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Optatec in focus im fokus

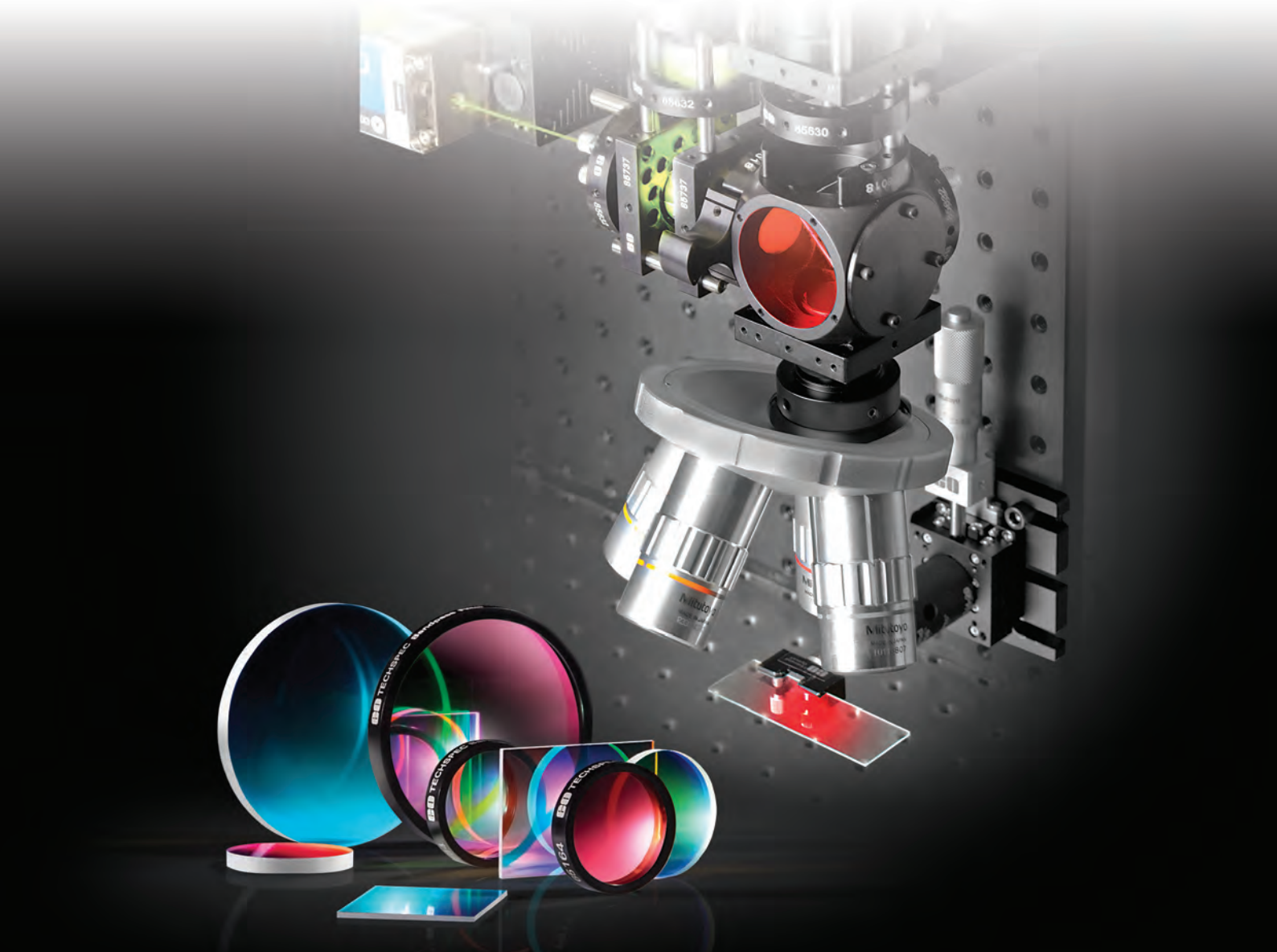
The latest news from the International trade fair for optical technologies,components and systems

www.optatec-messe.de

Welcome to Optatec 2018

Willkommen zur Optatec 2018

THE **FUTURE** DEPENDS ON OPTICS



Millions of people are affected by ailments of the brain including strokes, Alzheimer's, and Parkinson's, but advances in optics and medical diagnostics are enabling the non-invasive detection and treatment of these conditions. Innovative technologies including fluorescence microscopy and CLARITY are dependent on optical components such as high end optical filter coatings and multi- element objective lenses.

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Top of the optics

Optatec in focus©
The latest news from the International trade fair for optical technologies,components and systems
im fokus

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Original Content Ltd, Tel. +44 (0)117 939 4887
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P.E Schall, Gustav-Werner-Straße 6, D - 72636, Frickenhausen.
Tel: +49 7025 9206 0
Advertising Sales:
Lucent Media, Tel. +44 (0)117 244 3540

Welcome to the new Optatec magazine – which is designed to serve three distinct purposes: introducing this exhibition – Europe's leading industrial optics and photonics event; describing the new Symposium on Optical Systems Design (in partnership with SPIE, the international society for photonics engineers); and updating attendees with some of the latest news from across the industry, as reported by the editorial team behind optics.org.

Whether one focuses on heavy industrial processing, 3D manufacturing, medical technologies, image processing, laboratory technology for R&D, microelectronics or solar power, optics and photonics are always center stage nowadays. Progress in all of these disciplines would be unimaginable without the latest optical technologies.

Reflecting this the Optatec international trade fair – and new symposium – is showcasing this ever-expanding sector between May 15th-17th, 2018. Innumerable innovations will be exhibited and discussed at the Frankfurt International Exhibition Centre over the three days.

Business growth

Optical technologies enjoy a broad-based industrial footing in Germany. But at the international level as well, photonics, bio-photonics and photovoltaics are on the upswing.

"This is a situation which is also confirmed by Optatec, which is becoming more and more international. We are currently accommodating exhibitors from 32 countries," comments project manager Karen Waldow of trade fair promoters P.E.

Best practice

Numerous workshops and presentations at which exhibitors will report on their experience, and where colleagues as well as visitors will be invited to do so too, ensure an ideal transfer of optical technologies to routine daily work. The important fields of human resources, recruiting, training and career development will also be covered at this Optatec show. The "Study Photonics" training and research technology program will be presented by five highly experienced German universities.

This magazine should help you to understand the exhibition, the conference and the wider industry; you will find the following articles covering event highlights, industry news and new technologies:

- About Optatec with a focus on innovation potential
- Optatec enters its new phase
- The new SPIE Congress
- Conference Sessions highlights
- Industry news
- Product focus

If you have some interesting news from you company or from your experience of attending the show, please let us know by emailing me at: **matthew.peach@optics.org.** We hope you enjoy the show – and the new magazine!

Matthew Peach
Contributing Editor

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ENABLING PHOTONIC TECHNOLOGIES

Focus on Innovation Potential

Optatec focuses on the industry's innovation potential like no other event of its kind.

In co-operation with technological and institutional partners including the SPECTARIS association for the high-tech industries, Optence and OptecNet and SPIE, Optatec offers an international showcase for advanced technologies.

Exhibitors from Europe and all over the world display future technologies from the field of industrial optics and take advantage of Optatec to present their innovations and product premieres.

With its targeted offerings for development and production, as well as industrial use of optical components, optomechanics, optoelectronics, fibre-optics, fibre-optic cables, laser components and manufacturing systems, Optatec has become well-established within the industry sector and provides a top-level platform which brings suppliers and users together.

At the cutting edge, or: the Optatec international trade fair for optical technologies, components and systems is the industry event for an enormous future market.

This year marks the 14th edition of the Ever-expanding Optatec, which is undisputedly in pole position where worldwide rankings for relevant technical events are concerned!

