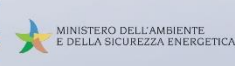


JULY 2-7, 2023 – IN PERSON AND ONLINE



# GREEN CHEMISTRY IN PERSON AND ONLINE POSTGRADUATE SUMMER SCHOOL

2nd-7th July 2023  
Venice, Italy

Organizers:

**Pietro Tundo** Chairman

**Fabio Aricò**

**Aurelia Visa**

**Mirabbos Hojamberdiev**

**Graziana Gigliuto** Secretary

**Beatrice Tassotti** Assistant Organizer

Topics:

**Benign synthesis routes**

**Green catalysis**

**Alternative solvents**

**Renewable and green raw materials**

**Green chemistry for energy**

**Clean processes**

**Green Chemistry education**

Info:

[www.greenchemistry.school](http://www.greenchemistry.school)

[www.gssd-foundation.org](http://www.gssd-foundation.org)

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**JULY 2-7, 2023 – IN PERSON and ONLINE**

**REPORT**

**GREEN CHEMISTRY POSTGRADUATE  
SUMMER SCHOOL**

**2nd-7th JULY 2023, IN PERSON and  
ONLINE**

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

JULY 2-7, 2023 – IN PERSON AND ONLINE

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## TIMETABLE

### 15th Edition of the Green Chemistry Postgraduate Summer School 2023



CEST TIME (Central European Summer Time)	MONDAY 3-July	TUESDAY 4-July	WEDNESDAY 5-July	THURSDAY 6-July	FRIDAY 7-July
9:00-9:45	OPENING CEREMONY	Alexander Antonov PhosAgro & Sergey Zinoviev Organisation for Prohibition of Chemical Weapons (OPCW)	John Torsten International Young Chemists Network & Buxing Han International Union of Pure and Applied Chemistry IUPAC	Pietro Tundo Green Sciences For Sustainable Development Foundation	Oliver Reiser (Alessandra Quadrelli)
9:45-10:15	Coffee break			Aurelia Visa (Oliver Reiser)	Fabio Aricò (Alessandra Quadrelli)
10:15-11:15	Jean-Marie Lehn (Pietro Tundo)	Mania Georgiadou (Pietro Tundo)		10:00-10:30	10:45-11:15
11:15-12:00	Katalin Barta (Philip Jessop)	Buxing Han (Alessandra Quadrelli)		10:30-11:00	Coffee Break
12:00-13:30	Lunch	Liu Zimin (Alessandra Quadrelli)	9:30-10:15	11:00-12:00	Alessandra Quadrelli (Fabio Aricò)
14:00-14:30	Poster session 1 (online)	Coffee break	Michael Graetzel (Mirabbos Hojamberdiev)	12:00-13:30	Lunch
14:30-15:30	Poster session 2 (online)	Philip Jessop (Alessandra Quadrelli)	10:15-10:45	13:30-14:00	CLOSING CEREMONY AND POSTER AWARDS
15:30-16:00	Coffee break	Lunch	Paul Anastas (Mirabbos Hojamberdiev)	14:30-15:00	
16:00-17:00	Posters Session 3 (in presence)	Krzysztof Matyjaszewski (Philip Jessop)	10:45-11:00	15:00-15:30	
		Francesco Trotta (Philip Jessop)	Coffee break	15:30-16:00	
		Coffee break	Carlo Barbante (Francesco Trotta)	16:00-17:00	
		Poster session 4 (online)	Peter Licence (Francesco Trotta)	15:30-16:00	
			Lunch	16:00-17:00	
			Social Event Boat Trip to Torcello and Burano		
12:00-17:00	Check-in and Registration at Campus Santa Marta				
17:00-19:00	WELCOME TOGETHER				

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 are marked in blue.

## FOREWORDS

The 15<sup>th</sup> Green Chemistry Postgraduate Summer School was held in hybrid mode, both online and in-person in Venice from 2<sup>nd</sup> to 7<sup>th</sup> July 2023.

