**Engineering the structure and properties of 2D materials by defect creation and intercalation**

Following isolation of graphene, many other 2D systems, e.g., single sheets of transition metal dichalcogenides (TMDs) have been manufactured. All these materials contain defects and impurities, which may govern their electronic and optical properties. Moreover, defects can intentionally be introduced using beams of energetic particles – ions and electrons. Formation of defects may also give rise to phase transformations in these materials and/or tune their properties. All of these calls upon the studies on defects and mechanisms of their formation under irradiation. In my talk, I will present the results of our recent theoretical studies [1] of point and line defects (such as mirror twin boundaries) in 2D TMDs obtained in close collaboration with several experimental groups. I will further discuss how new 2D phases of materials can be created upon atom intercalation between graphene sheets.  
  
[1] <https://users.aalto.fi/~ark/publist.html>