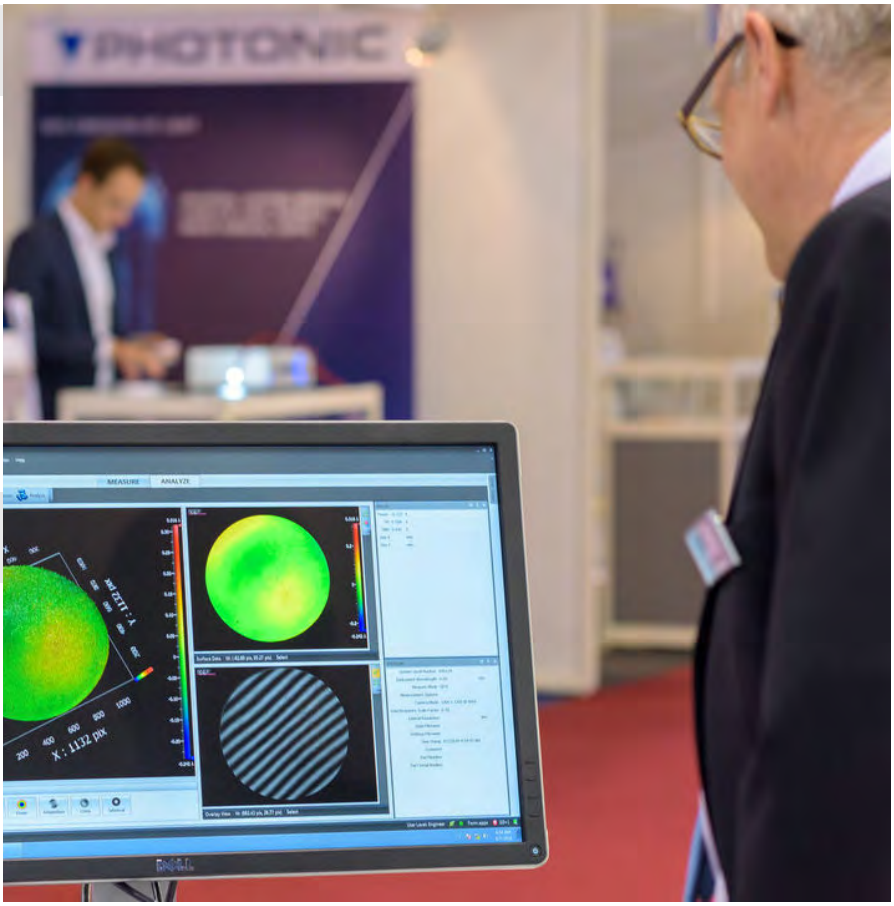
570 exhibitors from 31 countries occupied 194,000 square feet of overall exhibition floor space (amounting to a 7% increase in both categories), and attracted more than 5600 expert visitors from 55 nations with its highly specialised spectrum of products and services.

And everything is once again pointing towards further growth for Optatec 2018 – the percentage of exhibitors from outside of Germany will increase once more too, which can be seen as an indication of the great importance placed on Optatec amongst global experts.

Editorial contributor: P.E Schall

Photonics – Photovoltaics – Solar Technology

With its focus on optical technologies, components and systems in the form of optical modules, optomechanics/ optoelectronics, fibre-optics, fibre-optic cables, laser and fibre-laser components as well coating technologies, Optatec has a worldwide, uniquely special status, because alone Optatec deals with all aspects of research, science and industrial applications in the field of optical technologies.



Photonics is the key to future manufacturing technology

Photovoltaic systems will dominate the future of resource-conserving, climate-neutral hot water heating. Innovative solar systems with significantly increased power density assure efficient conversion of sunlight into energy.

And Optatec will present more than just the state-of-the-art in this regard!

Optatec International

The 570 exhibitors from 31 nations (251 from Germany) and above all the 5600 expert visitors from 55 countries view Optatec as a benchmark for offerings and applications.

With 56% of its exhibitors and 32% of its expert visitors from outside of Germany, it's by far the most international technical event with wide-reaching appeal within the sector for optical technologies and system solutions.

Appropriately supported by congress, seminar and round-table events, as well as special shows and the exhibitor forum with world-class presentations, the expert visitors can gain either an overview or in-depth insight into the global world of optical technology developments and applications in accordance with their own specific interests. There is something here for everybody in the industry.

Editorial contributor: P.E Schall

Optics facts speak for themselves

The technologically highly demanding subject matter surrounding the optical technologies is unsuitable for marketing gags, and thus for trendiness and hype as well.

The best example of this is laser technology which evolved from small beginnings in the form of Nd:YAG lasers, CO_2 lasers and disk lasers, and was first able to establish itself in today's diversity of actual applications, as well as tomorrow's spectrum of conceivable applications, with fibre-laser technology.

With their current levels of performance, fibre-lasers are replacing conventional Nd:YAG and CO_2 lasers step by step and no end to the performance explosion is yet in sight. But this is no reason for Optatec to lapse into short-lived hype, but rather to provide the issue of fibre-laser, which can be made use of far above and beyond the field of thermal manufacturing technology (medical technology etc.), with the necessary, serious presentation platform.

Editorial contributor: P.E Schall

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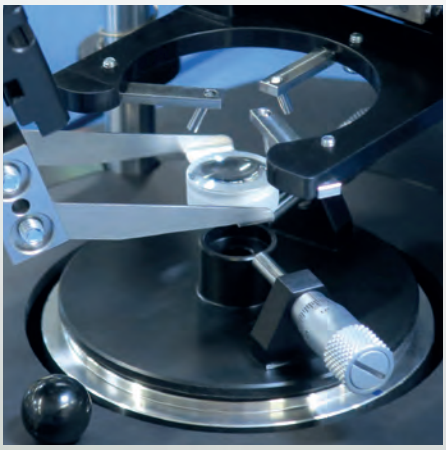

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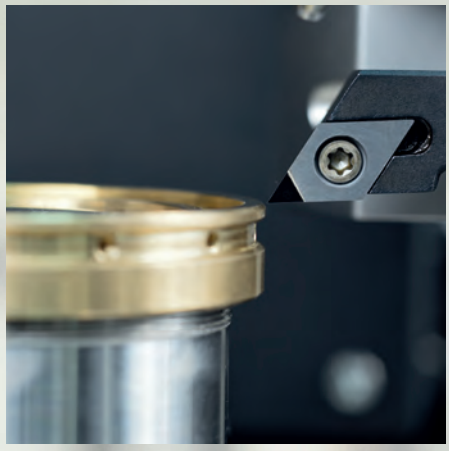

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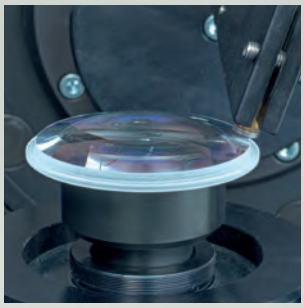
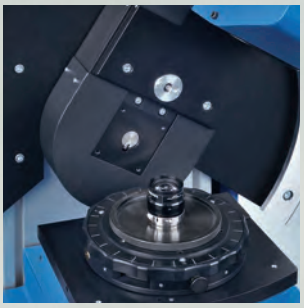
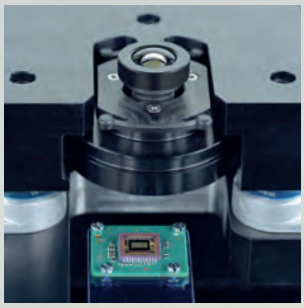


Fully Automated Centration Testing of Aspheres



Versatile MTF Measuring Device for Lenses



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Optatec 2018

Conference Sessions

“I welcome all delegates to Optatec 2018”

Bettina Schall,
Managing Director of P. E. Schall GmbH & Co.

Optatec enters new phase with SPIE conference

The long-established trade fair for optical technologies, components and systems Optatec, which takes place every two years in Frankfurt, Germany, is to offer attendees a new experience – a dedicated conference in partnership with SPIE, the global society advancing an interdisciplinary approach to the science and application of light.

Mike Hatcher interviews Bettina Schall, managing director of P. E. Schall GmbH & Co, the owner and organizer of the expo.

Mike Hatcher *When did the first Optatec trade fair take place, and what was the motivation behind establishing this event?*

Bettina Schall The first Optatec – International trade fair for optical technologies, components and systems took place in 1992. The motivation to establish this event has been the generation of an exhibition platform for an international clientele to represent the latest state of the art. Exhibitors as well as scientists and engineers of the specific optical branch should obtain the possibility to exchange and consequently improve their knowledge and progress in all relevant fields.

How has the trade fair changed since its inception? For example how much has it grown (in terms of attendee and exhibitor numbers)? Has it become a much more international event, in terms of exhibiting companies and/or attendees?

There were 138 exhibiting companies at the first Optatec in 1992. Of these 32 were foreign companies. In 2016 we registered 571 exhibiting companies and thereof 320 foreign companies. Regarding the visitors we recorded 2820 persons in 1992. In the year 2016 we noted 5607 visitors. In summery it can be said that the Optatec constantly increased regarding the internationality of exhibitors as well as visitors.

What would you say are the keys to the success and longevity of Optatec?

The Optatec expo is consequently not geared to single fields but to all relevant developments and potencial applications of optical technologies. Thus the Optatec worldwide takes up a solitary position. The exhibition does not follow fast moving trends. From the beginning until today the Optatec concentrates on the long lasting industrial benefit of the corresponding development and products so that piece by piece new market segments are pushed.

What are the major industry trends in this sector at the moment?

With the endeavor to realize industry 4.0 strategies we also here note a strong trend to a general digitalization. The optical technologies hereby occupy a central position regarding determination and especially transmission of manufacturing data and correction values.

