



**Conference Program**

# **EuroSensors XXIV**

**September 5 – 8, 2010**

**Linz, Austria**

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Microelectronics and Microsensors, Johannes Kepler University  
Linz, A-4040 Linz.

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## Session Chairs

- A1L-A: KEYNOTE I – B. Jakoby & M. Vellekoop  
A2L-A: KEYNOTE II – B. Jakoby & M. Vellekoop  
A3L-A: Gas sensors – C. Di Natale & I. Dufour  
A3L-B: Cell manipulation & analysis – H. Brueckl & A. Hierlemann  
A3L-C: Sensor electronics – M. Kraft & A. Springer  
A3L-D: Modeling and simulation – D. Elata & S. Rupitsch  
A4P-E: Solid-state gas sensors – C. Diskus & G. Schrag  
A4P-F: Interfaces & sensor networks – C. Diskus & G. Schrag  
A4P-G: Applications – C. Diskus & G. Schrag  
A4P-H: Materials, technology & packaging – C. Diskus & G. Schrag  
A5L-A: Selective surface modifications – N. Jaffrezic-Renault & U. Weimar  
A5L-B: Capacitive sensors – G. Brasseur & G. Gerlach  
A5L-C: Optical devices – F. Arregui & M. Kraft  
A5L-D: Microfluidic systems – A. Homsy & G. Urban  
B1L-A: KEYNOTE III – P. Hauptmann & R. Puers  
B2L-A: Resonant devices I – A. D'Amico & C. Hierold  
B2L-B: Biomedical systems – J. Gardner & U. Weimar  
B2L-C: Sensor signal processing – C. Diskus & T. Sauter  
B2L-D: Flow sensors – J. Dziuban & R. Puers  
B3L-A: Electrochemical sensors – J. Morante & G. Urban  
B3L-B: Thermal transducers – G. Gerlach & R. Lucklum  
B3L-C: Wireless biomedical systems – I. Giouroudi & R. Puers  
B3L-D: System design & optimisation – W. Mokwa & R. Werthschuetzky  
B4P-E: Physical and Optical Sensors & MEMS – I. Giouroudi & E. Reichel  
B4P-F: Micropower generation II – I. Giouroudi & E. Reichel  
B4P-G: Biosensors – I. Giouroudi & E. Reichel  
B4P-H: Materials and technology – I. Giouroudi & E. Reichel  
B5L-A: Label-free biosensors – I. Barsony & A. Hierlemann  
B5L-B: Thermal devices – R. Lucklum & A. van Herwaarden  
B5L-C: On-chip analysis devices – A. Bossche & M. Vellekoop  
B5L-D: Ultrasensitive magnetic probes – F. Keplinger & P. Ripka  
C1L-A: Optical chemical sensors – R. Jachowicz & E. Reichel  
C1L-B: Cantilever based sensors – B. Jakoby & F. Keplinger  
C1L-C: Nanomaterials – H. Brueckl & P. Sarro  
C1L-D: Acceleration sensors – P. French & C. Hierold  
C2L-A: Optical fiber sensors – M. Fleischer & U. Schmid  
C2L-B: Nanosensors & NEMS – A. Bossche & H. Chandralim  
C2L-C: Thin films – E. Comini & P. French  
C2L-D: Micropower generation – D. Briand & V. Ferrari  
C3P-E: Chemical sensors – S. Rupitsch & S. van den Driesche  
C3P-F: Modeling & theory – S. Rupitsch & S. van den Driesche  
C3P-G: Microfluidics & labs-on-a-chip – S. Rupitsch & S. van den Driesche  
C3P-H: Physical sensors, actuators & MEMS – S. Rupitsch & S. van den Driesche

**Welcome to the  
EUROSENSORS XXIV  
September 5 – 8, 2010  
in Linz, Austria**

The EUROSENSORS series of conferences was established in 1987 representing the major European forum to cover the entire field of sensors, actuators, and microsystems. The Euroensors conferences provide an excellent opportunity to bring together European scientists and engineers from academia, research institutes and companies to present and discuss the latest results in the general field of solid-state sensors, actuators, micro- and nanosystems.

**Hosting Organisations**

Johannes Kepler University Linz (JKU), Austria  
Austrian Center of Competence in Mechatronics (ACCM),  
Austria

**General Conference Chair**

Bernhard Jakoby, Johannes Kepler University Linz, Austria

**Technical Program Committee Chair**

Michiel J. Vellekoop, Vienna University of Technology, Austria

**Local Chair**

Christian G. Diskus, Johannes Kepler University Linz, Austria

**Conference Venue**

Johannes Kepler University  
Altenberger Straße 69  
4040 Linz  
AUSTRIA

<http://www.jku.at>

## Conference Chair's Message

The 24<sup>th</sup> edition of the Eurosenors conference series is the first one that is held in Austria and I am very proud that we were successful to bring it to Linz and to continue the successful series of conferences:



- 1987 Cambridge (United Kingdom)
- 1988 Enschede (The Netherlands)
- 1989 Montreux (Switzerland)
- 1990 Karlsruhe (Germany)
- 1991 Rome (Italy)
- 1992 San Sebastian (Spain)
- 1993 Budapest (Hungary)
- 1994 Toulouse (France)
- 1995 Stockholm (Sweden)
- 1996 Leuven (Belgium)
- 1997 Warsaw (Poland)
- 1998 Southampton (United Kingdom)
- 1999 The Hague (The Netherlands)
- 2000 Copenhagen (Denmark)
- 2001 Munich (Germany)
- 2002 Prague (Czech Republic)
- 2003 Guimaraes (Portugal)
- 2004 Rome (Italy)
- 2005 Barcelona (Spain)
- 2006 Gothenburg (Sweden)
- 2007 Lyon (France)
- 2008 Dresden (Germany)
- 2009 Lausanne (Switzerland)
- 2010 Linz (Austria)

Linz is a major international center in mechatronics – in 1990 the Johannes Kepler University (JKU) was the first university worldwide offering a full mechatronics curriculum at university level. Recently, the Austrian Center of Competence in Mechatronics (ACCM) was founded in the frame of the excellence program COMET. In its network, ACCM comprises about 100 international company and scientific partners and the turnover in research projects is roughly 8.5 million €/year. The JKU is one of the owners of ACCM and its major scientific partner. As it is one of the missions of ACCM to organize scientific workshops and conferences in disciplines relevant to mechatronics, it was near at hand for ACCM and JKU to jointly bid for organizing a Eurosenors conference. Besides its relevance for technology and research, Linz and its surroundings offer a lot of sights and cultural attractions and I hope that you find the time to enjoy these as well. From the submissions we were able to compile an interesting program – details are given in the TPC Chair's message.

