



MARIS ENVIRONMENTAL MONITORING AND STRATEGIC INNOVATIVE RESEARCH

MARIS is a public and nonprofit consortium signed by the Istituto Nazionale di Geofisica e Vulcanologia (INGV) and the University of Messina, Italy.

MARIS is particularly active in technological innovation for the human safety and the environmental heritage; both these activities are carried out in collaboration with industrial companies specialized in: environmental engineering for the disposal of waste and its transformation as energy resources, fire prevention and technologies for reduction / neutralization of fine particles.

In the UAE, MARIS is represented by P. Paolo Bruno, an INGV researcher, now professor at *Abu Dhabi University-Petroleum Institute*. He is a Geophysicist, specialized in seismic exploration, seismogenic, volcanic and geothermal studies and geological and geophysical data integration.

The background of Maris is based on study and research experiences of the INGV and university institutions. The strategic innovative research of MARIS is oriented towards the quality of the environment, control of pollution sources and the mitigation of environmental risk. Then, MARIS gives the local authorities a scientific and technical support for the development of coastal-marine monitoring systems. Maris is also interested in the effects of climate change.

In addition, MARIS carries out high-profile training in multidisciplinary field of energy and environment with particular attention to the technical-management of energy production from renewable sources, giving priority to sustainable development processes characterized by efficiency and energy saving.

MARIS is also involved in the prevention and safety areas through the development of integrated remote control systems, acquisition, processing and data interpretation, even with the use of advanced techniques of artificial intelligence.

MARIS has patented, together with other partners, some instrumental equipment:

- * SIMON - A submarine system for monitoring the subsidence and bradyseism
- * OS-IS ® System to measure the sea-waves characteristic parameters

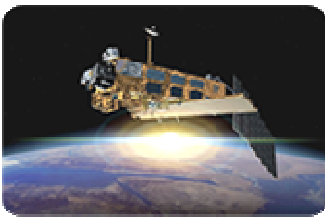


Headquartered INGV - MARIS in Rome



The headquarters of INGV-MARIS in Portovenere (La Spezia, Italy)

ACTIVITY



ENVIRONMENT AND TERRITORY

MARIS organizes important land and airborne measurement campaigns thanks to projects aimed at the characterization of land for environmental purposes, defense, mitigation of natural and industrial hazards. MARIS also designs and develops systems for the dissemination of spatial data, through the creation and population of digital databases, using both commercial and open source tools.



RESEARCH AND EXPLOITATION OF NATURAL RESOURCES

(GAS, OIL, etc.)

Through partnerships with “Assist Gravitation and Instrumentation - AGI” (spin-off company of the Italian National Institute of Astrophysics - INAF), we transfer the technology and know-how acquired in fundamental physics experiments and space activity to the field of the geophysics and of the research and exploitation of natural resources (gas, oil, etc.). The strength point of this collaboration between MARIS and AGI is the capability to execute the complete R&D activities related to the realization and the development of instrumentation connected to the measurement of the gravity and in general of the accelerations. Successful works and products are related to the space research and to the geophysics. The activities connected to the research of natural resources and to the geophysics are:

- ⇒ *Gravity Gradiometer for surveys on board of an AUV (Autonomous Underwater Vehicle);*
- ⇒ *Deep-sea gravimeter for underwater gravity monitoring;*
- ⇒ *Accelerometer for the seismic monitoring;*
- ⇒ *OS-IS (Oceanic Seismic – Integrated Solution) to measure the sea waves state from inland;*
- ⇒ *Gravimeter for helicopter surveys;*
- ⇒ *New concept of Borehole Gravity Gradiometer for research of petroleum and gas.*