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

A unique and peculiar endeavor of the Green Science for Sustainable Development Foundation was to financially support the attendance online and in presence at the Summer School of students coming from developing countries carefully selected on scientific merits basis.

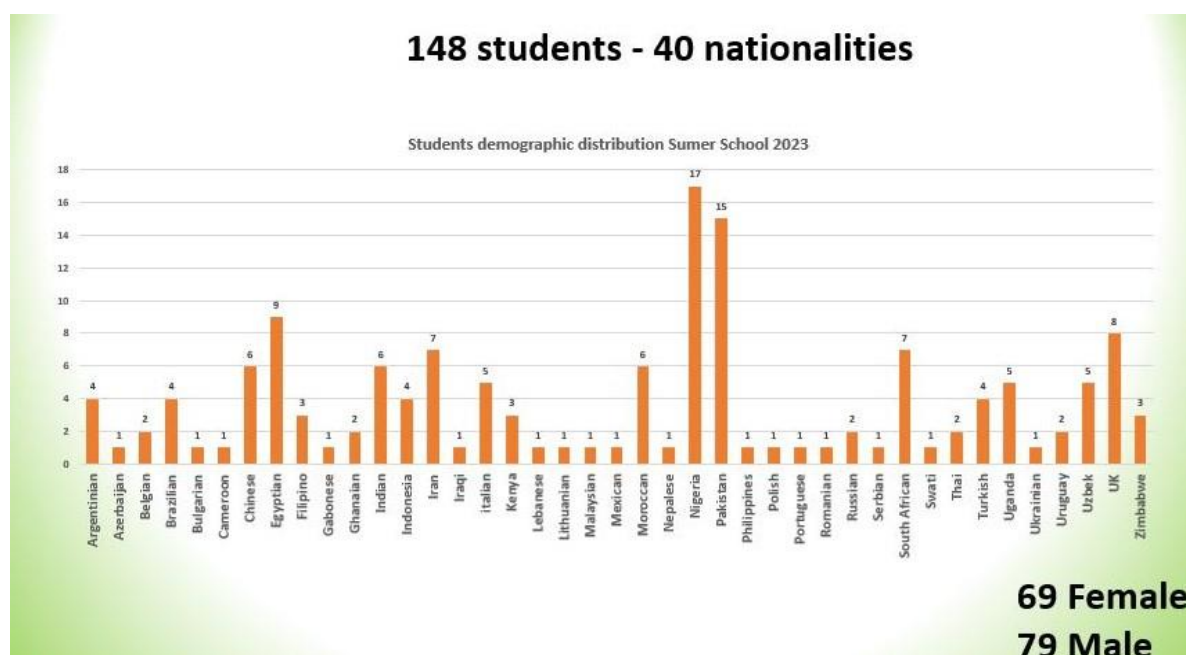
The GSSD Foundation is grateful to its Sponsors coming from all the Continents of the world for having supported this objective, and for having shown Science is and will always be a common language for all people coming from different nations and it is independent from politics.

This 15<sup>th</sup> edition of the Green Chemistry Summer Schools follows the 14 previous editions. The event in-person took place in the classroom “Gradoni” in Santa Marta, Ca’ Foscari University of Venice. The attendees in-person (50 students and about 13 professors) stayed in the Camplus Santa Marta Apartments (<https://www.camplusapartments.it/en/residences/venezia/camplus-santamarta>).

The event was chaired by Prof. Pietro Tundo, 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, Ms. Graziana Gigliuto from Green Sciences for Sustainable Development Foundation, Italy and by Ms. Beatrice Tassotti from Green Sciences for Sustainable Development Foundation.

Students attending were of 40 different Nationalities.



