

1st EOS Topical Meeting on Micro- and Nano-Optoelectronic Systems

7 - 9 December 2011, Ringhotel Munte am Stadtwald, Bremen, Germany

FINAL PROGRAMME

Featuring a special session on “Digital Holography”
on the occasion of Werner Jüptner’s 70th birthday

Cooperating Organisations



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1st EOS TOPICAL MEETING ON MICRO- AND NANO-OPTOELECTRONIC SYSTEMS

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SYNOPSIS

The European Optical Society, in cooperation with the Bremer Institut für angewandte Strahltechnik GmbH (BIAS) and the Institute for Microsensors, -actuators and -systems (IMSAS), is organizing the "1st EOS Topical Meeting on Micro- and Nano-Optoelectronic Systems" in Bremen from 7 - 9 December 2011.

The focus of the conference will be to explore new developments and applications in the field of optoelectronic systems using approaches based on micro- or nano-optics. Potential topics include (but are not limited to) design, simulation and fabrication of micro- and nano-optical systems, integration of micro- and nano-optical systems in micro-electronics, novel functionality, applications of microsystems using micro- and nano-optics including optical metrology and sensors. The last day of the conference will be devoted to digital holography with an emphasis on microsystems on the occasion of the 70th birthday of Werner Jüptner, former director of BIAS.

CHAIRS



Ralf B. Bergmann

BIAS - Bremer Institut für Angewandte Strahltechnik GmbH (DE)



Walter Lang

IMSAS - Institute for Microsensors, -actuators and -systems (DE)

This topical meeting is organised in cooperation with:



TOPICS

- **Design, simulation and fabrication of micro- and nano-optical systems**
 - Wave field propagation, rigid simulation and calculation
 - Geometrical optics for microsystems
 - Improving flexibility and efficiency
 - 2D/3D methods
- **Integration of micro- and nano-optical systems in micro-electronics**
 - On-chip optical functionalities
 - Photonics integrated circuit platform
- **Novel functionalities**
 - Overcoming diffraction limitations
 - Smart materials by micro- and nano-optics
 - New materials
- **Optical metrology for and by micro- and nanosystems**
 - Advancing standard methods by microsystems
 - Cheap and flexible measurement systems
 - Remote sensing systems in one-way applications
 - Autonomous systems
 - Novel imaging systems
- **Application of microsystems using micro- and nano-optics including sensors**
 - Optical data preprocessing
 - Computation and signal processing functions build-in at sensor level
 - Remote sensing using disposable sensors
 - Monitoring of gases, metals, chemicals
 - Industrial metrology and quality control
 - NDE by micro- and nano-optical systems
 - Structural health monitoring
 - 3D vision
 - Consumer applications
- **Digital holography with an emphasis on microsystems**

PROGRAMME COMMITTEE

Anand Asundi, Nanyang Technological University (SG)

Uwe Behringer, UBC Microelectronics (DE)

Stephanus Büttgenbach, IMT, TU Braunschweig (DE)

René Dändlicker, emeritus prof. (CH)

Cosme Furlong, WPI Worcester Polytechnic Institute (US)

Christophe Gorecki, FEMTO-ST, UFT des Sciences et Techniques (FR)

Steen Gruner Hanson, DTU Fotonik, Department of Photonics Engineering, Technical University of Denmark (DK)

Werner Jüptner, University of Aberdeen (GB)

Christoph von Kopylow, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE)

Michael Küchel, emeritus prof. (DE)

Malgorzata Kujawinska, Institute of Micro-mechanics and Photonics, Warsaw University of Technology (PL)

Bernd Michel, Micro Materials Center, Fraunhofer ENAS (DE)

Pramod Rastogi, EPFL - Ecole Polytechnique Fédérale de Lausanne (CH)

Lutz Rissing, Institut für Mikroproduktionstechnik, Leibniz Universität Hannover (DE)

Ventseslav Sainov, Bulgarian Academy of Sciences, Institute of Optical Materials and Technologies (IOMT-BAS) (BG)

Mitsuo Takeda, The University of Electro-Communications, Graduate School of Informatics and Engineering (JP)

PLENARY SPEAKER

Wednesday, 7 December (Room 3/4)

9:15 - 10:00



Andreas Tünnermann, Fraunhofer Institut für Angewandte Optik und Feinmechanik (FhG-IOF) (DE)

Micro and nanostructures for multichannel imaging – small lenses go big

INVITED SPEAKERS

Wednesday, 7 December (Room 3/4)

10:30 - 11:00



Michael J. Wale, Oclaro Technology Plc (UK)

Photonics²1: The European Technology Platform for Photonics

11:00 - 11:30



Wolfgang Osten, Institut für Technische Optik, Universität Stuttgart (DE)

Different approaches to overcome existing limits in micro and nano metrology

14:15 - 14:45



Brian Culshaw, Center for Microsystems and Photonics, University of Strathclyde (SCO)

Probing the Micro World with Lasers and Ultrasound – some Impressions and Observations

16:00 - 16:30



Michael Vellekoop, Vienna University of Technology (AT)

Optofluidic lenses for on-chip cytometers

Thursday, 8 December (Room 3/4)

08:30 - 9:00



Jürgen Jahns, FernUniversität in Hagen (DE)

Reflective-type integrated micro- and nano-systems

09:00 - 9:30



Ulrich Hofmann, Fraunhofer Institut für Siliziumtechnologie ISIT (DE)

Vacuum packaged MEMS scanning mirrors

INVITED SPEAKERS

Thursday, 8 December (Room 3/4)

13:45 - 14:15



Michael J. Wale, Oclaro Technology Plc (UK)

Integrated Photonic Systems on a Chip: Achievements and Prospect

14:15 - 14:45



Alberto Garcia-Ortiz, Institut für Theoretische Elektrotechnik und Mikroelektronik, Universitaet Bremen (DE)

Challenges of the on-chip system interconnects: an opportunity for integrated nano-optoelectronic systems

Friday, 9 December (Room 3/4)

11:30 - 12:00

Ryszard J. Pryputniewicz, Worcester Polytechnic Institute (US)

Title: *tba.*

14:30 - 15:00



James Trolinger, MetroLaser Inc. (US)

Gated Picosecond Digital Holography

16:00 - 16:30



John Watson, School of Engineering, University of Aberdeen (GB)

Submersible Digital Holographic Cameras and their Application

SPECIAL SESSION ON DIGITAL HOLOGRAPHY

Honouring W. Jüptner's 70th birthday

On the occasion of Werner Jüptner's 70th anniversary the last day of the conference is devoted to a special session on Digital Holography with an emphasis on microsystems, as part of the 1st EOS Topical Meeting on Micro- and Nano-Optoelectronic Systems.

Werner Jüptner, one of the most outstanding physicists in Germany, founded in 1977 together with Gerd Sepold the BIAS - Bremen Institute of Applied Beam Technology as the first civilian institution for use in laser science and technology which he directed until his retirement in 2006. His research interests were the coherent-optical measuring technology with an emphasis on holographic interferometry, physical fundamentals of laser technology and fundamentals of laser material processing.

In 1989 he was appointed by the University of Bremen as Chair for Laser Technology and metrology applications in physics/electrical engineering and by the WPI - Worcester Polytechnic Institute, USA, as an adjunct professor. The University of Aberdeen appointed him 6th Century Chair in laser engineering in 2007. There he became emeritus 2010. In 2012, Jüptner is going to chair the EOS Topical Meeting on Optical Systems for the Energy & Production Industries that is going to be held alongside EOSAM 2012 in Aberdeen, Scotland, from 25 to 28 September 2012.

In the course of his career he became member of various societies and associations. As a member of the EOS, he founded and initially directed the EOS Fellowship Committee. As a founding member of the WLT he acted as its treasurer until 2006. Besides he was founding member of the LZH - Laser Zentrum Hannover e.V. and of WE - Economic and Strukturrat Bremen-Nord e.V., which he chaired from 1989 – 2002, as well as of the Lions Clubs Ritterhude.

We congratulate Werner Jüptner to his anniversary, wish him all the best and thank him for his many valuable contributions to the optics community

W. Jüptner's contribution to Digital Holography

Since the 1970s Werner Jüptner has committed himself to the field of holography and its applications in science and technology. His major contribution was the invention and development of Digital Holography in co-operation with his longtime colleague Dr. Ulf Schnars.

Preliminary ideas and concepts were presented at the „Nato Advanced Research Workshop“ in Maratea in 1986. In his work, Werner Jüptner pointed out that a three-dimensional object recognition and scene detection would be possible under physical aspects. At that time, however, given technical conditions were far away from realization. A major step forward was made in the 1990s together with Ulf Schnars, who developed a recognized mapping method in his dissertation based on the aforementioned ideas.

Today, Digital Holography is a generally approved coherent-optical method with a wide variety of applications. These applications as well as manufacturing technologies in microsystems will be focussed on during the special session on Digital Holography. Three invited and eight regular speakers will introduce their research results and highlight new developments.



Werner Jüptner
Prof. Emeritus



Graphic by John Watson: *Submersible Digital Holographic Cameras and their Application*, 2011

GUIDED WALKING TOUR THROUGH THE HISTORIC CITY CENTRE OF BREMEN



Date: Wednesday, 7 December 2011
Departure: 17.30 hrs CET
Where: Entrance area, Ringhotel Munte am Stadtwald, Parkallee 299, 28213 Bremen

JOIN OUR WALKING TOUR THROUGH THE HISTORIC CITY CENTRE OF BREMEN FOLLOWED BY A FESTIVE DINNER AT THE BREMER RATSKELLER!

Discover and experience Bremen's key attractions that include the idyllic Schnoor Quarter and Böttcherstreet. Let yourself be enchanted by stories on patrician buildings round the Market Square, the city's history and local residents and take a picture of the Town Hall and Roland statue (UNESCO World Heritage Site).

Bremen's Market Square is regarded as one of the most beautiful in Europe. Its ensemble of historic buildings is unique and consists of the Town Hall, dating from 1405, St Peter's Cathedral, begun in 1042, the "Schütting", Bremen's historic Chamber of Commerce built in 1537, the merchants' houses that date back to the Weser Renaissance era around 1600, and the statue of Roland, the symbol of the city's freedom, erected in 1404. The modern "Haus der Bürgerschaft", Bremen's state parliament building, was built in 1966 and forms a sensitive counterpoint to the rest of the square.

In December, the festive season bathes Bremen in a soft light; fairy lights, candles and the lovingly adorned stalls create a special atmosphere. The Christmas market will be an outstanding experience during your visit to Bremen with its air full of delicious aromas and the "Glühwein" (mulled wine) which you are going to taste. There are numerous Christmas stalls, wonderfully romantic and beautifully decorated, assembled right in front of the town hall on the historical market square.

CONFERENCE DINNER AT BREMEN'S RATSKELLER



After the guided walk through the historic city centre, you will stop at Bremen's Ratskeller where your evening will continue with a festive dinner. The Ratskeller is one of Germany's oldest and most famous cellar taverns since 1405. More than 650 only German wines are served here.

