Consiglio Nazionale delle Ricerche

Cooperazione Italiana allo Sviluppo
Ministero degli Affari Esteri

Science for Diplomacy: Multidisciplinary Training Programme "DIPLOMAzia"

First Announcement

On October 24th Prof Luigi Nicolais, President of the National Research Council of Italy, and Minister Plen Giampaolo Cantini, Director General of the Development Cooperation of the Italian Ministry of Foreign Affairs, signed the convention on the Multisector Training Programme **DIPLOMAzia**, which represents the fruitful outcome of the ongoing and solid collaboration between these two public bodies.

Thanks to this new *diplomatic* initiative, worth a significant financial contribution provided by the DGCS MAE as well as a co-funding made available by CNR, 70 selected graduates, graduated professionals and officials in public institutions from the recipient countries (**Morocco, Tunisia, Egypt, Lebanon, Serbia, Montenegro**, **Bosnia Herzegovina, Albania**) will benefit from a six-month specialized training course run at CNR Institutes in Italy.

The candidates regarded as eligible must be citizens and resident in the above mentioned countries; year of birth not prior to 1973; hold a Masters degree in either socio-economic , scientific or humanities areas.

The courses will be held in English. A very good knowledge of English is required.

The fellowship will offer the following benefits:

- Logistic and administrative support during candidates' stay in Italy
- A gross sum of 1,600€ per month for six months
- Work accidents and health insurance
- Return flight ticket

The courses will cover the following macro-sectors:

1. Governance and management of marine and fishing policy
2. Management and utilization of food resources aimed at the sustainability of agriculture and forestry, and at the mitigation of the effects of climate change
3. Promotion and preservation of cultural heritage.

CNR structures responsible for course implementation are:

Course 1 Institute for Coastal Marine Environment IAMC
Course 2 Department for Agri-food Sciences DiSBA
Course 3 Institute of Archeological Heritage – Monuments and Sites IBAM;
Institute for Technologies Applied to Cultural Heritage ITABC;
Institute for the Conservation and Promotion of Cultural Heritage ICVBC
Institute for the Study on Ancient Mediterranean ISMA

The International Relations and Agreements Office will play a coordination role in contact with both the CNR Institutes and the relevant MAE DGCS Office

Such programme, consistent with the Italian Cooperation Development guidelines outlined for the years 2013-2015, will help the recipient countries enhance their human resources' skills, adding to their technical know-how and entrepreneurship qualities.

Not only will the project entail knowledge transfer activities, but also it will hopefully foster the *ownership* awareness necessary to bring about local development and new scientific and technological partnerships with Italy as well.

In order to achieve the objectives set by the programme, the selection of suitable and promising candidates is of paramount importance. Strong support letters by public or private bodies from their home country will be **greatly** taken into consideration.

The call for proposal will be launched at the beginning of January 2014 and will stay open till the end of February.

All relevant information will be available on the CNR website (http://www.cnr.it/sitocnr/IlCNR/Attivita/Attivitainternazionali/Diplomazia.html)

An outline of the course programme is given in attachment.

Course 1: Governance and management of fisheries and maritime policies

Course Director : Salvatore Mazzola

Masters' degree required: Environmental Sciences, Natural Sciences, Life Sciences, Chemical Sciences, Geological Sciences, Environmental Engineering

The above training course aims at creating specialized expertise in the definition of global, EU, national and regional policies for the marine environment and its renewable resources, by training young experts with a high level of specialization in the field of maritime policies aimed *sensu lato*, namely the related fishing, maritime and the legislative and regulatory aspects, environmental monitoring, economy related to the sea and its resources, political and economic geography.
The course, covering a period of 6 months, is aimed particularly at young graduates in scientific subjects: the 720-hour long course will comprise an internship period (120 h), while 600 hours will be divided into a theoretical section (lectures) and a practical section with training on the job activity (approximately 480 hours) in which case studies will be analyzed and laboratory activities will be carried out by the students.
The training course will begin with an introductory module which aims to provide basic knowledge on topics related to marine sciences and the international management of marine resources. The second part of the training activity will cover those categories and areas of scientific knowledge more linked to the application of governance and the management of emerging economies, particularly those of the Mediterranean basin, with a perspective of engagement in technology transfer actions, business creation and support to local governance. These areas will include:

1. *Interdisciplinary Oceanography*: concepts to ensure everyone basic knowledge of the scientific disciplines applied to marine environments, in particular chemistry, physics, biology and geology.
2. *Political and Economic Geography*: knowledge of the fundamentals of human geography and politics, with particular reference to issues and problems of political and economic geography on an international scale.
3. *Marine and Fisheries Economy*: knowledge of maritime activities economy, fishing and marine resources management, environmental and coastal land protection, as well as related economic sectors.
4. *Maritime Policies and International Maritime Law*: foundations of international maritime law and global maritime governance, in order to possess the tools necessary for a complete regulatory and legal framework of the sea sector in all its scientific and economic aspects.
5. *Technology Transfer*: techniques and tools. The technology transfer policies for the transfer on the ground, in terms of competitiveness, of scientific innovations developed in the laboratories of research centers.
6. *Corporate management and Euro-project management*: knowledge of enterprise and entrepreneurship dynamics, as well as planning and design, or access to funds and funding for scientific cooperation and development cooperation programs.
7. *Public Relations*: communication module. The objective is to develop relationships, to connect institutions, companies, people, facilities, also on an international scale, in order to implement and strengthen technology transfer strategies.

Course 2: Management and use of agro-food resources aimed at sustainability of agriculture and forestry and at mitigation of the effects of climate change

Course Director : Domenico Pignone

Masters' degree required: Agricultural Sciences, Forestry, Animal production Science, Food production Sciences, Veterinary Sciences, Life Sciences, Natural Sciences, Biotechnology

Mediterranean countries are confronting with new production and economic models to face challenges that countries such as Italy have already faced since the Second World War , with particular reference to the problems associated with the loss of indigenous plant genetic resources. This loss is due to changes of primary production systems , to pressure of the increasing domestic demand , modification of food preferences and to the need to adapt their production systems to reduced water availability . In addition, the Mediterranean is one of the geographical centres where climate change is occurring with greater intensity. These conditions pose a high risk of genetic erosion on Mediterranean crops, which constitute a resource of the utmost importance to mitigate the effects of climate change on primary production and for the development of new varieties highly adapted to the changing conditions of the region. Climate change also affects the microbial population of the macro-environment (soil, air and water) and the population of pets or other vectors. Particularly, temperature increase and precipitation pattern changes have a close relationship with the fate, the transport, the growth and survival of both desired (technological microorganisms such as lactic acid bacteria, yeast and fungi involved in the production of fermented fruit and vegetables) and undesired (spoilage and pathogenic) microorganisms.
The course aims to provide participants with the basics and experience to plan a mindful and sustainable management of local resources, in line with the recommendations and the methodologies internationally adopted.

Participants will be provided with the most extensive knowledge on the origin and conservation of native plant genetic resources, as an instrument on scientific grounds for planning interventions, together with an overview of the legal framework and strategies for implementing programs of plant genetic resources (PGR) conservation, with particular attention to those in force in the Mediterranean countries. The course will also provide guidelines for the development of legislation on PGR in their countries of origin as well as provide practical tools on how to organize and manage a germplasm bank and relevant information, using as an example the Italian framework . The phases of on-job training will focus on the practical aspects of the management of PGR, at different intervention levels:

- managing gene banks from the field to the cold stores, alternative methods of preservation (cryopreservation , tissue culture , etc. .) , managing data on the stored PGR
- PGR characterization from morphometric field data to molecular data, and search for genetic determinants of adaptation
- interaction of PGR with the biotic and abiotic environment
- optimization of water resources through careful use of germplasm and through a proper use of water resources ,
- Detection and typing of epiphytic microorganisms affecting the microbial food safety and quality of raw and fermented fruits and vegetables.
- agro-meteorological models to forecast water availability in a given growing season and to predict future climatic scenarios.

An evaluation module will allow to assess in detail the understanding of the topics of the course for each participant, also with the aim to issue a certificate to those who have successfully passed the test.

Course 3a: NEW APPROACHES TO CULTURAL HERITAGE MANAGEMENT

Course Director: Daniele Malfitana

Masters' Degree required: Physics, Geology, Chemistry, Conservation Science in Cultural Heritage, Architecture (specialization in Restoration, History of Urbanism), Archeology, Sciences of Antiquity (philological-literary, historical and artistic) Historical Sciences

Directed by experienced heritage professionals and leading researchers of the Institute for Archeological and Monumental Heritage (IBAM), the **training course "New approaches to Cultural Heritage Management"** provides appropriate and crucial training on theoretical issues and the operational methods applied to technologies in order to support the management process of cultural heritage.