Organizing a conference of this size requires the help of numerous individuals and there is a huge risk of forgetting someone when compiling an acknowledgement list. Thus, in view of this risk and the limited space, I would like to bundle my thanks by first

thanking all authors of and contributors to this conference and our distinguished keynote and invited speakers. All arrangements had to be coordinated by committees who were directed skilfully by Prof. Michiel Vellekoop (technical program committee and local scientific committee), Vienna University of Technology, and Prof. Christian Diskus (local organization committee), JKU Linz. Numerous members of Michiel's institute in Vienna and my Institute in Linz, as well as people at JKU and ACCM have supported our efforts in arranging this event, which is more than gratefully acknowledged. Moreover, volunteers – mostly students and the JKU's IEEE student branch – have helped us out in arranging important details and sub-events, a huge “thank you” is due to them. I am also most grateful to our sponsors and exhibitors for their donations and the arrangement of their exhibits which will hopefully add to the more applied side of our meeting. Last but not least, I'd like to acknowledge the support of the professional partners of the conference, i.e. Oberösterreich Tourismus GmbH (registration, hotel booking, organization of events), ePapers (abstract and paper handling, conference booklet), and Elsevier (conference proceedings).

As a final note, I would like to call to your attention that the Eurosenors series of conferences is a quite remarkable thing – it is an independent and autonomous series of meetings that has proven to be highly successful. Coordinated by a steering committee of volunteers, which by the way does not form a legal body of any kind, Eurosenors has quickly developed into a European top-conference over the 24 years of its existence. I think all of us have to thank those individuals who have devoted their efforts and ideas to this conference series.

We hope that you find this year's edition as rewarding as the previous Eurosenors conferences by having many fruitful discussions, meeting old and new friends, and enjoying your stay in Linz and surroundings!

Bernhard Jakoby  
General Chair

## TPC Chair's Message

Dear participant of Eurosensors 2010 in Linz!



As in previous years, the Eurosensors Conference heads off with the Eurosensors School on Sunday. We found four excellent speakers for the lectures: U. Schmid, *Introduction to micro-systems technology*; H. Zangl, *Analog Signal Processing and Conditioning for Sensor Signals*; S. Bauer, *Organic Materials for Sensors and Actuators*; and M. Brandl, *Optical Sensing in Biomedicine*.

The technical program this year consists of 376 presentations including three keynotes, eight invited talks, 142 orals and 223 posters. In order to acquire a broad overview of industrial sensor activities we invited keynote presenters from one small, one medium, and one large sensor-involved company: A. van Herwaarden (Xensor Integration, the Netherlands); F. Mayer, (Sensirion, Switzerland), and T. Tille (BMW, Germany). Together, these three keynote presentations will give insight in the requirements and needs for sensors to become commercially successful.

The invited talks have been selected from a list that was made up of nominations from TPC members and cover a wide range of sensor and actuator topics: from biological cell analysis to sensor technology and from gas sensors to physical sensors. They are mainly from academia, informing you on the latest research results and insights. We distributed the invited presentations as much as possible within the program so that you have the opportunity to visit several of them providing you with a wide overview of the field. The 142 oral talks will be presented in four parallel sessions. The poster presentations have been scheduled in three large blocks, one on each day of the conference right after the lunch-break.

Some statistic information: All abstracts have been reviewed by at least three reviewers, where about 90% received four reviews. Of the 509 submitted abstracts, 365 were accepted (72%). This relative high percentage is caused by the fact that according to the review scores, the quality of the abstracts was very high: 74% of the papers received a score of 3 points or higher on a maximum of 4 points.

We have received abstracts from no less than 44 countries, the accepted papers come from 39 countries. 17% of the accepted papers are from outside Europe: 12% from Asia, 4% from the Americas and 1% from the Middle East.

Topic wise the largest areas are *Physical sensors* (22%), *Chemical sensors* (16%), *Technology and Materials* (10%), *Applications* (10%), and *Theory, modelling and design* (8%). Runners up are *Biosensors* with 7%, *Microfluidic devices* with 5%, *Optical MEMS* with 5%, and *Interfaces, systems, and networks*, which also



represent 5% of the accepted papers. The number of papers on biotechnological and related topics is increasing which reflects the world-wide trend.

The conference program could come to existence only with the help of a large number of people who were willing to support the Eurosensors Conference. We have 92 TPC members who reviewed between 20 and 25 abstracts each. When the final scores from all reviewers had been received, a Local Scientific Program Committee (LSPC) of ten people came together and finalized the program in a one-day meeting.

The TPC and LSPC were greatly supported by the General Chair, Bernhard Jakoby, and by a group of local postdocs and PhD students from the Johannes Kepler University and the Vienna University of Technology. You will find the names of all those people in this booklet.

It is my pleasure to thank all of you who participated in the creation of the technical program and in particular all the authors who have submitted their latest work.

I wish you a great conference!

Michiel Vellekoop  
TPC Chair

## **International Steering Committee**

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Johannes Sell, IME JKU Linz  
Wolfgang Buchegger, ISAS TU Vienna  
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Nicola Moscelli, ISAS TU Vienna  
Michael Rosenauer, ISAS TU Vienna  
Sander van den Driesche, ISAS TU Vienna

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Udo Weimar (DE)  
Roland Werthschuetzky (DE)  
Reinoud Wolffenbuttel (NL)  
Bernhard Zagar (AT)  
Hubert Zangl (AT)  
Roland Zengerle (DE)

## **Local Scientific Program Committee**

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Peter Burgholzer, RECENDT, Linz  
Franz Keplinger, ISAS TU Vienna  
Franz Kohl, Austrian Academy of Sciences  
Martin Kraft, CTR AG, Villach  
Bernhard Lendl, CTA TU Vienna  
Christa Nöhhammer, Austrian Institute of Technology, Seibersdorf  
Ulrich Schmid, ISAS TU Vienna  
Bernhard Zagar, JKU Linz

## Program at a Glance

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### Sunday, September 5

09:00 – 18:00	Eurosensors School
17:00 – 20:00	Registration & Infopoint
18:00	Informal Welcome Reception

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### Monday, September 6

08:00 – 18:00	Registration & Infopoint
09:00 – 11:00	Keynote Sessions I & II
11:30 – 13:00	Lecture Sessions
14:30 – 16:00	Poster Sessions
16:00 – 17:30	Lecture Sessions
19:30 – 22:00	Official Reception in Downtown Linz

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### Tuesday, September 7

08:00 – 16:00	Registration & Infopoint
09:00 – 10:00	Keynote Session III
10:00 – 13:00	Lecture Sessions
14:30 – 16:00	Poster Sessions
16:00 – 17:30	Lecture Sessions
19:30 – 22:30	Conference Banquet on Danube River Cruise

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### Wednesday, September 8

08:00 – 16:00	Registration & Infopoint
09:00 – 12:30	Lecture Sessions
14:00 – 15:30	Poster Sessions
15:30	Informal Farewell Reception

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## Registration Desk

On Sunday evening the registration desk will be set up at the Uni-Center (green coloured building on the campus map) and will be open 17:00–20:00. You are invited to join colleagues in an informal Welcome Reception in the mensa on the ground floor of the same building.

