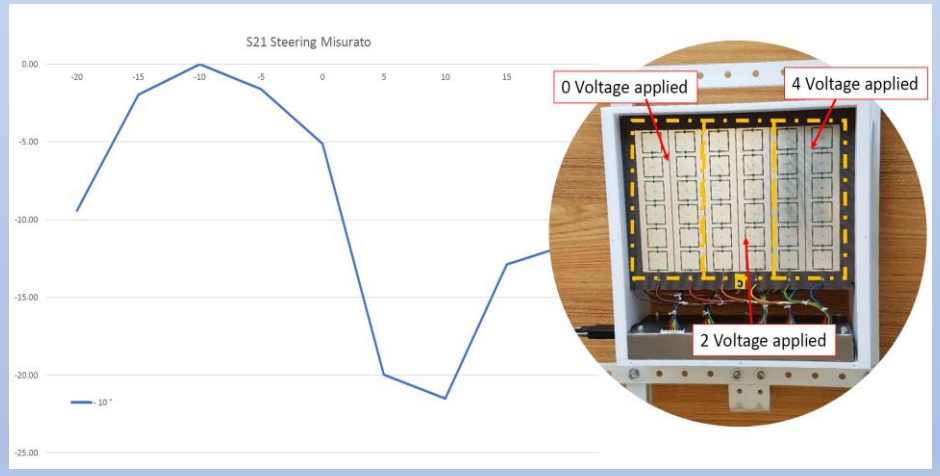
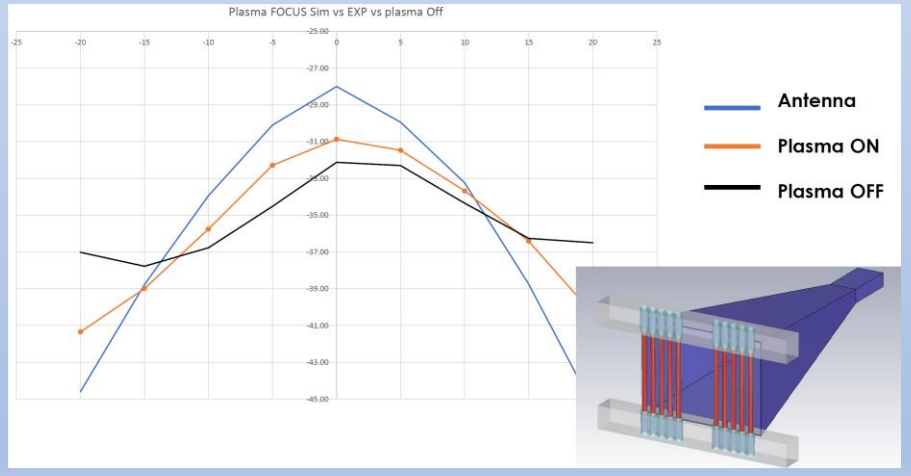
RTD Projects: Metamaterial & Plasma Antenna

The study of the material arises from the growing need to create antennas for telecommunication and navigation with a high gain, capacity for reconfigurability, antijamming and antispoofing potential and with characteristics of weight, dimensions and consumption more and more sophisticated. Alma Sistemi Srl, which has been operating in the aerospace and defense sector for over 10 years, with significant results in the field of consultancy and new development products and services, has established itself on the international market in the sectors of remote sensing, image processing, software development of tests for space and avionics systems.





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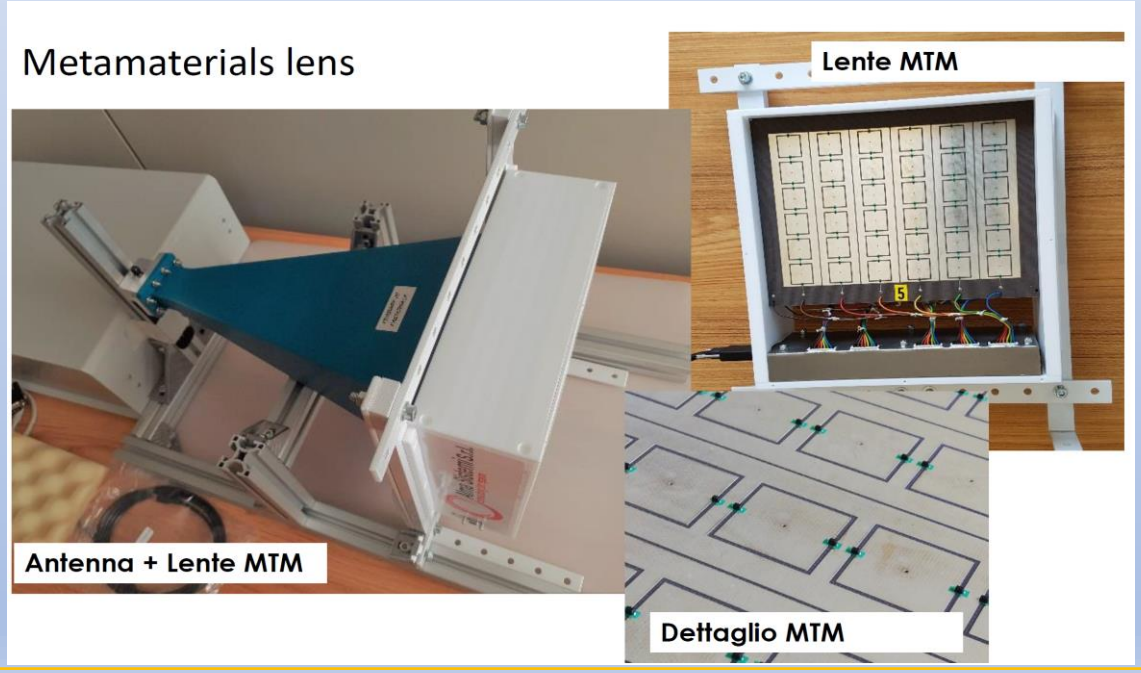
RTD Projects: Metamaterial & Plasma Antenna

