

## PEM Fuel Cells - Focus on Electrocatalysts (Prof. V. Di Noto, UNIPD)

The lecture will begin with an introduction on the fundamental electrochemistry principles involved in the operation of the electrocatalysts (ECs) implemented in PEM fuel cells. In a second step, the main electrode processes taking place at the electrodes of PEM fuel cells (e.g., the hydrogen oxidation reaction, HOR, and the oxygen reduction reaction, ORR) will be overviewed, identifying their most relevant electrochemical features and discussing how the latter affect the performance of the final device. The main techniques adopted to gauge the electrochemical performance and durability of the ECs will be described (e.g., the “*cyclic voltammetry with the thin-film rotating ring-disk electrode*” method). The lecture will be closed by an overview of the main families of state-of-the-art ECs for implementation in PEMFCs covering conventional Pt/C ECs, developmental nanostructured Pt-based ECs and also completely “*Pt-free*” ECs.