

SWISS PHOTONICS

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October 8, 2015

In cooperation with the CTI



KTT-Support

National thematic networks



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Commission for Technology and Innovation CTI


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[Events](#)
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Swissphotonics is the Swiss National Thematic Network (NTN) for photonics.

It is the declared goal of Swissphotonics to improve the competitiveness of its members through the support of the innovation forces, by

- Organizing **Events**: Workshops to foster the interaction within the innovation community, roundtables to address challenges and we support conferences to provide opportunities for communicating leading edge information.
- Supporting eight **Labs** which act as center of competence and provide single point of contact service and support to SMEs.
- Informing about Swiss and European strategic **Research** agendas, research platforms and initiatives.
- Providing information about **Funding** opportunities as well as supporting to access them.

Swissphotonics is a non-profit association, registered under "**Verein Schweizer Laser und Photonik Netz**". The activities of Swissphotonics are supported by the Swiss innovation promotion agency **CTI** under the **NTN** initiative.

Upcoming events

Thursday, 08.10.2015

Forum EPFL Industry Day 2015, Lausanne

Tuesday, 27.10.2015

Photonik Kolloquium: Dr. Oliver Föhnle, Buchs

Friday, 30.10.2015

Workshop: Smart Lighting, EPFL

Wednesday, 04.11.2015

Workshop: APPOLO, BFH Burgdorf

Tuesday, 17.11.2015

Swissphotonics GA, Burgdorf BE

Tuesday, 17.11.2015

Workshop: Novel light sources for industrial applications, BFH Burgdorf

More:

[» upcoming events](#)

[» past events](#)

News

Total Lunar Eclipse

Strong CHF: CTI helps SMEs

Photonics Industry Report 2015

Int. Year of the Light

Open Day Sept. 26, 2015

Horizon 2020

Funds institutes+industry

More:

[» current news](#)

[» previous news](#)

In cooperation with the CTI



KTT Support

National Thematic Networks



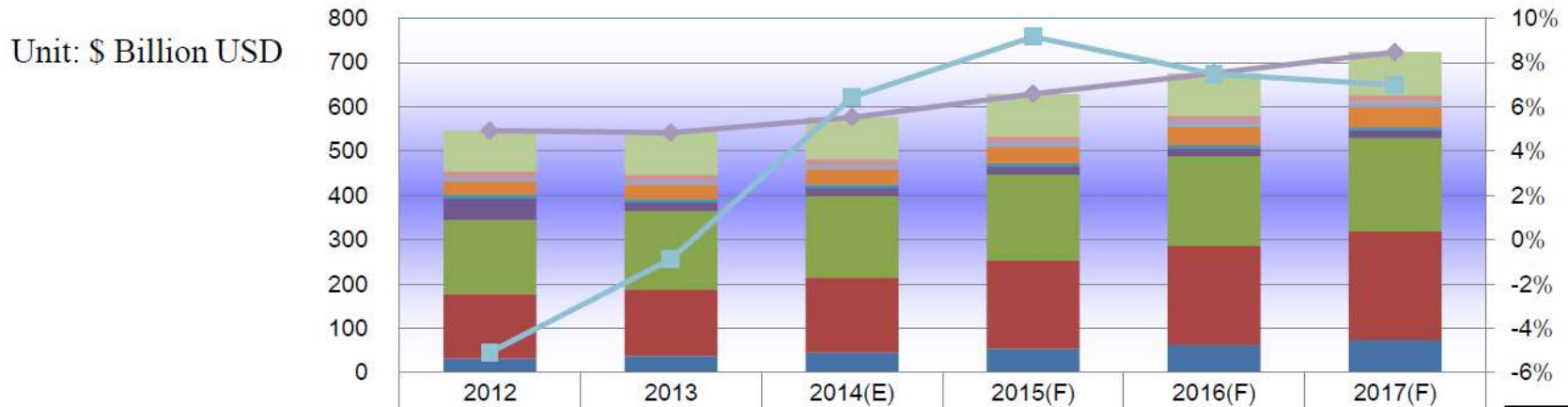
Schweizerische Eidgenossenschaft
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Worldwide photonics industry scale will reach 629B USD

