

JUNE 30-JULY 5, 2024 – IN PERSON AND ONLINE



GREEN CHEMISTRY POSTGRADUATE SUMMER SCHOOL

In memory of Professor Pietro Tundo

30th of June - 5th of July 2024
Venice, Italy

Organizers:

Francesco Trotta Chairman

Fabio Aricò

Aurelia Visa

Mirabbos Hojamberdiev

Graziana Gigliuto Secretary

Topics:

Benign synthesis routes

Green catalysis

Alternative solvents

Renewable and green raw materials

Green chemistry for energy

Clean processes

Green Chemistry education

Sustainable Polymers

Info:

www.greenchemistry.school

www.gssd-foundation.org

Contacts:

postmaster@pec.gssd-foundation.org

secretariat@gssd-foundation.org

sponsor



Ideated and managed by



In collaboration with



Ca' Foscari
University
of Venice
Department of Environmental
Sciences, Informatics and Statistics



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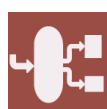
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**JUNE 30-JULY 5, 2024 – IN PERSON and
ONLINE**

REPORT

**GREEN CHEMISTRY POSTGRADUATE
SUMMER SCHOOL**

**30th June-5th July 2024, IN PERSON and
ONLINE**

<https://www.greenchemistry.school/>

TIMETABLE

CEST TIME (Central European Summer Time)			
	SUNDAY 30 June		
12:00-17:00	Check-in and Registration at Campus Santa Marta		
17:00-19:00	WELCOME TOGETHER		
		MONDAY 1 July	
9:00-10:00	OPENING CEREMONY		
10:00-11:00	Klaus Kummer <i>Chair: F. Arco</i>		
11:00-11:30	Coffee Break		
11:30-12:15	Paul Anastas on line <i>Chair: F. Arco</i>		
12:15-13:00	Peter Licence <i>Chair: F. Arco</i>		
13:00-14:30	Lunch		
14:30-15:15	Fabio Arco <i>Chair: K. Triantafyllidis</i>		
15:15-16:00	Aurelia Visa <i>Chair: K. Triantafyllidis</i>		
16:00-16:30	Coffee break		
16:30-17:00	M. Hojamberder on line <i>Chair: A. Visa</i>		
17:00-17:30	Natalia Tarsova on line <i>Chair: A. Visa</i>		
		TUESDAY 2 July	
9:00-9:30	Phosagro <i>Chair: F. Trota</i>		
9:30-10:30	Krzysztof Matyjaszewski <i>Chair: G. Cravotto</i>		
10:30-11:15	Alberto Figoli <i>Chair: G. Cravotto</i>		
11:15-11:35	Coffee Break		
11:35-12:20	Giancarlo Cravotto <i>Chair: L. Vaccaro</i>		
12:20-13:05	Kostas Triantafyllidis <i>Chair: L. Vaccaro</i>		
13:05-14:30	Lunch		
14:30-15:15	Claudia Barolo <i>Chair: A. Visa</i>		
15:15-16:00	Banochille Makubela <i>Chair: A. Visa</i>		
16:00-17:30	POSTER SESSION 1 ON SITE + Coffee break		
		WEDNESDAY 3 July	
9:00-9:30	Foundation <i>Chair: F. Arco</i>		
9:30-10:30	Gaetano Guerra <i>Chair: F. Trota</i>		
10:30-11:15	Chris Brett <i>Chair: F. Trota</i>		
11:15-11:35	Coffee break		
11:35-12:30	Buxing Han on line <i>Chair: G. Trappaso</i>		
12:30-13:15	Carlo Barbante <i>Chair: G. Trappaso</i>		
13:05-14:30	Lunch		
		THURSDAY 4 July	
9:00-9:30	OPCW <i>Chair: F. Trota</i>		
9:30-10:30	Philip Jessop <i>Chair: C. Samori</i>		
10:30-11:15	Luigi Vaccaro <i>Chair: C. Samori</i>		
11:15-11:35	Coffee Break		
11:35-12:20	Florent Allias <i>Chair: C. Barolo</i>		
12:20-13:05	Javier Garcia Martinez <i>Chair: C. Barolo</i>		
13:05-14:30	Lunch		
14:30-15:15	Giulia Licini <i>Chair: G. Trappaso</i>		
15:15-16:00	Jonathan Forman <i>Chair: G. Trappaso</i>		
16:00-17:30	POSTER SESSION 2 ON SITE + Coffee break		
		FRIDAY 5 July	
9:00-9:30	IUPAC Sci. Gruppo interdisciplinare Green Chemistry <i>Chair: F. Arco</i>		
9:30-10:30	Francesco Trota <i>Chair: F. Arco</i>		
10:30-11:15	Chara Samori <i>Chair: F. Arco</i>		
11:15-11:35	Coffee Break		
11:35-13:00	CLOSING CEREMONY AND POSTER AWARDS		