Date: Wednesday, 7 December 2011
When: 20.00 hrs CET
Where: Hauff-Saal, Bremer Ratskeller,
Am Markt, 28195 Bremen

Should you have any special food requirements (vegetarian), please let us know by 2 December 2011 by sending an email to bremen@myeos.org in order to facilitate the organisation of the conference dinner.

VISIT TO BIAS & IMSAS



Join the guided visit to the Bremer Institut für Angewandte Strahltechnik GmbH (BIAS) or the Institute for Microsensors, -actuators and -systems (IMSAS) and discover the BIAS laser hall or the cleanroom of the University of Bremen.

Date: Thursday, 8 December 2011
Departure: 16.15 hrs CET
Where: Entrance area, Ringhotel Munte am Stadtwald, Parkallee 299, 28213 Bremen

GETTING TO IMSAS & BIAS

From Hotel Munte to BIAS

- starting at Hotel Munte you turn right into *Parkallee* and after 500 m please go straightforward to *Universitätsallee*
- at the traffic lights you turn left into *Bibliothekstraße*
- you pass the University and go straightforward into *Klagenfurter Straße*
- BIAS is located on the right side directly behind the *State and University Library (SUB)*

Distance: BIAS is about 2 km away from Hotel Munte
(Walking time: approx. 20 min.)

Directions between IMSAS & BIAS

- from NW 1 Building you turn right into *Otto-Hahn-Allee*
- at the traffic lights you go straightforward into *Bibliothekstraße*
- you pass the *University* and go straightforward into *Klagenfurter Straße*
- BIAS is located on the right side directly behind the *State and University Library (SUB)*

Walking time: approx. 10 min.

Further information:

- a detailed map can be downloaded at: www.imsas.uni-bremen.de/pictures/detailed_map_large.jpg
- a route planner is available at: maps.nokia.com/

From Hotel Munte to IMSAS

- starting at Hotel Munte you turn right into *Parkallee*
- at the first traffic lights you turn right into *Achterstraße* (that leads beside the river *Kleine Wümme*)
- after approximately 500 m you turn right into *Otto-Hahn-Allee*
- NW 1 Building and IMSAS are located directly on the left side

Distance: IMSAS is about 1 km away from Hotel Munte
(Walking time: approx. 10 min. walking distance)

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JOURNAL OF
THE EUROPEAN
OPTICAL SOCIETY
RAPID PUBLICATIONS

Discounted publication rates for
attendees of BREMEN 2011

The paper submitted must be an original contribution
that is connected to the topics of this EOS event.

Special publication rates:
(incl. 20 % discount)

- 320 € (non-member rate)
- 280 € (member rate)

Paper submission deadline:
31 January 2012

Journal Management Contact: Silke Kramprich
Phone: +49-511-2788-117 | Email: jeos-rp@myeos.org

www.jeos.org

VENUE



Take advantage of your stay in this northern city of Germany and discover the historical market square, the popular Weser promenade and the picturesque Schnoor quarter. Enjoy a hands-on approach to science and visit the Universum presenting science as an adventure, with more than 250 exhibits in the Science Centre and EntdeckerPark plus temporary exhibitions in the Schaubox. Visit the Bremen Christmas market and Schlachte Magic with its 160 Christmas stalls, beautifully decorated and assembled right in front of the 600-year-old town hall. For more information on Bremen and its destinations, please visit the official tourism website www.bremen-tourismus.de.



The 1st EOS Topical Meeting on Micro- and Nano-Optoelectronic Systems takes place at

Ringhotel Munte am Stadtwald
Parkallee 299
28213 Bremen
Phone: +49 (0)421 2 20 20
Fax: +49 (0)421 2 20 26 09
Email: info@hotel-munte.de

GETTING THERE

BY PLANE

There are frequent direct connections from a number of German and international airports. The City Airport Bremen is located in the south-west of the city and just 3.5 km away from the centre of Bremen.

The city centre is easily accessible by tram (line 6) or bus (line 52) that stops directly in front of the airport terminal and takes about 15 minutes to the centre. It departs at daytime every 10 minutes, at nighttime every 30 minutes.

The venue hotel can be directly reached by tram line 6 direction *Universität*. Alight *Klagenfurter Straße/Universität/NW1*. The journey takes about 45 minutes.

BY TRAIN

The InterCityExpress (ICE) and InterCity/EuroCity (IC/EC) provides services to the main station that is one of the most modern in Germany.

Regular and frequent services connect Bremen with all major German cities. There are two trains every hour to Hamburg in the north and Osnabrück, Münster and the Ruhr Area in the south as well as to Hanover. There are also trains (via main station) connecting the peripher areas of Bremen (two times per hour to North Bremen, final station *Bremen-Vegesack*, or to Verden via Mahndorf or Sebaldsbrück.

For timetables and journey planner, please refer to <http://reiseauskunft.bahn.de/bin/query.exe/en>.

BY TRAM/BUS

From the Main Station, take tram line 8 to stop *Kulenkampallee*. Change to Bus No. 22 direction *Universität* and alight at *Munte* after 2 stops.

Another option from main station is to take tram line 6 direction *Universität* and alight at *Klagenfurter Straße/University/NW1*.

BY CAR

The A1 motorway connects Bremen with Hamburg in the north and with Cologne in the south. The A27 goes north to Bremerhaven and Cuxhaven and south towards Hanover, Braunschweig, Berlin and other eastwards connections. The Bremer Kreuz intersection is a major transport hub linking the A27 Cuxhaven-Bremerhaven-Hannover motorway and the A1 Hamburg-Osnabrück-Rhineland motorway.

Coming from direction Bremerhaven, Hamburg, Hanover:

Change to A27 if necessary, take exit *Horn-Lehe/Universität*, direction *Universität*. After the 3rd traffic light turn right into *Universitätsallee*. The venue hotel is located after approx. 1 km on the left hand side.

Coming from direction Osnabrück:

Change from A1 to A27 at Bremer Kreuz direction Bremerhaven. Take exit *Horn-Lehe/Universität*, direction *Universität*. After the 3rd traffic light turn right into *Universitätsallee*. The venue hotel is located after approx. 1 km on the left hand side.

Find map on how to get to the venue hotel here:

www.myeos.org/download/Bremen2011/anfahrtsskizze_RinghotelMunteAmStadtwald.pdf.

GETTING AROUND IN BREMEN

BY CAR

Long before you reach the city centre the tourist information system and the parking information system will direct you to attractions, hotels and available car parks. Alternatively, please use the park+ride scheme which connects with tram and bus (BSAG) services. Information panels can be found at prominent locations throughout the city centre.

Low-emission zone

From July 2011, only cars with green discs will be permitted to enter the Bremen low-emission zone (LEZ). Low emission zones are identified by traffic signs and additional signs. The ordinance on the marking of vehicles stipulates that vehicles have to be marked with stickers (on the windscreen inside the vehicle) and lays down the criteria vehicles have to meet for the different kinds of stickers.

If you are staying in a hotel within the LEZ zone, you are allowed to enter the zone without the green sticker if you place the booking confirmation of the hotel behind the windscreen. The confirmation must be readable from outside the car and needs to state the name of the hotel and the duration of your stay. If your hotel does not lie within the low emission zone, but you want to cross the zone to get to your hotel you need to obtain a sticker or a certificate of exemption before driving into the zone.

However, you are allowed to access the parking garages *Ostertor/Kulturmeile*, *Stephani* and *Pressehaus* which are within the zone via *Osterdeich*, *Tiefer*, *Martinstraße*, *Am Brill*, *Faulenstraße*. For the other city centre parking garages, this exemption does not apply so that you need to have a windscreen sticker.

Find a map of the LEZ zone here:
www.umweltzone.bremen.de/sixcms/media.php/13/Karte_UZ_neu_klein.pdf

Please note that the Ringhotel Munte am Stadtwald is located outside the low-emission zone.

BY TRAM/BUS

Bremen offers an intensive public transportation network with trams and buses. Bremer Straßenbahn AG (BSAG), is the public transport provider for Bremen, offering tramway and bus services.

About 10 tram lines are run by BSAG.

Find map of the tram lines here:
www.urbanrail.net/eu/de/hb/bremen-map.png

The BSAG also operates quite many regular bus lines. In front of the Main Station and near the City Hall, there are main hubs.

Lines (from main station) to venue hotel:

Tram 6 (direction: *Universität*, stop: *Klagenfurter Straße/Universität/NW1*)

Runs Monday - Sunday (6.00 - 0.00 CET)



Tram 8 (direction: *Kulenkampallee*, stop: *Kulenkampallee*)

Runs Monday - Sunday (5.00 - 20.00 CET)

From Kulenkampallee to venue hotel:

Bus 22 (direction: *Universität/Lehe*, stop: *Munte*)

Runs Monday - Sunday (5.00 - 0.00 CET)

For the timetables, please click here:

www.myeos.org/download/Bremen2011/Timetable_Station-Munte.pdf

There are night buses and trams (indicated by an "N"), running through almost the whole night, departing every 30 minutes from the Main Station. Fares on the night network are 1 € in addition to normal individual, group or day fares. Tickets can be bought on the bus or tram. It is slightly cheaper to buy a set of 4 rides or a day pass for individuals or groups, or a weekly pass for individuals.

For all public transportation timetables and ticket fares, please see: www.bsag.de/eng/index.php

BY FOOT

Like other cities in Germany, Bremen's sights are located within easy walking distance from one another and as the city centre is quite compact. Since many streets in the centre are pedestrianized, exploring on foot definitely is the best option. Bremen's Main Station is located about 10 minutes away from the centre, the Markt. There are also bike rentals available.

Find a map of Bremen and its surroundings here:

www.myeos.org/download/Bremen2011/BTZ_Innenstadtplan_D_GB.pdf

FURTHER INFORMATION

More information about Bremen and its places of interest can be found at www.bremen-tourismus.de.

ACCOMODATION

Rooms at a special rate have been blocked at the venue hotel, the Atlantic Hotel Universum and the City Partner Hotel Residence Bremen nearby. Please find the booking details below:

Ringhotel Munte am Stadtwald ****

Phone: +49 (0)421 2 20 20

Fax: +49 (0)421 2 20 26 09

Parkallee 299, 28213 Bremen

info@hotel-munte.de

www.hotel-munte.de

Remarks: Free WiFi in rooms and common areas. Private parking chargeable (6 € per 24 hrs.).

Rate: Room per single occupancy incl. breakfast 95 €/night.

Keyword: Please refer directly to the hotel reservation via email or telephone. When making your reservation, please mention the keyword "1st EOS Topical Meeting".

Booked period: 6 - 9 December 2011

After 8 November, a reservation at this rate is possible only upon availability.

Atlantic Hotel Universum ****

Phone: +49 (0)421 24 67 0

Fax: +49 (0)421 24 67 500

Wiener Str. 4, Horn-Lehe, 28359 Bremen

reservierung.ahu@atlantic-hotels.de

www.atlantic-hotels.de/universum/hotel

Remarks: 500 m walking distance to venue hotel.

