Micro and small size display technologies, systems and applications
WELCOME

Annually selected European display-related entities organize SID Mid-Europe (SID-ME) meetings with technical and scientific presentations, attracting many display professionals from Europe and abroad. The 2017 spring meeting will be organized by Fraunhofer FEP and sets its focus on different aspects of Wearable and Projection Displays.

The symposium is to target basic technologies for micro- and small-size, or flexible/rollable displays, their back- and frontplane technology and embedded sensors. This is complemented by system integration aspects like system hardware design, sensor and software/service integration. Applications will focus on automotive, medical, sports and leisure, safety/security markets as well as smart devices, wearable signage and training/education sectors.

Symposium lectures and poster sessions will be organized, as well as on-site exhibition. Special emphasis is given to presentations of related collaborative projects funded by the European Commission (EC). As the conference is connected to the weekend, it will start on Monday with two optional scientific tours to Fraunhofer FEP sites. Subsequently the SID-conference at Quality Hotel Park Plaza in Dresden will take place. One further highlight will be an evening event at the end of the first conference day with a reception at Dresden city centre.

We are looking forward to welcoming you in Dresden!

Dr. Uwe Vogel

Head of Division Microdisplays and Sensors
Deputy Director
DRESDEN – CITY OF ART AND SCIENCE

The Frauenkirche, the Zwinger, the Semper Opera House, the Residential Palace, the Elbe river, over 50 museums and more than 30 theatres, both large and small – this is Dresden. The city is one of the most popular tourist destinations in Germany. Millions of visitors come to Dresden every year to admire its many attractions. Dresden boasts a unique collection of historic buildings, great history and art treasures and fascinates with its own distinctive character. The city owes its description as ‘Florence on the Elbe’ to the combination of the riches to be found in its art collections and the Italian influence on its architecture built under Augustus the Strong.

Dresden is the capital of the Free State of Saxony, the most south-easterly of the 16 federal states in Germany. Only two hours drive to the north lies the capital Berlin and to the south Prague, the capital of the Czech Republic. The city with its more than 540,000 inhabitants not only has a strong cultural attraction, it is also the political, economic and scientific centre of the Free State of Saxony. Dresden is home to numerous research institutes and universities, among them the TU Dresden, which in 2012 was honoured with the title of ‘elite university’.

But Dresden is not only the Saxon capital for business and science, it is also one of the greenest cities in Europe. The Great Garden, the broad meadows along the Elbe, the Heide Forest, numerous palaces, parks and green open spaces in and around Dresden encourage its inhabitants and visitors to spend time outdoors, and influence the quality of life in the city. Dresden’s green landscape is further complemented by the vineyards on the slopes of the Elbe valley. Wine is even grown in the city of Dresden itself, a fact that makes Dresden the most northerly city with a tradition of wine growing.


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TOPICS

Technologies

- Micro- and small-size displays
  - e.g., OLED, LCD, LCOS/FLCOS, MEMS, LED, laser, electrophoretic
  - Component design, manufacturing technology
- Bendable, flexible, rollable displays
  - Backplane and frontplane technology
- Display-embedded sensors and actors (e.g., optical, haptic, sound)
- Non-standard display form-factors (e.g., round-shaped)

System Integration

- System design and manufacturing for
  - Near-to-eye displays (NTE), head-mounted displays (HMD), Smart glasses
  - Electronic viewfinders
  - Smart watches, Smart contact lenses
  - Displays for wearable sensing (e.g., health/fitness tracker)
- Sensor and service integration (e.g., gesture recognition, interaction)
- Optics (e.g., near-to-eye, micro-projection, light-field, illumination)
- Low-power electronics, data interfaces, image processing, power supply (e.g., energy harvesting, batteries)
- Software, firmware
Applications / Markets

- Near-to-eye projection, smart glasses, smart contact lenses, augmented/virtual reality (AR/VR)
  - Industry 4.0 (e.g., automation, logistics, assembly, quality assurance)
  - Automotive (e.g., HUD/HMD in cars or motorcycles)
  - Medical (e.g., intensive care, sensorineural-impaired)
  - Sports and leisure
  - Safety/security
  - Electronic viewfinder in consumer and professional video
- Personal and professional wearable display applications
  - Smart watches
  - Personal health (e.g., fitness, medication, skin patch), medical (e.g., tele medicine, diagnostics)
  - Wearable signage (e.g., alerts, advertising, translation, fashion, art)
- Ergonomics
- Training/Education
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tr>
<td>09.00</td>
<td><strong>Scientific Tour 1 (Fraunhofer Campus)</strong></td>
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<td>Fraunhofer FEP equipment for electron beam structuring of microdisplays,</td>
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<td>roll-to-roll line for organic electronics, plants for precision coatings</td>
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<td>and coatings on ultra-thin-glass and other flexible substrates</td>
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<td>12.00</td>
<td><strong>Welcome guests</strong></td>
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<td>13.00</td>
<td><strong>Opening and Session Chair</strong></td>
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<td></td>
<td>Dr. Uwe Vogel, Fraunhofer FEP, Germany</td>
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<tr>
<td>13.15</td>
<td><strong>KEYNOTE</strong></td>
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<td></td>
<td><strong>Designing Mixed Reality (MR) wearable displays</strong></td>
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<td></td>
<td>Bernard Kress, Ph. D., Microsoft Corporation, USA</td>
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<tr>
<td>13.50</td>
<td><strong>INVITED</strong></td>
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<td></td>
<td><strong>Review of Current Microdisplay Technologies</strong></td>
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<td>Prof. Ian Underwood, University of Edinburgh, UK</td>
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<td>14.20</td>
<td><strong>INVITED</strong></td>
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<td></td>
<td><strong>Applications of Microdisplays in AR and VR</strong></td>
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<td>Hong K. Choi, Ph. D., Kopin Corporation, USA</td>
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<td>15.00</td>
<td><strong>Coffee Break / Poster Session</strong></td>
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15.45 – 16.10  Market trends and forecasts for wearable displays  
Dr. Guillaume Chansin, IDTechEx, UK

