

13<sup>th</sup> Conference  
„Electron Technology” ELTE



43<sup>rd</sup> International  
Microelectronics and Packaging  
IMAPS Poland Conference



*4 – 6 September 2019, Wrocław, Poland*

# Conference Programme

Conference under auspicious of  
Rector of Wrocław University of Science and Technology  
**prof. Cezary Madryas**

Conference organized with support of Wrocław City under  
“Wrocław Scientific Conferences” programme



Wrocław University  
of Science and Technology

Wrocław the meeting PLACE

WCA Wrocław  
Academic  
Hub

## **General information**

ELTE & IMAPS 2019 Conferences take place in Wrocław – a scientific, industrial and cultural centre of south-western region of Poland. The conferences are held in the D-20 building (Conference Centre) of the Wrocław University of Science and Technology, Janiszewskiego 8 Str.

## **Registration & Information desk**

The registration and information desk located in D-20 building will be open during the following times:

Wednesday, September 4<sup>th</sup> ..... 8.00 – 18.30

Thursday, September 5<sup>th</sup> ..... 8.00 – 17.30

Friday, September 6<sup>th</sup> ..... 8.00 – 12.30

## **Wireless LAN**

The wireless LAN will be provided in the Conference Centre. For the network settings please contact the reception.

## **Breaks**

All scheduled breaks will be held in the Conference Centre (D-20 building). Coffee, tea and snacks will be served during scheduled breaks. The Conference Centre does not allow any food or beverage inside the auditorium rooms.

## **Name badges**

All attendees must wear their name badges at all time to gain admission to all sessions, exhibits, and social events.

## **Cellular phones and alarms**

As a courtesy to our speakers and other attendees, please turn off or mute any mobile phones and alarms during sessions.

## **Language**

Presentations/posters for ELTE can be prepared either in English or Polish. Presentations/posters for IMAPS should be prepared only in English.

## ELTE and IMAPS Conferences Technical Digest

Dear ELTE and IMAPS 2019 Conferences Attendee,

We are pleased to announce the ELTE & IMAPS 2019 electronic Technical Digest is available for download. You have been issued a “ticket” that is valid for one single download of the ELTE & IMAPS 2019 Technical Digest. In order to successfully obtain the Technical Digest, you must have the capability to open a pdf file. Please read this entire letter before taking any action to download the Technical Digest.

Follow the directions below to download ELTE & IMAPS 2019 Zip file:

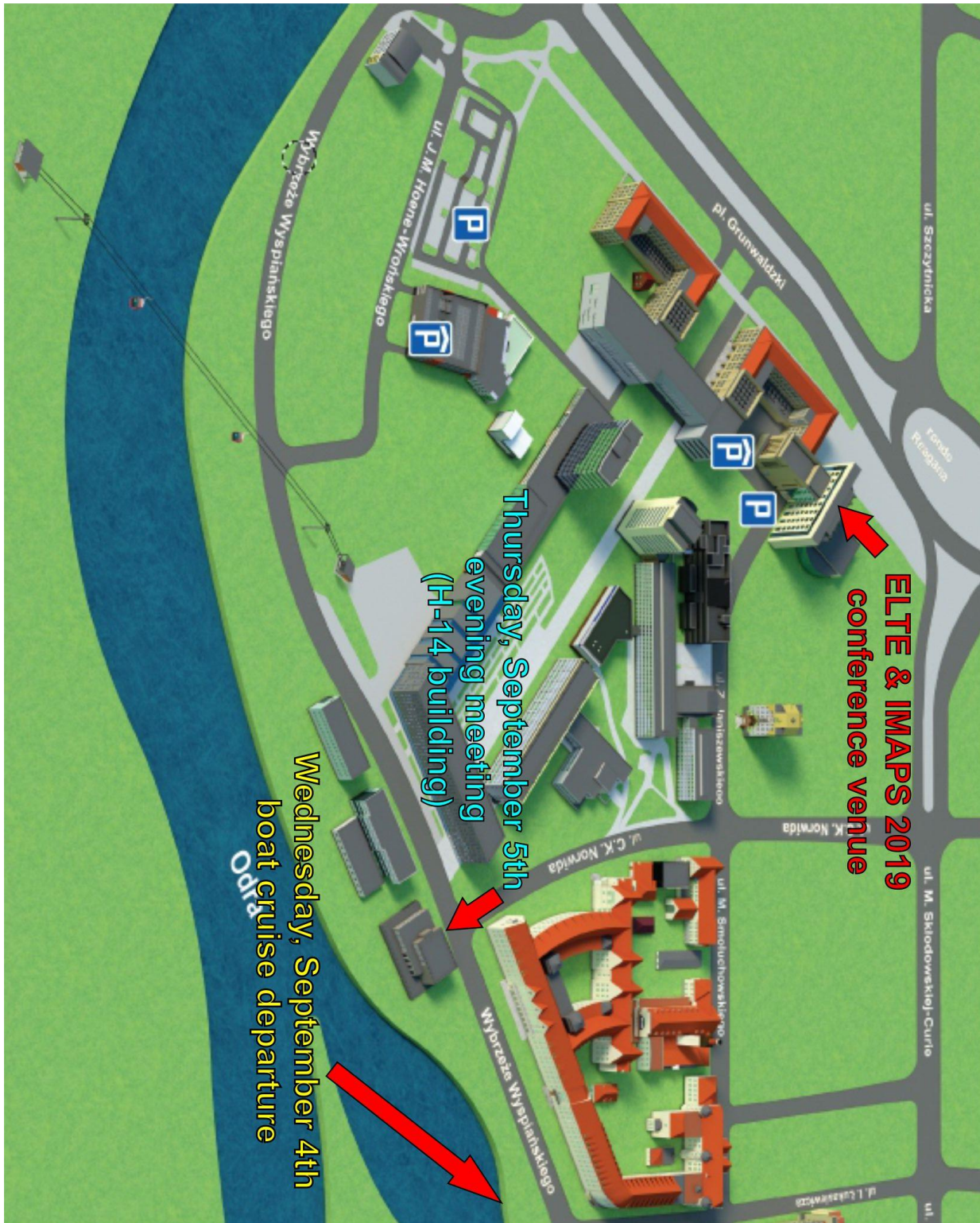
1. Please go to the following: <https://elteimaps2019.pwr.edu.pl/en/technical-digest>.
2. Select *Other user* or *Pozostali uzytkownicy*.
3. Enter login: *elte\_imaps*, password: \_\_\_\_\_, confirm by clicking *Sign in* or *Zaloguj*.
4. Click Technical Digest. This will start the download process. Make sure that the download is completed 100% before continuing the next step.
5. Once the download is complete, you have a file called “ELTE\_IMAPS2019\_TechnicalDigest.pdf”. This file does not need to be “extracted” or “unzipped”.
6. Open the file “ELTE\_IMPAS2019\_TechnicalDigest.pdf and it is ready to browse conference abstracts.

