Analytics - understanding materials

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In the last decades, advancements in analytical methods and tools have progressed enormously. Methods that are ever more precise and tools have been demonstrated and developed to a level of maturity that allows rapid collection of large amounts of data with high precision. Be it by using electrons, photons, neutrons or quasi particle interaction at various energy levels data that give insights into the materials, its surfaces and interfaces is obtained. Understanding and driving the 'right' conclusions from this data remains the challenge given that the laws of physics, in particular, quantum mechanics govern the interaction between material under investigation and the probe. Hence, understanding the materials around us also required the diligent use of the computational concepts and the modeling toolbox. Modern machine learning algorithms – also known as AI – are a rapidly growing filed supporting the deeper understanding of analytical data. While we start to grasp on the atomistic level materials interactions, the world seems to get ever more complex. Trans- and interdisciplinary collaborative work of scientist of various domains is required. It is at the boundary of the various disciplines that new insights can be found. Driven by creativity and imagination of open-minded researches new insights in materials will lead us to novel applications and solutions for the well-being of our society.