Free internet access in the rooms. Private parking chargeable (7/10 € per 24 hrs.).
Room for single occupancy incl. breakfast 99 €/night.

Double Room incl. breakfast 129 €/night.

Keyword: Please use this [registration form](#) when making your reservation and mention the keyword "EOS Meeting".

Booked period: 6 - 9 December 2011

After 8 November, rooms can be booked at this rate only upon availability.

City Partner Hotel Residence Bremen ***

Phone: +49 (0)421 34 87 10

Fax: +49 (0)421 34 23 22

Hohenlohestr. 42, Schwachhausen, 28209 Bremen

info@hotelresidence.de

www.hotelresidence.de

Remarks: 300 m walking distance from Main Station. 3.4 km (approx. 7 minutes by car) distance to venue hotel. Internet Access/WiFi available (3€/day). Parking chargeable (5/8 €/day).

Rate(s): Comfort Single Room incl. breakfast 88 €
Superior Single Room incl. breakfast 99 €.
Standard Single Room incl. breakfast 77 €.

Keyword: Please mention the keyword "EOS Meeting" when making your reservation.

Booked period: 7 - 9 December 2011



ALTERNATIVE HOTELS IN BREMEN

Please note that the room rates as well as the information on internet facilities (internet plugs, Wi-fi etc.) are taken from the homepages of the listed hotels. Rates may vary from the prices listed below (e.g. during fairs) according to room availability and reservation date. Please contact the following hotels directly to make your reservation.

SCHWACHHAUSEN (NEAR VENUE HOTEL)

Parkhotel Bremen *****

Prices: Single Room 125 - 185 €
Double Room 175 - 235 €
(breakfast not included, 25 €/day)

Address: Im Bürgerpark, 28209 Bremen
URL: www.park-hotel-bremen.de
E-Mail: relax@park-hotel-bremen.de
Phone: +49 (0)421 34 08 0
Fax: +49 (0)421 34 08 602
Remarks: Free WiFi available in all areas, free parking
Distance: 3.4 km (approx. 7 minutes by car)

Hotel Böltz am Park **

Prices: Single Room incl. breakfast 50 - 65 €
Double Room incl. breakfast 85 €

Address: Slevogtstraße 23, 28209 Bremen
URL: www.hotel-boelts.de
E-Mail: info@hotel-boelts.de
Phone: +49 (0)421 34 61 10
Fax: +49 (0)421 34 12 27
Remarks: Free WiFi available in rooms, no parking facilities available
Distance: 3.4 km (approx. 7 minutes by car)

CITY CENTRE

Swissôtel Bremen *****

Prices: Room for single occupancy incl. breakfast 465 €
Double Room incl. breakfast 525 €

Address: Hillmannplatz 20, Centre, 28195 Bremen
URL: www.swissotel.com/DE/Destinations/Germany/Swissotel+Bremen
E-Mail: bremen@swissotel.com
Phone: +49 (0)421 62 000 0
Fax: +49 (0)421 62 000 222
Remarks: Free WiFi in entire hotel, public parking chargeable (15 €/day)
Distance: 3.9 km (approx. 8 minutes by car)

Courtyard by Marriott Bremen ****

Prices: Double/Twin Room incl. Breakfast 79 - 185 €

Address: Theodor-Heuss-Allee 2, 28215 Bremen
URL: www.marriott.de/hotels/travel/brecy-courtyard-bremen
Phone: +49 (0)421 69 640 0
Fax: +49 (0)421 69 640 555
Remarks: WiFi and internet access chargeable (12.50 €/24 hrs.), private parking on site (10 €/day), public parking chargeable (4 €/day)
Distance: 3.2 km (approx. 6 minutes by car)

Maritim Hotel Bremen ****

Prices: Single Room incl. breakfast 129 €
Double Room incl. breakfast 129-155 €

Address: Hollerallee 99, Findorff, 28215 Bremen
URL: www.maritim.de/de/hotels/deutschland/hotel-bremen
E-Mail: info.bre@maritim.de
Phone: +49 (0)421 37 89 0
Fax: +49 (0)421 37 89 610
Remarks: Free WiFi available in rooms, private parking chargeable
Distance: 3.2 km (approx. 6 minutes by car)

Designhotel ÜberFluss ****

Prices: Design Single Room incl. Breakfast 139 - 154 €
Design Double Room incl. breakfast 184 - 199 €

Address: Langenstr. 72, 28195 Bremen
URL: www.hotel-ueberfluss.de
E-Mail: info@hotel-ueberfluss.de
Phone: +49 (0)421 322 86 0
Fax: +49 (0)421 322 86 77
Remarks: Directly located at the Weser promenade
Distance: 4.8 km (approx. 9 minutes by car)

Atlantic Grand Hotel Bremen *****

Prices: Single Room 135 - 145 €
(breakfast at additional charge, 20 €/day)

Address: Bredenstraße 2, Centre, 28195 Bremen
URL: www.atlantic-hotels.de/grandhotel/hotel
E-Mail: grandhotel@atlantic-hotels.de
Phone: +49 (0)421 620 62 0
Fax: +49 (0)421 620 62 500
Remarks: free WiFi available in rooms, private parking chargeable (20 €/day)
Distance: 5.2 km (approx. 10 minutes by car)

Hilton Bremen ****

Prices: Single Room 109 - 124 €
Double Room 124 €
(breakfast at additional charge, 16 €/day)

Address: Böttcherstr. 2, Centre, 28195 Bremen
URL: www.hilton.de/bremen
E-Mail: info.bremen@hilton.com
Phone: +49 (0)421 36 96 0
Remarks: WiFi available in rooms (22 €/day)
Distance: 5.8 km (approx. 12 minutes by car)

Hotel Classico ***

Prices: Single Room 106 €
Double Room 129 €
(breakfast at additional charge, 6,50 €/day)

Address: Hinter dem Schütting 1A, Centre, 28195 Bremen
URL: www.hotel-classico-bremen.de
E-Mail: info@hotel-classico-bremen.de
Phone: +49 (0)421 24 40 08 67
Fax: +49 (0)421 17 84 696
Remarks: Free WiFi available in entire hotel, private parking chargeable
Distance: 5.8 km (approx. 12 minutes by car)

ALTERNATIVE HOTELS IN BREMEN

InterCity Hotel Bremen ***

Prices: Double Room for single use
incl. breakfast 98 €
Double Room incl. breakfast 122 €
Address: Bahnhofsplatz 17-18, Centre, 28195 Bremen
URL: www.intercityhotel.com/Bremen
E-Mail: reservation@bremen.intercityhotel.de
Phone: 00800 – 784 683 57 (free-of-charge reservation hotline)
Fax: +49 (0)421 16 03 599
Remarks: Free WiFi and internet access available in entire hotel, public parking available (10 €/day)
Distance: directly located at the Central Station, 3.7 km (approx. 8 minutes by car)

Star Inn Bremen Columbus ***

Prices: Standard Single Room 59 €
Business Single Room 74 €
Business Double Room 84 €
(breakfast at additional charge, 11 €/day)
Address: Bahnhofsplatz 5 - 7, Centre, 28195 Bremen
URL: www.starinnhotels.com/de/bremen-columbus
E-Mail: bremen.columbus@starinnhotels.com
Phone: +49 (0)421 30 12 0
Fax: +49 (0)421 30 12 123
Remarks: Free internet access in public areas, WiFi in rooms chargeable (5 € /24 hrs.), public parking chargeable (11 €/24 hrs.)
Distance: 3.7 km (approx. 8 minutes by car)

Prizeotel Bremen-City **

Prices: Single Room 74 - 84 €
Double Room 79 - 89 €
Breakfast not included (9.75 €/day)
Address: Theodor-Heuss-Allee 12, 28215 Bremen
URL: www.prizeotel.com/hotel-bremen
<https://www.prizeotel.com/contact/reservation>
Phone: +49 (0)1805 68 77 49
Remarks: Free WiFi available in all areas, parking chargeable
Distance: 3.9 km (approx. 8 minutes by car)

Gästeträume

Prices: Apartments for 2 - 6 persons 70 - 80 €/night
Address: Sielwall 80 (office only), 28203 Bremen
URL: www.gaestetraeume.de
E-Mail: info@gaestetraeume.de
Phone: +49 (0)421 33 13 455
Fax: +49 (0)421 790 11 844
Remarks: Free WiFi in rooms available, free public parking
Distance: 4.6 km (approx. 9 minutes by car)

Further hotels and accomodation facilities in Bremen can be booked here:

www.bremen-tourismus.de/btz/bremenbuchen.cfm?loc=Hotels&m=2.021

HOSTELS

GastHaus Bremer Backpacker Hostel

Prices: Single Room 29 €
Twin Room 23 €/person
Room for 3 Persons 22 €/person
Room for 4 Persons 20 €/person
Dorm 18 €/person
Address: Emil-Waldmann-Str. 5-6, 28195 Bremen
URL: www.bremer-backpacker-hostel.de
E-Mail: gasthaus@bremer-backpacker-hostel.de
Phone: +49 (0)421 22 38 057
Fax: +49 (0)421 22 38 102
Remarks: Free WiFi available in rooms
Distance: 4 km (approx. 9 minutes by car)

Townside Hostel Bremen

Prices: Single Room 30 - 35 €
Twin Room 25 - 28 €/person
4/5-Bed-Room 21 - 23 €/person
6-Bed-Room 18 - 20 €/person
7-Bed-Room 17 - 20 €/person
9-Bed-Room 14 - 17 €/person
Address: Am Dobben 62, 28203 Bremen
URL: www.townside.de
E-Mail: info@townside.de
Phone: +49(0)421 78 01 5
Fax: +49 (0)421 70 40 91
Remarks: Free WiFi in common areas, private parking chargeable
Distance: 4.1 km (approx. 8 minutes by car)

The Grand Hostel Bremen

Prices: Single Room 27 €
Twin Room 38 - 46 €/room
3-Bed-Room 57 €/room
4-Bed-Room 64 - 88 €/room
5-Bed-Room 75 €/room
Address: Feuerkuhle 30, 28207 Bremen
URL: www.thegrandhostel.com
E-Mail: info@thegrandhostel.com
Phone: +49 (0)421 64 37 209
Fax: +49 (0)421 64 37 178
Remarks: Free private parking available
Distance: 6 km (approx. 12 minutes by car)

Schlafcompany

Prices: Single room (with shared bathroom) 33 €
Double room (with shared bathroom) 49 €
(breakfast at additional charge)
Address: Ölmühlenstraße 1-5, Centre, 28195 Breme
URL: www.schlafcompany.de
E-Mail: info@schlafcompany.de
Phone: +49 (0)421 27 67 921
Remarks: Free WiFi available, private parking chargeable (5 €/day)
Distance: 5.1 km (approx. 10 minutes by car)

INFORMATION FOR AUTHORS AND ATTENDEES

ORAL PRESENTATIONS

Time slots: Presenting authors are allotted 15 minutes (12 minutes presentation plus 3 minutes for discussion). Please plan your presentation accordingly to meet the 15 minute maximum.

