

“STRESSES” AT THE RHIZOSPHERE:  
THE ROLE OF AGRICULTURAL CHEMISTRY IN SOLVING CHALLENGES  
OCCURRING IN THE PLANT-SOIL SYSTEM

6-9 February 2023 – Udine, Italy



### School aims

The United Nations predicts that a 50-70% increase in agricultural production will be needed to feed the estimated 9 billion people who will live on this planet in 2050. As the global population grows, the great challenges that agricultural chemists face today will become critical in the years ahead. Land has long been recognized as a finite resource, and degraded farmland cannot be readily replaced. The soil erosion and degradation, depletion of water bodies, environmental pollution, climate change, are only some of the stresses that agricultural chemists are claimed to cope in order to preserve the integrity of the rhizosphere. The rhizosphere is a complex system occurring at the root-soil interface, where multiple factors interact together, and which properties have an impact on plant and soil health. Therefore, the use of sustainable and technologically advanced approaches is needed to maintain the quality and quantity of crop production.

This edition of the Agricultural Chemistry Winter School will focus on the previously mentioned issues and promote the importance of agricultural chemistry research among young scientists in an international, friendly, and casual environment. The Winter School, organized by the Italian Society of Agricultural Chemistry (SICA) and the Dept. of Agricultural, Food, Environmental and Animal Sciences, University of Udine, is offered to doctoral students, post-docs and early-stage researchers, and aims at providing an opportunity to: (i) exchange and extend their understanding of the theoretical, conceptual and applicative aspects regarding soil, plant and environmental sciences; (ii) provide insights into novel methodological and analytical approaches; (iii) build and nurture research networks; and (iv) consolidate scientific communication skills. The program will therefore provide a series of activities including keynote lectures, seminars, workshops, as well as oral and poster presentations by the participants.

### School venue

All the activities related to the school will take place at the:

Palazzo Garzolini di Toppo Wassermann\*  
via Gemona, 92 - 33100 Udine, Italy.

\* In the eventuality of pandemic restrictions to the mobility, the school will be carried out on-line.



## School details and contact

All details regarding the school, can be found at [www.acws.unito.it](http://www.acws.unito.it)

For any information related to the school please contact:

Laura Zanin, writing an e-mail at [acws@uniud.it](mailto:acws@uniud.it)

Dept. of Agricultural, Food, Environmental and Animal Sciences,  
University of Udine.

## Programme

### Monday, 6 February 2023

13:30 – 14:00	<b>Registration</b>
14:00 – 14:10	<b>Opening Session</b>
<i>Session 1: Introduction to agroecosystem</i>	
<i>Moderators: Laura ZANIN</i>	
14:10 – 14:50	<b>An introduction to the rhizosphere complexity</b> <i>Roberto PINTON, University of Udine, Italy</i>
14:50 – 15:30	<b>Pollution by potentially toxic elements (PTEs) and fire: A dangerous combination for the soil-plant system</b> <i>Concetta Eliana GATTULLO, University of Bari, Italy</i>
<i>Coffee break</i>	
15:50 – 16:30	<b>Climate change and terrestrial ecosystems, what can we do? Exploring nature based solutions for climate mitigation"</b> <i>Giorgio ALBERTI, University of Udine, Italy</i>
<i>Workshop: Presenting your research</i>	
<i>Moderator: Daniel Said PULLICINO</i>	
16:30 – 18:00	<b>Participants' presentations (oral)</b>
19:00	<b>Get together</b>

