

Curriculum vitae of Giulio Ragazzon

ERC subpanels: PE4_12 Chemical reactions: mechanisms, dynamics, kinetics and catalytic reactions; PE4_1 Physical chemistry; PE5_16 Supramolecular chemistry

PERSONAL DETAILS

Family name, First name: Ragazzon, Giulio

Birthdate: 21/08/1989 (Treviso, Italy)

Nationality: Italian

Researcher unique identifier(s): ORCID 0000-0002-7183-2985;

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• Education and key qualifications

2025 Qualification aux fonctions de Professeur des Universités, section 31
Conseil National des Universités, France

24/11/2023 Habilitation to supervise research (HDR)
University of Strasbourg, France

2021 Italian National Habilitation as Associate Professor
Sectors 03/C1 (Organic Chemistry) and 03/B1 (Fundamentals of Chemical Sciences and Inorganic Systems), valid 2021–2030

03/05/2017 PhD in Chemistry — Topic: molecular devices and machines
Department of Chemistry, University of Bologna, Italy. PhD Supervisor: Prof. Alberto Credi

2013 MSc in Photochemistry and Molecular Materials (110/110 cum laude)
Department of Chemistry, University of Bologna, Italy

2011 BSc in Chemistry (110/110 cum laude)
Department of Chemistry, University of Trieste, Italy

• Current position(s)

2025– Full professor of Chemistry
Institut de Science et d'Ingénierie Supramoléculaires (ISIS), University of Strasbourg & CNRS, France

2021– Group Leader, “Laboratory of driven chemical processes”
ISIS, University of Strasbourg & CNRS, France — energy-demanding chemical processes

• Previous position(s)

2021–25 Assistant Professor of Chemistry (Maître de Conférences Associé)
ISIS, University of Strasbourg & CNRS, France

2018–21 Assistant Professor of Chemistry (RTDa) — Topic: functional carbon nanodots
University of Trieste, Italy. Mentor: Prof. Maurizio Prato

2017–18 Postdoctoral Researcher — Topic: non-equilibrium self-assembly
University of Padova, Italy. Supervisor: Prof. Leonard J. Prins

RESEARCH ACHIEVEMENTS AND PEER RECOGNITION

Research achievements

Author of more than 40 peer-reviewed articles and book chapters. Selected venues include *Nature Nanotechnology* (×2, both as first author), *Angewandte Chemie* (×15, 7 as corresponding author), *Chem* (×3, all as corresponding author), *PNAS* (×1), and *Small* (×1, corresponding). Collective citations: >2,800; H-index: 25 (Google Scholar, July 2026).

The most important contributions are centered on non-equilibrium chemistry, bridging fundamental chemistry to systems that may enable biomimetic technologies (keywords: molecular machines, ratchet mechanisms, dissipative self-assembly, endergonic processes, active transport, energy storage).

*Selected top-10 research outputs (reverse chronological; * = corresponding author):*