The M2P project, developed in partnership with the Engineering Department of the University Roma Tre, is the latest in a series of Research, Development activities and Innovation, which sees Alma Sistemi as the protagonist at an international level in the fields of computer and mechanical engineering and in the engineering of project, especially in the areas of application of space, environment and ICT.



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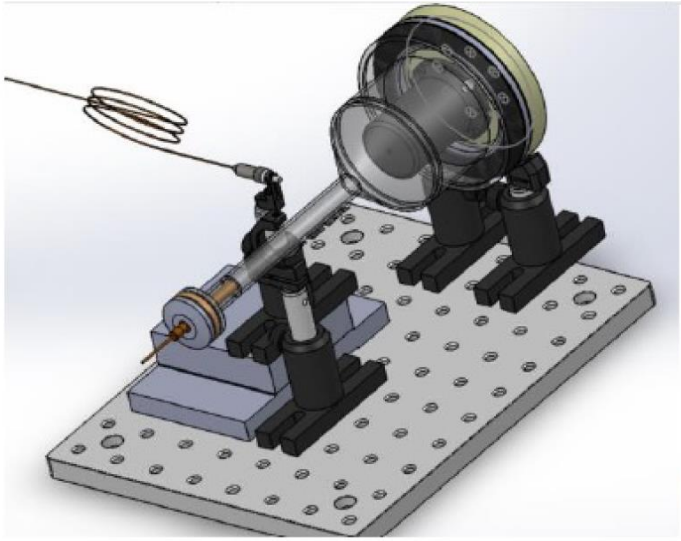
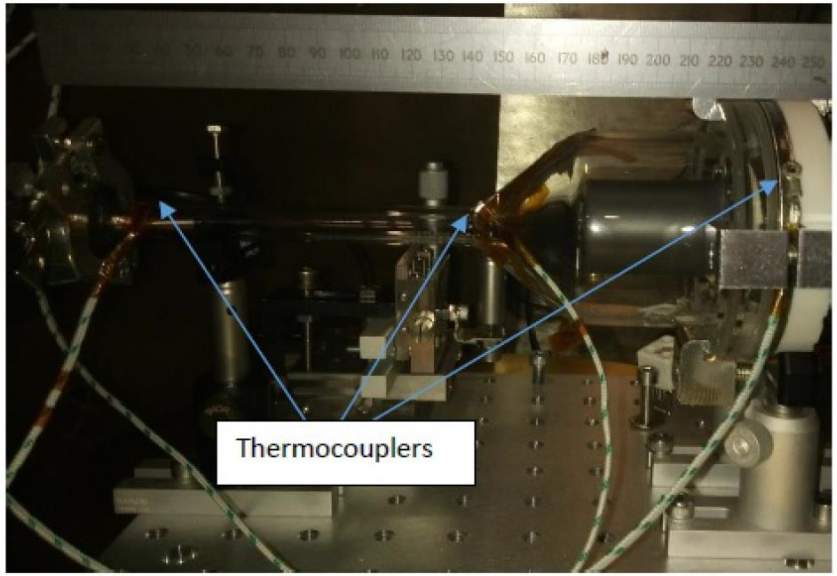
RTD Projects: PATH

A Gaseous Plasma Antenna (GPA) is a plasma discharge confined in a dielectric tube that uses partially or fully ionized gas to generate and receive electromagnetic waves; GPAs are virtually “transparent” above the plasma frequency and become “invisible” when turned off. Unlike ordinary metallic antennas, GPAs and Plasma Antenna Arrays can be reconfigured electrically (rather than mechanically) with respect to impedance, frequency, bandwidth and directivity on time scales the order of microseconds or milliseconds.