The Scale of Worldwide Photonics Production Value 2012~2017



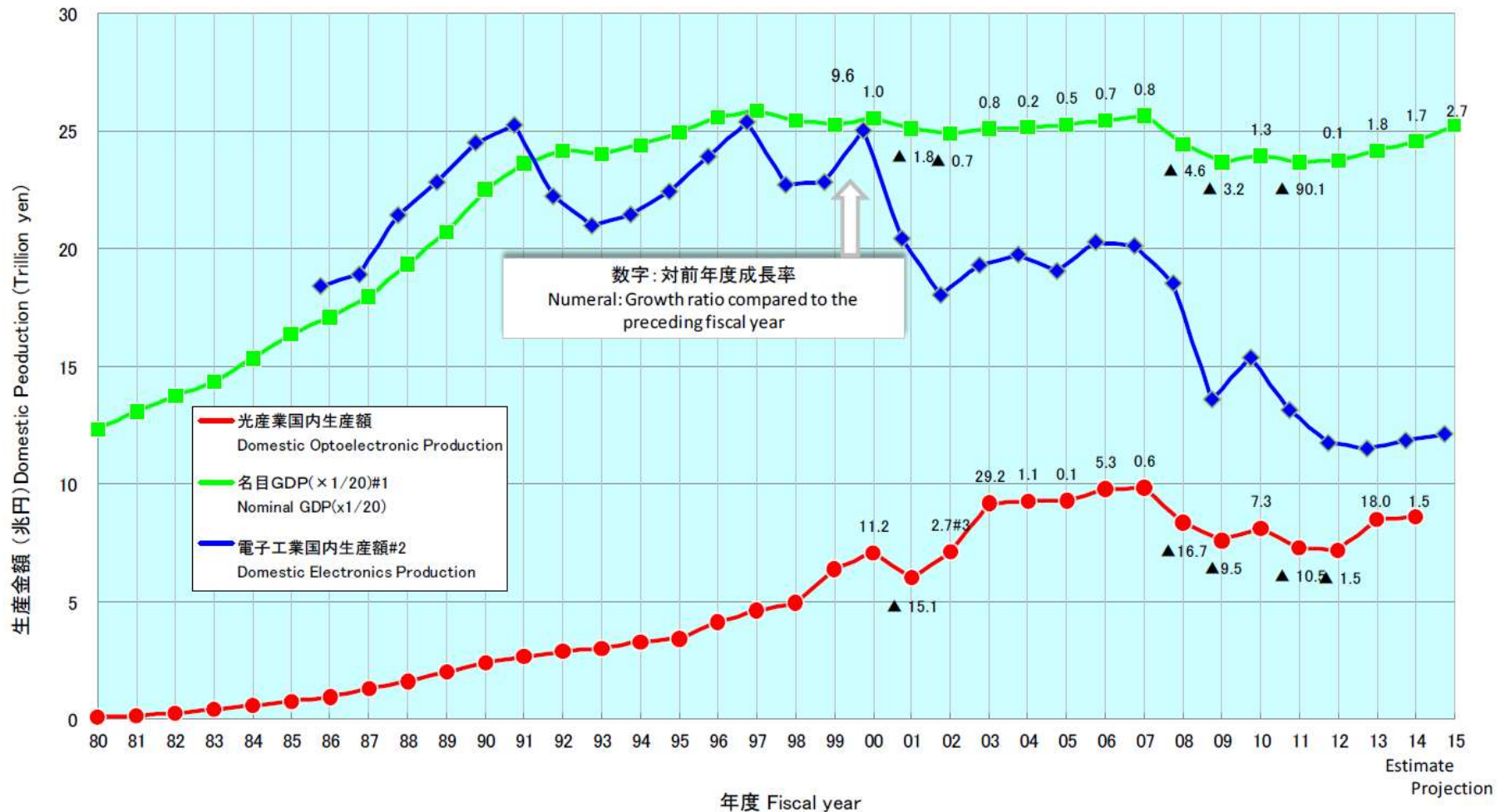
Biophotonics	92.2	94.9	94.8	95.8	96.8	97.9	1%
Precision Optical Lens & Module	14.4	13.2	12.8	13.1	13.7	14.3	0%
Laser Light Sources	7.7	8.8	9.4	9.9	10.6	11.3	8%
Optical Fiber Communication	30.0	33.0	34.9	37.9	41.8	46.0	9%
Optical Storage	8.5	7.6	7.3	6.9	6.6	6.2	-6%
Image Sensor & Optical I/O Devices	48.7	19.0	18.5	18.4	18.2	18.5	-18%
Flat Panel Display	167.4	178.1	185.1	194.6	202.7	211.0	5%
Photovoltaic	146.7	149.7	168.7	199.4	223.4	244.6	11%
LED & Lighting Application	30.9	37.3	45.1	53.5	62.8	74.2	19%
Total Value	546	542	577	629	677	724	6%
Growth Rate	-5%	-1%	6%	9%	7%	7%	CAGR

* The CAGR is 7% during year 2012~2017 lower than the rate 10% of year 2010s.

