

Notice of Open Competition for Admission to PhD Programs Related to the 37th Cycle - Academic Year 2021/2022

The three-year PhD programs listed below are activated, for the academic year 2021/2022, in the context of the 37th Cycle, with administrative offices at the University of Teramo. A public exam on the qualifications and tests are called for admission to mentioned PhD Programs.

PhD in "**Historical studies from the Middle Ages to the contemporary age**"

Degree title required	All master's degrees with a degree thesis on a historical discipline or a historical subject.
Positions available	6
Positions available with a grant	5
Positions available with a grant reserved for graduates from foreign Universities	1
Coordinator	Prof. Massimo Carlo Giannini

PhD in "**Cellular and Molecular Biotechnologies**"

Degree title required	All master's degrees
Positions available	12
Positions available with a grant	6
Positions available with a grant reserved for graduates from foreign Universities	5
Number of seats reserved for employees ASSUT EUROPE SpA	1
Research projects covered by a grant	Candidates interested in study grants must submit, together with the application, a specific research project indicated below
Coordinator	Prof.ssa Barbara Barboni

PhD in "**Food Science**"

Degree title required	Possession of one of the following degrees: LM-6 Biology; LM-7 Agricultural Biotechnology; LM-8 Industrial Biotechnology; LM-9 Medical, veterinary and pharmaceutical biotechnology; LM-13 Pharmacy and industrial pharmacy; LM-22 Chemical engineering; LM-42 Veterinary medicine; LM-54 Chemical Sciences; LM-56 Economics; LM-60 Sciences of nature; LM-61 Sciences of
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	human nutrition; LM-69 Agricultural Sciences and Technologies; LM-70 Food science and technology; LM-71 Sciences and technologies of industrial chemistry; LM-73 Forest and environmental sciences and technologies; LM-75 Sciences and technologies for the environment and the territory; 6 / S (specialist in biology); 7 / S (specialist in agricultural biotechnology); 8 / S (specialist in industrial biotechnology); 9 / S (specialist in medical, veterinary and pharmaceutical biotechnology); 27 / S (specialist in chemical engineering); 62 / S (specialist in chemical sciences); 77 / S (specialist in agricultural science and technology); 78 / S (specialized in agri-food science and technology); 79 / S (specialized in agro-technical sciences and technologies); 81 / S (specialized in industrial chemistry sciences and technologies); 92 / S (specialists in statistics for experimental research) - In the case of requests for graduates with a degree class other than those indicated, the jury will evaluate the possible admission according to particular curricular requirements that may make the candidate suitable for carrying out activities in the field of food sciences
Positions available	4
Positions available with a grant	4
Research projects covered by a grant	Candidates interested in study grants must submit, together with the application, a specific research project indicated below
Coordinator	Prof. Dario Compagnone

PhD in "Veterinary Medical Sciences, Public Health and animal welfare"

Degree required	title	Possession of one of the following degrees: LM-6 Biology; LM-9 Medical, veterinary and pharmaceutical biotechnology; LM-17 Physics; LM-21 Biomedical Engineering; LM-32 Computer engineering; LM-42 Veterinary medicine; LM-54 Chemical Sciences; LM-69 Agricultural Sciences and Technologies; LM-70 Food science and technology; LM-77 Economics and Business Sciences; LM-86 Zootechnical sciences and animal technologies; 6 / S (specialist in biology); 20 / S (specialist in physics); 26 / S (specialist in biomedical engineering); 47 / S (specialist in veterinary medicine); 62 / S (specialist in chemical sciences); 78 / S (specialized in agri-food science and technology); 79 / S (specialized in agro-technical sciences and technologies); 84 / S (specialist in business economics)
Positions available		9
Positions available with a grant		7
Positions available with a grant reserved for graduates from foreign Universities		1 funded with funds from the Department of Excellence - Demetra project
Positions available without a grant		1
Coordinator		Prof. Fulvio Marsilio

PhD in "Processes law harmonization between history and system"

Degree required	title	All master's degrees
Positions available		4

Positions available with a grant	3
Positions available with a grant reserved for graduates from foreign Universities	1
Coordinator	Prof.ssa Paola Bellocchi

PhD in **"International Perspectives in Corporate Governance and Public Administration"**

