Plastic Optoelectronics

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Dr. Christoph Harder received the Electrical Engineering Diploma from the ETH in 1979 and the Master and PhD in Electrical Engineering in 1980 and 1983 from Caltech, Pasadena, USA. He is co-founder of the IBM Zurich Laser Diode Enterprise which pioneered the first 980nm high power pump laser for telecom optical amplifiers.
He has been managing during the last few years the high power laser diode R&D effort in Zurich expanding, working closely with a multitude of customers, the product range into 14xx pumps as well as 808 and 9xx multimode pumps for industrial applications. He has published more than 100 papers and 20 patents and has held a variety of staff and management positions at ETH, Caltech, IBM, Uniphase, JDS Uniphase, Nortel and Bookham.

Welcome

Dr.
Alexander Stuck
Basel

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Dr. Alexander Stuck is heading the Division Functional Coatings of CSEM in Basel. He is an expert in nano-optics and brings a track record of successful collaboration with industry leaders in brand protection and optical microsystems. Before joining CSEM he headed the development and production of DVD-recorders and managed a successful turnaround of a microtechnology company as CEO. He also worked as a project leader and industry consultant for larger technological companies. Dr. Alexander Stuck has a successful academic track record in optics and nanotechnology and received the first research award by the Swiss Physical Society (SPG-Preis) in 1991, sponsored by IBM, for his work on nano-technology and holography.

Introduction

Dr. Carsten
Winnewisser
Neuchâtel

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Dr. Carsten Winnewisser received his diploma and Ph.D. degrees in physics from Freiburg University, Germany in 1994 and 1999, respectively. After working as a research fellow at different institutions like NIST and Ohio State University, he was active at the Freiburg Materials Research Center on the topic of luminescence conversion for white LEDs. Afterwards he joined JDS Uniphase working on InGaAs diode lasers for optical fiber amplifiers. From 2002 on he established the Polymer Optoelectronics activity at CSEM and since 2010 Carsten Winnewisser is active as Senior Manager Business Development at CSEM.

Plastic Optoelectronics in the Border Triangle - OPERA Cluster Evaluation
Organic and Large Area Electronics (OLAE) offers a huge potential for novel products like OLED-Lighting, -Displays, OPVs, and Electronics. Europe is a leader in many OLAE-based R&D innovations, but handicaps like fragmentation and duplication of R&D efforts, lack of investments, and a sub-optimal transfer process turning these innovations into products are observed. The OPERA project fosters regional OLAE-cluster formations in order to overcome this dilemma in Europe.

Dr. Emilie Galand
Basel

Huntsman Advanced Materials, Basel
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Dr. Emilie Galand is the technical project leader of the Organic Electronic team of Huntsman Advanced Materials, Basel. She is responsible for the development of encapsulating materials for flexible Organic Light Emitting Diodes (OLED) for lighting applications. She joined Huntsman in 2007 after receiving her Engineering Diploma in Chemistry and Physics from the ENSCPB, France, in 2002, and her PhD in Organic Chemistry from the University of Florida, USA, in 2006.

Thin-Film Encapsulation of OLED Lighting Devices
With its partners from the Fast2Light consortium, Holst Center/TNO, Philips Research Laboratories, and Roth and Rau, Huntsman is developing device encapsulation technology protecting OLEDs from environmental impacts, providing prolonged lifetime and enabling flexible OLED lighting.
This is achieved by thin film encapsulation stacks based on alternating organic/inorganic layers for which Huntsman is developing the organic materials.
This presentation deals with various aspects of defects in OLEDs created by water permeation through the device, and the impact on the specifications of the final thin-film encapsulation technology.

Wolfgang
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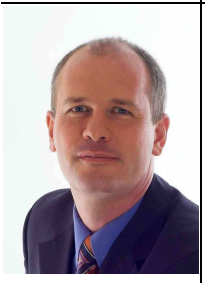
1986	Diploma in Physics Justus Liebig University Of Giessen
1986 - 1990	Leybold Hereaus, R&D vacuum web coating
1990 - 2000	CERAMIS® process development at Alusuisse/Lawson Mardon Packaging
2000	Head Of R&D Vacuum Thin Film Technolgy, Alcan Packaging/Amcor Flexibles

Barrier Foils for Plastic Optoelectronics
The food and pharma industry is using barrier materials for decades. Some of them are even fullfilling the barrier requirements of organic electronics (like aluminium foil). Many Packages are even already employing thin film transparent oxide barrier coatings. The presentation will cover the state of the art and new ideas for the use of such materials for low cost, high barrier encapsulation of moisture sensitive organic electronic devices.



Thomas Walther
St. Gallen

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Thomas Walther was 19 years engaged as a printing engineer at the printing machine company manroland (Offenbach / Germany). His last position at manroland was head of *New Technologies*.
In this department he was responsible for the development of new printing technologies and prototypes.
Since late 2008, he is Head of Engineering and Technology, Steinemann Technology.