16.10 – 16.35  Thin and spherical-cap-shaped LCD with a flexible thin-film driver for use in a smart contact lens  
Prof. Herbert De Smet, Ghent University & imec, Belgium

16.35 – 17.00  Low Temperature Atomic Layer Deposition as an enabling technology in the manufacturing of OLED displays  
Dr. Lydia Baril, Encapsulix SAS, France

17.00 – 17.25  Industrial scale manufacturing of transparent and flexible moisture barriers  
Luca Gautero, Ph. D., Meyer Burger (Netherlands) B.V., Netherlands

17.25 – 17.50  Advanced microdisplays and imagers – achieved by synergy of IC design and OLED/OPD technology development  
Bernd Richter, Fraunhofer FEP, Germany

18.00  End

Accompanying Poster Session

19.00 – 00.00  Evening Event  
Reception at „felix - Das lebendige Haus“, Dresden City Centre
### TUESDAY, 14 MARCH 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>08.30</td>
<td>Welcome guests</td>
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<tr>
<td>09.00 – 09.10</td>
<td>Opening and Session Chair</td>
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<tr>
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<td><em>Prof. Herbert De Smet, Director SID Mid-Europe, Ghent, Belgium</em></td>
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<tr>
<td>09.10 – 09.45</td>
<td><strong>KEYNOTE</strong></td>
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<td>5G – enabler for consumer AR/VR</td>
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<td><em>Prof. Frank H.P. Fitzek, Deutsche Telekom Chair of Communication</em></td>
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<td><em>Networks, Technische Universität Dresden, Germany</em></td>
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<td>09.45 – 10.10</td>
<td><strong>INVITED</strong></td>
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<td></td>
<td>Highly energy efficient and compact OLED microdisplays and their use in wearables</td>
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<td><em>Dr. Gunther Haas, Microoled, France</em></td>
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<td>10.10 – 10.40</td>
<td>Large cost-effective OLED microdisplays and their application</td>
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<td><em>Dr. Beatrice Beyer, Fraunhofer FEP, Germany</em></td>
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<td>10.40 – 11.00</td>
<td>Coffee Break / Poster Session</td>
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<td>11.10 – 11.35</td>
<td>National Funded Project “Glass@Service” – An Approach to Interactive Personalized Visualization in Industry Processes with Smart Glasses</td>
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<td><em>Christian Wegener, Siemens AG, Germany</em></td>
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<td>11.35 – 12.00</td>
<td>Atomized scan strategy for high definition OLED microdisplay</td>
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<td><em>Wendong Chen, Shanghai University, China</em></td>
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<td>12.00 – 12.25</td>
<td>InP-based Quantum Dots for highly efficient solution based QLEDs</td>
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<td><em>Dr. Armin Wedel, Fraunhofer IAP, Germany</em></td>
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<td>12.25 – 13.30</td>
<td>Lunch Break</td>
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13.30 – 14.00  **Award ceremony SID-ME Chapter Best Student Award**
(incl. 15 min Student presentation)

**Session Chair**
*Dr. Beatrice Beyer, Fraunhofer FEP, Germany*

14.00 – 14.35  **KEYNOTE**
**AMOLED Displays - A Review of Device-Circuit Interactions and Compensation Techniques**
*Prof. Arokia Nathan, University of Cambridge, UK*

14.35 – 14.55  **INVITED**
**Display technologies – Where is the EU?**
*Dr. Henri Rajbenbach, European Commisson, Belgium*

*Elisabeth Bodenstein, Fraunhofer FEP, Germany*

15.15 – 15.45  **Coffee Break / Poster Session**

15.45 – 16.15  **INVITED**
**GaN LED micro-displays for digital and structured lighting applications**
*Prof. Martin Dawson, University of Strathclyde, UK*

*Dr. Francois Templier, CEA-Leti, France*

16.40 – 17.05  **LEDs for Augmented Reality Near-to-Eye Displays**
*Dr. Stefan Morgott, Osram Opto Semiconductors GmbH, Germany*

