



Training school on Eco-AERoGELS

Technical, commercial and societal innovations on aerogels towards circular economy (IG18125)



29-31 May 2024
Udine, Italy

WELCOME

On behalf of the Organizing Committee, we are pleased to invite you to the Training School on “Technical, commercial and societal innovations on aerogels towards circular economy”, which will be held on 29-31 May 2024, in Udine, Italy. The meeting is organized by the ECO-AERoGELS CIG and the Food Technology group from the University of Udine, Italy.

AIMS & SCOPE

In the last 4 years, AERoGELS COST Action (CA18125) has explored the research, development and engineering of aerogels, dramatically increasing their scientific impact. Indeed, IUPAC has identified aerogels as a Top Ten Emerging Technology in Chemistry in 2022.

However, Europe is currently facing challenges linked to limited resources and zero-waste objective, so aerogels production has to adapt to the current European environmental policy to sustain and further extend the niche markets of aerogels while reducing manufacturing costs.

In this context, the COST Innovators Grant (CIG) ECO-AERoGELS will position aerogel technology in the forefront of the technical solutions tackling the current European needs for environmental sustainability, one-health and circular economy frameworks. Innovations will focus on: (i) the product, with new sources from the biorefinery approach, the valorisation of wastes, and the reuse and recycling of materials; (ii) the process, integrating a rationale use of raw materials and energy, as well as the use of emerging green technologies, and the reprocessing of aerogels for the next use; and (iii) the applications, for energy-efficient uses, personalized solutions, and water/air remediation.

ECO-AERoGELS will be based on ideas cross-fertilization and networking between innovators, including scientists, industrial players and business developers, contributing to disruptive products featuring long-term sustainability. It will also create a dynamic international aerogels community and a European scientific-technological ecosystem for development of the future generation of aerogels.

For further details and specific objectives, please visit the ECO-AERoGELS COST Innovation Grant website at <https://cost-aerogels.eu/eco-aerogels/about-eco-aerogels/>

LOCAL ORGANIZING COMMITTEE

Lara Manzocco (University of Udine, IT)
Marilisa Alongi (University of Udine, IT)
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Marika Valentino (University of Udine, IT)

SCIENTIFIC COMMITTEE

Antonella Caterina Boccia (SCITEC, CNR, IT)
Tatiana Budtova (Mines ParisTech, FR)
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Luisa Durães (University of Coimbra)
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Ana Iglesias-Mejuto (University of Santiago de Compostela, ES)
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Monica Neagu (Victor Babes Institute, RO)
Zoran Novak (University of Maribor, SI)
Patrina Paraskevopoulou (National and Kapodistrian University of Athens, GR)
Stella Plazzotta (University of Udine, IT)
Rosana Simón (University of Vigo, ES)
Irina Smirnova (Hamburg University of Technology, Germany)
Željko Tomović (Eindhoven University of Technology, NL)
Shanyu Zhao (Empa, CH)

Wednesday, 29th May 2024 (Biblioteca UNIUD Rizzi)

8:00-9:00 – *Registration*

9:00-9:15 – *Opening*

9:15-9:45 *Aerogels from biorefinery approach*

Tatiana Budtova and Zoran Novak

9:45-10:15 *Aerogels from valorization of wastes*

Luisa Durães and Lara Manzocco

10:15-10:45 *Recycling and reprocessing of aerogels*

Željko Tomović and Patrina Paraskevopoulou

10:45 *Coffee break*

11:15-11:45 *Rational and/or minimal use of resources*

Shanyu Zhao and Ana Iglesias-Mejuto

11:45-12:15 *Safe use of aerogels*

Monica Neagu and Rosana Simón

12:15-13:00 *Organization of groups and technical info for hands-on sessions*

13:00 *Lunch*

Technical session 1 Aerogels from biorefinery approach

14:30-15:15 *Biomass identification and processing*

Tatiana Budtova, Zoran Novak and Gabrijela Horvat

15:15-16:00 *Case studies on successful biorefinery-based aerogel applications*

Tatiana Budtova, Zoran Novak and Gabrijela Horvat

16:00 *Coffee break*

16:30-17:30 *Elevator pitch*

20:00 *Dinner Ristorante Pizzeria Concordia, Piazza I Maggio, 9/A, Udine*

Thursday, 30th May 2024 (Biblioteca UNIUD Rizzi)