Degree title required	All master's degrees
Positions available	7
Positions available with a grant	2
Positions available with a grant reserved for graduates from foreign Universities	1
Positions available without a grant	1
Number of seats reserved for CNR employees	3
Coordinator	Prof. Romano Orrù

PhD in **"Economic and social sciences"**

Degree title required	All master's degrees
Positions available	7
Positions available with a grant	2
Number of seats reserved for employees ELITAL Srl – Metron Srl – ARAN World	4
Positions available without a grant	1
Coordinator	Prof. Christian Corsi

The number of grant may be increased as a result of additional funding made available after the publication of this announcement. Any increase in the number of scholarships may determine the increase in the total number of positions available. This increase will be communicated exclusively on the University website (<http://www.unite.it>).

Admission Requirements

The application for the call may be submitted without any limitations of age and citizenship, by those who hold the above mentioned qualifications or appropriate foreign qualifications at the date of expiry of the call or by those who will obtain the required qualifications for admission by October 31, 2021. The equivalence of the foreign qualification is ascertained by the PhD Committee on the basis of the documentation presented by the candidate together with the application for admission to the admission competition (*).

The lack of the above mentioned requirements will lead to the exclusion from the procedure at any time, with a written notice of the person in charge of the procedure.

Research projects funded with a grant for a PhD course in "Cellular and Molecular Biotechnologies"

Fellowship 1

Tutor: Prof. Perugini

Fellowship grant: **UNITE**

Topic title: Multilevel experimental approach to study endocrine disruptors (EDs)

Topic description: Evaluations by various international agencies indicate that Endocrine Disruptors are a large, heterogeneous and still incompletely known class of substances ranging from persistent environmental contaminants to compounds used as phytosanitary or pesticides to compounds used in cosmetics or as antimicrobial additives. The interest of the scientific community is linked both to the heterogeneity of the compounds, which results in the ability to alter various mechanisms of the endocrine system and the variety of possible routes of exposure, and to the importance of not sufficiently understood aspects, such as the risk of additive or synergistic effects and / or the possibility to produce effects at very low doses during vulnerable phases of the life cycle, in particular for compounds interacting with nuclear receptors.

The project aims to acquire new knowledge about the effects of individual compounds and mixtures, using in vitro and in vivo experimental models. As part of the project, the zebrafish model (*Danio rerio*) will be used to study the toxic and molecular effects in the pre- and postnatal development phases of the different EDs.

Fellowship 2

Tutors: Prof. Claudio D'Addario & Prof. Enrico Dainese

Fellowship grant: **UNITE**

Topic title: Microbiota and Epigenetic Modulation in Mental Health: Study on Psychobiotic Influences

Topic description: Several mental conditions have been proposed to be partially sensitive to gut microbiota manipulation and it is likely that the consumption of prebiotics or probiotics is able to improve symptoms related to the brain. Despite animal studies consistently reporting the modulation of the nervous system by gut microbiota, human data are more limited. The large individual's microbiota variability might drive the risk to the development of a particular morbidity interacting with environmental signal processing (i.e. diet), genetic susceptibility as well as epigenetic regulation of genes transcription. In this context, it is thus of particular relevance to better characterize the recently suggested cross-talk between gut microbiome and epigenome. The PhD student will have to possibility to use different preclinical animal models showing behavioral abnormalities that correspond to the human psychiatric diseases, as well as clinical material from different subset of subjects with or without mental health problems, to provide the identification of biomarkers modulated by gut microbiota in mental health. This will be of help for psychiatry and nutritional professional population by appreciating the importance of microbiota-based strategies to improve human health. Moreover, this will reduce the cost of treatment by preventing disease and efficiently targeting nutritional strategies by means of probiotic/prebiotic administration. Furthermore, the PhD student will also be involved and will develop skills in organizing activities of Dissemination, Exploitation and Outreach of results of EU research projects granted to UniTe.

Fellowship 3

Tutor: Prof. Ippoliti

Fellowship grant: **UNIVAQ**

Topic title: Thiol-dependent proteins as possible targets for rational drug design and for biotechnological applications

Topic description: The 3D structure of proteins from eucaryotic parasites and the corresponding human homologues will be studied with the aim of developing rational-based drugs. Moreover, proteins with the ability to form appropriate supramolecular structures, will be evaluated as possible components of scaffolds for cell culture and tissue regeneration.

