



Dutch
Optics
Centre

Dutch Optics Centre

**Strengthening the position of
Dutch Industry in Optics**

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An initiative of

TNO innovation
for life

and

TU Delft



Dutch High-tech in a glance

- The sector has an export value of 60 billion USD and a production value of about 130 billion USD
- Around 500,000 people work in the sector
- The sector invests about 3,3 billion USD in R&D annually, which is 50% of the total Dutch private R&D
- World leading Dutch high tech companies, such as:

ASML



PHILIPS



FEI

part of Thermo Fisher Scientific



with its > 300 1st, 2nd and 3rd tier high tech suppliers.





Dutch Optics Centre (DOC)

- Initiated by **TNO** and **TU Delft**, joined by **Dutch high tech companies** leading in the field of optics and opto-mechatronics;
- **Centre of excellence and one stop shop** for innovative solutions with optics and opto-mechatronics;
- **Joint world class research facilities** from TU Delft, TNO, other knowledge institutes;
- **Educating** talents in optics and Opto-mechatronics;
- **Development of tailor-made high tech systems** with flexible cooperative business models based on specific request of the customer;
- Maturing **product offers** as well as **technology transfer** opportunities
- **Strongly supported** by Dutch government;



TNO in a glance

- Largest research organisation for applied scientific research in the Netherlands;
- Established by law in 1932 with about 3000 employees;
- Independent of public and private interests;
- Bridging between universities and industry and assisting companies to innovate by doing R&D
- Innovation areas include Industry, Healthy Living, Defense & Security, Urban Environment and Energy;



TU Delft in a glance

- Established in 1842: this year 175th anniversary!
- Rector: Prof.Ir. Karel Ch.A.M. Luyben
- Academic staff: 3.375
- Students: 19.613
- Ambitions: leading global reputation, breeding ground for cutting-edge technological scientific developments, source of outstanding professional scientists and engineers, with significant impact on economic environment.

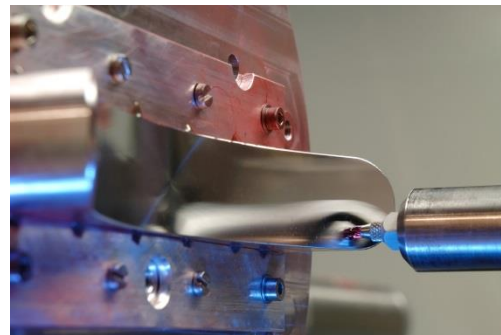
Faculties:

- Architecture and Built Environment
- Civil Engineering and Geosciences
- Electrical Engineering, Mathematics & Computer Science
- Industrial Design Engineering
- Aerospace Engineering
- Technology, Policy & Management
- Applied Sciences
- Mechanical, Maritime and Materials Engineering



TNO & TU Delft shared Facilities

- TU Delft and TNO have great facilities;
 - Nanolab
 - Commercial as well as equipment developed in house
 - Van Leeuwenhoek lab
 - Used for R&D activities related to EUV lithography for ASML, Carl Zeiss etc.
 - EUV beamline lab
 - Used for R&D activities related to EUV lithography for ASML, Carl Zeiss etc.
 - Optics manufacturing Lab
 - Conventional optics as well as freeform optics





Government support for DOC

- Regional and national fund for setting up field labs:
 - EFRO (European Fund for Regional Development) supported Field Labs:
 - Application Labs Nanosats
 - Metrology for Semicon
 - Medical Instrumentation
 - Telecommunication
 - Smart Industry Field lab;
- National innovation credit fund:
 - Specially setup for Dutch entities to create innovation in high-tech sector;
 - Accessible for companies and institutes which are members of DOC;
 - Stimulates more high tech jobs in the Netherlands;
 - Stimulates export;
 - Yearly fund of 60 MEURO



Summary: What DOC offers

- Education and Training of personnel in Optics and Opto-mechatronics with opportunities of working with companies (internship etc.);
- Existing product cases for commercialization (see some examples);
- Joint research & development of specific products/solutions based on the specific requirements;
- Custom solutions with possibilities of total knowledge/IP transfer;
- Shared unique R&D facilities

