

Unknown or poorly characterised small, pnictogen-containing molecules:
Photochemistry, spectroscopy, photophysics

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Complex phosphorus-bearing molecules are extensively studied by biochemists and materials scientists. Yet, many of the simplest organophosphorus species remain only poorly known, this gap being even more evident for their arsenic or antimony analogues.

The lecture will present spectroscopic studies of small molecules generated in cryogenic matrices by UV irradiation of precursors containing trivalent phosphorus (e.g. CH_3CP) or heavier pnictogen atoms (e.g. CH_3AsH_2). It was found that dehydrogenation dominates among the reaction pathways. The resulting species are characterized using IR and UV/Vis spectroscopy. While the phosphorus compounds under study are particularly relevant in astrochemistry, their arsenic- and antimony-bearing counterparts are of broader chemical interest.

Literature:

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A. Lawzer, E. Ganesan, T. Custer, J.-C. Guillemin, and R. Kołos; "Free Ethynylarsinidene and Ethynylstibinidene: Heavier Analogues of Nitrenes and Phosphinidenes"; *Chem. Europ. J.* 29 (2023) e202300887.

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A. Lawzer, T. Custer, J.-C. Guillemin, and R. Kołos; " HC_3As , the simplest arsadiyne"; *Dalton Trans.*, submitted