

Atmospheric Biosignatures

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The search and detection of terrestrial type planets beyond the solar system is of considerable scientific and philosophical interest. The physical and chemical properties of the planets and their atmospheres can be studied by observation as soon as a spectral analysis of the planetary radiation becomes feasible. Due to favourable planet – star contrast ratios planets orbiting M dwarf stars in their habitable zones are of particular importance. However, the atmospheres of such planets are exposed to high energy radiation and particles caused by stellar activity, which poses fundamental questions:

Can possible spectral signatures indicating some biological activity (as we know it) be observed and how are these atmospheric biomarkers affected by energetic particle and radiation processes in atmospheres of (potentially) habitable exoplanets?

A brief review and discussion of the concept of extrasolar biosignatures in context of the solar system will be given to address these key issues. Atmospheric processes affecting spectral signatures and in particular biomarkers will be discussed in this presentation.