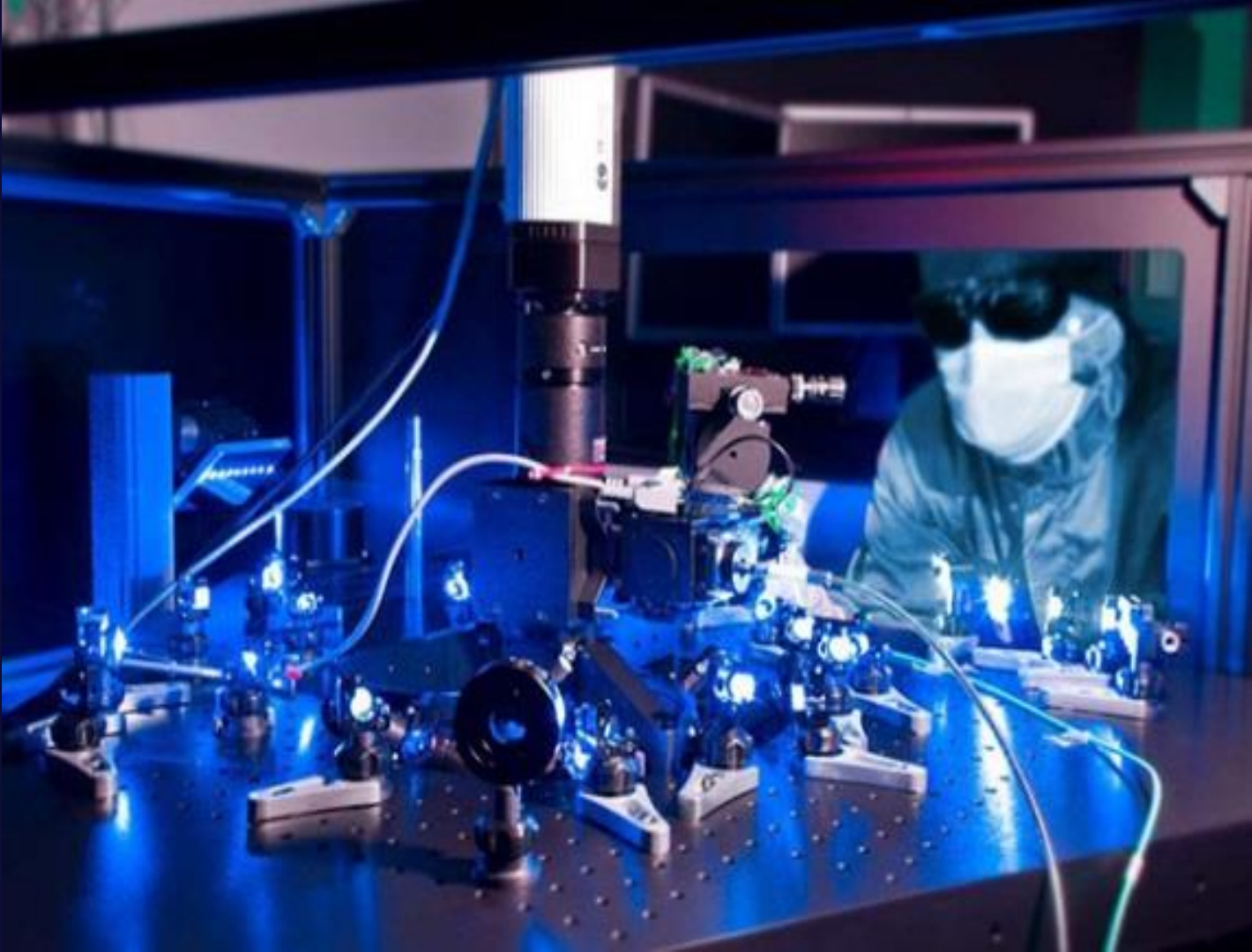


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Examples of Successful Product Cases