The download file will be in the form of a pdf file. Please be advised that the file size is approx. 50 MB and can take few minutes, depending on connection time, so plan accordingly. Once the download is complete, your ticket will no longer be valid. Please download the file before Monday, September 9<sup>th</sup>, 2019.

Sincerely,

ELTE & IMAPS Conferences Organizing Committee

Map of the Main Campus of Wrocław University of Science and Technology



## Conference opening (9.00 – 9.15)

## Plenary Session I (Wednesday, September 4<sup>th</sup>)

*Chairs: Rafał Walczak, Karol Malecha*

9:15-10:00	10AC	<b>3D printing of microscale parts for prototyping, tooling and production</b> Martin Hermatschweiler <i>Nanoscribe GmbH, CEO &amp; Co-founder, Germany</i>
10:00-10:45	10AC	<b>Thin film capacitors on ceramic and glass substrates</b> Daniel Krueger <i>Kansas City National Security Campus, Honeywell, United States of America</i>

## 10.45 – 11.30 Coffee break

## Technical Sessions I (Wednesday, September 4<sup>th</sup>)

### ELTE Session I – Electronic Materials 1

*Chair: Bogdan Majkusiak*

11:30-11:50	10AC	<b>Tranzystor polowy z wykorzystaniem AlO<sub>x</sub>Ny w roli dielektryka bramkowego</b> P. Firek <sup>1</sup> , J. Szarafiński <sup>1</sup> , G. Głuszko <sup>2</sup> , J. Szmidt <sup>1</sup> <sup>1</sup> <i>Politechnika Warszawska, Instytut Mikroelektroniki i Optoelektroniki;</i> <sup>2</sup> <i>Sieć Badawcza Łukasiewicz, Instytut Technologii Elektronowej</i>
11:50-12:10	10AC	<b>Wybrane problemy wieloetapowej i selektywnej epitaksji azotków trzeciej grupy układu okresowego osadzanych metodą MOVPE</b> M. Wośko <sup>1</sup> , B. Paszkiewicz <sup>1</sup> , A. Stafiniak <sup>1</sup> , J. Prażmowska-Czajka <sup>1</sup> , A. Vincze <sup>2</sup> , P. Pokryszka <sup>1</sup> , R. Paszkiewicz <sup>1</sup> <sup>1</sup> <i>Politechnika Wroclawska, Polska;</i> <sup>2</sup> <i>International Laser Center, Slovak Republic</i>
12:10-12:30	10AC	<b>Optimization of ultra-thin magnetron sputtered aluminum films</b> D. Iwanicki <sup>1</sup> , E. Warchulski <sup>1</sup> , M. Ożga <sup>2</sup> , M. Świniarski <sup>3</sup> , A. Gertych <sup>3</sup> , I. Pasternak <sup>3</sup> , M. Zdrojek <sup>3</sup> , M. Godlewski <sup>2</sup> , J. Arabas <sup>1</sup> , R. P. Mroczyński <sup>1</sup> <sup>1</sup> <i>Warsaw University of Technology, Faculty of Electronics and Information Technologies, Poland;</i> <sup>2</sup> <i>Polish Academy of Sciences, Institute of Physics, Poland;</i> <sup>3</sup> <i>Warsaw University of Technology, Faculty of Physics, Poland</i>
12:30-12:50	10AC	<b>Wybrane problemy związane z trwałością struktur OLED</b> Z. Porada <i>Politechnika Krakowska</i>

### IMAPS Invited Talks 1

*Chair: Małgorzata Jakubowska*

11:30-12:00	10D	<b>Industrialization of panel level packaging</b> R. Aschenbrenner <i>Fraunhofer IZM, Germany</i>
12:00-12:30	10D	<b>Multilayer coils for the use at high temperatures</b> H. Bartsch <sup>1</sup> , S. Thiele <sup>1</sup> , J. Müller <sup>1</sup> , B. Capraro <sup>2</sup> , D. Schabbel <sup>2</sup> , T. Reimann <sup>3</sup> , J. Töpfer <sup>3</sup> , S. Grund <sup>4</sup> <sup>1</sup> <i>TU Ilmenau, Germany;</i> <sup>2</sup> <i>Fraunhofer-Institut für Keramische Technologien und Systeme IKTS, Hermsdorf, Germany;</i> <sup>3</sup> <i>Ernst-Abbe-Hochschule Jena, Germany;</i> <sup>4</sup> <i>Tridelta Weichferrite GmbH, Hermsdorf, Germany</i>
12:30-13:00	10D	<b>Analysis of resistive gas sensors properties in hydrogen</b> O. Rac-Rumijowska <i>Wroclaw University of Science and Technology, Poland</i>

