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# Joint ICTP-IAEA Workshop on Physics of Radiation Effect and its Simulation for Non-Metallic Condensed Matter | (smr 2359)

## Monday 13 August 2012

**Fundamentals of ion-matter interactions - Adriatico Guest House Kastler Lecture Hall (14:30-16:00)**

*The first part of the presentation deals with slowing down of energetic ions in matter. We start with introduction of the basic concepts and parameters. The theoretical formulation for light ion electronic stopping is summarized including, e.g., the concept of stopping number and the related corrections. Comparison with experimental data is surveyed followed by discussion on nuclear stopping. The scaling of proton stopping powers to heavy ion stopping powers by the effective charge formulation is introduced. The topic of energy loss in compounds including Bragg's rule and the Core and Bonds (CAB) model is discussed next. The concepts of straggling and range are discussed to some detail. Various sources providing stopping powers for practical use are listed and the most common associated computer programs are briefly mentioned. The experimental techniques most commonly employed for extracting stopping powers are described. Finally, hadron therapy serves as a topical example where charged particle slowing down plays a clear role. The second part of the presentation deals with radiation effects in solids. The principal effects and the basic terms are briefly discussed along with features associated with defect production by ion bombardment. Common techniques employed for minimizing radiation damage and for crystal recovery are discussed by means of examples.*

time	title	presenter
14:30	Fundamentals of ion-matter interactions	JYRKI RAISANEN