

The Bioeconomy Transformation: Science, Economics, Business and Society

Lake Como School of Advanced Studies - 5-9 June 2023

[Home](#) [Committees](#) [Invited speakers](#) [Program](#) [Application](#) [Registration](#) [Sponsors and Financial Support](#)
[Venue and Accommodation](#) [Contacts](#)



Home

Bioeconomy Summer School (2nd edition)

The Bioeconomy Transformation: Science, Economics, Business and Society Villa del Grumello, Como, Italy, June 5-9, 2023

The increasing importance of Life Sciences for the creation of value-added compounds in many economic sectors contributed to the rise of the now popular term "Bioeconomy", referring to "the set of economic activities relating to the invention, development, production and use of biological products and processes" (OECD, 2009). These activities are characterized by the focus on the reduction of environmental pollution and on the adoption of sustainable practices. Since new scientific advancements in Biology and Biotechnology can be applied to an increasing number of fields, the Bioeconomy revolution is expected to provide solutions and benefits for a wide variety of human necessities, such as health care (e.g., biopharmaceuticals), agriculture (e.g., bio-pesticides), industrial processes (e.g., bio-refineries and biopolymers) and environmental sustainability (e.g., bioremediation and biofuels), in both developing and developed countries.

However, the positive impacts of a knowledge-based Bioeconomy will not unfold automatically.

Established industries are suffering from the so-called not-invented here syndrome, because overcoming the lock-in of fossil-based technologies displaces their traditional business models. Consumers are confronted not only with new products and services, but often are required to change their consumption behaviour and preferences. The Bioeconomy transformation asks for enormous creativity, from both technology-driven and social entrepreneurs, together with normative considerations concerning the design and implementation of tailored public policies and the effective regulation of complex economic systems, characterized by the emergence of new markets and business models requiring actors with novel, advanced and heterogeneous competences.

The aim of this Summer School is to offer, to PhD students and young scholars/researchers from different disciplines, an overview of the main scientific topics and of the related advanced competences that are necessary to understand and govern the Bioeconomy transformation. The program offers a set of multi-disciplinary lectures, organized in sub-modules, ranging from the main scientific toolbox used in Biology and Biotechnology, to more specific topics related to the design and use of simulation models for analysing and evaluating complex economic, managerial, sociological and ethical implications. Mastering these aspects is expected to be relevant for entrepreneurs, public institutions and researchers working on these topics. Alongside the classes, the instructors of the school will provide mentoring sessions to the participants with feedback on their research interests and ongoing works.

The school will be held in person at Villa del Grumello, Como (Italy), from Monday June 5 (afternoon) to Friday June 9 (morning), 2023.

This is the **2nd edition** of the Bioeconomy Summer School: [click here](#) to visit the website of the **1st edition** (2021).



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[Home](#) [Committees](#) [Invited speakers](#) [Program](#) [Application](#) [Registration](#) [Sponsors and Financial Support](#)
[Venue and Accommodation](#) [Contacts](#)



Committees

Organizing committee:

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Scientific committee:

Garabed Antranikian – Hamburg University of Technology

Mario Bonaccorso – Spring Cluster

Alan Kirman – EHESS & Aix-Marseille Université

Loredano Pollegioni – University of Insubria

Barbara Pozzo – University of Insubria

Andreas Pyka – University Hohenheim

Elena Rosini – University of Insubria

Raffaello Seri – University of Insubria

Daniela Ubiali – University of Pavia

Andrea Vezzulli – University of Insubria

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[Home](#)
 [Committees](#)
 [Invited speakers](#)
 [Program](#)
 [Application](#)
 [Registration](#)
 [Sponsors and Financial Support](#)
[Venue and Accommodation](#)
[Contacts](#)



Invited speakers

Speakers and mentors:

[Andrés R. Alcántara](#) (Complutense University of Madrid)
[Garabed Antranikian](#) (Hamburg University of Technology)
[Mario Bonaccorso](#) (Spring Cluster)
[Mark Brewer](#) (Euro University of Bahrain)
[Stefania Brocca](#) (University of Milano-Bicocca)
[Ernesto Carrella](#) (University of Oxford)
[Sara Daniotti](#) (Green Chemistry Lombardy Cluster)
[Stefano Fanetti](#) (University of Insubria)
[Navarro Ferronato](#) (University of Insubria)
[Bruno Galuzzi](#) (University of Milano-Bicocca)
[Marco Mangiagalli](#) (University of Milano-Bicocca)
[Elena Maggi](#) (University of Insubria)
[Francesco Molinari](#) (University of Milan)
[Gianluca Molla](#) (University of Insubria)
[Antonello Montagnoli](#) (University of Insubria)
[Alan Kirman](#) (EHESS & Aix-Marseille Université) – TBC
[Giulia Pesaro](#) (University of Insubria)
[Loredano Pollegioni](#) (University of Insubria)
[Barbara Pozzo](#) (University of Insubria)
[Andreas Pyka](#) (University of Hohenheim)
[Marina S. Robescu](#) (University of Pavia)
[Elena Rosini](#) (University of Insubria)
[Davide Secchi](#) (University of Southern Denmark)
[Raffaello Seri](#) (University of Insubria)
[Daniela Ubiali](#) (University of Pavia)
[Andrea Vezzulli](#) (University of Insubria)
[Gianluca Tettamanti](#) (University of Insubria)
[Vincenzo Torretta](#) (University of Insubria)

During the summer school, each student will be assigned to a mentor, who will provide support and feedback on the student's research topic.



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Program

PROGRAM: 5-9 June 2023

(Talks: approximately 30 min + 10 min for discussion)

Module A: Introduction to Biosciences – Chair: Antranikian, Pollegioni, Molinari

- Biodiversity: from origin of life to circular bioeconomy – Loredano POLLEGIONI
- A new generation of biocatalysts for circular bioeconomy – Garabed ANTRANIKIAN
- Biocatalysis intensification: sustainable processes for the bioeconomy – Francesco MOLINARI
- Turning waste biomasses into a resource: from invasive alien plant species to the black soldier fly – Antonello MONTAGNOLI, Gianluca TETTAMANTI

Module B: Introduction to Economics – Chair: Seri, Vezzulli

- Economics, sustainability and bioeconomy: an introduction: part 1 – Elena MAGGI
- Economics, sustainability and bioeconomy: an introduction: part 2 – Giulia PESARO
- Externalities: problems and solutions – Raffaello SERI
- Bioeconomy and Innovation – Andrea VEZZULLI

Module C: Biotechnology – Chair: Ubiali, Alcántara

- Enzymes for the sustainable production of value-added chemicals – Andrés R. ALCÁNTARA
- Constrained-based Models for Systems Biology – Bruno GALUZZI
- Systems Biocatalysis for lignin valorization: dream and/or reality? – Elena ROSINI
- Case studies (20-30 min each):
- Cheese whey: one biomass, two stories – Stefania BROCCA, Daniela UBIALI, Marco MANGIAGALLI

Exploiting microbial enzymes for a sustainable plastic recycling and upcycling – Gianluca MOLLA

- Green Chemistry and Circular Economy: a scientific overview – Andrés R. ALCÁNTARA

Module D: Simulation Models – Chair: Secchi, Carrella (online), Kirman (TBC)

- Basics of simulation models: causation and emergence – Davide SECCHI
- Complexity and evolution in economics – Alan KIRMAN
- A quick history of fisheries bio-economic modelling and simulation – Ernesto CARRELLA
- Agent Based Modelling of sustainable behaviour – Davide SECCHI