Source: PIDA, 2015

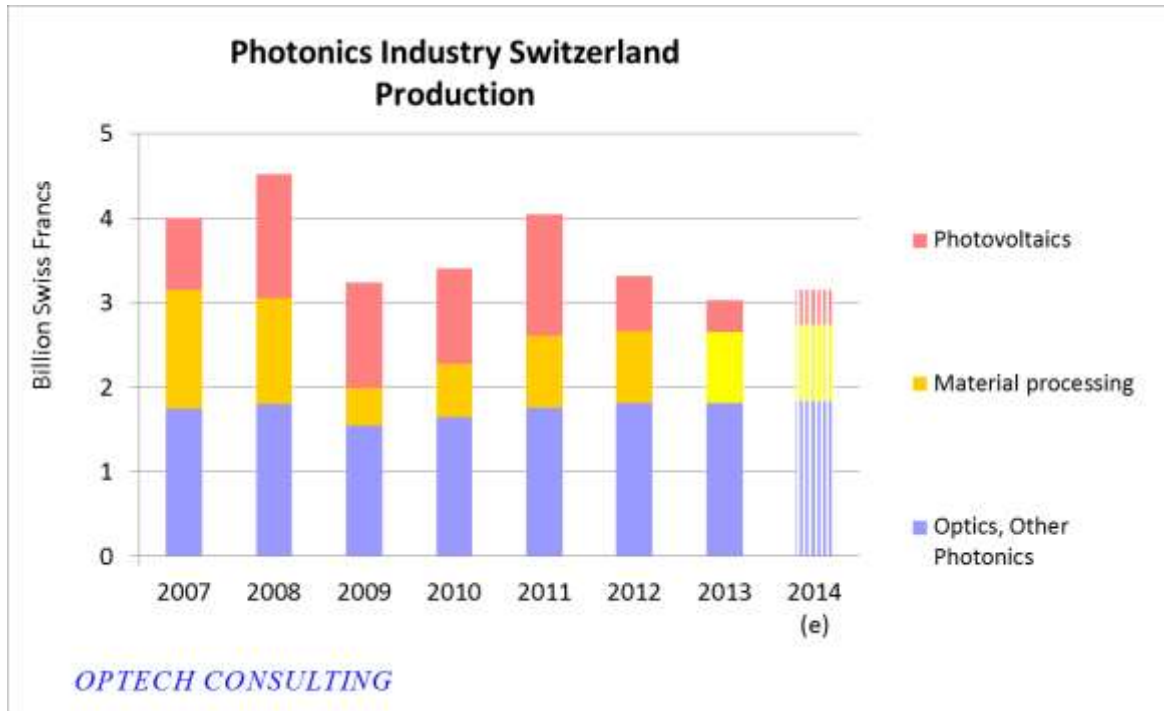


Domestic Production of OE vs. GDP



#1 : FY 2014 Economics Outlook and Basic Stance for Economic and Fiscal Management, Feb.2015 (Cabinet Decision)
 #2 Production Forecasts for the Global Electronics and Information Technology Industries, JEITA, Dec.154, 2014

Swiss Photonic Industry



- **3 to 4 Billion CHF/year**
 - 2nd largest per capita in Europe
- **10'000 employees**
 - A few hundred PhDs and masters
 - A few tens of new PhDs and masters per year required

Swiss are toolmakers

Our toolset



Other toolset



Light is a sharp and precise tool

- **Material processing**
 - Cutting, welding, brazing, of “any” material



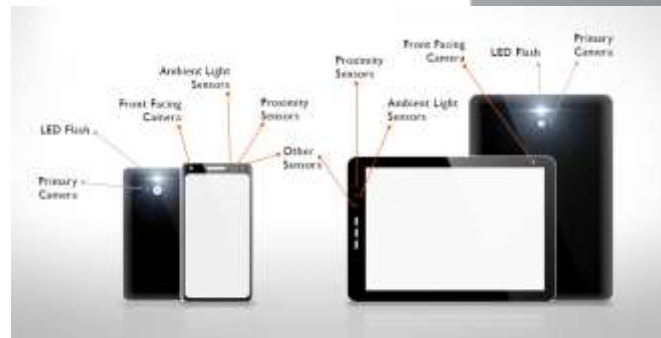
- **PV manufacturing line**
 - Material processing of a photonic device (PV cell) with a photonic tool (Laser direct write&cut, lithography)
- **3 d printers**



Light needs precision tools

- **Lenses**

- Objective on Philae on the Rosetta
- Handheld computers



- **3 d measurements**

- 3d cameras
- OCT



- **Microscopes**



innovation landscape

Innovationslandkarte der Schweizer Privatwirtschaft



Swissphotonics is the Swiss national thematic network (NTN) for photonics. It is the declared goal of Swissphotonics to improve the competitiveness of its members by supporting the innovation forces.

Swissphotonics

- serves companies, research organisations, and universities in the field of photonics
- supports the industry and research institutes in finding research partners and funding
- provides seed money to initiate projects and participates in funding infrastructure for strategic activities within National Photonic Labs
- supports the networking within Switzerland and establishes international contacts, within Europe (Photonics21, EPIC) and worldwide (OSA, IOA)
- works with Swissmem to support Innovation in photonics
- is a non-profit association, registered under «Verein Schweizer Laser und Photonik Netz»
- is supported by the Swiss innovation promotion agency CTI under the NTN initiative and by the Photonics21 project Innopho21/Europho21

Direct support to SMEs – Swiss National Photonic Labs:

- Centers of competence: combine interested research organizations for a specific topic
- Single point contact: connection to the best suitable institute to handle a specific request

Laboratory for Photonic Tools and Manufacturing

Fiber Laboratory

Laboratory for Solid State Lighting

Photonic Packaging Laboratory

National Optics Platform

Photonics Master Education

Photo Voltaic Research Platform


Laboratory for Optical Sensors

PHOTONICS²¹



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Laboratory for Solid State Lighting

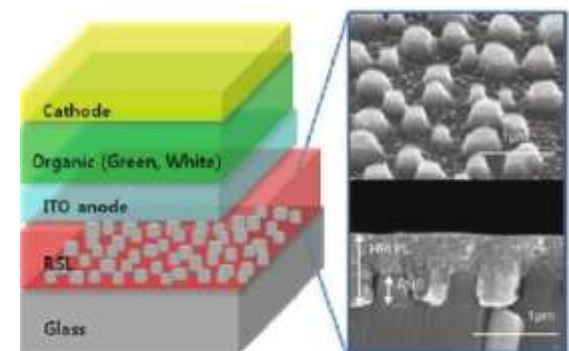
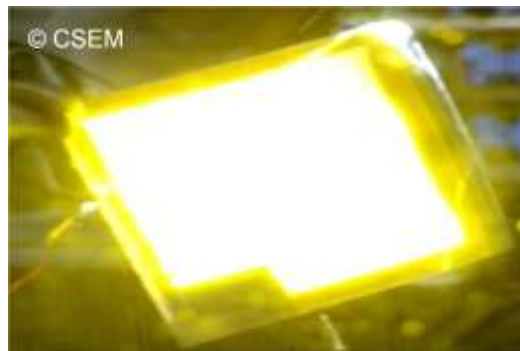
Solid State Lighting

