

Radiation effects in astrophysical ices and biomolecules

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Astrophysical ices are exposed to ionic projectiles from galactic cosmic rays, Solar wind, shock waves or ions trapped in the magnetospheres of giant planets. Induced radiation effects include sputtering, amorphisation and compaction, dissociation of molecules, and formation of new molecular species after radiolysis and by implantation of reactive ions. We present recent results on radiolysis of astrophysical ices and on radio-resistance of biomolecules, with special emphasis on experiments with multiply charged ion beams. These experiments aim in particular at simulating the effects of cosmic rays on icy grains in dense molecular clouds, and on the formation of molecules on icy bodies in the Solar System [Rothard, Domaracka, Boduch, Palumbo, Strazzulla, da Silveira, Dartois, *J. Phys. B: At. Mol. Opt. Phys.* 50 (2017) 062001 (Topical Review) doi: 10.1088/1361-6455/50/6/062001].

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