

Cosmic-rays : non thermal nucleosynthesis

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In this lecture, we will discuss cosmic-rays. After a rapid presentation of cosmic-ray physics and its history we will discuss in more details one of the most important aspect of cosmic-ray phenomenology, namely the cosmic-ray composition. We will see that low energy cosmic-rays while propagating in the Galactic medium experience spallation interactions and that these interactions are responsible for the **spallative nucleosynthesis** of a several nuclear species (emphasis will be put on the production of Li, Be and B isotopes) which are extremely underabundant in stellar or explosive nucleosynthesis. We will then discuss the importance of precise measurements of the abundances of spallative nucleosynthesis products for deciphering the origin of cosmic-rays and understanding their propagation in the Galaxy.

If time permits we will discuss the importance of nuclear interactions in the context of ultra-high-energy ($E > 10^{18}$ eV) cosmic-ray physics.

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Research fields :

High energy astrophysics : ultra-high-energy cosmic-ray phenomenology , multimessenger (cosmic-rays, neutrinos, photons) astrophysics.

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