Printing Technologies for Flexible Electronics
Steinemann, a swiss SME, presents solutions and approaches in engineering that are of interest also for the field of printed functionalities. These solutions include high-efficiency screen printing, register-accurate lamination and format width inkjet solutions.

Dr.
Peter Chabrecek
Thal SG

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Dr. Peter Chabrecek studied chemistry at Comenius University in Bratislava.
In 1992 he started his work in CIBA AG in Basel. He coordinated projects for development of innovative surfaces on biomaterials, primarily contact lenses.
In 2001 he joined Sefar AG and is responsible for R&D activity. Inventor of more than 40 patents; three leading-world products are launched onto the market.

Woven Electrodes for Optoelectronic Devices
Transparent electrodes with high conductivity (< 1 Ω/sq.) and transmittance (> 90%) are produced by integration of conductive wires into precision polymeric fabrics or by metallization of the fabrics and coating the fabrics with a transparent polymer film. Such electrodes are more flexible and cheaper than the ITO coated ones and present additional advantages, especially in large area devices.

Prof. Dr.
Beat Ruhstaller
Winterthur ZH +
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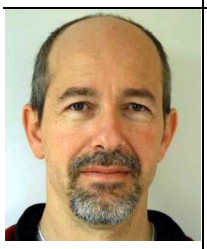
Beat Ruhstaller is head of the Institute of Computational Physics at the Zurich University of Applied Sciences as well as founder of the spin-off Fluxim AG. He received his Diploma in Physics from ETH Zurich, a Ph.D. from the University of California at Santa Cruz, USA, and was involved in OLED modeling at the IBM Almaden Research Center, USA, as well as in OLED display technology development at the IBM Zurich Research Laboratory, Switzerland.

Simulation Software for Organic Electronics
Fluxim commercializes simulation software for organic electronics devices such as OLEDs and organic solar cells and thus helps to accelerate the product development process at several positions along the value chain. Several examples are presented that illustrate the practical use of software in the design and characterization process.



Dr.
Thomas Heiser
Strasbourg F

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Thomas Heiser has received his PhD at the University Louis Pasteur in 1988 and became assistant professor at the ULP in 1989. From 1995 to 1996 he has been visiting scientist at the University of California in Berkeley. In 2000 he was appointed professor at the Physics Engineering Department of ULP. Since 2002, he is working on polymer-based photovoltaic devices.

Research on Organic and Hybrid Photovoltaics within the MATEOH-PV consortium
The MATEOH-PV research network has been founded recently to bring together the chemists, physicists and engineers, from Alsace and Lorraine, working on the development of organic and hybrid materials for photovoltaic device applications. In this talk, I will give a short overview of the major research activities and on-going projects performed by the consortium members.

Dr. Martin
Brinkmann
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Martin Brinkmann is a senior scientist at the Institut Charles Sadron (CNRS) in Strasbourg. He is managing a small group dedicated to structural investigations on conjugated materials (polymers and small molecules) within the MATEOH-PV consortium in Strasbourg. The group has expertise in Transmission Electron Microscopy (TEM) and epitaxial growth of conjugated polymers. M. Brinkmann is co-author of 52 publications.

Structural Analysis of Organic Thin Film Materials
Structure and morphology control in thin films is essential to improve the performances of the active layers in organic devices. TEM is a powerfull tool to address key issues regarding thin film structure. Various examples will be given to illustrate the use of TEM on highly oriented and epitaxied thin films of relevant semi-conducting polymers and materials.

Dr.
Ton Offermans
Basel

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Ton Offermans (M. Sc. Applied Physics 2001, Ph. D. in 2005). For his Ph. D. research in the group of René Janssen (TU Eindhoven), he investigated the charge carrier dynamics in organic bulkheterojunction solar cells combining experimental techniques with modelling. This research was published in 10 scientific papers. In 2007 he joined CSEM Basel where he is currently leading the research on organic photovoltaics.

Inkjet printing of polymer solar cells
Recent results on the ink-jet printing of polymer blends are presented. Good layer uniformity has been achieved by tuning solvent mixture composition, concentration, print head velocity and dot spacing. Polymer solar cells have been fabricated based on the ink-jet printed active layer. By optimizing the printing process and using a novel low band gap polymer, a power conversion efficiency surpassing the current state of the art of ink-jet printed OPV has been achieved.

Dr. Frank Nüesch
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Dr. Frank Nüesch graduated in physics in 1989 at the ETH Zurich. In 1995 he earned his Ph.D. at the EPFL in the Laboratory of Prof. M. Grätzel, the inventor of the dye sensitized solar cell. Since April 2004 he is heading the Laboratory for Functional Polymers at Empa Dübendorf. He is a lecturer at EPFL, teaching thermodynamics and organic semiconductors.

Novel device Substrates and Materials for Organic based Photovoltaics

Organic semiconductors are advantageously processed from solution or from the vapour phase at low temperatures. This presentation focuses on the use of high absorbing photographic dyes in organic based photovoltaics. The possibility to replace rigid conductive oxide glass substrates by flexible and conductive fabrics will be highlighted. A novel micro-fabrication method for organic multilayer devices implying laser ablation transfer will be presented.

