

Some aspects of atomic, molecular and plasma physics in Mexico

Carmen CISNEROS, Universidad Nacional Autónoma de México

The field Atomic, Molecular and Plasma Physics (AMP) in Mexico encompasses the study of atoms, molecules, and light, among those are the studies of fundamental and applied aspects as well as from the experimental and theoretical points of view.

There are groups of different institutions dedicated to AMP studies. The main groups are at diverse institutes in the Universidad Nacional Autónoma de México, besides there are also laboratories in other institutions where AMP research is performed. Regarding particular laboratories it is worth to mention Collisions Laboratory, Laboratory of Low Temperature Plasma, Spectroscopies Laboratories: FTIR and Mass, Optical Emission, Raman and Atmospheric Plasma, Molecular Photodynamics Laboratory, Cold Atoms and Quantum Optics Laboratory, Plasma Physics and Radiation Interaction with Matter and Multiphotonionization and Multiphotondissociation of PHA and Organic Molecules, all these laboratories have strong inter collaborations and with groups from all over the world.

Some faculty members have been involved with AMP for fusion, collaborated on Atomic data for fusion. Volume 1: Collisions of H, H₂, He and Li atoms and ions with atoms and molecules (still revered). They also participated in the Coordinated Research Program on Atomic Data for Medium and High - Z Impurities in Fusion Plasmas "resulting in the report Electron Capture Collision Processes involving multiple charged ions: Si, Ni, Ti, Mo, and W ions with H, H₂ and He Targets. Results on hydrogenic negative ion formation have been generated with proposes of plasma heating and electron capture and stripping of Tl and K for plasma diagnostics were also obtained. More recently they had collaborated in ground breaking advances on atomic and molecular physics, including studies of ion-photon experiments at the Advanced Light Source in Berkeley.

There are also projects related to Atomic and Molecular Theoretical Physics that go to the theories of the first principles (electronic structure of atoms and molecules, theory of functional density, production and characterization of ultra-cold atomic and molecular gases and their interaction with electromagnetic radiation, Bose-Einstein condensates and degenerated Fermi gases), Group Theory applied to the molecular structure, to very specific applications to particular problems (conversion of hydrocarbons into energy, study of the nucleic bases of DNA). Topics in which very important contributions have been made.

We are open to undertake and collaborate with new projects related with the present Network.