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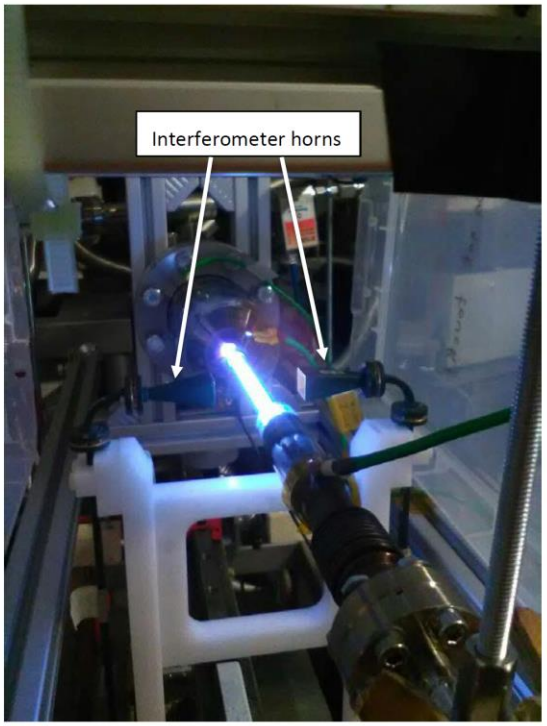
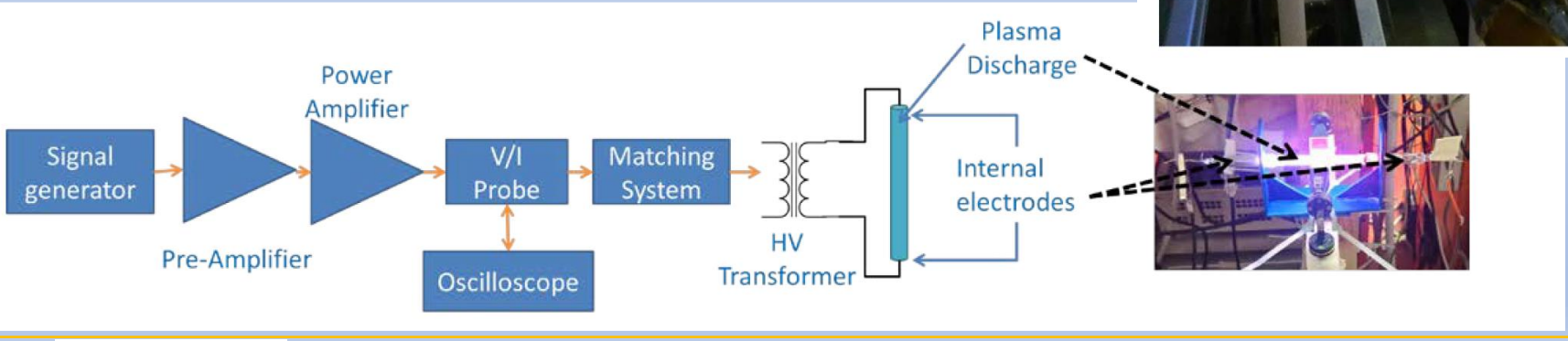
RTD Projects: PATH

The project aims at establishing the knowledge and technology needed to develop micro-plasma sources that can tune the density up to 1020 ion/m-3 with low power (<10W) and their use as elements for advanced antenna systems.

A Plasma Antenna will be able to:

- identifying the direction of incoming signal,
- tracking and locating the antenna beam on the mobile/target,
- beam-steering while minimizing interferences.





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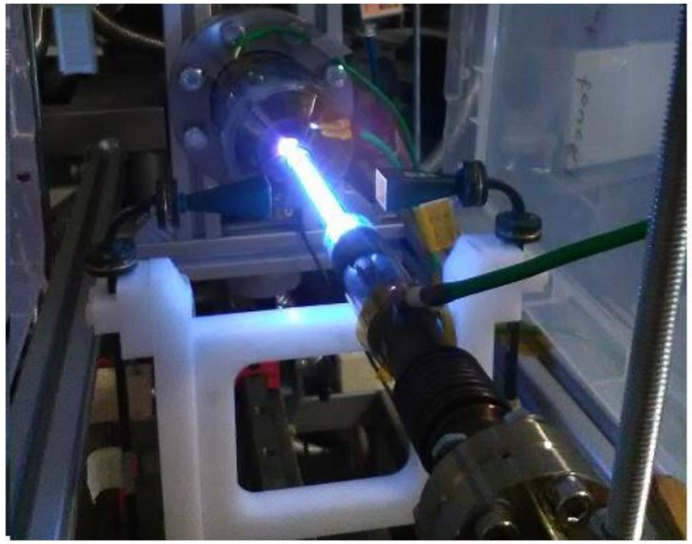
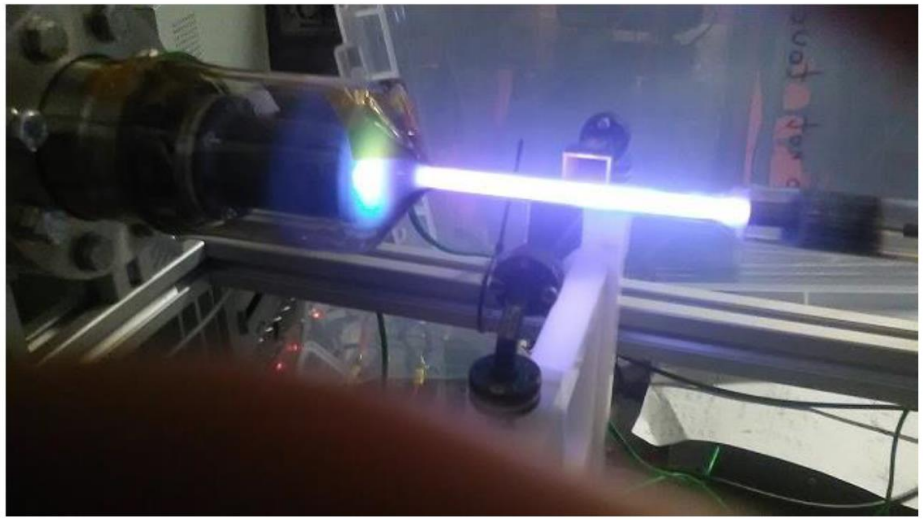
RTD Projects: PATH

