

Plenary-05

## **Information-driven approach to materials discovery and design**

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There has been considerable interest over the last few years in accelerating the process of materials design and discovery. After all, finding new materials with targeted properties has largely been guided by intuition and trial and error, and with increasing complexity (e.g. chemical), the number of possibilities becomes exceedingly large for an Edisonian approach to be practical. The Materials Genome Initiative (MGI) initiative has spurred considerable activity and brought new researchers into the nascent field of materials informatics. The activity has also highlighted some of the open questions in this emerging area, including identifying key features, guiding the next experiment to aid the learning process, and incorporating domain knowledge to make better predictions. After a perspective of where the field is, I will review some of the work we have been doing related to classifying solids into different structure types, synthesis of smart alloys with very low thermal dissipation as well as Pb-free piezoelectrics with adequate response and temperature insensitivity, and predicting polymer dielectrics with large band gaps and dielectric constants.