The landmark report on Integrated Computational Materials Engineering (2008) called for the integration of computational materials science tools into a holistic system that can accelerate materials development and transform the engineering design optimization process. Since many important properties are determined at the nanoscale, such top-down integration should eventually reach down to atoms. At the same time, bottom-up multiscale modelling has been maturing, and many properties can now be determined *ab initio* with high accuracy. Nevertheless, the question remains as to how best an integration of these different disciplines can be achieved in practice for maximum impact. This presentation discusses various approaches to integration, from multiscale to workflow based, and provides application examples of realising an integrated optimisation of materials and engineering.

*Reference*:

* Integrated Computational Materials Engineering: A Transformational Discipline for Improved Competitiveness and National Security; Committee on Integrated Computational Materials Engineering, National Research Council (2008)