The timetable reports the schedule of each day's lecture session with different colors; for each lecture, under the name of the Teacher, the names of the Moderators.

FOREWORDS

The 16th Green Chemistry Postgraduate Summer School was held in hybrid mode, both online and in-person in Venice from 30th of June to the 5th of July 2024.

The Summer School is an international initiative ideated and managed by the **Green Sciences for Sustainable Development (GSSD) Foundation** (www.gssd-foundation.org), a non-profit Foundation established in February 2020 and based in Venice, Italy.

The GSSD Foundation undertook a unique and admirable initiative by providing financial support for students from developing countries to attend the Summer School, either online or in person. This program focused on selecting participants based on their scientific merits, ensuring that talented individuals had the opportunity to enhance their education and skills, regardless of their financial situation or geographical limitations.

This program aimed to promote sustainable development and empower young scientists. In addition to providing educational opportunities, the initiative encouraged the exchange of knowledge and ideas across different cultures and backgrounds, fostering a more inclusive and collaborative scientific community.

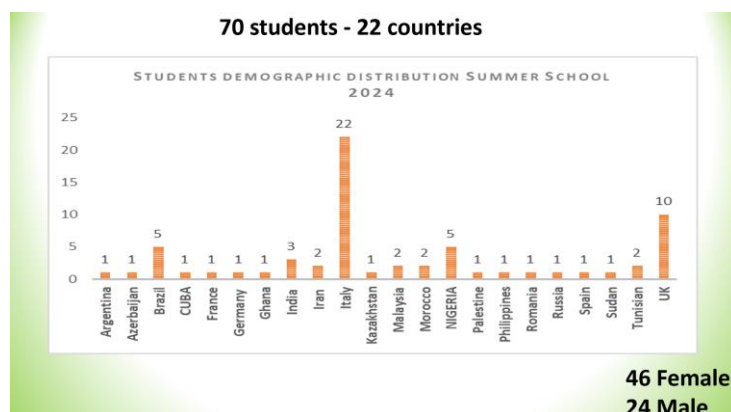
The GSSD Foundation expresses its gratitude to its sponsors for supporting this initiative and demonstrating that science is, and will always be, a universal language that transcends national boundaries.

This 16th Edition of the Green Chemistry Summer Schools follows the 15 previous editions. The event in-person took place in the classroom “Gradoni” in Santa Marta, Ca’ Foscari University of Venice. The attendees in-person were 55 students and 20 teachers, attendees online were 15 students and 5 teachers

The event was chaired by Prof. Francesco Trotta, President of Green Sciences for Sustainable Development Foundation.

The Organizing Committee included Prof. Fabio Aricó from Ca’ Foscari University of Venice, Italy, Dr. Aurelia Visa from Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry in Timisoara, Romania, Dr. Mirabbos Hojamberdiev from Technische Universität Berlin, Germany, and Ms. Graziana Gigliuto from Green Sciences for Sustainable Development Foundation, Italy.

Students' demographic distribution and gender distribution of the 16th Edition of the Green Chemistry Postgraduate Summer School



INTRODUCTION

The 16th Green Chemistry Postgraduate Summer School (GCPSS 2024) brought together 70 young scholars from across the world for an intensive five-day program from June 30th to July 5th, 2024. This edition marks the first without the leadership of Professor Pietro Tundo, the founder of the Green Chemistry Postgraduate Summer Schools and the GSSD Foundation, who passed away in October 2023.