## 13.00 – 14.00 Lunch

## Technical Session II (Wednesday, September 4<sup>th</sup>)

### ELTE Session 2 – Electronic Materials 2

Chair: Paweł Szczepański

14:00-14:20	10AC	<b>Structural and optical properties of modified oxides based on titanium for application in electronics</b> D. Wojcieszak, D. Kaczmarek, M. Mazur, J. Domaradzki, A. Obstarczyk, R. Pastuszek, J. Rogala, M. Strzyżewski, E. Mańkowska <i>Wroclaw University of Science and Technology, Poland</i>
14:20-14:40	10AC	<b>Optical properties of Al thin films and multi-layered structures</b> B. Fetliński, M. Kaczkan, M. Malinowski <i>Warsaw University of Technology, Poland</i>
14:40-15:10	10AC	<b>Wielofunkcyjne powłoki na bazie wybranych tlenków metali do zastosowania w elektronice i optoelektronice</b> M. Mazur, D. Kaczmarek, D. Wojcieszak, J. Domaradzki <i>Politechnika Wroclawska</i>
15:10-15:30	10AC	<b>Optyczna diagnostyka procesu magnetronowego rozpylania miedzi w atmosferze argon-tlen</b> A. Brudnik, A. Rydosz, A. Czapla <i>Akademia Górniczo-Hutnicza im. S. Staszica w Krakowie</i>

### IMAPS Invited Talks 2

Chair: Agata Skwarek

14:00-14:30	10D	<b>Reliability of solder joints under long term thermal cycle and assembly conditions</b> R. Dudek <sup>1</sup> , S. Rzepka <sup>1</sup> , M. Novak <sup>2</sup> , P. Fruehauf <sup>3</sup> , R. Ortmann <sup>4</sup> <sup>1</sup> Fraunhofer ENAS, Germany; <sup>2</sup> Continental, Division Powertrain, Business Unit Transmission, Germany; <sup>3</sup> Siemens AG, Corporate Technology, Research In Energy and Electronics, CT REE ELM EMI-DE, Germany; <sup>4</sup> Continental Automotive France SAS, Toulouse, France
14:30-15:00	10D	<b>Fabrication and characterization of functional electroceramic layers for energy conversion devices</b> S. Molin <sup>1</sup> , K. Cysewska <sup>1</sup> , J. Karczewski <sup>2</sup> , B. Kamecki <sup>2</sup> , A. Mroziński <sup>1</sup> , J. Ignaczak <sup>1</sup> , P. Jasiński <sup>1</sup> <sup>1</sup> Gdańsk University of Technology, Faculty of Electronics, Telecommunications and Informatics, Poland; <sup>2</sup> Gdańsk University of Technology, Faculty of Applied Physics and Mathematics, Poland
15:00-15:45	10D	<b>IMAPS Poland Chapter Board Meeting</b>

*15.30 – 16.00 Coffee break*

**Poster Session (Wednesday, September 4<sup>th</sup>, room 113-114)**

*Chair: Katarzyna Zakrzewska*

16:00-17:30	P1	<b>Photothermal properties of nano-CuO films</b> E. Czerwosz, I. Stępińska, M. Kozłowski, R. Diduszko, K. Biernacki, H. Wronka <i>Lukasiewicz Research Network, Poland</i>
16:00-17:30	P2	<b>Thickness influence on electrical and optical properties of ITO thin films for application in transparent electronics</b> R. Pastuszek, M. Mazur, D. Wojcieszak, D. Kaczmarek, J. Domaradzki, A. Obstarczyk <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P3	<b>Analiza generacji promieniowania w laserze z nieliniowym zwierciadłem wykazującym parzystą symetrię</b> A. Mossakowska-Wyszyńska, P. Witoński <i>Warsaw University of Technology, Poland</i>
16:00-17:30	P4	<b>Coupled-mode formulation by reciprocity in directional coupler based on hyperbolic metamaterials</b> A. Tyszka-Zawadzka <sup>1</sup> , M. Kieliszczyk <sup>1</sup> , B. Janaszek <sup>1</sup> , P. Szczepański <sup>1,2</sup> <sup>1</sup> <i>Warsaw University of Technology, Poland;</i> <sup>2</sup> <i>National Institute of Communications, Poland</i>
16:00-17:30	P5	<b>Effect of spatial dispersion in hyperbolic media</b> B. Janaszek <sup>1</sup> , M. Kieliszczyk <sup>1</sup> , A. Tyszka-Zawadzka <sup>1</sup> , P. Szczepański <sup>1,2</sup> <sup>1</sup> <i>Warsaw University of Technology, Poland;</i> <sup>2</sup> <i>National Institute of Communications, Poland</i>
16:00-17:30	P6	<b>Thermal MEMS nanostructure dynamic measurement problem investigation</b> J. Topiłko, P. Pietrzak, M. Janicki <i>Lodz University of Technology, Poland</i>
16:00-17:30	P7	<b>Statyczne efekty piezotroniczne w diodach Schottky'ego wykonanych w heterostrukturze AlGaIn/GaN</b> B. K. Paszkiewicz, M. Wośko, B. Paszkiewicz, A. Dziedzic <i>Politechnika Wroclawska</i>
16:00-17:30	P8	<b>Modeling and analysis of electron-hole bilayer TFET current-voltage characteristics</b> P. Wiśniewski <sup>1,2</sup> , B. Majkusiak <sup>2</sup> <sup>1</sup> <i>Warsaw University of Technology, Centre for Advanced Materials and Technologies CEZAMAT, Poland;</i> <sup>2</sup> <i>Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, Poland</i>
16:00-17:30	P9	<b>Application of Fourier transform to determine the width of quantum wells in multicomponent layers</b> Ł. Pawlaczyk, J. Serafińczuk, T. P. Gotszalk <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P10	<b>Influence of the area of a thermal pad on optical and thermal parameters of LED modules</b> K. Górecki, P. Ptak <i>Gdynia Maritime University, Poland</i>
16:00-17:30	P11	<b>Chosen properties of polymer-silver screen-printed heaters operating at elevated temperature</b> K. Witek <sup>1</sup> , A. Skwarek <sup>1</sup> , P. Guzdek <sup>1</sup> , B. Illés <sup>2</sup> <sup>1</sup> <i>Lukasiewicz Research Network – Institute of Electron Technology, Poland;</i> <sup>2</sup> <i>Budapest University of Technology and Economics, Department of Electronics Technology, Hungary</i>
16:00-17:30	P12	<b>Hydrogen sensor based on field effect transistor with C-Pd layer</b> P. Firek <sup>1</sup> , S. Krawczyk <sup>2</sup> , H. Wronka <sup>2</sup> , E. Czerwosz <sup>2</sup> , J. Szmidt <sup>1</sup> <sup>1</sup> <i>Warsaw University of Technology, Poland;</i> <sup>2</sup> <i>Tele- &amp; Radio Research Institute, Poland</i>
16:00-17:30	P13	<b>Electrochemical biosensor for detection of 17β-estradiol using semi-conducting polymer and horseradish peroxidase</b> K. A. Spsychalska, J. Cabaj <i>Wroclaw University of Science and Technology, Poland</i>



