Title: The only thing worse than **NO** Nanoinformatics is **BAD** Nanoinformatics or is it? Case studies in materials characterization

Abstract: The emergence of nanoinfromatics as a key component can, in principle, act as a key enabling platform towards the route to materials discovery and deployment of advanced materials at a fraction of cost compared to traditional methods. However, harnessing the power of nanoinformatics requires intensive efforts in unifying and integrating advanced modeling, computational and experimental tools and good quality quantitative data. Nevertheless, central to this multi-faceted tool is the acquirement of accurate, precise, reliable data. Accurate use of materials characterization techniques is therefore essential, if the rational design of materials for specific practical applications, is to be realized. To date, the focus is on what constitutes data quality and completeness putting more emphasis on the FAIR (findable, accessible, interoperable, and reusable) data principles which is the first necessary step in moving from the theoretical realm to practical implementation. This calls for a circular metadata methodology to facilitate discovery and identification for accelerating the pace of research in nanomaterials development. In this talk, we fist focus on the introduction of some open-source platforms that can be accessed through multiple channels for both interactive exploration and data mining which can also be used for developing robust, sophisticated materials analyses. Then we focus on the shortcomings of such open datasets and present some case studies to further exemplify the problem.