Prof. dr hab. inż. Paweł Zięba

Mass and charge transport in polycrystalline materials.

Mass and Charge Transport plays a dominant role in many industrial processes. Therefore, the understanding of the mechanism and kinetics of diffusive transport of matter in metals, alloys and ceramic materials is one of the issues needed for the proper design of the advanced and modern materials.

During Seminar PhD students will be obliged to prepare and present selected topics related to the diffusion processes including: basics (Fick's laws, Darken equation), mechanism of diffusion (volume, grain boundary), diffusion in nanomaterials and ceramic materials, kinetics of diffusion processes.

Prof. nadzw. dr hab. inż. Henryk Paul

Instability of plastic flow and their role in texture transformations in fcc metals.

Crystal lattice rotations induced by shear bands, transition bands and deformation bands developed in fcc metals characterized by different stacking fault energy have been examined in order to investigate the influence of the bands on slip propagation across a structure of twin-matrix layers and elongated cells and the resulting texture evolution. The microstructure and texture after deformation and recrystallization of plane strain compressed single crystals evolutions were characterized by TEM, including TEM orientation mapping and SEM equipped with EBSD facility. The results obtained on model single crystals (deformed in plane strain conditions) are compared with polycrystalline samples behavior in other deformation modes.