What new elements can attendees look forward to at Optatec 2018?

With new products and solutions out of the fields photonics, photovoltaics and particularly fiber laser technology as well as optical fiber new and so far unknown application and market possibilities are appearing. By tradition many technology and market leaders are using the Optatec to present their latest developments to the international experts. For example the fiber laser technology will be very impressive as its enormous development will allow to reach new production-technical dimensions.

You are collaborating with SPIE Europe this time: what is the thinking behind this collaboration, and what benefits will attendees and exhibitors gain from it?

With the conference "Optical Systems Design" we will further support the information exchange and will bring together experts, users and scientists who are worldwide known and recognized. The target group of the event are technicians, engineers, scientists and managers in the field of optical systems. Exhibitors and attendees equally will benefit from the heightened exchange and networking.

Do you have any specific highlights or new events from the Optatec 2018 program that you would like to promote?

The Optatec 2018 will offer a focused plenty of expert information to the experts coming from around the world and all different fields. We focus on showing the big development potential for the subject optical technologies. Not just shown by new developments but also by the high-quality supporting program with international recognized referents we support the technology and knowledge transfer of science and development to the scientific as well as industrial application.

What else should Optatec attendees try to experience during their time in Frankfurt (i.e. in the city and region, outside the trade fair)?

Frankfurt as one of the worldwide leading financial metropolis offers an impressive city skyline, a variety of cultural events, interesting museums on both sides along the river Main and most notably the cordial hospitality of the people who welcome visitors from all over the world.

Mike Hatcher, Contributing Editor to optics.org

Optatec's new SPIE Congress – the details

This year's – the fourteenth – edition of Optatec will feature even more technical information, a more in-depth exchange of knowledge and greater opportunities for delegates to learn about industrial applications of optics than ever before.

Conference organizer Wilhelm Ulrich, who is Senior Director Competencies, Corporate Research & Technology at Carl Zeiss AG, speaks to Matthew Peach about what attendees can expect from the new event.

Wilhelm Ulrich, Senior Director Competencies, Corporate Research & Technology at Carl Zeiss AG.

"Optical instruments are addressing an ever-increasing number of industrial and research applications: imaging and vision, defense, space, telecommunications, transportation, industrial process control, laser fusion, and more. As end users are expecting more demanding performances, optical systems designers and manufacturers are faced with growing challenges," says Ulrich.

"This symposium on Optical Systems Design in Frankfurt is intended to provide an interdisciplinary forum for technicians, engineers, researchers, and managers who are involved in instrumental optics at all levels: design, specification, production, and testing."

Complementary objectives

He explains the links between the Optatec exhibition and the new conference thus: "By collocating the tenth SPIE Optical Systems Design conference with Optatec, the networking experience for both attendees and exhibitors will be significantly increased. It is important to connect science with industry as well as technology and manufacturing with application in order to optimize the solutions to meet customers' needs."

The Optatec international trade fair for optical technologies, components and systems unites industrial praxis with the most up-to-date developments. Whether considering photonics or bio-photonics, solar technology, image processing or vision systems, 3D manufacturing or testing, this event covers all aspects of optics in industrial applications.

Interdisciplinary forum

SPIE Optical Systems Design is an interdisciplinary forum on the latest advances in optical systems applications, materials, and processing. It attracts technicians, engineers, researchers, and managers who are involved in instrumental optics at all levels: design, specification, production, and testing.

This interdisciplinary symposium represents an excellent opportunity to stay informed and further the debate about the latest (and future) developments in optical design and how strong digital transformation and connectivity drive these developments.

Ulrich makes the following remarks on the breadth and depth of the new conference program:

This will be a notable framework program, which will round out this international event. Notable features include:

- The Science Slam, held by OptecNet, which will present new knowledge in a modern and entertaining style;
- At the Training & Research Technology Park "Study Photonics" five German universities will introduce themselves and provide opportunities to young people how to join the exciting world of optics and photonics
- A Short Course by Optence will give an introduction in the world of optical coatings
- A Spectaris workshop for DIN / ISO standardization of surface imperfections should be not just interesting, but also important for R&D expert as well as for manufacturing people.

Carl Zeiss at Optatec

Carl Zeiss Jena and Carl Zeiss Spectroscopy divisions are both taking part at this year's exhibition.

The company provides a wide range of technological innovations, engineering expertise and production reliability.

Ulrich adds, "We design, customize and manufacture optical and opto-mechanical components; whereby the spectrum reaches from precision optical components up to opto-electronic systems as well as from optical diffraction gratings up to OEM spectrometers."

At Optatec the company divisions will be presenting the following precision components and technologies: aspheres, freeform surfaces and complex coatings; super finish machining for diverse materials; the machining of magnesium; diffraction gratings for industrial applications such as UV, visible and NIR spectroscopy; pulse compression gratings for ultrafast lasers; and various sensing technologies.

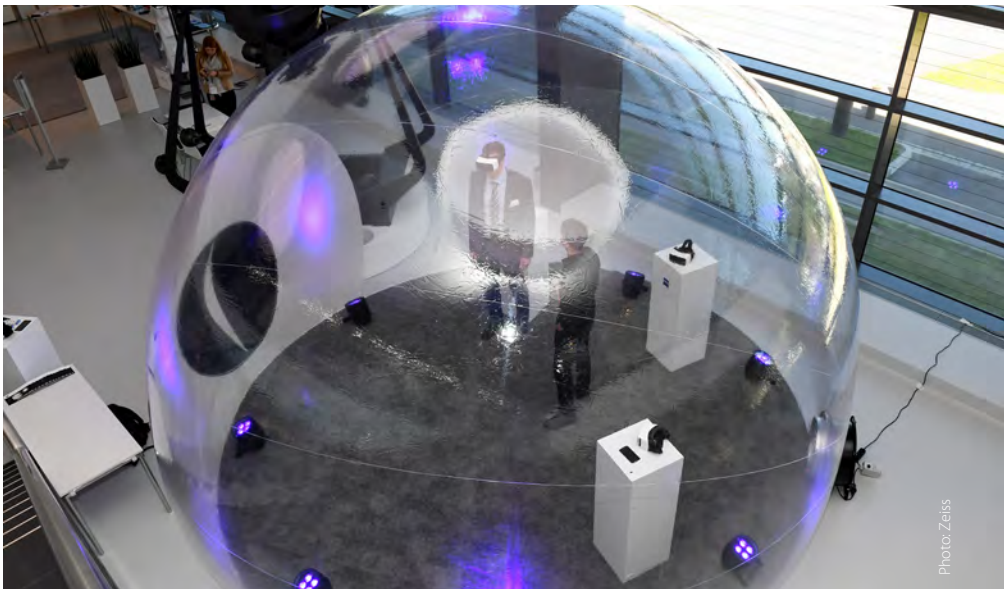
Photo: Zeiss

Zeiss is showcasing its latest VR solutions from the Virtual Reality Bubble.

Directed at astronomy and space applications, there will be also a Zeiss paper at the SPIE conference entitled "Optical gratings with low wavefront aberrations and low stray light for enhanced spectroscopic applications" presented by Peter Triebel from Carl Zeiss Spectroscopy GmbH.

Plenary speakers and their abstracts

Pablo Benítez
Univ. Politécnica de Madrid: Optics for Virtual Reality: State of The Art and Future Challenges

Virtual Reality aims to become a new multimedia platform thanks to the advent of high-quality affordable headsets. However, mass adoption of VR technology will probably need to overcome multiple technological challenges, many of them limited by the conventional optics used today. Dramatically reducing its size and weight, increasing its resolution up to the human visual acuity, matching vergence and accommodation, will require novel optical designs and displays.

This talk will describe the design constraints and parameters, present commercial architectures as well as the most promising solutions that are facing the future challenges.

Joseph Howard
NASA Goddard Space Flight Center: Current and Future NASA Space Telescopes

Astronomy is arguably in a golden age, where current and future NASA space telescopes are expected to contribute to this rapid growth in understanding of our universe. A summary of our current space assets will be given, as well as an update on the status of the James Webb Space Telescope (JWST), which is in its final stages of integration and testing.

Future telescopes will also be discussed, including the formulation of the Wide Field Infra-Red Survey Telescope (WFIRST), as well as a brief overview of the mission concept studies being prepared for the 2020 Decadal Survey in Astrophysics.

Federico Capasso
Harvard John A. Paulson School of Engineering and Applied Sciences: High Performance Flat Optics

Metasurfaces are leading to the emergence of new optical components that circumvent the limitations of standard refractive and diffractive one and with entirely new functionalities. Our formulation of the generalized laws of reflection and refraction for metasurfaces has led us recently to demonstrate for the first time achromatic, diffraction limited lenses across the entire visible. Multifunctional components such as metalenses for chiral imaging, ultracompact spectrometers and high efficiency holograms in the visible will be also discussed. I will conclude by presenting novel compact polarimeters that have allowed us to match the performance of existing state-of-the-art bulky polarimeter.