In his honor, this year's school was dedicated to his memory. Professor Tundo's extensive career as a scientist and educator has left a profound impact on generations of students and scientists worldwide who had the privilege of knowing and working with him. In recognition of his contributions, the board of the Green Science for Sustainable Development Foundation decided to continue his legacy by organizing this highly regarded international summer school.

Reflecting Professor Tundo's vision, the event was guided by his belief: *“Green Chemistry can be seen as the branch of Chemistry that directly addresses the needs of humanity. It is a future-oriented discipline that seeks to align chemical research with societal needs. Therefore, we need as many new and innovative proposals as possible from both pure and applied research to find the best solutions.”*

The primary goal of the Summer School was to offer its students the knowledge and skills in chemistry and related fields necessary to drive positive change in their communities. These students are envisioned as ambassadors of Green Chemistry, promoting its principles within their institutions, countries, and among their peers, and forming international networks of scientists. The school facilitated a fruitful exchange of ideas and information among students, instructors, and various stakeholders, fostering long-lasting scientific relationships.

The curriculum covered a range of topics, including benign synthesis routes, green catalysis, alternative solvents, renewable and green raw materials, green chemistry for energy, clean processes, green chemistry education, and sustainable polymers. Participants attended daily lectures delivered by experts, enhancing their understanding of these critical areas.

The program attracted participants from 22 countries, creating a vibrant environment for scientific and cultural exchanges. Over the five days of this hybrid event, the 70 participants had the opportunity to listen to 25 talks by experts, sponsors, and institutional representatives. Additionally, 43 posters were presented in two sessions for on-site students, complemented by 13 online posters.

Participants concluded the program with enhanced green chemistry skills, a deeper understanding of global challenges, and a robust peer network. Feedback was overwhelmingly positive, with many attendees appreciating the program's comprehensive approach and the chance to learn alongside their colleagues.

In conclusion, the 16th Green Chemistry Postgraduate Summer School (GCPSS 2024) was a resounding success, providing participants with invaluable experience and knowledge.

A detailed list of instructors can be found at <https://www.greenchemistry.school/>.

SUMMER SCHOOL COMMITTEES

CHAIR OF THE SUMMER SCHOOL

- **Francesco Trotta**, *President of Green Sciences for Sustainable Development Foundation, Venice, Full Professor of Industrial Chemistry, University of Turin, Italy*

ORGANIZING COMMITTEE

- **Francesco Trotta**, *President of Green Sciences for Sustainable Development Foundation, Venice, Full Professor of Industrial Chemistry, University of Turin, Italy*
- **Aurelia Visa**, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry – Timisoara, Romania*
- **Mirabbos Hojamberdiev**, *Technische Universität Berlin, Germany*
- **Fabio Aricò**, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*
- **Graziana Gigliuto**, *Green Sciences for Sustainable Development Foundation, Italy*

INTERNATIONAL JURY FOR THE POSTER SESSIONS IN PRESENCE AND ONLINE FOR THE “Green Sciences for Sustainable Development Foundation Students Online Awards” AND “PhosAgro In Presence Students Award”

Coordinator of the Posters Evaluation: Aurelia Visa, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry – Timisoara, Romania*

- **Alberto Figoli**, *Director of the Institute on Membrane Technology of the National Research Council of Italy, ITM-CNR*
- **Giancarlo Cravotto**, *Full Professor of Organic Chemistry, Department of Pharmaceutical Science and Technology University of Turin, Italy*
- **Chiara Samorì**, *Professor of Organic Chemistry Department of Chemistry ‘Giacomo Ciamician’, University of Bologna, Italy*
- **Banothile Makhubela**, *Professor at University of Johannesburg, Research Centre for Synthesis & Catalysis, South Africa*
- **Christopher Brett**, *Full professor of chemistry, University of Coimbra, Portugal*
- **Philip Jessop**, *Full Professor and Canada Research Chair of Green Chemistry at the Department of Chemistry, Queen’s University in Kingston, Canada*
- **Luigi Vaccaro** *Full Professor of Organic Chemistry, Università degli Studi di Perugia, Italy*
- **Giulia Licini**, *Professor of Organic Chemistry Department of Chemical Sciences, University of Padua, Italy*
- **Claudia Barolo**, *Professor at the Department of Chemistry, University of Turin, Italy*
- **Javier Garcia Martinez**, *Professor of Inorganic Chemistry at the University of Alicante, Spain*
- **Florent Allais**, *Full Professor in Chemistry at AgroParisTech (Paris, France) and the Director of the Chair ABI (Industrial Agro-Biotechnologies) in Reims (France)*

SUMMER SCHOOL 2024

The School was held in collaboration with Ca' Foscari University of Venice and University of Turin.

