

# “From star and planet formation to early life”

Vilnius, Lithuania 25 - 28 April 2016

Preliminary scientific programme

Sunday April 24 <sup>th</sup> , 2016	
14:00 - 19:00	Registration of participants at Artis Hotel
17:00 - 18:30	<b>Public event at the Vilnius Planetarium</b>
17:00 - 17:40	<b>Comets: Relics of the Birth of our Solar System</b> <i>Karen Meech, University of Hawaii, USA</i>
17:40 - 17:45	Questions from the public
17:45 - 18:25	<b>Rosetta - the Comet Chaser</b> <i>Martin Hilchenbach, MPI for Solar System Research, Germany</i>
18:25 - 18:30	Questions from the public
19:30	Reception with wine and finger food at Artis Hotel
Monday April 25 <sup>th</sup> , 2016	
08:00 - 09:00	Registration
09:00 - 09:15	<b>Welcome addresses and organizational matters</b> <i>Muriel Gargaud, COST Action Chair, University of Bordeaux, FR</i> <i>Wolf Geppert, Stockholm University, SE</i> <i>Grazina Tautvaišienė, Vilnius University, LT</i>
09:15 - 10:45	<b>Session 1: Physical and chemical processes under star and planet formation (WG1)</b> <i>Chair: Ewa Szuszkiewicz, University of Szczecin, PL</i>
09:15 - 09:45	<b>The formation and evolution of planetary systems</b> <i>Wilhelm Kley, University of Tübingen, DE</i>
09:45 - 09:55	Discussion
09:55 - 10:15	<b>Gas and Dust in Protoplanetary Disks</b> <i>Anne Dutrey, University of Bordeaux, FR</i>
10:15 - 10:20	Discussion
10:20 - 10:40	<b>Chemical evolution of star-forming regions</b> <i>Floris van der Tak, SRON, NL</i>
10:40 - 10:45	Discussion
10:45 - 11:15	Coffee break
11:15 - 12:45	<b>Session 2: Formation of complex molecules in space, planetary and satellite atmospheres</b> <i>Chair: Wolf Geppert, Stockholm University, SE</i>
11:15 - 11:45	<b>The formation of complex molecules in space</b> <i>Tom Millar, Queen's University Belfast, UK</i>
11:45 - 11:55	Discussion
11:55 - 12:15	<b>Gas phase chemistry and molecular complexity: how far do they go?</b> <i>Nadia Balucani, University of Perugia, IT</i>
12:15 - 12:20	Discussion
12:20 - 14:00	Lunch break
14:00 - 15:30	<b>Session 3: Before and after the Last Common Universal Ancestor: Early evolution of Life</b> <i>Chair: Purificación López-García, Université Paris Sud, FR</i>
14:00 - 14:30	<b>Molecular evolution before the domain ancestors: Indications for dramatic planetary changes during life's early evolution</b> <i>Johann Peter Gogarten, University of Connecticut, US</i>
14:30 - 14:40	Discussion

