ETH zürich

Centre for Origin and Prevalence of Life
COPL

NOMIS Foundation ETH Fellowship 2024

Welcome to

Sean Jordan

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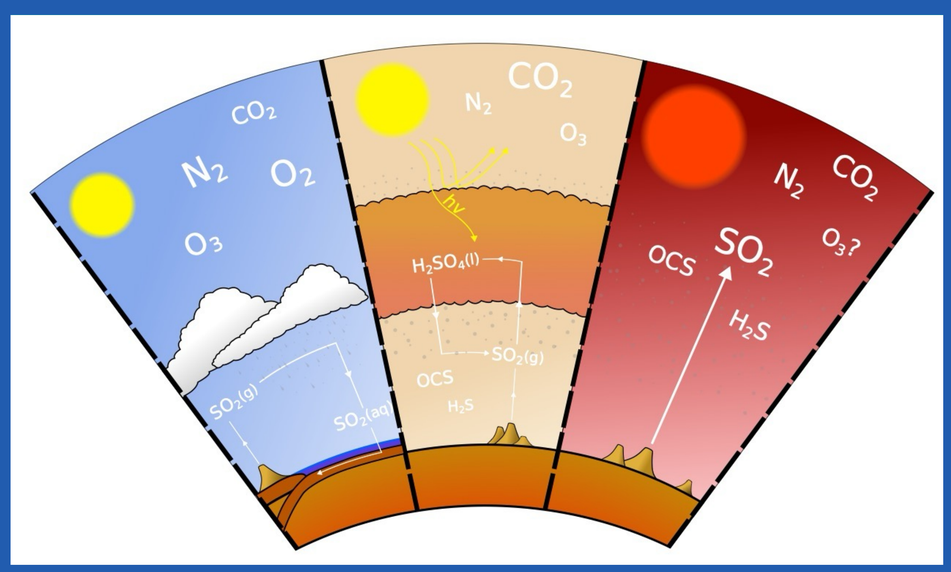

Sean will carry out this research under the mentorship of Prof. Sascha Quanz, who leads the Exoplanets and Habitability group in the Institute for Particle and Astrophysics. Sean is grateful for the exciting opportunity made possible by the NOMIS foundation.

Sean Jordan is a planetary scientist and astrophysicist, originally from Manchester, UK, and more recently based at the Institute of Astronomy in Cambirdge. He is interested in how we can apply our models of the planetary processes that we can study in detail in the Solar System, to help us interpret observations of exoplanets in orbit around distant stars.

Sean studied Natural Sciences at the University of Cambridge specialising in Astrophysics, and continued there to embark on his PhD. During this time, he has examined a range of multidisciplinary problems including the prospect of extremophilic life in the cloud droplets of Venus, the discovery of photochemical sulfur-dioxide on the gas-giant exoplanet WASP-39b, and how a molten planetary interior could be shaping the observed atmosphere of elusive sub-Neptune exoplanet K2-18b. In his current research, Sean is investigating how we can use observations of atmospheric sulfur-dioxide to learn about the climate and surface conditions of rocky worlds orbiting small M-dwarf stars.

Sean's research at the COPL will focus on the mapping between limited astronomical observations that we can make of exoplanet atmospheres currently, and the true nature of the planetary surface and interior, in order to constrain the prevalence of habitable climates and the emergence of life. "Venus and Earth provide us with the local paradigms of an uninhabitable versus a habitable world. These local examples, however, give us only two data points to understand the evolution of habitable planets across the universe more generally. In order to test our theories about the `Habitable Zone' and the sensitivity of Earth-like climate systems, we must prospect the population of observable exoplanets in new astrophysical environments. The preponderance of rocky exoplanets out there, that could potentially resemble Venus or the Earth, brings this test within reach, however the observations that we can make of their atmospheres are limited leading to ambiguity about their true surface conditions. In order to understand what our astronomical observations are telling us about these other worlds, we require detailed models of the planets and their host stars."

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