During the conference from Monday to Wednesday, the registration and information desk will be situated in the Keplergebäude (red coloured building on the campus map) in front of the main auditorium (Raiffeisensaal) and will be open 8:00–16:00.

## Keynote Speakers

This year, the Eurosensors conference presents three keynote speakers from industry. In order to acquire a broad overview of industrial sensor activities we invited players from one small, one medium and one large sensor-involved company.

The medium sized company **Sensirion AG** located near Zurich in Switzerland has grown from a start-up to 170 employees today in 12 years, amongst others developing sensors for flow, humidity, and pressure. The managing director, **Dr. Felix Mayer** will discuss innovation for commercial sensors. A1L-A, Monday, 09:30, Room 1

From **BMW** in Munich, the head of the Development Mechatronics/ Driving Functions department, **Dr. Thomas Tille**, will present "Automotive Requirements for Sensors using Air-Quality Gas Sensors as an example". A2L-A, Monday, 10:15, Room 1

In Delfgauw, The Netherlands, the small sensor company **Xensor Integration BV** develops and produces client-specific integrated sensors, but also offers a series of standard silicon sensors. The managing director **Dr. Sander van Herwaarden** will talk about in-company sensor research and development, also illustrated with one or two examples. B1L-A, Tuesday, 09:10, Room 1

Together, these three keynote presentations will give insight in the requirements and needs for sensors to become commercially successful. The talks will be of interest not only for junior and senior sensor researchers, but also for R&D- and market officers from many branches of industry.

## Invited Speakers

Eight scientists have been invited to present a paper on their topic of research. They have been selected from a list that was made up of nominations from TPC members. Invited talks receive a slot of 30 min. for the presentation.

**Winnie Svendsen**, Technical University of Denmark (DTU), Nanotech, Lyngby, DK: "Micro and nano-platforms for biological cell analysis", A3L-B, Monday, 11:30, Room 2

**Isabelle Dufour**, University of Bordeaux, IMS, FR: "Unconventional uses of cantilevers for chemical sensing in gas and liquid environments", C1L-B, Wednesday, 09:00, Room 2

**Thorsten Kern**, Continental Automotive GmbH, DE: "Requirements and design considerations for the measurement of haptic object properties", B3L-D, Tuesday, 11:45, Room 7

**Hubert Zangl**, Graz University of Technology, AT: "Capacitive sensors uncovered: measurement, detection and classification in open environments", A5L-B, Monday, 16:00, Room 2

**Francisco Arregui**, University of Navarra, Pamplona, ES: "Optical fiber sensors based on layer-by-layer nanostructured films", C2L-A, Wednesday, 11:00, Room 1

**Kofi Makinwa**, Delft University of Technology, NL: "Smart temperature sensors in standard CMOS", B5L-B, Tuesday, 16:00, Room 2

**Giovanni Boero**, Ecole Polytechnique Fédérale de Lausanne (EPFL), SUI: "Electron spin resonance sensors", B5L-D, Tuesday, 16:00, Room 7

**Srinivas Tadigadapa**, Penn State University, PA, USA: "Piezoelectric MEMS - Challenges and Opportunities", B2L-A, Tuesday, 10:00, Room 1

## Lecture Presentation Information

The duration of a presentation slot is 15 minutes. You will have 12 minutes for the presentation itself and 3 minutes for questions from the audience.

An LCD projector and a computer (Windows XP, MS Powerpoint, Adobe Acrobat Reader) will be available in every session room for regular presentations. Neither Overhead projector, 35mm slides projectors nor VHS videotape player will be available.

Preparation of visuals: please note that individuals using computer projection must either bring their own laptop computer with the appropriate presentation software loaded or bring a USB memory stick containing their presentation. Files can be uploaded to the local PCs in the lecture rooms during the breaks between the sessions. To avoid software compatibility problems (MS Powerpoint), speakers are advised to save their Powerpoint presentation with the Package for CD feature AND bring a backup PDF-version of their presentation.

Speakers should arrive in their session room 15 minutes BEFORE the start of their session to report to the chair person.

## Poster Presentation Information

There will be a large number of posters presented during the three days of the conference. In order to make these sessions run smoothly, some cooperation from you, as a poster exhibitor, is necessary.

First of all, it is essential that your poster is put up before the session and removed after it has ended. The placement of your poster will be marked on the panel, where it will be presented with the number of your poster contribution: e.g. A4P-E (A = first day, 4 = the time slot, P = poster session, E = room E). Look for your number in the conference program.

Please attach your poster to the panel with pins, which are available in the poster area. If you need more pins, please contact the information. After you have removed your poster, please leave the pins on the board.

## WLAN Web Connectivity

The Johannes Kepler University is member of EDUROAM. In case you have an account of your university and your university is also member of EDUROAM, you can use the WLAN the usual way.



*Settings:*

SSID: eduroam

Authentication: 802.1X - PEAP - MSCHAPv2

No certificate

Alternatively, guest accounts are available at the registration desk, where you are asked for a signature in order to receive a personal account and a password.

