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NEGATIVE ION CHEMISTRY AMONG STARS AND CLOUDS : MOLECULAR PROCESSES IN THE INTERSTELLAR MEDIUM

Friday 9 May 2025 10:00 (20 minutes)

The last ten years or so have witnessed a tremendous growth
on the detection and observation of charged molecular species in the interstellar medium (ISM), especially within the special environments provided by interstellar and circumstellar clouds. Further observations within the atmospheres of the exoplanets have confirmed the marked ubiquity of these most diverse chemical species in the rather hostile environments of the interstellar space and identified specific regions that are considered to be the most efficient laboratories for molecular formation processes involving molecular anions. In the present talk I shall draw examples from our recent works on the study of molecular mechanisms presiding over ion-molecule reactions which lead to those anionic molecular products which have already been astronomically observed. We have been investigating the most efficient paths which can guide the formation of the recently observed carbon-rich molecular anions and on a variety of possible molecular quantum processes which can take place in the Diffuse and Dark regions of the interstellar clouds and in the atmospheres of some of the exoplanets.

1. F.A. Gianturco et al., Phys. Rev.Lett. 127, 043001 (2021).
2. F.A.G. et al., Phys. Rev. Lett.,131,183002 (2023).
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7. F.A.G. et al., MNRAS, 522 , 5775-5787 (2023).
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