Particle detection for
semicon

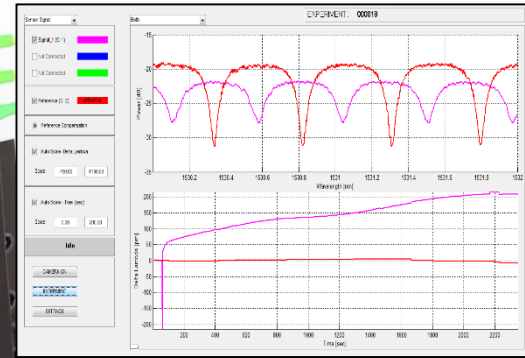
Detect down to
20nm particles



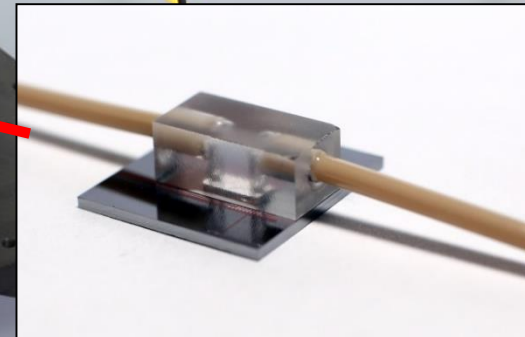
Biosensing Platform



FreeSpace Interrogator



Integrated Photonics Biosensor



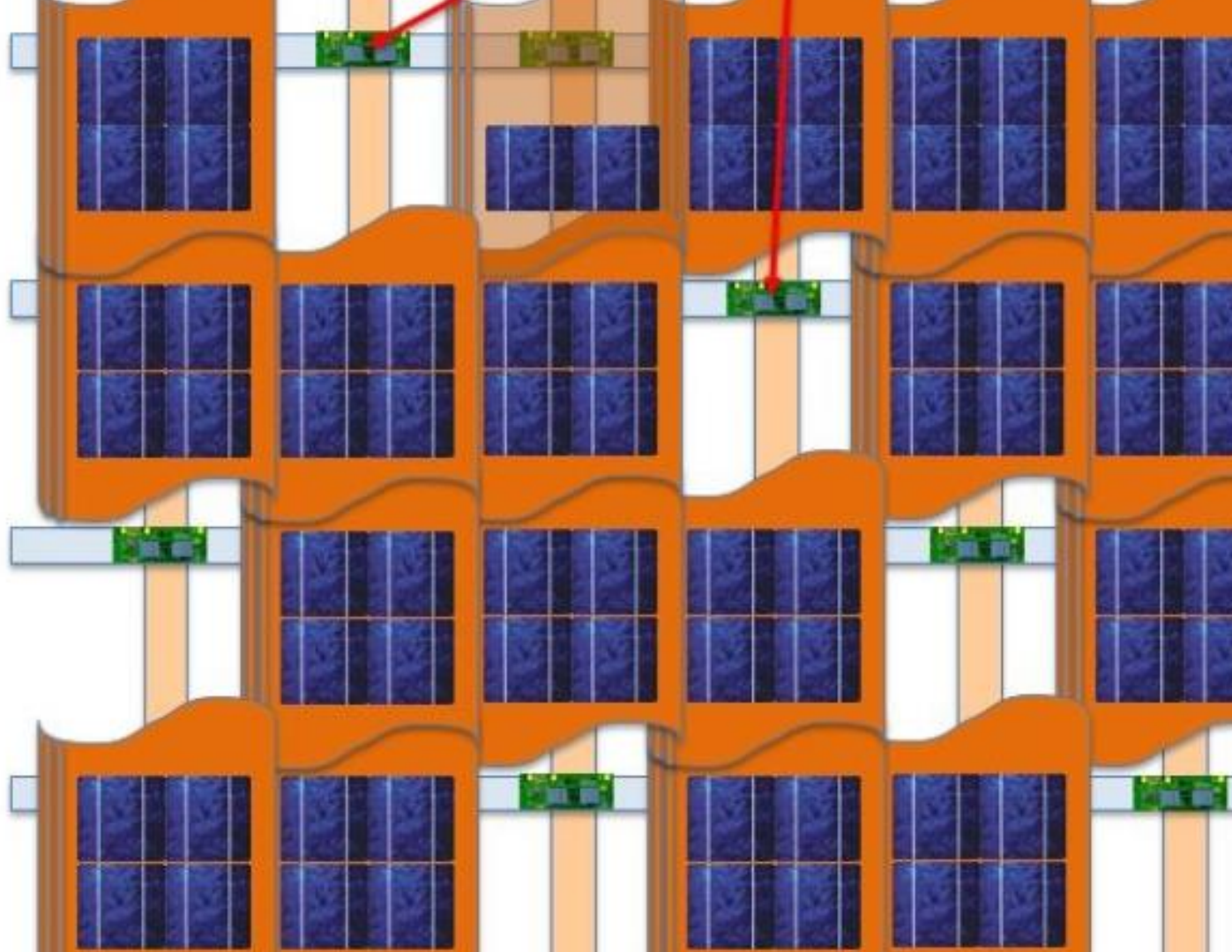


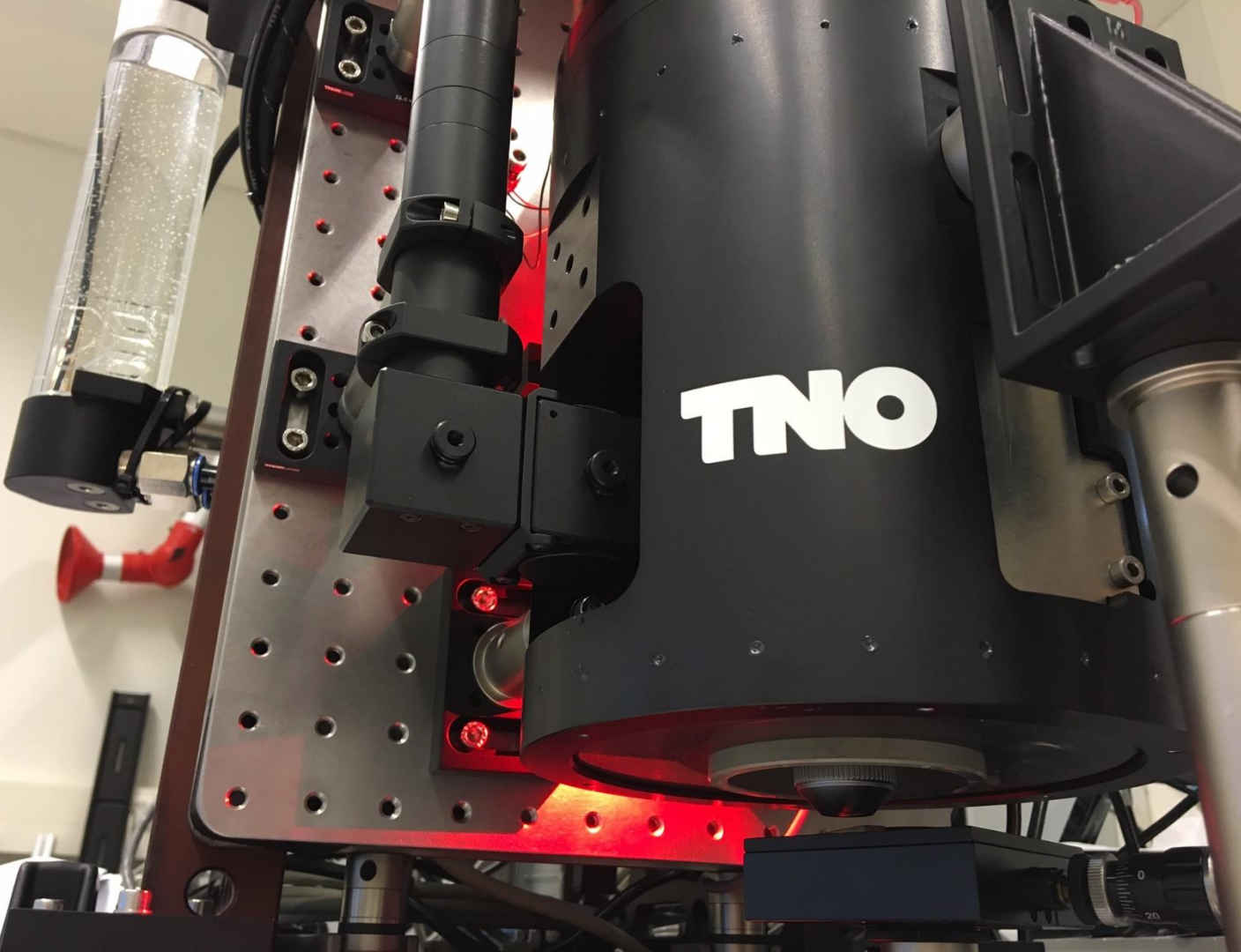
Non-contact
measurement machine
freeform optics

TNO technology
successfully transferred
to a Dutch company!

Solar power

Improving quality of
PV roof tiles





3D-imaging with
OCT for industrial
inspection

Yield improvement
by 100% inspection
of components
during production



DiaLIBS: sensor for portable kidney use at home

Measuring N, K, Ca concentrations to optimize dialysis process



Low cost fundus camera

Ophthalmic imaging for
non-invasive detection of
diseases



Potential collaboration models

- Joint fund from both countries:
 - The Dutch government has setup national innovation credit fund for the Dutch companies to work on product cases;
- Joint development based on end user's specific requirements:
 - Task allocation based on each other's strength in development/manufacturing capabilities;
 - Possibility for total IP transfer
- Joint venture for existing product cases;
 - Joint development/manufacturing of the products
 - Presence of local sales and service;
- Licensing of product case
- Contract research and development
- Any other collaboration models to be discussed with DOC members

Together we will make it happen



Dutch Optics Centre
a TNO and TU Delft initiative



Thanks for your attention !

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