Fellowship 4

Tutor: Prof. Poma

Fellowship grant: **UNIVAQ**

Topic title: Genomic and epigenomic responses in vitro and in vivo to emerging air pollutants such as micro and nanoplastics, endocrine-disrupting compounds, NO_x (NO+NO₂) and ozone

Topic description: Plastic is currently one of the most widespread pollutants on Planet Earth. Once dispersed, plastics undergo chemical-physical degradation and the formation of smaller particles classifiable as micro- and nanoplastics. These can spread not only in aqueous matrices, but also in the air as atmospheric particulate subject to interaction with NO_x (NO + NO₂) and ozone. To date, little is known about the risk associated with these micro and nanomaterials, but studies agree on their ability to cause oxidative stress and genotoxicity in vitro. In vivo studies are still few, but they have demonstrated the ability to accumulate in mammalian tissues, including human organs and tissues.

Behavioural disturbances, reduced fecundity and increased mortality have been observed on marine organisms. Micro- and nanoplastics are also carriers of other pollutants that can increase their consequent toxicity. Recent studies have identified heavy metals, dioxins, estrogens and bisphenol A as the most present molecules associated with particles. Furthermore, exposure to micro- and nanoplastics can induce epigenetic changes in *D. melanogaster*, *C. elegans* and in plant organisms.

Fellowship 5

Tutor: Prof. Tatone

Fellowship grant: **UNIVAQ**

Topic title: Sirtuins in gamete biology and reproductive physiology

Topic description: Sirtuins are a family of NAD⁺-dependent deacetylases which have recently emerged as key metabolic sensors for body homeostasis. Together, they respond to metabolic challenges, inflammatory signals or hypoxic/oxidative stress, and are associated with aging and longevity. Fertility is very sensitive to redox perturbations related to aging and metabolic dysfunctions, which disrupt the link between energy metabolism and reproduction. Reproductive cells and organs are constantly challenged by stresses and privations and require adaptive responses for their survival. In addition to redox perturbations related to aging or diseases, reproductive cells have to face stress conditions if they undergo manipulation during assisted reproductive procedure. The current lifestyle of 'Western societies' characterized by excessive consumption of high-energy diets, physical inactivity and delayed family planning has pressured reproductive system towards subfertility. At present, the lack of sensitive methods for direct quantification of Sirtuin enzymatic activity makes it difficult to investigate Sirtuins in germ cells and embryos. On the other, hand high-throughput screening methods for the study of lysine acetylome, Sirtuin signalling, targets and modulators could be highly promising.

Fellowship 6

Tutor: Dr. Petrini

Fellowship grant: **IZSAM**

Topic title: New diagnostic techniques functional for wildlife pathology.

International mandatory mobility period: 12 months

Topic description: This project uses a One Health approach by integrating human, animal, and environmental health partners in monitoring wildlife/livestock/humans interface to study disease

spread among people, animals, and the environment and to control potential public health threats. New diagnostic and advanced imaging technology will be used and/or developed to support the traditional necroscopy and offer better diagnostic solutions, crucial to comprehend and enhance our knowledge on emerging diseases including zoonoses.

Candidates interested in scholarships will have to present, together with the application, a specific research project on one of them.

Research projects funded with a grant for a PhD course in "Food Science"

Fellowship 1

Tutor: prof. Paola Pittia

Title: New foods and ingredients design and structuring by innovative technologies

Abstract: In this project, different structuring approaches and methodologies will be developed to obtain new food products and/or ingredients with modern and innovative qualitative and sensory properties, as well as technological functionalities. Different innovative technologies (e.g. spray-drying, freeze-drying, co-milling, high dynamic and hydrostatic pressure) will be used as single process or in combination on individual biomolecules (e.g. starch, proteins) and/or mixed with other co-solutes (e.g. sugars, bioactives) to obtain simple-to-complex structured systems (e.g. gels, mixed gels, encapsulates) to match the consumer needs of healthy and high quality foods.

The project will include a minimum 6-months secondment in a EU or non-EU research lab.

Fellowship 2

Tutor: Prof. Manuel Sergi

Title: Study of bioactive compounds in food related matrices by means of mass spectrometry

Abstract: The identification of bioactive compounds in food related matrices is an interesting challenge which needs suitable analytical techniques and advanced data mining tools.