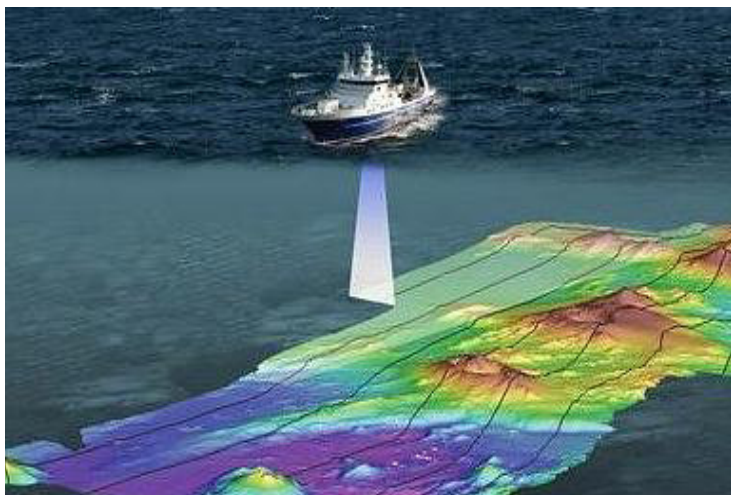
UNMANNED AERIAL VEHICLES

MARIS has professional drones, on board of which is able to install equipment suitable to the purposes of recovery operations, as well as dedicated software for aerial reconnaissance and the acquisition of multiple information on different environmental scenarios. In summary, MARIS works with their drones in the following ways: acquisition of remote sensing images for the characterization of the natural, scenic, urban, architectural, archaeological monitoring of industrial systems, areas subject to remediation and conversion, shipbuilding, infrastructure and regional reconnaissance of areas subject to hydrogeological risk, landslides,

UNDERWATER ROBOTICS

MARIS designs and develops, together with a qualified partnership, robotic submarine systems (ROV, AUV, USV) for investigation, sampling and exploration of the underwater world.

Currently are being studied: gas samplers, USV for environmental surveys in marine areas, AUV and ROV, even in a swarm configuration, for inspections of archaeological sites, for harbor protection, for oil and gas exploration and regional geological studies.





PREVENTION AND SAFETY

Studies and consultancy in the field of prevention and safety in industrial environments, offices, museums, hospitals and public places in general, especially in the fire protection industry with the use of advanced technologies.



FIRE IN INDUSTRIAL ENGINEERING, PUBLIC BUILDINGS, COMMERCIAL AND RESIDENTIAL

MARIS provides advisory support and assistance in the development of advanced systems for the prevention and fire fighting. In particular, through collaboration with companies **Tema Sistemi spa** and **Ecology Ltd.**



Industrial and public buildings

Technologically advanced systems to be installed in buildings of public and private use, high-rise buildings, residential areas, shopping malls, government offices, schools, hospitals, libraries, places of assembly, with design and turnkey construction by Italian company leader in the sector.

The "Aquatech" system is based on the emission of atomized water mixed with a special additive molecular encapsulator, able to quickly inerting the combustion process.

This technology provides a considerable reduction of the damage from fire, a substantial reduction in the amount of water used, thanks to the spray

emitted from special nozzles of the home network system.

This innovative technology allows you to greatly limit fire damage, especially in environments with furniture, valuables or valuable resources, such as:

- ◆ or department stores and electronics stores, computers, telephones and so on
- ◆ or department stores and shops in the clothing industry
- ◆ or department stores and furniture stores of value (rugs, tapestries, objects)
- ◆ or large supermarkets and related storage facilities of food.



Refineries and industrial oil in particular

Fire protection systems through the design, installation and testing of special-Fog Cannon emitting jets of water spray (droplets of artificial rain) with the mixing of additive molecular encapsulator. In particular, in the case of industrial plants, and oil wells, can be designed and built a network of Fog-Cannon at the perimeter of the resource to be protected, with sensor systems and electronic automatic activation properly designed and controlled remotely.

LINK – VIDEO ON FIRE TESTS

<http://www.flickr.com/photos/dustsuppression/6298269214/>

<http://www.flickr.com/photos/dustsuppression/6297733989/>

<http://www.flickr.com/photos/29202392@N07/6295561534/>

<http://www.flickr.com/photos/29202392@N07/6294914225/>

FIRE TRUCK WATER MIST 150MT THROW

An innovative approach utilizing modern technology to control dust with water mist not wetting the ground but agglomerating the PM10 on flight.

