Rector's Decree No. 529/2020

CALL FOR APPLICATIONS
Autumn School
Digital water management and water-related agroecosystem services: geostatistics, hydroinformatics and groundwater flow numerical modelling
2020/2021 Academic Year

Art. 1
General information

The Institute of Life Sciences of the Scuola Superiore Sant'Anna (Pisa – Italy) organises the third edition of the Autumn School Digital water management and water-related agroecosystem services: geostatistics, hydroinformatics and groundwater flow numerical modelling, pursuant to Art. 3 of the Statute.

The School was born as a two-weeks long full-immersion Summer School, an activity foreseen in Action D2 (Dissemination of results) of the EU LIFE REWAT (sustainable WATer management in the lower Cornia valley through demand REduction, aquifer Recharge and river REstoration; http://www.liferewat.eu) project co-financed by the European Union.
Because of the COVID-19 emergency, it is turned in an Autumn School as 40-hours on-line course. This year it is run within the framework of the EU MSCA-ITN MARSOLUT project (https://www.marsolut-itn.eu/).

MARSoluT - Managed Aquifer Recharge Solutions Training Network - is a four-year Marie Skłodowska-Curie Actions (MSCA) Innovative Training Network (ITN) funded by the European Commission. MARSoluT intends to tackle specific technical challenges in the operation of Managed Aquifer Recharge (MAR) sites on a scientific basis, specifically:

- *chemical, biological and hydraulic processes resulting in clogging and reduction of infiltration rates,*
- *hydrogeochemical processes affecting the water quality, with special focus on micropollutants,*
- *performance monitoring and modelling, including reactive transport models to predict the fate of pathogens and emerging pollutants, and*
- *implications of the processes mentioned above on the technical design of MAR projects in the frame of regional flow models and water management plans.*

MARSoluT intends, at the same time, to train a significant number (12) of Early Stage Researchers (ESRs) to become experts in the application of MAR in the frame of an Integrated Water Resources Management. We envisage these ESRs to become highly qualified multipliers for the effective promotion and implementation of MAR concepts in Europe and worldwide.

MARSoluT brings together 19 Beneficiaries and Partners Organisations, 9 of which come from academia and 10 from the non-academic sector, including SMEs but also large companies from the water sector, indicating

the high potential of the research approaches for commercial, full-scale application.

The LIFE REWAT takes place in the coastal Cornia plain (Tuscany, Italy). There, the aquifer system provides the only source of water for drinking, irrigation, and industrial purposes, and it also contributes to the water needs of the nearby Elba island. Since 60 years, intensive exploitation of groundwater resulted in consistent head lowering and water balance deficit, causing subsidence, reduction of groundwater dependent ecosystems, and salinization of freshwater resources. Rebalancing the water budget of the hydrologic system by means of innovative concepts (such as those of water-related agroecosystem services and nature-based solutions) is the main objective of the LIFE REWAT project. Five demonstration measures (river restoration; Managed Aquifer Recharge; reuse of treated wastewater for irrigation; high irrigation efficiency scheme; leakage management in water distribution systems) are in place for promoting water resource management, along with capacity building and participatory actions. Information and Communication Technologies (ICT; sensors and software use) are widely used in order to monitor the impact of such actions and to monitor quantitative and qualitative status of the groundwater resource.

The Autumn School will be run each Monday from **October 12th to November the 23rd 2020** as an online course. Because of the need of keeping small the applied on-line ICT lab activities, enrolment must be limited to a maximum of 30 participants.
The official language of the Autumn School is English.

Art. 2
ECTS

The Autumn School envisages the acknowledgement of 2 European Credit Transfer and Accumulation System (ECTS) for students attending 80% of the whole Autumn School programme.
Acquiring European Credit Transfer and Accumulation System (ECTS) is subject to passing the foreseen learning test and complying with the attendance obligations envisaged.

Art. 3
Educational Objectives

The Autumn School aims at proposing innovative ideas on water resource management by focusing on the concept of water-related agro-ecosystem services and on nature-based solutions and blue infrastructures, with specific reference for this year edition to Managed Aquifer Recharge. Digital tools (software applications) will constitute the other pillar of the Autumn School, aiming at preparing the participants to develop the skills for dealing with the management and analysis of **groundwater-related spatial data** by using state-of-the-art Information and Communication Technologies.