PATH Project H2020 is intended to promote a collaborative research focused in the development of high density plasma sources, which find large number of industrial applications from material treatment to Telecommunications. Overcoming the density limit of current source will open new frontier in several technological field. PATH aims at cross linking different competences to study and develop prototypes of plasma sources and plasma antenna based on hybrid technologies based on Radiofrequency and Hollow cathode technologies.





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Ongoing RTD Projects

H2020-RESEARCH – Monitoring of Cultural Heritage assets by remote sensing. Role: Partner. Consortium including Italy, Greece, Cyprus, Poland. KO November 2018. Duration 60 months (www.re-se-arch.eu).

H2020-STABLE – Structural stability of Cultural Heritage building monitoring from EO and simulation. Role Coordinator. Partners from Italy, Greece, Cyprus. KO November 2018. Duration 60 months (www.stable-project.eu)

H2020-IN TIME – Planetary Instrument and Mars Geoscience. Research Innovation Staff Exchange. Role: Coordinator. Partner from Italy, Spain, Cyprus, USA (University of Texas at Austin). KO November 2018. Duration 60 months (www.intime-project.eu).

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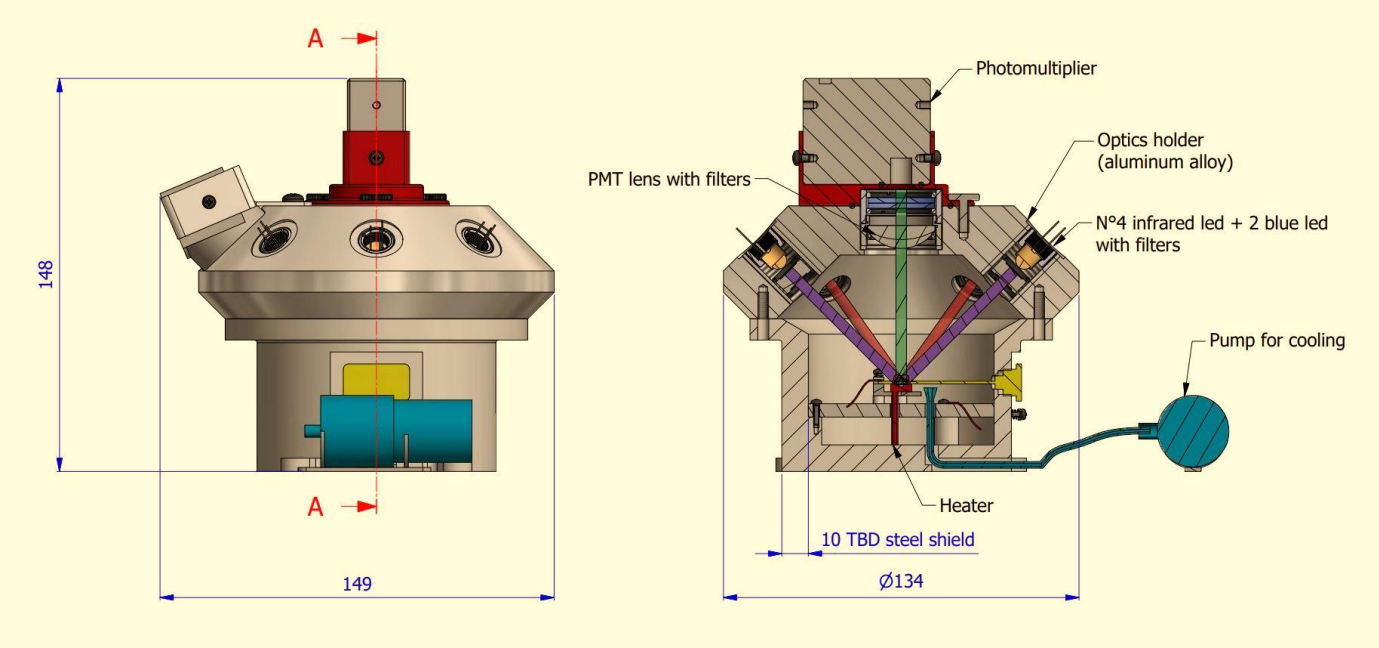
Ongoing RTD Projects: IN TIME

The project has the following objectives:

- Study of Mars geology and (radiation) environment and differences with Earth with respect to the 'luminescence' physics principles
- Develop an engineering, miniaturized luminescence dating instrument fulfilling the Mars «requirements» (science & mission)
- Calibrate and validate the instrument using Mars analogues samples focussed on feldspars.



