The Institute of Methodologies for Environmental Analysis of the National Research Council of Italy (IMAA-CNR) has its headquarters in the Potenza Research Area and a Centre in Marsico Nuovo, Val d’Agri (Basilicata region).

### Staff

There are more than 140 working units, all of them young, dynamic and strongly motivated to carry out research activities (47 researchers, 5 technologists, 21 technicians, 4 administrators and office staff, 14 post-graduated fellows, 14 PhD students, 15 associate university professors and more than 40 others collaborators). More than 70 personnel units are currently paid with resources deriving from projects. The IMAA researchers have been coordinating activities in more than 30 national and international projects and published more than 150 articles (average impact factor IF=1.9) between 2009-2011.
Financial resources

IMAA shows a strong tendency towards self-fund rising. During the three-year period from 2009 to 2011 active contracts were stipulated with third parties for more than 6 million Euros of which 80% was invested in the Earth Observation sector.

In 2011 the budget derived from outside contracts was about 2.8 million Euros of which more than 30% was represented by financial resources relating to the participations in EU call for bids.

Research activity

Right from the start IMAA’s research activity has been devoted to the development and the integration of Earth Observation Technologies with the aim of studying environmental and geophysical processes. The Institute’s activities are organized within the four following axes:

- Satellite, airborne and ground-based Earth Observation for the study of the atmosphere, hydrosphere, lithosphere, and biosphere plus their interactions, for the development of meteo-climatic applications and the prediction, prevention and mitigation of risks;
- Chemical-physical characterization of ground, soil and subsoil;
- Development of advanced environmental monitoring techniques based on the integration of in-situ and remote sensing chemical-physical, biological and ecological methods;
- Integrated methodologies for energy-environmental planning and modelling and the management and interoperability of geospatial data.

This multidisciplinary approach has permitted the study of geophysical and environmental processes of remarkable complexity in an innovative way by following the GMES (Global Monitoring of Environment and Security) programme guidelines, and finding itself in a good position within the GEOSS strategy (Global Earth Observation System of Systems).
Main research infrastructures

The IMAA has been proved to be particularly capable of designing and creating important research infrastructures, some of these of international significance. IMAA’s property in terms of scientific equipment is now estimated at more than 12 million Euros. The main instrumental facilities operating at the IMAA laboratories are:

- The CIAO-CNR-IMAA Atmospheric Observatory which is one of the worldwide sites within the GRUAN network for the study of the high atmosphere.
- A system for receiving, processing and storing satellite images (NOAA, MSG, EOS-AQUA, EOS-TERRA), which is capable of providing near real time geospatial information for environmental and geo-hazard monitoring.
- A Hydrogeosite Experimental test field at the the Marsico Nuovo Centre, which is the first full-scale laboratory in Italy for the investigation of hydrogeophysical processes.
- Mobile laboratories consisting of a Lidar system, a system for interferometric and radiometric measurements, a system for non-invasive chemical-physical and geophysical measurements, a system for geochemical and mineralogical measurements and hyperspectral sensors for airborne platforms.

IMAA is the coordinator of two European infrastructural projects: “EARLINET-ASOS European Aerosol Research Lidar Network Advanced Sustainable Observation System”, funded within the FP6 framework involving 21 teams from many European countries and “ACTRIS- Aerosols, Clouds, and Trace Gases Research Infrastructure Network”, funded within the FP7 framework involving 28 European sites of key infrastructures for the study of aerosols and clouds. For the EARLINET network IMAA runs the operations for the validation of the data from LIDAR CALIOP operating on the CALIPSO platform (NASA JAXA mission). This validation program is being studied by the European Spatial Agency for the next ADM-AEOLUS and EARTH-CARE satellite missions. This facility system really appeals to both Italian and foreign researchers. An example of this is the September 2005 international EAQUATE campaign carried out in cooperation with NASA and the University of Wisconsin for water and temperature profiling by using active and passive ground, airborne and satellite instruments.
International activities

