

Program – 20–23 February 2023



SELF-ORGANIZATION ON EARLY EARTH:
FROM PSEUDOFOSFILLS TO THE ORIGIN OF LIFE

20-23 February 2023
Athens, Greece



<https://www.chemobrionics.eu/athens>

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“Self-organization reactions on early Earth: from pseudofossils to the origin of Life”

Monday 20th February

09.30 -10.00	Registration - Coffee
10.00 - 10.30	Welcome note - Ice breaker
10.30 - 11.10	“From Anaxagoras to Chemobrionics: The Athens origin of life 2500 workshop” Julyan Cartwright
11.10 - 11.50	“A top-down, biological approach to the origin of life” Purificacion Lopez-Garcia
11.50 - 12.00	Social game
12.00 - 13.10	Lunch break (own arrangements)
13.10 - 13.50	“Boundaries as a Prelude to the Origins of Life” Jim Cleaves
13.50 - 14.10	“RNA-like polymers produced by hot wet dry cycling” Tue Hassenkam
14.10 - 14.30	“CO ₂ reduction driven by pH gradient” Feixue Liu
14.30 - 15.00	Coffee break
15.00 - 15.40	“Modern hydrothermal vents as analogues of the past: the case of Kolumbo submarine volcano from the Hellenic Volcanic Arc (Greece)” Paraskevi (Evi) Nomikou
15.40 - 17.00	Poster session

Tuesday 21st February

09.30 -10.00	Arrival of participants & Coffee
10.00 - 10.40	“Mineral self-organization in the origin and detection of Life” Electra Kotopoulou
10.40 - 11.20	“Self-assembly in the carbon-sulfur system: potential for false positives in the search for microbial life” Julie Cosmidis
11.20 - 11:40	“The use of surface roughness resulting from abiotic and biotic dissolution of minerals as a proxy for the reaction conditions: a potential biosignature?” Luca Stigliano
11.40 - 12.00	“Biomimetic crystallization of biomorphs and chemical gardens: Their formation and geological implications” Pamela Knoll
12.00 - 13.15	Lunch break (own arrangements)
13.15	** meeting at the entrance of the Acropolis Museum
13.30 - 15.30	Museum visit

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15.40 - 16.10	Arrival of participants & Coffee
16.10 - 16.50	"From Dissipative Structures to Biological Organisms" Dilip Kondepudi
16.50 - 17.30	"The role of transport phenomena in the emergence of biological homochirality: the involvement of autocatalytic networks" Jean Gillet

Wednesday 22nd February

09.30 - 09.40	Arrival of participants
09.40 - 10.00	"A biophysical basis for the emergence of the genetic code in protocells" Stuart Harrison
10.00 - 10.40	"RNA catalysis in heterogeneous reaction environments - In search of a suitable habitat for primitive life on early Earth" Hannes Mutschler
10.40 - 11.00	"From Cradle to Compartment: the evolution of novel inorganic architectures triggers vesicle formation" Silvia Holler
11.00 - 11.20	Coffee break
11.20 - 12.00	"From astrochemistry to prebiotic chemistry: an experimental approach to understand the origin and composition of early Earth's reservoir of exogenous organic matter and its impact on the emergence of prebiotic chemical systems" Gregoire Danger
12.00 - 12.40	"Origin, chirality and detection of extra-terrestrial organic molecules with the space missions Rosetta and ExoMars" Guillaume Leseigneur
12.40 - 14.00	Lunch break (own arrangements)
14.00 - 14.20	"Automated investigation of the emergence of selective effects in mineral environments" Silke Asche
14.20 - 14.40	"Interatomic interactions of amino acids with mineral surfaces, insights for prebiotic chemistry" Claro Ignacio Sainz-Diaz
14.40 - 15.00	"Experimental measure of the mineral complexity" Daniel Santamaria
15.00- 15.20	"Applying Periodic Temperature Forcing to Synthesis of Gold Nanoparticles" Masaki Itatani
15.20 - 15.30	Energizer
15.30 - 16.00	Coffee break
16.00 - 16.20	"Chemical gardens in horizontal planar confined geometry: Diffusion-controlled growth and osmotic lysis" Mingchuan Zheng

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19.30 - 21.30	<i>Dinner at Electra Palace in Plaka (pls confirm your attendance)</i>

Thursday 23rd February

09.30 - 10.00	Arrival of participants & Coffee
10.00 - 10.40	"Nonenzymatic Metabolic Reactions and Life's Origin" Joseph Moran
10.40 - 11.20	"The role of geochemical protoenzymes ('geozymes') in primordial metabolism: hydrogen activation in mineral-assisted CO ₂ fixation and NAD ⁺ reduction" Martina Preiner
11.20 - 11.40	"Ultraviolet radiation as a selection factor for early biomolecular building blocks" Roza Ozkon
11.40 - 12.00	"Light-controlled local gradients to direct bio-inspired self-assembly BaCO ₃ -silica architectures" Marloes Biverstels
12.00 - 13.10	Lunch break (own arrangements)
13.10 - 13.50	"Biogenicity tests and pattern recognition: applications for tracing life in the Precambrian rock record" Mark van Zuilen
13.50 - 14.30	"Troubled by Tubules, Agog at Agates" Sean McMahon
14.30 - 15.00	Coffee break
15.00 - 16.20	Discussion Panel "OoL: what we know, what we assume, what we envision and what we will never know" Chairs "TBD"
16.20 - 16.30	wrap up & end of meeting

Posters

1. Liquid marbles as seeds for chemical gardens
Adriana Augustínová
2. Selective incorporation of aliphatic amino acids to the genetic code in prebiotic conditions.
Yishi Ezerzer
3. Elucidating relationships between structure and hydrolytic stability of peptides.
Sarah Fisher and Moran Frenkel-Pinter
4. Spectroscopy-based chemometrics in the study of ancient life.
Corentin Loron
5. Droplets as self-propelled liquid robots.

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Eliška Paulíková

6. Building the prebiotic machinery for autotrophic CO_2 fixation at the origin of life.

Hanadi Rammu

7. Self-organization in biological fluid dynamics.

Idan Tuval

8. Metal/ADP complexes promote phosphorylation of ribonucleotides and ribonucleosides.

Emilie Werner

9. Bacterial influence on the formation of manganese mineral dendrites.

Dawid Woś

10. Non-enzymatic synthesis of phosphoenolpyruvate.

Joris Zimmermann