Bill Cassarly
Synopsys, Inc: Demystifying Etendue

Etendue is often used to characterize the fundamental performance limits for illumination systems, especially systems that use extended sources. Despite its value in illumination design, the term Etendue is often considered confusing. In this talk, we'll demystify Etendue by examining numerous common examples (e.g., MR16/Par38 lamps, projector displays, automotive signal lamps, etc). These examples will be used to show how Etendue is directly related to performance limits for some system but not others.

Optatec 2018 Conference Sessions

Monday 16th - Tuesday 17th May 2018

Daily Event Schedule

TIME	Optical Design and Engineering VII (Conf. 10690)	Advances in Optical Thin Films VI (Conf. 10691)	Optical Fabrication Testing, and Metrology VI (Conf. 10692)	Illumination Optics V (Conf. 10693)	Computational Optics 2018 (Conf. 10694)	Optical Instrument Science, Technology, and Applications (Conf. 10695)
MONDAY 16 MAY						
MORNING 8:15 to 10:00	PLENARY PRESENTATIONS: Current and Future NASA Space Telescopes (Joseph M. Howard); Optics for Virtual Reality: State of The Art and Future Challenges (Pablo Benítez)					
	SESSION 1: **Design Methods I** (Rolf Wartmann)	SESSION 1: **Opening Session** (Detlev Ristau)		SESSION 1: **Optical Modelling, Effects, and Techniques I** (Julius A. Muschaweck)		SESSION 1: **Space and Remote Sensing** (Nils Haverkamp)
12.00	LUNCH BREAK					
AFTERNOON	SESSION 2: **Design Methods II** (Demetrio Labate)	SESSION 2: **Design and Modelling** (Alexander V. Tikhonravov)		SESSION 2: **Freeform Techniques I** (Fabian Duerr)		SESSION 2: **Optical and Photonic Instrument Applications** (Michael Layh)
	SESSION 3: **Design Methods III** (Rolf Wartmann)	SESSION 3: **Deposition Processes** (Juan I. Larruquert)				SESSION 3: **Computational Methods and Prototyping** (Alois M. Herkommer)
EVENING 17:30 to 20:00	**WELCOME RECEPTION**					

TUESDAY 17 MAY						
MORNING 8:00 to 8:45	PLENARY PRESENTATIONS: Demystifying Etendue (Bill J. Cassarly)					
	SESSION 4: **Design Methods IV** (Andrew P. Wood)	SESSION 4: **Deposition Monitoring and Characterization I** (Frank Delmotte)	SESSION 1: **Optical Systems** (Peter Hartmann)	SESSION 3: **Freeform Techniques II** (Fabian Duerr)		SESSION 4: **Metrology and Applications** (Richard N. Youngworth)
	SESSION 5: **Design Solutions I** (Andrew P. Wood)	SESSION 5: **Deposition Monitoring and Characterization II** (Angela M. Piegari)	SESSION 2: **Microoptics** (Reinhard Voelkel)			
12.00	LUNCH BREAK					
AFTERNOON	SESSION 6: **Design Solutions II** (Simon Thibault)	SESSION 6: **Deposition Monitoring and Characterization III** (Claude Amra)	SESSION 3: **Space Optics** (Monika Kroneberger)	SESSION 4: **Optical Modelling, Effects, and Techniques II** (Peter Brick)		
	SESSION 7: **Design Solutions III** (Richard N. Youngworth)	SESSION 7: **Short Wavelengths Coatings** (Norbert Kaiser)	SESSION 4: **Gratings and Functional Surfaces** (Robert Leitel)			
18:00 to 19:30	POSTER SESSION					

Programme current as of time of print.

Optatec 2018 Conference Sessions

Wednesday 18th - Thursday 19th May 2018

Daily Event Schedule

TIME	Optical Design and Engineering VII (Conf. 10690)	Advances in Optical Thin Films VI (Conf. 10691)	Optical Fabrication Testing, and Metrology VI (Conf. 10692)	Illumination Optics V (Conf. 10693)	Computational Optics 2018 (Conf. 10694)	Optical Instrument Science, Technology, and Applications (Conf. 10695)
WEDNESDAY 18 MAY						
MORNING 8:00 to 8:45	PLENARY PRESENTATIONS: High performance flat optics (Federico Capasso)					
	SESSION 8: **Design Solutions IV** (Rolf Wartmann)	SESSION 8: **Post- Deadline Session** (Detlev Ristau)	SESSION 5: **Freeforms** (Pierre Gloesener, Francois Riguet)	SESSION 5: **Illumination Applications** (Bill J. Cassarly)	SESSION 1: **Design and Optimization** (Frank Wyrowski)	
	SESSION 9: **Freeforms I** (Thierry Lépine)	SESSION 9: **Materials** (Ulrike Schulz)		SESSION 6: **Trends in Automotive Lighting** (Steffen Reichel)		
13:00 to 15:00	AGILENT TECHNOLOGIES LUNCH					
AFTERNOON	SESSION 10: **Freeforms II** (Herbert Gross)	SESSION 10: **Coatings and Lasers** (Liu Xu)	SESSION 6: **Low-Loss Optics and Metrology** (Sven Schröder)		SESSION 2: **Computational Imaging** (Andreas Erdmann)	
16:00 to 18:00	**INTERNATIONAL DAY OF LIGHT SPECIAL EVENT**					
19:30 to 21:30	30 SYNOPSYS/LIGHT TEC DINNER RECEPTION					
THURSDAY 19 MAY						
MORNING 8:30	SESSION 11: **Freeforms III** (Laurent Mazuray)	SESSION 11: **Filters and Manufacturing I** (Franck Delmotte)	SESSION 7: **Optical Fabrication** (Roland Geyl)		SESSION 3: **Microstructures and Illumination** (Daniel G. Smith)	
	SESSION 12: **Space Applications I** (Laurent Mazuray)	SESSION 12: **Filters and Manufacturing II** (Marco Jupé)			SESSION 4: **Physical Optics I** (Miguel A. Alonso)	
12.00	LUNCH BREAK					
AFTERNOON	SESSION 13: **Space Applications II** (Laurent Mazuray)		SESSION 8: **Metrology I** (Claude Amra)		SESSION 5: **Physical Optics II** (Martin Hammerschmidt)	
			SESSION 9: **Metrology II** (Christof Pruss)			
			CLOSING REMARKS			

Programme current as of time of print.

Industry News

Top stories from optics.org

Engineering software giant ANSYS snaps up OPTIS

Acquisition adds physics-based optical simulation software expertise to ANSYS' already extensive portfolio.

The Pittsburgh-based engineering software giant ANSYS is set to acquire OPTIS, the French developer of optics and photonics simulation.

Established by founder Jacques Delacour back in 1989, OPTIS has since built up a portfolio of software products including packages covering laser propagation, illumination, visual ergonomics, real-time color evaluation and, more recently, virtual reality applications.

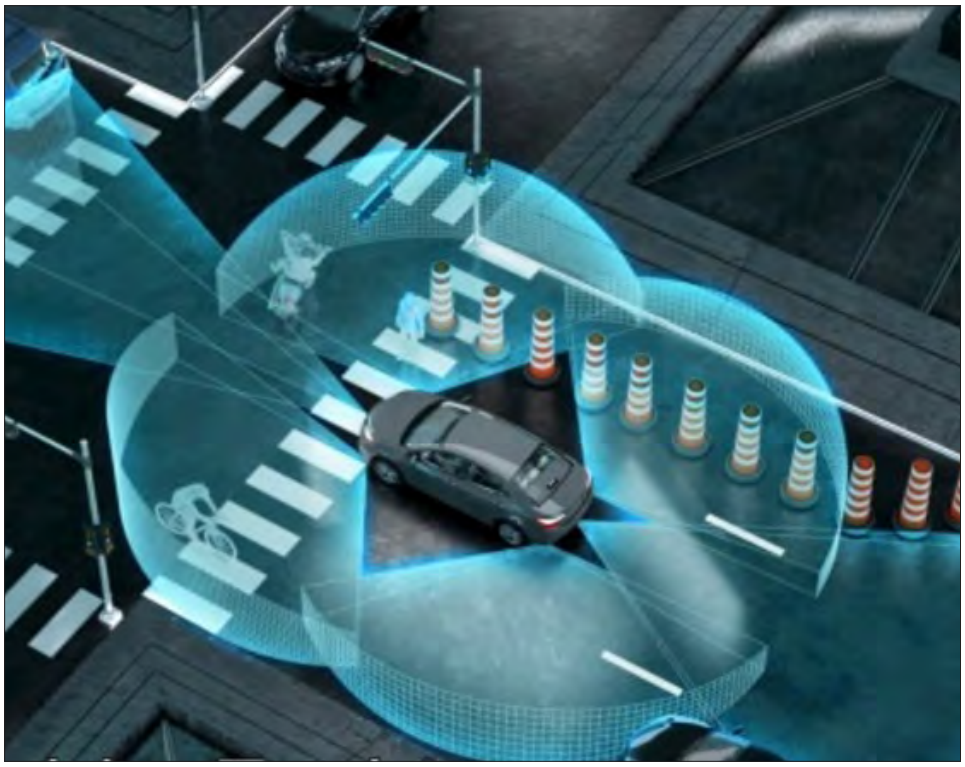

Image: LeddarTech/OPTIS.

