



University of Stuttgart
Eurodisplay 2022



Eurodisplay 2022

September 19th 2022 – September 23rd 2022
University of Stuttgart
Germany

Program

The information given here is expected to be correct at the time of the creation of the document but minor changes may still occur. Please check for updates from time to time

Last change: September 12th 2022

Sponsors and Exhibitors:



Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP



higher color fidelity



KONICA MINOLTA



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EUROLCDs



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Tabletop Exhibition

21. Sep. 22, 01:00 PM - 23. Sep. 22, 01:00 PM

List of Exhibitors

ADMESY B.V.

Sleestraat 3
6014 CA Ittervoort
The Netherlands
www.admesy.com

Bayflex Solutions

San Jose, CA
USA
www.bayflextechnologies.com

ELDIM

1333, rue d'Epron
14200 Hérouville-Saint-Clair
France
www.eldim.biz

EuroLCDs, Ltd

Ventspils Augsto Tehnoloģiu Parks 2
Ventspils, LV-3602
Latvia
www.eurolcds.com

Fluxim AG

Katharina-Sulzer-Platz 2
8400 Winterthur
Switzerland
www.fluxim.com

Fraunhofer FEP

Maria-Reiche-Str. 2
01109 Dresden
Germany
www.fep.fraunhofer.de

HYPHY USA Inc.

2033 Gateway Place
San Jose, CA 95100
USA
www.hyphy-usa.com

Konica Minolta Sensing Europe B.V.

Werner-Eckert-Str. 2
81829 München
Germany
www.konicaminolta.eu

Mercedes-Benz AG

Benzstr.
71059 Sindelfingen
Germany
www.mercedes-benz.com

TechnoTeam Bildverarbeitung GmbH

Werner-von-Siemens-Str. 5
98693 Ilmenau
Germany
www.technoteam.de

TRUMPF Laser- und Systemtechnik GmbH

Johann-Maus-Str. 2
71254 Ditzingen
Germany
www.trumpf-laser.com

XTPL S.A.

Stabłowicka 147
54-066 Wrocław
Poland
www.xtpl.com

Conference Site

The scientific sessions as well as the tabletop exhibition will take place in the University of Stuttgart's Electrical Engineering Building located at Pfaffenwaldring 47 in Stuttgart-Vaihingen.

Technical Sessions

Technical sessions will take place in the rooms V47.03 and V47.05. V 47.03 can be reached from ground floor or basement, while V47.05 is located on the ground floor. Both conference rooms are equipped with a presentation laptop (Microsoft Windows, Microsoft Office 2019, Adobe Acrobat Reader).

Speaker Preparation Room

Speaker can find a preparation room (room number V47.06) on the ground floor. The speaker preparation room is equipped with a laptop to upload presentations to the server. Also testing of the presentation is possible.

Exhibition

The tabletop exhibition takes place in the exhibition hall, which can be reached from the basement