Technical session 2 Aerogels from valorization of wastes

Luisa Durães and Lara Manzocco

9:00-9:30: Industrial waste as raw materials for aerogels production

Luisa Durães

9:30-10:00: Potentiality of food waste for the development of aerogels

Stella Plazzotta

10:00-10:20: The role of food structure for the control of food functionality

Sonia Calligaris

10:20-10:40: Aerogels for food applications

Lara Manzocco

10:40-11:00: Aerogels as tailored adsorbents for water cleaning

Luisa Durães

11:00 *Coffee break*

Technical session 3 Recycling and reprocessing of aerogels

11:30-12:00 Recycling of polymers and thermosets

Željko Tomović

12:00-12:30 Recycling of organic aerogels

Željko Tomović

12:30-13:00 Reuse and repurposing/reprocessing of aerogels towards environmental remediation and biomedical applications

Patrino Paraskevopoulou and Carlos A. García-González

13:00 *Lunch*

14:30-17:30 **Hands-on training** (Laboratories, Via Sondrio 2/A)

<p>1 Aerogels from biorefinery approach Tatiana Budtova, Zoran Novak and Gabrijela Horvat</p> <p>Enzymatic polymerization and depolymerizations of bio-based polymers; recycling of polymers Water and oil absorption by aerogels/cryogels</p>	<p>2 Aerogels from valorisation of wastes Luisa Durães, Stella Plazzotta, Lara Gibowsky, and Marilisa Alongi</p> <p>Aerogels from recycled plastic materials; clearing water with dyes with aerogels; preparation of aerogels from food waste and plant materials (lab and pilot scale); use of food grade aerogel powders in the preparation of fat analogues; digestibility assessment of aerogels</p>
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17:45-18:45 **Round Table: Future developments for eco-innovative aerogels** (organised by EPNOE)

20:00 *Gala dinner – Fondazione Friuli, Palazzo Antonini Stringher, Via Gemona 1, Udine.*

Friday, 31st May 2024 (Biblioteca UNIUD Rizzi)

Technical session 4 Rational and/or minimal use of resources

9:00-9:40 Fundamentals of materials used for 3D-printing and case studies (several ones and select one from aerogels); Ink selection for 3D-printing: rheological aspects. Overview of 3DP technologies (microextrusion-based, light-based and drop-on-demand 3D-printing of aerogels)

Shanyu Zhao and Carlos García-González

9:40-10:20 Applications of 3D-printing of aerogels in biomedical and food applications

Ana Iglesias-Mejuto

10:20-11:00 Applications of 3D-printing of aerogels in thermal insulation, microelectronics

Shanyu Zhao

11:00 *Coffee break*

Technical session 5 Safe use of aerogels

11:30-13:00 Potential toxicity and biodistribution of aerogels: lessons learnt from nanomaterials

Monica Neagu, Rosana Simón and Antonella Caterina Boccia

13:00 *Lunch*

14:30-17:30 **Hands-on training** (Laboratories, Via Sondrio 2/A)

<p>3 Recycling and reprocessing of aerogels Željko Tomović and Patrina Paraskevopoulou</p> <p>Chemical depolymerization of organic aerogels Water decontamination from heavy metals and organic solvents using biopolymer-based aerogels. Reuse of biopolymer-based aerogels for environmental decontamination</p>	<p>4a Rational and/or minimal use of resources Shanyu Zhao and Ana Iglesias-Mejuto</p> <p>3D-printing Demo. Explanation of the process fabrication of own 3D-printed samples</p> <p>4b Safe use of aerogels Rosana Simón and Monica Neagu</p> <p>Bacterial contamination in samples for in vitro/in vivo testing as a source of non-aerogel related toxicity. Influence of the method of synthesis and material source. Tissue regeneration using aerogels: histological characterization of knee and skin samples</p>
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PITCH ELEVATOR CALL

Participants are encouraged to follow the instructions at https://cost-aerogels.eu/eco-aerogels/stsms/#Other_grants_Elevator_Pitch_Session_Grant and submit their proposals by 12th April 2024.

Eligible applicants must submit their applications online at the following web address <https://e-services.cost.eu>

TRAVEL GRANTS

A) Travel grants offered by **ECO-AERoGELS** Innovation Grant will be appointed only to trainees having submitted for the pitch elevator session in due time.