Prof. Dr.
Günter Reiter
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Professor für Experimentelle Polymerphysik
Fakultät für Mathematik und Physik, Universität Freiburg

1987:	PhD TU Graz, Austria
1987 - 1992:	MPI für Polymerforschung Mainz, Germany
1992 - 1994:	University of Illinois, USA
1994 - 2008:	CNRS, Mulhouse, France
Since 06/2008:	Professor am Physikalischen Institut der Universität Freiburg

Research Topics:
- Behaviour and properties of polymers at interfaces
- Growth processes (crystallisation) in complex systems
- Molecular self-organisation and formation of functional structures at surfaces

Coordinated Soft Matter Research Training in the Upper Rhine Valley
Modern materials science increasingly exploits soft matter for the design of new materials. The objective of the International Research Training Group *Soft Matter Science: Concepts for the Design of Functional Materials* between the universities of Freiburg and Strasbourg (with colleagues from Basel and Mulhouse participating) is to promote graduate education and scientific exchange in the modern field of research on soft matter materials.

Prof. Dr.
Marcel Mayor
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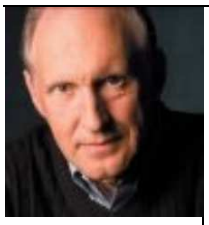
Marcel Mayor studierte an der Universität Bern Chemie wo er unter R. Scheffold promovierte. Während einem Postdoc Aufenthalt bei J.-M. Lehn in Strassburg machte er sich mit den Prinzipien der Supramolekularen Chemie vertraut. Anschliessend kümmerte er sich um den Aufbau einer synthetisch chemischen Arbeitsgruppe am neu gegründeten Institut für Nanotechnologie (INT) am Forschungszentrum Karlsruhe (heute: Karlsruhe Institute of Technology, KIT) wo er sich vor allem mit Fragestellungen der Molekularelektronik beschäftigte. Seit 2005 ist Marcel Mayor Professor für Chemie an der Universität Basel wo er sich u.a. mit der Entwicklung von massgeschneiderten Molekülen für physikalische Experimente befasst.

Molekulare Elektronik an der Universität Basel
Die Stossrichtungen im Bereich der *Molekularen Elektronik* an der Universität Basel werden anhand aktueller Beispiele vorgestellt. Dabei stehen grundlegende Arbeiten zur Selbstorganisation von Molekülen an Oberflächen oder zum Stromtransport durch Einzelmoleküle genau so im Mittelpunkt, wie die Entwicklung preiswerter Sensibilisatoren für kommenden Generationen von Solarzellen.



Prof. Dr.
Bertram Batlogg
Zürich

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Bertram Batlogg ist in Bludenz, österreich aufgewachsen und studierte Physik an der ETH Zürich wo er das Diplom erwarb und 1979 mit einer Arbeit über gemischt-valente Seltene-Erden-Verbindungen promovierte. Anschliessend ging er zu Bell Laboratories, New Jersey, in den Forschungsbereich Physikalische Wissenschaften wo er als Forscher und später auch als Abteilungsleiter/Direktor tätig war. Von 1990 bis 1996 war er zusätzlich einer der Direktoren des Konsortiums für Superconducting Electronics, einer Forschungs- und Entwicklungs-Partnerschaft von mehreren führenden industriellen und akademischen Institutionen der USA.
Seine wissenschaftlichen Interessen liegen hauptsächlich im Bereich der Physik neuer Materialien und haben zum Ziel, neue Materialien zu kreieren, neuartige Phänomene zu verstehen und mögliche Anwendungen zu explorieren. Dabei stehen optische, elektrische und magnetische Eigenschaften im Vordergrund. Er hat ein breites Spektrum von Themen bearbeitet, u.a.: Hochtemperatur-Supraleiter, Quanten-Magnete, oxidische Supraleiter, Schwere Fermionen, gemischt-valente Verbindungen. Seit kurzem hat er sich den organischen Molekülkristallen gewidmet.

OTFT-performance by optimized Trap Density Control
The performance of organic field-effect devices is determined by several factors, including trap density in the semiconductor bulk and at the dielectric-semiconductor interface. As a result of systematic in-depth studies of trap formation we have been able, by an appropriate choice of materials combination, to minimize undesired trap effects and to produce low-voltage high-performance field effect transistors employing standard laboratory procedures.

Dr. Paul Seidler
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Dr. Seidler is the coordinator for the Nanoscale Exploratory Technology Laboratory being built at IBM Research - Zurich in collaboration with the ETH Zurich. Dr. Seidler received a B.S. in Chemistry from the California Institute of Technology in 1980 and a Ph.D. in Chemistry from the University of California at Berkeley in 1985. He joined IBM Research in 1988.

Nanoelectronics Across the Zurich Lake
The Nanoscale Exploratory Technology Laboratory (NETL) is a unique facility for exploratory research being created in a public-private partnership between IBM and the ETH Zürich. The talk will describe the leading-edge capabilities of the center, the cooperation model, the planned research activities, and the opportunities for additional partners to join.