

## **Associate Professor FEDERICO ROSSI**

Department of Physical, Earth and Environmental Sciences, University of Siena, Siena, Italy.

### **Professional Experience**

2018 - ... Associate Professor in Physical Chemistry (CHIM/02)

2012 – 2018 Assistant professor in Environmental Chemistry (CHIM/12) at the Chemistry and Biology Department, University of Salerno, Italy.

2009 – 2012 Marie Curie Fellow at Brandeis University, Waltham (MA, USA) and University of Siena, Department of Chemistry and Biosystems

2006 – 2009 Post-Doc at the Chemistry Department, University of Palermo, Italy.

### **Education**

2003 – 2006

PhD (cum laude)

University of Siena (Italy). Supervisor: Prof. Enzo Tiezzi

- Nonlinear dynamics. Chemical oscillators. Thermodynamics of far-from-equilibrium systems. Environmental chemistry. Spectroscopic analysis of polluted soils, waters and sediments. Title of the Thesis: “On the dynamics of pattern formation in biomimetic systems”

1995 – 2003

Master Degree, MSc. (cum laude)

University of Siena (Italy). Supervisor: Prof. Enzo Tiezzi

- Nonlinear dynamics. Chemical oscillators. Thermodynamics of far-from-equilibrium systems. Title of the Thesis: “Effect of the electrolytes on the chaotic transient of the Belousov-Zhabotinsky Reaction”

### **Awards and recognitions**

2004 – Prigogine Award Special mention

2009 – 2011 Marie Curie Fellow

2017 – Grant for Fundamental Research, Law 11/12/2016 n.232/295-302 –MIUR.

### **Grants**

2015 – Pollutants diffusion in aqueous matrices (ORSA158121), University of Salerno.

2016 – Catalytic oxidation of halogenated solvents (ORSA167988), University of Salerno.

2017 – Nitrogen compounds reduction from wastewater (ORSA174250), University of Salerno.

2017 – FAABR Italian National Research minister grant for outstanding researchers

2021 – “Stimuli-responsive Synthetic Cells for Drug Delivery Applications”, University of Siena.

2022 – “Gene Therapy and Drugs based on RNA Technology” Spoke 5 – PNRR CN3

2022 – “Tuscany Health Ecosystem” Spoke 4 – PNRR Ecosystems

2023 – “Smart Artificial Cells for Health Applications” – PRIN 2021

2024 – “ComeInCell” European MC-ITN

### **Participation in research networks as Principal Investigator**

2021 – ... Participation in WG1 and WG3 of COST Action CA21169 Dynalife

2018 – 2022 Participation in WG1 (Morphology and Nanocharacterization) of COST Action CA17120 Chemobrionics.

2013 – 2017 Participation in WG3 (Compartmentalization) of COST Action CM1304 on Emergence and Evolution of Complex Chemical Systems.

### **Organization of conferences**

2004: Member of the steering committee: VIII National Conference of the Environmental and Cultural Heritage Italian Society, Colle di Val d’Elsa (Siena), 8-11 June.

2015: Co-Chair: IV National School of the Environmental and Cultural Heritage Italian Society, University of Salerno, 13 –16 July.  
2015: Co-Chair: WIVACE 2015: the Workshop on Artificial Life, Evolutionary Computation and System Chemistry, University of Bari, 23 – 25 Settembre.  
2015: Co-Chair: WG COST MEETING, Action CM1304 Biomimetic compartmentalized chemical systems, 25 – 26 September.  
2016: Co-Chair: WIVACE 2016: the Workshop on Artificial Life, Evolutionary Computation and System Chemistry, University of Salerno, 4 – 7 October.  
2016: Co-Chair: BIONAM 2016: II Workshop on bio-nanomaterials, University of Salerno, 4 – 7 October.  
2019: Co-Chair: 1st Italian Systems Chemistry Gathering, University of Florence, 26 July.  
2019: Co-Chair: BIONAM 2019: III Workshop on bio-nanomaterials, University of Siena, 16 – 19 October.  
2020: Co-Chair: VI National School of the Environmental and Cultural Heritage Italian Society, University of Siena, 3 – 6 February.  
2022: Co-Chair: 2nd Italian Systems Chemistry Gathering, virtual event, 11 February.  
2023: WS-Organizer: Dynamics Days Europe 2023, Napoli, 5 – 8 September.  
2023: Co-Chair: 3rd Italian Systems Chemistry Gathering, SCI headquarter, Rome, 25 September.