Art. 4
Recipients

The Autumn School is designed for early career scientists (PhD students or post-doc), with a degree in engineering, environmental sciences, earth sciences, agricultural engineering, physics, mathematics, informatics. Twelve positions are reserved to the Early Stage Researchers/PhD of the MSCA - ITN MARSOLUT

project.

The Autumn School is particularly relevant for participants interested in innovation and software application in water, and more specifically groundwater, resource monitoring and management, in particular dealing with:

- aquifer overexploitation,
- non-conventional use of water resources;
- treated wastewater reuse,
- agricultural water use,
- GIS and spatial data analysis,
- hydroinformatics,
- numerical modelling of groundwater flow and solute transport in aquifers.

The Autumn School is also organised within the framework of the ICT4WATER cluster (www.ict4water.eu) and the EUROPEAN INNOVATION PARTNERSHIP on WATER (www.eip-water.eu) MAR to Market Action Group.

Art. 5

Course Structure

The Autumn School has a duration of 7 days, and it is structured in:

a. on-line class lectures and applied software laboratories,

b. one international webinar on the application of modelling tools to managed aquifer recharge and contaminant transport and aquifer remediation.

Class lectures and exercises are divided in four modules:

i) Module I: Innovation in water resource management: water-related agroecosystem services and nature-based solutions (7 hours);

ii) Module II: Data management, spatial data analysis and geostatistics (8 hours);

iii) Module III: Hydroinformatics: introducing programming to water resource management (8 hours);

iv) Module IV: Numerical modelling of groundwater flow in aquifers (17 hours).

Further information on the Autumn School programme and modules may be obtained by writing to Rudy Rossetto (r.rossetto@santannapisa.it)

On line classes will be run on Monday, tentative programme foresees about 5 to 6 hours lecture per day between 9 am and 6 pm. Participants will need a good and reliable internet connection; the on-line teaching platform will be provided by Scuola Superiore Sant'Anna.

Theoretical and applied lectures, when possible, will make use of real data coming from the MARSOLUT and LIFE REWAT interested area: the Val di Cornia coastal plain.

The teaching activities will make use of an extremely interdisciplinary approach granted by the diverse competences of the key staff members.

Free and Open Source Software will be used for applied lectures. The FREEWAT software (www.freewat.eu) will be used in the modelling module.

Up to a maximum of additional 20 participants (aside from the 30 students) will be allowed to participate to the modelling webinar.

A final assessment test is foreseen at the end of the Autumn School.

Art. 6

Admission requirements

Admission application may be submitted by persons with at least a MSc in engineering, environmental sciences, earth sciences, agricultural engineering, chemistry, physics, mathematics, informatics **enrolled in a PhD programme** or **having completed a PhD programme** in the field of the Autumn School topics.

Applicants must have an advanced knowledge of the English language.

The above requirements are to be met at the deadline to submit the application.

At any time, the Administration, with motivated decision, may declare the exclusion of a candidate due to lack of admission requirements.

Art. 7

Application

Perspective students must apply for admission to the Autumn School must, by and not-later than **October 1st 2020 at 12 am (midnight)** :

A. Submit the application exclusively online, and ensure that the data requested are entered at the following address: http://www.santannapisa.it/diwat/application

The online application requires a registration and login procedure (including the creation of a "User ID" and a "Password").

B. The following documentation, in electronic format, is to be attached to the application, under penalty of non-eligibility to the Autumn School:

- an up-to-date CV in .pdf file;
- presentation and motivation letter;
- other documents considered of interest (e.g.: scientific publications, awards, etc.);

The presentation and motivation letter must respectively present in 400 words (each):

- the candidate experience (with special reference to the use of GIS and numerical modelling experience), and
- an explanation of why the candidate believes the contents of the Autumn School are beneficial to his/her career.

Applications received after the deadline or submitted in a form other than the one indicated in this article, for whatever reason, will not be considered. Late or incomplete applications, whatever the reason, will not be considered.

Falsification of documents and fraudulent statements are punished in accordance with the Italian Criminal Code and the special applicable laws, Art. 75 and Art. 76 of Presidential Decree (D.P.R.) No. 445/2000.

The Scuola Superiore Sant'Anna may monitor the truthfulness of the statements provided and the documents submitted at any time during the procedure, even after the Autumn School has started, and request the original documents, should copies having been submitted. In the case of false statements the Scuola Superiore Sant'Anna may decide, at any time, to exclude candidates from the selection procedure, based on a motivated decision issued by the Rector, without prejudice to the resulting criminal liability.