Presentation upload: Speakers are requested to upload their presentation to the computer in the meeting room well in advance to their talk.

Presentation format: Please bring your presentation on an USB mass storage, CD-ROM or DVD and include all video files. File formats: ppt, pptx and pdf. A Windows-based presentation computer will be provided.

For Mac users: To make sure your presentation is displayed correctly, please:

- bring your presentation as pdf-file with fonts embedded or
- restrict yourself to Arial/Times New Roman (not Times)/Courier New (not Courier)/Symbol/Windings when creating your ppt - or pptx-file.

Technical equipment: All technical equipment (presentation computer, video projector, sound system, laser pointer) will be available on-site. It is not possible to use your personal laptop.

POSTER PRESENTATIONS

There will be **one** poster session during the conference. The poster session will be taking place at the get together of the conference on **Thursday, 8 December, 18.00 - 19.30 CET at the Bremer Institut für Angewandte Strahltechnik GmbH.**

Please see the programme to find out which number your poster has and look for the poster number at the poster boards on site. Poster authors are requested to be present at their posters during the official poster session. The poster set-up and removal is the responsibility of the authors only. Poster pins will be provided by the organisers.

Poster size maximum: A 0 (841 mm width x 1189 mm height; portrait format).

WHISKY TASTING



EOSAM 2012 moves to Aberdeen

In 2012 the EOS Annual Meeting moves from Paris to Aberdeen. For this reason, the office will offer a whisky tasting for all attendees of this topical meeting.

You will find it during the poster session at the get together on **Thursday, 8 December, 18.00 - 19.30 CET.**

REGISTRATION & FEES

At least one author of an accepted presentation is requested to register properly in advance to the conference.

The full-time registration fee includes the participation in all three meeting days, one copy of the Topical Meeting Digest CD-ROM, lunch and coffee breaks on all three meeting days and an expense contribution of 15 € for the social programme on Wednesday, 7 December 2011.

Registration category	Late/on-site fee (from 4 Nov.)	
	incl. 19 % VAT	excl. VAT*
Registration for members	535 €	449.58 €
Registration for non-members	595 €	500.00 €
Registration for student members	285 €	239.50 €
Registration for student non-members	305 €	256.30 €
Registration for one-day (9 Dec.)	330 €	277.31 €
Registration for accompanying person	200 €	168.07 €
Registration for accompanying person (social programme & conference dinner only)	70 €	58.82 €
Extra digest CD-ROM		
Member rate	40 €	33.61 €
Non-member rate	50 €	42.02 €

* **PLEASE NOTE:** Registrations from companies and non-university research institutes registered in EU countries (except Germany) are exempted from VAT, if VAT no. is given.

INFORMATION FOR AUTHORS AND ATTENDEES

Registration options

- Fax registration:** Register via fax, using the following form: [fax registration](#)
Payment options: credit card or bank transfer
- Online shop registration:** Register via our secure online shop: <http://www.myeos.org/shop>
Payment option: credit card only

EOS REGISTRATION DESK

The EOS registration desk is located in the foyer of the venue hotel (Ringhotel Munte am Stadtwald, Parkallee 299, 28213 Bremen). Please collect your material **on Tuesday afternoon from 17:00 - 18:00 CET or on Wednesday morning from 8.00 - 9.00 CET.**

Opening hours	information / receipts / confirmation of attendance / cash payment
Tuesday, 6 December	17:00 - 18:00 Attendees requiring a payment receipt or confirmation of attendance
Wednesday, 7 December	08:00 - 17:30 may obtain these documents onsite at the EOS registration desk.
Thursday, 8 December	08:30 - 16:00 Attendees paying by cash are requested to have the exact change
Friday, 9 December	08:30 - 16:30 ready in euros.

EOS CONFERENCE PROCEEDINGS (CD-ROM)

The registration includes a CD-ROM with the abstracts of all accepted, invited and plenary presentations at this topical meeting. The CD-ROM is ISBN numbered.

NOTE: A one-day registration does not include the digest CD-ROM. It can be ordered separately on-site.

The EOS does not publish conference proceedings with extensive papers. Authors who wish to publish in-depth papers are welcome to take advantage of JEOS:RP. The publication offer for JEOS:RP is an option but no obligation.

JEOS:RP SPECIAL PUBLICATION OFFER



All regular attendees of this EOS event receive a 20% discount on the publication rate for the Journal of the European Optical Society - Rapid Publications (JEOS:RP). The paper submitted must be an original contribution that is connected to this Topical Meeting and must be submitted no later than 31 January 2012 (www.jeos.org).

Special publication rates

- 320 € (instead of 400 €) for non-members
280 € (instead of 350 €) for full EOS members

JEOS:RP will dedicate a special issue to micro- and nano-optoelectronic systems. This special issue will be refereed and is planned to appear timely after the conference.

BEST STUDENT PRESENTATION AWARD



The best student oral contribution and the best student poster presentation will be awarded a diploma and a prize sponsored by Springer. All student oral and poster contributions are eligible to the prize. The criteria for the award are relevance, originality, scientific merit and clarity.

SPONSORING & ADVERTISING OPPORTUNITIES

Boost your visibility at this topical meeting with some sponsoring opportunities.

- Please download our [advertiser's and sponsor's guide](#) including all specifications and prices for further information. For individual offers or sponsoring packages, please contact Julia Dalichow at dalichow@myeos.org or via phone: +49-(0)511-27-2673.

WIFI ACCESS

Free WIFI access will be available at the venue hotel and the meeting room.

Tuesday, 6 December

17:00 - 18:00 Pre-Registration

Wednesday, 7 December

08:00 - 09:00 Registration

09:00 - 09:15 WELCOME BY THE CHAIRS

09:15 - 10:00 PLENARY TALK

Micro and nanostructures for multichannel imaging – small lenses go big
Andreas Tünnermann

10:00 - 10:30 Coffee break

10:30 - 11:00 INVITED TALK

Photonics21: The European Technology Platform for Photonics
Michael J. Wales

11:00 - 12:45 MICRO AND NANO METROLOGY AND FABRICATION I

11:00 - 11:30 INVITED TALK

Different approaches to overcome existing limits in optical micro and nano metrology
Wolfgang Osten

12:45 - 14:15 Lunch break

14:15 - 15:15 MICRO AND NANO METROLOGY AND FABRICATION II

14:15 - 14:45 INVITED TALK

Probing the Micro World with Lasers and Ultrasound – Some Impressions and Observations
Brian Culshaw

15:15 - 16:00 Coffee break

16:00 - 17:00 PHOTONIC MICRO AND NANO SYSTEMS

16:00 - 16:30 INVITED TALK

Optofluidic lenses for on-chip cytometers
Michael Vellekoop

~17:30 Departure to City Centre

18:00 - 20:00 Guided walking tour through the historic city centre

20:00 - 23:00 CONFERENCE DINNER
Hauff-Saal, Bremer Ratskeller
Am Markt, 28195 Bremen

Thursday, 8 December

08:30 - 10:45 MICROSYSTEMS, MEMS AND MOEMS

08:30 - 09:00 INVITED TALK

Reflective-type integrated microsystems
Jürgen Jahns

09:00 - 09:30 INVITED TALK

Vacuum packaged MEMS scanning mirrors
Ulrich Hofmann

10:45 - 11:15 Coffee break

11:15 - 11:45 PLASMONICS

11:45 - 13:45 Lunch break

13:45 - 16:15 PHOTONIC SYSTEMS

13:45 - 14:15 INVITED TALK

Integrated Photonic Systems on a Chip: Achievements and Prospect
Michael Wales

14:15 - 14:45 INVITED TALK

Challenges of the on-chip system interconnects: an opportunity for integrated nano-optoelectronic systems
Alberto Garcia-Ortiz

~16:15 Departure to IMSAS & BIAS

16:45 - 17:45 Visit IMSAS & BIAS

17:45 Departure from IMSAS to BIAS

18:00 - 19:30 POSTER SESSION
FEAT. GET TOGETHER & WHISKEY TASTING



BIAS - Bremer Institut für
Angewandte Strahltechnik GmbH
Klagenfurter Str. 2, 28359 Bremen

Friday, 9 December

09:00 - 10:30 PHOTONIC COMPONENTS

10:30 - 11:15 Coffee break

11:15 - 13:00 SESSION ON DIGITAL HOLOGRAPHY I

11:15 - 11:30 Laudatio
Ralf B. Bergmann

11:30 - 12:00 INVITED TALK

Title tba.
Ryszard J. Pryputniewicz

13:00 - 14:30 Lunch break

14:30 - 16:30 SESSION ON DIGITAL HOLOGRAPHY II

14:30 - 15:00 INVITED TALK

Gated Picosecond Digital Holography
Jim Trolinger

16:00 - 16:30 INVITED TALK

Submersible Digital Holographic Cameras and their Application
John Watson

16:30 Coffee break

~16:45 Farewell

END OF EOS TOPICAL MEETING

09:00 - 09:15

WELCOME BY THE CHAIRS

09:15 - 10:00

PLENARY TALK

Micro- and nanostructures for multichannel imaging - small lenses go big*A. Tünnermann; Fraunhofer Institute for Applied Physics and Precision Engineering (DE).*

Micro- and nanooptics facilitate the realization of novel types of low cost multi aperture imaging systems. The current status and perspectives of these systems are reviewed. [4666]

10:00 - 10:30

Coffee break

10:30 - 11:00

Invited Talk

Photonics²¹: The European Technology Platform for Photonics*M.J. Wales; Oclaro Technology Ltd. (GB).*

Photonics²¹ aims to unite the photonics community in Europe and enable it to speak with a common voice in establishing public policy and steering private investment. This paper aims to explain why Photonics²¹ is needed and how it works, show some of its achievements and outline current challenges. [4830]

11:00 - 12:45

MICRO AND NANO METROLOGY AND FABRICATION I*Chairs: C. von Kopylow, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE)*

11:00 - 11:30

Invited Talk

Different approaches to overcome existing limits in optical micro and nano metrology*W. Osten; Institut für Technische Optik ITO (DE).*

Modern products are becoming more miniaturised, more complex and have an increasing number of functionalities. The critical dimensions of structures written in silicon are becoming considerably smaller than the wavelength of the applied light source and this trend is to be sustained for the coming years until the next-generation patterning using extreme UV is implemented. [4769]

11:30 - 11:45

Fabrication of Lenses made of Adhesive Using a Silicon Wafer Clamp*D. Hoheisel, L. Rissing; Leibniz Universität Hannover (DE).*

A new approach for fabricating polymer lenses is presented in this paper. The lenses are fabricated by filling circular holes in a Si wafer with an UV cured adhesive. The free surface of the glue performs initially a liquid lens due to the surface tension. This shape is then preserved by curing with UV-hardening light. The backside of the lenses is polished and afterwards, the lenses are released from the wafer, which is serving as a frame. [4757]

