



# PHOTONICS LECTURE

WEDNESDAY, JANUARY 10TH 2024 | 16:00 H

## DR. ANDREAS WIENKE

LECTURE HALL A.1

### How quantum nanolaminates can revolutionize optical thin film manufacturing

Quantum nanolaminates are a novel tool for enhancing the material-intrinsic properties in optical interference thin films. The spectral performance of optical coatings is essentially defined by the specific sequence of layers and materials used. After a long history on investigations in optical coatings manufacturing, as a result only few materials, design routines and coating concepts have been established in modern times, which have been brought to the highest level of maturity. However, to overcome current technological limitations, new concepts must be pursued that can incorporate for example quantum mechanical phenomena.

The concept presented here is based on the targeted generation of quantization states by reducing the spatial expansion in one direction. The presentation will briefly discuss the fundamentals and the manufacturing process of quantum nanolaminates in optical thin films. The focus will be on the application and in particular on how the refractive index and absorption edge can be optimized for a given material system to enable broader spectral properties or enhance the laser induced damage threshold. Finally, examples for a successful transfer of this technique to industrial manufacturing processes are presented.



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