The event was endorsed by the Italian Council of Research CNR, by Istituto Superiore di Sanità, by the Gruppo Interdivisionale di Green Chemistry of Società Chimica Italiana (SCI) and by the Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry.

The Summer School was sponsored by PhosAgro-Russia, the Organization for the Prohibition of Chemical Weapons-OPCW, the International Union of Pure and Applied Chemistry (IUPAC), Sasol-South Africa and Processes MDPI.

Thanks to the participation of these Sponsors, 22 postgraduate students attending in presence and online coming from developing countries have been awarded scholarships.

This year, the number of applications coming from developing countries students was 138. During a strict selection made in March by the Organizing Committee, the scholarship applicants were evaluated based on their CVs, their list of publications, the recommendation letters from their Tutors, and their motivations to attend the Summer School 2024.

The total number of students attending the 16th GCPSS 2024 was 70; 55 of them were in-person in Venice and 15 students were online, coming from 22 different countries.

The rigorous selection of the participants contributed to forming a class of high cultural level students, who certainly find themselves at a point in their life where they are ready to invest their talents and scientific know-how for their future professional careers maturely and responsibly. The top-level and diverse range of lectures offered at the Summer School, provided them the chance to look around, exchange their scientific knowledge, and establish important links with other participants and professors for fruitful joint projects and research activities.

Green Chemistry has proven to be a compelling field for young scientists, as demonstrated by the Summer Schools held from 1997 to 2023, with over 1500 students participating. This interest is evident as around 10 alumni have returned as teachers, showing the program's significant impact on their careers and their commitment to the field. Green Chemistry's interdisciplinary nature provides a unique perspective, encouraging students to think creatively about sustainable solutions. The Summer Schools offer a valuable opportunity for students to explore various scientific disciplines and understand the importance of environmentally responsible practices.

The Summer School hosted 8 lecture sessions and 3 poster sessions on the following main topics:

- 1. Exploitation of renewable resources**
- 2. New reaction pathways**
- 3. Energy saving**
- 4. Food safety**
- 5. Sustainable Polymers**
- 6. Climate Change**
- 7. Health**

After the Summer School, all participants received a certificate of attendance.

This Summer School held in person and remotely, was joined in person and online for those who cannot come to Venice yet. We engaged the participants with the outstanding scientific quality of the teachers, involving them in the discussion of the lectures and, not less importantly, through the poster sessions.

From the outcomes of these hybrid Summer Schools, the GSSD Foundation has learned how to manage future events, which they hope will become a permanent feature in Venice due to their long-standing tradition and high scientific value.

Among various Summer Schools and similar educational events, the Green Chemistry Summer School in Venice stands out as a model of good practice for several reasons. First, the careful selection process ensures a class of top international students passionate about green chemistry and eager to contribute to its research. Second, the program attracts an exceptionally high caliber of teachers, including Nobel Prize winners and top-ranked global scientists. Third, the unique setting of Venice adds a profound dimension to the school, as the city itself is a symbol of sustainability and resilience, offering a fitting backdrop for discussions on environmental stewardship.

During the 16th Edition of the Green Chemistry Summer School in 2024, the teachers provided an in-depth overview of their current scientific work over the five days of the program. They also evaluated the students' research, offering valuable feedback and suggestions for improvement, further enhancing the educational experience.

THE SUMMER SCHOOL 2024 PROGRAMME

MONDAY 1 JULY MORNING

OPENING CEREMONY-

MEMORIAL PROFESSOR PIETRO TUNDO

Presenters:

Francesco Trotta, Chairman of the Green Chemistry Summer Schools and President of GSSD Foundation, University of Turin.

Ferruccio Trifirò, Board Member GSSD Foundation, University of Bologna.