Software firm OPTIS and lidar technology developer LeddarTech announced their collaboration at the CES event in Las Vegas earlier this year. OPTIS already works with several blue-chip automotive companies, including Ford and Ferrari.

"The acquisition of OPTIS will extend ANSYS' industry-leading multiphysics-based portfolio into the increasingly important area of optical simulation," announced Nasdaq-listed ANSYS, adding that the deal should be completed in the second quarter of the year.

Automotive roster

ANSYS, which last year posted pre-tax profits of nearly $400 million on sales that exceeded $1 billion for the first time, already sells simulation packages for structural analysis, fluid flow modelling, electronics, semiconductor physics, high-performance computing and more – but did not have a dedicated product for optics simulation.

Headquartered in La Farlède, France, OPTIS should fill that gap nicely, having built up an impressive roster of customers including what ANSYS describes as a "who's who" of the automotive industry. Named customers include the likes of Audi, Ford, Toyota and Ferrari, while OPTIS also works with Boeing, Airbus, GE, Swarovski, and L'Oreal.

One of the major motivations behind the acquisition appears to be the emergence of lidar as a critical technology for self-driving vehicles.

ANSYS'VP and general manager Eric Bantegnie said in a company release: "Like ANSYS, OPTIS is a technology leader, and together we'll deliver pervasive engineering simulation to a new set of companies while extending simulation to next-generation use cases like cameras and lidar development for autonomous vehicles."

OPTIS has developed a photo-realistic virtual reality and closed-loop simulation platform, which is expected to help speed the development of autonomous vehicles. "Using this VR backbone – combined with other ANSYS solutions – automotive manufacturers can simulate the environment [that] driverless vehicles are navigating, including road conditions, weather and one-way streets," stated the two companies.

Pilot's eye view

ANSYS has created simulation packages specifically aimed at autonomous vehicle sensor development, and believes that the addition of OPTIS' products will result in a comprehensive offering that covers visible and infrared light, as well as electromagnetics and acoustics, for camera, radar, and lidar technology.

"Combining OPTIS' physics-based solutions for optical simulation with ANSYS' deep and broad portfolio will be a competitive advantage for our customers and the entire industry," predicted Delacour. "The entire OPTIS family is looking forward to working closely with ANSYS and its impressive customer community around the world."

Previous developments involving OPTIS have included improved designs of aircraft cockpits – based on the creation of a "pliot's eye view" of the inside of a cabin produced using the firm's "SPEOS" visual ergonomics software.

And more recently the French firm teamed up with Canada-based automotive lidar firm LeddarTech, revealing details of their collaboration during January's Consumer Electronics Show (CES) in Las Vegas.

"This collaboration allows transportation companies to virtually test and integrate their next generation of lidar developed around the LeddarCore integrated circuit before its actual release," the partners said.

By Mike Hatcher, contributing editor to optics.org

http://optics.org/news/9/3/34

Growing Berliner Glas sets up training scheme to help close skills gap

German optics firm looking to expand headcount quickly as it racks up record sales figures.

Berliner Glas Group, the Berlin-headquartered manufacturer of optics and optical systems, has posted record sales for 2017, and is looking to recruit heavily as demand for its products continues to grow strongly.

At €193 million, 2017 revenues were up nearly 16 per cent on the 2016 level, with the company expecting that growth to accelerate to 20 per cent this year. The group's turnover has now doubled over the past decade.

Training scheme

Group CEO Andreas Nitze commented: "We want to continue to grow faster than the market and gain new shares in our market segments. We are on a good path, which is shown by the very high level of incoming orders, among other things."

Headcount has grown at a similarly rapid rate, with the group now employing some 1334 people – up nearly 13 per cent in a year. Berliner Glas wants to add another 200 recruits in Berlin, and with optics and photonics skills at a premium it has set up a dedicated training scheme to help bridge something of a skills shortage.

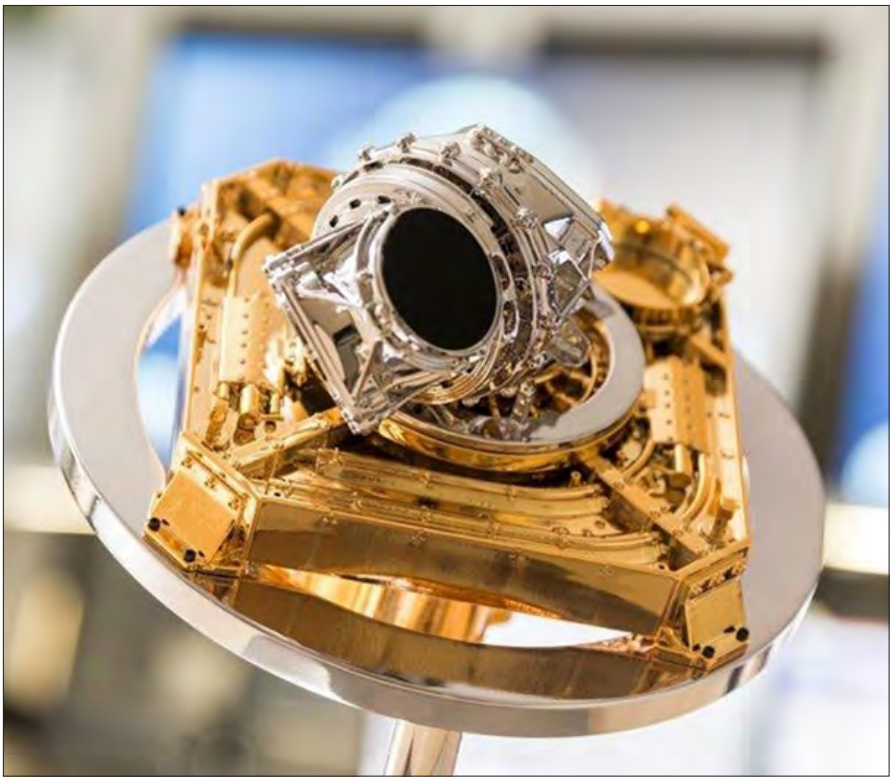

Image: Airbus/Tesat.

A laser terminal for high-speed optical satellite communications. Berliner Glas provides precision optical components used in the European Space Agency's European Data Relay System (EDRS) network.

The group of companies contributing to the total includes Berliner Glas, as well as subsidiaries Berliner Glas Technical Glass, and SwissOptic, with sites in Berlin, Heerbrugg in Switzerland, and Wuhan in China.

The parent firm says that each of the businesses contributed to last year's sales growth, with impetus coming from its semiconductor and photonics-focused divisions and the current momentum in organic LED display production.

"One essential, limiting factor is the availability of skilled staff," announced the firm. "We are looking for employees in every business segment, [including] development, production, support departments, and sales."

In particular, the firm needs to hire qualified precision opticians for the volume production of key optical components, assemblies, and systems. With such experience in very limited supply, even in Germany, the company has developed an internal training program to help meet the demand.

"Anyone with technical training, such as precision engineers, flat glass mechanics, opticians, dental technicians, watchmakers, microtechnologists, or physics lab technicians, can participate in this eight-week training program and learn the various production techniques and work procedures in precision optics," it says.

Space communications

Meanwhile, the expansion of the production area at the company's Berlin headquarters is said to be "in full gear". Investments include new cleanroom space, alongside production processes, innovation, and personnel.

Berliner Glas added that trends in the medical, semiconductor, metrology, and display sectors were all helping to drive demand, alongside the growing move to deploy laser-based communications in space.

Back in 2015, the company said it was expanding its "coatings and surfaces" division. A new customized plasma system has helped with the production of highly sophisticated coatings comprising a plurality of individual layers. Examples include edge filters, dielectric mirrors with highly reflective layers, or laser-resistant layers.

One application for such coatings is space communications, and in 2016 the first element of the high-speed European Data Relay System (EDRS) - featuring several optical components and systems provided by Berliner Glas - was launched into geostationary orbit.