16:00-17:30	P14	<b>Studies of metal-insulator transition in vanadium oxides</b> K. Schneider, M. Dziubaniuk, J. Wyrwa <i>AGH University of Science and Technology, Poland</i>
16:00-17:30	P15	<b>Developing the idea of wire textile RF circuits and antennas fabricated by sewing conductive threads</b> P. Jankowski-Mihułowicz <sup>1</sup> , M. Węglarski <sup>1</sup> , M. Chamera <sup>2</sup> <i><sup>1</sup>Rzeszow University of Technology, Poland; <sup>2</sup>Talkin Things, Poland</i>
16:00-17:30	P16	<b>Development of assembly techniques for connection of AlGaIn/GaN/Si chips to DBC substrate</b> R. Kisiel <sup>1</sup> , M. Guzewicz <sup>2</sup> , A. Taube <sup>2</sup> , M. Sochacki <sup>1</sup> <i><sup>1</sup>Warsaw University of Technology, Poland; <sup>2</sup>Institute of Electron Technology, Poland</i>
16:00-17:30	P17	<b>PV panels on the flexible substrate for integrating with the acoustic screen</b> K. Drabczyk, G. Kulesza-Matlak, P. Sobik <i>Institute of Metallurgy and Materials Science of Polish Academy of Sciences, Poland</i>
16:00-17:30	P18	<b>Electrical properties of carbon-black-, graphite- and graphene- glass composites</b> T. Matusiak, A. Dabrowski, K. Laszczyk, L. Golonka <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P19	<b>Piezoresistive effect in surface and embedded thick-film resistors</b> J. Borecki <sup>1</sup> , J. Kalenik <sup>2</sup> , W. Steplewski <sup>1</sup> , A. Arazna <sup>1</sup> , K. Janeczek <sup>1</sup> <i><sup>1</sup>Tele and Radio Research Institute, Poland; <sup>2</sup>Warsaw University of Technology, Poland</i>
16:00-17:30	P20	<b>3D-printed microfluidic sensor for fluorescence measurements</b> W. M. Gzubicka, W. J. Nawrot, K. Malecha <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P21	<b>Textronic UHF RFID transponder characteristics and determining the dielectric properties of textile substrates</b> P. Jankowski-Mihułowicz, M. Węglarski <i>Rzeszow University of Technology, Poland</i>
16:00-17:30	P22	<b>Nitrogen dioxide gas-sensing detection with GO modified CuO thin films</b> A. Szkudlarek <sup>1</sup> , M. Kawa <sup>1</sup> , G. Jasinski <sup>2</sup> , P. Jasinski <sup>2</sup> , A. Rydosz <sup>1</sup> <i><sup>1</sup>AGH University of Science and Technology, Poland; <sup>2</sup>Gdansk University of Technology, Poland</i>
16:00-17:30	P23	<b>Analyzes of the growth of Intermetallic compounds IMC induced by aging in climatic chamber</b> J. Sitek <sup>1</sup> , M. Koscielski <sup>1</sup> , W. Steplewski <sup>1</sup> , A. Arazna <sup>1</sup> , K. Janeczek <sup>1</sup> , P. Ciszewski <sup>2</sup> <i><sup>1</sup>Lukasiewicz Research Network - Tele and Radio Research Institute, Poland; <sup>2</sup>Semicon Sp. z.o.o., Poland</i>
16:00-17:30	P24	<b>Evaluation of the prediction ability of air pollutants based on the electronic nose responses</b> P. Kalinowski, L. Wozniak, G. Jasinski, P. Jasinski <i>Gdansk University of Technology, Poland</i>
16:00-17:30	P25	<b>Investigation of the temperature modulation parameters on semiconductor gas sensor response</b> L. Wozniak, P. Kalinowski, G. Jasinski, P. Jasinski <i>Gdansk University of Technology, Poland</i>
16:00-17:30	P26	<b>Model of boron diffusion in silicon used for solar cell emitter layer fabrication based on boric acid solutions</b> W. Filipowski <i>Silesian University of Technology, Poland</i>
16:00-17:30	P27	<b>Influence of ammonium tungstate (NH<sub>4</sub>)<sub>2</sub>WO<sub>4</sub> additive in metallization baths on Ni-Cu-P resistive layer chemical composition</b> W. Filipowski <sup>1</sup> , Z. Pruszowski <sup>1</sup> , N. Waczyńska-Niemiec <sup>1</sup> , P. Kowalik <sup>1</sup> , A. Czerwiński <sup>2</sup> , J. Kulawik <sup>3</sup> , K. Waczyński <sup>1</sup> <i><sup>1</sup>Institute of Electronics, Silesian University of Technology, Gliwice, Poland; <sup>2</sup>Institute of Electron Technology, Warsaw, Poland; <sup>3</sup>Institute of Electron Technology, Kraków Division, Krakow, Poland</i>
16:00-17:30	P28	<b>UV assisted gas sensors detection system</b> D. Michoń <sup>1</sup> , W. Maziarz <sup>1</sup> , D. Wojcieszak <sup>2</sup> , A. Brudnik <sup>1</sup> <i><sup>1</sup>AGH University of Science and Technology, Poland; <sup>2</sup>Wroclaw University of Science and Technology, Poland</i>



