

Climate and Climate Change on the Terrestrial Planets

Fredric W Taylor

Halley Professor of Physics, Oxford University, Department of Atmospheric, Oceanic and Planetary Physics, Clarendon Laboratory, OXFORD OX1 3PU, United Kingdom

For the last three decades we have been fortunate enough to experience the first close-up exploration of the planets of the solar system through space missions and experiments to explore the atmospheres and environments of many worlds. We now understand the Earth in its wider context as never before, and are poised to address in depth the many mysteries that have been revealed by US, Russian, and (increasingly) European planetary exploration programmes. A key scientific theme is the climate on Earth-like planets, the physical processes that determine environmental conditions, the stability in each case against climate change, and ways to devise feasible and affordable experiments to investigate these. In each case, we can compare the processes at work to those on our own planet and slowly gain an understanding of global change on the Earth, both of the origin and evolution over the long term of this habitable world, and in terms of recent and anticipated threats such as greenhouse warming.

This talk aims to convey the excitement of the new field of Comparative Planetary Climatology, highlighting recent discoveries and the hopes for new space projects now underway.