## SUMMER SCHOOL COMMITTEES

### CHAIR OF THE SUMMER SCHOOL

- **Pietro Tundo**, *President of Green Sciences for Sustainable Development Foundation, Venice, Italy, Secretary of IUPAC Interdivisional Committee of Green Chemistry for Sustainable Development (ICGSSD)*

### ORGANIZING COMMITTEE

- **Pietro Tundo**, *President of Green Sciences for Sustainable Development Foundation, Venice, Italy, Secretary of IUPAC Interdivisional Committee of Green Chemistry for Sustainable Development (ICGSSD)*
- **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*
- **Beatrice Tassotti**, *Green Sciences for Sustainable Development Foundation, Italy*

The Conference had a higher scientific value compared to the previous editions, both in terms of the quality of students and the quality of Teachers, such as the Nobel Prize for Chemistry 1987 Jean-Marie Lehn, and the top-ranked world scientists Michael Grätzel and Krzysztof Matyjaszewski <https://research.com/scientists-rankings/chemistry> .

### INTERNATIONAL SCIENTIFIC JURY FOR SCHOLARSHIPS GRANTS TO STUDENTS FROM DEVELOPING COUNTRIES.

- **Pietro Tundo**, *President of the Green Sciences for Sustainable Development Foundation and Ca' Foscari University of Venice, Italy*
- **Natalia Tarasova**- *Director, Institute of Chemistry and Problems of Sustainable Development, Mendeleev University of Chemical Technology of Russia (Moscow)*
- **Aurelia Visa**, **Romanian Academy**, *"Coriolan Drăgulescu" Institute of Chemistry, Timisoara, Romania*
- **Jonathan Forman**, *Science and Technology Advisor in the Global Security Technology and Policy Group under the National Security Directorate of Pacific Northwest National (PNNL), USA*
- **Neil Coville**, *University of the Witwatersrand, Johannesburg, South Africa*
- **Fabio Aricò**, *Ca' Foscari University of Venice, Italy*
- **Mirabbos Hojamberdiev**, *Technische Universität Berlin, Germany*
- **Konstantinos S. Triantafyllidis**, *Aristotle University of Thessaloniki, Greece*
- **Francesco Trotta**, *Department of Chemistry, University of Turin, Italy*
- **Ten. Col. Andrea Gloria**- *National Authority for the implementation of the Chemical Weapons Convention, Disarmament, arms control and non-proliferation Office, Ministero Affari Esteri Roma, Italy*

**FORMER STUDENTS FROM THE Summer School 2022 WHO SUPPORTED THE INTERNATIONAL SCIENTIFIC JURY WITH THEIR QUALIFIED EXPERIENCE GIVEN BY THEIR PARTICIPATION IN PREVIOUS EDITION.**

As a matter of fact, the students selected have been authors of an article regarding the Green Chemistry Summer School 2022, published in Chemistry International Journal (<https://iupac.org/etoc-chemistry-international-oct-dec-2022/> pp 42-48 ).

- **Fabrizio Politano** *Universidad Nacional de Córdoba, Argentina*
- **Akwaowo Inyangudoh**, *Department of Chemistry, University of Uyo, Nigeria*
- **Zikhona Tywabingeva**, *Department of Chemistry, Faculty of Science, Nelson Mandela University, Port Elizabeth, South Africa.*
- **Amy Naylor Randles** - *University of Nottingham, UK*
- **Fábio G. Delolo**, *Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil*

**INTERNATIONAL JURY FOR THE POSTER SESSIONS IN PRESENCE AND ONLINE FOR THE “Green Sciences for Sustainable Development Foundation Awards”.**

- **Fabio Aricò**, *Professor of Organic Chemistry, Ca’ Foscari University of Venice*
- **Katalin Barta**, *Institute of Chemistry, University of Graz, Austria.*
- **Jonathan Forman**, *Science and Technology Advisor in the Global Security Technology and Policy Group under the National Security Directorate of Pacific Northwest National (PNNL)*
- **Mirabbos Hojamberdiev**, *Technische Universität Berlin, Germany*
- **Alessandra Quadrelli**, *CNRS Director of Research, IRCELYON, Lyon, France*
- **Oliver Reiser**, *Universität Regensburg, Germany*
- **Francesco Trotta**, *Department of Chemistry, University of Turin.*
- **Aurelia Visa**, *Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry – Timisoara, Romania*

