X-ray diffraction is the standard procedure to reveal structural information from materials like size, strain, internal defects etc. With the advent of new generation x-ray optics and synchrotron facilities, the capabilities of this technique is increasing. That, however, brings new challenges to the data analysis problem. The existing data analysis routines used to analyze XRD patterns from bulk materials have been proven successful over the past decades. However their application on XRD profiles from nanomaterials is not trivial.

In our study, we will use fundamental physics equations to generate synthetic XRD profiles from known artificial samples with a few nanometers in size. These profiles will then be analyzed using the existing routines to extract structural information about our sample and their accuracies will be investigated.