16:00-17:30	P29	<b>Studies on Au-free ohmic contact metallization for power AlGaIn/GaN HEMTs</b> M. Guziewicz <sup>1</sup> , A. Taube <sup>1</sup> , K. Golaszewska <sup>1</sup> , M. Ekielski <sup>1</sup> , J. Zdunek <sup>2</sup> , A. Szerling <sup>1</sup> <sup>1</sup> Lukasiewicz Research Network – Institute of Electron Technology, Poland; <sup>2</sup> Warsaw University of Technology, Poland
16:00-17:30	P30	<b>Response of an amperometric gas sensors in multicomponent gas mixtures</b> G. Jasiński <sup>1</sup> , M. Dmierzak <sup>1,2</sup> , P. Jasiński <sup>1</sup> <sup>1</sup> Gdańsk University of Technology, Poland; <sup>2</sup> PM Ecology Sp. z o. o., Poland
16:00-17:30	P31	<b>Conductive polyacrylonitrile-polyaniline (PAN/PANI) fibers - characteristics and electrical properties</b> I. Karbownik <sup>2</sup> , O. Rac-Rumijowska <sup>1</sup> , H. Teterycz <sup>1</sup> <sup>1</sup> Wroclaw University of Science and Technology, Poland; <sup>2</sup> Technical University of Łódź, Poland
16:00-17:30	P32	<b>The repeatability of the capacitor layers inkjet printed on a flexible substrate</b> M. Kiliszkiwicz, D. Przybylski, J. Felba, R. Korbutowicz Wroclaw University of Science and Technology, Poland
16:00-17:30	P33	<b>Impedance spectroscopy in H2 sensing of TiO2/SnO2 nanomaterials</b> B. Szafraniak, A. Kusior, M. Radecka, K. Zakrzewska AGH University of Science and Technology, Poland
16:00-17:30	P34	<b>Atomic layer deposition of TiO2 blocking layers for dye-sensitized solar cells</b> A. Drygała, M. Szindler, M. Szindler, E. Jonda Silesian University of Technology, Poland
16:00-17:30	P35	<b>Magnetic field generated by permanent magnets embedded on a spinning disc</b> M. Gierczak, A. Dziedzic Wroclaw University of Science and Technology, Poland
16:00-17:30	P36	<b>Measurement of mixed thin-/thick film thermoelectric microgenerators based on constantan and silver with NiCr sublayer</b> M. Gierczak, E. Prociów, A. Dziedzic Wroclaw University of Science and Technology, Poland
16:00-17:30	P37	<b>Ceramic microfluidic device with integrated differential microwave circuits</b> P. Gruszewski, L. Jasińska, K. Malecha, K. Szostak, P. Słobodzian Wroclaw University of Science and Technology, Poland
16:00-17:30	P38	<b>Ink-jet printed microwave ring resonator with integrated microfluidic components</b> L. Jasińska, K. Szostak, M. Kiliszkiwicz, K. Malecha, P. Słobodzian Wroclaw University of Science and Technology, Poland
16:00-17:30	P39	<b>Electromagnetic disturbances generated by an multi reader RFID-based navigation robot</b> M. Hubacz, D. Klepacki, B. Pawłowicz, W. Sabat, B. Trybus Rzeszów University of Technology, Poland
16:00-17:30	P40	<b>EMC aspects in microelectronic circuits made on ceramic substrate</b> W. Sabat, D. Klepacki, K. Kuryło, K. Kamuda Rzeszów University of Technology, Poland
16:00-17:30	P41	<b>Electrochemical sensors based on coupled TiO2 - Fe2O3 system</b> A. M. Kusior <sup>1</sup> , I. Karoń <sup>2</sup> , M. Radecka <sup>1</sup> <sup>1</sup> AGH University of Science and Technology, Poland; <sup>2</sup> State Higher Vocational School, Poland
16:00-17:30	P42	<b>Thermovoltaic effect in a multilayer junction structure with an oxide insulation barrier</b> M. Turkiewicz, D. Nowak, E. Prociów, A. Dziedzic Wroclaw University of Science and Technology, Poland
16:00-17:30	P43	<b>Effect of different thermocouple constructions during heat-level vapour phase soldering</b> M. A. Alaya <sup>1</sup> , V. Megyeri <sup>1</sup> , D. Busek <sup>2</sup> , G. Harsányi <sup>1</sup> , A. Géczy <sup>1</sup> <sup>1</sup> Budapest University of Technology and Economics, Hungary; <sup>2</sup> Czech Technical University in Prague, Czech Republic
16:00-17:30	P44	<b>Numerical investigation on the effect of solder paste rheological behaviour and printing speed on stencil printing</b> O. Krammer <sup>1</sup> , T. Al-Ma'aiteh <sup>1</sup> , B. Illés <sup>1</sup> , D. Bušek <sup>2</sup> , K. Dušek <sup>2</sup> <sup>1</sup> Budapest University of Technology and Economics, Hungary; <sup>2</sup> Czech Technical University in Prague, Czech Republic