Mass spectrometry represents nowadays the most promising technique in identification and quantification of bioactive compound in different matrices, especially when coupled with chromatographic techniques (GC-MS o LC-MS), together with NMR being still the gold standard for structural elucidation of molecules.

Suitable informatics tools may help to obtain important information on unknown samples, both through databases and/or recognition systems based on structural similarity (i.e. molecular networking). This PhD Project will have the objective to develop analytical methods which may exploit the most advanced analytical techniques, mainly based on mass spectrometry (UHPLC-MSn and MALDI/TOF), in order to obtain exhaustive information on the properties of food related matrices and their interactions with human organism.

Fellowship 3

Tutor: Prof. Fabio Stagnari

Title: Innovative agronomic practices for high quality vegetable crops production

Abstract: Sustainability and high quality products within a vegetable production system require an ecosystem approach, which should be based on the application of innovative agronomic solutions, especially in an increasingly degraded environment and in a context of uncertainties resulting from climate change. Agricultural systems will necessarily higher yields as well as be able to improve the organoleptic and nutraceutical quality of products while reducing the impact on agro-ecosystems. The introduction of new technologically advanced tools in the management of crop systems, and the modulated and controlled application of technical means in the management of environmental "stress" conditions could be potentially capable of implementing yields, sustainability and nutritional characteristics of vegetable products. A scientifically rigorous and methodological approach is required to study their adoption, under sub-optimal or stress crop conditions, and to understand the responses of crops in terms of dynamics involved at the biochemical and molecular level (especially in secondary metabolism), changes in organogenesis and pigment accumulation, alterations in gas exchanges and

photosynthetic efficiency, changes in the translocation dynamics of photo-assimilated, alterations in the uptake of water and nutrients.

Fellowship 4

Tutor: Prof.ssa Rosanna Tofalo

Title: Selection and characterization of tailored yeasts and bacteria to shape wines' aroma profile

Abstract: The wine sector is facing several challenges and the need of innovation and diversification is the main one. It requires an in-depth study of natural wine yeasts and bacteria to exploit their potential for renewing fermentation processes and obtaining new styles of wines. Therefore, researches on yeasts and bacteria associated with specific wine areas are necessary to better understand microbial interactions during fermentation. This project will allow to valorise local and non-local wineries exploiting the microbial biodiversity to obtain high quality wines reinforcing the link with the a specific vitiviniculture area.

Candidates interested in scholarships will have to present, together with the application, a specific research project on one of them.

*Research projects funded with a grant for a PhD course in
"Veterinary Medical Sciences, Public Health and animal welfare"*

Fellowship 1 and 2

Tutor: Dr Maria Teresa Mercadante

Fellowship grant: **IZSAM**

Title: Application of new generation technologies for the research production of antigens, i.e. Single-cycle replicable virus, deleted and recombinant vaccines with and without vector and Virus Like Particles to be used in vaccine and diagnostic kit development.

Abstract: In the last years, the evolution in vaccinology field has led to the actual research strategies that are based on sequencing of pathogen genomes and on the identification of immunizing antigens. These last can be used in vectors capable of entering cells and stimulating the expression of antigens.

Recently the use of artificial intelligence allows to develop screening models of antigens and predictive models for the development of a vaccine containing the immunogens that best fit to the vaccinal plans. That said, we observed a progressive substitution of traditional vaccines with novel ones, in order to improve in process productivity and safety and efficacy.

Considering this context, the main object of the research project consists in the new technology acquisition for the production of antigens to be used in vaccine and diagnostic kit development in veterinary subject matter.

International mobility period: 12 months

Additional grants "PON Innovative Doctorates with Industrial characterization"

The University of Teramo participates in the call for competition "PON Dottorati Innovativi con caratterizzazione industriale" with proposals for the assignment of additional grants within the scope of all doctorate courses.

Admission procedure

Admission to the PhD courses is based on the evaluation of qualifications and interview and is divided into two phases.

In the first phase the Selection Committee proceeds to evaluate the following qualifications, giving each candidate a maximum score of 20 points according to the following division:

1) PhD in "Cellular and Molecular Biotechnology".

a. thesis abstract: maximum 4 points;

- b. research project developed by the candidate, consistent with the topics of the course: maximum 7 points;
- c. scientific curriculum vitae (university career including profit exams with the specific indication of the individual marks and the relative average - letter \ and reference of university professors or qualified scholars and any professional, training and / or research experience, degree of knowledge of foreign languages and other qualifications held): maximum 4 points;
- d. any publications: maximum 5 points.