Poster Session

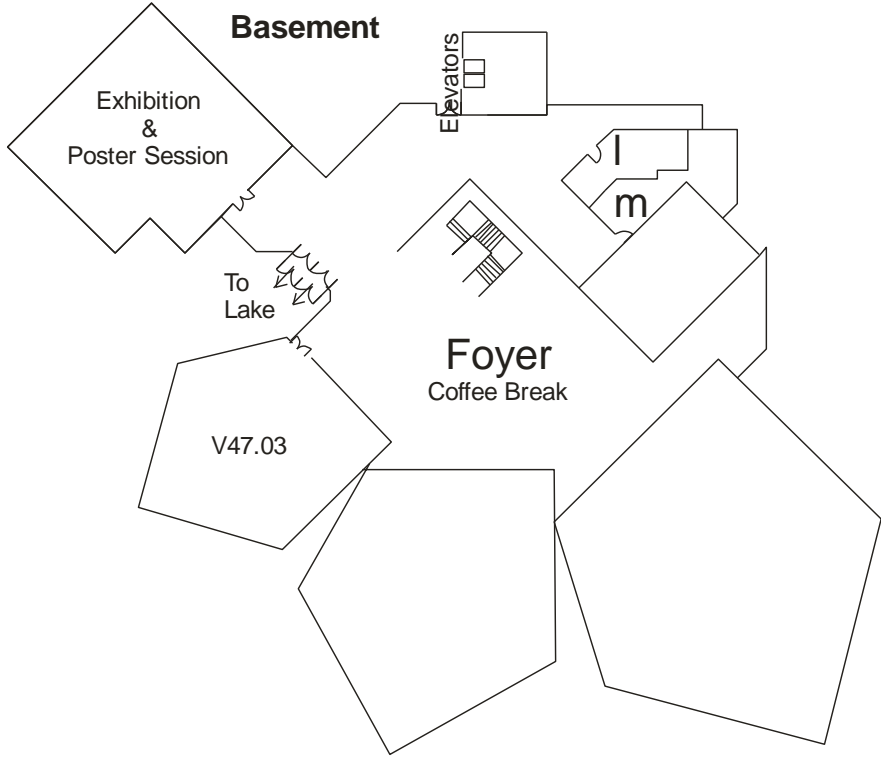
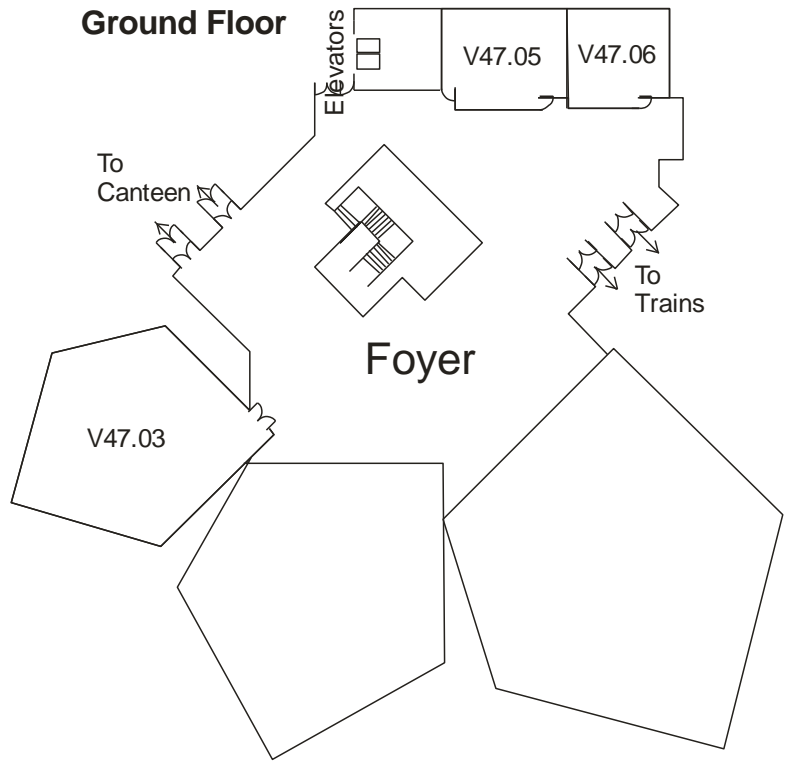
The poster session also takes place in the exhibition hall.

Coffee Breaks

Coffee and snacks will be served during the coffee breaks in the foyer in the basement.



Floor Plan



WiFi

Free WiFi networks are available during the conference in the conference building and across the campus.

uni-stuttgart-open:

Connect to the network “uni-stuttgart-open” and proceed to the confirmation page with a web browser of your choice. You can switch to English at the top of the page and confirm that you have accepted the terms of use.

Caution: This network is not encrypted, so network traffic might be monitored by third parties.

eduroam:

If you come from an academic institution, your eduroam account will work across the campus.

konferenz:

Secured (encrypted) guest network with daily changing password.