16:00-17:30	P45	<b>Investigations of electrical behavior of resistive switching effect in hafnia MIS structures</b> J. Domaradzki, D. Kaczmarek, A. Obstarczyk, D. Wojcieszak, M. Mazur, L. Nenkin <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P46	<b>Different approach of thermal analysis for thermal joints made by low-temperature and low-pressure sintered silver for non-metalized semiconductors</b> K. J. Stojek <sup>1</sup> , J. Felba <sup>1</sup> , J. Nicolics <sup>2</sup> , W. Klausek <sup>1</sup> <sup>1</sup> <i>Wroclaw University of Science and Technology, Poland;</i> <sup>2</sup> <i>Vienna University of Technology, Austria</i>
16:00-17:30	P47	<b>Thermoelectric properties of thin-film germanium-gold alloys on different substrates</b> D. Nowak, M. Turkiewicz, M. Reczuch <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P48	<b>Improving detection of sulphur halitosis markers using resistive gas sensors modified with nanomaterials</b> P. Suchorska-Woźniak, O. Rac-Rumijowska, H. Teterycz <i>Wroclaw University of Science and Technology, Poland</i>
16:00-17:30	P49	<b>Optical Al<sub>2</sub>O<sub>3</sub> thin film for applications in silicon solar cells</b> M. Szindler, M. Szindler, A. Drygała, P. Boryło <i>Silesian University of Technology, Poland</i>
16:00-17:30	P50	<b>Low voiding solder pastes in LED assembly</b> B. Dziurdzia <sup>1</sup> , M. Sobolewski <sup>2</sup> , J. Mikołajek <sup>3</sup> <sup>1</sup> <i>AGH University of Science and Technology, Poland;</i> <sup>2</sup> <i>Fideltronik S.A., Poland;</i> <sup>3</sup> <i>Fideltronik Poland Ltd., Poland</i>
16:00-17:30	P51	<b>Optical properties of Al<sub>2</sub>O<sub>3</sub> + TiO<sub>2</sub> structure for photovoltaics application</b> B. Swatowska <sup>1</sup> , Z. Starowicz <sup>2</sup> , K. Gawlińska <sup>2</sup> , P. Panek <sup>2</sup> <sup>1</sup> <i>AGH University of Science and Technology, Poland;</i> <sup>2</sup> <i>Institute of Metallurgy and Material Science PAS, Poland</i>
16:00-17:30	P52	<b>Multilayer structures of reduced graphene oxide/Fe<sub>2</sub>O<sub>3</sub> for room temperature nitrogen dioxide sensing</b> T. Pisarkiewicz <sup>1</sup> , W. Maziarz <sup>1</sup> , A. Małolepszy <sup>2</sup> , L. Stobiński <sup>2</sup> , D. Michoń <sup>1</sup> , A. Rydosz <sup>1</sup> <sup>1</sup> <i>AGH University of Science and Technology, Poland;</i> <sup>2</sup> <i>Warsaw University of Technology, Poland</i>
16:00-17:30	P53	<b>Optimization of optical properties of titanium nitride (TiN) thin-films</b> A. Vashistha <sup>1</sup> , R. Mroczyński <sup>2</sup> <sup>1</sup> <i>Warsaw University of Technology, Faculty of Mechatronics, Poland;</i> <sup>2</sup> <i>Warsaw University of Technology, Institute of Microelectronics and Optoelectronics, Poland</i>
16:00-17:30	P54	<b>Screen printing process optimization using Taguchi method</b> P. Markowski <i>Wroclaw University of Science and Technology, Poland</i>

**18.30 – 22.00 Odra river boat cruise and dinner**



## Plenary Session II (Thursday, September 5<sup>th</sup>)

*Chairs: Andrzej Dzedzic, Krzysztof Górecki*

09:00-09:45	10AC	<b>MEMS for nanosatellites for solar system and deep space explorations</b> Jan Dziuban <i>Wroclaw University of Science and Technology, Poland</i>
09:45-10:30	10AC	<b>Solid oxide cells - technology for distributed energy conversion</b> Piotr Jasiński <i>Gdańsk University of Technology, Poland</i>

**10.30 – 11.00 Coffee break**

## Technical Sessions III (Thursday, September 5<sup>th</sup>)

**ELTE Session 3 – Microsystems**

*Chair: Jan Dziuban*

11:00-11:20	10AC	<b>Uniwersalna platforma lab-on-chip dla nanosatelitów biologicznych</b> A. Podwin <sup>1</sup> , A. Graja <sup>1,2</sup> , D. Przystupski <sup>3</sup> , D. Lizanets <sup>1</sup> , J. Dziuban <sup>1</sup> , R. Walczak <sup>1</sup> <i><sup>1</sup>Politechnika Wroclawska; <sup>2</sup>SatRevolution; <sup>3</sup>Uniwersytet Medyczny we Wroclawiu</i>
11:20-11:40	10AC	<b>Hybrid microfluidic chip fabricated using new dry film resist</b> W. Kubicki <i>Wroclaw University of Science and Technology, Poland</i>
11:40-12:00	10AC	<b>Fibre optic system for optomechanical interaction studies</b> K. Orłowska <sup>1</sup> , B. Świadkowski <sup>1</sup> , P. Kunicki <sup>1</sup> , A. Sierakowski <sup>2</sup> , M. Świątkowski <sup>1</sup> , T. Gotszalk <sup>1</sup> <i><sup>1</sup>Wroclaw University of Science and Technology, Poland; <sup>2</sup>Institute of Electron Technology, Poland</i>
12:00-12:20	10AC	<b>Mikrobelka jako czujnik do pomiaru masy wykonany metodą druku strumieniowego 3D</b> P. Śniadek, B. Kawa, R. Walczak <i>Politechnika Wroclawska</i>
12:20-12:40	10AC	<b>Inkjet 3D printed microfluidic device for root and stalk growing forces measurement</b> B. Kawa, K. Adamski, R. Walczak <i>Wroclaw University of Science and Technology, Poland</i>