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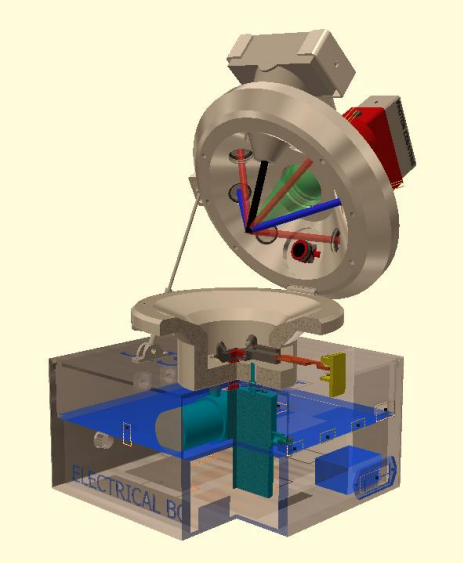
IN TIME Project H2020-RISE-2018, is dealing with the development of a miniaturized instrumentation based on luminescence to date sediment and rocks on Mars surface and subsurface.



IN TIME is co-funded by EU (G.A. 823934 and coordinated by ALMA Sistemi Srl in cooperation with Università di Sassari (IT), Università d'Annunzio (IT), Universitad Complutense de Madrid (ES) Sensia Solution SA (ES), Cyprus Space Exploration Organization Space System Solutions (CY) Jackson Geoscience Institute of University of Austin (USA)

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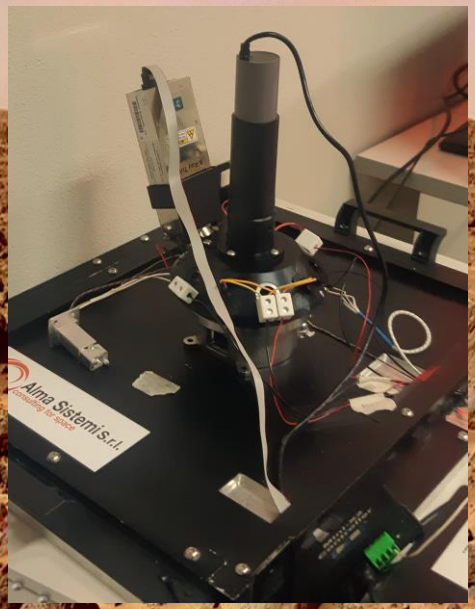