*Settings:*

SSID: JKU

No WEP (no Wireless Encryption Protocol)

TCP/IP configuration using DHCP (retrieve IP-address and DNS server automatically)

Turn off proxy-server

Protocols: DNS, DHCP, HTTPS und HTTP

IP-address of WLAN-gateway (140.78.164.1) must be accessible

## Social Program

September 5, 2010, 18:00:

Informal welcome reception at JKU Campus, Uni Center

September 6, 2010, 19:30

Official reception by the state of Upper Austria and the City of Linz in downtown Linz

Location: Landhaus Linz, Kloostergasse 11 / Promenade 24

Closest tram stops (lines 1 and 2): Taubenmarkt, Hauptplatz

September 7, 2010: 19:30

Conference banquet on Danube river cruise

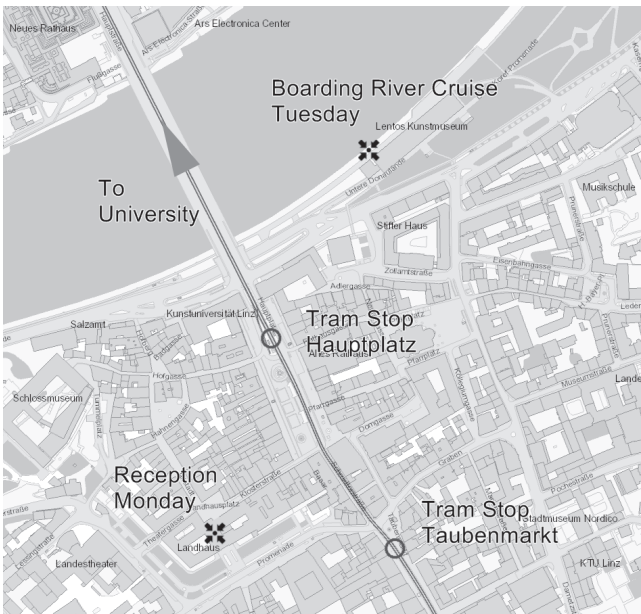
Boarding **19:00**: Lentos Museum, Ernst Koref Promenade 1

Closest tram stop (lines 1 and 2): Hauptplatz

September 8, 2010, 15:30

Informal farewell reception at JKU Campus, Uni Center

## Downtown Linz





## Austrian Center of Competence in Mechatronics

The K2 Center ACCM bundles the research competencies of its three founders – JKU, LCM and vatron – to realize their vision: **"To be a leader in mechatronics excellence and a successful European innovation provider"**. The competence center merges science and research with industrial product development and catalyzes an intensive dialog between science and industry.

Together with an international consortium currently consisting of 53 companies and 40 scientific partners, a one-stop shop that is unique and completely novel for Austria has been created. The scientific knowledge from research projects at the Austrian Center of Competence in Mechatronics is implemented by the application-oriented owners of the center – LCM and vatron – as market-ready products for their customers. More than 110 researchers work on joint projects at ACCM.

The competence center conducts research in the following Areas:

Computational and Experimental Process Modeling and Simulation

Mechanics and Model-Based Control

Information and Control

Mechatronic Design of Machines and Components

Sensors and Signals

Wireless Technologies

The individual research projects are organized in a branch/competence matrix. On the one hand, a project is allocated to the competencies of multiple Areas; on the other hand, these competencies are applied across Area boundaries.

ACCM customers profit from cross-branch know how and from the expertise of a network of high-caliber international scientific partners.



## Johannes Kepler University

The Johannes Kepler University (JKU) in Linz, one of the most modern universities in Austria, was founded in 1966 as an Academy for Social and Economic Sciences. Teaching and research activities initially began with a faculty focused on academic studies in the fields of social sciences, economics and legal studies, serving a student body of approximately 600. The Faculty of Technical and Natural Sciences was introduced in 1969, followed by the Faculty of Law in 1975. In the same year, the Academy transitioned to become the Johannes Kepler University (JKU), named after the world-famous and renowned mathematician and astronomer Johannes Kepler.

In the beginning, the idea of a “university campus setting” was a completely new concept in Austria. Situated on the north-eastern outskirts of the Upper Austrian capital of Linz, the campus accommodates approximately 16.000 students and employs over 2.000 faculty and staff. JKU currently offers 29 Bachelor, Masters and Doctorate programs.

From the start, the JKU depicted a new style of university offering interdisciplinary combinations between the fields of economics, social science, law, natural science and engineering, as well as a concentrated focus on its obligations to the community and economy. Today, the JKU not only provides expertise in basic research, but is also the province’s largest institution of application-oriented research.

Subsequently, in addition to traditional institutes, the university has seen an increasing number of institutes funded by third parties and, more recently, the introduction of competence centers which are privately owned companies and other organizations that reflect the important role JKU plays within the economy of Upper Austria. These include: the Research Institute of Symbolic Computation (RISC), the Software Competence Center Hagenberg, the Institute of Application-oriented Knowledge Processing and Numerical and Symbolic Scientific Computing. In addition to the SCCH Hagenberg, the competence centers include the ACCM (Austrian Competence Center in Mechtronics) and the Competence Center in Wood. These university institutes cooperate with large companies as well as small and medium-sized companies that specialize in these particular fields.



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## Sponsor Message



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### *Presentations:*

Monday, Sept. 6, 13:05 – 13:35 in room 7

Tuesday, Sept. 7, 13:45 – 14:15 in room 7



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**Notes**

## Notes

# Monday, September 6: Keynotes I & II

## Technical Program

**A1L-A      KEYNOTE I**

Time:        09:30 - 10:15

Room:       Room 1

Chairs:      B. Jakoby and M. Vellekoop

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**Innovation for Commercial Sensors: from Stepping Into an Opportunity Gap to Continuous Innovation**

F. Mayer

*Sensirion AG, Switzerland*

**A2L-A      KEYNOTE II**

Time:        10:15 - 11:00

Room:       Room 1

Chairs:      B. Jakoby and M. Vellekoop

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**Automotive Requirements for Sensors Using Air Quality Gas Sensors As an Example**