Main services for Swiss companies active in the field of lighting and luminaires:

- Feasibility and case studies
- Supply of test components, characterization and metrology
- Access to standard know-how and equipment

Solid State Lighting: Team

- CSEM Muttenz (CSEM), Section Head Integrated Light Management at CSEM SA, Dr. Rolando Ferrini
- EPFL Lausanne (LASPE), Advanced Semiconductors for Photonics and Electronics Lab, Prof. Dr. Nicolas Grandjean
- ZHAW Winterthur (ICP- Institute of Computational Physics), Organic Electronics and Photovoltaics, Prof. Dr. Beat Ruhstaller
- EMPA Thun, Laboratory for Advanced Material Processing, Prof. Dr. Patrick Hoffmann
- HSLU Luzern, Technik und Architektur, Competence Center Electronics, Prof. Othmar Schälli



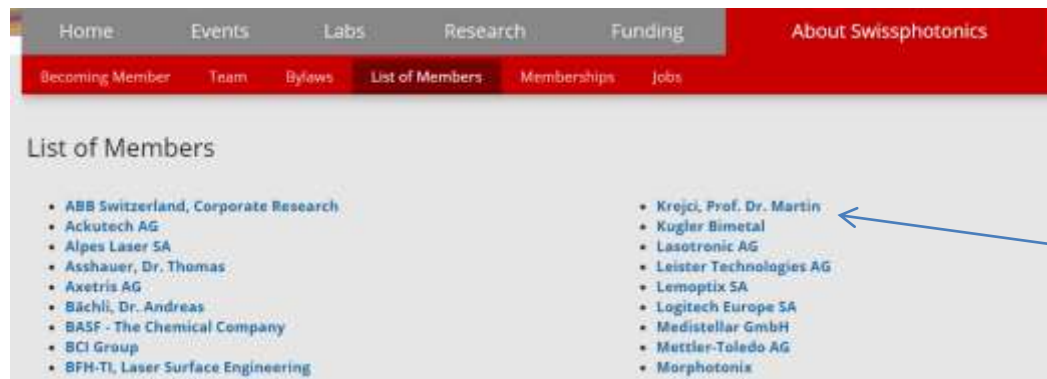
Laboratory for Solid State Lighting

- Workshop: [Large-area SSL](#); 30.10.2014; Muttenz, BL
 - BASF Schweiz AG, Basel, BS; [Link](#)
 - Eulitha AG, Würenlingen, AG; [Talk](#), [Link](#)
 - Regent Lighting AG, Basel, BS; [Talk](#), [Link](#)
 - Rolic Technologies Ltd., Allschwil, BL; [Talk](#), [Link](#)
 - Atelier D. Schlaepfer, Lausanne, VD; [Talk](#), [Link](#)
 - Sefar AG, Thal, SG; [Talk](#), [Link](#)
- Workshop: [Smart Lighting](#), 30.10.2015, EPFL
 - Workshops are free of charge and include networking breaks

(Link-)lists of Swiss Photonic Companies

- Swissphotonics Website – Members

<http://www.swissphotonics.net/about-swissphotonics/list-of-members>



Currently about 150 companies
About 5000 friends of Swissphotonics addressed in broadcast mails to advertise workshops

- Swissmem Website – Members

<http://www.swissmem.ch/organisation-mitglieder/fachgruppen/photronics.html>



Die Fachgruppe arbeitet im Bereich der Innovationsförderung eng mit den Nationalen Thematischen Netzwerk [ITN Swissphotonics](#) zusammen.

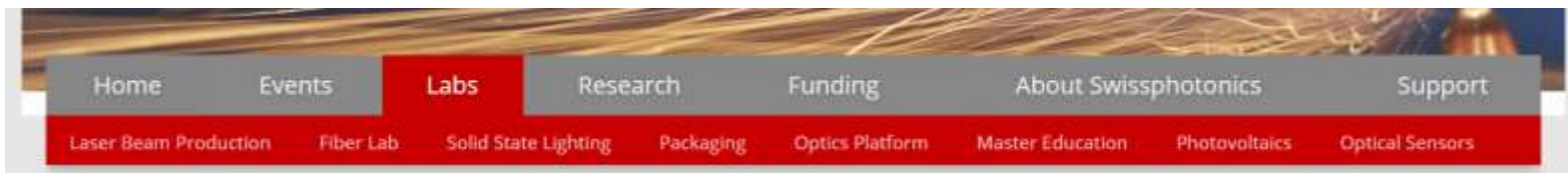
Mitglieder

- [APM Technica AG, Heerbrugg / SG](#)
- [Axetris AG, Kägswil / OB](#)
- [Berner Fachhochschule, Hochschule für Technik und Architektur Burgdorf, Burgdorf](#)
- [Bystronic Laser AG, Niederönz / BE](#)

Swiss National Photonics Labs

National laboratories within Swissphotronics

- [Center of competence: Single contact points for SMEs](#)



- **Laboratory for Photonic Tools and Manufacturing**
- Fiber Laboratory
- Laboratory for Solid State Lighting
- Photonic Packaging Laboratory
- National Optics Platform
- Photonics Master Education
- **Photo Voltaic Research Platform**
- Laboratory for Optical Sensors