11:45 - 12:00

Microlens production in a microtechnological dry etch and reflow process for display applications*T. Knieling¹, M. Shafiq², W. Lang², W. Benecke¹; ¹Fraunhofer Institut für Siliziumtechnologie (ISIT) (DE), ²IIMSAS - Institut für Mikrosensoren, -aktuatoren und -systeme, Universität Bremen (DE).*

The fabrication of circular microlenses with diameters of 130 µm consisting of quartz glass in a photoresist reflow and dry etch structure transition process is demonstrated. The lenses were designed for focusing collimated light on the pixel center regions of a transparent interference display, which was also produced in microtechnological process steps. The implementation of microstructured refractive elements for light collection is helpful for increasing display brightness and contrast since incoming collimated light is partially blocked by opaque metallic ring contacts at the display pixel edges. [4714]

12:00 - 12:15

Photon Management Structures for Solar Cells - From Modeling to Fabrication*B. Bläsli¹, H. Hauser¹, M. Peters¹, J. Benick¹, A. Mellor², S. Jüchter¹, Ch. Wellens¹, A. Guttowski¹, O. Höhn¹, V. Kübler¹, A.J. Wolf¹; ¹Fraunhofer Institute for Solar Energy Systems ISE (DE), ²Instituto de Energía Solar, Universidad Politécnica de Madrid (ES).*

Photon management structures are of increasing importance for solar cells. A coupled wave-optical and electrical simulation approach is introduced. Furthermore, fabrication technologies based on interference and nanoimprint lithography are presented. Simulation and experimental results are shown for an exemplary system. [4723]

Ringhotel Munte am Stadtwald, Room 3/4

12:15 - 12:30

STUDENT PRESENTATION

Fabrication of low-loss multi-layer compatible hydrogenated amorphous silicon optical thin films for photonic applications*T. Lipka, J. Amthor, O. Horn, J. Müller; Hamburg University of Technology, Institute of Micro Systems Technology (DE).*

Low-loss hydrogenated amorphous silicon material is evaluated for the employment in modern telecommunication and on-chip applications. The plasma-deposited material is characterized by thin film metrology. Photonic wire based couplers, MZIs, ring and racetrack resonators were designed, fabricated, and optically characterized. [4753]

12:30 - 12:45

Ray tracing based on poynting-vectors for an aspherical lens coated with antireflective subwavelength structured surfaces*A. Mizutani, N. Nakatochi, S. Hamataka, H. Kikuta; Osaka Prefecture University (JP).*

A ray-tracing method based on poynting-vectors with the rigorous coupled wave analysis (RCWA) has been discussed for calculating wavefront aberration of a lens coated with periodic subwavelength structured surfaces (SWS). Beam shifts in SWS layers and the wavefront aberration of the lens were investigated. [4722]

12:45 - 14:15

Lunch break

14:15 - 15:15

MICRO AND NANO METROLOGY AND FABRICATION II*Chairs: M. Kujawińska, Warsaw University of Technology (PL)*

14:15 - 14:45

Invited Talk

Probing the Micro World with Lasers and Ultrasound - Some Impressions and Observations*C. McKee, I. Armstrong, A. Cleary, G. Thursby, G. Pierce, B. Culshaw; University of Strathclyde, Electronic and Electrical Engineering Department (GB).*

This paper will examine the principles and prospects for optically generated and detected ultrasound in the context of the characterisation of microscale structures. The objective of the work reported here has been to assess the applicability of this technique to implement non-contact measurements of multiple mechanical parameters, particularly in plate-like samples. Parameters of interest may include: layer thickness; layer modulus, Poisson ratio and density. [4767]

14:45 - 15:00

Measuring Micro- and Nanostructures with Heterodyne Interferometry*C. Rembe; Polytec GmbH (DE).*

Heterodyne interferometry can be used to measure the time dependent electrical field vector with GHz bandwidth and with a resolution that is at or at least is close to the shot-noise level of the detected measurement light. This measurement makes possible a meaningful characterization of micro- and nanostructures. [4675]

15:00 - 15:15

STUDENT PRESENTATION

Determination of nanoscale inhomogeneities in scattering and absorbing media*D.N. Vavulin, A.V. Alfimov, A.V. Panteleyev, E.M. Arysanova, S.A. Chivilikhin; Saint-Petersburg State University of Informational Technologies, Mechanics and Optics (RU).*

In this paper, we propose a method for determining the size of nanoscale inhomogeneities in scattering and absorbing medium by comparing the theoretical and experimental dependences of the transmission medium on different wavelength of the light. The method was tested on a sample of nanoporous glass. [4684]

15:15 - 16:00

Coffee break

NOTES

Ringhotel Munte am Stadtwald, Room 3/4

16:00 - 17:00

PHOTONIC MICRO AND NANO SYSTEMS

Chair: L. Rissing, Institut für Mikroproduktionstechnik, Leibniz Universität Hannover (DE)

16:00 - 16:30

Invited Talk

Optofluidic lenses for on-chip cytometers

M.J. Vellekoop, M. Rosenauer; Institute of Sensor and Actuator Systems, Vienna University of Technology (AT).

The realization of cytometers on chip-level requires the integration of a few functions. The positioning and line-up of cells in the middle of the channel, illumination of the cells by a focused light beam, and the light detector should all be miniaturized. Especially the illumination of the passing cells requires extra attention because efficient focusing can dramatically increase the sensitivity of the system. The application of adjustable optofluidic lenses is a new technique that allows 2D and even 3D light beam focusing. The design and realization of such lenses will be discussed in this contribution. The feasibility of the optofluidic cytometer is shown by first tests of cell viability and by cell type determination. [4740]

16:30 - 16:45

STUDENT PRESENTATION

Cell Screening With PDMS-Based Photonic lab-on-a-chip Systems

B. Ibarlucea¹, J. Vila-Planas¹, E. Fernández-Rosas^{1,2}, S. Demming³, C. Nogués², J.A. Plaza¹, C. Fernández-Sánchez¹, S. Büttgenbach³, A. Llobera¹; ¹Instituto de Microelectrónica de Barcelona, IMB-CNM(CSIC) (ES), ²Universitat Autònoma de Barcelona (UAB), Departament de Biologia Cel·lular (ES), ³Technische Universität Braunschweig, Institut für Mikrotechnik (DE).

A low-cost photonic lab-on-a-chip with three different working regimes for cell screening is presented: scattering, scattering+absorbance and absorbance. A Limit of Detection (LOD) of 53 ± 1 cells has been obtained. It has also been used for measuring dead/live cell ratios, obtaining a LOD of $6.7 \pm 0.3\%$ of dead cells. [4718]

16:45 - 17:00

STUDENT PRESENTATION

High-Sensitive Refractive Index Sensor Using a Resonant Grating-Waveguide on a Metal Substrate

S. Urakawa, A. Mizutani, H. Kikuta; Osaka Prefecture University (JP).

A high-sensitive refractive-index sensor using a resonant grating waveguide on a metal substrate has been developed. The resonant angle of incidence was as sensitive as that of a surface-plasmon-resonance (SPR) sensor, and the full-width at half-maximum (FWHM) of the resonant angle was narrower than the SPR sensor. [4717]

17:30

Departure to City Centre

18:00 - 20:00

Guided walking tour through the historic city centre

20:00 - 23:00

CONFERENCE DINNER

(Hauff-Saal, Bremer Ratskeller
Am Markt, 28195 Bremen)

NOTES

Ringhotel Munte am Stadtwald, Room 3/4

NOTES

08:30 - 10:45

MICROSYSTEMS, MEMS AND MOEMS*Chairs: L. Rissing, Institut für Mikroproduktionstechnik, Leibniz Universität Hannover (DE)*

08:30 - 9:00

Invited Talk

Reflective-type integrated micro- and nano-systems*J. Jahns, M. Bohling, A. Edelmann, S. Helfert, C.A. Jones; FernUniversität Hagen, LG Optische Nachrichtentechnik (DE).*

Reflective-type elements are of interest in many areas of micro- and nano-optics. Here, we consider three examples: a) a purely reflective integrated micro-optical pulse shaper, b) a tapped-delay line filter using a micro-retroreflector array, and c) a plasmonic coupler using a Fresnel-zone plate structure. [4829]

09:00 - 09:30

Invited Talk

Vacuum packaged MEMS scanning mirrors*U. Hofmann, J. Janes, W. Benecke; Fraunhofer ISIT, Department of Microsystems (DE).*

This paper reports on a recent improvement in MEMS scanning mirror technology. Vacuum encapsulation of MEMS scanning mirrors on wafer level is the key to overcome prior limits with respect to scan angle, scan frequency and mirror aperture size, exemplarily shown by a LIDAR sensor and a laser scanning pico projector. [4720]

09:30 - 09:45

Free-space micro-machined microoptical bench for assembling of hybrid MOEMS*C. Gorecki¹, S. Bargiel¹, K. Rabenoroosa², C. Clévy², P. Lutz²; ¹Micro Nano Sciences and Systems Department (MN2S), FEMTO-ST (UMR CNRS 6174/UFC/ENSMM/UTBM) (FR), ²Automatic Control and Micro-Mechatronic Systems department (AS2M), FEMTO-ST (UMR CNRS 6174/UFC/ENSMM/UTBM) (FR).*

We propose a technology platform for the integration of hybrid MOEMS on a reconfigurable free-space microoptical bench. Microoptical bench includes a micro-machined submount, movable carriers and holders to permit the building of dynamically-aligned, reconfigurable optical microsystems. Manipulation and final assembly of MOEMS components is obtained by the approach of micro-assembly workcell. [4708]

09:45 - 10:00

Cavity Optomechanics - Achieving quantum control over nanomechanical motion using radiation pressure of light*E. Verhagen¹, S. Deleglise^{1,2}, S. Weis^{1,2}, E. Gavartin^{1,2}, A. Schliesser^{1,2}, T.J. Kippenberg^{1,2}; ¹École Polytechnique Fédérale de Lausanne (EPFL) (CH), ²Max-Planck-Institut für Quantenoptik (DE).*

The mutual coupling of mechanical and optical degrees of freedom has given rise to a new research field, cavity optomechanics. In this talk the possibilities to cool, amplify and achieve coherent quantum control over mechanical oscillators in the form of toroidal microresonators is presented. [4712]

10:00 - 10:15

Functional tests of MEMS/MOEMS parallel inspection station "SMARTIEHS"*M. Kujawinska¹, M. Józwiak¹, A. Styk¹, R. Paris², P. Lambele³, S. Bargiel⁴; ¹Warsaw University of Technology (PL), ²IMMS (DE), ³Heliotis AG (CH), ⁴CNRS FEMTO-ST (FR).*

Testing of technical and material properties of M(O)EMS calls for precise measurement tools that allow for non contact and non contaminating inspection. Nowadays, the inspection step is one of the most serious bottlenecks in mass production of M(O)EMS. To remove this bottleneck test equipment needs to overcome the high ratio between required measurement resolution and wafer size. This demand is priority in the design of SMARTIEHS M(O)EMS inspection station. [4754]

10:15 - 10:30

STUDENT PRESENTATION

Fabrication Processes and Technologies for Monolithic InP Microsystems*N.P. Sijwak, X.Z. Fan, R. Ghodssi; University of Maryland, MEMS Sensors and Actuators Laboratory, Department of Electrical and Computer Engineering (US).*

The extension of microelectromechanical systems (MEMS) from Si-based to indium phosphide (InP)-based devices is not a straightforward technology transfer, particularly in monolithic designs. We present a review of challenges in this process and the current status of the InP microsystem field. [4737]

Ringhotel Munte am Stadtwald, Room 3/4

10:30 - 10:45

STUDENT PRESENTATION

Characterisation of a MEMS Pressure transducer using Laser Generated Ultrasound

C. McKee, B. Culshaw, I. Armstrong, A. Cleary, G. Thursby; University of Strathclyde, Electronic and Electrical Engineering Department (GB).