Objectives: At the conclusion of the course, participants will have a better understanding of critical processes in cultural heritage in order to apply them at the macro/micro levels; expand their awareness, knowledge, skills and understanding of current principles and practices in cultural heritage management.

Methodology: Training is based on a multiple activity model including lectures, case studies, practical hands-on exercises, site visits, group work, and classroom discussions. Looking at the new funding possibilities offered by the new Horizon 2020 programme and combining academic studies with practical applications, this flexible course covering a period of time of six months provides an informed and up-to-date overview of heritage management theory (100 hours) and practice (approximately 620 hours), exploring the multi-disciplinary nature of heritage studies.

Place: IBAM represents the ideal environment for heritage studies. Heritage is writ large in the landscape around the four regions where IBAM Offices are placed: Catania, Lecce, Roma, Potenza.

Structure : The didactic section aims to provide basic knowledge on topics related archeology and management of cultural heritage techniques. It is made of the following modules:

1) Archeological Heritage

- Archaeology and Art History of the Mediterranean countries, with particular attention to the identification of cultural heritage on which to develop common policies.
- History of the Mediterranean: cultural and political processes that have characterized the history of the ancient Mediterranean
- Archaeology of the Roman and Greek period.
- Methodology of archaeological research: description of the main methods and tools of current archaeological research.
- Theory, techniques and tools for cataloging, promotion and use of indoor and outdoor cultural heritage systems.
- Theory and tools to better understand ethno-anthropological heritage in order to strengthen the construction of systems enhancement and enjoyment of territorial identity.

2) Legal Aspects applied to cultural heritage

- Cultural Heritage Legislation to learn and develop the most advanced experiences in the field of European regulatory framework.

3) Management module

- Understanding of the key principle of archaeological project management.

- Knowledge of the curatorial frameworks and policies that govern archaeological project work in Horizon 2020.

4) ICT tools applied to Cultural Heritage

- General outline of the main tools for the management of cultural heritage .
- Geographic information systems and data management : leading and innovative information systems and spatial data management.
- Elements of digitization and image processing : knowledge of principal and innovative systems for scanning and image processing .

- The practical section includes the laboratory activities aimed at the transmission of technical expertise of the major tools and technology applications useful for cataloging, managing and administrating cultural heritage. The laboratories will focus on 1) foundational practical experience with VR modeling, 2)with the using of GIS and its application in archaeology, 3)a practical training in the use of topographical survey equipment: ranging from conventional techniques, though total station and GPS survey. Site visits and group work will be planned over the section.

Course 3b: CULTURAL HERITAGE AND ANCIENT MEDITERRANEAN CIVILIZATIONS: THE ISMA TRAINING PROJECT

Course Director: Sergio Ribichini

Masters' Degree required: Physics, Geology, Chemistry, Conservation Science in Cultural Heritage, Architecture (specialization in Restoration, History of Urbanism), Archeology, Sciences of Antiquity (philological-literary, historical and artistic) Historical Sciences

The Institute for Ancient Mediterranean Studies (ISMA) offers an historical and archaeological course on different civilizations of the ancient Mediterranean, with the aim of providing knowledge and expertise to the research, preservation, conservation and improvement of cultural heritage. It provides for a didactic section (180 hours) and a practical section (540 hours), basically realized in the "Area della Ricerca CNR di Roma - Montelibretti".

The didactic section will include both Lessons and Seminars. They will concern the following topics: (1) History of the Ancient Near East; (2) Middle and Late Bronze Age in the Near East and Eastern Mediterranean: material culture and craft traditions; (3) The alphabet as innovation, in its Near Eastern context; (4) Egypt as cultural crossroad of the ancient Mediterranean: historical and archaeological research between tradition and innovative technologies; (5) The Phoenician and Punic civilization: religion and identity of a Mediterranean people; (6) The pre-classical Aegean civilization in the Mediterranean Bronze Age; (7) Elements of Mediterranean and European proto-history; (8) Topics of Italian proto-history. The development of cultural *facies* in the Italian peninsula from the Early Bronze Age to the Early Iron Age; (9) Etruscan civilization and Italic archaeology; (10) Etruscan religion: beliefs and practices; (11) Art and handicraft productions of the Etruscan-Italic world, in the context of the ancient Mediterranean; (12) Phoenician and Punic colonial structures in Sardinia: a case-study (Pani Loriga, Sardinia); (13) The archaeometallurgy in the Western Phoenician colonies; (14) Encountering ancient Mediterranean polytheisms: a comparative approach; (15) The roman villas: a Mediterranean phenomenon from its origins to Late Antiquity; (16) Knowledge of library science and bibliography; (17) Archaeology in the Digital Age; (18) Databases and automating catalogue of cultural heritage; (19) History and Historiography: how modern scholars reconstruct(ed) the ancient Mediterranean world, and - on the reverse - how ancient Mediterranean societies perceived and shaped their own past.