Laboratory for Solid State Lighting

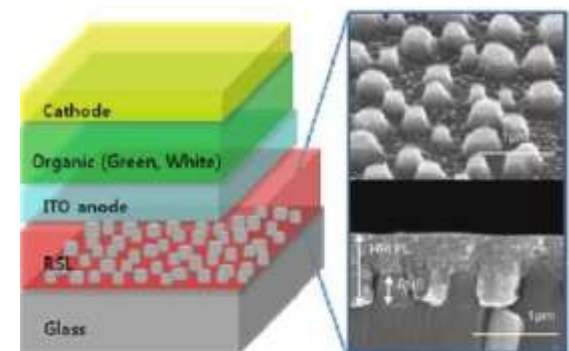
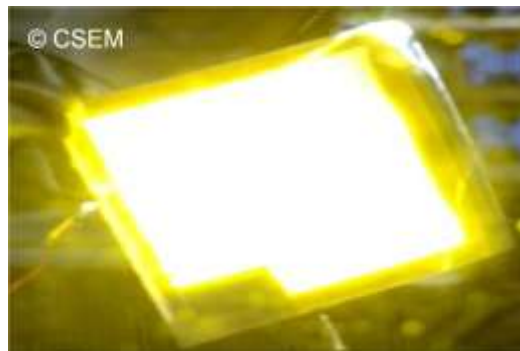
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- HSLU Luzern, Technik und Architektur, Competence Center Electronics, Prof. Othmar Schälli



Laboratory for Solid State Lighting

- Workshop: [Large-area SSL](#); 30.10.2014; Muttenz, BL
 - BASF Schweiz AG, Basel, BS; [Link](#)
 - Eulitha AG, Würenlingen, AG; [Talk](#), [Link](#)
 - Regent Lighting AG, Basel, BS; [Talk](#), [Link](#)
 - Rolic Technologies Ltd., Allschwil, BL; [Talk](#), [Link](#)
 - Atelier D. Schlaepfer, Lausanne, VD; [Talk](#), [Link](#)
 - Sefar AG, Thal, SG; [Talk](#), [Link](#)

Laboratory for Photonic Tools and Manufacturing

Laser Beam Production

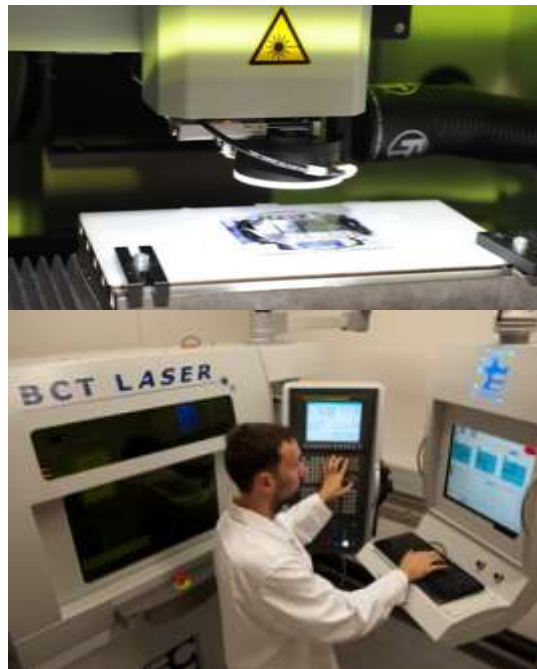
Laser beam material processing :

- Laser micromachining and drilling of almost any material, i.e. metals, textiles, tissue, ceramics, glass, plastic and carbon composites
- Functional structures on surfaces
- Laser welding, soldering and brazing
- 3D-Laser surface treatment of many materials (polishing, hardening, structuring, marking, engraving,)
- Rapid manufacturing, 3D printing

Laser Beam Production / Manufacturing: Team

(from west to east)

- HES Genève (**HEPIA**), Prof. Dr. Jacques Richard
- HEC La Chaux-de-Fonds (**Haute Ecole-ARC**), Prof. Dr. Keppner
- EMPA Thun (EMPA), **Laboratory for Advanced Material Processing**, Prof. Dr. Patrik Hoffmann
- EMPA Dübendorf (EMPA), **Mikro- / Nanotechnology**, Dr. Rolf Brönnimann
- CSEM Alpnach (**CSEM**), Julian Kaufmann
- UAS Burgdorf (**BFH**), **Laser Surface Engineering**, Prof. Dr. Beat Neuenschwander
- UAS Windisch (FHNW IPPE), **Institut für Produkt- und Produktionsengineering**, Dipl. Masch. Ing. HTL Beat Lüscher
- Inspire AG (**at ETH Zürich**), **IWF Micromachining**, Dipl. Masch. Ing. ETH Josef Stirnimann



Laboratory for Photonic Tools and Manufacturing

- Workshop: [Innovative Laser Microprocessing Solutions](#); 04.06.2015; Genève
 - 3D Precision SA, Delémont, JU; [Link \(http://www.3dprecision.ch/ \)](http://www.3dprecision.ch/)
 - Class 4 Laser Professionals AG, Lyss, BE; [Talk](#), [Link](#)
 - Femtoprint SA, Muzzano, TI; [Talk](#), [Link](#)
 - Futuretech AG Baar, ZG; [Link](#)
 - Synova SA, Ecublens, VD; [Talk](#), [Link](#)
- Workshop: [3d Laser Printers and Printing](#); 25.11.2014; St. Gallen, SG
 - Inspire AG, St. Gallen, SG, [Talk](#), [Link](#)
 - Oerlikon Metco Management AG, Winterthur, ZH, [Talk](#), [Link](#)
- Workshop: [EPMT 2014](#); 18.06.2014; Genève, GE
 - Blösch AG, Grenchen, SO, [Talk](#), [Link](#)
 - Time Bandwidth Products -> JDSU -> Lumentum, Schlieren, ZH, [Talk](#), [Link](#)
 - Trumpf Maschinen AG, Baar, ZG, [Talk](#), [Link](#)
- [Bystronic](#), [Dätwyler](#), [Rofin-Lasag](#), [Leister](#), [One-Five](#)