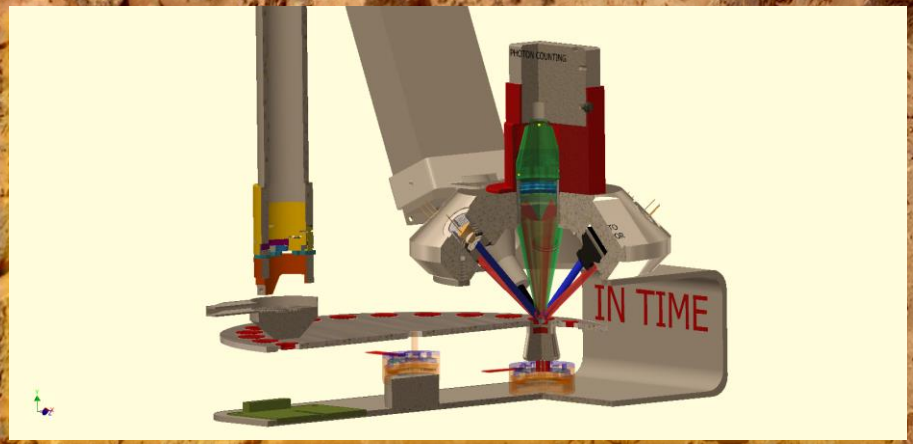

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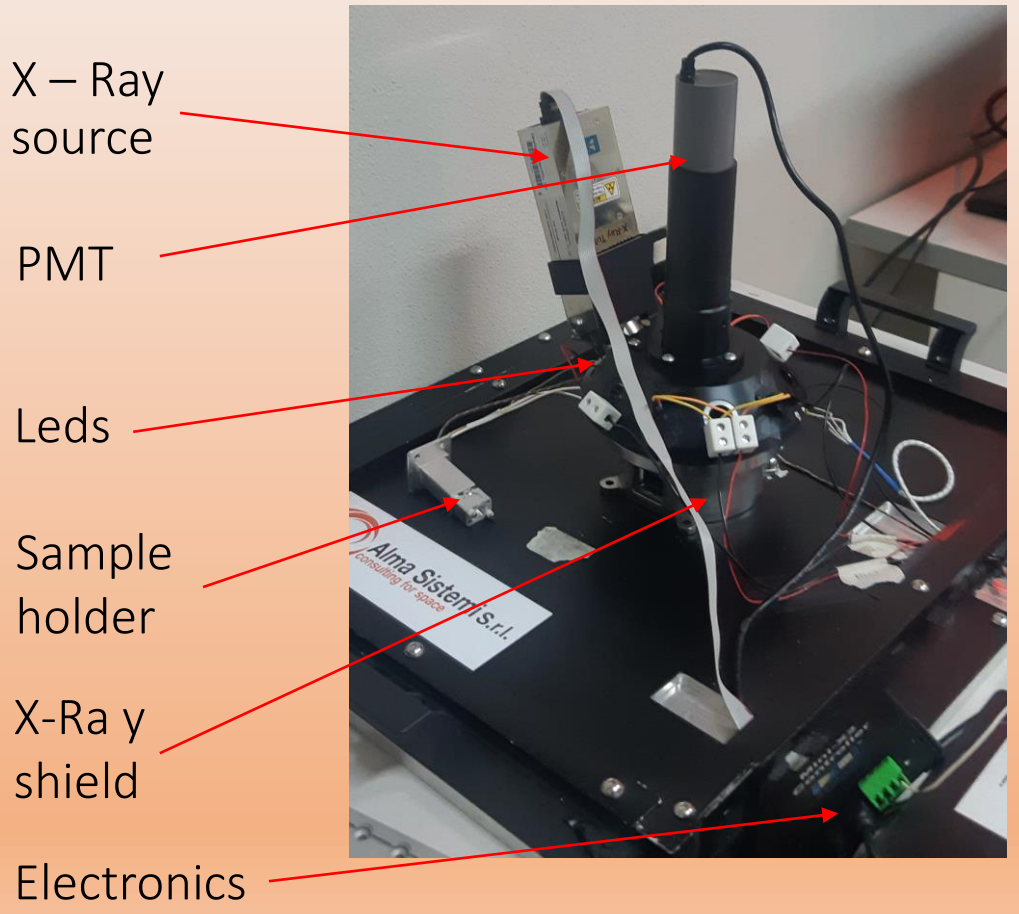
Ongoing RTD Projects: IN TIME

- The instrument prototype employs X-ray source instead of radiative source. The irradiation happens only when required.
- A X-ray shield is included and tested (no X-ray radiations have been detected outside the shield).
- Photomultiplier, leds and filters are equivalent to the reference instrument.
- 2 configurations of filters and leds are available for targeting quartz (mainly for Earth Science) and k-feldspar (mainly for Mars applications).
- Heather is also included to heath the sample up to 250-300 °C to improve the emission.
- An innovative air cooling system is under test and it will be implemented in pre-serie model (under design).
- The electronic box is limited and subject to further miniaturization.
- The software is loaded in a notebook and connected via USB port.



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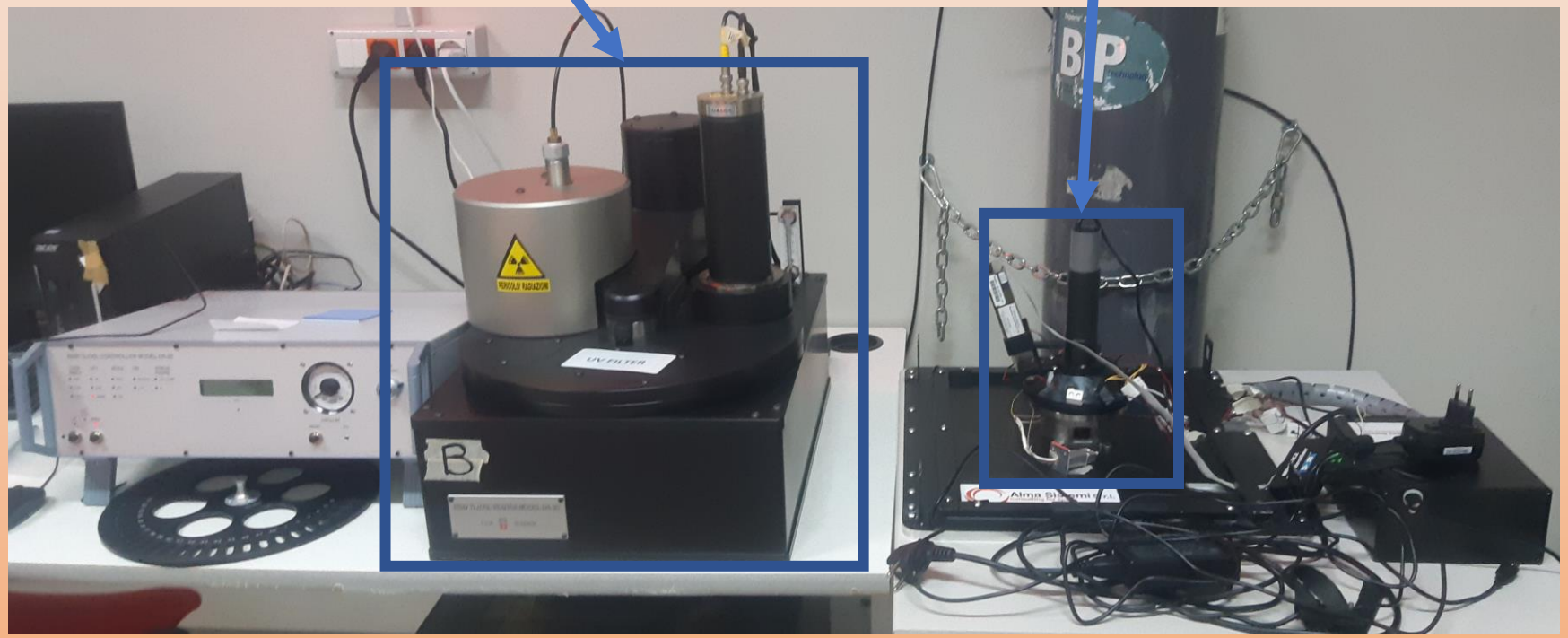
Ongoing RTD Projects: IN TIME