14:40 - 15:00	<b>Energy and matter at the origin of life</b> <i>Nick Lane, UCL, UK</i>
15:00 - 15:05	Discussion
15:05 - 15:25	<b>Life as a dissipative structure; implications for the emergence of metabolism</b> <i>Wolfgang Nitschke, Université Aix-Marseille, FR</i>
15:25 - 15:30	Discussion
15:30 - 16:00	Coffee break
16:00 - 17:30	<b>Session 4: Meteorites as probes for understanding the Early Solar System</b> <i>Chair: Akos Kereszturi, Konkoly Observatory, HU</i>
16:00 - 16:30	<b>Introductory talk</b> <i>Henning Haack, University of Copenhagen, DK</i>
16:30 - 16:40	Discussion
16:40 - 17:00	<b>Pre-solar grains: the ingredients to make a solar system</b> <i>Ian Lyon, University of Manchester, UK</i>
17:00 - 17:05	Discussion
17:05 - 17:25	<b>Meteorites as probes for understanding the Early Solar System</b> <i>Zita Martins, Imperial College London, UK</i>
17:25 - 17:30	Discussion
17:30 - 20:00	Dinner break
20:00 - 21:30	<b>Poster session</b>
<b>Tuesday April 26<sup>th</sup>, 2016</b>	
09:00 - 10:30	<b>Session 5: Comets and the early history of the solar system</b> <i>Chair: Erik Vigren, Swedish Institute for Space Physics, SE</i>
09:00 - 09:30	<b>Tracing early solar system history with comets: A compositional and dynamical perspective</b> <i>Karen Meech, University of Hawai'i, USA</i>
09:30 - 09:40	Discussion
09:40 - 10:00	<b>New insights from ROSETTA into cometary dust</b> <i>Martin Hilchenbach, MPI for Solar System Research, DE</i>
10:00 - 10:05	Discussion
10:05 - 10:25	<b>Organic Molecules Identified by the Rosetta Lander Philae</b> <i>Uwe Meierhenrich, Université de Nice Sophia Antipolis, FR</i>
10:25 - 10:30	Discussion
10:30 - 11:00	Coffee break
11:00 - 12:15	<b>Session 6: Geological conditions for prebiotic chemistry</b> <i>Chair: Emmanuelle Javaux, University of Liège, BE</i>
11:00 - 11:30	<b>The Hadean Earth vs. the Origin of Life</b> <i>Stephen Mojzsis, University of Colorado, US</i>
11:30 - 11:40	Discussion
11:40 - 12:10	<b>Geochemical complexities as a setting for life's origins</b> <i>Robert Hazen, Carnegie Institute of Washington, US</i>
12:10 - 12:15	Discussion
12:15 - 13:45	Lunch break
13:45 - 15:15	<b>Session 7: Early Universe, early Earth and the origin of Life: Evolution of concepts in history and philosophy</b> <i>Chair: David Dunér, Lund University, SE</i>
13:45 - 14:15	<b>Some Twentieth-Century Ideas of Extraterrestrial Life and Physical Eschatology</b> <i>Helge Kragh, University of Aarhus, DK</i>
14:15 - 14:25	Discussion

14:25 - 14:55	<b>The ghosts behind the molecules: the recent history of the attempts to understand the origin of life</b> <i>Antonio Lazcano, National Autonomous University of Mexico, MX</i>
14:55 - 15:00	Discussion
15:00 - 15:45	Coffee break
15:45 - 19:00	<b>Management Committee Meeting of the COST Action TD1308</b> <b>Fre time for non MC-members</b>
<b>Wednesday April 27th, 2016</b>	
09:00 - 10:30	<b>Session 8: Scientific misconceptions: case studies in astrobiology</b> <i>Chair: Antonio Lazcano, National Autonomous University of Mexico, MX</i>
09:00 - 09:20	<b>Excitements and challenges in tracking the early traces of life</b> <i>Emmanuelle Javaux, University of Liège, BE</i>
09:20 - 09:25	Questions and ad-hoc discussion contributions
09:25 - 09:45	<b>Tenacious misconceptions about biological evolution</b> <i>Purificación López-García, Université Paris Sud, FR</i>
09:45 - 09:50	Questions and ad-hoc discussion contributions
09:50 - 10:10	<b>Misconceptions, Truths and Controversies: Is Origins of Life Research no Different from the Rest of Science?</b> <i>Christophe Malaterre, UQAM, CA</i>
10:10 - 10:15	Questions and ad-hoc discussion contributions
10:15 - 10:30	Open Discussion
10:30 - 11:00	Coffee break
11:00 - 12:05	<b>Session 9: Borderline between chemistry and biology</b> <i>Chair: John Brucato, Arcetri Observatory, IT</i>
11:00 - 11:30	<b>Transition between chemistry (non-life) and biology (life)</b> <i>Sjibren Otto, University of Groningen, NL</i>
11:30 - 11:40	Discussion
11:40 - 12:10	<b>Chemical selection at the origins of life</b> <i>Matthew Powner, UCL, UK</i>
12:10 - 12:15	Discussion
12:15 - 14:00	Lunch break
14:00 - 22:30	Excursion and conference dinner
<b>Thursday April 28th, 2016</b>	
09:00 - 10:30	<b>Parallel sessions</b>
10:30 - 11:00	Coffee break
11:00 - 12:30	<b>Parallel sessions</b>
12:30 - 14:00	Lunch break
14:00 - 15:45	<b>Parallel sessions</b>
15:45 - 16:15	Coffee break
16:15 - 17:45	<b>Parallel sessions</b>
17:45 - 19:00	<b>Room for individual discussions of the individual WGs</b>
See next pages for detailed programme	