Passwords:

Will be given in the printed program

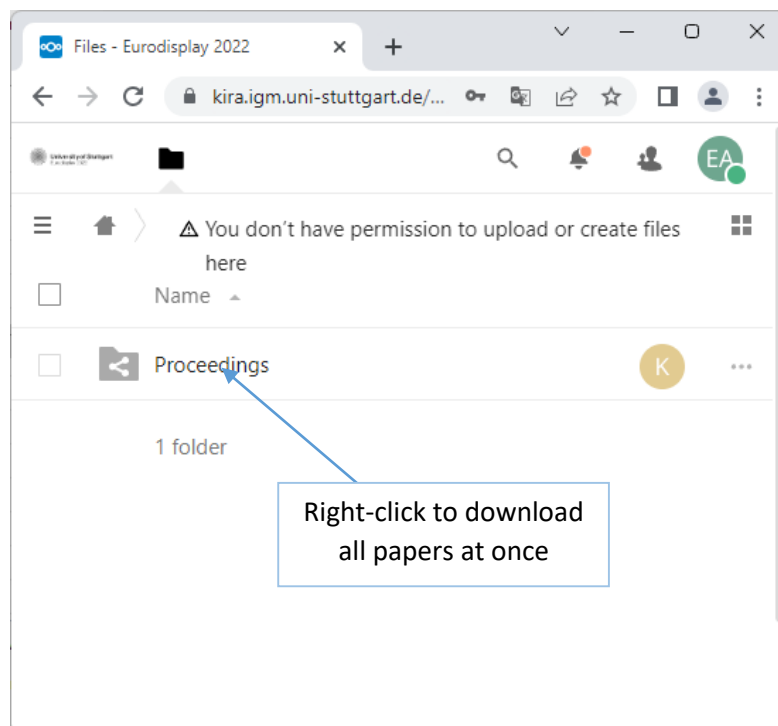
Proceedings

The papers presented in the technical sessions can be downloaded under the following URL until end of 2022:

<https://kira.igm.uni-stuttgart.de>

Username: conference

Password: *Will be given in the printed program*





Monday

Workshop - Sputtering and Lithography

19. Sep. 22, 08:00 AM - 19. Sep. 22, 12:00 PM

Lunch Break

19. Sep. 22, 12:00 PM - 19. Sep. 22, 01:00 PM

Workshop - Orientation layer

19. Sep. 22, 01:00 PM - 19. Sep. 22, 07:00 PM

Tuesday

Workshop - Cell assembly

20. Sep. 22, 08:00 AM - 20. Sep. 22, 12:00 PM

Lunch Break



20. Sep. 22, 12:00 PM - 20. Sep. 22, 01:00 PM

Workshop - Vacuum filling

20. Sep. 22, 01:00 PM - 20. Sep. 22, 07:00 PM

Wednesday

Registration Desk open

21. Sep. 22, 08:30 AM - 21. Sep. 22, 10:30 AM

Welcome Remarks

21. Sep. 22, 10:15 AM - 21. Sep. 22, 10:30 AM, Room V 47.03

Keynote Session

21. Sep. 22, 10:30 AM - 21. Sep. 22, 12:00 PM, Room V 47.03

Chair: Patrick Schalberger

Co-Chair: Norbert Fruehauf

K-1: Future Automotive Displays: Tec, Vision & Trends

10:30 AM Volker Reinhold, Mercedes-Benz AG

K-2: Recent Challenges in OLED Material Development

11:15 AM Christof Pflumm, Merck KGaA

Lunch Break

21. Sep. 22, 12:00 PM - 21. Sep. 22, 01:00 PM

Session 1 - Emerging Technologies 1

21. Sep. 22, 01:00 PM - 21. Sep. 22, 02:25 PM, Room V 47.03

Chair: Mamoru Furuta

Co-Chair: Martin Römhild

1-1: Letter Reproduction from Incomplete Image to Complete Image by Neuromorphic System using LSI Neurons and MOSFET Synapses

01:00 PM Mutsumi Kimura, Ryukoku University

1-2: *Invited*: Building Active Matrix By Additive Manufacturing (BAMBAM)

01:20 PM Hugues Lebrun, Aledia, France

1-3: Direct-View Lightfield Displays Using Micro-optic Elements

01:45 PM Rohan Kundu, Institute for Applied Physics, Friedrich-Schiller-University, Jena, Germany

