

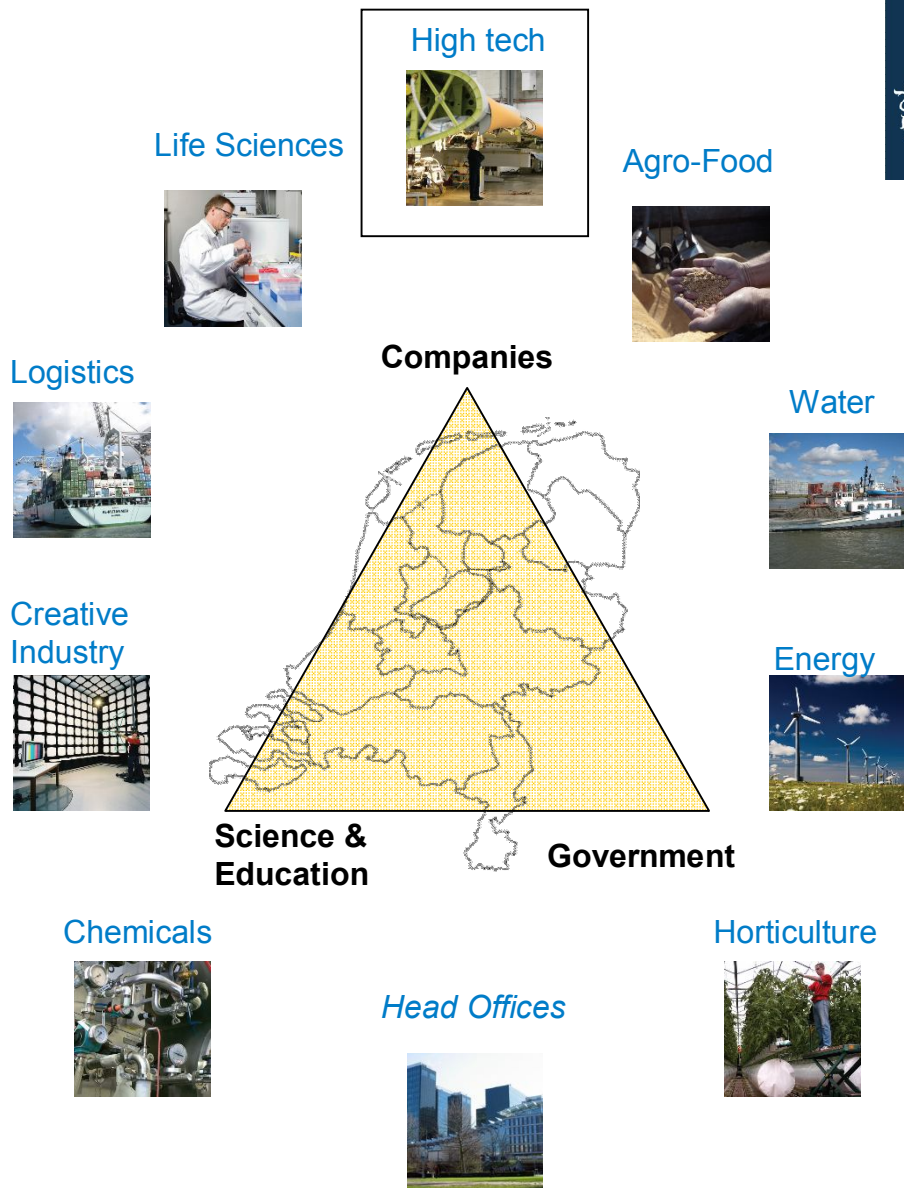


Ministerie van Economische Zaken,
Landbouw en Innovatie

Photonics and the Dutch Innovation Approach

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Director NL Innovation





Outline

- Importance of Photonic Devices
- Public private partnership
- IOP Photonic Devices
- New TOP sector Approach
- Photonics in TOP sector HTSM roadmaps
- Importance of good equipment for photonics manufacturing



1. Importance of Photonic Devices

Photonics turnover 280 billion euro/year of which 60 billion/year in Europe (20%)

Biggest market worldwide is displays. In Europe this is a small market.

Europe leading in other markets like LED lighting, Laser manufacturing, medical with market shares up total 45%

- In total more than 246.000 people employed in photonics in Europe
- Yearly growth rate in Europe ~10% (inflation corrected) (2-3 faster than average)
- Photonics is also a 'green' technology (LEDS, Solar...)