Natalia Tarasova, Director, Institute of Chemistry and Problems of Sustainable Development, Mendeleev University of Chemical Technology of Russia, Past Ordinary Member of the International Science Council and currently Member of its Scientific Board.

Siroj Loikov, First Deputy CEO PJSC PhosAgro

Fabio Aricò, Board Member GSSD Foundation, Ca' Foscari University of Venice.

1st LECTURES SESSION:

Moderator: Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*

Klaus Kummerer, *Professor of Sustainable Chemistry and Material Resources at the Institute for Sustainable Chemistry (INSC), Leuphana University Lüneburg and Bonn, Germany*

Sustainable Chemistry as the Overarching Guiding Principle to Embed Chemistry into Sustainability

Moderator: Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*

Paul Anastas, *Teresa and H. John Heinz III Professor in the Practice of Chemistry for the Environment, Faculty Director, Yale University, USA*

The Periodic Table of the Elements of Green and Sustainable Chemistry

Moderator: Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*

Peter Licence, *Full Professor of Chemistry and Director of The GlaxoSmithKline Carbon Neutral Laboratory, Faculty of Science, Nottingham, UK*

Ionic Liquids: The Good, The Bad and The Ugly

MONDAY 1 JULY AFTERNOON

2nd LECTURES SESSION:

Moderator: Konstantinos Triantafyllidis, *Professor at the Department of Chemistry, Aristotle University of Thessaloniki, Greece*

Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*

The reactions of dimethyl carbonate and its derivatives

Moderator: Konstantinos Triantafyllidis, *Professor at the Department of Chemistry, Aristotle University of Thessaloniki, Greece*

Aurelia Visa, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry, Timisoara, Romania*

Green and environmentally friendly approaches for Metal-Organic Frameworks synthesis and applications

Moderator: Aurelia Visa, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry, Timisoara, Romania*

Mirabbos Hojamberdiev, *Technische Universität Berlin, Germany*

Green Hydrogen Generation from Solar Water Splitting over Metal Oxynitrides

Moderator: Aurelia Visa, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry, Timisoara, Romania*

Natalia Tarasova, *Director, Institute of Chemistry and Problems of Sustainable Development, Mendeleev University of Chemical Technology of Russia.*

Green Chemistry within Planetary Boundaries

TUESDAY 2 JULY MORNING

SPONSORS and INSTITUTIONS

Presenters:

Alexander Antonov- *Director Department PJSC PhosAgro International Projects*

3rd LECTURES SESSION:

Moderator: Giancarlo Cravotto, *Full Professor of Organic Chemistry, Department of Pharmaceutical Science and Technology University of Turin, Italy*

Krzysztof Matyjaszewski, *Department of Chemistry Carnegie Mellon University, Pittsburgh, USA*

Towards Green Atom Transfer Radical Polymerization

Moderator: Giancarlo Cravotto, *Full Professor of Organic Chemistry, Department of Pharmaceutical Science and Technology University of Turin, Italy*

Alberto Figoli, *Director of the Institute on Membrane Technology of the National Research Council of Italy, ITM-CNR*

Toward a more Sustainable Membrane Fabrication

Moderator: Luigi Vaccaro, *Full Professor of Organic Chemistry, Università degli Studi di Perugia, Italy*

Giancarlo Cravotto, *Full Professor of Organic Chemistry, Department of Pharmaceutical Science and Technology University of Turin, Italy*

Enabling technologies for chemical process intensification, scalability of green procedures

Moderator: Luigi Vaccaro, *Full Professor of Organic Chemistry, Università degli Studi di Perugia, Italy*

Konstantinos Triantafyllidis, *Professor at the Department of Chemistry, Aristotle University of Thessaloniki, Greece*

Integrated Waste/Bio-Refineries to fuels, chemicals, and polymers

TUESDAY 2 JULY AFTERNOON

4th LECTURES SESSION:

Moderator: Aurelia Visa, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry, Timisoara, Romania*

Claudia Barolo, *Professor at the Department of Chemistry, University of Turin, Italy*

Organic functional dyes: key elements for a sustainable energy transition?

