

# 1<sup>st</sup> German – United Kingdom Integrated Terahertz Systems Workshop 10 - 11 October 2022

Venue : Gästehaus - University of Wuppertal, Rainer-Gruenter-Straße 3, 42119 Wuppertal

Fixtures at a glance:

Schedule	Mon - 10th Oct	Tue - 11th Oct
8:30 am	Opening remarks	Mobile material characterization and localization by electromagnetic sensing
9:00 am	EPSRC Terahertz facility at the National Physical Laboratory	Integrated graphene-on-chip terahertz technology
9:30 am	Terahertz - Network 2021 in NRW	Terahertz metamaterial/graphene optoelectronic devices
10:00 am	Interactive session with DFG - EPSRC	Large area THz-detector arrays enabled by thin-film technology
Coffee Break (10:30 am - 11:00 am)		
11:00 am	New opportunities open by advances in table-top high-power broadband THz sources	Role of Terahertz radiation in 6G communications
11:30 am	Empowering highly integrated Terahertz electronic devices	Regenerative, Beyond-fmax, 3D-printed Terahertz Camera Transceiver
12:00 pm	Integrated THz time-domain spectrometer for space applications	Integrated Terahertz Modules for Wireless Energy Harvesting and Sensing
12:30 pm	Sensing with Metamaterials in the Terahertz Domain	Terahertz Digital Chess-Board-Modulated Spread-Spectrum System for Radar and Communication
Lunch Break (1:00 pm - 2:00 pm)		
2:00 pm	Terahertz devices and applications at Warwick	THz near field sensing with silicon integrated circuits
2:30 pm	MLL-based Integrated THz Frequency Synthesizers	Development of Metasurface Biosensors Using Terahertz Spectroscopy
3:00 pm	Photonic Integrated Circuits for Terahertz Source Generation	Coherent emission from an array of resonant tunneling diodes (RTDs) mediated by a strong-Laser-driven Terahertz source development at Manchester: developing spintronic emitters with
3:30 pm	Micro-integrated terahertz quantum-cascade laser for high-resolution spectroscopy	
Tea Break (4:00 pm - 4:30 pm)		
4:30 pm	THz EPR-on-a-Chip for Enhanced Spin Sensitivity	Linear Array Multipixel Antenna for Beam Shaping Applications.
5:00 pm	Uni-travelling carrier photodiodes for continuous wave Terahertz spectroscopy	Microfluidic Active-Feedback THz Biosensor for Direct, Sensitive and Selective Exosome and Virus
5:30 pm	An integrated gas spectroscopy system – combining TeraFETs and THz QCLs to enable 2–5-	Terahertz plasmonics with two-dimensional electron systems
6:00 pm	Dinner - Barbeque (18:00 onwards)	SAB recommendations) + 2023 preview



Day 1 – Monday, 10th October 2022

### Session 1 - Integrated THz Systems Roadmap

- 08:30 Workshop opening - Roadmap of INTEREST  
*Ullrich Pfeiffer & Vishal Jagtap, University of Wuppertal, Germany*
- 09:00 EPSRC Terahertz facility at the National Physical Laboratory  
*Mira Naftaly, National Physics Laboratory, Middlesex, United Kingdom*
- 09:30 Terahertz - Network 2021 in NRW  
*Dirk Nübler, Fraunhofer Institute – FHR, Wachtberg, Germany*
- 10:00 DFG – EPSRC Role in INTEREST & THz-UK  
*Bastian Mohr & Maryam Crabe-Mann*

### Session 2 - Broadband THz Systems

- 11:00 New opportunities open by advances in table-top high-power broadband THz sources  
*Clara Saraceno, Ruhr-University Bochum, Germany*
- 11:30 Empowering highly integrated Terahertz electronic devices  
*Chong Li, University of Glasgow, United Kingdom*
- 12:00 Integrated THz time-domain spectrometer for space applications (ITISA)  
*Michael Gensch, Technical University of Berlin, Germany*
- 12:30 Sensing with Metamaterials in the Terahertz Domain  
*Stephan Hanham, University of Birmingham, United Kingdom*

