



Optopub 2023-02-16

# High Performance Lasers Enabling Innovative Life Science Applications

Join Photonics Sweden for the first Optopub of the year, hosted by HÜBNER Photonics. This evening will include scientific talks, drinks, food and an exclusive soft opening of HÜBNER Photonics new office expansion.

## Real-time single-molecule 3D tracking in E. coli

*Elias Amselem, Researcher at Dpt. of Cell and Molecular Biology*

We have little detailed knowledge about the intracellular dynamics of fundamental processes such as gene regulation or protein translation; the intracellular environment is very different from the dilute conditions where most of what we know about biochemistry has been learned. Here, we present a 3D single-molecule tracking system based on cross-entropy. Putting the system into practice, we track single fluorophores within the Escherichia coli bacterium. A fluorescent marker is attached to the E. coli trigger factor (TF), a bacterial chaperone protein that binds to translating ribosomes close to the peptide exit tunnel. The system can locate a reporter in a volume of size  $0.95 \times 0.95 \times 1.40$  of  $0.84$  ms at a photon count rate of  $120$  kHz.

## Transient state (TRAST) spectroscopy and imaging of cellular and molecular states and conditions – exploiting the sensing side of fluorophore blinking kinetics

*Jerker Widengren, Exp Biomol. Physics group, Dept. Applied Physics, Royal Institute of Technology (KTH)*

Dark state transitions of fluorophores are central for all forms of fluorescence-based, single-molecule and super-resolution microscopy and spectroscopy, mainly as limiting factors in single molecule studies, at the same time prerequisites for super-resolution imaging techniques. This overview will highlight an additional aspect of such transitions, namely that they can be used to sense a manifold of biomolecular environments, dynamics and interactions. Principles for how they can be imaged will be described, as well as application examples in cells and tissues.

## The B-BRIGHTER project

*Dr. Gustaf Mårtensson, Expert Complex Fluids at Mycronic Adjunct researcher at CBH-KTH*

The B-BRIGHTER project is an EU-financed research project with the goal of developing a novel, light-based bioprinting technology. The project utilises continuous-wave lasers, acousto-optics, galvanomirrors and custom hydrogel-based bioinks to make this concept a reality.

As well as a company presentation of HÜBNER Photonics and Cobolt by Håkan Karlsson, CEO of Cobolt and Head of HÜBNER Photonics

Please register here for food & drinks until 2023-02-14:

<https://doodle.com/meeting/participate/id/er2MjP6e>



 **PhotonicsSweden**  
The Swedish Technology Platform in Optics and Photonics

Thursday 16 Feb 2023  
Vretenvägen 13, Floor 2  
Presentations will begin 17:30



**HÜBNER Photonics**



Scan to add to your calendar and we look forward to see you there!