Moderator: Aurelia Visa, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry, Timisoara, Romania*

Banothile Makhubela, *Professor at University of Johannesburg, Research Centre for Synthesis & Catalysis, South Africa*

Harnessing renewable carbon sources: Catalytic strategies for biomass and carbon dioxide conversion

1st POSTER SESSION – 22 POSTERS

WEDNESDAY 3 JULY MORNING

SPONSORS and INSTITUTIONS

Presenter:

Francesco Trotta- Green Sciences for Sustainable Development Foundation

Graziana Gigliuto – Green Sciences for Sustainable Development Foundation

Fabio Aricò – Green Sciences for Sustainable Development Foundation

5th LECTURES SESSION:

Moderator: Francesco Trotta, *Full Professor of Industrial Chemistry, University of Turin, Italy*

Gaetano Guerra, *Full Professor of Macromolecular Chemistry at the Department of Chemistry and Biology 'A.Zambelli' at the University of Salerno*

Packaging Plastics in the Circular Economy

Moderator: Francesco Trotta, *Full Professor of Industrial Chemistry, University of Turin, Italy*

Christopher Brett, *Full professor of chemistry, University of Coimbra, Portugal*

Deep eutectic solvents as a greener materials approach and electrochemical applications

Moderator: Giacomo Trapasso, *Ca' Foscari University, Venice, Italy*

Buxing Han, *Professor at Institute of Chemistry, Chinese Academy of Sciences, Director of Shanghai Key Laboratory of Green Chemistry and Chemical Processes – China*

Conversion of CO₂, Biomass, and Waste Plastics into Chemicals and Fuels

Moderator: Giacomo Trapasso, *Ca' Foscari University, Venice, Italy*

Carlo Barbante, *Full Professor of Analytical Chemistry, Director of the Institute of Polar Sciences – CNR, University Ca' Foscari Venice, Italy*

Climate Changes: the Poles Matter

FREE AFTERNOON

SOCIAL DINNER

THURSDAY 4 JULY MORNING

SPONSORS and INSTITUTIONS

Presenter:

Jonathan Forman- Organisation of Prohibition of Chemical Weapons (OPCW)

6th LECTURES SESSION:

Moderator: Chiara Samorì, *Professor of Organic Chemistry Department of Chemistry 'Giacomo Ciamician', University of Bologna, Italy*

Philip Jessop, *Full Professor and Canada Research Chair of Green Chemistry at the Department of Chemistry, Queen's University in Kingston, Canada*

How Chemists Can Use Life Cycle Assessment to Guide Our Research

Moderator: Chiara Samorì, *Professor of Organic Chemistry Department of Chemistry ‘Giacomo Ciamician’, University of Bologna, Italy*

Luigi Vaccaro *Full Professor of Organic Chemistry, Università degli Studi di Perugia, Italy*
Novel Technologies for green synthesis and catalysis

Moderator: Claudia Barolo, *Professor at the Department of Chemistry, University of Turin, Italy*

Florent Allais, *Full Professor in Chemistry at AgroParisTech (Paris, France) and the Director of the Chair ABI (Industrial Agro-Biotechnologies) in Reims (France)*

Valorizing lignocellulosic biomass through the combination of green chemistry, biotechnologies and downstream processing

Moderator: Claudia Barolo, *Professor at the Department of Chemistry, University of Turin, Italy*

Javier Garcia Martinez, *Professor of Inorganic Chemistry at the University of Alicante, Spain*

Catalyzing the Green Revolution: Unlocking Previously Inaccessible Chemical Processes

THURSDAY 4 JULY AFTERNOON

7th LECTURES SESSION:

Moderator: Giacomo Trapasso, *Ca’ Foscari University, Venice, Italy*

Giulia Licini, *Professor of Organic Chemistry Department of Chemical Sciences, University of Padua, Italy*

Catalytic aerobic oxidations: from simple organic reactions to biomass valorization

Moderator: Giacomo Trapasso, *Ca’ Foscari University, Venice, Italy*

Jonathan Forman, *Science and Technology Advisor in the Global Security Technology and Policy Group under the National Security Directorate of Pacific Northwest National (PNNL), United States*

Chemicals of War and the Chemistry of Peace: Eliminating the World’s Chemical Weapons Stockpiles and the Legacy Left Behind