## Detailed program for Thursday April 28th

Parallel sessions 09:00 – 10:30	
09:00 - 10:30	<b>Parallel Session P1: Protoplanetary disks and planet formation (WG1)</b> Aida Hall <i>Chair: Wilhelm Kley, University of Tübingen, DE</i>
09:00 - 09:25	<b>The variable circumstellar extinction in a protoplanetary disk with an embedded low-mass companion</b> <i>Tatjana Demidova, Russian Academy of Sciences, RU</i>
09:25 - 09:30	Discussion
09:30 - 09:55	<b>From the chemistry in protoplanetary disk via the formation history of planets to the atmospheric composition</b> <i>Christoph Mordasini, University of Berne, CH</i>
09:55 - 10:00	Discussion
10:00 - 10:25	<b>Stellar chemistry: hints for planet formation and structure</b> <i>Nuno Santos, University of Porto, PT</i>
10:25 - 10:30	Discussion
09:00 - 10:30	<b>Parallel session P2: Basic chemical processes in astronomical environments (WG2)</b> Carmen Hall <i>Chair: Nadia Balucani, University of Perugia, IT</i>
09:00 - 09:25	<b>The Ortho-to-Para Ratio of NH<sub>2</sub> at Different Temperatures</b> <i>Romane Le Gal, University of Virginia, US</i>
09:25 - 09:30	Discussion
09:30 - 09:55	<b>The Role of Low-Energy Electrons in Astrochemistry: A Tale of Two Molecules</b> <i>Chris Arumainayagam, Wellesley College, US</i>
09:55 - 10:00	Discussion
10:00 - 10:25	<b>Study of gas-phase ion molecular reactions at temperatures relevant to the atmosphere of Titan</b> <i>Ilia Zymak, J. Heyrovský Institute, CZ</i>
10:25 - 10:30	Discussion
09:00 - 10:30	<b>Parallel session P3: Early Universe, early Earth and the origin of Life: Evolution of concepts in history and philosophy (WG3 + WG5)</b> Mikado Hall <i>Chair: Christophe Malaterre, UQAM, Canada</i>
09:00 - 09:25	<b>C'est la Vie</b> <i>Kelly C. Smith, Clemson University, US</i>
09:25 - 09:30	Discussion
09:30 - 09:55	<b>Biosphere complexity: A new approach towards a definition of life</b> <i>Thomas Böttcher, University of Konstanz, DE</i>
09:55 - 10:00	Discussion
10:00 - 10:25	<b>Panspermia: a panoply of possibilities</b> <i>Clement Vidal, Vrije Universiteit Brussel, BE</i>
10:25 - 10:30	Discussion

<b>Parallel sessions 11:00 – 12:30</b>	
<b>11:00 - 12:30</b>	<b>Parallel Session P1: Protoplanetary disks and planet formation</b> (continued, WG1) <i>Chair: Nuno Santos, University of Porto, PT</i> Aida Hall
<b>11:00 - 11:35</b>	<b>The chemical heritage of planet-building material: new insights from ALMA and Rosetta</b> <i>Catherine Walsh, Leiden University, NL</i>
<b>11:35 - 11:45</b>	Discussion
<b>11:45 - 12:20</b>	<b>From chondrules to planets - tracking the recycling of solids in an evolving protoplanetary disk</b> <i>Martin Bizzarro, University of Copenhagen, DK</i>
<b>12:20 - 12:30</b>	Discussion
<b>11:00 - 12:30</b>	<b>Parallel Session P4: Formation of the building blocks of life</b> (WG2) <i>Chair: Yves Ellinger, University Pierre &amp; Marie Curie, FR</i> Carmen Hall
<b>11:00 - 11:25</b>	<b>State of the art electronic calculations and kinetic computations for formamide formation in cold interstellar clouds</b> <i>Dimitrios Skouteris, Scuola Normale Superiore, Pisa, IT</i>
<b>11:25 - 11:30</b>	Discussion
<b>11:30 - 11:55</b>	<b>Synthesis of formamide and isocyanic acid after ion irradiation of frozen gas mixtures</b> <i>Zuzana Kanuchova, Slovak Academy of Sciences, SK</i>
<b>11:55 - 12:00</b>	Discussion
<b>12:00 - 12:25</b>	<b>Formamide Prebiotic Plasma Chemistry Network in Reduction Atmospheres</b> <i>Martin Ferus, J. Heyrovský Institute, CZ</i>
<b>12:25 - 12:30</b>	Discussion
<b>11:00 - 12:40</b>	<b>Parallel session P5: Before and after the Last Common Universal Ancestor: Early evolution of Life</b> (WG3+ WG4) <i>Chair: Johann Peter Gogarten, University of Connecticut, US</i> Mikado Hall
<b>11:00 - 11:20</b>	<b>Modeling the origins of cellular systems: How complex must our system be to observe cell-like behaviors?</b> <i>Pierre-Alain Monnard, University of Southern Denmark, DK</i>
<b>11:20 - 11:25</b>	Discussion
<b>11:25 - 11:45</b>	<b>The last universal common ancestor: simple or complex?</b> <i>David Moreira, Université Paris-Sud, FR</i>
<b>11:45 - 11:50</b>	Discussion
<b>11:50 - 12:10</b>	<b>Origin and evolution of aerobic processes</b> <i>Céline Brochier, University of Lyon, FR</i>
<b>12:10 - 12:15</b>	Discussion
<b>12:15 – 12:35</b>	<b>The origin of eukaryotes is linked to the rooting of the Tree of Life... but the phylogenetic jury is still out</b> <i>Richard Gouy, University of Liège, BE</i>
<b>12:35 - 12:40</b>	Discussion