EDRS is now used by so-called "Sentinel" satellites in the European Space Agency's Copernicus constellation, helping to beam back high-resolution images back to Earth near-instantaneously.

By Mike Hatcher, contributing editor to optics.org

http://optics.org/news/9/3/31

Swiss pair share 2018 Zeiss Research Award

Tobias Kippenberg and Jean-Pierre Wolf recognized for work on frequency combs and ultra-intense laser pulses respectively.

Optics giant Zeiss has announced the 2018 winners of its prestigious Research Award - with both recipients of the biennial honor and €40,000 cash prize hailing from Switzerland.

Tobias Kippenberg and Jean-Pierre Wolf, professors at the Laboratory of Photonics and Quantum Measurements at the École Polytechnique Fédérale de Lausanne (EPFL) and the Biophotonics Institute at the University of Geneva respectively, received their prizes during the Zeiss Symposium entitled "Optics in the quantum world", which was recently held in Oberkochen.

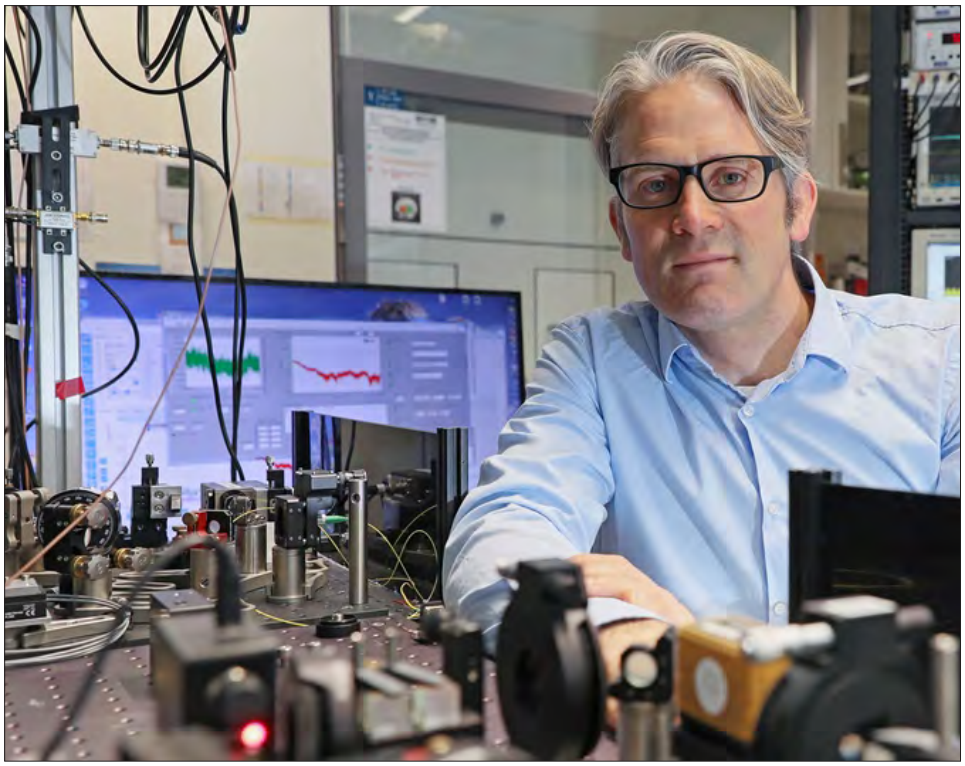

Photo: Zeiss.

EPFL researcher Tobias Kippenberg heads up the "K-Lab" laboratory of photonics and quantum measurements at EPFL in Switzerland.

Kippenberg is regarded as a pioneer in the field of cavity optomechanics and microresonator-based optical frequency combs. "His research has demonstrated that, by using microresonators – which can confine light in an extremely small space and guide it – the faint forces exerted by light rays can be used to measure and cool mechanical movements in the quantum regime," Zeiss said.

The phenomenon enables the development of high-precision sensors to measure mechanical movements several orders of magnitude more precise than currently available position sensors, and potentially sensitive enough to measure the quantum mechanical "zero point motion" of a mechanical oscillator.

Lightning seeds

Wolf's area of expertise is in ultra-short, ultra-intense laser pulses, used in atmospheric research and potentially able to control the weather, to some extent.

"His research makes it possible to find out more about pollutants in the Earth's atmosphere and potentially control lightning and condensation in clouds," Zeiss says. "This could even make it possible to prevent extreme weather."

Thus far, Wolf's work has been focused on applications of ultrafast spectroscopy for biological, medical and environmental research.

Photo: Zeiss.

Jean-Pierre Wolf heads up the Biophotonics Institute at the University of Geneva.

Zeiss' jury – which this year included previous winner and 2014 Nobel laureate Stefan Hell – also selected three "up and coming" recipients for its Young Researcher award.

Their selection will see the three winners - Irene Costantini from the European Laboratory for Nonlinear Spectroscopy in Florence, Italy; Kilian Heeg from the Max Planck Institute for Nuclear Physics in Heidelberg, Germany; and Fabian Stutzki from the Fraunhofer Institute for Applied Optics and Precision Engineering in Jena, also Germany – collect their prizes at Zeiss' April symposium.

Presented every two years, the main Zeiss Research Award dates back to 1990. Apart from Stefan Hell, previous winners who have gone on to win Nobel prizes include the late Ahmed Zewail, as well as Eric Cornell and Shuji Nakamura.

Joining Hell on this year's judging panel were chairman Jürgen Mlynek from Humboldt University of Berlin, Alain Aspect from Institut d'Optique in Palaiseau, previous winner Anne L'Huillier from Lund University, Zeiss' senior VP for corporate research and technology Ulrich Simon, and Andreas Tünnermann, director of the Fraunhofer Institute for Applied Optics and Precision Engineering in Jena.

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$12.2M funding round sees new CEO take charge at KMLabs

Former Zeiss executive Kevin Fahey takes the helm at the Colorado developer of cutting-edge ultrafast laser equipment.

KMLabs, the ultrafast laser systems company set up by the Kapteyn-Murnane research group at JILA in Colorado, has appointed a new CEO following its latest round of venture financing.

Kevin Fahey, who previously filled a series of executive-level roles at Carl Zeiss, takes over from co-founder Henry Kapteyn.

Kapteyn established the company alongside Magaret Murnane back in 1994, and will now shift to the role of executive VP, CTO, and board co-chair. Murnane will continue to sit on the KMLabs board and provide support for technology development, while Sterling Backus remains in his role as the company's chief scientist.

4-photon microscopy

The management switch comes just a couple of weeks after the Boulder-based firm filed details of a $12.2 million round of equity funding, in which Fahey was involved.

Supported by prior investors Intel Capital and the Colorado Impact Fund, the latest round is intended to support the release of more robust versions of KMLabs' state-of-the-art systems, and a focus on applications in advanced biophotonics and industrial markets.

Jackie Sturm, general manager of Intel's global supply management group and a member of the KMLabs board, commented: "The company is now poised to bring full solutions based on this technology to an expanded range of scientific applications, including neuroscience, materials research, and physics labs, as well relevance for industrial markets.

Fahey, who became CEO of Carl Zeiss' X-ray microscopy business when the German optics giant acquired Xradia back in 2013, added: "We are very excited to begin building the collaborations and the community that will enable emergent technologies like 3- and 4-photon microscopy, 2D-IR, and ultrafast photoemission spectroscopy."

products like its tabletop sources of coherent extreme ultraviolet (EUV) light.

"The results of development in recent years have generated class-leading and fully robust solutions within unusually small - laptop-to-tabletop-sized - form factors," claims the firm.

Image: KMLabs.

Before his executive roles at Xradia and Carl Zeiss Microscopy, new KMLabs CEO Kevin Fahey completed a Ph.D. and an M.S. in Materials Science and Engineering at Stanford University. He also holds a B.S. in Physics from the Massachusetts Institute of Technology.

"Even tabletop ptychographic imaging and EUV acoustic nanometrology will become practical realities for any laboratory," Fahey predicted. "KMLabs have developed phenomenal technology into which we will continue to make substantial investment. I am personally looking forward to working with this amazing team to drive the company's leadership in laser technology, collaborating with scientific and industrial thought leaders in these important fields to advance great technical approaches from pioneering science to everyday practical reality."

Tabletop EUV

The latest fundraising comes around 30 months after KMLabs secured $7.2 million in series A funding that was intended to extend the firm's manufacturing facilities, and accelerate the development of advanced

That kind of equipment is expected to become important for metrology and inspection tools required by the semiconductor industry for metrology and inspection applications related to the still-emerging technology ecosystem surrounding EUV lithography.

In a release announcing Fahey as the new CEO, Kapteyn noted: "We are very excited to see our company, which grew out of the commercialization of our research efforts, progress to this new, dynamic phase of its existence.

