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## Interaction of highly charged ions with surfaces and 2D materials

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The large amount of energy deposited by the neutralization of highly charged ions during their impact on solid surfaces leads to electronic excitations. Depending on the material's response to the ion impact, phenomena like sputtering and the formation of individual nanostructures at the surface can occur. To pinpoint the energy deposition and its time dependence experimentally we recently used freestanding two-dimensional materials like graphene as a target. By adjusting the ions' kinetic energy the interaction time with the 2D-solid can be controlled. Spectroscopic measurements of the ions after transmission not only give insight into the mechanisms of a rapid charge exchange and deexcitation sequence but show that highly charged ions are well suited to investigate properties of 2D materials under extreme conditions on a femtosecond time scale.

**Primary author:** Prof. AUMAYR, Friedrich (TU Wien)

**Presenter:** Prof. AUMAYR, Friedrich (TU Wien)

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