

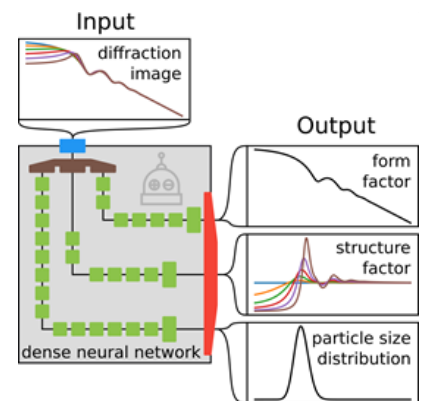
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AG Strong-Field Nanophysics

## Reconstructing the structure and composition of colloidal ensembles from diffraction images using neural networks

Extracting the structure and composition of a colloidal ensemble from a single diffraction image remains a tedious process. The exploration of dynamical processes requires the analysis of a large number of diffraction images. A highly promising method to achieve this in a very short amount of time is based on machine learning in the form of neural networks. The goal of this talk is to prove the conceptual viability of this approach. Initially the theoretical diffraction process in a colloidal ensemble is described considering the case of polydisperse hard spheres using the Percus-Yevick solution within Born's approximation. Thereafter the introduction of neural networks will be done in a beginner-friendly manner, especially highlighting the basic methodology involved in optimizing a fully connected dense network with a wide variety of parameters. Finally these aspects are brought together to investigate ensemble diffraction images.



Talk: English

Slides: English

**Location:** <https://uni-rostock-de.zoom.us/j/67867693635>