1-4: Electro-optical characterization of electrophoretic light modulator

02:05 PM Anatolie Mitioglu, eLstar Dynamics

Session 2 - Manufacturing

21. Sep. 22, 02:30 PM - 21. Sep. 22, 03:30 PM, Room V 47.03



Chair: Filip Granek
Co-Chair: Holger Baur

2-1: Optimization of Total Light Transmittance for AR/VR Displays by Use of Silica Based Thin Films

02:30 PM Ainars Ozols, EuroLCDs

2-2: Influence of Gas Composition during IGZO-Deposition for different TFT Structures and Introduction of IGZO Double Layers

02:50 PM Florian Kleber, Institute for Large Area Microelectronics and Research Center SCoPE, University of Stuttgart

2-3: TRUMPF Industrial Laser Solutions for flexible OLED and FPD Manufacturing

03:10 PM Michael Lang, TRUMPF Laser- und Systemtechnik GmbH

Coffee Break

21. Sep. 22, 03:30 PM - 21. Sep. 22, 04:00 PM

Poster Session

21. Sep. 22, 03:30 PM - 21. Sep. 22, 05:30 PM

P-1: Performance Enhancement of Indium Oxide Thin Film Transistor using Al₂O₃ and SiO₂ Buffer Layers with Trench Structure by means of Plasma Enhanced Atomic Layer Deposition and Application for Flexible Device

Youngjun Im, KAIST

P-2: Hydrogen Assisted Mechanism of Abnormal Threshold Voltage Negative Shifting of Oxide TFTs under Positive Bias Temperature Stress

Seong-In Cho, KAIST

P-3: Enhanced water vapor barrier property and long-term stability of PECVD-based silicon nitride encapsulation film through H₂ supplement

Jingyu Kim, KAIST

P-4: Surface Treatment for Hydrophilization of Polytetrafluoroethylene using Atmospheric-pressure Plasma by Argon Gas with Water-Ethanol Vapor

Yuki Takino, Graduate School of Engineering, Kochi University of Technology

P-5: ZnO Thin Films Synthesized by Mist Chemical Vapor Deposition for Self-Clean Surface Application

Taiki Terakura, Kochi University of Technology

P-6: Fabrication of Transparent and Conductive Oxide Films for Well-arranged Growth of ZnO Nanorods

Ryusei Yamashita, Kochi University of Technology

Thursday

Welcome

22. Sep. 22, 08:55 AM - 22. Sep. 22, 09:00 AM, Room V 47.03

Welcome

22. Sep. 22, 08:55 AM - 22. Sep. 22, 09:00 AM, Room V 47.05

Session 3 - Active Matrix and TFT

22. Sep. 22, 09:00 AM - 22. Sep. 22, 10:30 AM, Room V 47.03

Chair: Mutsumi Kimura
Co-Chair: Florian Kleber

3-1: Solid-State-Laser Annealing (SLA) Enhancing OLED Display Technology

09:00 AM Sebastian Geburt, Innovaent GmbH

3-2: High Gain Operational Amplifier Using Enhancement and Depletion Mode a-IGZO TFTs

09:20 AM Yannick Schellander, Institute for Large Area Microelectronics and Research Center SCoPE, University of Stuttgart

3-3: High Performance MEMS Shutter Display with Metal Oxide Thin Film Transistors

09:40 AM Sheikh Abdullah Al Nusayer, Institute for Large Area Microelectronics and Research Center SCoPE, University of Stuttgart

Session 4 - Emerging Technologies 2

22. Sep. 22, 09:00 AM - 22. Sep. 22, 10:30 AM, Room V 47.05

Chair: Alex Henzen
Co-Chair: Marc Wilke

4-1: Effects of surface alignment conditions on the polarization properties of blue-phase liquid crystals

09:00 AM Sumanyu Chauhan, Huawei Munich Research Center

4-2: Ultrasound Transducer on Flexible Substrate for Mid-Air Haptic and Touch Application

09:20 AM Yongbin Jeong, imec, Leuven, 3001, Belgium

4-3: *Invited*: Integration of Through Glass Via Interconnects within Thin Film Transistor Active Matrix Backplanes

