*Lars Nyborg, Professor, Chalmers University of Technology*

**Material Design for Additive Manufacturing and its Experimental Verification**

 Metal additive manufacturing offers unique possibilities for creating novel microstructures with performance that basically cannot be achieved otherwise. The fundamental aspect here lies in that additive manufacturing and so in particular laser beam powder bed fusion constitutes a rapid solidification technology. Taking advantage of this with elaborate control of the processing parameters the promising capabilities as depicted from computational alloy design can be realized. Examples how this is achieved for novel aluminium alloys and novel metallic materials as high entropy alloys are exemplified proving that metal additive manufacturing today is a technology that really has passed into the stage of creating novel materials with properties beyond the state-of-the-art in conventional manufacturing.

*Karin Frisk, Adjunct Professor, Chalmers University of Technology*

**Novel Material Compositions for Additive Manufacturing using Computational Alloy Design**

Materials for additive manufacturing often have inherited an alloy composition that was developed for a different production method, for example casting and forging. There is a lot to gain by adjusting the material compositions to the specific conditions of powder materials and additive manufacturing, in particular to the effect of rapid solidification on microstructure. For example, this can be to adjust compositions to avoid hot-cracking problems. In the presentation it will be shown how computational alloy design can be used avoid such problems, and to optimize compositions of aluminum alloys for additive manufacturing.