**JULY 2-7, 2023 – IN PERSON AND ONLINE**

**JULY 2-7, 2023 – IN PERSON and**

**ONLINE SUMMER SCHOOL 2023**

The School was held in collaboration with IUPAC - Interdivisional Committee of Green Chemistry for Sustainable Development, ICGCSD and Ca' Foscari University of Venice.

The event was endorsed by the Italian National Commission for UNESCO Roma, by the Ministry of Environment and Energy Security (Ministero dell'Ambiente e della Sicurezza Energetica), by the Italian Council of Research CNR, by Istituto Superiore di Sanità, by the Veneto Region and the Municipality of Venice, International Year of Basic Sciences for Sustainable Development 2022, and International Younger Chemists Network IYCN.

The Summer School was sponsored by the Organization for the Prohibition of Chemical Weapons - OPCW, PhosAgro-Russia, Sasol-South Africa, Bracco Foundation-Italy, GreeNovator-Italy and International Union of Pure and Applied Chemistry.

Thanks to the participation of these Sponsors, 30 postgraduate students attending in presence in Venice and more than 70 students online, coming from developing countries have been awarded scholarships.

From developing countries students 104 applications arrived and 100 were considered eligible to attend the school after a strict selection during March made by the 10 members of the International Scientific Jury, and based on their CVs, their list of publications, the recommendation letters from their Tutor and their motivations to attend the Summer School.

In total from the 148 postgraduate students selected for attendance coming from 40 different nationalities, 50 of them were in-person in Venice; from 19 teachers from all over the world, 13 of them held their lectures in presence.

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 in a mature and responsible way. The top-level and diverse range of topics 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. This was a real success for this Summer School since this opportunity will speed up the participants' careers as it occurred in the past.

The experience from the past 14 Summer Schools on Green Chemistry, held from 1997-2022 with more than 1500 students attending, tells us that young people are particularly attracted by Green Chemistry.

About 10 students from the former editions of the Summer Schools have returned to Venice as Teachers in one or more of the following Summer Schools.

Green Chemistry is a good key for students to look around the scientific disciplines and to decide how or where to go forward, as reported in the students' questionnaires from the present and past editions.



**The Summer School hosted 7 lecture sessions and 6 poster sessions on the following main topics:**

- 1. Exploitation of renewable resources**
- 2. New reaction pathways**
- 3. Energy saving**
- 4. Food safety**
- 5. 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 this hybrid Summer School, we will learn on how to manage the future Schools in Venice, which will become permanent; the Green Sciences for Sustainable Development Foundation will surely support and follow the activities of this initiative.

Our goal is to make the Summer School a permanent event, to be held every Summer the first week of July in Venice, and thanks to the involvement and participation of outstanding teachers and partners we are making this objective a reality.

Among all the Summer Schools and educational similar events, the Green Chemistry Summer School in Venice stands out as an example of good practice for the following reasons:

The careful process of selection of the participants previously described allows the formation of a class of top international students who are interested in the principles of green chemistry and motivated to contribute their research. The second important element is the extremely high quality of Teachers, among whom, Nobel Prizes and the top-ranked world scientists <https://research.com/scientists-rankings/chemistry>, take part every year in the School.

In the 15<sup>o</sup> Edition of the Green Chemistry Summer School 2023, the Teachers offered a selected panorama during the all five days of School regarding their current scientific work and evaluated the research presented by the students while giving them precious suggestions on possible improvements.

JULY 2-7, 2023 – IN PERSON AND ONLINE

JULY 3-8, 2022 – LIVE and ONLINE

## THE SUMMER SCHOOL 2023 PROGRAMME

The detailed program of the Green Chemistry Summer School 2023 is available in the **Book of Proceedings 2023**.