Photo Voltaic Research Platform

Photovoltaics

Main services:

- Development of advanced crystalline and thin film technologies including photovoltaic cells and modules
- Bringing all interested parties from research and development, industry and academia together to address technological advances in photovoltaics
- Organizing workshops and discussion meetings and promoting projects within the CTI framework

Photovoltaics: Team

- EMPA Dübendorf (EMPA), **Department for Functional Polymers**, Prof. Dr. Frank Nüesch
- EMPA Dübendorf (EMPA), **Department for Thin Films and Photovoltaics**, Prof. Dr. Ayodhya Tiwari
- UAS SUPSI Cannobio (ISAAC), **Institute for Applied Sustainability to the Built Environment**, Dr. Roman Rudel
- EPFL Neuchâtel (PVLAB) and CSEM (PV-center), Prof. Dr. Christophe Ballif
- EPFL Lausanne (LPI), **Laboratory of Photonics and Interfaces**, Prof. Dr. Michael Grätzel / Anders Hagfeldt
- EPFL Lausanne (LSPM), **Laboratoire des sciences photomoléculaires**, Prof. Dr. Michael Grätzel / Anders Hagfeldt
- ZHAW Winterthur (ICP- Institute of Computational Physics), **Organic Electronics and Photovoltaics**, Prof. Dr. Beat Ruhstaller

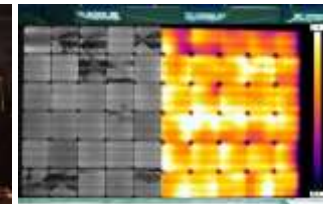


Photo Voltaic Research Platform

- Workshop: [Lifetime and Reliability Issues in PV](#); 10.09.2015; Manno, TI
 - Meyer Burger AG, Gwat, BE; [Talk](#), [Link](#)
 - Fluxim AG, Winterthur, ZH; [Talk](#), [Link](#)
 - Greatcell Solar SA (Dyesol), Ecublens, VD; [Talk](#), [Link](#)
- Workshop: [PV Energy](#); 22.10.2013; Dübendorf, ZH
 - Quantis, Switzerland; Zürich, ZH; [Talk](#), [Link](#)
 - TNC Consulting AG, Feldmeilen, ZH; [Talk](#), [Link](#)
- Further companies active in PV
 - Flisom AG, Dübendorf, ZH; [Link](#)
 - TEL Solar Services AG, Trubbach, SG; [Link](#)
 - Plus MAT AG, Schüpfen, BE, [Link](#)
 - Solaronix, Aubonne, VD, [Link](#)
 - ...

Laboratory for Photonic Packaging

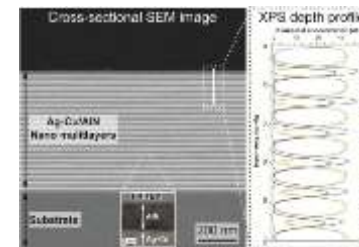
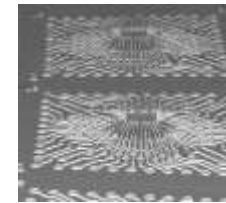
Packaging

Main services:

- Design services and consulting for miniaturizing of devices
- Development and integration of micro-optical, micro-mechanical and electronic systems into self-contained packages
- Interfacing with external electronics, optical fibers and waveguides
- Custom-designed solutions in the field of joining (e.g. brazing, soldering, diffusion bonding, transient liquid phase bonding, alloy design, development of nanostructured filler alloys, coatings and foils)

Packaging: Team

- CSEM Alpnach (**CSEM**), **Section Head Packaging & Optics**, Dr. Stefan Mohrdiek
- EMPA Dübendorf (**EMPA**), **Laboratory for Joining Technologies and Corrosion**, Dr. Lars Jeurgens
- FHO-NTB, Institute for Micro- and Nanotechnology (**MNT**), **Packaging group**, Dipl.Ing.HTL Dietmar Bertsch



Laboratory for Photonic Packaging

- Workshop: [Photonics Packaging for Harsh Environments](#); 08.06.2015; Alpnach, OW
 - MC-Monitoring SA, Givisiez, FR; [Talk](#), [Link](#)
 - RUAG Space, Zürich, ZH; [Talk](#), [Link](#)
 - Volpi AG, Zürich, ZH; [Talk](#), [Link](#)
- Workshop: [Packaging & Laser Services](#); 05.06.2013; Alpnach, OW
 - Heptagon Oy, Rüslikon, ZH; [Link](#)
 - Trumpf Maschinen AG, Baar, ZG; [Talk](#), [Link](#)
- Workshop: [Optical Packaging](#); 16.05.2012; Alpnach, OW
 - Exalos AG, Rüslikon, ZH; [Talk](#), [Link](#)
 - (Oclaro) II-VI Laser Enterprise, Zürich, ZH; [Talk](#), [Link](#)
 - Vario-Optics AG, Heiden, SG; [Talk](#), [Link](#)

