

Life and Planet

Burlington House, London

Tuesday, July 18th

9:30 – 10:45 **Arrivals, icebreaker, and coffee**

10:45 – 10:50 **Introductory remarks** and dedication to pioneering Earth system scientist and Wollaston Medal winner James Lovelock (1919-2022)

Session 1

11:00 – 11:15 **Modelling climate change over 500 million years – a community resource for ecological and biodiversity modelling**
Dan Lunt, Paul Valdes, Alex Farnsworth

11:15 – 11:30 **Ocean redox and nutrient cycling in the ~1.64 Ga Chuanlinggou Formation, North China Craton**
Chong He, Benjamin J.W. Mills, Fred T. Bowyer, Xiuqing Yang, Yafang Song, Simon W. Poulton

11:30 – 11:45 **Radiations and extinctions in early Paleozoic oceans: understanding the dynamics of the early marine biosphere**
Alexandre Pohl

11:45 – 12:00* **Highlight Talk: Prevailing views on the coevolution of life and oxygen**
Lewis J. Alcott, Fred Bowyer, Heda Agić

12:00 – 12:45 **Break for lunch** (*not catered*)

Session 2

13:00 – 13:15 **Calibrating the diversification of early animals during Ediacaran–Cambrian interval using a newly proposed beta ichnodiversity**
Zekun Wang, Imran Rahman

13:15 – 13:30 **Constraining the onset and environmental setting of Ediacaran metazoan biomineralization: The Nama Group of the Tsau Mountains, Namibia**
Fred Bowyer, Collen Issia-Uahengo, Kavevaza Kaputuza, Junias Ndeunyema, Mariana Yilales, Ruaridh Alexander, Andrew Curtis, Rachel Wood

13:30 – 13:45 **Shifting sands: Are late Ediacaran fossil assemblages reliable records of original ecosystems?**
Brennan O'Connell, William J. McMahon, Alexander G. Liu

13:45 – 14:00* **Highlight Talk: A Great late Ediacaran ice age**
Ruimin Wang, Bing Shen, Xianguo Lang, Bin Wen, Ross N. Mitchell, Haoran Ma, Zongjun Yin, Yongbo Peng, Yonggang Liu, Chuanming Zhou

14:00 – 14:15 **Break**

Session 3

14:15 – 14:30 **The (bacterio-)chlorophyll biosynthetic pathway provides Bayesian insights into the evolution of photosynthesis**
Giorgio Bianchini, Patricia Sánchez-Baracaldo, Tom Williams, Tanai Cardona

14:30 – 14:45 **Patterns of floral dominance-diversity architecture across the Pennsylvanian-Permian boundary of western equatorial Pangea**
Rebecca A. Koll, William A. DiMichele

14:45 – 15:00 **Testing for a signal of solar irradiance in fern spores from the K/Pg boundary**
Hendrik Nowak, Barry H. Lomax, Wesley T. Fraser, Phillip E. Jardine, Luke Mander

15:00 – 15:15* **Highlight Talk: Plant adaptation and dispersal shape climatic shifts following massive degassing events**
Julian Rogger, Yves Goddérés, Benjamin Mills, Taras Gerya, Loïc Pellissier

15:15 – 15:30 **Break**

Session 4

15:30 – 15:45 **The nature of LUCA and its impact on the early Earth system**
Edmund R. R. Moody, Holly Betts, James Clark, Nina Dombrowski, Stuart Daines, Richard Boyle, Xi Chen, Graham A. Shields, Gergely Szöllősi, Anja Spang, Davide Pisani, Tom A. Williams, Timothy M. Lenton, Philip J. Donoghue

15:45 – 16:00 **Dormant Arctic thermophiles point to cellular life histories operating over geologic timescales**
Margaret Cramm, Matteo Selci, Donato Giovannelli, Anne Jungblut, James Bradley

16:00 – 16:15 **Sulfate concentrations in the global ocean through Phanerozoic time**
Alexander J. Krause, Benjamin J.W. Mills

16:15 – 16:30* **Highlight Talk: The history of atmospheric oxygen: Towards an understanding of oxygen-vegetation feedbacks**
Rayanne Vitali, Claire M. Belcher, Benjamin J.W. Mills, Andrew J. Watson

16:30– 18:00

Poster session

In the Lower Library. Drinks included.

Life and Planet meeting code of conduct

All attendees are expected to behave in a professional manner and to treat each other with respect. The Conference organizers reserve the right to remove any attendee who violates this code of conduct without a refund. If you believe another attendee is in violation of the code of contact, please contact the organizing committee at info@lifeandplanet.com.

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* Highlight talks selected by the organizing committee.

