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CONTROL ID: 2258172
TITLE: Where is the Phosphorus in Cometary Volatiles?
ABSTRACT BODY:
Abstract Body: Phosphorus is a key element in all living organisms but its role in life's origin is not well understood. Phosphorus-bearing compounds have been observed in space, are ubiquitous in meteorites in small quantities, and have been detected as part of the dust component in comets Halley and Wild 2. However, searches for P-bearing species in the gas phase in cometary comae have been unsuccessful. We present results of the first quantitative study of P-bearing molecules in comets to identify likely species containing phosphorus. We found reaction pathways of gas-phase and photolytic chemistry for simple P-bearing molecules likely to be found in comets and important for prebiotic chemistry. We hope to aid future searches for this important element, especially the Rosetta Mission to Comet 67P/Churyumov-Gerasimenko, possibly shedding light on issues of comet formation (time and place) and understanding prebiotic to biotic evolution of life.

Acknowledgements: We greatly appreciate support from the NSF Planetary Astronomy Program under Grant No. 0908529 and the Instituto de Astronomia, Geofísica e Ciências Atmosféricas at the University of São Paulo.
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PRESENTATION TYPE: Poster