T. Tille

*BMW Group, Germany*

## Monday, September 6: Lecture Session A3

	Room 1	Room 2
Time	A3L-A Gas sensors	A3L-B Cell manipulation and analysis
11:30	<p><b>On the Origin of Sensing Properties of the Nanodispersed Layers of Semiconducting Metal Oxide Materials</b>                      N. Zaretskiy<sup>2</sup>, L. Menshikov<sup>1</sup>, A. Vasiliev<sup>1</sup>, P. Menshikov<sup>1</sup>  <sup>1</sup>RRC Kurchatov Institute, Russia; <sup>2</sup>Russian Research Center Kurchatov Institute, Russia</p>	<p><b>Micro and Nano-Platforms for Biological Cell Analysis</b>                      W. Svendsen, J. Castillo-Leon, J. Lange, L. Sasso, M. Olsen, L. Andresen, S. Levinsen, M. Dimaki                      Technical University of Denmark, Denmark</p>
11:45	<p><b>Gate Pulsed Readout of Floating Gate FET Gas Sensors</b>                      R. Pohle<sup>2</sup>, O. von Sicard<sup>2</sup>, M. Fleischer<sup>2</sup>, H. Frerichs<sup>1</sup>, C. Wilbertz<sup>1</sup>, I. Freund<sup>1</sup>  <sup>1</sup>Micronas GmbH, Germany; <sup>2</sup>Siemens AG, Germany</p>	
12:00	<p><b>Real-Time Detection of CO by Eukaryotic Cells</b>                      U. Bohrn<sup>2</sup>, E. Stütz<sup>2</sup>, M. Fleischer<sup>2</sup>, M. Schöning<sup>1</sup>, P. Wagner<sup>3</sup>  <sup>1</sup>Aachen University of Applied Sciences / IBN-2, Germany; <sup>2</sup>Siemens AG, Germany; <sup>3</sup>University Hasselt, Belgium</p>	<p><b>Multiple-Frequency Impedance Measurements in Continuous Flow for the Evaluation of Electrical Lysis of Yeast Cells</b>                      G. Mernier<sup>1</sup>, W. Hasenkamp<sup>1</sup>, N. Piacentini<sup>2</sup>, P. Renaud<sup>1</sup>  <sup>1</sup>Ecole Polytechnique Fédérale de Lausanne, Switzerland; <sup>2</sup>Politecnico di Torino, Italy</p>
12:15	<p><b>Polymer-Based Gas Sensor on a Thermally Stable Micro-Cantilever</b>                      T. Emadi, C. Shafai, D. Thomson, M. Freund, N. White, D. Jayas                      University of Manitoba, Canada</p>	<p><b>Continuous Separation of Viable Cells by Travelling Wave Dielectrophoresis</b>                      S. van Den Driesche<sup>2</sup>, V. Rao<sup>3</sup>, D. Puchberger-Enengl<sup>3</sup>, W. WitarSKI<sup>1</sup>, M. Vellekoop<sup>2</sup>  <sup>1</sup>Slovak Academy of Sciences, Slovakia; <sup>2</sup>Technische Universität Wien, Austria; <sup>3</sup>Vienna University of Technology, Austria</p>
12:30	<p><b>Gas Sensor Array System Inspired on the Sensory Diversity and Redundancy of the Olfactory Epithelium</b>                      L. Fernandez, A. Gutierrez-Galvez, S. Marco                      Universitat de Barcelona / IBEC, Spain</p>	<p><b>An Enhanced Platform for Cell Electroporation: Controlled Delivery and Electrodes Functionalization</b>                      L. Odorizzi<sup>1</sup>, C. Ress<sup>1</sup>, C. Collini<sup>1</sup>, E. Morganti<sup>1</sup>, L. Lorenzelli<sup>1</sup>, N. Coppedè<sup>2</sup>, A. Alabi<sup>4</sup>, S. Iannotta<sup>3</sup>, L. Vidalino<sup>5</sup>, P. Macchi<sup>5</sup>  <sup>1</sup>Fondazione Bruno Kessler, Italy; <sup>2</sup>IFN-CNR / Institute of Photonics and Nanotechnology, Italy; <sup>3</sup>IFN-CNR, Institute of Photonics and Nanotechnology, Italy; <sup>4</sup>IFN-CNR, Institute of Photonics and Nanotechnology / IFN-CNR, Italy; <sup>5</sup>Università degli studi di Trento / CIBIO, Italy</p>
12:45	<p><b>A Micro Gas Chromatography Chip with an Embedded Non-Cascaded Thermal Conductivity Detector</b>                      S. Narayanan, B. Alfeeli, M. Agah                      Virginia Polytechnic Institute and State University, United States</p>	<p><b>A High Density Microfluidic Device for Cell Pairing and Electrofusion</b>                      N. Pham Van<sup>2</sup>, J. Villemejane<sup>2</sup>, F. Hamdi<sup>2</sup>, G. Mottet<sup>2</sup>, C. Dalmay<sup>2</sup>, M. Woytasik<sup>4</sup>, E. Martincic<sup>4</sup>, E. Dufour-Gergam<sup>4</sup>, O. Francais<sup>2</sup>, L. Mir<sup>3</sup>, B. Le Pioufle<sup>1</sup>  <sup>1</sup>CNRS ENS de Cachan, France; <sup>2</sup>CNRS SATIE, Institut d'Alembert, ENS Cachan, France; <sup>3</sup>CNRS UMR 8203, Institut Gustave Roussy, France; <sup>4</sup>Université Paris-Sud 11, France</p>



## Monday, September 6: Lecture Session A3

	Room 6	Room 7
Time	A3L-C Sensor electronics	A3L-D Modeling & simulation
11:30	<p><b>A Programmable Sensor Conditioning Interface for Low-Power Applications</b>                      A. Bayo, N. Medrano, B. Calvo, S. Celma  <i>Universidad de Zaragoza, Spain</i></p>	<p><b>Macromodel-Based Simulation and Measurement of the Dynamic Pull-in of Viscously Damped RF-MEMS Switches</b>                      M. Niessner<sup>2</sup>, J. Iannacci<sup>1</sup>, A. Peller<sup>2</sup>, G. Schrag<sup>2</sup>, G. Wachutka<sup>2</sup>  <sup>1</sup>Fondazione Bruno Kessler, Italy; <sup>2</sup>Technische Universität München, Germany</p>
11:45	<p><b>Analog Compensation of Parasitic Sensor Signals in a Subsampling Impedance Analyzer Circuit for Resonating Sensors</b>                      A. Niedermayer, J. Sell, B. Jakoby  <i>Johannes Kepler Universität, Austria</i></p>	<p><b>Modeling of a Piezoelectric Fluid Sensor Excited by Lateral Fields Using a Spectral Domain Approach</b>                      T. Voglhuber-Brunnmaier, B. Jakoby  <i>Johannes Kepler Universität, Austria</i></p>
12:00	<p><b>A Novel PLL-Based Sensor Interface for Resistive Pressure Sensors</b>                      H. Danneels<sup>1</sup>, F. Piette<sup>2</sup>, G. Gielen<sup>1</sup>  <sup>1</sup>Katholieke Universiteit Leuven, Belgium; <sup>2</sup>Melexis, Belgium</p>	<p><b>Modeling and Measurement of Hysteresis of Ferroelectric Actuators Considering Time-Dependent Behavior</b>                      F. Wolf, A. Sutor, S. Rupitsch, R. Lerch  <i>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany</i></p>
12:15	<p><b>A Temperature-Compensated Differential VFC in 1.8 V-0.18 <math>\mu</math>m CMOS</b>                      M. Valero, S. Celma, B. Calvo, N. Medrano  <i>Universidad de Zaragoza, Spain</i></p>	<p><b>Analytical and Numerical Modeling of AlGaIn/GaN/AlN Heterostructure Based Cantilevers for Mechanical Sensing in Harsh Environments</b>                      S. Vittoz<sup>2</sup>, L. Rufer<sup>2</sup>, G. Rehder<sup>2</sup>, U. Heinle<sup>1</sup>, P. Benkart<sup>1</sup>  <sup>1</sup>microGaN GmbH, Germany; <sup>2</sup>TIMA Laboratory (UJF CNRS G-INP), France</p>
12:30	<p><b>An FPGA-Based Flexible Demo-Board for Endoscopic Capsule Design Optimization</b>                      C. Cavallotti<sup>2</sup>, P. Merlino<sup>1</sup>, E. Susilo<sup>2</sup>, M. Vatteroni<sup>2</sup>, P. Valdastrì<sup>2</sup>, A. Abramo<sup>3</sup>, A. Menciasci<sup>2</sup>, P. Dario<sup>2</sup>  <sup>1</sup>PTLab, Agemont S.p.A., Italy; <sup>2</sup>Scuola Superiore Sant'Anna, Italy; <sup>3</sup>Università di Udine / DIEGM, Italy</p>	<p><b>On the Quality-Factor of Micro-Resonators</b>                      M. Lerman, D. Elata  <i>Technion - Israel Institute of Technology, Israel</i></p>
12:45	<p><b>A Complete Low Voltage Analog Lock-in Amplifier to Recover Sensor Signals Buried in Noise for Embedded Applications</b>                      M. Gabal, N. Medrano, B. Calvo, P. Martinez, S. Celma, M. Valero  <i>Universidad de Zaragoza, Spain</i></p>	<p><b>Comparative Finite Element Analyses of Piezoelectric Ceramics and Polymers at High Frequency for Underwater Wireless Communications</b>                      M. Martins, V. Correia, L. Lanceros-Mendez, J. Cabral, J. Rocha  <i>University of Minho, Portugal</i></p>