EU Innovation Policy: Photonics is one of the five key enabling technologies



More info at: <http://www.photonics21.org/downloads.php>



Importance of Photonic Devices (Netherlands)

- In Europe Dutch photonics industry 5th position and Dutch Photonics research 6th position
- 7- 10% of European Photonics turnover in the Netherlands
- Netherlands leading role in Photonic integration, medical. Lighting and ICT production technology
- Dutch industry/universities very succesfull in last photonics EU ICT call (financieel is de succesvolle NL deelname verdubbeld naar 11,5% van het beschikbare budget)



More info at: <http://www.photonics21.org/downloads.php>



public private partnership

It is all about Collaboration !

Running innovation programmes:

- IOP Photonic Devices
- Memphis Program (NL Agency/NWO)
- STW programmes/projects
- ...

Dutch community is forming: Photonics Manifest (sept 2011), Dutch Hightech Photonics Delta (april 2011) and roadmap action in TOP sector (on going)

→ This was input for roadmap activity for TOPsector

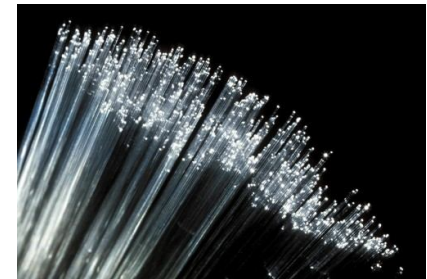


2. IOP Photonic Devices

Call for new Private public R&D projects

Topics:

- new photonic Devices for medical applications
- new photonic Devices based on generic technologies



EL&I Funding Budget 4,75 mln euro

Preproposal call open now. deadline nov 25 th 2011

Full proposal call march 26 th – april 20 th 2012

More info: <http://www.agentschapnl.nl/programmas-regelingen/iop-photonic-devices>



More Information IOP Photonic Devices

This afternoon presentation of running IOP Photonic Devices projects.

Also presentations of running STW projects of the Smart Optic Systems program and the Program Generic Technologies for Integrated Photonics

Also postersession

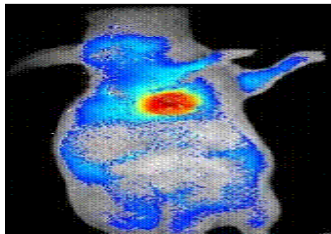


Photo:LUMC

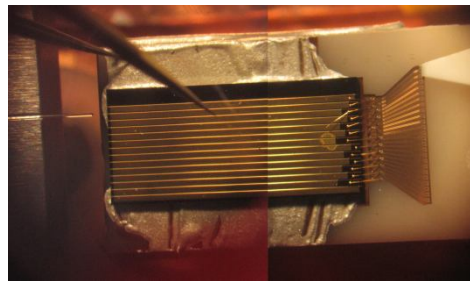


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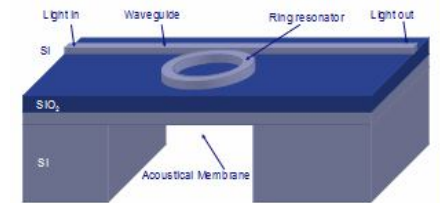


Photo TUDelft



3. New Top Sector Approach

- *Focus on 9 top sectors*
- *Sector approach:*
 - demand is leading
 - co-operation between government, companies and knowledge institutes (each from own responsibility)
- *An action-based agenda will be specified for each sector based on:*
 - **Knowledge and research:** R&D collaboration, specialisation, demand driven
 - **Foreign policy:** economic diplomacy, trade and investment promotion
 - **Sector pre-conditions:** procurement, spatial planning, taxation
 - **Education and training:** focus training on business needs, exchange programmes, knowledge migration
 - **Sustainability:** natural resources, biodiversity, bio-based economy
- *Budget of 1.5 billion Euro available (existing funds)*
- Innovation contracts



Organisation HTSM



Topteam

Bureau

- Eelco van der Eijk (EL&I)
- Fred van Roosmalen (NXP)
- Roy Paulissen (EL&I)
- Eppo Bruins (STW)
- Geert Huizinga (FME)
- Arnold Stokking (TNO)