Creating a new standard to control dust and particles in the open air as well indoor.

Providing a new solution to a problem that until most recently was impossible to resolve with traditional snowcannons or irrigators, it is not an adaptation of existing machine FogCannon have been expressly designed for this heavy duty work.

The dimensions of the water drops should be around 90-115 microns to obtain maximum efficiency and considering evaporation along the throw.

The special nozzles of the Fog Cannon generates the ideal drops size and because made in ABS and ceramic they are unclogging and long wear life, acid resistant.

Researchers have found that the best operating pressure is at 15 bar.





Dust Tex Net



An innovative approach which uses modern technology to contain the dust.

It creates a new standard to control dust and PM10 particles in open spaces and self clean.

It provides a new solution to problems that until now seemed impossible to resolve.

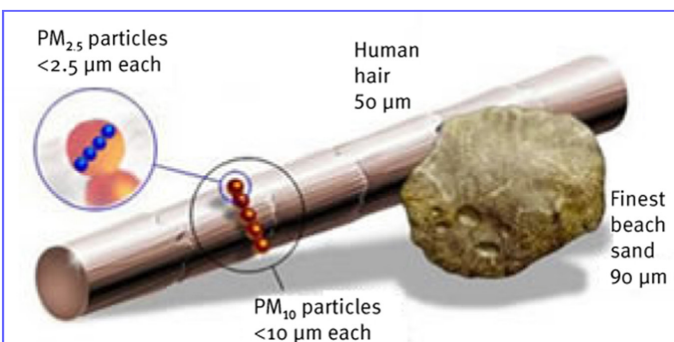
It works as Gore-Tex, dust proof which allows the passage of the air but repels dust and filter it, agglomerating the PM10 in bigger grains.

Dust Tex Net makes a statistical selection of the particles transported by the wind which rarely hit the net exactly at 90° and in most cases they have different angle according to the wind direction. Therefore the net mesh span is much bigger than the open granulometry of the collected dust which get filtered by the fence.

Dust Tex Net resists to the strongest winds thanks to its single wire structure and high tenacity. In case of an overload, the clips supporting the net open on the lower side leaving the net free to wave and preserving its integrity.



The ideal height of The structure is 20 mt.
The ideal distance between the poles is about 10 mt.



CONVERTING WASTE IN ENERGY RESOURCES



Study and consultation, preparation of feasibility studies regarding the conversion of urban solid wastes in energy resources, with the valorization of biogas through the production of electricity, cogeneration of electrical and thermal energy and distribution of gas metano, through local distribution pipelines for industrial use. In addition, MARIS is committed to experiment techniques and effectively transform the plastic material coming from MSW landfills or by selective mixing in diesel fuel.

LABORATORY ANALYSIS

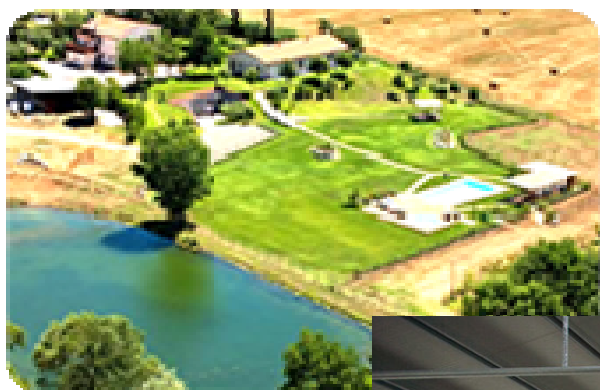
With the support of laboratory gas chromatography from INGV in Palermo, MARIS is able to coordinate studies and monitoring activities of geochemical type and pollutants in general. In the laboratory can be defined, in particular, the volume concentrations of Helium, Hydrogen, Oxygen, Nitrogen, Methane, Carbon Monoxide and Carbon Dioxide, Argon and gaseous hydrocarbons (C2 +).



