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第24回　情報統合型研究交流会

Deriving physics from mining of both extant literature and large imaging datasets:

case studies with complex oxides and scanning probe microscopy

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Conference Room#2, 1st Floor, Main Bldg. , NIMS Sengen site

The past decade has seen enormous increases in the size and quality of datasets produced by techniques such as SPM and XRD from synchrotrons globally. However, the necessary pathways to both mine the large datasets to derive understanding of fundamental mechanisms, as well as synthesize and compare the results across the wider available literature, are still generally limited. Here, I will present case studies involving our use of machine learning and deep data analysis of scanning probe microscopy datasets for understanding of physical mechanisms. I will emphasize techniques including examples of endmember extraction, matrix factorization and convolutional neural networks. These can be utilized to automatically learn appropriate features from images for classification, and from which subsequent physics is then derived by combining the information with first principles and thermodynamic models, such as cationic segregation processes in complex oxides in 3-D.

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