Module E: Initiatives and Policies – Chair: Bonaccorso, Pyka, Pollegioni

- Driving Green Investments by Measuring Innovation Impacts. Multi-Criteria Decision Analysis for Regional Bioeconomy Growth – Sara DANIOTTI
- Circular Bioeconomy in Italy: innovation, competitiveness and resilience – Mario BONACCORSO
- Economic Growth, Structural Change and Transformation: What's important now? – Andreas PYKA
- Bioeconomy Serious Play – Loredano POLLEGIONI

Module F: Case studies – Chair: Ubiali, Pollegioni

- RICH Project – Gianluca TETTAMANTI, Gianluca MOLLA, Daniele BRUNO, Valentina PIRILLO, Edoardo TESTA, Navarro FERRONATO
- L-Theanine goes greener: A highly efficient enzyme-based process – Marina S. ROBESCU
- The ProPla Project – Loredano POLLEGIONI

Module G: Law and Society – Chair: Pozzo, Brewer, Fanetti

- EU legal framework – Barbara POZZO
- Bioeconomy legal framework. Other relevant European experiences – Stefano FANETTI
- Legally Green, but not Sustainable: An Anglo-American analysis of Law's complicity in the unsustainable Fashion Industry – Mark BREWER
- Potential Legal Reforms to promote the Bioeconomy and combat Climate Change – Mark BREWER

PROGRAM: 5-9 June 2023 (PDF)

Monday June 5th

12:30-13:30: Registrations with light lunch (buffet 1)

13:30-14:00: Welcome address

14:00-16:40: Parallel sessions A and B (Talks: approximately 30 min + 10 min for discussion)

	Module A: Introduction to Biosciences Chair: Antranikian, Pollegioni, Molinari	Module B: Introduction to Economics Chair: Seri, Vezzulli (Sala Cernobbio)
14:00-14:40	Biodiversity: from origin of life to circular bioeconomy – Loredano POLLEGIONI	Externalities: problems and solutions – Raffaello SERI
14:40-15:20	A new generation of biocatalysts for circular bioeconomy – Garabed ANTRANIKIAN	The transition from linear to circular economy and bioeconomy – Elena MAGGI
15:20-16:00	Biocatalysis intensification: sustainable processes for the bioeconomy – Francesco MOLINARI	Ecological transition and economic systems: circular bioeconomy is an answer! – Giulia PESARO
16:00-16:40	Turning waste biomasses into a resource: from invasive alien plant species to the black soldier fly – Antonello MONTAGNOLI & Gianluca TETTAMANTI	Bioeconomy and Innovation – Andrea VEZZULLI

16:40 – 17:10: Coffee break

17:10 – 18:30: Student's presentations (about 5 minutes each)

18:30 – 22:00: Welcome drink in Villa del Grumello

Tuesday June 6th

9:00 – 13:00: Module C: Biotechnology

Chair: Ubiali, Alcántara

09:00-09:40: Enzymes for the sustainable production of value-added chemicals Andrés R. ALCÁNTARA

09:40-10:20: Constrained-based Models for Systems Biology Bruno GALUZZI

10:20-11:00: Systems Biocatalysis for lignin valorization: dream and/or reality? Elena ROSINI

11:00-11:30: Coffee break

11:30 – 13:00: Case studies (30 min each)

11:30-12:00: Cheese whey: one biomass, two stories Stefania BROCCA, Daniela UBIALI, Marco MANGIAGALLI

12:00-12:30: Exploiting microbial enzymes for a sustainable plastic recycling and upcycling Gianluca MOLLA

12:30-13:00: Green Chemistry and Circular Economy: a scientific overview Andrés R. ALCÁNTARA

13:00 – 14:30: Lunch break (buffet 2)

14:30 – 17:40: Module D: Simulation Models

Chair: Secchi, Seri

14:30-15:10: Basics of simulation models: causation and emergence Davide SECCHI

15:10-15:50: The economy as a complex adaptive system Alan KIRMAN

15:50 – 16:20: Coffee break

16:20-17:00: A quick history of fisheries bio-economic modelling and simulation Ernesto CARRELLA (online)

