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## Science 4.0 - a key driver for societal development



### Lars Montelius

DIRECTOR GENERAL

INL - International Iberian Nanotechnology Laboratory  
Avda. Mestre José Veiga s/n

4715-330 Braga, Portugal

T: +351 253 140 112

M: +351 915 176 967

[lars.montelius@inl.int](mailto:lars.montelius@inl.int)

#### Short Bio

Since Sept 1, 2014 Director General for INL, the International Iberian nanotechnology Laboratory located in Braga, Portugal. INL is the only by legal grounds intergovernmental organization in Nanotechnology. LM is also professor in Nanotechnology at Lund University. His nearly 30 years of research work in nanotechnology has centered around lithography and processing applied to various nanodevices. Especially in the field of Nanoimprint Lithography, he and his research group have published several seminal articles. Recent research focus on exploratory nanotechnology in the life sciences, e.g. in the neurosciences. LM has been the Director for Oresund University and Öresund Science Region, encompassing the 12 universities and five cluster organizations in Denmark and Sweden in the Oresund Region. LM is also the founder of several organizations and companies based on nanotechnology and its applications. LM is the President of IUUSTA (the International Union for Vacuum Science, Technique and Applications), an international member organization encompassing 32 countries and more than 15 000 researchers. LM is also a member of several European Technology Platforms (e.g. EuMaT, NanoFutures).

#### Abstract

Nanotechnology is a Key Enabling Technology with promises for making solid contributions to the grand challenges of today, such as sufficient sustainable energy supply on demand, clean water to everyone, the demand for novel solutions such as e-care, e-medicine and e-health as consequences of increased elderly population as well as globalization. Solutions to these challenges demands increased transversal interdisciplinary participation. The needed changes allow disruptive innovations. The explosion of IoT-products, massive data and sharing economy services are other mega-trends of today's society. Here the direct links to Industry 4.0, Factories-of-the-Future and Added-Value-Manufacturing concepts are easy to understand. Being reductionalistic, one could argue that the demands we are now identifying are linked to the consequences of digitalization and globalisation. These major societal developments challenge society and will in turn challenge present higher education systems. Systems that still to large extents are "analogue" although several novel concepts have lately been introduced in the discussions, e.g. massive on-line courses. Higher Educational Systems are key for addressing large societal challenges. But there are needs for novel solutions and incentives in order to recruit needed trans-disciplinary engagements. Simply put, there is a need for Science 4.0.

At INL, the International Iberian Nanotechnology Laboratory, we are implementing a full ecosystem for nanotechnology innovation and science. I will discuss how nanotechnology could be of importance to bring added value to products and services. I will also review some areas of nanotechnology that recently has been deployed giving rise to radical innovation and business development. And I will discuss about Science 4.0!