## Monday, September 6: Poster Session A4

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**A4P-E Solid-state gas sensors**

Time: 14:30 - 16:00

Room: Poster Area 1 (Boards 01 - 20)

Chairs: C. Diskus and G. Schrag

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**01: Zeolites As Transformation Elements in Discriminating Semiconductor Metal Oxide Sensors**A. Afonja<sup>1</sup>, R. Binions<sup>1</sup>, S. Dungey<sup>1</sup>, I. Parkin<sup>1</sup>, D. Lewis<sup>1</sup>, D. Williams<sup>2</sup><sup>1</sup>University College London, United Kingdom; <sup>2</sup>University of Auckland, New Zealand**02: BaTi<sub>0.95</sub>Rh<sub>0.05</sub>O<sub>3</sub> Catalytic Filter Layer - a Promising Candidate for the Selective Detection of CO in the Presence of H<sub>2</sub>**M. Hübner<sup>1</sup>, A. Yuce<sup>1</sup>, M. Mondragón Rodríguez<sup>1</sup>, B. Saruhan<sup>1</sup>, N. Barsan<sup>2</sup>, U. Weimar<sup>2</sup><sup>1</sup>German Aerospace Centre Cologne, Germany; <sup>2</sup>Universität Tübingen, Germany**03: Selectivity Problem of Metal Oxide Based Sensors in the Presence of Water Vapors**R. Pavelko<sup>1</sup>, A. Vasiliev<sup>2</sup>, E. Llobet<sup>3</sup>, X. Vilanova<sup>3</sup>, V. Sevastyanov<sup>1</sup>, N. Kuznetsov<sup>1</sup><sup>1</sup>Kurnakov Institute of General and Inorganic Chemistry, Russia; <sup>2</sup>RRC Kurchatov Institute, Russia; <sup>3</sup>Universitat Rovira i Virgili, Spain**04: Detection of O<sub>3</sub> and NH<sub>3</sub> Using Tin Dioxide/Carbon Nanotubes Based Sensors: Influence of Carbon Nanotubes Properties Onto Sensor's Sensitivity**

B. Ghaddab, F. Berger, J. Sanchez, C. Mavon

Université de Franche-Comté, France

**05: Operando DRIFT Measurements on a Tin Dioxide Based Gas Sensor**

K. Großmann, N. Barsan, U. Weimar

Universität Tübingen, Germany

**06: A Highly Sensitive Catalytic Gas Sensor for Hydrogen Detection Based on Sputtered Nanoporous Platinum**H. Sturm<sup>2</sup>, E. Brauns<sup>2</sup>, T. Seemann<sup>1</sup>, V. Zoellmer<sup>1</sup>, W. Lang<sup>2</sup><sup>1</sup>Fraunhofer IFAM, Germany; <sup>2</sup>Universität Bremen, Germany**07: Gas Sensitivity of Hybrid Nanostructured Films Based on Polyoxometalates**O. Ivanova<sup>2</sup>, S. Krutovtseva<sup>2</sup>, L. Krutovtseva<sup>1</sup>, A. Tarasova<sup>1</sup><sup>1</sup>JSC Ecological sensors and systems, Russia; <sup>2</sup>JSC Practic-NC, Russia**08: Characterization and Gas Sensing Properties of Intrinsic and Au-Doped WO<sub>3</sub> Nanostructures Deposited by AACVD Technique**T. Stoycheva<sup>2</sup>, S. Vallejos<sup>2</sup>, J. Calderer<sup>1</sup>, I. Parkin<sup>3</sup>, C. Blackman<sup>3</sup>, X. Correig<sup>2</sup><sup>1</sup>Universitat Politècnica de Catalunya, Spain; <sup>2</sup>Universitat Rovira i Virgili, Spain; <sup>3</sup>University College London, United Kingdom**09: Optimization of Operating Conditions of a Mini Fuel Cell for the Detection of Low or High Levels of CO in the Reformate Gas**C. Pijolat<sup>2</sup>, G. Tournier<sup>2</sup>, J. Viricelle<sup>2</sup>, N. Guillet<sup>1</sup><sup>1</sup>CEA Grenoble, France; <sup>2</sup>Ecole des Mines, France**10: Rare Earth Oxycarbonates As a Material Class for Chemoresistive CO<sub>2</sub> Gas Sensors**A. Haensch<sup>2</sup>, D. Koziej<sup>1</sup>, M. Niederberger<sup>1</sup>, N. Barsan<sup>2</sup>, U. Weimar<sup>2</sup><sup>1</sup>ETH Zürich, Switzerland; <sup>2</sup>Universität Tübingen, Germany**11: Low Power Hydrogen Sensors Using Electrodeposited PdNi-Si Schottky Diodes**A. Usgaocar<sup>2</sup>, C. de Groot<sup>2</sup>, C. Boulart<sup>1</sup>, A. Castillo<sup>1</sup>, V. Chavagnac<sup>1</sup><sup>1</sup>CNRS, France; <sup>2</sup>University of Southampton, United Kingdom**12: Hydrogen Gas Sensing Properties of Pt/Ta<sub>2</sub>O<sub>5</sub> Schottky Diodes Based on Si and SiC Substrates**J. Yu<sup>1</sup>, G. Chen<sup>2</sup>, C. Li<sup>2</sup>, M. Shafiei<sup>1</sup>, J. Ou<sup>1</sup>, J. du Plessis<sup>1</sup>, K. Kalantar-Zadeh<sup>1</sup>, P. Lai<sup>2</sup>, W. Wlodarski<sup>1</sup><sup>1</sup>RMIT University, Australia; <sup>2</sup>University of Hong Kong, Hong Kong**13: AlGa<sub>N</sub>/Ga<sub>N</sub> Based SAW-HEMT Structures for Chemical Gas Sensors**T. Lalinský<sup>1</sup>, I. Rýger<sup>1</sup>, G. Vanko<sup>1</sup>, M. Tomáška<sup>2</sup>, I. Kostic<sup>1</sup>, S. Hascik<sup>1</sup>, M. Vallo<sup>1</sup><sup>1</sup>Slovak Academy of Sciences, Slovakia; <sup>2</sup>Slovak University of Technology, Slovakia**14: Self-Adaptive Thermal Modulation of Gas Sensors**