Art. 8

Selection procedure

The Autumn School is open to a maximum of 30 participants; twelve positions are reserved for the ESRs of the MSCA ITN MARSOLUT project. Nine positions are reserved to European Union students and nine positions are reserved to African students. MARSOLUT ESRs have to apply to the Autumn School. MARSOLUT ESRs do not have to submit the presentation and motivation letter – in the application, when the presentation and motivation letter is required, MARSOLUT ESRs have to upload a .pdf file with a statement saying "application of MARSOLUT ESR".

The selection process is carried out by a standing special Committee appointed by the Rector of the Scuola Superiore Sant'Anna. The selection will be performed by evaluating the candidate's titles on the basis of candidates' application form and submitted documents. The Committee will select the applicants by awarding up to 100 points to their qualifications according to the following criteria:

- Educational qualification and experience: up to 40/100 points;
- Scientific publications (e.g.: full papers/abstracts presented at conferences): up to 20/100 points;
- Presentation and motivational letter: up to 30/100 points;
- Professional/academic experience in the field/awards: up to 10/100 points.

Educational qualification, professional/academic experiences have to be documented in the CV listing the time-period (initial and end date), the type of position, the institution/company address, and a contact person. Enrolment in or completion of a PhD programme have to be declared in the CV, clearly specifying:

- beginning date, title of the programme, year and Institutions running the PhD programme; or
- completion date, title of the programme, year and Institutions issuing the PhD title.

In the CV, a list of all the publications (divided in articles and conference papers) has to be presented.

At the end of the procedure a ranking list will be produced. The first 18 candidates awarded an overall score of at least 60 out of 100 points will be eligible to attend the Autumn School.

The youngest candidate will have precedence in the case of ex-aequo.

A decision issued by the Rector duly approves the selection documents, as well as the ranking list subject to the condition of verifying the requirements and the educational qualifications stated, as indicated in Art. 7 of this call for applications.

The educational qualifications gained at an Italian University or University Institute or gained at a foreign University or University Institute of equal standing are assessed by the selection Committee that reserves the right to request possible supplementary documents/information.

The list of the 18 successful candidates will be published, together with a reserve list, on the web-site of the Scuola Superiore Sant'Anna (www.santannapisa.it), section Advanced Education and notified by e-mail exclusively to the persons admitted to the Autumn School.

Art. 9

Enrolment

Participation to the Autumn School is free of charge, as it is offered within the framework of the EU MARSOLUT project. It includes: attendance to all the lessons, digital lectures' handouts.

Art. 10

Acceptance procedure

Successful candidates will be notified by e-mail with an admission notice. Successful candidates wishing to attend the Autumn School are required to confirm their attendance within the deadline and in accordance with the procedures indicated in the admission notice, under penalty of exclusion.

Art. 11

Educational Qualification issued

At the end of the Autumn School, the Scuola Superiore Sant'Anna will issue a certificate of attendance with value to the extent permitted by law, and with the details of the ECTS obtained by the students who attended at least 80% of the whole Autumn School programme, and passed the assessment tests foreseen and are up-to-date with the payment of the enrolment fee.

Art. 12

Person responsible for the competitive entrance examination procedure, personal data processing and prevention of corruption measures

Under the art. 5 of the Act n. 241/90 and ff.mm., the person in charge of the competition procedure is Mrs. Elena Cambi, Head of the U.O. Higher Education - Sant'Anna School of Advanced Studies - Via Maffi 27, 56127 Pisa - tel. 050/882645 - fax 050/882633 - e-mail: altaformazione@santannapisa.it.

Sant'Anna School of Advanced Studies (hereinafter the "School"), represented by the Rector, as Data Controller, under the article 13 of the EU General Data Protection Regulation n. 679/2016 and under the Italian Legislative Decree 30 June 2003 ("Privacy Code regarding the protection of personal data") with regard to the processing of personal data, and on his behalf, Roberta Chiordi, roberta.chiordi@santannapisa.it, Head of the UO Alta Formazione will process your data. Please read the privacy statement available at https://www.santannapisa.it/it/alta-formazione-info.

The Sant'Anna School of Advanced Studies operates in compliance with the legislation on the prevention of corruption (L.190 / 2012).