2) PhD in "Food Sciences".

- a. scientific curriculum vitae and university career including profit exams with the specific indication of the individual marks and the relative average: maximum 8 points;
- b. letter \ and reference from university professors or qualified scholars and any professional experience: maximum 1 points;
- c. any publications: maximum 1 points.
- d. quality of the research project proposal developed by the candidate, consistent with the course topics: maximum 10 points.

3) PhD in "Veterinary Medical Sciences, Public Health and Animal Welfare".

- a. thesis abstract: maximum 8 points;
- b. research project developed by the candidate, consistent with the topics of the course: maximum 6 points;
- c. scientific curriculum vitae (university career including profit exams with the specific indication of the individual marks and the relative average - letter \ and reference of university professors or qualified scholars and any professional, training and / or research experience, degree of knowledge of foreign languages and other qualifications held): maximum 4 points;
- d. any publications: maximum 2 points.

4) PhD in "Law harmonization processes between history and system".

- a. scientific curriculum vitae (comprehensive university career profit exams; abstract thesis; n. 1 letter of reference from university professors or scholars qualified; knowledge of foreign languages): maximum points 8;
- b. research project developed by the candidate, consistent with the course topics, indicating the scientific disciplinary sector of reference: maximum 8 points;
- c. any professional, educational and / or research experiences, relevant to the topics of the doctorate; any publications equipped of ISBN or ISSN related to the topics of the doctorate: maximum points 4.

5) PhD in "Economic and Social Sciences".

- a. degree thesis abstract: maximum 3 points;
- b. university career including the exams taken: maximum 3 points;
- c. reference letter (s): maximum 1 points;
- d. any publications: maximum 5 points;
- e. any professional experience and other qualifications held by the candidate: maximum 3 points;
- f. a research project developed by the candidate, consistent with the topics of the course, which does not constitute a constraint for the subsequent choice of the doctoral thesis: maximum 5 points.

6) PhD in "Historical Studies from the Middle Ages to the Contemporary Age".

- a. abstract of the old legal or master thesis consistent with the subject areas of the course (minimum abstract length 2,000 - maximum 8,000 characters, spaces included): maximum 4 points;
- b. quality of the research project, consistent with the topics of the course, developed by the candidate (minimum length 8,000 - maximum 10,000 characters, spaces included): maximum 8 points;

- c. scientific curriculum vitae (university career including exams with the specific indication of the individual marks and the relative average - 1 letter of reference from a university professor or scholar / or qualified / or of recognized prestige; any professional experience, study and / or research; degree of knowledge of foreign languages and other qualifications held): maximum 4 points;
- d. any publications: maximum 4 points - it should be noted that only publications of proven scientific nature and endowed with ISBN or ISSN will be evaluated.

7) PhD in "Corporate Governance, Administration and Society in the International Dimension".

- a. thesis abstract (min. 2,000 characters - max 8,000 characters, spaces included): max 2 points;
- b. research project developed by the candidate, consistent with the course topics: maximum 10 points;
- c. scientific curriculum vitae (university career including profit exams with the specific indication of the individual marks and the relative average - letter \ and reference of university professors or qualified scholars and any professional, training and / or research experience, degree of knowledge of foreign languages and other qualifications held): maximum 5 points;
- d. any publications: maximum 3 points.

The second phase is the interview which is only for candidates who have achieved a minimum score of 12 points. The list will be published on the university website after the assessment of all the qualifications.

The oral test will consist of an interview of the candidate with the Academic Board designed to test the knowledge on the topic of a relevant doctoral course and to discuss the proposed research project. The knowledge of the English language is also always verified during the interview. The interview may be conducted entirely in English if requested by the applicant. The interview may be conducted via computer if required in the process of submission of the application by the candidate residing abroad or by the candidate with a disability. The interview will be considered passed only if the candidate will be awarded a minimum score of 24 points.

The maximum score for each candidate for the oral exam is 40 points. At the end of the interview the Selection Committee will proceed to identify the suitable candidates who will be placed in the general ranking, expressed in sixty, based on the sum of the scores obtained by the candidates according to the evaluation of the qualifications and the interview.