The appointment of a more specific teaching-schedule will be customer-tailored.

The practical section is divided into: Archaeological training programme, Involvement in projects, Individual research, and Guided tours to museums and archaeological sites.

The archaeological training programme includes: (1) Participation in the excavation at the Phoenician and Punic site of Pani Loriga (Carbonia-Iglesias, Sardinia), in June; (2) Restoration, identification of wares, and managing archaeological objects: a laboratory which will take place at the Archaeological Museum of Santadi (Sardinia), in June; (3) Participation in the excavation at the Roman Villa of Cottanello (Rieti), in July. The fieldwork will include both lessons on excavation techniques and documentation, with the compilation of stratigraphic unit forms and digitalization of plans and sections of the investigated areas.

Involvement in projects includes: (1) Participation in the work of SatER, "Team Satellite Remote Sensing in support to Egyptological Research"; (2) Participation in the activities of TECH, "Photogrammetry: Technology for the Egyptian Cultural Heritage"; (3) Participation in other events organized by the ISMA.

Individual research involves: (1) Course-works; (2) Computer graphics.

Guided tours to museums and sites include the Museo Nazionale Etrusco di Villa Giulia and a visit to the main collections of Egyptian archaeological objects in Rome.

Institute for Technologies Applied to Cultural Heritage ITABC - Course 3c

Course Director: Paolo Salonia

Masters' Degree required: Physics, Geology, Chemistry, Conservation Science in Cultural Heritage, Architecture (specialization in Restoration, History of Urbanism), Archeology, Sciences of Antiquity (philological-literary, historical and artistic) Historical Sciences

The training period offered by CNR ITABC is addressed to early carrier researchers and experts with a background in Science and Humanities. It covers various integrated fields.

- **Geophysical methods and techniques**. It aims at verifying, through the use of appropriate technologies, the characteristics of specific geographic areas and landscapes, such as location of ancient settlements. It also include the development of integrated approaches of high-resolution geophysical methods (differential and magnometrial GPR) relevant for the analysis and enhancement of archaeological sites in urban and suburban areas. This activity aims at defining the most appropriate acquisition techniques, at different scales, of multidimensional modeling, of data representation and management referred to areas which may contain archaeological sites and historic buildings. The various sciences and techniques (remote sensing, high resolution geophysical techniques, geology , topography, archaeology) are applied in situ all together with the goal of obtaining information on spaces and volumes.

- **Reality-based acquisition methods and techniques**, processing and modeling of morphometric data, descriptive data processing and integration of heterogeneous databases used to understand the knowledge of artifacts geometry and conservation. This approach is applied to any method and technology used to characterize in 3D, relevant artifacts morphometry and radiometry. A further Integrated Information System is than adopted to monitor built heritage of the territory, mapping on the 3D artifacts geometry, all relevant heterogeneous data.

- **Virtual Reality methods and techniques** for the reconstruction of archaeological landscapes and for the creation of immersive interactive environments and Virtual Museums. Tools (with particular reference to Open Source) and methods will be described and tested in relevant use cases. On Site and On Line interactive 3d applications will be specifically the focus of this course.

- The course will therefore be divided into three main areas that will be developed both theoretically and in terms of technical application. The theoretical section will be divided roughly into the following modules:

    1. Module **Geophysics** (40 h)
        - Evaluation of integration approaches through analysis of available literature and experiences developed ad hoc.
        - General information of research aspects at national and international level, with respect to both the latest scientific developments and relevant laws.
        - Analysis of the potentialities of the expected results.
        - Evaluation of potential applications in the Mediterranean countries

    2. Module **Survey and 3D Modeling** (40 h)
        - Study of the artifact and analysis of its conservation
        - Instrumental morphometric data acquisition systems
        - Multi-scale photo-scanning systems and UAVs
        - Image-processing
        - GIS for monitoring

3. Module **Virtual Heritage** (40 h)

- Virtual Heritage techniques through Open Source tools
- Data post-processing from 3D acquisition
- Basics about photography applied to Cultural Heritage
- Basics of digital mapping and GIS
- Basics and methods of virtual museums, webGIS, multimedia communication applied to Cultural Heritage

The practical section includes modules:

4. **Laboratory activities** (600 hours)

Laboratory work is focused on the application of the theory and methodology in the 3 domains, including field work activities, use of specific instruments and software.