INFORMATION TECHNOLOGY AND COMMUNICATION

MARIS has experience in the management of complex data-management centers, the whole cycle of design, development, implementation, support and management of computer systems, as well as in the consolidation of systems already in operation in order to optimize the resources and lower the costs.

The focus is on both the hardware (infrastructure and monitoring of data centers, networks, communication, security) and software (operating systems, databases, software development, ad-hoc).



REGIONAL DEVELOPMENT AND INTERNATIONAL COOPERATION

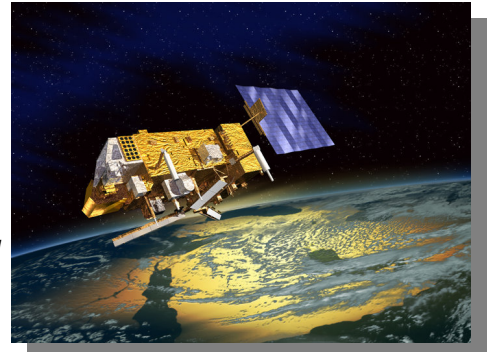
Design, project management, consultancy support and integrated coordination of the implementation of self-sufficient farms in underdeveloped areas, including research and rationalization of water resources and self-sustainable energy.



ENVIRONMENTAL RESOURCES MANAGEMENT

MARIS together with its cooperating structures are engaged in study activities and specialized consultancy in the following areas:

- *Environmental planning and development of coastal and marine systems*
- *Specific plans of action for the prevention and combating of marine pollution*
- *Support for the management of harbor services, the prevention and the safety of life at sea*
- *Organizational planning of cultural tourism and environmental connotations based on the specific geographic, climatic and local eco-biological*
- *Consultancy, operational support and training in the field of aquaculture and mariculture.*



HELIPORTS CONSULTING, DESIGN, CONSTRUCTION AND MANAGEMENT



MARIS through its partnerships with the “Alidaunia” airline, is able to support the design, implementation, training and start-up operation of Central Management Services Heliports based on remote control processes and highly automated. The Central Manager is able to coordinate the traffic 24/7 on all heliports or helipads controlled, transit stations and rest of the passengers, supplies, security safeguards intrusion, fire fighting, etc.

ALIDAUNIA produces a totem providing all heliport’s management functions and she’s manages the training of pilots and ground staff for all maintenance and service on the fly. Since 2002, Alidaunia is “Agusta Service Center for maintenance of AgustaWestland helicopters”.

From 2011 Authorized Service Center for the maintenance Robinson Helicopters. From 2012 Authorized Service Center Tronair.





HIGH-LEVEL PROTECTION OF INFRASTRUCTURE, PLACES, PEOPLE AND INFORMATION

MARIS, as part of their collaborations, including the company VITROCISSET. This organization is aimed at highly competitive as well as extremely diversified markets - from defense to security, from logistics to transport, up to space and smart cities. Vitrociset offers high-level protection of infrastructure, places, people and information, through risk prevention, threat identification and response to attacks.

Border management, critical infrastructure protection, land conservation, and protection of public order: national security is a complex challenge that can only be accomplished with broad and extensive control capabilities, supported by resilient, secure, multi-service modern communication networks. To this the end, this organization have developed solutions that extend the operational capabilities of our customers in every domain, from land to sea, from the skies to space, including cyberspace. Indeed, physical security cannot ignore the security of cyberspace.



TRAINING

MARIS is engaged in the field of advanced training in various areas:

- ⇒ *Application of geophysical techniques for environmental monitoring with the active participation of international inspectors of the United Nations*
- ⇒ *characterization of the territory*
- ⇒ *electromagnetic pollution*
- ⇒ *radionuclide contamination*
- ⇒ *identification of targets associated with nuclear testing in sensitive areas*
- ⇒ *conducting techniques management farming and animal husbandry in areas prone to desertification processes, including the hydrological research and optimization of irrigation techniques (cooperation with the Italian Ministry of Foreign Affairs)*
- ⇒ *Management of coastal territorial systems especially susceptible to transformation induced by climate change.*



MARIS

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