## IMAPS Invited Talks 3

*Chair: Ryszard Kisiel*

11:00-11:40	10D	<b>Heat transfer aspects of condensation during vapour phase soldering on oriented PCB-based surfaces</b> A. Géczy <sup>1</sup> , I. Bozsóki <sup>1</sup> , D. Straubinger <sup>1</sup> , D. Busek <sup>2</sup> , O. Krammer <sup>1</sup> , B. Illés <sup>1</sup> <i><sup>1</sup>Budapest University of Technology and Economics, Hungary; <sup>2</sup>Czech Technical University of Technology and Economics, Czech Republic</i>
11:40-12:20	10D	<b>Willemite ceramics with Li<sub>2</sub>CO<sub>3</sub> as a sintering aid for LTCC microwave substrate applications</b> B. Synkiewicz-Musialska <i>Lukasiewicz Research Network - Institute of Electron Technology, Poland</i>

**12.40 – 13.30 Lunch**

## Technical Sessions IV (Thursday, September 5<sup>th</sup>)

### ELTE Session 4 – Micro- and nanoelectronics

Chair: Jarosław Domaradzki

13:30-13:50	10AC	<b>Wytwarzanie i charakteryzacja testowych przyrządów MIS zawierających nanokryształy Si i SiC</b> A. Mazurak, R. Mroczyński <i>Politechnika Warszawska, Poland</i>
13:50-14:10	10AC	<b>White light using phosphor structure of ZrO<sub>2</sub> films with RE</b> Ł. Wachnicki, S. Gierałowska, M. Godlewski <i>Polish Academy of Science, Institute of Physics, Poland</i>
14:10-14:30	10AC	<b>The n-i-p heterostructure light emitting diodes with oxide layers grown by ALD</b> S. Gierałowska, Ł. Wachnicki, M. Godlewski <i>Polish Academy of Science, Institute of Physics, Poland</i>
14:30-14:50	10AC	<b>Identyfikacja żywotności komórek przy pomocy struktur typu ISFET</b> K. Kondracka <sup>1</sup> , P. Firek <sup>1</sup> , A. Kiepusa <sup>2</sup> , M. Waśkiewicz <sup>1</sup> , S. Lewicki <sup>2</sup> , R. Zdanowski <sup>2</sup> , J. Szmidt <sup>1</sup> <sup>1</sup> <i>Politechnika Warszawska, Instytut Mikroelektroniki i Optoelektroniki;</i> <sup>2</sup> <i>Wojskowy Instytut Higieny i Epidemiologii</i>

### IMAPS Invited Talks 4

Chairs: Piotr Jasiński

13:30-14:10	10D	<b>Cycle life and degradation sources in Li-S cells</b> V. Sedlakova <sup>1</sup> , J. Sikula <sup>1</sup> , P. Sedlak <sup>1</sup> , O. Cech <sup>2</sup> <sup>1</sup> <i>Brno University of Technology, CEITEC, Czech Republic;</i> <sup>2</sup> <i>Brno University of Technology, FEEC, Czech Republic</i>
14:10-14:50	10D	<b>Review of LTCC technology for millimetre waves and photonics</b> M. S. Lahti, K. Kautio, P. Karioja <i>VTT Technical Research Centre of Finland, Finland</i>
15:00–15:30	10D	<b>ELTE Conference Scientific Committee Meeting</b>

*14.50 – 15.50 Coffee break*

## Technical Session V (Thursday, September 5<sup>th</sup>)

### ELTE Session 5 – Vacuum Microsystems

Chair: Tadeusz Pisarkiewicz

15:50-16:10	10AC	<b>Mikrosystemy wysokopróżniowe</b> T. Grzebyk <i>Politechnika Wroclawska</i>
16:10-16:30	10AC	<b>MEMS mass spectrometer</b> P. Szyszka, T. Grzebyk, A. Górecka-Drzazga, J. A. Dziuban <i>Wroclaw University of Science and Technology, Poland</i>
16:30-16:50	10AC	<b>Field emission CNT film in a triode configuration for the purpose of the miniaturized transmission electron microscope</b> K. U. Laszczyk, M. Krysztof, A. I. Herman, A. Górecka-Drzazga <i>Wroclaw University of Science and Technology, Poland</i>
16:50-17:10	10AC	<b>Design and testing of an Einzel lens for MEMS transmission electron microscope</b> M. Krysztof, M. Białas, A. Górecka-Drzazga <i>Wroclaw University of Science and Technology, Poland</i>

**IMAPS Session**

15:50-16:50	10D	<b>IMAPS Poland Chapter Meeting</b>
-------------	-----	-------------------------------------

*17.30 - 22.00 Evening meeting and dinner (H-14 building)*



## Plenary Session III (Friday, September 6<sup>th</sup>)

*Chairs: Małgorzata Jakubowska, Piotr Markowski*

09:00-09:45	10AC	<b>Selected applications and challenges of metrology with MEMS tools</b> Tomasz Piasecki <i>Wroclaw University of Science and Technology, Poland</i>
09:45-10:30	10AC	<b>Thin film metal oxide nanostructures for gas sensing</b> Katarzyna Zakrzewska, Marta Radecka <i>AGH University of Science and Technology, Poland</i>