Laser generated ultrasound is used as a tool to characterise MEMS pressure transducers. The acoustic waves are detected using a large bandwidth interferometer and time-frequency representations are used to analysis the dispersion relations that define guided acoustic waves in plates. [4759]

10:45 - 11:15

Coffee break

11:15 - 11:45

PLASMONICS

Chairs: M. Bülters, BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE)

11:15 - 11:30

A novel imaging technique for plasmonic nano-optical systems

V.K. Valev¹, A.V. Silhanek², B. De Clercq³, D. Denkova², O.A. Aktsipetrov⁴, M. Ameloot³, V.V. Moshchalkov², T. Verbiest¹; ¹Molecular Electronics and Photonics, INPAC, Katholieke Universiteit Leuven (BE), ²Nanoscale Superconductivity and Magnetism, Pulsed Fields Group, INPAC, Katholieke Universiteit Leuven (BE), ³University Hasselt and transnational University Limburg, BIOMED (BE), ⁴Department of Physics, Moscow State University (RU).

Imaging the plasmonic fields in nano-optical systems is essential for understanding their unusual optical properties. However, the diffraction limit remains an important obstacle. Here we report on a novel imaging technique that offers resolution beyond that limit. Our method is fast, user friendly and widely applicable. [4744]

11:30 - 11:45

STUDENT PRESENTATION

Gain and loss in metal-semiconductor plasmonic waveguides

D.Yu. Fedyanin, A.V. Arsenin; Moscow Institute of Physics and Technology (State University) (RU).

We present a scheme of surface plasmon polariton (SPP) amplification in metal-semiconductor structures that is based on a minority carrier injection in a Schottky diode. Compact size and a planar structure of the proposed amplification scheme gives a possibility to use it in nanoscale circuits and also to design spasers. [4745]

11:45 - 13:45

Lunch break

NOTES

Ringhotel Munte am Stadtwald, Room 3/4

13:45 - 16:15

PHOTONIC SYSTEMS

Chairs: W. Lang, IMSAS- Institute for Microsensors, -actuators and -systems (DE)

NOTES

13:45 - 14:15

Invited Talk

Integrated Photonic Systems on a Chip: Achievements and Prospects*M.J. Wales; Oclaro Technology Ltd. (GB).*

Monolithic integration of diverse optical functions on a single chip provides an attractive solution for many applications in photonics. This paper reviews the current state of the art and examines new approaches to design and manufacture that could have important economic impact. [4831]

14:15 - 14:45

Invited Talk

Challenges of the on-chip system interconnects: an opportunity for integrated nano-optoelectronic systems*A. García-Ortiz; University of Bremen, Inst. of Electrodynamics and Microelectronics (DE).*

Interconnect architectures are becoming a major bottleneck for the design of modern System-on-Chip. This talk discusses the challenges of those architectures, and the role that integrated nano-optoelectronic systems can play to solve them. [4768]

14:45 - 15:00

Novel three-dimensional Polymer Waveguides for Optical on-Chip Interconnects*M. Bülters, M. Schröder, C. von Kopylow, R.B. Bergmann; BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE).*

A novel concept for realising a three-dimensional polymer optical waveguide for optical on-chip communication is presented. Photonic on-wafer structures like waveguides, resonators, splitters and couplers can be realised with an extended freedom of design to the third dimension. [4755]

15:00 - 15:15

Novel concept for three-dimensional polymer waveguides*M. Schroeder, M. Buelters, V.V. Parsi Sreenivas, C. von Kopylow, R.B. Bergmann; BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE).*

New developments in micro- and nano-technology make it possible to create freeformed three-dimensional structures. This has a high potential for photonic applications like optical waveguides. Here, we present a simulation study for a novel polymer three-dimensional waveguide design. [4732]

15:15 - 15:30

Nanosized Subsurface Modification of mono-crystalline Silicon via Non-Linear Absorption*V.V. Parsi Sreenivas, M. Bülters, C. von Kopylow, R.B. Bergmann; BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE).*

We introduce a novel method of optically inducing nanosized subsurface structures using non-linear absorption of near infra red (NIR) light in mono-crystalline silicon. We present an analytical model describing the physical processes such as multiphoton absorption and self focussing. Initial tests are presented showing the optically separated wafers via subsurface modifications. [4733]

15:30 - 15:45

STUDENT PRESENTATION

Fiber Bragg grating based bend sensor with compact evaluation unit*S. Kibben¹, M. Koerd¹, M. Kropp², G. Dumstorff², W. Lang², F. Vollertsen¹; ¹BIAS - Bremer Institut für angewandte Strahltechnik GmbH(DE), ²IMSAS - Institute for Microsensors, -actuators and -systems (DE).*

A new principle of a bend sensor based on a Bragg grating in a polarization maintaining fiber is developed. The two reflection maxima of s- and p-polarization of the fiber Bragg grating alter in their reflectivity depending on the bend direction. In an asymmetrical fiber also the wavelengths shift thus allowing resolving the absolute bend direction. [4727]

Ringhotel Munte am Stadtwald, Room 3/4

15:45 - 16:00

Nanophotonic system based on localized and hierarchical optical near-field processes

M. Naruse^{1,2}, N. Tate^{2,3}, M. Ohtsu^{2,3}; ¹National Institute of Information and Communications Technology (JP), ²The University of Tokyo, Nanophotonics Research Center (JP), ³The University of Tokyo, Dept. Electrical Eng. & Info. Sys. (JP).

To break through the diffraction limit and achieve novel functionalities and energy saving at a smaller scale, a deeper understanding of light-matter interactions on the nanoscale is indispensable. Here we demonstrate nanophotonic systems exploiting localized and hierarchical optical near-field processes on the nanoscale. [4730]

16:00 - 16:15

Graphene nanocomposites for UV detectors integrable on silicon

D. Cristea, P. Obreja, C. Obreja; National Institute for R&D in Microtechnologies (IMT-Bucharest) (RO).

The paper presents the preparation method of an isocyanate functionalized grapheme (IRGO) - regioregular poly 3-hexyl thiophene (rr-P3HT) nanocomposites and the optoelectrical characteristics of field effect transistors based on this material. The doping of P3HT with graphene increases the mobility and also the photoresponse in UV-DUV range. The fabrication process of the detectors based on IRGO-P3HT nanocomposite is simple and compatible with silicon technology. [4758]

16:15

Departure to BIAS & IMSAS

16:45 - 17:45

Visit BIAS & IMSAS

17:45

Departure from IMSAS to BIAS

18:00 - 19:30

**POSTER SESSION (for poster presentations see pg. 25-27)
FEAT. GET TOGETHER & WHISKEY TASTING**

(BIAS- Bremer Institut für Angewandte Strahltechnik GmbH
Klagenfurter Str. 2, 28359 Bremen)

NOTES

NOTES

Ringhotel Munte am Stadtwald, Room 3/4

09:00 - 10:30

PHOTONIC COMPONENTS

Chairs: C. Gorecki, Micro-Nano Sciences & Systems department, FEMTO-ST (FR)

NOTES

09:00 - 09:15

STUDENT PRESENTATION

Waveguide-based External Cavity Diode Laser with method of controlling spectral properties

R.M. Oldenbeuving^{1,2}, H. Song³, M. Verhaegen³, E.J. Klein⁴, C.J. Lee^{1,2}, G. Schitter⁵, H.L. Offerhaus^{2,6}, K.-J. Boller^{1,2}; ¹University of Twente, Laser Physics and Nonlinear Optics group (NL), ²MESA+ institute for nanotechnology (NL), ³Delft University of Technology, Delft Center for Systems and Control (NL), ⁴XiO Photonics B.V. (NL), ⁵Vienna University of Technology, Automation and Control Institute (AT), ⁶University of Twente, Optical Sciences group (NL).

We report on the wavelength tuning and spectral properties of a diode laser with an integrated optics external cavity. The tunable laser is frequency agile-it is able to access preset wavelengths in as little as 200 ms-and able to tune over the full telecom C-band (1530 nm – 1565 nm). The spectral bandwidth is as small as 30 kHz (at 3 dB), at a side-mode suppression ratio (SMSR) of 50 dB. [4705]

09:15 - 09:30

Oxygen-controlled photoconductivity in hybrid ZnO-nanowire/CdSe-quantum-dot devices

D. Hou, A. Dev, J. Gutowski, I. Voss; University of Bremen (DE).

Surface functionalization of semiconductor nanowires is a very versatile means for tailoring their optical absorption and emission properties. Through specially designed organic linker molecules, a tight binding of a variety of different semiconductor or metal nanoparticles to the nanowire surface can be achieved. The separation between the nanoparticles and the nanowire surface can be precisely controlled by adjusting the length of the organic linker molecule. [4749]

09:30 - 09:45

Ultrafast transfer of spatially encoded data with programmable arrays of highly localized wavepackets

R. Grunwald, M. Bock; Max Born Institute for Nonlinear Optics and Short-Pulse Spectroscopy (DE).

Arrays of highly localized wavepackets enable for efficient multichannel processing. Reconfigurable arrangements of supercollimated and temporally nondiffracting few-cycle pulses were generated by microaxicons programmed into spatial light modulators. The ultrafast transfer of quick response code data is reported. [4752]

09:45 - 10:00

Detection of different orbital angular momentum modes of a plane wave field with a nanoscopic semiconductor ring

O. Vänskä¹, M. Kira², I. Titttonen¹, S.W. Koch²; ¹Aalto University, Department of Micro- and Nanosciences (FI), ²Philipps-University Marburg, Department of Physics and Materials Sciences Center (DE).

An optical plane wave carries zero average orbital angular momentum. We propose that a donut-shaped microstructure, a semiconductor quantum ring, offers rather unique circumstances to experimentally observe nonzero orbital angular momentum modes of a plane wave, which are very hard to detect otherwise. [4721]

10:00 - 10:15

A comparison of eigenmode and Fourier modal algorithms for simulation of 3D photonic nanostructures

P. Kwiecien¹, I. Richter¹, J. Luksch², J. Petráček²; ¹Department of Physical Electronics, Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University in Prague (CZ), ²Institute of Physical Engineering, Brno University of Technology (CZ).