1. Yahaya, S.; Amano, S.; Nicoli, F.; Ragazzon, G.* “A Versatile Strategy for Light-driven Active Transport of Ions”, *Angew. Chem. Int. Ed.* **2026**, e20638. Featured as hot paper.
Significance: Establishes a general design strategy for using light to pump ions against their gradient: a key step toward artificial active-transport devices for ion separation and energy conversion.
2. Liang, K.; Nicoli, F.; Al Shehimi, S.; Penocchio, E.; Di Noja, S.; Li, Y.; Bonfio, C.; Borsley, S.; Ragazzon, G.* “Catalysis-driven active transport across a liquid membrane”, *Angew. Chem. Int. Ed.* **2025**, e202421234. Featured as hot paper.
Significance: First demonstration that a small-molecule catalyst can sustain directional transport across a membrane using chemical energy, opening a route to autonomous chemical pumps.
3. Penocchio, E.*; Bachir, A.; Credi, A.; Astumian, R. D.*; Ragazzon, G.* “Analysis of kinetic asymmetry in a multi-cycle reaction network establishes the principles for autonomous compartmentalized molecular ratchets”, *Chem* **2024**, 10, 3644-3655. Highlighted by Leigh et al. in Chem 2024, 10, 3526.
Significance: Provides the theoretical principles that govern autonomous molecular ratchets in compartmentalized systems - a foundational reference for the field.
4. Al Shehimi, S.; Lee, H. D.; Di Noja, S.; Amano, S.; Monari, L.; Ragazzon, G.* “Progressive endergonic synthesis of Diels-Alder adducts driven by chemical energy”, *Angew. Chem. Int. Ed.* **2024**, 63, e202411554. Featured as hot paper.
Significance: Demonstrates that a chemical fuel can drive an organic reaction energetically uphill, producing adducts in higher-than-equilibrium yields.
5. Penocchio, E.*; Ragazzon, G.* “Kinetic Barrier Diagrams to Visualize and Engineer Molecular Nonequilibrium Systems”, *Small* **2023**, 19, 2206188. Featured in the "Rising stars" collection.
Significance: Introduces a general tool that can be used to design and interpret molecular non-equilibrium systems. This is currently the only alternative available to kinetic modeling in this field.
6. Ragazzon, G.*; Malferrari, M.; Arduini, A.; Secchi, A.; Rapino, S.*; Silvi, S.*; Credi, A. “Autonomous non-equilibrium self-assembly and molecular movements powered by electrical energy”, *Angew. Chem. Int. Ed.* **2023**, 62, e202214265.
Significance: First demonstration of an autonomous molecular system powered by electrical energy: establishes a new modality for fuelling artificial molecular machines.
7. Patrahaeu, B.; Piejko, M.; Mayer, R. J.; Antheaume, C.; Sangchai, T.; Ragazzon, G.; Jayachandran, A.; Devaux, E.; Genet, C.; Moran, J.; Ebbesen, T. W.* “Direct observation of polaritonic chemistry by nuclear magnetic resonance spectroscopy”, *Angew. Chem. Int. Ed.* **2024**, e202401368.
Significance: Introduces the use of NMR to study chemistry under strong coupling conditions (i.e., under the influence of the vacuum field).

8. Yang, Z.; Wang, X.; Penocchio*, E.; Ragazzon*, G.; Chen, X.; Lu, S.; Zhou, Y.; Fu, K.; Liu, Z.; Cai, Y.; Yu, X.*; Li, X.; Li, X.*; Feng, W.; Yuan, L*. "Beyond Single-Cycle Autonomous Molecular Machines: Light-Powered Shuttling in a Multi-Cycle Reaction Network", *Angew. Chem. Int. Ed.* **2024**, 137, e202414072.
Significance: For the first time we quantified key non-equilibrium parameters in a multicycle reaction network, expanding the functional toolbox of light-driven molecular machines.
9. Di Noja, S.; Amato, F.; Zinna, F.; Di Bari, L.*; G. Ragazzon*, Prato, M. "Transfer of axial chirality to the nanoscale endows carbon nanodots with circularly polarized luminescence", *Angew. Chem. Int. Ed.* **2022**, 134, e202202397.
Significance: This is the first example of axially chiral carbon nanoparticles.
10. Ragazzon, G.; Prins, L. J. "Energy consumption in chemical-fuel driven self-assembly", *Nat. Nanotechnol.* **2018**, 13, 882–889.
Significance: Lays the conceptual framework for using catalysis to drive systems away from equilibrium and storing energy in supramolecular systems.

Peer recognition

Selected prizes and fellowships (international):

- **2025** Junior Scientist Participation Fellow, 58th Bürgenstock Conference — selective award to early-career European scientists in academia and industry.
- **2024** iCANX Young Scientist Award — recognising leading young scientists worldwide.
- **2023** Guy Ourisson Prize, Cercle Gutenberg — highest cross-disciplinary recognition for promising researchers in Alsace.
- **2022** Fellow of the Foresight Institute (class of 2022) — non-profit advancing technologies of fundamental importance to the future of life.
- **2021** Dream Chemistry Award (top 5) — worldwide award for young chemists with bold ideas on fundamental problems.
- **2016** European Young Chemist Award — PhD level, Gold Medal — most important European recognition in chemistry at the PhD level.

