Sulfur in astrochemistry and astrobiology: Laboratory and theoretical studies

Initiative: Trilaterale Partnerschaften – Kooperationsvorhaben zwischen Wissenschaftler(inne)n aus der

Ukraine, Russland und Deutschland

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The central idea of the proposed research is 1) identification of a set of relevant sulfur containing molecules structurally related to each other, 2) development of tailored experimental and theoretical methods for their study and analysis, and 3) application of those methods to the selected molecules for obtaining a global description with predictive power for almost arbitrary environmental conditions. As a result, reliable laboratory data of high quality will be supplied allowing scientists to analyze and interpret spectroscopic data of relevant sulfur compounds of astronomical objects in very different contexts, ranging from exoplanetary atmospheres over the interstellar medium to extraterrestrial planetary atmospheres in our own solar system and, last not least, to the atmosphere of our own planet Earth. Relevant molecules comprise "simple structure species" where established methods can readily be applied for their characterization and "complex structured molecules" where current analysis methods, both experimental and theoretical, are insufficient and need to be developed or modified. Experimental observation and theoretical analysis of high resolution infrared and microwave spectra are needed and will be in the focus of our research proposal. A detailed and comprehensive understanding of sulfur species is expected from this collaboration yielding insight into their role in terrestrial and extraterrestrial environments and for assessing their relevance as biosignature molecules in the context of the search for extraterrestrial life.

Projektbeteiligte

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