*10.30 – 11.00 Coffee break*

## Technical Session VI (Friday, September 6<sup>th</sup>)

**ELTE Session 6 – Photonics**

*Chair: Ryszard Romaniuk*

11:00-11:20	10AC	<b>Manufacturing technology for high precision passive photonic elements</b> K. Pavlov, M. Słowikowski, P. Wiśniewski, B. Stonio, M. Filipiak, M. Myśliwiec, B. Michalak, R. B. Beck <i>Warsaw University of Technology, Centre for Advanced Materials and Technologies CEZAMAT, Poland</i>
11:20-11:40	10AC	<b>Analysis of the influence of errors of fabrication of photonic structures with the FIB technology on the properties of this structures</b> D. Przybylski <sup>1</sup> , A. Zięba <sup>1,2</sup> , S. Patela <sup>1</sup> <i><sup>1</sup>Wroclaw University of Science and Technology; <sup>2</sup>Nanores, Wroclaw, Poland</i>
11:40-12:10	10AC	<b>High sensitive optical transducers based on grating couplers for biomedical applications</b> P. Karasiński <i>Silesian University of Technology, Poland</i>
12:10-12:30	10AC	<b>Zintegrowana matryca mikropryzmatów do sprzęgania światła w optycznych systemach detekcji w platformach lab-on-a-chip</b> A. Pokrzywnicka, P. Śniadek, R. Walczak <i>Politechnika Wroclawska</i>

**IMAPS Invited Talks 5**

*Chair: Damian Nowak*

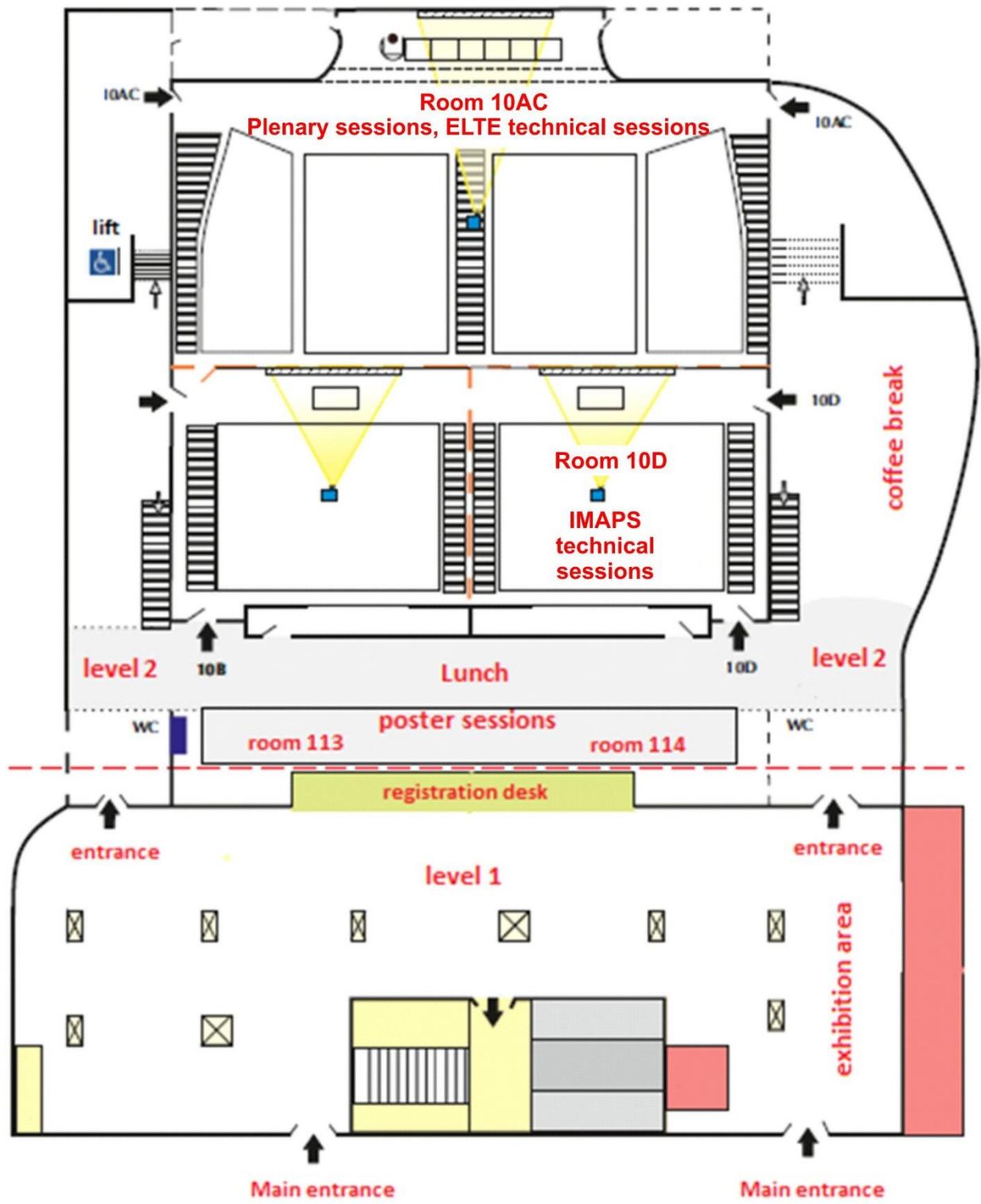
11:00-11:40	10D	<b>Sensor technologies for Point-of-Care testing</b> J. Cabaj, S. Baluta, K. Malecha <i>Wroclaw University of Science and Technology, Poland</i>
11:40-12:20	10D	<b>Additive manufacturing revolution in ceramic microsystems</b> W. Nawrot, K. Malecha <i>Wroclaw University of Science and Technology, Poland</i>

*12.30 – 12.45 Awards ceremony, conference closing*

*12.45 – 13.45 Lunch*



# Conference Centre, building D20





## Notes