Selected prizes (national):

- **2019** Junior Prize "Organic chemistry for the environment, energy and nanoscience", Italian Chemical Society.
- **2017** Best PhD thesis in photochemistry — Italian Group of Photochemistry.
- **2017** Best PhD thesis in inorganic chemistry — Italian Chemical Society.
- **2017** Levi Prize 2016 — mention (recognition for an outstanding contribution by a young SCI member).
- **2015** NEST Prize 2014 — best Italian paper of the year in experimental nanoscience.

Major competitive funding (PI):

- ERC Starting Grant.
- ANR-FNR PRCI (Franco-Luxembourgish bilateral project).
- FRC ITI Chemistry of Complex Systems.
- SESRI – Region Grand-Est.

Invited talks (selection).

Overall 40+ invited lectures since 2015 at major international forums. Selected institute invitations: ETH Zurich (2026), KAIST (2025), TU Munich (2024), Peking University (2023), Stratingh Institute Groningen (2024), University of Edinburgh (2022); Selected conference invitations: European Symposium on Organic Reactivity - ESOR (2025), iCANX Davos Summit (2024), ERC Grantee Conference (2023), EuChemS (2022). On top of invited lectures, >15 contributed conferences with 10 talks and several posters - three poster prizes received on three different topics.

ADDITIONAL INFORMATION

Other contributions to the research community

Institutional leadership and training of the next generation.

Since 2024: Pedagogical Director of the Graduate School in Complex Systems Chemistry at the University of Strasbourg, where I have also been Chair of the Selection Committee since 2022, member of the Pedagogical Committee since 2022.

Member of the local excellence initiative on the chemistry of complex systems (ITI SysChem), and member of its executive committee since 2024.

Member of the Board of Directors and of the Institute Council of ISIS since 2021.

As a teacher I am course referent for the "Entrepreneurship & Innovation" course: an unconventional master-level course that explicitly connects fundamental chemistry with industrial and societal applications, training students for technology-transfer, with the participation of local and global chemical companies (e.g. over the years Syensqo, P&G, BASF and others).

International networks and community service.

Member of the early-career advisory board of ChemPhysChem (2022–26) and of Chem. Eur. J. (2024–26).

Reviewer for >20 international journals including Nature, Nature Chemistry, Nature Communications, Nature Nanotechnology, Nature Reviews Chemistry, JACS and Angewandte Chemie.

External expert evaluator for ERC, ANR, NWO, Israel Science Foundation and the Sloan Foundation.

Selected national (France) representative at the 3rd Chemistry Europe Early Career Researchers Meeting (Weinheim, 2024), featuring one member per European chemical society.

Co-organiser of the "Journées de Chimie Supramoléculaire" (Strasbourg, 2025), the Systems Chemistry Virtual Symposium (2023), the RSC vMASC seminar series (2022–25) and the monthly ISIS Institute Seminars (2022–, >50 events).

Member of the French, Royal (MRSC) and Italian Chemical Societies.

Outreach and science communication.

Active in outreach for over 15 years. Recent highlights include: panelist at the Frankfurt Book Fair on "The next generation of Open Access and its users - early-career researchers" (Wiley, October 2024); outreach lecture "La chimie du sommeil" (Schirmeck and Haguenau, 2024–25); high-school engagement event "I più piccoli oggetti con una forma: le molecole" (Strasbourg, 2025). Author of four Italian-language dissemination articles, notably "Molecole in azione" in Sapere (2015), the oldest Italian science-popularisation magazine (founded 1935). Participation in long-running outreach programs (Bergamoscienza, Il Collegio Incontra, Esperluette, CIsiAM).