D. Polese, E. Martinelli, A. Catini, A. D'Amico, C. Di Natale

Università degli Studi di Roma Tor Vergata, Italy

## Monday, September 6: Poster Session A4

### 15: Sensitivity of CoWO<sub>4</sub> Thin Films to CO

I. Kärkkäinen, M. Kodu, T. Avarmaa, J. Kozlova, L. Matisen, H. Mändar, A. Saar, V. Sammelselg, R. Jaaniso  
*University of Tartu, Estonia*

### 16: Effect of Nanostructured WO<sub>3</sub> Layers in the Sensitivity to Nitrogen Oxide in YSZ-Based Electrochemical Sensors for Automotive Applications

C. López-Gándara, J. Fernández-Sanjuán, F. Ramos, A. Cirera  
*Universitat de Barcelona, Spain*

### 17: Concentration Specific Detection of Hydrogen at Room Temperature Using Palladium Nanoparticles-Nafion Film

S. Arya<sup>2</sup>, S. Krishnan<sup>2</sup>, K. McGrath<sup>1</sup>, F. Rinaldi<sup>1</sup>, S. Bhansali<sup>2</sup>  
<sup>1</sup>QuantumSphere Inc., United States; <sup>2</sup>University of South Florida, United States

### 18: Quasi 2D-ZnO Thin Film for CO Sensing at Room Temperature

V. Dam, M. Blauw, S. Brongersma, M. Crego-Calama  
*Holst Centre/IMEC, Netherlands*

### 19: A Duo-Type Smart Gas Sensor ASIC Chip for Use with Resistive Nanomaterials

J. García-Guzmán<sup>1</sup>, J. Gardner<sup>2</sup>, M. Cole<sup>2</sup>  
<sup>1</sup>Universidad Veracruzana, Mexico; <sup>2</sup>University of Warwick, United Kingdom

### 20: Preparation of Highly Selective, Sensitive and Stable Hydrogen Sensors Based on Pd-Doped Tungsten Trioxide

A. Boudiba<sup>1</sup>, C. Zhang<sup>1</sup>, C. Navio<sup>1</sup>, C. Bittencourt<sup>1</sup>, R. Snyders<sup>2</sup>, M. Debliquy<sup>1</sup>  
<sup>1</sup>Université de Mons, Belgium; <sup>2</sup>Université de Mons / Materia Nova Research Center, Belgium

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#### A4P-F Interfaces & sensor networks

Time: 14:30 - 16:00  
Room: Poster Area 2 (Boards 25 - 36)  
Chairs: C. Diskus and G. Schrag

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### 25: Ultra Low Power Temperature Compensation Method for Palladium Nanowire Grid

F. van der Bent<sup>1</sup>, C. van Rijn<sup>2</sup>, E. Puik<sup>1</sup>  
<sup>1</sup>HU University of Applied Sciences Utrecht, Netherlands; <sup>2</sup>University of Wageningen, Netherlands

### 26: A Phase-Based Amplitude Regulation for Gyroscope Drive Loops

T. Northemann, M. Maurer, A. Ziegler, Y. Manoli  
*Universität Freiburg, Germany*

### 27: A Coverage-Guaranteed Algorithm to Improve Network Lifetime of Wireless Sensor Networks

C. Chen<sup>2</sup>, C. Chuang<sup>2</sup>, T. Lin<sup>2</sup>, C. Lee<sup>1</sup>, J. Jiang<sup>2</sup>  
<sup>1</sup>National Pingtung University of Science and Technology, Taiwan; <sup>2</sup>National Taiwan University, Taiwan

### 28: Implementation of an Ultrasonic Distance Measuring System with Kalman Filtering in Wireless Sensor Networks for Transport Logistics

O. Bischoff, X. Wang, N. Heidmann, R. Laur, S. Paul  
*Universität Bremen, Germany*

### 29: Analog Automatic Lock-in Amplifier for Very Low Gas Concentration Detection

A. De Marcellis<sup>1</sup>, A. Di Giansante<sup>1</sup>, G. Ferri<sup>1</sup>, C. Di Natale<sup>2</sup>, E. Martinelli<sup>2</sup>, A. D'Amico<sup>2</sup>  
<sup>1</sup>Università degli Studi dell'Aquila, Italy; <sup>2</sup>Università degli Studi di Roma Tor Vergata, Italy