09:40 AM Rajesh Vaddi, Corning Research & Development Corporation, Corning NY

4-4: *Invited*: Exploring the potential of illumination by holographic projection in active 3D Imaging

10:05 AM Ian Underwood, University of Edinburgh; School of Engineering

Coffee Break

22. Sep. 22, 10:30 AM - 22. Sep. 22, 11:00 AM

Session 5 - OLED

22. Sep. 22, 11:00 AM - 22. Sep. 22, 12:30 PM, Room V 47.03

Chair: Armin Wedel

Co-Chair: Yannik Schellander

5-1: Accelerated Lifetime Testing and Degradation Mechanisms of a Blue TADF OLED

11:00 AM Simon Züfle, Fluxim AG

5-2: Emissive microdisplays: The quest for μ LED frontplane technology - as seen from an OLED and CMOS backplane perspective

11:20 AM Uwe Vogel, Fraunhofer Institute for Organic Electronics, Electron Beam and Plasma Technology FEP

5-3: Digital twins of OLEDs: Predicting the impact of molecular properties on device performance

11:40 AM Tobias Neumann, Nanomatch GmbH

5-4: Accelerating OLED R&D with Digital Twins

12:00 PM Jacopo Marcheselli, Simbeyond B.V.

Session 6 - Modern Displays

22. Sep. 22, 11:00 AM - 22. Sep. 22, 12:30 PM, Room V 47.05

Chair: Karlheinz Blankenbach

Co-Chair: Holger Baur

6-1: The Study for the Optimum Curvature of Gaming Monitor considering Game Performance

11:00 AM Yoojin Kang, LG display Co., Ltd

6-2: Switchable Privacy Device for Modern Laptops

11:20 AM Timothy Large, Microsoft (UK) Ltd

6-3: Challenges in Uniformity and Defect Measurements of Curved Displays

11:40 AM Kedar Sathaye, Konica Minolta Sensing Europe

6-4: A 0.9-inch Native 8K LCOS microdisplay and its SLM applications

12:00 PM Koichi Amari, Stuttgart Laboratory2, R&D Center, Sony Europe B.V., Stuttgart, Germany

SID-ME Chapter General Meeting

22. Sep. 22, 12:30 PM - 22. Sep. 22, 01:00 PM, Room V 47.05

Lunch Break

22. Sep. 22, 12:30 PM - 22. Sep. 22, 01:30 PM

Session 7 - Quantum Dots

22. Sep. 22, 01:30 PM - 22. Sep. 22, 03:00 PM, Room V 47.03

Chair: Chaoyang Li

Co-Chair: Florian Kleber

7-1: Giant Shell Quantum Dots for color conversion and as active material in QLEDs

01:30 PM Jan Niehaus, Fraunhofer CAN

7-2: Application of InP/GaP/ZnSeS Quantum Dots in Electrohydrodynamic Jet Printing for Electroluminescence Devices.

01:50 PM Jiyong Kim, Fraunhofer Institute for Applied Polymer Research

7-3: *Invited*: Progress in Quantum Dots for Display Technologies - Materials and Processing

02:10 PM Armin Wedel, Fraunhofer Institute for Applied Polymer Research, Potsdam, Germany

Session 8 - Display Metrology and Application

22. Sep. 22, 01:30 PM - 22. Sep. 22, 03:00 PM, Room V 47.05

Chair: Ian Underwood

Co-Chair: Yannik Schellander

8-1: A Circuit Modeling Method of OLED On-Cell Touch Panels Including the Touch Objects for Full-Frame Touch Simulation

01:30 PM Seung-Hun Choi, Korea University

8-2: Digital Video's Limitations are Impeding the Market Transition from 4K to 8K Displays. Modulated Analog Video Is the Way Forward!