If you have any other queries throughout the conference, please contact info@lifeandplanet.com



Wednesday, July 19th

9:30 – 9:45 **Coffee**

Session 5

- 9:45 – 10:00 **No evidence for falling marine sulfate levels after the Great Oxidation Event in Fennoscandia**
Roger Bryant, Jordan Todes, Jocelyn Richardson, Tara Kalia, Anthony Prave, Aivo Lepland, Kalle Kirsimäe, Clara Blättler
- 10:00 – 10:15 **Heterogeneous sulfide reoxidation buffered oxygen release in the Ediacaran Shuram ocean**
Wei Shi, Benjamin Mills, Thomas Algeo, Simon W. Poulton, Robert J. Newton, Matthew S. Dodd, Zihu Zhang, Lei Zheng, Tianchen He, Mingcai Hou, Chao Li
- 10:15 – 10:30 **Exploring belemnite calcite as an archive of water column phosphorus**
Ailsa C. Roper, Clemens Ullmann, Crispin T.S. Little, Simon Poulton, Pail Wignall, Tianchen He, Robert Newton
- 10:30 – 10:45*** **Highlight Talk: What triggered the calcification of coccolithophores? Tracing upper ocean oxygenation trends through the Triassic using I/Ca ratios**
Mariana Yilales A., Rachel Wood, Rosalind Rickaby, Sylvain Richoz, Matthew Clarkson, Tianchen He, Stephen Reid, Fred Bowyer
- 10:45 – 11:00 **Break**

Session 6

- 11:00 – 11:15 **Climate homeostasis by and for active inference in the biosphere**
Sergio Rubin
- 11:15 – 11:30 **Reconstructing levels of volcanic ashfall through geological time**
Jack Longman
- 11:30 – 11:45 **Disentangling the effects of seasonality from average conditions on modeled forest distribution during the Pennsylvanian**
William J. Mattheaus, Sophia I. Macarewich, Jon D. Richey, Jonathan P. Wilson, Joseph D. White, Jennifer C. McElwain
- 11:45 – 12:00*** **Highlight Talk: Exploring the rise of oxygen and fall of carbon dioxide over the Paleozoic Era using a deep time dynamic vegetation model**
Khushboo Gurung
- 12:00 – 12:45 **Break for lunch** (*not catered*)

Session 7

- 13:00 – 13:15 **Phosphorus controls on the formation of vivianite versus green rust under anoxic conditions**
Yijun Xiong
- 13:15 – 13:30 **A Mesoproterozoic weathering event and its possible link to oxygenation**
Xi (Helen) Chen, Ying Zhou, Graham Shields
- 13:30 – 13:45 **Enhanced continental silicate weathering linked to the Karoo-Ferrar LIPs in the lacustrine Sichuan Basin during the Jenkyns Event**
Jinchao Liu, Jian Cao, Simon W. Poulton, Tianchen He, Wang Zheng
- 13:45 – 14:00*** **Highlight Talk: Devonian afforestation significantly altered the global silicate weathering regime: Evidence from lithium isotopes**
Xianyi Liu, Alexander J. Krause, David J. Wilson, Wesley T. Fraser, Michael M. Joachimski, Uwe Brand, Alycia L. Stigall, Wenkun Qie, Bo Chen, Xiangrong Yang, Philip A.E. Pogge von Strandmann
- 14:00 – 14:15 **Break**

Session 8

- 14:15 – 14:30 **Are widespread ¹³C-depleted microbial mats a source of more negative $\delta^{13}\text{C}$ composition of organic matter in Proterozoic mudrocks?**
Heda Agić, Susannah Porter, Phoebe Cohen, Christopher Junium
- 14:30 – 14:45 **Constraining the redox landscape in Mesoproterozoic mat grounds: A possible oxygen oasis in the 'Boring Billion' seafloor**
Tianyi Jia, Ruimin Wang, Tianzheng Huang, Xianguo Lang, Haoran Ma, Bing Shen
- 14:45 – 15:00 **Micro-elemental analysis of stromatolites reveal Fe as potential biosignature and remnant of a lithification mechanism**
Victoria Cassidy, Dylan R. Levene, Aaron Celestian, Victoria Petryshyn, William M. Berelson, Kalen Rasmussen, Bradley S. Stevenson, John R. Spear, Frank A. Corsetti
- 15:00 – 15:15*** **Highlight Talk: Photochemical modeling of atmospheric oxygen over Earth's middle history and co-evolution with the biosphere**
Bethan Gregory, Mark Claire, Sarah Rugheimer
- 15:15 – 15:30 **Break**

Session 9

- 15:30 – 15:45 **Solid Earth forcing of oceanic anoxic events**
Thomas Gernon, Benjamin Mills, Thea Hincks, Andrew Merdith, Lewis Alcott, Eelco Rohling, Martin Palmer
- 15:45 – 16:00 **Mass extinctions and close calls: Using experimental Earth system and ecophysiological modelling to understand what makes a catastrophic extinction**
Richard G. Stockey, Erin E. Saupe, Benjamin J. W. Mills, Alexandre Pohl
- 16:00 – 16:15 **Dynamics of ocean oxygenation and anoxic events**
Stuart Daines, Ziheng Li
- 16:15 – 16:30 **Instability in the geologic regulation of Earth's climate**
Dominik Hülse, Andy Ridgwell
- 16:30 **Closing remarks**