



The National Centre for Scientific Research “Demokritos” is the oldest and largest research facility in Greece. It covers a wide gamut of scientific research from Nuclear Technology to microelectronics and material science. The Institute of Nuclear Technology –Radiation Protection (INTRP) evolved over the years conducting research by means of the 5 MW research reactor it operates. Parallel related activities include environmental and energy research.

NCSR “Demokritos” plays a significant role in providing the State, policy Makers and Industry with technological tools and innovation and facilitates technology transfer between the Research Community and the Society. NCSR Demokritos has disposed a major effort in developing infrastructure and knowhow in the fields of air quality and effects of air pollution on humans and the environment. The Laboratories working in the above areas has acquired long-time experience and ever-growing expertise over the years, given the firm interest of the relevant funding agencies for further activity in the particular areas. NCSR Demokritos has disposed a major effort in developing infrastructure and knowhow in the fields of air quality and effects of air pollution on humans and the environment.

The Institute can dispose a highly integrated expertise on all aspects of the environmental impact of air pollutants, on humans and the environment. It has specifically contributed towards several issues related to the understanding of atmospheric pollutants with respect to:

- a) Exposure of humans to aerosol contaminants such as heavy metals and organic pollutants
- b) Source apportionment of atmospheric pollutants
- c) Development of novel sampling and measurement techniques for aerosol particles
- d) Physicochemical aerosol characterization with respect to climatic active aerosol species.

It maintains a state of the art analytical infrastructures not readily available at similar Institutes such as the analytical facilities for trace metals by several techniques (INAA, Atomic Absorption Spectroscopy, X-Ray Fluorescence):

Analytical facilities for PAHs by Gas Chromatography

Cascade impactors and denuder/filter pack,

High and Low Volume sampling systems for PM aerosol fractions and equilibrium trace gases

Condensation Particle counters

Scanning Mobility Particle Sizer

Optical particle spectrometers for study of particle microphysical properties

Elemental and Organic Carbon Thermo-Optical analytical systems aethalometers and nephelometers for particle optical properties

The major applications for this infrastructure are focused on the study of microphysical properties and their effect on climate as well as the retrieval of information on emission sources, source apportionment and receptor modelling.



NCSR “Demokritos” provides technology transfer services for Local Authorities and Industry in the field and in line with EU directives for environmental protection and compliance with limit values legislation.

NCSR “Demokritos” is accredited for PM10 ambient measurements. Services include Calibration and validation of aerosol/particulate matter measurement infrastructure according to EN12341 standard for fine and coarse aerosol mass fraction measurement (PM10 PM2.5 PM1), isokinetic sampling of pollutants from stacks and indoor air quality.

The Institute is also involved in the design and development of aerosol instrumentation, application of chemical speciation techniques on aerosol samples and extensive analyses of mainly experimental data.

Work also includes the air quality in the remote and urban atmosphere, aerosol optical properties and source apportionment and receptor modelling techniques, wind flow and pollutant dispersion modeling over terrain of high complexity; meteorological data processing, urban pollution; vapour cloud (dense gas) dispersion modelling; use of Decision Support Systems for nuclear emergencies. The Institute has participated and coordinated several European Community and National Research Projects in Environmental Pollution and Radiation Protection. EU-co-funded projects coordinated by NCSR/EREL in the areas of air pollution and climate change are “Biogenic aerosols and air quality in the Mediterranean Area - BOND” (EVK2-CT-200100107, 2001-2004) and “Assessment of Impact of SF6 and PFCs Reservoir Tracers on Global Warming – AEOLUS”, (ENK6-CT-2001-00501, and has also participated in the 5th EU Framework programmes URBAN-AEROSOL, URBAN-EXPOSURE.

NCSR “Demokritos” is actively promoting the dissemination of research results and technology innovation through a wide range of activities such as:

Participation in exhibitions and trade fairs

Training of young scientists in Summer schools

Organization of Conferences and Workshops

Provision of Services and Training for Industry partners on a project basis

Many aspects of this work are directly relevant to the Health and Safety requirements at a National level. Experiences and results are shared with bodies like the Ministry of the Environment the Greek Atomic Energy Commission and facilitate to the implementation of Monitoring networks for the Protection of the Public and the Environment