B) The journal **Food Structure** is delighted to sponsor two grants of 250 Euro, providing partial support for the participation at the Training School ECO-AERoGELS of young scientists contributing to the field of bioaerogels. (<https://www.sciencedirect.com/journal/food-structure>)

Eligibility: the young scientist must be aged 30 years or under. Each nomination package must include:

1. a motivation letter;
2. a recent CV;
3. a letter of support from an established colleague.

The nomination package must be submitted by 1st April 2024 to uniud@cost-aerogels.eu with the subject heading "Young Scientist Grant". Selected candidates will be notified by 12th April 2024.

IMPORTANT DATES

Pitch elevator application: 12th April 2024

Pitch elevator decision: 3rd May 2024

Early-bird registration: 10th May 2024

REGISTRATION

For registration, please fill out the following link:

https://kuleuven.eu.qualtrics.com/jfe/form/SV_3fmnVa6NHezhiES

Registration Fees, including coffee breaks and meals (VAT included):

- 270 Euro
- 220 Euro for COST action and EPNOE members

CONTACTS

For registration issues: contact@epnoe.eu

For scientific issues: uniud@cost-aerogels.eu

VENUE

<p>Technical and Hands-on-sessions</p>	 <p>Department of Agricultural, Food, Environmental and Animal Sciences - University of Udine</p> <p>Biblioteca Rizzi, Campus Rizzi, Via delle Scienze 206 (Technical sessions); Campus Rizzi, Via Sondrio 2/A (Hands-on-sessions)</p> <p>The best option to get around Udine is city bus transport: https://tplfvg.it/it/il-viaggio/servizi-e-orari/</p>
<p>Dinner May 29th</p>	<p>Ristorante Pizzeria Concordia, Piazza I Maggio, 9/A, Udine</p>
<p>Gala Dinner May 30th</p>	<p>Fondazione Friuli, Palazzo Antonini Stringher, Via Gemona 1, Udine</p>

TOURIST INFORMATION

Udine is a town with squares of Venetian charm and ancient buildings: from Piazza Libertà, defined as "the most beautiful Venetian square on the mainland", to Piazza Matteotti (or Herbal) which, all surrounded by porticos, seems to be an open-air lounge; here you can observe the slideshow of ancient and colourful historical buildings which impart the spirit of Udine. On the hill of the town rises the castle: from its walls you can see the whole city, the mountains all around it, whereas to the south, less than an hour's drive away, there is the Adriatic Sea.

In the eighteenth century, Udine was the city of Giambattista Tiepolo who reached his artistic maturity here: today, his masterpieces can be admired in the Gallerie del Tiepolo (in the Patriarchal Palace), in the Duomo (Cathedral), and in the Chiesa della Purità.

Today, Udine is a city that is open to innovation while tying its image to authentic taverns where one of the most loved rituals is celebrated: in the late afternoon, after work, people often call in to one of the traditional osterias for a tajut, namely the tasting of a goblet of good wine (tajut) all in a very pleasant and friendly atmosphere.

Friulian cooking, cultural events and traditional festivals (such as Friuli Doc), make of Udine and its surroundings an inviting place for a business trip, maybe followed by an unforgettable weekend break.



Friuli Venezia Giulia is a peculiar region in which the Alps and the sea are connected through a gentle hill landscape. These unique land characteristics concurred to the development of regional specialties. The San Daniele ham, which is produced in a small city nestled in the hills, is known internationally for the inimitable taste. Montasio cheese is another typical Friulan product, which takes its name from the Montasio mountain in the Julian Alps. These offer astonishing mountain landscapes, including beautiful lakes (Fusine, Sauris and Cavazzo) and hiking trails. The Alpeadria cycle route links the mountains to the sea through the hills. Among these, the Colli Orientali is a land of excellent wines from including Ramandolo, which was the first wine to obtain the DOCG label in Friuli. In this area, Cividale is a beautiful Roman city, founded in 50 B.C. by Julius Caesar and the historical importance is testified by the artistic heritage of the city. Don't miss a walk on the beautiful Ponte del Diavolo (the bridge symbol of the city), which offers a wonderful view on the Natisone river. Further to south, another historical city, Aquileia, is the most important archeological site in northern Italy, with many Roman ruins. Reaching the sea, you can visit the island of Grado, known as "The Sunny Island"; the Marano Lagoon, famous for its uncontaminated nature and Lignano Sabbiadoro, true paradise for people who love sun, sea and have the taste for fun. On the coast, situated towards the end of a narrow strip of land near the border with Slovenia, lays Trieste, which embodies the soul of "Mitteleuropa", being a crossroad of Germanic, Latin and Slavic cultures.