### Wednesday, 8 February 2023

<i>Session 3</i>	
<i>Moderators: Daniela PEZZOLLA</i>	
09:00 – 10:00	<b>Introduction to ecology and management of the rhizosphere</b> <i>Markus.PUSCHENREITER, BOKU University, Austria</i>
10:00 – 10:40	<b>The role of humic substances at the plant-soil interface: biological activity and mechanisms of action</b> <i>Michela SCHIAVON, University of Turin, Italy</i>
<i>Coffee break</i>	
11:00 – 11:40	<b>Rhizospheric stresses challenged by application of humic substances from lignocellulosic residues</b> <i>Davide SAVY, University of Naples, Italy</i>
11:40 – 12:20	<b>Investigating the formation of organo-mineral interactions during the first stage of terraforming</b> <i>Beatrice Giannetta, University of Verona, Italy</i>
<i>Lunch break / Poster session</i>	
14:00 – 15:00	<b>Methods in rhizosphere research</b> <i>Markus.PUSCHENREITER, BOKU University, Austria</i>
<i>Coffee break</i>	
<i>Workshop: Presenting your research</i>	
<i>Moderator: Antonio CAPORALE</i>	
15:20 – 17:00	<b>Participants' presentations (oral)</b>
19:00	<b>Social Dinner</b>

### Tuesday, 7 February 2023

<i>Session 2</i>	
<i>Moderators: Michela SCHIAVON</i>	
09:00 – 10:00	<b>Nutritional signaling interactions (NxP)</b> <i>Gabriel KROUK, SupAgro Montpellier, France</i>
10:00 – 10:40	<b>Investigating the impact of abiotic and biotic stress on plants' mineral nutrition</b> <i>Gianpiero VIGANI, University of Turin, Italy</i>
<i>Coffee break</i>	
11:00 – 11:40	<b>Plant-microbe interactions under adverse conditions: a multiomics approach</b> <i>Maria Begona MIRAS MORENO, University of Piacenza, Italy</i>
11:40 – 12:20	<b>The role of Plant growth-promoting bacteria in alleviating abiotic stresses"</b> <i>Mónica Yorlady ALZATE ZULUAGA, University of Bozen, Italy</i>
<i>Lunch break / Poster session</i>	
14:00 – 15:00	<b>Synthetic proteins using AI, and a new kind of GWAS</b> <i>Gabriel KROUK, SupAgro Montpellier, France</i>
<i>Coffee break</i>	
<i>Workshop: Presenting your research</i>	
<i>Moderator: Nicola TOMASI</i>	
15:20 – 16:20	<b>Meet the editor</b> <i>Daniel Said PULLICINO, University of Turin, Italy</i>
16:20-18:00	<b>Participants' presentations (poster)</b>

### Thursday, 9 February 2023

<i>Session 4</i>	
<i>Moderators: Youry PII</i>	
09:00 – 09:40	<b>Phytoremediation: soil-plant-microbe interactions for remediation of contaminated soils</b> <i>Laura GIAGNONI, University of Brescia, Italy</i>
09:40 – 10:20	<b>Enzymatic activities in the soil-root interface and their role as soil quality indicators</b> <i>Martina MAZZON, University of Bologna, Italy</i>
<i>Coffee break</i>	
10:40 – 11:20	<b>Root exudates under nutritional stresses</b> <i>Nicola TOMASI, University of Udine, Italy</i>
<i>Workshop: Presenting your research</i>	
11:20 – 12:30	<b>Roundtable group Discussion</b>
12:30-13:00	<b>Closing session</b>

## Application

Enrolment for the Winter School will be open from the **1<sup>st</sup> October 2022**, by using the online form available on the school's website [www.acws.unito.it](http://www.acws.unito.it).

Deadline for application is the **1<sup>st</sup> December 2022**.

Applicants will be asked to provide a brief description of their research, and a short abstract of the work they would like to present. Doctoral students will also be required to provide proof of their status from their supervisor. The school will be limited to maximum 50 participants. Preference will be given to doctoral students carrying out research in topics related to the theme of the school, and with a strong motivation to attend. Selected applicants will be informed by email and invited to complete their registration by payment of the participation fee, payable by bank transfer. The registration fee\* of € 80 will include participation to the sessions and course materials, as well as coffee and lunch breaks. (\* No registration fee will be asked to the attendees of the previous edition, ACWS 2022).

## Organizing committee

Laura Zanin	University of Udine	Daniela Pezzolla	University of Perugia
Daniel Said Pullicino	University of Turin	Gianpiero Vigani	University of Turin
Michela Schiavon	University of Turin	Laura Giagnoni	University of Brescia
Youry Pii	Free University of Bolzano	Arianna Lodovici	University of Udine
Antonio Caporale	University of Naples		

## Thanks to



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