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

MONDAY 3 JULY MORNING

### OPENING CEREMONY

#### Presenters:

**Pietro Tundo**, Chairman of the Green Chemistry Summer Schools and President of the Green Sciences for Sustainable Development Foundation

**Cristiana Rita Alfonsi** Director of Fondazione Ca' Foscari and **Fabio Aricò** Delegate for internationalization at DAIS Department- Ca' Foscari University

**Alexander Antonov**, Director Department PJSC PhosAgro International Projects

**Buxing Han**, Chair of the Interdivisional Committee on Green Chemistry for Sustainable Development (ICGCSD)

**Maria Georgiadou**, Senior Expert for R&I Policies for Renewable Energy, European Commission

**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.

**Jean-Marie Lehn**, Nobel Prize for Chemistry in 1987

### 1<sup>st</sup> LECTURES SESSION:

Moderator: **Pietro Tundo**, *Professor of Organic Chemistry, President of Green Sciences for Sustainable Development Foundation, Venice, Italy*

**Jean-Marie Lehn**, *The Nobel Prize in Chemistry 1987,*

**Perspectives in Chemistry: Molecular – Supramolecular – Adaptive Chemistry**

Moderator: **Philip Jessop**, *Queen's University, Dept. of Chemistry, 90 Bader Lane, Kingston, Ontario, K7L 3N6, Canada*

**Katalin Barta**, *Professor at University of Graz, Austria*

**Embracing complexity in renewable resources: sustainable pathways to valuable products**

**MONDAY 3 JULY AFTERNOON**

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

**1<sup>st</sup> POSTER SESSION (Online)**

**N° Poster 1-6**

**2<sup>nd</sup> POSTER SESSION (Online)**

**N° Poster 7-18**

**3<sup>rd</sup> POSTER SESSION (In Presence)**

**N° Poster 1-17**

**TUESDAY 4 JULY MORNING**

**SPONSORS and INSTITUTIONS**

**Presenters:**

**Alexander Antonov**- Director Department PJSC PhosAgro International Projects

**Sergey Zinoviev** - Organization for Prohibition of Chemical Weapons (OPCW)

**2<sup>nd</sup> LECTURES SESSION:**

Moderator: Pietro Tundo, *Professor of Organic Chemistry, President of Green Sciences for Sustainable Development Foundation, Venice, Italy*

**Maria Georgiadou**, *Senior Expert - Renewable energy R&I policy, European Commission, Greece*

**EU Perspective for renewable fuels under the European Policies**

Moderator: Alessandra Quadrelli, *Director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories, France*

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

**Conversion of CO<sub>2</sub> and Biomass into Chemicals and Fuels**

Moderator: Alessandra Quadrelli, *Director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories, France*

**Zhimin Liu**, *Institute of Chemistry, Chinese Academy of Sciences, 100190, Beijing, P. R. China*

**Properties of Ionic Liquids and Their Applications in Chemical Reactions**

Moderator: Alessandra Quadrelli, *Director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories, France*

**Philip Jessop**, *Queen's University, Dept. of Chemistry, 90 Bader Lane, Kingston, Ontario, K7L 3N6, Canada*

**How Chemists Can Use Life Cycle Assessment to Guide Our Research**

**TUESDAY 4 JULY AFTERNOON**

**3<sup>rd</sup> LECTURES SESSION:**

Moderator: Philip Jessop, *Queen's University, Dept. of Chemistry, 90 Bader Lane, Kingston, Ontario, K7L 3N6, Canada*

**Krzysztof Matyjaszewski**, *Department of Chemistry Carnegie Mellon University, Pittsburgh, USA*  
**Towards Green Atom Transfer Radical Polymerization**

Moderator: Philip Jessop, *Queen's University, Dept. of Chemistry, 90 Bader Lane, Kingston, Ontario, K7L 3N6, Canada*