2nd POSTER SESSION- 21 POSTER SESSION

FRIDAY 5 JULY MORNING

SPONSORS and INSTITUTIONS

Presenter:

Javier Garcia Martinez- International Union of Pure and Applied Chemistry (IUPAC)

Giulia Licini- Interdivisional Group of Green Chemistry - Sustainable Chemistry of the Italian Chemical Society (SCI)

8th LECTURE SESSION:

Moderator: Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*
Francesco Trotta, *Professor at the Department of Chemistry, University of Turin, Italy*
Exploitation of renewable resources in Polymer Chemistry

Moderator: Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*
Chiara Samorì, *Professor of Organic Chemistry Department of Chemistry 'Giacomo Ciamician', University of Bologna, Italy*
Microalgae as cellular factories: from biofuels to high-added value compounds

FRIDAY 5 JULY AFTERNOON

CLOSING CEREMONY AND POSTER AWARDS

Presenters:

Francesco Trotta, *President of Green Sciences for Sustainable Development Foundation*
Aurelia Visa, *Senior Researcher, Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry – Timisoara, Romania*
Mirabbos Hojamberdiev, *Technische Universität Berlin, Germany*
Graziana Gigliuto, *Ca' Foscari University, Venice, Italy*
Fabio Aricò, *Professor of Organic Chemistry, Ca' Foscari University of Venice, Italy*

The detailed program of the Green Chemistry Summer School 2024 is available in the Book of Proceedings 2024.

The Proceeding Collection is available at <https://www.greenchemistry.school/>.

BOOK OF PROCEEDINGS 2024

The Book of Proceedings 2024 features the comprehensive scientific content presented at the Green Chemistry Summer School in 2024. This volume includes detailed abstracts of all lectures and posters showcased by the students, reflecting the latest advancements and research in the field of green chemistry.

The proceedings are freely accessible on our webpage <https://www.greenchemistry.school/>. However, please note that all rights are reserved by the GSSD Foundation.

SPONSORS

The Sponsors of the Green Chemistry Postgraduate Summer School 2024 were: the International Union of Pure and Applied Chemistry (IUPAC), the Organization for the Prohibition of Chemical Weapons (OPCW), PhosAgro Industry, MDPI Processes, and Sasol Industry.

The GSSD Foundation extends a special thank you to our Platinum Sponsor, PhosAgro Industry, for their financial support of the event and for sponsoring the PhosAgro Award for Best Poster Presentation in Presence. We are also grateful to the International Union of Pure and Applied Chemistry (IUPAC) for sponsoring two in-person scholarships for students from developing countries, Sasol Industry (South Africa) for sponsoring one in-person scholarship for a student from a developing country, and the Organization for the Prohibition of Chemical Weapons (OPCW) for sponsoring fifteen scholarships for online attendance for students from developing countries.

Thanks to the generous contributions from these Sponsors, the GSSD Foundation can support the participation of students from developing countries, enabling them to engage in this educational project and establish international connections that will benefit their future careers.

Additionally, this year the Interdivisional Group of Green Chemistry - Sustainable Chemistry of the Italian Chemical Society (SCI) has generously sponsored the attendance in presence of two Italian students, selected directly by the SCI Interdivisional Group of Green Chemistry.

The Green Sciences for Sustainable Development Foundation is seeking to establish new partnerships with leading industries in clean processes, universities, and international organizations worldwide that uphold the principles of scientific independence and global collaboration. These partnerships will help support even more students in future editions of the Green Chemistry Summer Schools.

In conclusion, the Green Sciences for Sustainable Development Foundation is grateful to all the Sponsors who have embraced the principles of sustainability and equality by supporting the Green Chemistry Summer School 2024.

POSTER WINNERS AWARDS

The scientific quality of the posters presented at the Green Chemistry Postgraduate Summer School 2024 has significantly improved compared to previous editions. This enhancement reflects the increasing availability of high-level scientific instrumentation in underdeveloped regions and the growing focus on green chemistry research.

A total of 56 posters were submitted, with 13 from online students and 43 from in-person attendees. Students showcased their research during the poster sessions held on Tuesday, July 2nd, and Thursday, July 4th. Additionally, the posters from online students were made available for ongoing consultation on the website <https://www.greenchemistry.school/poster-sessions/>.