Two independent implementations of frequency-domain modal methods for the modeling of three-dimensional (3D) photonic structures are compared, namely 3D bidirectional eigenmode expansion and propagation algorithm (BEP) and aperiodic rigorous coupled wave analysis (aRCWA). Whereas in the BEP case, the eigenmodes, are searched numerically using a full vector finite-difference (or finiteelement) modesolver, both modesolver and propagation schemes rely on the combined aRCWA algorithm. Based on such comparison of these techniques, their practical applicability is discussed. [4741]

Ringhotel Munte am Stadtwald, Room 3/4

10:15 - 10:30

STUDENT PRESENTATION

A transparent projection display based on photonic crystals

T. Buß, C.L.C. Smith, A. Kristensen; Technical University of Denmark, Department of Micro- and Nanotechnology (DK).

We present a novel type of projection display, based on photonic crystals. Guided light in an optical chip is selectively outcoupled at narrow divergence angles. The physics of the device is discussed and measurements of the device presented. The half angle beam divergence is measured as 0.93 mrad. [4746]

10:30 - 11:15

Coffee break

11:15 - 13:00

SESSION ON DIGITAL HOLOGRAPHY I

Chairs: J. Watson, School of Engineering, University of Aberdeen (GB)

11:15 - 11:30

Laudatio

Ralf B. Bergmann, BIAS - Bremer Institut für Angewandte Strahltechnik GmbH (DE).

11:30 - 12:00

Title tba

R. Pryputniewicz; Worcester Polytechnic Institute (US).

Invited Talk

12:00 - 12:15

Applications of Digital Holography: From Microscopy to 3D-Television

T. Kreis; BIAS - Bremer Institut für Angewandte Strahltechnik GmbH (DE).

Holography is the method invented by D. Gabor for recording and reconstructing whole optical fields, i. e. with amplitude and phase distributions. We speak about digital holography, if steps in the chain from capture to reconstruction are performed by digital computers. While originally the term was used for the digital computation of hologram intensities, which then were printed and recorded on film for later optical reconstruction, nowadays digital holography indicates the capture of the holograms by digital CCD- or CMOS-targets, storing the discrete hologram data in computer and executing a numerical reconstruction of the complex wave fields. Due to the introduction of effective spatial light modulators (SLM) the optical reconstruction from digital holograms fed to such SLMs now has become feasible, so in future not only the capture, but also the reconstruction will be summarized under the term digital holography. [4679]

12:15 - 12:30

Michelson interferometer-based digital holographic microscope for inspection of technical and biological phase specimens

B. Kemper, F. Schlichthaber, A. Vollmer, S. Ketelhut, S. Przibilla, G. von Bally; Center for Biomedical Optics and Photonics, University of Muenster (DE).

A Michelson interferometer-based digital holographic microscopy (DHM) approach for quantitative phase imaging is presented. The method requires only an object illumination wave and simplifies the integration of DHM into common research microscopes. Experimental results demonstrate the applicability on phase specimens. [4751]

12:30 - 12:45

Wear recording at micro deep drawing tools with comparative digital holography

S. Huferath-von Luepke, P. Huke, C. von Kopylow, R.B. Bergmann; BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE).

Due to scaling effects friction and wear plays a major roll in the micro deep drawing process. Therefore, in this paper we present a holographic method to record the wear by measuring the state of a micro deep drawing tool and comparing it with the initial one. [4756]

12:45 - 13:00

Diamond machining of diffractive photomasks for UV-lithography

E. Brinksmeier, R. Gläbe, A. Meier; Laboratory for Precision Machining (LFM) (DE).

The diamond machinability of two aluminium alloys is investigated to identify work-piece materials suitable as photomasks for UV-lithography. A blaze structure, serving as diffraction grating, is generated by a diamond turning operation. Both aluminium alloys yield an adequate structure accuracy and a sufficient surface roughness. [4715]

13:00 - 14:30

Lunch break

NOTES

Ringhotel Munte am Stadtwald, Room 3/4

14:30 - 16:30

SESSION ON DIGITAL HOLOGRAPHY (PART II)

Chairs: W. Osten, Institut für Technische Optik, Universität Stuttgart (DE)

14:30 - 15:00

Invited Talk

Gated Picosecond Digital Holography

J. Trolinger; MetroLaser Inc. (US).

This presentation describes work that demonstrated the feasibility of producing an imaging system that is capable of producing high-resolution images of three-dimensional particle and structure details deep within dense fields of particles, smoke and debris. [4833]

15:00 - 15:15

STUDENT PRESENTATION

Investigation of smooth wave fronts using SLM-based phase retrieval and a phase diffuser

M. Agour^{1,2}, P.F. Almoró³, C. v. Kopylow¹, C. Falldorf¹; ¹BIAS - Bremer Institut für Angewandte Strahltechnik (DE), ²Physics Department, Aswan Faculty of Science, South Valley University (EG), ³National Institute of Physics, University of the Philippines (PH).

A phase retrieval technique for the determination of smooth wave fronts is demonstrated. It is based on a spatial light modulator in the Fourier domain of a 4f-setup which enables rapid measurements and a diffuse illumination of the test object introducing significant diversity. Optical testing of a lens is given as an application. [4729]

15:15 - 15:30

STUDENT PRESENTATION

Speckle Reduction by Using a Translucent Spatial Light Modulator

Z. Tong^{1,2}, X. Chen¹; ¹Institute for Microsystems Technology, Vestfold University College (NO), ²Department of Electronics and Telecommunications, Norwegian University of Science and Technology (NO).

A translucent Spatial Light Modulator (SLM) and a condenser lens are introduced to suppress the laser speckle effect. The SLM is programmed as a sinusoidal grating with rotating orientation and adjustable period. Different speckle patterns are obtained, and about 0.32 speckle Contrast Ratio (CR) is achieved in free space. [4697]

15:30 - 15:45

STUDENT PRESENTATION

Design of diamond turned holograms for tilted illumination and reconstruction

C. Dankwart, C. Falldorf, C. von Kopylow, R.B. Bergmann; BIAS - Bremer Institut für angewandte Strahltechnik GmbH (DE).

We present an algorithm for the design of diamond turned holograms (DTH) for the reconstruction of intensity distributions. In contrast to recently reported methods it can be used with an experimental setup, where the illumination and the reconstruction plane are tilted with respect to the DTH. [4750]

15:45 - 16:00

Holographic lithography on tilted surfaces based on diamond-turned diffractive optical elements

J. Möller, S. Kibben, M. Koerdt, C. Dankwart, F. Vollertsen; BIAS – Bremer Institut für angewandte Strahltechnik (DE).

The applicability of diamond-turned diffractive optical elements (DOEs) to address the issue of non-planar substrates in photolithography is investigated for the first time. As a first systematic progress tilted surfaces are employed. Consistent illumination of a plane tilted by 30° is achieved by means of a DOE. [4748]

16:00 - 16:30

Invited Talk

Submersible Digital Holographic Cameras and their Application

J. Watson; School of Engineering, University of Aberdeen (GB).

The use of holography in biological science dates to Knox in 1966. From that several underwater holographic cameras were developed and deployed Subsea to study, for example, plankton populations and their distribution in the water column. These early "holocameras" were based on "classical" holographic recording on photographic plates or film. For in-water deployment the weight and bulk of these instruments restricted their use on advanced observation platforms such as remotely, or autonomously operated vehicles (ROVs or AUVs), or in global observation networks, and limited operation to a few hundred metres depth. Advances in electronic imaging sensors and improvements in computer performance have brought digital holographic (DH) recording coupled with numerical reconstruction to prominence; and has led to the development of a range of small, rugged holocameras. [4951]

16:30

Coffee break

16:45

FAREWELL
END OF EOS TOPICAL MEETING

NOTES

Thursday, 8 December
18:00 - 19:30
POSTER SESSION

NOTES

4662_BREMEN2011_001**Multichannel Architecture for Surface Plasmon Resonance Sensors**

R. Kasztelanicz; University of Warsaw, Department of Physics (PL).

The presentation deals with an optical sensor based on the phenomenon of surface plasmon resonance. It proposes a new geometry of the measurement head which allows for measurements with both the change of the incident light angle and the change of the wavelength. The sensors proposed can also be used in parallel configurations, where they increase the functionality of the setup, allow for a greater precision of measurement, and eliminate such distracting factors as temperature change. The article presents the results of computer analyses of the sensor proposed, as well as the results of its experimental realization.

4663_BREMEN2011_002

STUDENT PRESENTATION

Broadband Optical Antenna with a Disk Structure

I. Wang, Y.-p. Du; Dept. BSE, The HongKong Polytechnic University (CN).

Broadband optical antennas are of interest as they can transmit more information like traditional microwave UWB antennas. This paper presents a design of broadband optical antennas with a concentric disk structure. An equivalent circuit for the optical antenna with a disk structure is introduced. The broadband radiation at optical frequencies was demonstrated via the computer simulation.

4665_BREMEN2011_003

STUDENT PRESENTATION

Plasmonic nanosensor in the treatment of cancer: An attempt to conquer the immortal illness

S. Das, J. Turunen; Department of Physics and Mathematics, University of Eastern Finland (FI).

In 2010 a survey conducted all over the world says that more than 7 million humans around the world died of cancer. One in three women and one in two men developed cancer during their life time. About 15 percent of all deaths worldwide were attributed to cancer. In some nations, cancer will surpass heart disease to become the most common cause of death. This paper attempts to demystify the behavior of cancer-the defining plague of our generation. Here, we present a novel method based on silver nanoparticle-generated transient photothermal vapour nanobubbles. These intracellular plasmonic nanobubbles are effective in the diagnosis (by optical scattering) and treatment (by mechanical, nonthermal and selective destruction of target cells) of cancerous cells. Theoretical simulation of fused silica rod SPR sensors and optical fiber SPR sensors was carried out. Then these nanosensors were designed, fabricated and their sensitivities were measured experimentally. We introduce the nanosensors and describe how its size and environment can be harnessed to detect and treat cancer cells. This paper has been written from the quest to launch something that can eradicate this disease from our bodies and societies forever.

4696_BREMEN2011_004**Lithium borates glasses, us new materials of the optical device**

V.T. Adamiv, Ya.V. Burak, I.M. Teslyuk; Institute of Physical Optics (UA).

Results of comprehensive analysis of the glasses anhydrous lithium borates $\text{Li}_2\text{B}_4\text{O}_7$, LiKB_4O_7 , $\text{Li}_2\text{B}_6\text{O}_{10}$ and $\text{LiCsB}_6\text{O}_{10}$ are presented. Acquired results of investigation of the physical properties of glasses at the room temperature are compared with the corresponding ones of the same single crystals.

