Laser Research Infrastructures

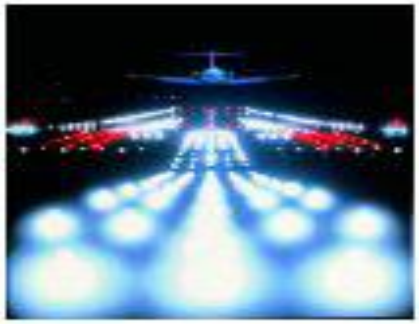
-

Innovations and Spin-offs

Claes-Göran Wahlström

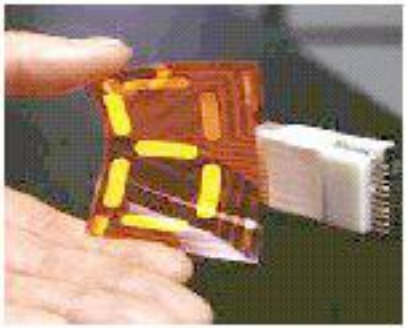
Lund University, Sweden
and
Laserlab Europe

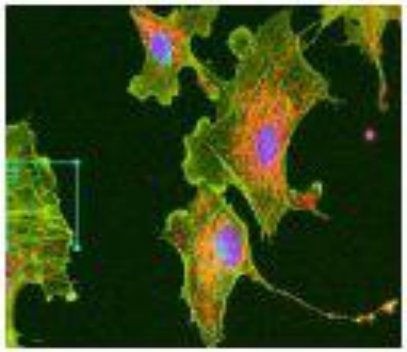
This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no 654148



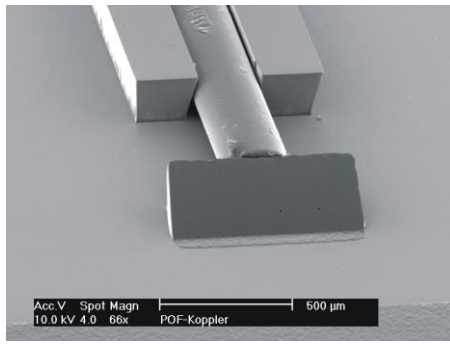
Lasers and Photonics:

- **Global market 400 billion € annually, leverage on other enabled industries much larger**
- **~300,000 employees in Europe The sector is largely based on SMEs**
- **19,000 new jobs in Europe created between 2011 and 2015. Growth rate 1.7% per year**





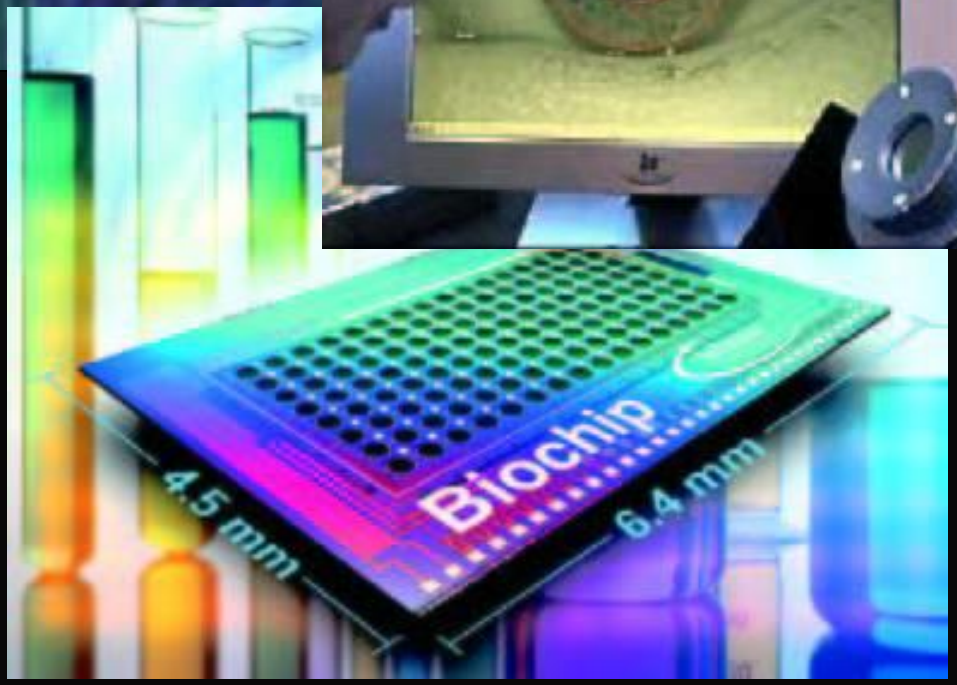
⇨ *Key Enabling Technology*



By virtue of coherence,
laser light acquired unprecedented properties:

Spectral purity
Precision
fastest modulatio

- Sensing
- Medicine
- Biology
- Micro- and nano-technologies



LASERLAB-EUROPE

The Integrated Initiative of European Laser Laboratories

Laserlab Europe

National resources:
33 laser infrastructures from 16 countries

- **Transnational Access**
- **Joint Research Activities**
- **Networking Activities**

EUCALL

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no 654148

Examples of Laserlab-Europe
Innovation and Spin-off Supporting Activities

- **Access (TNA) and Joint Research Activities (JRAs)**
- **Promote excellent science**
- **Reaching and training *new* Users**
- **Technical workshops**
- **Industrial Advisory Committee IAC**
- **Involvement of industry, medical centers and SMEs in Laserlab training and topical workshops, e.g. '*Lasers for life*'**
- **Berlin Workshop with industry and IAC, '*Metrology and standards'***
- **Spin-off session during JRA meeting -> Inspiration + advice**

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no 654148

Laser RIs: Innovation and Spin-offs

Laserlab Europe

Laser-based innovation and spin-offs, by RIs and by Users

- ***About lasers***
  New materials, shorter pulses, higher repetition rates, higher peak and average power, increased stability, etc

- ***For lasers and laser science***
  Laser diagnostics, targetry, etc

- ***With lasers***
  Medical applications, environmental monitoring, process control, industrial measurements and sensing, optical communication, etc

SpectraCure

CLASS 5 Photonics

SourceLAB

GASPOROX INTELLIGENT LASER SOLUTIONS

femtika

RADIANTIS

PHASICS

Examples of Laser RIs Innovation and Spin-offs

Laserlab Europe

Sphere - Ultrafast Photonics

LLC, Sweden and U. Porto Portugal, TNA & ERC PoC

SourceLAB - Laser Plasma Technologies

LOA, France

Light4tech

LENS, Italy

Cobalt Light Systems

CLF, UK

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no 654148

Summary

Lasers and photonics key enabling technology for innovation

Large-scale laser RIs push the frontiers in methods and technology for excellent science and stimulate at the same time innovation and spin-offs

LASERLAB-EUROPE provide training and support for users and allow them to explore their novel ideas at state-of-the-art laser RIs

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no 654148

EUCALL

The European Cluster of Advanced Laser Light Sources

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 654220

Large-scale Laser Research Infrastructures

Lasers different from, for example, synchrotrons and neutron sources

- **Can be small and simple to use**
- **Can be affordable for single-PI groups**
- **Can also be large, complex and very expensive**

Laser RIs serve, at the same time, excellent science and innovation

- **Top 15% of the most advanced experiments (peak laser performance)**

  Lesson learned: Fundamental science leads to innovation and spin-off

- **Allow novel experiments by New users**
  - **New scientific areas and/or new geographic areas (TN access)**
  - **Non-expert users (technical support)**
  - **Industrial users**

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement no 654148