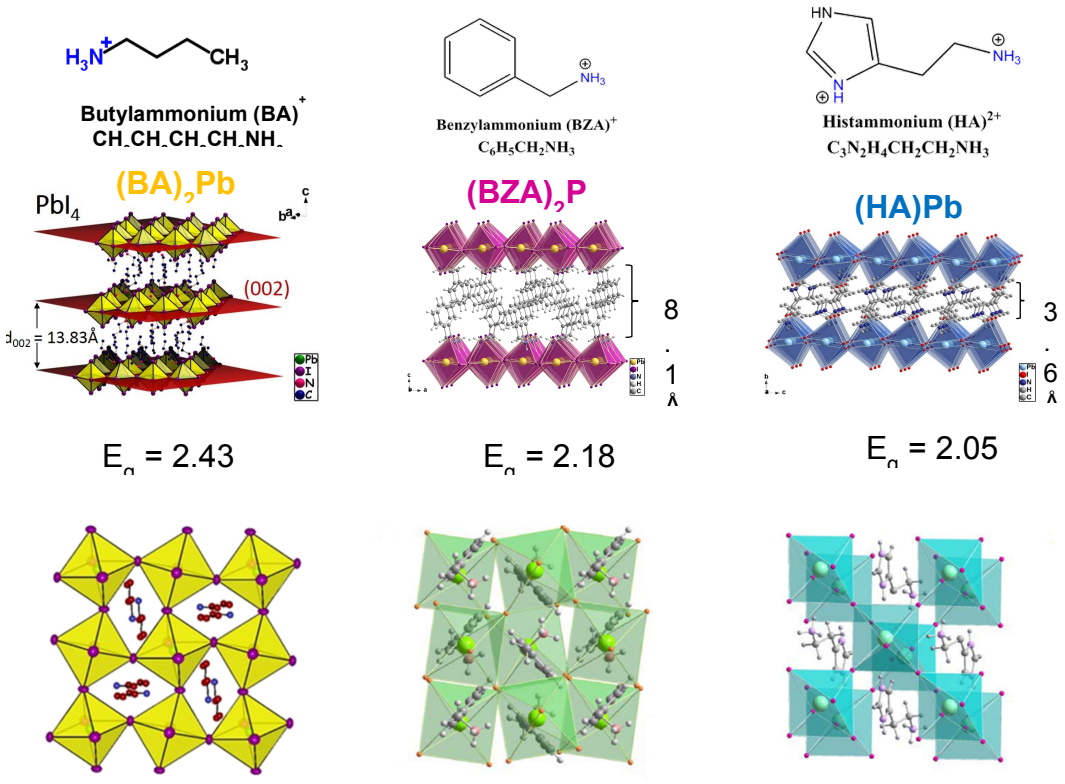
Revealing the excitonic nature of 2D perovskites

Organic-inorganic halide perovskites are intensively studied materials for opto-electronic applications such as solar cells, light emitting diodes and lasers. Recently, layered 2D perovskites have gained significant attention because of their improved moisture stability and intriguing optical properties. An interesting feature of 2D hybrid perovskites is the high tunability of their chemical and physical properties. Specifically, the nature of the organic cation affects the confinement and distortion on the inorganic $[PbI_6]^{-1}$ sheets. This ultimately affects the charge and excited state dynamics. The aim of this project is to study the charge and excited state dynamics in order to reveal the nature of excited states in 2D perovskites. This knowledge will give us a unique insight into the properties of 2D perovskites in order to optimize/design these materials for specific applications.

In this project you would learn characterization techniques such as XRD, SEM, XPS, DSC and advanced techniques to study charge transport such as photoconductivity TRMC, Absorption and photo-luminescent spectroscopy and femtosecond transient absorption (TA).



Literature

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