The Poster Sessions is a highlight of the Summer School, notable for the originality and diverse scientific contributions. The sessions featured a significant number of young researchers sharing their work, generating considerable interest among participants. During the poster awarding ceremony, five participants were recognized for their outstanding posters and were given the opportunity to present their work orally during the Closing Ceremony.

There were 5 Awards: 2 by the Green Sciences for Sustainable Development Foundation online poster presenters, and 3 PhosAgro Awards for in-person presenters.

The 2 online poster award winners of the Green Sciences for Sustainable Development Foundation Awards were:

Fernanda Abigail Silva Melgarejo – *Faculty of Chemistry, Autonomous University of San Luis Potosi, 78210, SLP, Mexico*

Poster title: **“Sustainable development of nano-adjuvants for radiotherapy in Mexico”**

Faeze Kazemi-Andalib – *Department of Chemistry, Institute for Advanced Studies in Basic Sciences (IASBS), Zanjan, 45137-66731, Iran.*

Poster title: **“Synthesis of Cyclometalated Platinum(II) Complex in a Green Solvent: Biological Evolution”**

The 3 in person winners of the PhosAgro Award were:

Valentina Benazzi – *Dipartimento di Chimica Organica, Università degli Studi di Pavia, Via Torquato Taramelli 12, 27100 Pavia, Italia*

Poster title: **“Carbon dots as visible light biobased photocatalysts in organic synthesis”**

Vanessa Spadavecchia– *Dipartimento di chimica “Giacomo Ciamician”, Università di Bologna, Via Piero Gobetti 85, 40129 Bologna*

Poster title: **“Multilayer packaging delamination process using CO₂-switchable surfactants”**

Sulafa Abdalmageed Saadaldeen Mohammed – *Manzoor Ahmed Hashmani UTP, Malaysia*

Poster title: **“Computational and experimental evaluation of triazolium and imidazolium-based ionic liquids as electrolyte for CO₂ electrochemical reduction”**

The In-presence students Award consist in a cash price (respectively of 250€, 250€, and the third one of 500€). The Awards have been was handed over to the students during the closing ceremony.

The Online students Award consists in an original print of Venice, which has been given to the winners during the Closing Ceremony and will be sent to the online winners (Joaquin Arata Badano, Vuyolwethu Tokoyi, and Ariadne Magalheas Carneiro) through postal service.



The winning students presented their research work with a PowerPoint presentation during the Closing Ceremony on the last day of the Summer School 2024.

CLOSING CEREMONY

During the Closing Ceremony of the 16th Green Chemistry Postgraduate Summer School (GCSS 2024), the President of the Green Sciences for Sustainable Development Foundation, Prof. Francesco Trotta, presented the Poster Awards to outstanding participants. The ceremony featured remarks and presentations from the member of the Organizing Committee.

Prof. Aurelia Visa, Senior Researcher at the Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry – Timisoara, Romania, shared data collected from the 16th edition of the GCSS 2024, highlighting the increasing number of participants in presence and the long-lasting impact of the program. Along with presenting the results of this sixteenth edition, Prof. Aurelia Visa also recounted the history of the Green Chemistry Summer Schools. She highlighted how this educational event has nurtured numerous generations of students, many of whom are now established scientists and university professors.

Following Prof. Visa's presentation, three additional speakers—Prof. Mirabbos Hojamberdiev, Dr. Graziana Gigliuto, and Prof. Fabio Aricò—emphasized the importance of this event and wished the students success in their careers in green chemistry.

In conclusion, Prof. Francesco Trotta delivered the Closing Remarks, summarizing the achievements and experiences shared during the event. At the end of the ceremony, a group photo was taken, capturing the gathering of teachers, students, and all participants of the Summer School.

For more details and information, please visit the Green Sciences for Sustainable Development Foundation's website: www.gssd-foundation.org.



*Signature of the Chairman of the
Green Chemistry Summer School*

31/07/2024, Venice, Italy

JUNE 30-JULY 5, 2024 – IN PERSON AND ONLINE

Group Photos of the 16th Edition of the Green Chemistry Postgraduate Summer