"We've built a solid foundation of advanced technology on which new integrated solutions will now be built, under leadership experienced at doing the same."

By Mike Hatcher, contributing editor to optics.org

http://optics.org/news/9/4/29

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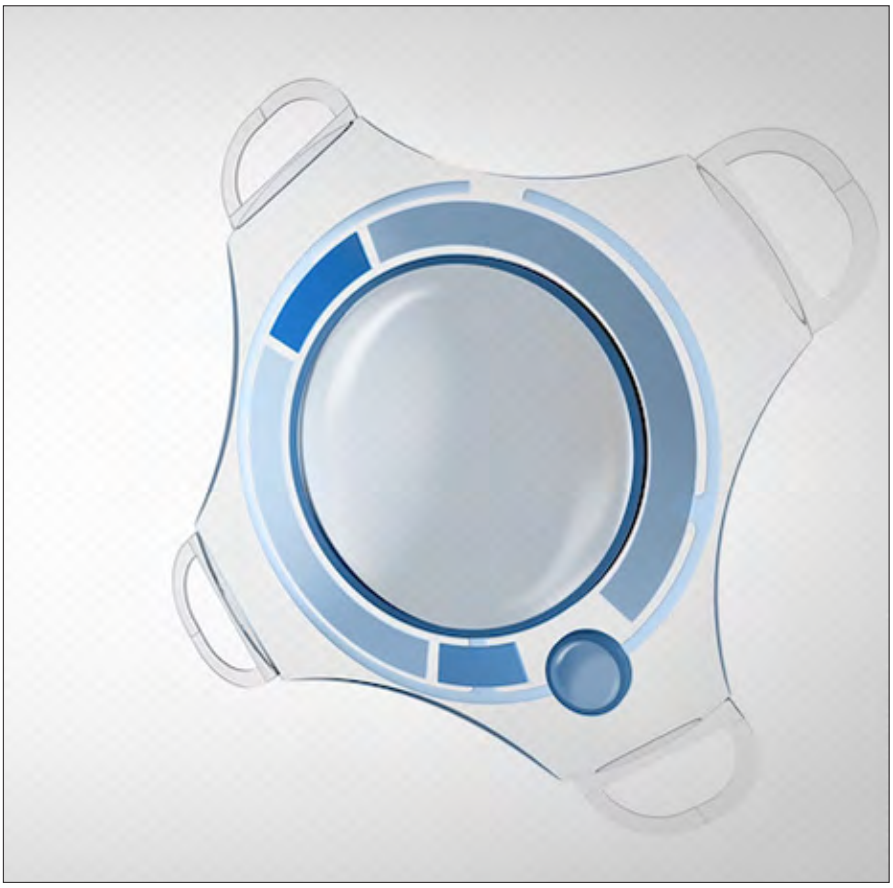
Active intraocular lens could offer real-time autofocus to patients

Swiss Advanced Vision aims to restore a more natural focusing function after ophthalmic surgery.

Intraocular lenses (IOLs), implanted in the eye as treatment for cataracts or myopia, are a growing global market in an ageing population, one estimated to be worth more than $4.5 billion by 2022.

Swiss Advanced Vision (SAV-IOL), a developer of IOLs designed for cataract surgery, has announced plans to develop a new class of lens that could potentially disrupt the IOL market and offer patients a more natural vision experience than existing lenses can provide.



Concept design credit: SAV-IOL.

Swiss Advanced Vision is developing a IOL to be placed in the eye's anterior chamber, as a complement to the eys's natural lens rather than a replacement.

SAV-IOL already markets a type of IOL with an extended depth of focus, or EDOF-IOL, in which an aspheric optical element in the center of the lens produces an elongated area of focus compared to conventional lenses. According to the company, the aspheric element turns the incident wavefront into a pseudo non-diffractive beam and enables a constant resolution and light intensity on the retina, leading to a higher level of comfort for the patient.

However, SAV-IOL itself has commented that there have been few recent innovations in the field of IOLs overall, despite the market size and opportunity, with the static design of all current lenses bringing inherent optical compromises in light distribution, resolution, and visual disturbance. In particular, IOLs lack an ability to provide the focusing reflex, termed accommodation, that natural crystalline lenses deliver.

The company's new development project aims to address these issues through an entirely novel approach to IOLs. It proposes an active lens with autofocus and wireless connectivity, termed Real-Time Autofocus Servo Control, or R-TASC.

The project is still at an early stage, with SAV-IOL aiming to raise CHF20 million over the next five years to move R-TASC towards market, but the company envisages a lens able to be fitted alongside an implanted monofocal lens for distance vision, or added to patients who already have a monofocal lens but want to restore their visual accommodation. The project could ultimately lead to an IOL platform able to incorporate augmented reality and other interactive or connected features.

Totally new in the ophthalmic field

"To our knowledge there is no current similar device under development," said Alexandre Pascarella, R&D director of SAV-IOL. "Most projects developing electro-active lenses concern external contact lenses, while most designs for prospective implantable devices describe solutions for the posterior chamber of the eye to replace the natural lens. The R-TASC device is intended to be placed in the eye's anterior chamber, sitting between the cornea and the iris, as a complement to the eye's natural lens rather than a replacement for it."

The active focusing function will require a power source and an energy gathering operation, both likely to be at the heart of SAV-IOL's forthcoming development project, and intended to allow focusing for any vision distance independently, solving the lack of accommodation reflex common to other IOLs.

"The main feature of the device is to change the lens focus function by autofocus means, therefore providing accommodation for the vision," commented Pascarella. "Some materials used in the device will be common to other intraocular lenses while some others required for the varifocal lens are more specific. But the proposed lens concept specifically dedicated to vision accommodation, its positioning, and its autofocus feature are totally new in the ophthalmic field."

By Tim Hayes, contributing editor to optics.org

http://optics.org/news/9/4/25

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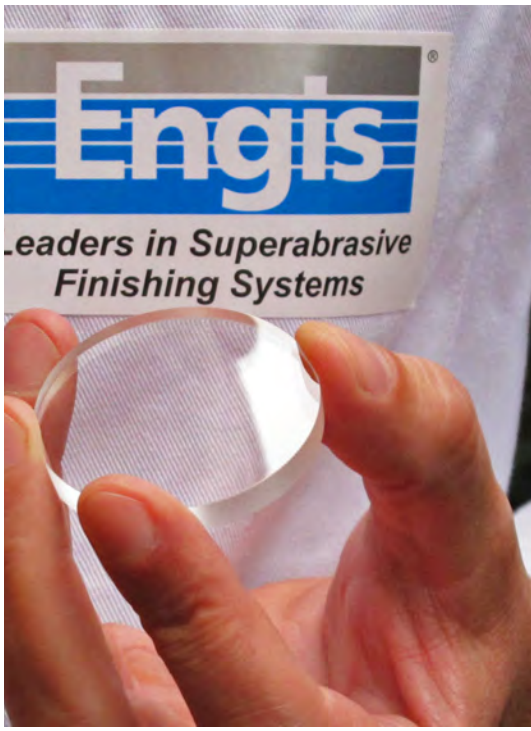
Sponsored Editorial

Engis Corporation Europe brings two new Polishing Products to Optatec

Superabrasives specialist, Engis Corporation Europe, is bringing two new polishing slurries - En-Sapp and En-Cer - to its Stand G53 in Hall 3 at Optatec.



En-Sapp, a polishing slurry for C-plane sapphire can produce high quality surfaces to 0.2nm Ra. The product can be diluted with water to reduce processing costs and its high stock removal rate makes it many times faster than colloidal silica. In addition, its non-crystalising formulation results in reduced machine maintenance, so increasing efficiency and extending machine life.

En-Cer, glass polishing slurry, can be used on both pitch and pad polishers and offers reduced polishing times while producing high-end surface quality. This product can also be diluted to achieve optimum performance on different types of glass and, in addition, suffers from no freezing restrictions, so can be supplied over winter months, reducing inventory and cost. Both En-Cer and En-Sapp can be re-circulated, so reducing processing costs and increasing efficiency.

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COAXwire laser process showcased at industry expos

Fraunhofer IWS showing updated laser methods at Hanover and Berlin for building up complex components with wire. ***By Matthew Peach***

During April's Hannover Messe and ILA Berlin events, the Fraunhofer-Institut für Werkstoff- und Strahltechnik (IWS), Dresden, presented two refined versions of its coaxial wire laser manufacturing system.

A newly-developed miniaturized version enables high-precision processing of complex components with fine wire; and in a macro version, the machining head can now be equipped with a hot-wire module.

Due to the positive response from users and what it calls "visibly growing demand", the IWS is presenting its next generation of coaxial laser wire processing optics under the name "COAXwire" in the fifth year since its introduction.