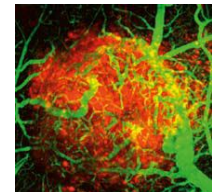
Roadmap teams: input for innovationcontracts



4. Photonics in TOP sector HTSM Roadmaps

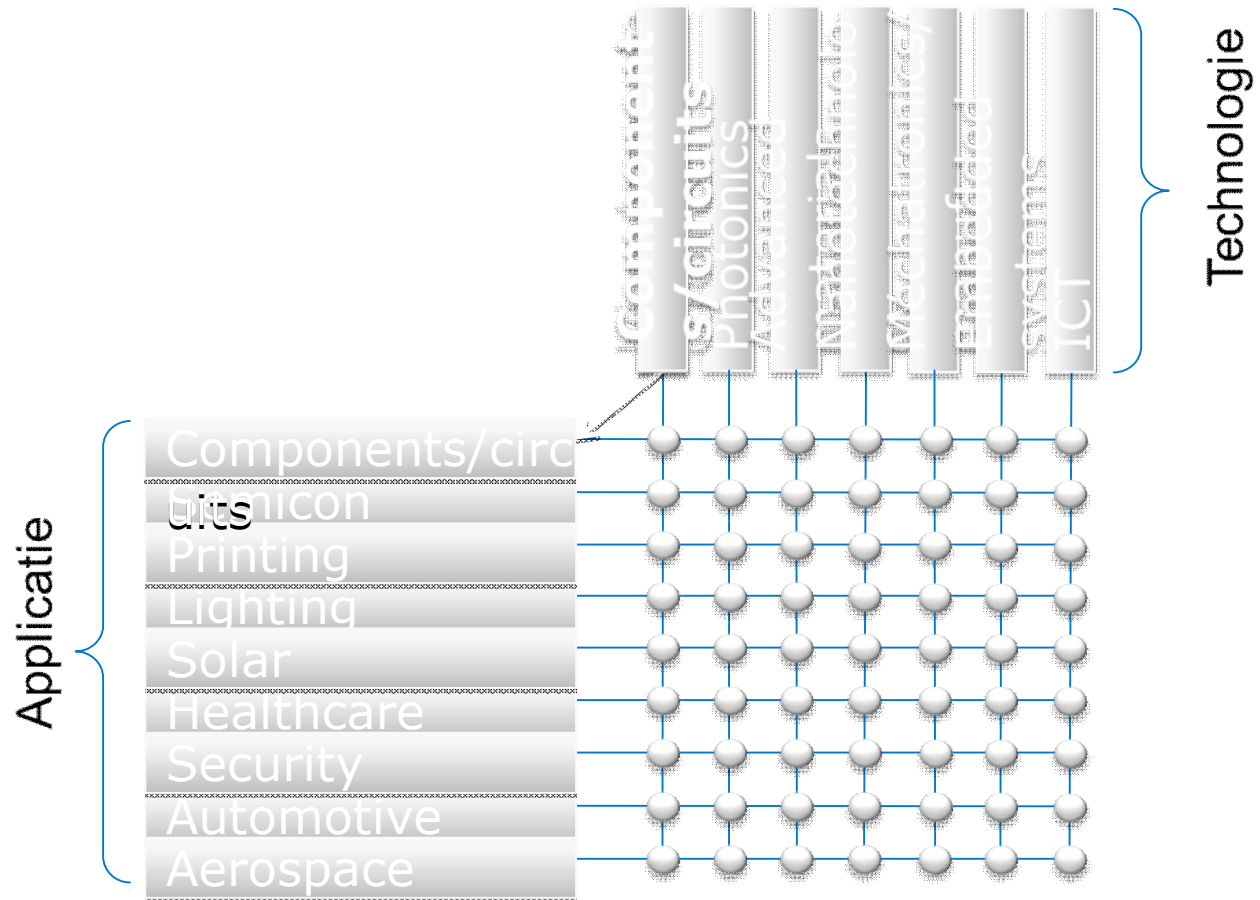
Technology for:

- **Healthcare:** new medical imaging techniques, (bio)sensors
- **Lighting:** LED
- **Energy:** Solar
- **Automotive:** Opto-electronic systems in cars, trucks and on the road
- **Security:** detection systems for use in public space
- **Components/circuits:** packaging of chips with photonic functionality, new functions with 3-5 materials, photonic chip data transfer
- **Semicon equipment:** EUV gas lasers, sensors, lenses/mirrors
- **Aerospace:** sensors, instrumentation