4710_BREMEN2011_005**Modeling the initial stage of formation of porous alumina**

E. Arysanova, D. Vavulin; National Research University of Information Technologies, Mechanics and Optics (RU).

Aluminum has a great tendency to oxidation. Artificially on the surface may build a thick layer of Al_2O_3 , which has a porous structure. The process of creating an artificial oxide film on the surface of aluminum and its alloys is called oxidation of aluminum. Oxidation divided into chemical oxidation and electrochemical oxidation in various solutions (anodic oxidation).

4711_BREMEN2011_006

Sensitive measurement of water content in dry material using low-frequency terahertz time-domain spectroscopy system equipped with micro-structured photoconductive antennas

T. Yasuji^{1,2}; T. Araki²; ¹Univ. Tokushima, Inst. Tech. and Sci. (JP), ²Osaka Univ., Grad. Sch. Engg. Sci. (JP).

We proposed sensitive measurement of water content in dry material using low-frequency THz time-domain spectroscopy. Simultaneous use of micro-structured bowtie-type photoconductive antennas for generation and detection of THz pulse enables to achieve water content measurement in dry materials.

4719_BREMEN2011_007

STUDENT PRESENTATION

The stimulated Raman adiabatic passage in the tri-core waveguide arrays

Z. Ye¹, D. Song¹, L. Tang¹, C. Lou¹, Z. Chen^{1,2}; ¹Nankai University, TEDA Applied Physics School (CN), ²San Francisco State University, Department of Physics and Astronomy (US).

We theoretically study the tri-core waveguide (WG) arrays which can be analogy to the three-level atomic systems. The Bragg-type stimulated Raman adiabatic passage is proposed in this photonic structure.

4724_BREMEN2011_008

Fabrication of miniaturized atomic clocks

N. Passilly, M. Hasegawa, R. Chutani, R. Boudot, C. Gorecki; Micro-Nano Sciences & Systems department, FEMTO-ST (FR).

This contribution presents the fabrication of micromachined Cesium-vapor cells aimed to be part of miniaturized MEMS-based atomic clocks. This work was performed in the frame of a European Collaborative Project (MAC-TFC) whose target is the development of the European version of MEMS atomic clock presenting a short-term stability of 5×10^{-11} over 1 hour while operating with less than 200 mW power consumption. The consortium is made of five major academic institutions (University of Besançon/FEMTO-ST, University of Neuchâtel, EPFL-Lausanne, Technological University of Wrocław and University of Ulm); two research institutes (VTT and CEA/Léti) and three industrial partners (SAES Getters, SWATCH R&D and Oscilloquartz).

4728_BREMEN2011_009

STUDENT PRESENTATION

1-D Photonic Wire Microcavities for Refractive Index Sensing

M. Ghazali A. Rahman¹, P. Velha¹, Richard M. De La Rue^{1,2}, Nigel P. Johnson¹; ¹Optoelectronics Research Group, School of Engineering, University of Glasgow (GB), ²Physics Department, Science Faculty, University of Malaya (MY).

We present the design modelling and fabrication of Silicon-On-Insulator (SOI) nanobeam cavities that are immersed in a microfluidic system for refractive index sensing. The sensitivity has a value greater than 200 nm/RIU with a Q-factor more than 20 000.

4731_BREMEN2011_010

Stochastic modelling and rigorous simulation of line roughness effects for EUV scatterometry

H. Gross¹, M.-A. Henn¹, A. Rathsfeld², M. Bär¹; ¹Physikalisch-Technische Bundesanstalt (PTB) (DE), ²Weierstrass Institute for Applied Analysis and Stochastics (DE).

The impact of line edge and line width roughness (LER/LWR) on diffraction patterns measured by scatterometry is simulated rigorously for a typical EUV line-space structure. Repeated calculations for large FEM computation domains with stochastically chosen line and space widths are applied to investigate the influence of aperiodic random perturbations on the diffracted efficiencies.

NOTES

4735_BREMEN2011_011

STUDENT PRESENTATION

Magneto-optical properties and stability tests of iron oxides nano-particles

E. Matei, A. Predescu, A. Predescu, A. Berbecaru, C. Predescu; Politehnica University of Bucharest (RO).

The studied materials consist of nano-magnetic particles of magnetite (Fe_3O_4), maghemite (γ - Fe_2O_3) and copper ferrite (CuFe_2O_4). The materials were in-situ prepared by coprecipitation method and mechanical mixing. The magnetic and optical properties as well as stability properties of the materials were investigated by measurements such as: magnetization curves, UV-visible spectra, Faraday rotation in visible range, quantity of dissolved iron at different pH values. The oxidation of Fe_3O_4 to γ - Fe_2O_3 has been studied into solution via the loss of optical absorption in the near-IR region. The saturation magnetization of the γ - Fe_2O_3 and CuFe_2O_4 was almost as same as that expected from the initially amount of Fe_3O_4 nano-particles. Although γ - Fe_2O_3 and CuFe_2O_4 had large and broad absorption domain at about 400 nm, they still maintained their transparency. No intermediate optical spectra are observed, which confirms the extremely local nature of the optical transitions.

NOTES

4747_BREMEN2011_013

STUDENT PRESENTATION

FBG based upon evaporated Silica nano particles

K. Hammarling¹, R.Y. Zhang², A. Manuilskiy¹, H-E. Nilsson²; ¹Mid Sweden University, ITM (SE), ²Mid Sweden University, NAT (SE).

A fiber bragg grating was made by evaporating silica nano particles on the outside of a multi-mode silica fiber core using EISA method. The particles size was 220 nm, which then correspond to a filter at 440 nm. We demonstrates that a cost effective bragg filter may be built by evaporating nano particles directly on a fiber core.

4960_BREMEN2011_014

Three dimensional optical modeling of amorphous thin film solar cells

J. Lacombe, K. von Maydell, C. Agert; EWE Research Center for Energy Technology, NEXT ENERGY (DE).

For high efficiency silicon thin film solar cells light features needs to be implemented in the cell structure because of the poor absorption coefficient of the microcrystalline bottom cell. A common way is the structuring of the front TCO by chemical etching or during the processing using LPCVD. The structuring has a strong influence on the incident light. Due to the rough interfaces the light is scattered and also multiple reflections occurs. This leads to a higher generation rate of charge carriers in the active absorber layers. On the other hand interference due to thin layers has to be taken into account.

NOTES



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Page 1 / 2

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CANCELLATION POLICY:
Requests for cancellation must be made in writing to the EOS Office (address see below). Refunds are subject to a processing fee of 50 €.
Cancellations received **by 23 November 2011**: full refund minus processing fee (50 €).
Cancellations received **after 23 November 2011**: no refund.

ABOUT EOS

History

The European Optical Society (EOS) was founded in 1991. The purpose of the society is to contribute to progress in optics and related sciences, and to promote their applications at the European and international levels, by bringing together individuals and legal entities involved in these disciplines and their applications. EOS is a not for profit organisation and serves as the joint forum for all individuals, companies, organisations, educational institutions, and learned and professional societies, who recognise the opportunity and challenge that a common European base provides for the development of optics in its broadest sense. EOS organises recognised topical meetings, conferences, workshops and other events, publishes journals and is an important player on the European level. 22 national optical societies and a great number of individuals and companies are currently members of EOS (www.myeos.org).



EOS membership - Join us and...

Be a part of the umbrella organisation of the national optical societies in Europe

- Connect with colleagues from all over Europe and beyond
- Contribute to strengthening Europe's future in optics and photonics
- Stay up-to-date about European Research Funding
- Benefit from discounts on EOS events and publications in the EOS online journal JEOS:RP
- Receive the Annual EOS Member Directory - your guide to the European optics and photonics community

Activities

- Organisation of topical meetings, workshops and conferences, and endorsement of other scientific events
- Operation of a virtual platform for the European optics and photonics community at www.myeos.org
- Focus Groups and Student Clubs (as of 2011)
- Publication of JEOS:RP, the electronic Journal of the European Optical Society - Rapid Publications (www.jeos.org)
- Quarterly print member newsletter
- Representation of the optics and photonics community on the European level (Photonics21 Technology Platform)
- Annual award of the EOS Prize

Membership modes and fees

Individual membership | Annual fee: 50 €

Individual membership through an EOS Branch

Every member of an EOS Branch is automatically an individual member of the EOS, too, with all benefits.

Annual fee: included in the Branch membership fee.

Student membership | Annual fee: 10 €

Associate membership through an EOS Affiliated Society

Every member of an EOS Affiliated Society is automatically an associate member of the EOS, too, but with limited benefits.

The annual fee is included in the Affiliated Society membership fee.

Upgrade for associate members | Annual fee: 12.50 €

Upgrade to an individual EOS membership with full benefits:

Corporate membership through an EOS Branch or Affiliated Society | Annual fee: 200 €

Direct corporate membership | Annual fee: 300 €

For detailed information about our membership modes, fees and benefits please see the EOS website at www.myeos.org/members.

How to join?

To join the EOS as an individual, student or corporate member, please see our website at www.myeos.org/members/howtojoin.

Questions?

Please contact the EOS Office at info@myeos.org.



DO 2012

8th EOS Topical Meeting on Diffractive Optics

Delft University of Technology, Delft, Netherlands | 27 February - 1 March 2012

www.myeos.org/events/do2012 | do2012@myeos.org



PSDM 2012

1st EOS Topical Meeting on Photonics for Sustainable Development - Focus on the Mediterranean

Ramada Plaza Tunis, Tunis, Tunisia | 31 March - 3 April 2012

www.myeos.org/events/psdm2012 | psdm2012@myeos.org



ANGEL 2012

2nd Conference on Laser Ablation and Nanoparticle Generation in Liquids

Hotel Caparena, Taormina (Sicily), Italy | 22 - 24 May 2012

www.myeos.org/events/angel2012 | angel2012@myeos.org



TST 2012

3rd EOS Topical Meeting on Terahertz Science & Technology

Prague, Czech Republic | 24 - 27 June 2012

www.myeos.org/events/tst2012 | tst2012@myeos.org



AIT 2012

6th EOS Topical Meeting on Advanced Imaging Techniques

Hyères - Southern Alps (Provence), France | 2 - 5 July 2012

www.myeos.org/events/ait2012 | ait2012@myeos.org



EMVPO 2012

6th EOS Topical Meeting on Visual and Physiological Optics

University College Dublin (UCD), Dublin, Ireland | 20 - 22 August 2012

www.myeos.org/events/emvpo2012 | emvpo2012@myeos.org



EOSAM 2012

EOS Annual Meeting 2012

Aberdeen Exhibition and Conference Centre, Aberdeen, Scotland | 25 - 28 September 2012

www.myeos.org/events/eosam2012 | aberdeen@myeos.org

For more information about EOS organised and EOS co-sponsored events, please go to www.myeos.org/events.

Should you wish to be kept informed about an EOS organised event, please send an email with your contact details to the above mentioned email address.

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* Associate members are requested to upgrade to a full membership first (12.50 €/year).
Special rates for attendees of EOS Events available! Check the event website for details.