17.15  **End**
### Accompanying Poster Session

| Title                                                                 | Author(s)                                                                                     | Institution/Location                  |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| Characterization and Modelling of Tandem structure OLED              | Hanning Mai, University of Edinburgh, UK                                                       |
| High-resolution OLED Patterning for Microdisplays                    | Dr. Matthias Schober, Fraunhofer FEP, Germany                                                  |
| FEF: Fast Ellipse Fitting in Real-World                              | Marcus Penzel, University of Applied Sciences Zwickau, Germany                                 |
| Organic light-emitting diodes allow for active beam-shaping without additional optical elements | Felix Fries, Technische Universität Dresden, Germany                                             |
| Integration of light functionality within textiles by flexible OLED lighting | Jan Hesse, Fraunhofer FEP, Germany                                                            |
| Electrical properties of SAM-modified ITO surface using aromatic small molecules with double bond carboxylic acid groups for OLED applications | Prof. Siddik Icli, Ege University, Solar Energy Institute, Izmir, Turkey                        |
| Pulse magnetron sputtering for pre-encapsulation and large area precision optical coatings | Dr. Daniel Glöß, Fraunhofer FEP, Germany                                                      |
The Personal Reader: A New Way to Read  
Avram Shlemeh Adler, Personal Reader Project, Israel

A novel IPS-VA pixel architecture for phase modulation and beam-steering application  
Clément Abélard, CEA-Leti, France

The LOMID H2020 project for large microdisplays  
James Whitby, Amanuensis GmbH, Switzerland

OLEDs on CMOS Automated Encapsulation Cluster  
Jens Drechsel, CreaPhys GmbH, Germany  
Wolfgang Ganter, M. Braun Inertgas-Systeme GmbH, Germany

Ultraviolet Laser Separation of Flexible Devices  
Ralph Delmdahl, Coherent LaserSystems GmbH & Co. KG, Germany

Please note that the program is subject to change.  
Last update: March 2, 2017
STUDENT AWARD

The 1500 Euro SID-ME Chapter Best Student Award is granted yearly for an outstanding scientific or technical contribution to research on information display. More information on the SID website: [www.sid.org/Chapters/Europe/Mid-Europe.aspx#award](http://www.sid.org/Chapters/Europe/Mid-Europe.aspx#award)

EXHIBITION AND SPONSORING

An exhibition will be held in conjunction with the conference, limited space is available for interested companies and other organizations. A choice of sponsoring possibilities is available. More information about exhibition and sponsoring options can be found at Sponsoringbook [www.fep.fraunhofer.de/sidme17](http://www.fep.fraunhofer.de/sidme17)

Confirmed exhibitors:
- Meyer Burger (Deutschland) AG
- HOLOEYE Photonics AG
- Wirtschaftsförderung Sachsen
- FUJIFILM Dimatix, Inc.
- X-Fab Dresden GmbH & Co. KG
- Aspect Systems GmbH
- Fraunhofer IOF
- Fraunhofer FEP
**VENUE**

Quality Hotel Plaza Dresden  
Königsbrücker Straße 121a  |  01099 Dresden, Germany  
Phone +49 351 8063-0  |  Fax +49 351 8063-721  
[www.qualityhotelplazadresden.de](http://www.qualityhotelplazadresden.de)

Information about hotel reservation is given on the registration website:  
[www.fep.fraunhofer.de/sidme17](http://www.fep.fraunhofer.de/sidme17)

Public transportation (bus 64 and tram 7 and 8) is located in front of the hotel and provides direct access to the city in just a few minutes.
REGISTRATION

Online registration is open on conference website:

www.fep.fraunhofer.de/sidme17

The registration fee (regular 250 €) includes attendance to the lectures, download of abstracts, coffee breaks, quick lunch on both days, evening event, and visit of Fraunhofer FEP.

Important deadlines

- Early registration (230 €): February 1, 2017
- Hotel reservation: February 15, 2017

CALL FOR POSTERS

Abstract submission for oral presentations is closed. Authors are kindly invited to submit abstracts and manuscripts for poster presentations during the accompanying poster sessions.

Please send the abstract in English according to the provided template on the website to: sidme17@fep.fraunhofer.de.

Please note, that submissions for posters until February 15, 2017 will be considered for the final program, submissions after this deadline are also welcome but will not be included into the final program.
CONFERENCE ORGANIZERS

Conference Chairs
Dr. Uwe Vogel (Fraunhofer FEP) | General Chair
Ines Schedwill (Fraunhofer FEP) | Executive Chair
Dr. Beatrice Beyer (Fraunhofer FEP) | Program Chair

Program Committee
Achin Bhowmik, Ph.D. Intel Corporation, Santa Clara, USA
Hong K. Choi, Ph.D. Kopin Corporation, Westborough, USA
Dr. Gunther Haas Microoled, Grenoble, France
Bernard Kress, Ph.D. Microsoft, Mountain View, USA
Prof. Arokia Nathan University of Cambridge, Cambridge, UK
Dr. Michael Totzeck Carl Zeiss AG, Oberkochen, Germany
Prof. Ian Underwood University of Edinburgh, Edinburgh, UK
Klaus Zimmermann Sony Deutschland GmbH, Stuttgart, Germany

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