Cosmic ray ion irradiations of interstellar carbonaceous dust

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Laboratory simulations of the radiation-induced processes occurring in space allow understanding their relative importance. The aim of such studies is to obtain data on the evolution of interstellar matter, understand its evolution and provide constraints to astrophysical environments models. The interstellar carbonaceous dust grains are immersed in a radiative environment comprising high-energy ultraviolet photons and cosmic rays, influencing their composition. Following the ionizing interaction with accelerated ions, carbonaceous dust particles are modified, and in addition release fragments having an impact on the observed evolution of the gas phase chemistry. This talk will be dedicated to describe the evolution, in an astrophysical context and based on laboratory experiments, of carbonaceous dust analogues, resulting from the interactions with swift ions.

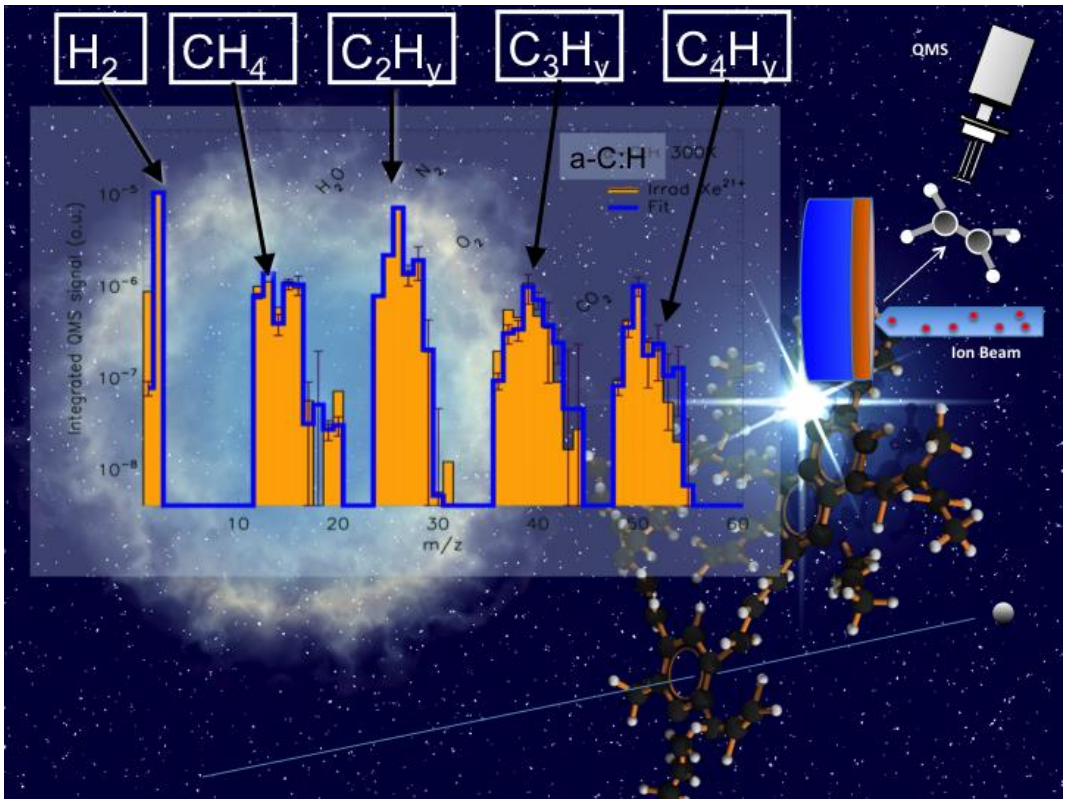

Figure 1: QMS integrated signal of released fragments for a hydrogenated amorphous carbon interstellar analogue sample irradiated with $^{132}Xe^{21+}$ at 633 MeV, simulating low energy cosmic rays [1].

Acknowledgments: This work has the support of the French INSU-CNRS program "Physique et Chimie du Milieu Interstellaire" (PCMI). This work is supported by the European Union's Horizon 2020 research and innovation program and grant agreement number 6544002.

References

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