Hollow nanoparticles (NPs) are of great interest in such applications as catalysis or biomedical, as they offer a higher active surface compared the spherical NPs. However, most of them are stuck on the laboratory level, due to problems in upscaling of their synthesis procedure. In our previous research, we already successfully synthesized multimetallic PtNi NP and made them hollow by galvanic replacement reaction between Ni and Sn, resulting PtNiSn nanoframes. However, this synthesis procedure allows to synthesize only microgram quantities of these hollow multimetallic frames. The NPs had to be produced in multiple milliliter volume syntheses. For any potential application, it is necessary to produces at least milligram quantities of nanoparticles in a controlled and repetitive way. Therefore, in the present project we propose novel hollow nanoparticles, based on Cu_2O nanocubes, which we can produce, by wet chemistry syntheses in liter quantities. These Cu_2O template nanocubes, will be transformed via galvanic replacement reaction (GRR) with Pt, Pd, Au and Ag into hollow Pt@Cu_2O, Pd@Cu_2O, Au@Cu_2O and Ag@Cu_2O nanoskeletons. Thus, the basic research aim of the project is to understand the mechanism of the GRR leading to the formation of hollow nanoparticles, in order to use it in a controlled way for larger scale production of hollow NPs. We will apply a novel approach, which is imaging in-situ the course of GRR between noble metal elements (Pt, Pd, Au and Ag) and Cu_2O template nanocubes at nanoscale resolution using liquid cell transmission electron microscope (LC-TEM) and scanning transmission X-ray microscopy (STXM) technique in the synchrotron. These observations will allow us to establish, which parameters control the efficiency of NPs hollowing process, taking into account the effects of the electron or X-ray beam on the GRR. The ground-breaking idea is to compare the effect of those two beams on GRR course in nanoparticles, providing fundamental knowledge on the mechanism of GRR.