Institute for the Conservation and Promotion of Cultural Heritage - ICVBC Course 3d

Course Director: Marco Realini

Masters' Degree required: Physics, Geology, Chemistry, Conservation Science in Cultural Heritage, Architecture (specialization in Restoration, History of Urbanism), Archeology, Sciences of Antiquity (philological-literary, historical and artistic) Historical Sciences

The course organised by the Institute for the Conservation and Valorisation of Cultural Heritage –ICVBC aims to offer to the participants a knowledge integrating the scientific and humanistic approach relative to the conservation of both monuments and historic cities. In this sense, the organisation and management of a diagnostic laboratory will play a central role in the participants' training. The ICVBC proposal is articulated in two parts, comprising several units aiming to offer an in-depth knowledge, both on a theoretical and practical level, of the multiple aspects regarding the conservation and enhancement of cultural heritage. More specifically, the theoretical part will be based in Florence and will comprise lectures offered to all the participants in Florence. During the practical part of the course, participants will be subdivided in the three different seats of ICVBC located in Florence, Milan and Rome, where each participant will further develop the subjects proposed in the theoretical part through laboratory activities and field work, closely related to the Institute's activity in selected case studies.

The THEORETICAL PART, for a total of 120 hours, is articulated in the following units:

Unit 1. Materials and techniques (18 hours)
- natural stone materials: identification, provenance, quarries, working techniques, tools, reuse;
- artificial stone materials (mortars, ceramic materials) glasses and metals: components, raw materials, working techniques, tools;
- Italian and European standards.

Unit 2. Decay of materials (18 hours)
- Definition of decay phenomena, study of decay mechanisms and of the effects related to different environmental conditions and locations (archaeological site, urban area, indoor, outdoor);
- Italian and European standards.

Unit 3. Diagnostic (18 hours)
- Non invasive and invasive techniques: first principles of the main analytical techniques;
- Sampling: best practices according to the nature of the hand fact and to the diagnostic plan.

Unit 4. Conservation (24 hours)
- Products and methods used for biodeterioration control, cleaning, consolidation and protection. Chemical classes, working principles, application methodologies, performance evaluation.
- Italian and European standards

Unit 5. Preventive and planned maintenance (12 hours)
- Monitoring of surfaces. Protocols to evaluate the evolution of decay and the efficacy and the durability of the conservative products;
- Inspecting activity and maintenance project.

Unit 6. History of Architecture and of the Mediterranean city (20 hours)
- Urban History in the Euro-Mediterranean context: analysis of the fundamental disciplinary principles and of the cultural and political processes that have characterised the history of the Mediterranean city in modern times.

- History of Art and Architecture (medieval and modern): presentation of the major artistic and cultural expressions in the Euro-Mediterranean context during the period in question, with particular reference to stone buildings, their building techniques and materials, the circulation of knowledge and experts and the transmission of know-how which is at the basis of a common artistic and technological culture in the Mediterranean area.

Unit 7. Conservation and Valorisation of historic centres (10 hours)

- Conservation of historic urban centres and of their place identity: analysis of the present European urban policies relative to tourism and presentation of the ICVBC protocols for monitoring tourist impact in historic centres and in UNESCO sites (method PreservingPlaces).

The PRACTICAL PART, for a total of 600 hours, comprises the units:

Unit 8. Laboratory Activities

- Realisation of diagnostic campaigns developing specific analytical protocols employing the diagnostic techniques and knowledge acquired during the theoretical part of the course.

Unit 9. Field Activity

- Monitoring the state of conservation and of the treatments' proposed in the pilot case study areas of the Institute ;
- Itinerary visits in the historic city and UNESCO site in order to have a first hand experience of the issues proposed by the course relative to the city's history and conservation of monuments, archaeological sites and of the historic centre as such.

Unit 10. Activity relative to the monitoring of tourist impact with the PreservingPlaces method (seat of Rome).

- The activity aims to convey the specific know how relative to the above mentioned monitoring system regarding tourist impact and the quality of life in historic centres and UNESCO sites. It regards the use and management of appropriate techniques for cataloguing and managing the data collected. More specifically the field work will be a survey comprising the collection of different kinds of data regarding the built heritage and urban context (such as administrative information, photographic material, use of public space, state of conservation, samples of the buildings' plaster, etc) and their implementation in an appropriate digital databank.