The Institute has equipped the system with specially-designed optical components, wire and media supply as well as cameras and sensors according to the application.

The development scientists have enabled monitoring of the cladding head as well as recording, processing and networking of relevant digital data as new functionalities.

COAXwire mini for complex parts

A completely new miniaturized version is on show at the Hannover Messe. The COAXwire mini is intended to close the gap to high- precision machining, especially for applications for repairing and generating high- quality and filigree complex components.

For the first time, fine wires from 300 to 600 µm in diameter can be processed in a machine-guided system – for certain alloys this applies to the particularly demanding range of 100 to 250 µm. This opens up the dimension from 200 to about 1200 µm structure resolution of the deposited material with complete material utilization.

Following new trends in laser source development, the system's optics are designed for the relevant wavelengths from

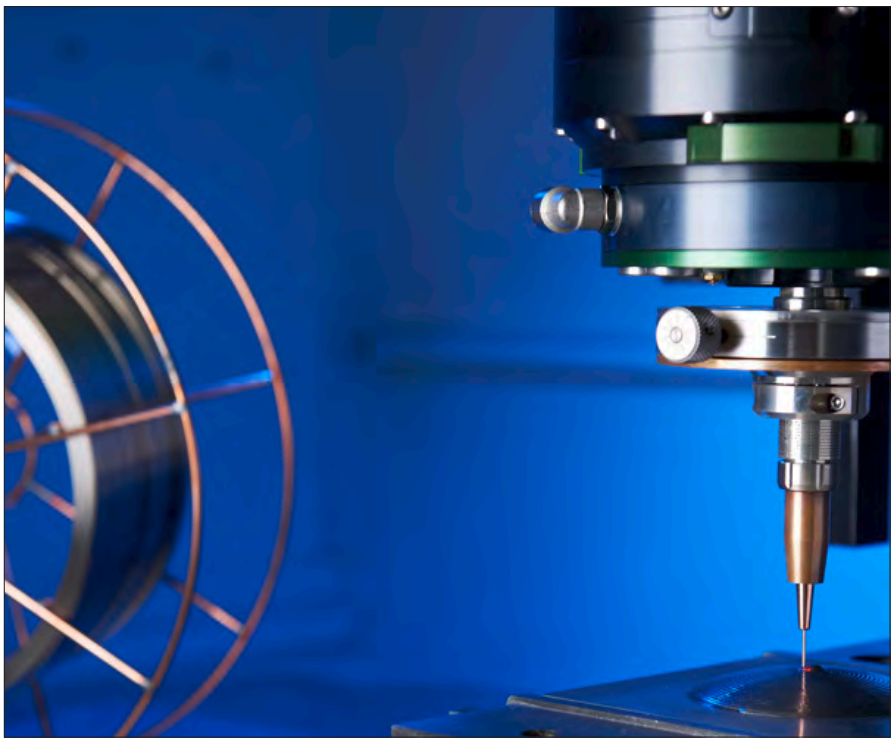

Photo © Jürgen Jeibmann

COAXwire laser processing head can be optionally equipped with hot-wire module.

890 to 1100 nm and from 450 to 550 nm. This qualifies the processing head for beam sources emitting in the green or blue light spectrum and opens up a better possibility to process materials such as copper or gold.

Increased productivity

With the second larger COAXwire version, which the IWS is presenting at the ILA expo, the laser wire processing head can be equipped with a hot wire module. While maintaining full directional independence and 3D capability, this option enables a 20 to 40 percent increase in deposition rate, depending on the material, says the institute.

In addition, the process window for efficient and defect-free processing of modern high-performance metallic materials is increased to the same extent. "Wires have always been the backbone of filler materials in welding technology," explained Prof. Steffen Nowotny, head of the Thermal Coating Department at the Fraunhofer IWS.

Photo: © Fraunhofer IWS Dresden.

Mini form enables fabrication of parts made of fine wires

He added, "Particularly in cladding processes, this permits the possibility to be inserted easily into the welding zone, to make full use of the wire and to protect environment, machine as well as operating personnel due to the characteristic clean processes."

http://optics.org/news/9/4/34

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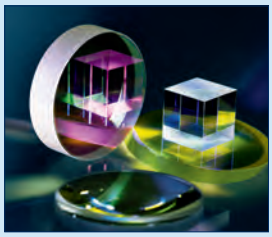

Contact Details

EKSMA Optics
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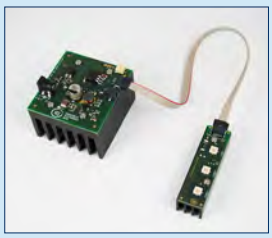

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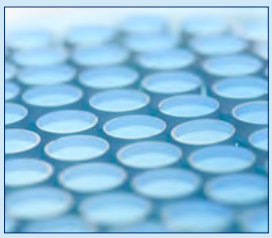

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P.O. Box 3370, Nesher
20306
Israel
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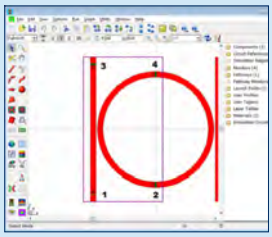

Contact Details
Synopsys, Optical Solutions Group
199 S. Los Robles Avenue
Suite 400
Pasadena, CA 91101
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The FREEDOM C spectrometers offer a very high resolution; down to 0.15 nm in a small foot print of only 61x65 mm for the UV, VIS and VIS-NIR range. It is equipped with the latest CMOS detector technology with 4096 pixels and a cylindrical lens to increase throughput.

The FREEDOM C can be supplied with Ibsen's own DISB electronics, which offer fast and accurate timing control for applications like LIBS and Raman.

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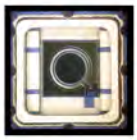

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- Testing and optimisation of laser designs
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- Optical design via simulation/modelling and incremental improvements
- Literature reviews
- Working with Manufacturing Production teams and New Product Development teams

Qualifications & Skills required:

- MSc in photonics / optics / lasers or MPhys
- General understanding of laser related subjects e.g. beam optics, polarisation optics, phase-matching criteria and objectives
- Excellent observational and analytical skills; Initiative and ability to think on feet
- Demonstrates good interpersonal skills; Good team player
- Keen interest in continuous improvement
- Excellent oral and written communication skills

Qualifications & Skills desirable:

- PhD in laser physics or related field
- 3+ years of Laser experience
- Proven track record in laser design
- Optical modelling
- Experience in 1 or 2 of the following fields is desirable but not essential: non-linear optics (SHG, OPO, Raman, …), fibre technologies (lasers, amplifiers, or telecoms), high-power laser diodes
- Programming ability: Python, C++
- Experience of Zemax
- Electronics experience
- Good organisational and planning skills

Salary: £30,000 to £40,000 plus bonus *(dependant on experience)*

Please send your CV and covering letter to HR@laserquantum.com

Bentham Instruments Limited

READING, United Kingdom

Head of Sales

Bentham Instruments Limited has a world-wide reputation in optics and photonics. A privately-owned company, for over 40 years, we have been at the fore-front of the development and manufacture of scientific instrumentation used to characterise sources of light, detectors and materials and for in vivo applications. Our diverse client base comprises industrial R&D, production and quality departments, universities, research establishments, hospitals and national metrology institutes. With an enviable reputation for quality and service and a global presence, we have an ambitious plan for growth.

Job Description

Bentham Instruments Limited is seeking a head of sales to drive growth and develop its position as a leading provider of light measurement instrumentation. The successful candidate will develop, manage and motivate the sales team to achieve ambitious sales targets. Based at our offices in Reading, UK, this role includes an element of international travel. This is an exciting opportunity for a proven and driven sales leader to join the team.

Responsibilities:

- Focus on sales growth through new market opportunities, hands-on leadership and developing a more proactive sales culture
- Develop, implement and drive performance metrics in all areas of the sales cycle
- Provide monthly, quarterly and annual sales forecasting to the management team
- Travel internationally as required to manage and support exhibition attendance, key accounts and distributors
- Establish and maintain long-term relationships with key accounts and distributors
- Stay abreast of competitor activity to maximise on opportunities
- Provide input into the product development, pricing strategy, product positioning and market prioritisation
- Work closely with the marketing department to identify new opportunities

Job Requirements

- A highly driven individual with a proven track record in developing and managing sales teams
- Minimum five year sales experience in international B2B sales, preferably within a similar industry
- Degree-educated in a science or engineering discipline desirable
- Thrive on building a highly-motivated team in order to achieve sales success
- A strong leader with exceptional interpersonal and communication skills
- An entrepreneurial, self motivated and enthusiastic self starter

The successful candidate must have the permanent right to work in the UK.

Please send your CV and covering letter to personnel@bentham.co.uk

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