**Francesco Trotta**, *Professor at the Department of Chemistry, University of Turin, Italy*  
**Exploitation of renewable resources in Polymer Chemistry**

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

**4<sup>th</sup> POSTER SESSION (Online)**  
**N° 19-26**

**WEDNESDAY 5 JULY MORNING**

**SPONSORS and INSTITUTIONS**

**Presenter:**

**John Torsten** - International Younger Chemists Network (IYCN)

**Buxing Han** – ICGCSD, International Union of Pure and Applied Chemistry (IUPAC)

**4<sup>th</sup> LECTURES SESSION:**

Moderator: Mirabbos Hojamberdiev, *Senior Researcher, Technische Universität Berlin, Germany*

**Michael Graetzel**, *Director of Photonics and Interfaces (LPI), Institute of Chemical Science and Engineering Faculty of Basic Science Ecole Polytechnique Federale de Lausanne, Switzerland*

**Light and energy, mesoscopic photosystems mimic photosynthesis**

Moderator: Mirabbos Hojamberdiev, *Senior Researcher, Technische Universität Berlin, Germany*

**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: Francesco Trotta, *Professor at the Department of Chemistry, University of Turin, Italy*  
**Carlo Barbante**, *Institute of Polar Sciences and Ca' Foscari University of Venice, Italy*  
**Too late for 2°C? From the Paris Agreement to the Climate of Tomorrow**

Moderator: Francesco Trotta, *Professor at the Department of Chemistry, University of Turin, Italy*  
**Peter Licence**, *School of Chemistry, University of Nottingham, United Kingdom*  
**Lecture title: Ionic Liquids: The Good, The Bad and The Ugly**

### WEDNESDAY 5 JULY AFTERNOON

**SOCIAL EVENT: Boat Trip in the Venice Laguna and the islands of Torcello and Burano.**

### THURSDAY 6 JULY MORNING

### SPONSORS and INSTITUTIONS

#### Presenter:

**Pietro Tundo**- Green Sciences for Sustainable Development Foundation

### 5<sup>th</sup> LECTURE SESSION

Moderator: Oliver Reiser, *Institute of Organic Chemistry, University of Regensburg, Universitätsstr. 31, 93053 Regensburg, Germany*

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

**Metal organic frameworks: complexity and diversity in structures and applications**

Moderator: Oliver Reiser, *Institute of Organic Chemistry, University of Regensburg, Universitätsstr. 31, 93053 Regensburg, Germany*

**Mirabbos Hojamberdiev**, *Technische Universität Berlin, Germany*

**Perovskite BaTaO<sub>2</sub>N for Green Hydrogen Generation from Solar Water Splitting**

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

### 5<sup>th</sup> POSTER SESSION (Online)

N° 27-38

**THURSDAY 6 JULY AFTERNOON**

**6<sup>th</sup> LECTURES SESSION:**

Moderator: Fabio Aricò, *Professor of organic Chemistry, Ca' Foscari University of Venice, Italy*  
**Konstantinos Triantafyllidis**, *Professor at Department of Chemistry, Aristotle University of Thessaloniki, Greece*

**Adding Value to Biorefinery and Pulp Industry Side-streams: Lignin Valorization to Fuels, Chemicals and Polymers**

Moderator: Fabio Aricò, *Professor of organic Chemistry, Ca' Foscari University of Venice, Italy*  
**Natalia Tarasova**, *Director, Institute of Chemistry and Problems of Sustainable Development, Mendeleev University of Chemical Technology of Russia.*

**Green Chemistry within Planetary Boundaries**

Moderator: Fabio Aricò, *Professor of organic Chemistry, Ca' Foscari University of 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), USA*

**Chemicals of War and Peace: Arms Control, Disarmament, Non-Proliferation, and Green Chemistry**

**6<sup>th</sup> POSTER SESSION (In presence)**

**N° 18-34**

**FRIDAY 7 JULY MORNING**

**7<sup>th</sup> LECTURE SESSION:**

Moderator: Alessandra Quadrelli, *Director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories, France*