IMAA is firmly included in European research programmes and its researchers have coordinated actions in 7 projects of the EU VI Framework Programme (EURORISK-PREVIEW, NEEDS, GRIDCC, GEOMON, EARLINET-ASOS, CYCLOPS, GMOSS). Its inclusion in the European context has been gaining ground over the last few months thanks to the start-up of new projects funded within the VII Framework Programme (ACTRIS, DORIS, G-MOSAIC, EUROGEOSS, SAFER, GIGAS, ModelProbe, ISTIMES, DORIS_NET). Such projects are mostly aimed at the development and integration of earth observation techniques as well as data sharing and interoperability in order to be used in the fields of environment, natural risks and homeland security. It is worth noting that IMAA is the coordinator of the EARLINET network consisting of 20 Lidar stations and the ACTRIS infrastructural project. In addition, the Institute takes part in many research programmes promoted by International Institutions (European Space Agency, EUMETSAT, CSIC, CNES) and cooperates with Universities and Research Centres in the USA (NASA Goddard Space Flight Center, SSEC in Madison, Colorado School of Mines etc…). Moreover, in the field of energy-environmental modelling IMAA is involved in research projects funded within other European programmes (e.g. IEE and LIFE-TCY) and has been representing Italy in the ETSAP/IEA executive committee since 2005.

National activities

IMAA cooperates intensively with other CNR Institutes and Universities, especially with the University of Basilicata. IMAA finances doctorate grants directly, and involves a very large number of final-year students in the experimental activities carried out in its laboratories. The Institute cooperates with the most important national research centres, the Italian Space Agency (ASI), the Geophysics and Volcanology Institute (INGV) and with University Consortia (CNIT, CNISM, RELUIS). At present it is coordinating the research activities within the framework of the MORFEO, CIRCE and SAP4PRISMA projects funded by the Italian Space Agency, aiming at the development and integration of Earth Observation Techniques for landslide and coast monitoring and their application in agriculture.

IMAA has been in charge of numerous projects funded by MiUR, the project “Development of Atmospheric Radiation Site” has been considered a national best-practice example (www.miur.it/ponricerca).
Projects and cooperation with the end-user system

IMAA is the Dip Competence Centre of Civil Defence (D.M. n. 252 of 26 February 2006) and during 2009 supported the DPC activities both on the occasion of the Abruzzo earthquake. It stipulated collaboration agreements and/or joint projects with the Basilicata Regional Authority, the Province of Potenza, the Campania Center of Competence for Environmental Risk, the Lombardia Regional Authority, the Emilia Romagna ARPA, the Basilicata Basin Authority, the Italian Corps of Forest Rangers and other local institutions. It is worth mentioning, among the regional initiatives, the “Val d’Agri” Project and some projects for the chemical characterization of contaminated sites of national interest. IMAA gave technical-scientific support to facilitate the participation of Basilicata in the European NEREUS initiative entitled “The European Regions for the Space” started with an international agreement stipulated in Toulouse in December 2007.

Projects and collaborations with industrial partners

IMAA was one of the promoters of a public-private Consortium (TeRN – Earth and Natural Risk Observation Technologies) involving CNR, e-Geos of the Gruppo Finmeccanica, the RELUIS Consortium, the CREATEC Consortium and ARPAB with the aim of carrying out activities in the field of Earth Observation and the mitigation-prevention of natural risks. The TeRN Consortium, which originated on the basis of a Framework Programme Agreement stipulated between MiUR, MERF and the Basilicata Regional Authority, is the actor for the Basilicata Technological District. IMAA has promoted industrial research projects in collaboration with companies of national importance. ENI has recently financed a project for the integration of in-situ electromagnetic techniques and satellite interferometry for the investigation of hydrogeological instability phenomena in Val d’Agri. IMAA is developing a project financed by the Ministry of Defence – TELEDIFE – with Selex Galileo aimed at the study and creation of a hyperspectral sensor for application in the military field. A project is now being developed with the Italian National Railways for the development of a geo-electrical system to monitor a railway-line section affected by a landslide. IMAA has a well-established relationship with the Confederation of Basilicata Industry, Basilicata Unioncamere, Sviluppo Italia Basilicata as well as with the Area Science Park with which protocols of agreement have been stipulated. Finally, IMAA has a well-established relationship with the territorial system, especially with the productive one which benefits from IMAA’s involvement in a wider and more qualified international environmental research context.