11:00 – 12:00	<b>Parallel session P3: Early Universe, early Earth and the origin of Life: Evolution of concepts in history and philosophy</b> (WG5, continued) <i>Chair: Erik Persson, Lund University, SE</i> Tosca Hall
11:00 - 11:25	<b>Astrobiology in culture: NASA's current interests</b> <i>Linda Billings, National Institute of Aerospace, US</i>
11:25 - 11:30	Discussion
11:30 - 11:55	<b>Progress on the White paper</b> <i>David Dunér, Lund University, Sweden</i>
11:55 - 12:00	Discussion
<b>Parallel sessions 14:00 – 15:30</b>	
14:00 - 15:30	<b>Parallel Session P1: Protoplanetary disks and planet formation</b> (continued, WG1) <i>Chair: Olga Prieto Balleteros, CAB, ES</i> Aida Hall
14:00 - 14:35	<b>A comprehensive analysis of presolar SiC grains using NanoSIMS and Time-of-Flight Secondary Ion Mass Spectrometry (TOF-SIMS)</b> <i>Alex Clarke, University of Manchester, UK</i>
14:35 - 14:45	Discussion
14:45 - 15:20	<b>Abundance trends with condensation temperature and terrestrial planet formation: The case of Zeta Reticuli</b> <i>Vardan Adibekyan, Institute of Astrophysics and Space Sciences, PT</i>
15:20 - 15:30	Discussion
<b>Parallel Session P4: Formation of the building blocks of life</b> (continued, WG2)	
14:00 - 15:40	<i>Chair: William Irvine, University of Massachusetts at Amherst, US</i> Carmen Hall
14:00 - 14:20	<b>Follow the evolution of organic matter using laboratory experiments: from volatile organics to organic residues</b> <i>Gregoire Danger, PIIM Marseille, FR</i>
14:20 - 14:25	Discussion
14:25 - 14:45	<b>Plausible Prebiotic Formation of Carbohydrates</b> <i>Paul Clarke, University of York, UK</i>
14:45 - 14:50	Discussion
14:50 - 15:10	<b>About the abundance of prebiotic species: the energetic aspect</b> <i>Yves Ellinger, University Pierre &amp; Marie Curie, FR</i>
15:10 - 15:15	Discussion
15:15 – 15:35	<b>Inspecting the Role of Serpentinite-hosted Hydrothermal Minerals in Prebiotic Processes: Binding of Nucleic Acids Components to Brucite</b> <i>Teresa Fornaro, Observatory of Arcetri, IT</i>
15:35 – 15:40	Discussion
<b>Parallel Session P6: Life in extreme environments</b> (WG3 + WG4)	
14:00 - 15:15	<i>Chair: Anna Łosiak, Polish Academy of Sciences, PL</i> Mikado Hall
14:00 - 14:20	<b>Description and comparison of microbial communities and metagenomes in a subglacial lake under the Vatnajökull ice cap, East Skaftárketill</b> <i>Viggo Marteinson, MATIS, IS</i>
14:20 - 14:25	Discussion
14:25 - 14:45	<b>Life in Mars analogue sites: microbes adapted to extreme conditions in Iceland</b> <i>Oddur Vilhelmsson, University of Akureyri, IS</i>

