**Solar cell simulations via SCAPS.**

Advanced semiconductor materials for energy will assist the road to photovoltaics without the use of scarce or toxic material. These novel materials are in the ideal way combined as a junction to form a solar cell. For such a layered structure with many possible mechanisms that have impact on the performance an adequate numerical model is necessary. Therefore computer modelling is essential for our understanding and the corresponding progress of these solar cell technologies. Consequently, SCAPS and other simulation packages for thin film solar cells are very successful. In this lecture an introduction will be given on the use of SCAPS as a modelling tool for solar cells and the conventional characterization techniques for photovoltaics.