17:00-17:40: Agent Based Modelling of sustainable behaviour. Davide SECCHI

18:00 – 20:00: Social event – Guided visit to Como and free time

Wednesday June 7th

9:00 – 11:00: Module E: Initiatives and Policies

Chair: Bonaccorso, Pyka

9:00-9:40: Circular Bioeconomy in Italy: innovation, competitiveness and resilience Mario BONACCORSO

9:40-10:20: Economic Growth, Structural Change and Transformation: What's important now? Andreas PYKA

10:20-11:00: Driving Green Investments by Measuring Innovation Impacts. Multi-Criteria Decision Analysis for Regional Bioeconomy Growth Sara DANIOTTI (online)

11:00 – 11:30: Coffee break

11:30 – 12:30: Module F: Case studies (20 mins per speaker)

Chair: Ubiali, Pollegioni

11:30-11:50: L-Theanine goes greener: A highly efficient enzyme-based process. Marina S. ROBESCU

11:50-12:10: The ProPla Project

12:10-12:30: Bioeconomy Serious Play (introduction) Loredano POLLEGIONI

12:30 – 14:00: Lunch break (buffet 2)

14:00-15:30: RICH Project (15 mins per speaker) – (link Teams)

Gianluca TETTAMANTI

Gianluca MOLLA

Daniele BRUNO

Valentina PIRILLO

Edoardo TESTA

Navarro FERRONATO

16:00 – 20:00: Social event – Round ferry-boat trip to Tomo and free time.

Thursday June 8th

9:30 – 11:00: Bioeconomy Serious Play (hands-on)

Chair: Pollegioni, Seri, Vezzulli, Ubiali

11:00 – 11:30: Coffee break

11:30 – 13:00: Students' group project mentorship

13:00 – 14:30: Lunch break (buffet 2)

14:30 – 17:40: Module G: Law and Society – Chair: Pozzo, Brewer, Fanetti

14:30-15:10: EU legal framework Barbara POZZO

15:10-15:50: Bioeconomy legal framework. Other relevant European experiences Stefano FANETTI

15:50 – 16:20: Coffee break

16:20-17:00: Legally Green, but not Sustainable: An Anglo-American analysis of Law's complicity in the unsustainable Fashion Industry Mark BREWER

17:00-17:40: Potential Legal Reforms to promote the Bioeconomy and combat Climate Change Mark BREWER

20:00 – 22:00: Social event – Social Dinner

Friday June 9th

9:30 – 11:00: Students' project presentations

Chair: Pollegioni, Seri, Vezzulli, Ubiali

11:00 – 11:30: Coffee break

11:30 – 12:00: Final address

12:00 – 12:30: Students' project awards and farewell

Program schedule*

	June 5 th (half)	June 6 th	June 7 th	June 8 th	June 9 th (half)
Morning (9:00-13:00)	-	Module C	Module E + F	Students mentorships for projects' preparation	Challenge: students' projects presentation Concluding remarks
Afternoon (14:00-18:00)	Parallel sessions: Module A and Module B + Students' presentations	Module D	Module F	Module G	-
Evening	Welcome drink & refreshments	Guided visit to Como & free time	Social Event: ferry-boat trip and visit to a nearby town	Social dinner	

* The program schedule may be subjected to change



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[Home](#) [Committees](#) [Invited speakers](#) [Program](#) [Application](#) [Registration](#) [Sponsors and Financial Support](#)
[Venue and Accommodation](#) [Contacts](#)



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With the support of **Fondazione CARIPLO**



- "ProPla: proteins from plastics" 2022-0631
- "RICH: Turning Rubbish Into biobased materials: a sustainable CHain for the full valorization of organic waste" 2020-0900
- "From local dairy waste to SUGAR blocks for the synthesis of bioPoLymerS (SURPLaS)" 2020-0838
- "Integrated platform for the sustainable production of bio-based surfactants from renewable resources (BioSurf)" 2020-1094