**Oliver Reiser**, *Institute of Organic Chemistry, University of Regensburg, Universitätsstr. 31, 93053 Regensburg, Germany*

**Copper makes the difference: Developing Sustainable Photoredox Catalyzed Transformations**

Moderator: Alessandra Quadrelli, *Director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories, France*

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

**Bio-based platform chemicals and dialkyl carbonates: synthesis, functionalization and applications**

Moderator: Fabio Aricò, *Professor of organic Chemistry, Ca' Foscari University of Venice, Italy*  
**Alessandra Quadrelli**, *Director of research of the French National Centre for Scientific Research, CNRS, at the IRCELYON laboratories, France*

**The challenge of being a researcher in green chemistry at the anthropocene epoch: A transdisciplinary talk.**

**FRIDAY 7 JULY AFTERNOON**

**CLOSING CEREMONY AND POSTER AWARDS**

**Presenters:**

**Pietro Tundo**, *President of Green Sciences for Sustainable Development Foundation*

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

**Graziana Gigliuto**, *Ca' Foscari University, Venice, Italy*

**The Book of Proceedings 2023 contains the complete scientific contents for the Green Chemistry Summer School in 2023 where all the abstracts of the lectures and the posters presented by the students are reported.**

**The Book Proceedings 2023 is about 160 pages, where students' posters are indicated with the numbers 1-34 for poster presentations in person and 1-38 for poster presentations online.**

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

**JULY 2-7, 2023 – IN PERSON AND ONLINE**

**JULY 2-7, 2023 – IN PERSON and  
ONLINE**

### **SPONSORS**

The Sponsors of the Green Chemistry Postgraduate Summer School 2023 were: Organization for Prohibition of Chemical Weapons OPCW, PhosAgro Industry, International Union of Pure and Applied Chemistry IUPAC, Sasol Industry, Bracco Foundation, American Chemical Society and GreeNovator.

In particular, the GSSD Foundation thanks our Platinum Sponsors the Organization for Prohibition of Chemical Weapons and PhosAgro Industry for supporting the event. We would like to thank also, Sasol Industry (South-Africa) Bracco Foundation (Italy), and the International Union of Pure and Applied Chemistry for their contribution.

The Green Sciences for Sustainable Development Foundation is grateful to all the Sponsors who embraced the principle of sustainability and equality by supporting the Green Chemistry Summer School 2023.

Thanks to the Sponsors' contribution the GSSD Foundation can fund the participation of students from developing countries, allowing them to take part in this educational project and create international connections that will be useful for their future careers.

The GSSD Foundation is seeking to establish new partnerships with Industries which are leaders in the implementation of clean processes, Universities, and International Organizations from all over the world which follow the principles of independence of Science from the West to the East and from the North to the South of the globe, in order to support more and more students for the future editions of the Green Chemistry Summer Schools.



## POSTER WINNERS AWARDS

The scientific quality of the presented posters has enormously increased compared to the previous editions of the School, as it appears that most of the underdeveloped regions are acquiring the high-level scientific instrumentation.

76 Posters were received, and the students had the opportunity to expose their research work at the poster sessions from Monday 3<sup>rd</sup> July to Friday 6<sup>th</sup> July, for a total of 6 poster sessions. The poster sessions can be considered a highlight of the Summer School, for the originality and the diversity scientific value of the contributions, for the significant number of young people that shared their research with the other attendees and for the interest shown by the participants. During the poster awarding ceremony, six participants were awarded for their posters and gave an oral presentation on their work.

