

**DTU**



# Inaugural lecture **Kresten Yvind**

“Nanofabrication of photonic devices for communication and medical diagnostics”



**Friday 23 August 2019**  
**from 15:00 to 16:00**

# DTU



## “Nanofabrication of photonic devices for communication and medical diagnostics”

DTU Fotonik is pleased to invite all interested parties to welcome our new Professor Kresten Yvind.

In his inaugural lecture he will outline the trends and challenges in the area of nanophotonic devices and show specific highlights from the work done at DTU.

His inaugural lecture will take place on:

**Friday 23 August 2019 from 15:00 to 16:00**

Building 101, Room M1  
Anker Engelundsvej  
2800 Kgs. Lyngby

The lecture is followed by a reception from 16:00 to 17:00.

We look forward to celebrating Kresten and seeing all of you.

Best regards,  
DTU Fotonik

Lars-Ulrik Aaen Andersen  
Head of Department

**DTU Fotonik**  
Department of Photonics Engineering

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## Summary

The engineering of semiconductor materials at the nanoscale has enabled the diode laser which is the basis of the internet, LIDARs for self-driving vehicles and is the optical power supply for the large laser systems used for cutting and welding. LED lighting and efficient solarcells are other devices resulting from engineering of optical semiconductors that typically are made from column 3 and 5 in the periodic table of elements (e.g. GaAs, InP and GaN).

In the last decade a strong trend in the fabrication of these devices had been to use silicon substrates as the base material and then add the active materials by bonding them as thin layers to the silicon carrier. This so-called heterogeneous silicon photonics approach not only allows the use of automated processing equipment designed for silicon CMOS, with a potential massive cost reduction, but also better devices since one is no longer limited to one material for all functions. Optimization of materials stacks, use of high refractive-index contrast and improved processing yields in optoelectronic devices are enabling further reduction in energy consumption and price, which facilitates the price and penetration of advanced photonic devices into new areas.

## Kresten Yvind

Professor Kresten Yvind received the M.Sc.E. and PhD degree in 1999 and 2003 from the Research Center for Communication, Optics and Materials (COM) at the Technical University of Denmark. After the PhD he spent several years establishing growth and processing of compound semiconductors at the cleanroom facility at DTU. He became Associate Professor in 2008 and full professor in 2019 at DTU Fotonik.

His research is centered on III-V and silicon optoelectronic devices and involves the full range from design of epitaxial structures to growth, processing and advanced characterization. Membrane based devices (on silicon) have been a focus the last decade leading to efficient nonlinear integrated photonics, MEMS tunable VCSELs and various (active) photonics crystal devices for optical interconnects. He teaches three courses and is part time CTO of OCTLIGHT ApS, which commercializes MEMS VCSEL technology for ophthalmic imaging.