Optics Platform Laboratory

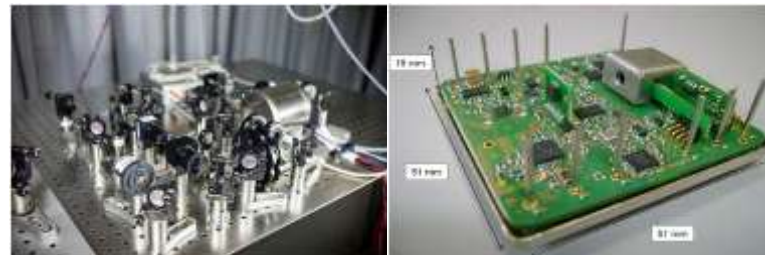
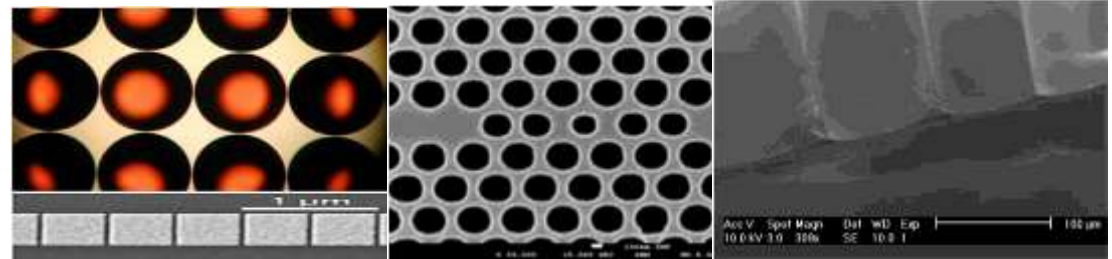
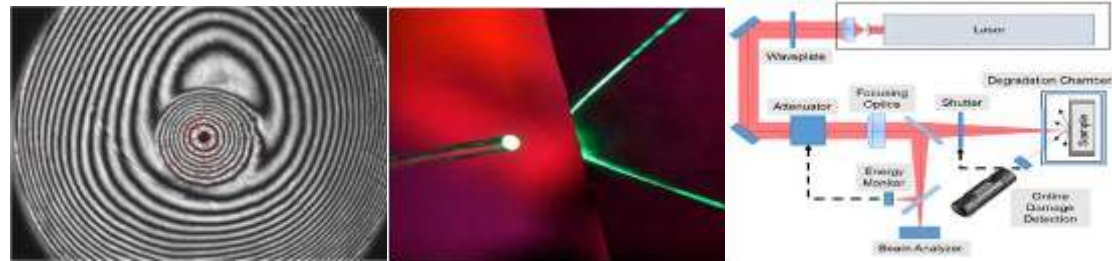
Optics Platform

Main services:

- Optical coatings
- Micro optics
- Optical metrology for surfaces, length, time and frequency
- Optical components and systems

Optics Platform: Team

- NTB Buchs, **Institute for Production Metrology, Materials and Optics** (PWO), Prof. Dr. Andreas Ettemeyer
- University Neuchâtel, **Time and Frequency Laboratory** (LTF), Prof. Dr. Thomas Südmeyer
- EPFL Neuchâtel, **Optics Technology Laboratory** (OPT), Prof. Dr. Hans Peter Herzig



Optics Platform Laboratory

- Workshop: [Optical Coatings for Laser Applications](#); 11.06.2015; Buchs, SG
 - W. Blösch AG, Grenchen, SO; [Talk](#), [Link](#)
 - RhySearch, Buchs, SG, [Link](#)
- Thin film optics companies in Switzerland
 - Econorm, Saint-Imier, BE ; [Link](#)
 - Evatec, Trübbach, SG; [Link](#)
 - flo-ir, Oberdorf, NW; [Link](#)
 - Fluxim AG, Winterthur, ZH; [Talk](#), [Link](#)
 - IMT Masken und Teilungen, Greifensee, ZH; [Link](#)
 - Opticsbalzers AG, Balzers, LI; [Link](#)
 - Schott Suisse SA, Yverdon, VD; [Link](#)
 - Schott Schweiz AG, St. Gallen, SG; [Link](#)
 - Swissoptic AG, Heerbrugg, SG; [Link](#)
 - Thin Film Physics, Regensdorf, ZH; [Link](#)
 - Winterthur Instruments, Winterthur, ZH; [Link](#)
 - WZW Optics AG, Balgach, SG; [Link](#)
 - ...

Laboratory for Optical Sensors

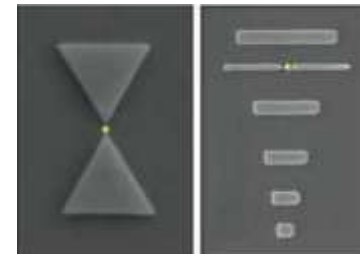
Optical Sensors

Main services:

- Optical metrology
- Development of optical sensors
- Gas sensing
- Identifying new technologies and new applications
- Dedicated workshops and information meetings

Optical Sensors: Team

- ETHZ Zürich (ETHZ), **Photonics Laboratory**, Prof. Dr. Lukas Novotny
- EMPA Dübendorf (EMPA), **Laser Spectroscopy**, Dr. Lukas Emmenegger



Laboratory for Optical Sensors

- Workshop: [Optical Gas Sensing](#); 15.01.2015; Dübendorf, ZH
 - Rüeger SA, Crissier, VD; [Talk](#), [Link](#)
 - Heptagon Oy, Rüslikon, ZH; [Link](#)
 - Alpes Lasers SA, Neuchâtel, NE; [Talk](#), [Link](#)
 - Camlin Technologies Switzerland, Zürich, ZH; [Talk](#), [Link](#)
 - Hamamatsu Photonics, Solothurn, SO; [Talk](#), [Link](#)
 - IRSweep GmbH, Zürich, ZH; [Talk](#), [Link](#)
 - Eco Physics, Dürnten, ZH; [Talk](#), [Link](#)
 - Wilco AG, Wohlen, AG; [Talk](#), [Link](#)
 - ABB Switzerland Ltd., Baden-Dättwil, AG; [Talk](#), [Link](#)
 - Axetris AG, Kägiswil, OW; [Link](#)
- ...