Reference Laboratory Instrument (Riso)

IN TIME prototype



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New RTD Projects

- **H2020-eUMaP** - Development of Utilities Management Platform for the case of Quarantine and Lockdown including energy management, waste management, water management and telecommunication network usage. KO held in January 2021. Coordinator of a team of organizations from Italy, Greece, Cyprus, Germany and Lithuania.

- **H2020-EYE** - Economy bY spacE. Monitoring economic trend under crisis situations including the spread of Covid-19 pandemic using space assets. KO 1st July 2021Coordinator of a team of partner from Italy, Spain, Cyprus, Greece and Poland.

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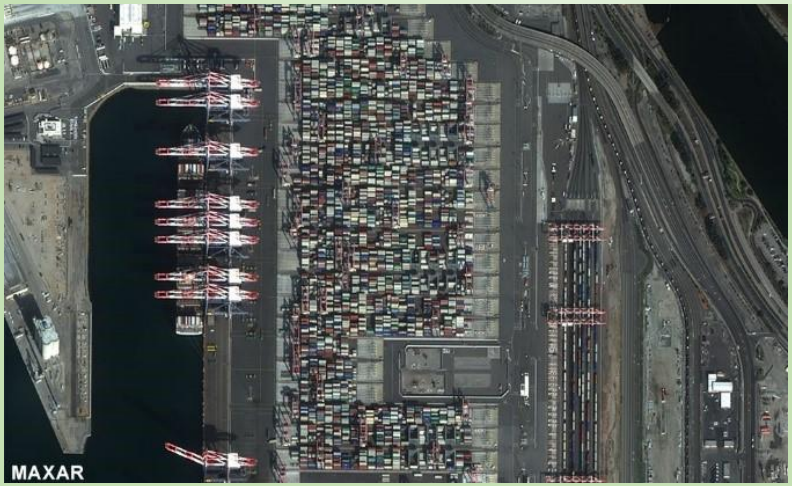
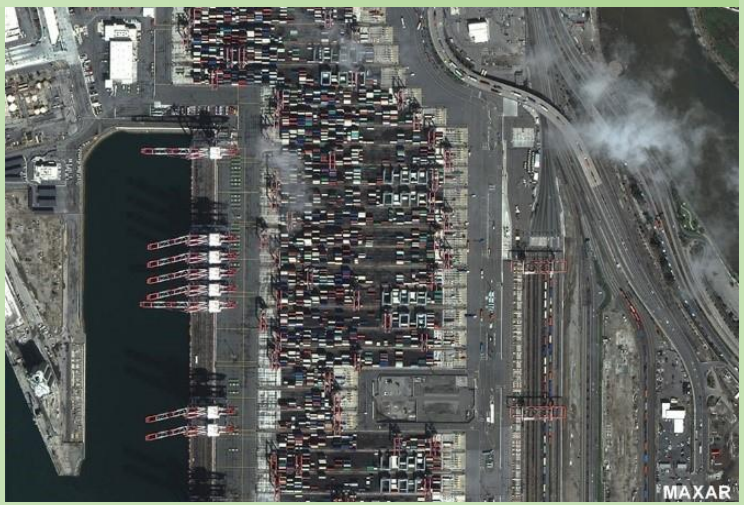
Ongoing RTD Projects: EYE

ALMA Sistemi Srl was awarded another H2020 project focused on Covid-19 impact on Economy using space monitorization. The project EYE intends to propose a pre-operational service based on Copernicus data integrated with statistic and geospatial data into an IT platform able to provide automate image processing supported by artificial intelligence algorithms and forecasting models to assess the impact on the economy of the Covid-19 epidemic at different scale (Regional/National/European).

In the pictures below the Long Beach container yard on February 8th (left) and March 17th 2020 (right) showing the slowing of business in container transportation.