The information about the oral test, indicating the date, time and place in which it takes place, will be published on the university website at least 7 days before taking the oral test. For the interview candidates must bring a valid ID.

Application and submission deadline

To participate in the competition the candidate must complete and submit the application form – together with all attachments - using only the form available in the online procedure on the University website (www.unite.it).

The application must be submitted, under penalty of exclusion, no later than midnight on the thirtieth day following the publication of this announcement on the University website. If the expiry date indicated falls on an holiday day, the deadline is extended to the first following working day. The candidate can submit only one application for each PhD course.

Reserved places for graduates from foreign universities

For some PhD program there is a reserve of positions intended for graduates who have obtained all the qualification to enter the PhD program at a foreign University.

Contributions for the access and the attendance of the courses

All students enrolled in doctoral courses are required to pay € 140 per year as a regional tax in favor of the Company for the Right to University Studies, together with the stamp duty amount of € 16

for each year and € 32 for the issue of the parchment. All payments must be made through MAV, generated in the appropriate section of the University website.

Study grants

The financial support is awarded to the candidates according to the ranking.

The amount of the grant, to be paid in monthly installments, is EUR 15,343.28, gross of fees to be paid by the PhD student, according to current law.

The PhD grant is subject to the payment of INPS social security contributions.

This amount is increased to a maximum of 20 percent, for a maximum period of 18 months and a minimum of 30 days, if the doctoral student is authorized to carry out the research abroad.

Starting from the second year, a budget for research activities in Italy and abroad within the existing financial resources is guaranteed for each student.

The recipient of the study grant must have a gross annual total personal income not exceeding € 15,000.00 in the years of prevalent use of the grant.

The determination of this income, which is that related to the year of awarding the grant, includes all the patrimonial income, well as emoluments of any other nature, with the exception of those with an occasional nature or deriving from military service.

The grant cannot be cumulated with any other grants, except with those awarded by national or foreign institutions aimed at integrating, with the periods abroad, the training or research activity of the PhD students; in this case the right to the expected increase of the grant is lost.

(*) Academic title awarded abroad: university degree obtained abroad must be comparable to the title of Master of Science in duration, level and subject area. In accordance with this principle, acting on their eligibility with the Academic Board. Applicants who have a foreign qualification that has not already been declared equivalent (1) to an Italian degree will make implicit request for equivalence in their application for admission, must attach the following documents: certified the degree with exams and the corresponding vote (EU citizens may submit a self-certification according to Presidential Decree no. 445 of 28.12.2000, as amended, English translation, if the document is not already in that language, the certificate the degree earned, with exams taken and grades obtained, signed under their own responsibility, in order to allow the teacher to assess their suitability, solely for purposes of participation in the contest; any other documentation deemed useful to assess the eligibility of the title held for participation in the competition (Diploma Supplement (2), or declaration of local value (3), etc.). Candidates holding a degree not achieved in Italy winners of the contest must submit to the Service PhDs by February 28, 2022: Declaration of Value-site together with the degree certificate with exams and grades, translated and authenticated by Italian diplomatic authorities in the country where the institution that issued it. The Value Statement must certify that the qualification obtained is valid in the country of graduation for enrollment in an academic course similar to the Ph.D.; or, if the Value Statement above is not yet ready for the date indicated, a document showing that the release request has been submitted to the diplomatic mission of competence; In this case, the student must then deliver the Declaration of Value in the original as soon as available; or, as an alternative to Value Statement, the Diploma Supplement in English, according to the model developed by the European Commission, the Council of Europe and UNESCO / CEPES. In the absence of such documents will not be achieved the title of Doctor of Philosophy.

(1) For more information visit the web page <http://www.cimea.it/default.aspx?IDC=113>.

(2) With Diploma Supplement is a document attached to a diploma of higher education with the aim of improving the 'transparency' international and facilitate academic and professional recognition of the qualifications (diplomas, degrees, certificates, etc.). The Diploma Supplement should be issued by the same institution that issued the license. More details on the website: http://ec.europa.eu/education/lifelong-learning-policy/doc1239_en.htm.

(3) The Value Statement is issued by the Italian diplomatic missions abroad (embassies / consulates) competent. For more information, visit <http://www.cimea.it/default.aspx?IDC=118>.