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**NATIONAL REPORT ON REMOTE SENSING ACTIVITY IN ITALY**

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**ABSTRACT**

In Italy the Remote Sensing activity started in 1970. Actually it is strongly developed in private or public organisations, such as University, National Research Council or industries; also the education and training in Remote Sensing is well distributed in the peninsula offering official or private courses. A non profit Association (A.I.T.) collects practically all the operators in the country, individual members or groups; since 1998 exists a Federation (ASITA) which groups together the societies of Photogrammetry and Topography, Cartography, Remote Sensing and GIS.

**1) History**

In Italy the first group operated since 1970, mixed University and National Reserch Council (CNR), in Milano and the first works were on thermal infrared aerial surveys over italian volcanic areas. Then the people involved in Remote Sensing increased rapidly mainly in Milan, Florence, Neaples, Bari, Venice, Rome. In the 1978 two Remote Sensing societies were founded, SITE in Milan and AITA in Florence, merging then in the AIT (1986). The Italian Remote Sensing Association (non profit, scientific) collects practically all the private or public operators. In the 1998 in Italy four Associations decided to join themselves in a National Federation (ASITA, acronymous of "Federazione delle Associazioni Scientifiche per le Informazioni Territoriali ed Ambientali"); the four Associations are:

SIFET –Italian Photogrammetric and Topographic Society, ISPRS member (Società Italiana di Topografia e Fotogrammetria).

AIC – Italian Cartographic Society (Associazione Italiana di Cartografia).

AIT – Italian Remote Sensing Society, ISPRS member (Associazione Italiana di Telerilevamento).

AM/FM-GIS Automated Mapping Facilities Management Geographic Information Systems.

Every year since 1997 ASITA organizes a National Conference during which every single Society develops its annual national congress: in such a way all the italian people of environmental survey, representation and software meet together minimizing the expenses and optimizing the results.

Furthermore in the 1987 was activated the firs official university course of Remote Sensing at the Faculty of Civil Engineering of the Politecnico di Milano.

**2) Actual situation**

The Remote Sensing scientific research is conducted in several laboratories (approximatively 30) mainly in the CNR and University geographically distributed in all the peninsula, working in all the classic bands, from visible to microwave on many national and international projects, covering different investigation objects, from geolgy to land use, from athmosferic studies to agriculture, from hydrology to oceanography, from urban planning to water pollution control, and so on. Also ASI (Italian Space Agency) promotes very actively the scientific research sponsoring several projecse every year in the field of fundamental research.

The operative Remote Sensing in Italy is present at various levels and in different organizations.

Two Ministry are very active in Remote Sensing, that is Agriculture-Forestry and Foreign Affairs. The first with the national, annual inventory and yeld production of several important italian cultures, by means of Landsat images, aerial surveys and ground controls; the second through the activity of an Institute located in Florence (IAO, Istituto Agronomico per l'Oltremare) operating in Remote Sensing mainly for Developing Countries since 1974.

Many regional administrations also are active in Remote Sensing producing thematic cartography suitable for the environmental planning projects.

Regarding the satellite data collection Telespazio is working since 1972 with the Fucino Landsat receiving station.

Obviously a lot of private companies use Remote Sensing techniques as a support of environmental projects, urban planning, environmental control.

Furthermore in Italy there are some foreign important organisations which operate in Remote Sensing, namely:

ESA with the ESRIN office in Frascati (Rome)

FAO with the Remote Sensing Unit in Rome

JRC with SAI (Space Applications Institute) in Ispra (Varese)

### 3) Education and training

The education and training in Remote Sensing are developed mainly in the University, and the “map” of the location and the title of the courses is illustrated in the Table 1:

UNIVERSITY DEGREE	TITLE OF THE COURSE	UNIVERSITY
ARCHITECTURE Environmental Planning Environmental Planning Environmental Planning	Thematic Cartography Remote Sensing for Environmental Planning Photogrammetric Survey for Architecture	VENEZIA - IUAV POLITECNICO - MI GENOVA
ENGINEERING Civil Civil Mechanics Civil and Environmental Civil and Environmental Environmental Environmental Environmental Electronics Electronics Electronics (e.m. fields) Electronics Electronics Electronics Telecommunication Electronics Electronics Informatics Aerospace Aerospace Aerospace Materials	Remote Sensing Hydrology Environment Planning (with RS lab) Remote Sensing Remote Sensing Remote Sensing Remote Sensing with exercises Remote Sensing RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic RS and e.m. diagnostic Remote Sensing (for Environmental Planning) RS and e.m. diagnostic Aerospace Techniques Aerospace Systems Pollution Control	FIRENZE BRESCIA PADOVA POLITECNICO – MI NAPOLI POLITECNICO – TO NAPOLI FIRENZE POLITECNICO – MI ROMA Univ. Sapienza ROMA II PERUGIA NAPOLI Univ. Federico II NAPOLI -Ist. Navale CAGLIARI GENOVA POLITECNICO – (MI-CO) NAPOLI Univ. Federico II NAPOLI Univ. Federico II NAPOLI Univ. Federico II MODENA
<b>Graduation:</b> <i>Environmental Engineering</i> <i>Structural Engineering</i> <i>Civil Engineering</i> <i>Environmental Engineering</i> <i>GIS</i> <i>Environmental Engineering</i>	<i>Remote Sensing Systems</i> <i>Environmental Remote Sensing</i> <i>Environmental Remote Sensing</i> <i>Remote Sensing and Aerial Photography</i> <i>Remote Sensing and Aerial Photography</i> <i>Remote Sensing</i>	<i>FIRENZE</i> <i>POLITECNICO - TO</i> <i>POLITECNICO - TO</i> <i>POLITECNICO - TO</i> <i>POLITECNICO - TO</i> <i>POLITECNICO - (MI-CO)</i>
ENVIRONMENTAL SCIENCES	Remote Sensing of natural resources Aerial Photography and Remote Sensing Geology RS and Aerial Photography Remote Sensing and Cartography	MILANO – UNI 2 VENEZIA LECCE UNIV. MOLISE
GEOLOGY	Photogeology Remote Sensing and Photogeology Photogeology Geography Cartography (RS)	FIRENZE MILANO – UNI 2 MILANO – UNI CAGLIARI COSENZA
EARTH SCIENCES	Photogeology	PARMA
NATURAL SCIENCES	RS of Natural Resources Photogeology Environmental Remote Sensing	NAPOLI FIRENZE TORINO
AGRONOMY AND FORESTRY SCIENCES	Planning Agricultural and Forestal Resources RS and Forestal Inventory RS and Forestal Inventory GIS Forestal Inventory Planning Agricultural and Forestal Resources	MILANO – UNI FIRENZE PALERMO UNIV. TUSCIA UNIV. TUSCIA UDINE

Table 1 – Remote Sensing University courses in Italy.

As it easy to see very few courses are named simply “Remote Sensing”; in several courses the Remote Sensing is only a part of the whole course.

#### **4) Available data collection systems**

- Since 1994 we have the MIVIS Daedalus hyperspectral aerial scanner (property of CNR) which operates in 102 spectral bands.
- Since 1972 the Landsat images are available from Fucino receiving station.
- A Daedalus 12 channels aerial scanner is operating at the IGM (National Geographic Institute) in Florence.
- The Italian Navy operates with 4 Daedalus UV aerial scanners for coastal pollution control
- Various radiometers, spectrophotometers and radiometric instruments in different research institutes.

#### **5) Publications**

A good panorama of the italian Remote Sensing activity is described in the Proceedings of ASITA Conferences (Parma 1997, Bolzano 1998, Napoli 1999) as well as in the official issue of the A.I.T. called "Rivista Italiana di Telerilevamento".