### **Local Institutional activities**

2022 – ... Chair of the Science Library committee of the University of Siena.  
2018 – ... Responsible for the PLS (divulcation of scientific culture) project in Environmental Science of the University of Siena.  
2015 – 2018 Responsible for the Erasmus project of the Chemistry and Biology Department of the University of Salerno.

### **Editorial activity**

2017 – ... International advisory board member Nature-Springer's book series "*Lecture Notes in Bioengineering*"  
2018 – ... Editorial board member, section Physical Chemistry, "*Scientific Reports*"  
2020 – ... Editorial board member "*Reactions*"  
2021 – ... Editorial Board member "*Frontiers in Materials*"  
2004 – ... Reviewer for scientific journals among which Nature Comm., Nature Nanotechnology, JACS, PCCP, JPCL, PRL, Sci. Rep., Small, etc.

### **Outreach activities**

2007 – 2008 Commitment to high-school program (PON Projects, Severeal high schools in Palermo)  
2010 – ... Occasional lectures for the general public (Researchers' Night, local initiatives, national radio broadcasts, etc.)

### **Supervision of graduate students and postdoctoral fellows**

2011 Supervision of 1 postdoctoral fellow at the Department of Chemistry and Biosystems, University of Siena, Italy.  
2017 Supervision of 1 postdoctoral fellow at the Department of Chemistry and Biology, University of Salerno, Italy.  
2022 Supervision of 1 postdoctoral fellow at the Department of Physical, Earth and Environmental Sciences, University of Siena, Italy.  
since 2014 Supervision of 5 PhD-students (2 at University of Salerno and 3 at the University of Siena)  
since 2007 Supervision of more than 20 Bachelor and more than 10 Master thesis.

### **Conferences**

During his career, Federico Rossi delivered more than 40 presentations. Here it follows the most representative invited talks:

1. "Chaotic Dynamics in the batch unstirred Belousov-Zhabotinsky reaction" at "Non-linéarité, irréversibilité et complexité Interrogations et perspectives dans les sciences de la nature et du vivant." 7 - 8 October 2004, Paris, France.
2. "Chemical Self-organization in self-assembling biomimetic systems" at "Emergence of novelties: the Prigogine legacy" Pacina (SI, Italy), 9 – 16 October 2008
3. "Arsenic Pollution in the Southwest of Tuscany: Monitoring of Cornia Catchment Basin" The Ravage of the Planet 2006. Management of Natural Resources, Sustainable Development and Ecological Hazards. Bariloche (AR), 9 – 16 December 2006.
4. "Cross-diffusion induced convective patterns in micellar systems" XLIV Winter Meeting on Statistical Physics (2015) Mexico City 6 - 9 Gennaio. Invited Keynote Speaker
5. Invited Mentor and discussion leader at the GRC seminars Oscillations and Dynamic Instabilities in Chemical Systems 2016, Stowe, VT, US 16 – 17 July 2016.
6. "Giant Vesicles as Host Reactors for Nonlinear Chemical Reactions" XXXVII Dynamics Days Europe June 5–9, 2017, Szeged, Hungary.
7. "Dynamics of Lipid-stabilize droplets in networks of Belousov Zhabotinsky Micro-oscillators" 5th International Conference on Complex Dynamical Systems and Applications, 4-6 December 2017, Indian Institute of Technology Guwahati, India.
8. "Autonomous Self-Division of Vesicles Driven by Nonlinear Chemical Reactions" (Late Breaking Topic Session) at the GRC seminars Oscillations and Dynamic Instabilities in Chemical Systems 2018, Les Diablerets, CH, 8 – 13 July 2018.
9. "Global dynamics in networks of chemical micro-oscillators", STRUCTAPP2020, L'Aquila (Italy), 23 – 24 February 2020.
10. "Self-Division and Shape Changes of Giant Vesicles Induced by an Internal Chemical Trigger: an Interplay between Osmosis and pH Change", International MaxSynBio Symposium: Avenues towards Artificial Life-like Systems. 30 November – 2 December 2020
11. "Shape Changes and Budding of Giant Vesicles Driven by an Internal Enzymatic Reaction", Build-a-Cell, synthetic cell community virtual seminar, 25 October 2021.
12. "Engineered Giant Vesicles for a Bottom-up approach to Artificial Cells", Reunión de la Red de la Materia Condensada Blanda 2022, Mexico, 1 – 2 December 2022.
13. "Giant vesicles for a bottom-up approach to artificial cells" Workshop: 'Lipothermogel for Therapies and Antibiotic Prophylaxes in Situ' Bari, 11th December 2023.

#### **Publications:**

<https://www.scopus.com/authid/detail.uri?authorId=58142973800>