**There were 6 Awards: 5 by the Green Sciences for Sustainable Development Foundation for both online and in presence poster presenters, and 1 honorable mention by Ca' Foscari University only for in person presenters.**

**The 2 in-person poster award winners of the Green Sciences for Sustainable Development Foundation Awards were:**

**Sherwin Hugo Tan Lu** – *Department of Chemistry, Faculty of Science, Chulalongkorn University, Bangkok 10330, Thailand*

Poster title: **“Laser-Induced Graphene from Coconut Fiber for the Solid-Phase Extraction of Organophosphorous Pesticides”**

**Geraldine Chanteux** – *Institute of Condensed Matter and Nanosciences (IMCN), Université catholique de Louvain, Place Louis Pasteur 1, B-1348 Louvain la Neuve, Belgium.*

Poster title: **“Building high functional MOFs with electrically conducting properties for energy storage applications”**

**The one in-person poster winner of the Ca' Foscari University for a honorable mention was:**

**Soulaima Chkirida** – *Moroccan Foundation of Advanced Science Innovation and Research MAScIR, Composites and Nanocomposites Center, Rabat Design Center, Madinat Al Irfane, Rabat, Morocco*

Poster title: **“New in-situ magnetic alginate coated chitosan core@shell beads with excellent performance in simulated and real wastewater treatment: behavior, mechanisms, and green perspectives”**

**The 3 online winners of the Green Sciences for Sustainable Development Foundation Awards were:**

**Joaquin Arata Badano** – *Instituto de Investigaciones en Físico Química Córdoba (INFIQC-CONICET), Facultad de Ciencias Químicas, Universidad Nacional de Córdoba, Córdoba, Argentina*

Poster title: **“Guanidine-based Deep Eutectic Solvents in CO<sub>2</sub> capture process”**

**Vuyolwethu Tokoyi** – *Durban University of Technology, Faculty of Applied Sciences, P O Box 1334, Durban, South Africa*

Poster title: **“Application of ZIF-8/ionic liquids for the conversion of glucose extracted from sugarcane bagasse to biochemicals”**

**Ariadne Magalheas Carneiro** – *Green Biotech Network, São Paulo State University – São Paulo, Brazil*

Poster title: **“An efficient, fast, and green procedure to quantify zeaxanthin and lutein in corn grains”**

The 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 2023.

**JULY 2-7, 2023 – IN PERSON and ONLINE**

**CLOSING CEREMONY**

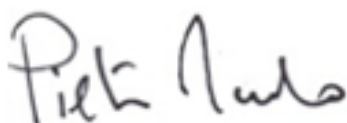
During the Closing Ceremony, an official presentation of the objectives achieved during the event was given by the Organizer Professor Aurelia Visa, Senior Researcher, Romanian Academy "Coriolan Drăgulescu" Institute of Chemistry – Timisoara, Romania, who presented the data collected from the 15<sup>o</sup> Edition of the Summer School and announced the dates for the next Summer School.

The Closing Remarks were given by the Chair of the Summer School, Prof. Pietro Tundo. Prof. Pietro Tundo announced the possible future activities in which the Green Sciences for Sustainable Development Foundation could be engaged and involved; in particular, he has underlined the possibility for the students of the Summer Schools and their academic Tutor for the publication of an online scientific journal in order to extend the scientific results of the Summer Schools. This high-quality publication online might be distributed for free among the international network connected to the Summer Schools and the GSSD Foundation. This project, of which more details would be provided in September 2023, aims to engage young researchers and Universities in broad-based initiatives while promoting the dissemination of Green Chemistry as an independent objective.

At the end of the Closing Ceremony a group photo with all the participants of the Summer School, including teachers and students, was taken. The photo can be found on the Green Sciences for Sustainable Development Foundation's website ([www.gssd-foundation.org](http://www.gssd-foundation.org)).

These and more information could be found on the Green Sciences for Sustainable Development Foundation's website ([www.gssd-foundation.org](http://www.gssd-foundation.org))

- Proceedings (Book of Abstracts)
- Group photo
- Students' feedback



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

**21/07/2023, Venice, Italy**

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**Some of the group pictures of the 15<sup>th</sup> Edition of the Green Chemistry Postgraduate Summer School 2023**