01:50 PM Alex Henzen, HYPHYUSA



8-3: Reproducibility and Sensitivity Experiments of Display-MTF using ILMDs with Fixed Focus Macroscopic Lenses

02:10 PM Ingo Rotscholl, TechnoTeam Bildverarbeitung GmbH

8-4: Immersive Multiuser VR Displays Based on LED-Technique with six different views

02:30 PM Steffen Hergert, xCave Technology GmbH

Social Event: Visit of Mercedes Benz Museum including Dinner

22. Sep. 22, 03:40 PM - 22. Sep. 22, 09:00 PM

Friday

Welcome

23. Sep. 22, 08:55 AM - 23. Sep. 22, 09:00 AM, Room V 47.03

Session 9 - Novel Applications

23. Sep. 22, 09:00 AM - 23. Sep. 22, 10:00 AM, Room V 47.03

Chair: Takahiro Ishihara

Co-Chair: Marc Wilke

9-1: Smart Window by Nano-Pigments in Asymmetric Patterns

09:00 AM Yonghyeon Lee, Seoul National University of Science and Technology

9-2: Fit for purpose: Flexible electronic design from devices to systems

09:20 AM Radu A. Sporea, Advanced Technology Institute, University of Surrey

9-3: 3D Pupil Tracking Using a Stereo Camera

09:40 AM Can Oguz, Koc University

Session 10 - Automotive

23. Sep. 22, 10:10 AM - 23. Sep. 22, 10:50 AM, Room V 47.03

Chair: Hugues Lebrun

Co-Chair: Marc Wilke

10-1: *Invited*: Augmented Reality in Automotive: HUD vs. Transparent Displays vs. Video-AR

10:10 AM Karlheinz Blankenbach, Pforzheim University Display Lab

10-2: Automotive Displays - LCDs vs. OLEDs: Merits and Shortcomings

10:35 AM Faraz Bhatti, Pforzheim University Display Lab

Coffee Break

23. Sep. 22, 10:50 AM - 23. Sep. 22, 11:20 AM

Session 11 - Emerging Technologies 3

23. Sep. 22, 11:20 AM - 23. Sep. 22, 12:50 PM, Room V 47.03

Chair: Radu Sporea
Co-Chair: Martin Römhild

11-1: *Invited*: Ultra-Precise Deposition for the Fabrication of Next-Generation OLED, MicroLED, and QD-LED Displays

11:20 AM Filip Granek, XTPL SA, Stablowicka 147, 54-066 Wroclaw, Poland

11-2: *Invited*: Material Innovation for Future Stretchable Displays

11:45 AM Takahiro Ishinabe, Department of Electronic Engineering, Graduate School of Engineering, Tohoku University

11-3: Annealing Temperature Effects on the Growth and Photoluminescence of Nanostructured ZnO Thin Film Phosphor

12:10 PM Chaoyang Li, Kochi University of Technology

11-4: *Withdrawn*

Lunch

23. Sep. 22, 01:00 PM - 23. Sep. 22, 02:00 PM

Farewell: Farewell Event at Cannstatter Wasen Beer Festival

23. Sep. 22, 05:00 PM - 23. Sep. 22, 09:00 PM



List of Authors

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van Mensfoort, Siebe	Zabels, Roberts
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van Rijswijk, Tom	Züfle, Simon
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Vogel, Uwe	



Eurodisplay 2022 Program at a Glance

	Monday	Tuesday	Wednesday	Thursday	Friday
08:00	Workshop	Workshop	Registration Desk open	Session 3 Active Matrix and TFT Session 4 Emerging Technologies 2 Coffee Break Session 5 OLED Session 6 Human Factors Exhibition Session 7 Quantum Dots Session 8 Display Metrology and Applications Exhibition Social Event Visit of Mercedes Benz Museum incl. Dinner	Session 9 Novel Applications Session 10 Automotive Coffee Break Session 11 Emerging Technologies 3 Exhibition Farewell Event
08:15					
08:30					
08:45					
09:00					
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10:30	Lunch Break	Lunch Break	Lunch Break	SID/E Chapter General Meeting Exhibition	Exhibition
10:45					
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12:30					
12:45					
13:00	Workshop	Workshop	Session 1 Emerging Technologies 1 Session 2 Manufacturing Exhibition Coffee Break Poster Session	Exhibition Social Event Visit of Mercedes Benz Museum incl. Dinner	Exhibition Farewell Event
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