### Session 3 - Photonic THz Sources

- 14:00 Terahertz devices and applications at Warwick  
*James Lloyd-Hughes, University of Warwick, United Kingdom*
- 14:30 MLL-based Integrated THz Frequency Synthesizers (MINTS)  
*Martin Schell, Fraunhofer Institute – HHI, Berlin, Germany*
- 15:00 Photonic Integrated Circuits for Terahertz Source Generation  
*Lianping Hou, University of Glasgow, United Kingdom*
- 15:30 Micro-integrated THz QCLs for high-resolution spectroscopy (Micro-QCL)  
*Heinz-Wilhelm Hübers, DLR Berlin, Germany*

### Session 4 THz Spectroscopy Systems

- 16:30 THz EPR-on-a-Chip for Enhanced Spin Sensitivity  
*Klaus Lips & Anh Chu, Helmholtz-Zentrum Berlin, & University of Stuttgart, Germany*
- 17:00 Uni-travelling carrier photodiodes for continuous wave Terahertz spectroscopy  
*James Seddon, University College London, United Kingdom*
- 17:30 An integrated gas spectroscopy system – combining TeraFETs and THz QCLs to enable 2–5-THz power detection and heterodyne mixing  
*Alvydas Lisauskas, University of Frankfurt, Germany*
- 18:00 Barbeque



Day 2 – Tuesday, 11th October 2022

### Session 1 - Mobile THz sensing with novel materials

- 08:30 **Mobile material characterization and localization by electromagnetic sensing - Collaborative Research Centre / Transregio (SFB/TRR) 196**  
*Thomas Kaiser, University of Duisburg-Essen, Germany*
- 09:00 Integrated graphene-on-chip terahertz technology (INTEGRATECH)  
*Dmitry Turchinovich, University of Bielefeld*
- 09:30 Terahertz metamaterial/graphene optoelectronic devices  
*Riccardo Degl'Innocenti, Lancaster University, United Kingdom*
- 10:00 Large area THz-detector arrays enabled by thin-film technology (LATINO)  
*Ullrich Pfeiffer & Ralf Heiderhoff, University of Wuppertal, Germany*

### Session 2 - Integrated THz communication systems

- 11:00 **Role of THz radiation in 6G communications**  
*Ullrich Pfeiffer, University of Wuppertal, Germany*
- 11:30 Regenerative, Beyond-fmax, 3D-printed Terahertz Camera Transceiver (TeraCaT)  
*Christian Carlowitz, FAU University Erlangen, Germany*
- 12:00 Integrated Terahertz Modules for Wireless Energy Harvesting and Sensing  
*Jiafeng Zhou, University of Liverpool, United Kingdom*
- 12:30 Terahertz Digital Chess-Board-Modulated Spread-Spectrum System for Radar and Communication Comprising 200 GHz Bandwidth (TIEMPO)  
*Vadim Isakov, Technical University Braunschweig, Germany*

### Session 3 - Integrated THz Biosensing (1)

- 14:00 **THz near field sensing with silicon integrated circuits**  
*Philipp Hillger, University of Wuppertal, Germany*
- 14:30 Development of Metasurface Biosensors Using Terahertz Spectroscopy  
*SaeJue Park, Queen Mary University of London, United Kingdom*
- 15:00 Coherent emission from an array of RTDs mediated by a strong-coupling cavity  
*Fanqi Meng, University of Frankfurt, Germany*
- 15:30 Laser-driven Terahertz source development at Manchester: developing spintronic emitters with advanced functionality  
*Darren Graham, University of Manchester, United Kingdom*

### Session 4 Integrated THz Biosensing (2)

- 16:30 Linear Array Multipixel Antenna for Beam Shaping Applications.  
*Nishtha Chopra, University of Warwick, United Kingdom*
- 17:00 Microfluidic Active-Feedback THz Biosensor for Direct, Sensitive and Selective Exosome and Virus Detection in Aqueous Environments (“MATISSE”)  
*Anna Katharina Wigger, University of Siegen, Germany*
- 17:30 Terahertz plasmonics with two-dimensional electron systems  
*Oleksiy Sydoruk, Imperial College London, United Kingdom*
- 18:00 **SAB statements and recommendations + 2023 preview**  
*Damian Dudek, Marco Rahm, and Edmund Linfield*