<https://www.turismofvg.it/Home>

HOW TO ARRIVE FROM THE AIRPORT

The easiest and quickest way to reach Udine from the airports is by train. Each airport is connected to the nearest train station by shuttle-bus services.

There are three international airports in the area (from the nearest to the furthest):

Trieste (TRS). TRS airport has its own integrated train stop (Trieste Airport). Trains leave roughly every hour from 6:51 a.m. to 8:20 p.m. on working days. The journey takes around 30 minutes. Train tickets pricing ranges from € 4,40 to € 7,45 according to the purchased solution.

Venezia Treviso (TFS). "Treviso Airlink" shuttle-bus leaves every 30 minutes from the airport from 6:40 a.m. to 11:10 p.m. on working days and on public holidays. Bus tickets cover the whole city network for 2 days and cost € 5,00 per person. Excess luggage (more than 55x50x25 cm, 12 kg) are subjected to € 2,00 extra charge per item. Trains leave roughly every half an hour from 5:34 a.m. to 11:35 p.m. on working days. The journey takes around an hour and a half and costs € 11,35. Train+bus tickets pricing ranges from € 15,50 to € 27,00 according to the purchased solution.

Venezia Marco Polo (VCE). Bus line 15 to Venezia Mestre train station leaves every 30 minutes from the VCE airport from 6:06 a.m. to 11:40 p.m. on working days, and every hour from 7:24 a.m. to 23.40 p.m. on public holidays (journey duration ~ 25 minutes). Bus tickets cost € 10.00. Trains leave roughly every half an hour from 5:14 a.m. to 23:14 p.m. on working days. The journey takes around 1 hour and 45 minutes. Train tickets pricing ranges from € 13,25 to € 29,00 according to the purchased solution. Bus+train tickets pricing ranges from € 23,25 to € 39,00 according to the purchased solution.

On public holidays timetables are subjected to variations. We suggest checking the train timetables in advance at <https://www.trenitalia.com/en.html>

It is possible to utilize Taxi services as well, which can be directly booked in the airport facilities.

HOW TO ARRIVE FROM TRIESTE

The easiest and quickest way to reach Udine from Trieste is by train from the Trieste Central Station. Trains leave roughly every hour from 5:28 a.m. to 22:17 p.m. on working days. The journey takes around 1 hour and 30 minutes. Train tickets pricing ranges from € 8,25 to € 11,50 € according to the purchased solution.

ACCOMODATION OPTIONS

Although Udine offers a variety of hotels, early reservation of accommodation is strongly advised. To search for accommodation in Udine you can use the following website: <https://www.turismofvg.it/>

The Conference Secretariat has pre-booked some hotel rooms at reduced prices for the conference attendants. You can book using the promotional code: ECO-AERoGELS

Ambassador Palace Hotel****

Single room (breakfast included): 99 € per room and night

Via Carducci, 46 - 33100 Udine - Italia -

Tel. +39/0432/503777 - Fax +39/0432/503711

E-mail : info@ambassadorpalacehotel.it

Astoria Hotel Italia****

Single room (breakfast included): 94 € per room and night

Piazza 20 settembre 24 - UDINE

Tel. 0039/0432/505091 - Fax 0039/0432/509070

www.hotelastoria.udine.it

Booking code to be mentioned along with the ECO-AERoGELS code: P141407

Cristallo***

Single room (breakfast included): 60 € per room and night

Piazzale Gabriele D'Annunzio, 43 - 33100 - Udine

Tel. +39 0432 501919 - Fax +39 0432 501673

E-mail: info@cristallohotel.com

www.cristallohotel.com

Friuli***

Single room (breakfast included): 71 € per room and night

Viale Ledra, 24 - 33100 Udine

Tel. +39 0432 234351- Fax +39 0432 234606

e-mail: friuli@hotelfriuli.udine.it

www.hotelfriuli.udine.it