Images source BBC / MAXAR

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Ongoing RTD Projects: EYE

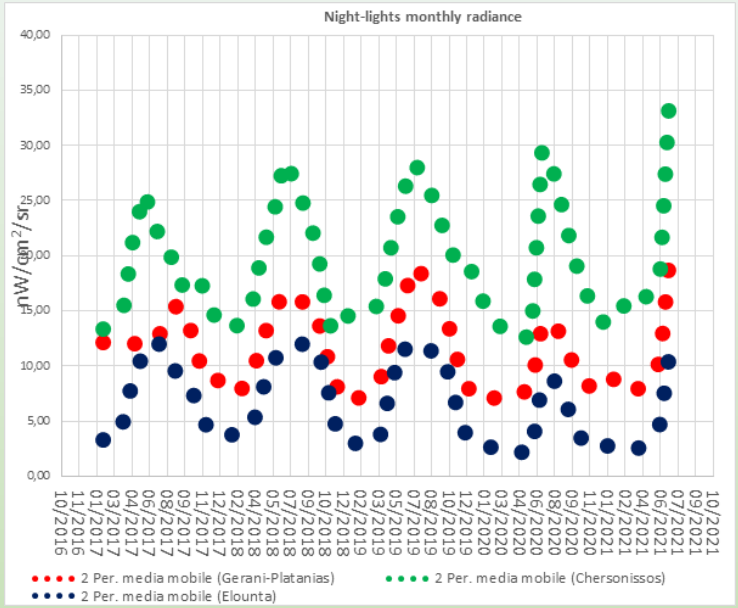
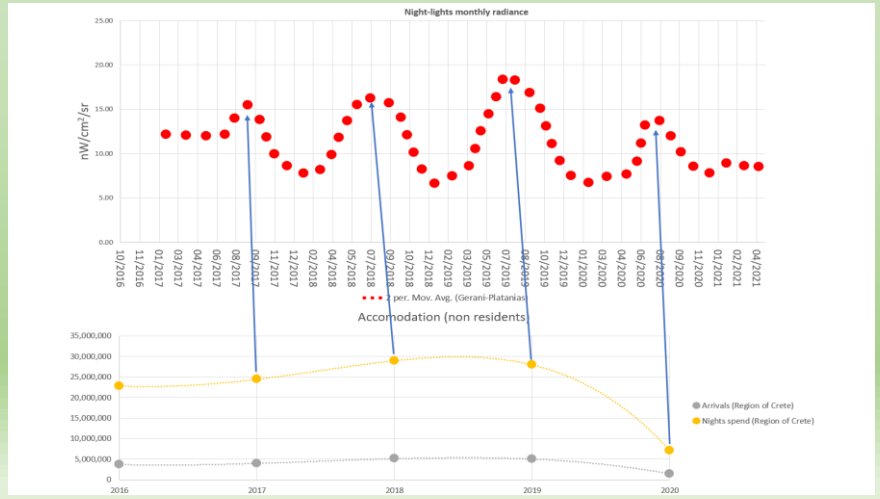


Figure left shows night light recorded in different sites in Crete 2016-21. Economic data that describe the touristic activity in Crete were collected from public authorities responsible to record and disseminate them. In figure below, we present yearly aggregated economic data related to accommodation (nights spend) and arrivals of non-residents for Crete compared with Night Light indicator of the same period (Gerani-Platanias area). There is a noticeably increase in both arrivals and nights-spend from 2016 to 2019 and a sudden drop in 2020.

Example of a nightlights monthly composite raster for the city of Heraklion in Crete island.



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National Projects (ongoing)

- SIS-DAT - Earthquake Risk assessment of historical centres in Lazio region. Project funded by Lazio Innova SpA under DTC Cultural Heritage. KO held in June 2021. ALMA Sistemi is a partner in the project and it is tasked with S/W development.

- ATLAS - Monitoring archaeological sites using remote sensing techniques. Project funded by Lazio Innova SpA under DTC Cultural Heritage. KO held in October 2021. ALMA Sistemi is a partner in the project and it is tasked with S/W development.

- PEDROS (ASI) - Forest fire investigation using drones in cooperation with Carabinieri (police) and University “La Sapienza”. KO starting in June 2021. Duration 24 months.

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Customers

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Alessio Di Iorio *(CEO)*
Tel +39 335 6317013 ,
E-mail: adi@alma-sistemi.com

DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

Certificato no./Certificate No.: 279777-2018-AQ-ITA-ACCREDIA
Data prima emissione/Initial date: 29 aprile 2019
Validità/Valid: 29 aprile 2019 - 29 aprile 2022

Si certifica che il sistema di gestione di/This is to certify that the management system of

ALMA SISTEMI S.r.l. - Sede Legale e Operativa
Via Dei Nasturzi, 4 - 00012 Guidonia Montecelio (RM) - Italy
e i siti come elencati nell'Appendix che accompagna questo certificato / and the sites as mentioned in the appendix accompanying this certificate

È conforme ai requisiti della norma per il Sistema di Gestione Qualità/
has been found to conform to the Quality Management System standard:
ISO 9001:2015

Questa certificazione è valida per il seguente campo applicativo:
Realizzazione di prodotti e servizi di ingegneria ad alto valore aggiunto (EA: 34)

This certificate is valid for the following scope:
Realization of engineering products and services with high added value (EA: 34)

Luogo e Data/Place and date:
Vimercate (MB), 29 aprile 2019

ACCREDIA

Per l'Organismo di Certificazione/
For the Certification Body
DNV GL – Business Assurance
Via Energy Park, 14 - 20871 Vimercate (MB) - Italy

Zeno Beltrami
Management Representative

La validità del presente Certificato è subordinata al rispetto delle condizioni contenute nel Contratto di Certificazione/
Lack of fulfilment of conditions as set out in the Certification Agreement may render this Certificate invalid.

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