14:45 - 14:50	Discussion
14:50 - 15:10	<b>Health hazards posed by ionizing radiation in manned space missions BLEO</b> <i>Franco Ferrari, University of Szczecin, PL</i>
15:10 - 15:15	Discussion
<b>Parallel sessions 16:15 – 17:45</b>	
16:15 - 17:45	<b>Parallel session P7: Habitability (WG3 + WG4)</b> <i>Chair: Yann Alibert, University of Berne, CH</i> Mikado Hall
16:15 - 16:40	<b>Dissipative structures in the Universe: Super massive black holes and life</b> <i>Andjelika Kovacevic, University of Belgrade, RS</i>
16:40 - 16:45	Discussion
16:45 - 17:10	<b>From stellar evolution to tidal interaction: impact on planetary habitability</b> <i>Florian Gallet, University of Geneva, CH</i>
17:10 - 17:15	Discussion
17:15 - 17:40	<b>Water-rich planets: how habitable is a water layer deeper than on Earth?</b> <i>Lena Noack, Royal Observatory of Belgium, BE</i>
17:40 - 17:45	Discussion
<b>Parallel Session P8: Comets and meteorites: Composition, chemical processes and their role in the evolution of the solar system (WG1 + WG2)</b> <i>Chair: Martin Hilchenbach, MPI for Solar System Research, Germany</i> Aida Hall	
16:15 - 16:40	<b>First spectrally complete survey of cometary water emission at near IR wavelengths (0.9-2.5 <math>\mu</math>m): C/2014 Q2 Lovejoy with TNG/GIANO spectrograph</b> <i>Sara Faggi, Observatory of Arcetri, IT</i>
16:40 - 16:45	Discussion
16:45 - 17:10	<b>Prebiotic molecules in comets detected by Rosetta and their possible synthesis in the ice</b> <i>Guillermo Muñoz Caro, Centro de Astrobiología, ES</i>
17:10 - 17:15	Discussion
17:15 - 17:40	<b>Ion chemistry in the innermost coma of comet 67P/Churyumov-Gerasimenko</b> <i>Erik Vigren, Swedish Institute for Space Physics, SE</i>
17:40 - 17:45	Discussion
17:45	<b>Room for WG meetings</b>
<b>Friday April 29th, 2016</b>	
09:00 - 10:30	<b>Internal meeting for COST Action TD1308</b> <i>Chairs: Muriel Gargaud, Wolf Geppert</i>
09:00 - 09:12	<b>Report from WG1</b>
09:12 - 09:15	Discussion
09:15 - 09:27	<b>Report from WG2</b>
09:27 - 09:30	Discussion
09:30 - 09:42	<b>Report from WG3</b>
09:42 - 09:45	Discussion
09:45 - 09:57	<b>Report from WG4</b>
09:57 - 10:00	Discussion

<b>10:00 - 10:12</b>	<b>Report from WG5</b>
<b>10:12 - 10:15</b>	Discussion
<b>10:15 - 10:30</b>	<b>Further projects of our Action</b>
10:30 - 11:00	Coffee break
<b>11:00 - 12:00</b>	<b>Internal meeting for COST Action TD1308</b> <i>Chairs: M.Gargaud, W.Geppert</i>
<b>11:00 - 11:15</b>	<b>Past and future training activities by our Action and the European Astrobiology Campus</b> <i>Kalle Kirsimäe and Wolf Geppert</i>
<b>11:15 - 11:20</b>	Discussion
<b>11:20 - 11:35</b>	<b>Outreach and Dissemination Activities of our Action</b> <i>Muriel Gargaud</i>
<b>11:35 - 11:40</b>	Discussion
<b>11:40 - 11:55</b>	<b>Progress on the European Astrobiology Institute</b>
<b>11:55 - 12:00</b>	Discussion
12:00	Lunch, Departure of participants