Photonics in TOP sector HTSM Roadmaps





5. Importance of good equipment for photonics manufacturing

Moore's law for Photonics. Complexity and performance of chips are constantly growing. Components and details becoming smaller: a need for High Resolution Lithography

With (financial) support of NWO, EL&I, ASML, Cymer and Brewer Science:

ASML Lithographic scanner for photonics

→ **Better photonic devices (less optical losses)**

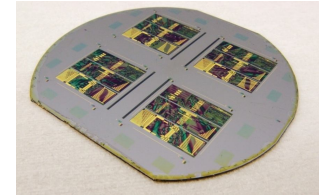
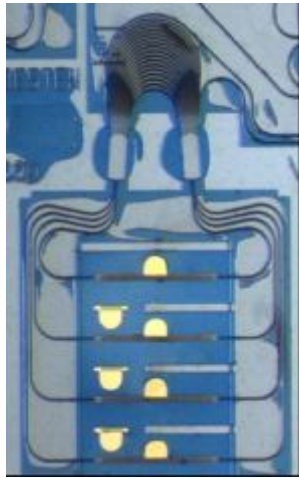


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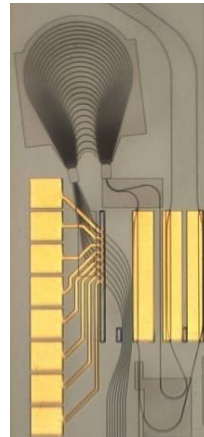
Examples of photonic Chips



WDM ring laser



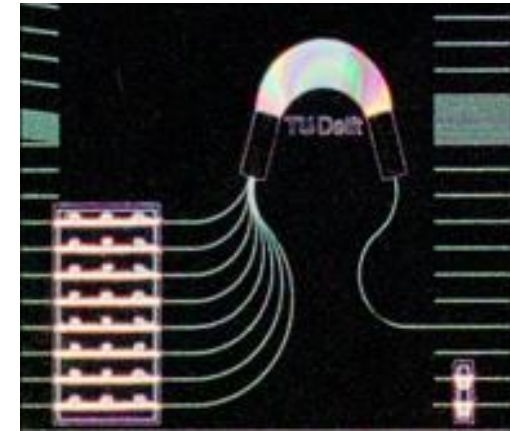
WDM-TTD switch



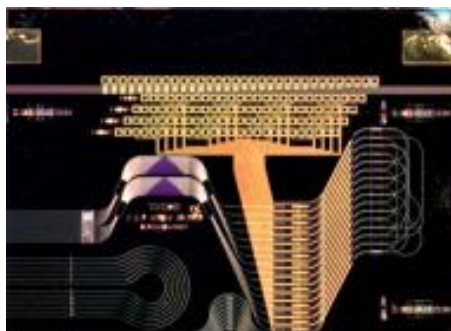
Tunable WDM laser



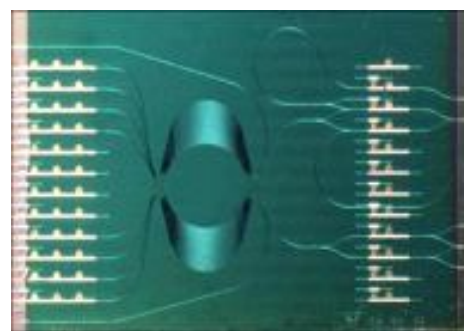
picosecond pulse laser



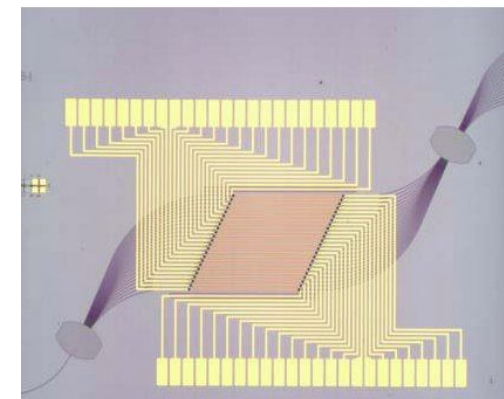
multiwavelength laser



optical crossconnect



wavelength converter



1x16 AWG Switch



New Lithographic Scanner for Photonic Devices is a
excellent example of public private partnership