Selected start-ups and companies

Photonics in Switzerland – economical impact

- Swissphotonics employed [Optech Consulting](#) (Taegerwilen, TG) regularly for a Market Report on the economical impact of Photonics industry for Switzerland in November 2014. You can download the latest report here: [Optech Consulting-Photonik Schweiz 2014](#) (German version only).
- Key findings:
 - The photonic industry plays an important role in Switzerland with a direct revenue of more than 4 billion SFr in 2014, ranking second per capita in Europe.
 - End of 2013 about 10'000 employees working in Swiss Photonics industry. (A 3% reduction compared to 2012. Main reason: downscaling of photovoltaics).

Photonics Start-ups from Institutes

- CSEM – [Start-ups & Ventures](#)
 - [Heptagon](#), [Avalon->Bookham->II-VI Laser Enterprise](#), [Photon Focus](#), [Heliotis AG](#), [Mesa Imaging Ag -> Heptagon](#)
- EPFL – [Start-ups](#)
 - [Act Light](#), [Atto Light](#), [Fastree 3D](#), [GCell](#), (Greatcell Solar SA) [Dyesol](#), [Lyncée tec](#), [Morphotonix](#), [Nanolive](#), [Solarimpulse](#), [SolNanoTek](#), [SwissINSO](#),
- ETHZ – [Spin-offs](#)
 - [Bitsplitters GmbH](#), Phocon AG -> [Camlin Technologies](#), [greenTEG](#), [IRsweep](#), Time-Bandwidth -> JDSU -> [Lumentum Operations](#), [Nanograde](#), [Optotune AG](#), [Rainbow Photonics](#) , [Sensirion AG](#),
- EMPA – [Glatec](#) , [Jobs at Glatec Startups](#)
 - [Bitsplitters GmbH](#), [Optotune AG](#), [Micos Engineering GmbH](#), [Crealas GmbH](#), [FLISOM](#)
- PSI – [spin-off-companies](#)
 - [EULITHA AG](#), [DIECTRIS AG](#)

Classical optical components & assemblies

- Feinwerkoptik Zünd AG, Werdenberg, SG; [Link](#)
- FISBA AG, St. Gallen, SG; [Talk](#), [Link](#)
- IMT Masken und Teilungen AG, ZH; [Link](#)
- Micos Engineering GmbH, Dübendorf, ZH; [Link](#)
- Optotune AG, Dietikon, ZH; [Link](#)
- Spectros AG, Ettingen, BL; [Link](#)
- Vectronix, Balgach, SG; [Link](#)
- WZW Optics AG, Balgach, SG; [Link](#)

- Interglass, Cham, ZG; [Link](#)

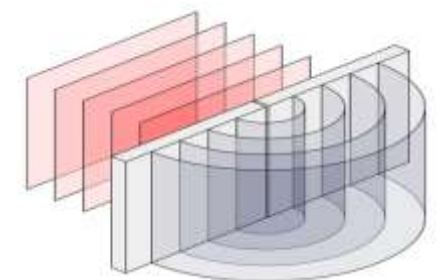


Optical microsystems

- Axetris, Kägiswil, SW; [Link](#)
- Heliotis AG, Root, LU; [Link](#)
- Heptagon, Rüslikon, ZH; [Link](#)
- Suss Micro Optics, Hauterive, NE; [Link](#)
- WZW Optics AG, Balgach, SG; [Link](#)

Optical security / brand protection

- 3D AG, Baar, ZG; [Link](#)
- KBA NotaSys SA, Lausanne, VD; [Link](#)
- Morphotonix, Ecublens, VD; [Talk](#), [Link](#)
- OVD Kinegram AG, Zug, ZG; [Link](#)
- Rolic Technologies Ltd., Allschwil, BL; [Talk](#), [Link](#)



Telecom / Fiberoptics

- Albis Optoelectronics, Rüslikon, ZH; [Link](#)
- Diamond SA, Losone, TI; [Talk](#), [Link](#)
- EMC, St. Antonino, TI; [Link](#)
- Huber & Suhner AG, Herisau, AR; [Talk](#), [Link](#)
- IBM, Rüslikon, ZH; [Talk](#), [Talk2](#), [Link](#), [Special link](#)
- II-VI Laser Enterprise, Zürich, ZH; [Talk](#), [Talk2](#), [Link](#)
- Reichle & De-Massari AG, Wetzikon, ZH; [Link](#)
- Sercalo Microtechnology Ltd., Neuchâtel, NE; [Link](#)
- Variooptics, Heiden, SG; [Talk](#), [Link](#)
- VOLPI AG, Schlieren, ZH; [Talk](#), [Link](#)
- Xenlux, Buochs, NW; [Link](#)

