General Info

Organized by: University of Naples "Federico II", Department of Chemical Sciences

Name of the Advanced School

The new frontiers of NMR: advanced applications

Objective and learning goals

The school proposed by the Department of Chemical Sciences of the University of Naples "Federico II" will develop topics related to "Molecular and supramolecular characterization", as established within the framework of the PRP@CERIC project (Activity 8.1).

The school will provide students with both the basic concepts underlying the theory of the Nuclear Magnetic Resonance (NMR) spectroscopy and the main applications of this technique for the characterization of different classes of organic compounds from polymers to biologically relevant macromolecules.

Subject/scientific programme

The NMR school program will be organized into the following two modules.

MODULE 1: Theory and applications of the 1D/2D NMR techniques

Leader scientists in the field of NMR spectroscopy will hold a series of lessons on the chemical-physical fundamentals at the basis of the NMR phenomenon and on the basic and more advanced types of experiments available in the library of a NMR spectrometer. A special session on the most relevant applications of the NMR technique for the characterization of organic compounds will also be organized.

MODULE 2: Training on the NMR spectrometer

Specialists of the Bruker will carry out a training session for the students by using the Bruker NMR facilities available at the Department of Chemical Sciences of the University of Naples "Federico II". In particular, the first training day will be focused on the registration of 1D/2D NMR experiments on liquid samples by using the Ascend® 400 Bruker NMR spectrometer (400MHz), whereas the second training day will be dedicated to the registration of NMR experiments carried out on samples at the solid state by using the Bruker Avance IIITM HD spectrometer equipped with a wide bore probe (400MHz).

In both cases, the analyses will be carried out by observing the following nuclei: 1H, 13C, 15N, 19F, 31P.

Methods of carrying out the lessons

The school is structured into two modules, the first one in which the theoretical background of the technique is disclosed, and a second one in which one-to-one practical session at the spectrometer will be offered by specialists of the Bruker.

Teachers

The NMR school involves:

- 7 world experts, proven by scientific production, who use NMR as part of their experimental investigation (teachers);
- 4 Italian and European researchers (level II - senior), who develop their research activities also using NMR technology (active listeners);
- 6 + 6 Italian and European researchers (level I - pupil), who develop their research activities also using MALDI-TOF technology (passive listeners).

Duration

The NMR school is a 4-day full immersion training on NMR spectroscopy. The first two days will be devoted to learning sessions and the last two days to training sessions.

Dates

The NMR school will take place in Naples from December 16 to 19 2024.

Lesson times

Programme		
Day 1	**University of Naples "Federico II" – Conference Room**	
14:00-15:00	Lecturer #1	*Title TBD*
15:00-16:00	Lecturer #2	*Title TBD*
16:00-17:00	Lecturer #3	*Title TBD*
17:00-18:00	Lecturer #4	*Title TBD*
20:00	***Dinner***	
Day 2	**University of Naples "Federico II" – Conference Room**	
09:00-10:00	Lecturer #5	*Title TBD*
10:00-11:00	Lecturer #6	*Title TBD*
11:00-12:00	Lecturer #7	*Title TBD*
12:00-13:00	Lecturer #8	*Title TBD*
Lunch		
	University of Naples "Federico II" – Conference Room	
15:00-16:00	Lecturer #9	*Title TBD*
16:00-17:00	Lecturer #10	*Title TBD*
17:00-18:00	Lecturer #11	*Title TBD*
20:00	***Dinner***	
Day 3	**University of Naples "Federico II" – Department of Chemical Sciences**	
09:00-13:00	**Specialist from Bruker**	Practical Training: "*Liquid State Mono- and Bidimensional NMR*"
Lunch		
15:00-19:00	**Specialist from Bruker**	Practical Training: "*Liquid State Mono- and Bidimensional NMR*"
20:00	***Dinner***	
Day 4	**University of Naples "Federico II" – Department of Chemical Sciences**	
09:00-13:00	**Specialist from Bruker**	Practical Training: "*Solid State Mono- and Bidimensional NMR*"
Lunch		
15:00-19:00	**Specialist from Bruker**	Practical Training: "*Liquid State Mono- and Bidimensional NMR*"
20:00	***Dinner***	

Location

University of Naples "Federico II".

Admission requirements

An open call is expected to be opened, also addressed to partners of international agreements already active at the Department of Chemical Sciences of the University of Naples "Federico II". The selection will take place based on the qualification held, the scientific activity carried out and, if present, on the type of collaboration underway.

Recruitment of participants

The school is accessible to 10 + 6 participants who will be selected from level I and II researchers who have requested participation based on the type of scientific activity they carry out and their familiarity with the available technology (NMR spectroscopy).

The 6 additional places, if requested, are reserved for PRP@CERIC project partners.

Documentation to be submitted When the call opens, applicants will have to draft a short letter of acceptance in which to indicate the description of the scientific activity carried out, if they use NMR spectroscopy, the reasons that led to the request for participation, the type of collaboration they have in place with the Department of Chemical Sciences – UNINA and/or with other PRP@CERIC partners.
Evaluation of participants The evaluation is carried out by the head of the school, prof. Paola Manini, assisted by the head of the Laboratory of NMR spectroscopy, prof. Alba Silipo.
Certificate of attendance At the end of the school, a certificate of participation signed by the head of the school and the director of the Department of Chemical Sciences will be issued.
Other information https://www.scienzechimiche.unina.it/
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