### 30: Digital Phase-Locked Loop Circuit for Driving Resonant Sensors

J. Sell, A. Niedermayer, B. Jakoby  
*Johannes Kepler Universität, Austria*

### 31: An Efficient Hardware-Optimized Compression Algorithm for Wireless Capsule Endoscopy Image Transmission

J. Thone, J. Verlinden, R. Puers  
*Katholieke Universiteit Leuven, Belgium*

### 32: Monitoring and Troubleshooting Wireless Sensor Nodes by Measuring the Supply Current Waveform

M. Tanevski, A. Boegli, P. Farine  
*Ecole Polytechnique Fédérale de Lausanne, Switzerland*

# Monday, September 6: Poster Session A4

## 33: Wireless Interrogation Techniques for Sensors Utilizing Inductively Coupled Resonance Circuits

T. Salpavaara, J. Verho, P. Kumpulainen, J. Lekkala  
*Tampere University of Technology, Finland*

## 34: Dynamic Indoor Localization Using Multilateration with RSSI in Wireless Sensor Networks for Transport Logistics

A. Wessels, X. Wang, R. Laur, W. Lang  
*Universität Bremen, Germany*

## 35: Applications of Wireless SAW Sensing in the Steel Industry

R. Fachberger<sup>1</sup>, A. Erlacher<sup>2</sup>  
<sup>1</sup>*Carinthian Tech Research AG, Austria;* <sup>2</sup>*RHI AG, Austria*

## 36: Hardware and Software System-Level Simulator for Wireless Sensor Networks

D. Navarro, W. Du, F. Mieyeville, L. Carrel  
*Ecole Centrale de Lyon, France*

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### A4P-G Applications

Time: 14:30 - 16:00

Room: Poster Area 3 (Boards 49 - 72)

Chairs: C. Diskus and G. Schrag

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## 49: Direct Color Sensor, Optical Amplifier and Demux Device Integrated on a Single Monolithic SiC Photodetector

M. Vieira<sup>2</sup>, P. Louro<sup>1</sup>, M. Vieira<sup>1</sup>, J. Costa<sup>1</sup>, M. Fernandes<sup>1</sup>  
<sup>1</sup>*ISEL, CTS-UNINOVA, Portugal;* <sup>2</sup>*ISEL, CTS-UNINOVA, DEE-FCT-UNL, Portugal*

## 50: Measuring Yarn Diameter Using Inexpensive Optical Sensors

M. Tresanchez, T. Palleja, M. Teixido, J. Palacin  
*Universitat de Lleida, Spain*

## 51: A Computer Mouse Based on Highly Sensitive Micromachined Flow Sensors

S. Cerimovic<sup>2</sup>, M. Forstner<sup>3</sup>, F. Kohl<sup>1</sup>, A. Talic<sup>1</sup>, F. Keplinger<sup>2</sup>  
<sup>1</sup>*Austrian Academy of Sciences, Austria;* <sup>2</sup>*Technische Universität Wien, Austria;* <sup>3</sup>*Vienna University of Technology, Austria*

## 52: Nitric Oxide Monitoring System Based on ZnO Sensors for Exhaled Air

S. Krutovertsev<sup>1</sup>, M. Chuprin<sup>1</sup>, O. Ivanova<sup>1</sup>, A. Pisyakov<sup>1</sup>, A. Shevchenko<sup>1</sup>, V. Konovalov<sup>2</sup>, V. Kalinovsky<sup>2</sup>  
<sup>1</sup>*JSC Practic-NC, Russia;* <sup>2</sup>*VNIIEF, Russia*

## 53: Early Detection and Monitoring of Forest Fire with a Wireless Sensor Network System

A. Bayo, D. Antolín, N. Medrano, B. Calvo, S. Celma  
*Universidad de Zaragoza, Spain*

## 54: A High-Density Ternary Barcode Detection System with a Fixed-Period Delay Method

H. Wakaumi  
*Tokyo Metropolitan College of Industrial Technology, Japan*

## 55: Precision Friction Measurement Between Ultrathin Wire and Microprobe by a Special Microforce Sensor

M. Akanda, H. Tohmyoh, M. Saka  
*Tohoku University, Japan*

## 56: MEMS Based Color-VGA Micro-Projector System

D. Raboud<sup>1</sup>, T. Barras<sup>1</sup>, F. Lo Conte<sup>1</sup>, L. Fabre<sup>1</sup>, L. Kilcher<sup>2</sup>, F. Kechana<sup>2</sup>, N. Abelé<sup>2</sup>, M. Kayal<sup>1</sup>  
<sup>1</sup>*Ecole Polytechnique Fédérale de Lausanne, Switzerland;* <sup>2</sup>*Lemoptix, Switzerland*

## 57: Realization of a Calorimetric Gas Sensor on Polyimide Foil for Applications in Aseptic Food Industry

P. Kirchner<sup>5</sup>, J. Oberländer<sup>5</sup>, P. Friedrich<sup>2</sup>, J. Berger<sup>4</sup>, G. Rysstad<sup>3</sup>, M. Keusgen<sup>6</sup>, M. Schöning<sup>1</sup>  
<sup>1</sup>*Aachen University of Applied Sciences / IBN-2, Germany;* <sup>2</sup>*Aseptik-Food, Germany;* <sup>3</sup>*Elopak, Norway;* <sup>4</sup>*FillDesign GmbH, Germany;* <sup>5</sup>*Institute of Nano- and Biotechnologies & Aachen University of Applied Sciences, Germany;* <sup>6</sup>*Philipps-Universität Marburg, Germany*

## 58: Acousto-Capacitive Tomography of Liquid Multiphase Systems

S. Wöckel, U. Hempel, J. Auge  
*ifak e.V. Magdeburg, Germany*

## Monday, September 6: Poster Session A4

### 59: Development of Flexible Pressure Sensing Polymer Foils Based on Embedded Fibre Bragg Grating Sensors

C. Yan<sup>1</sup>, E. Ferraris<sup>1</sup>, T. Geernaert<sup>2</sup>, F. Berghmans<sup>2</sup>, D. Reynaerts<sup>1</sup>

<sup>1</sup>Katholieke Universiteit Leuven, Belgium; <sup>2</sup>Vrije Universiteit Brussel, Belgium

### 60: Position Sensing System for Eddy-Current Mine Imager

P. Ripka, P. Novacek, M. Reinstein, J. Rohac

Czech technical University in Prague, Czech Rep.

### 61: Depth Estimation of Metal Objects

P. Ripka, M. Janosek, P. Novacek

Czech Technical University in Prague, Czech Rep.

### 62: A Mobile Measurement System for Urban Immission-Monitoring Using Satellite Navigation

J. Wöllenstein<sup>2</sup>, S. Rademacher<sup>2</sup>, A. Eberhardt<sup>2</sup>, M. Henning<sup>1</sup>, W. Schönewolf<sup>1</sup>

<sup>1</sup>Fraunhofer IPK, Germany; <sup>2</sup>Fraunhofer IPM, Germany

### 63: Using the Micro-Array Electrode Chip and AC Signals to Generate the Electric Field Effect on Cell Migration

C. Yeh, P. Tu, Y. Lin

National Cheng Kung University, Taiwan

### 64: 3D Rapid Prototyping Technology (RPT) As a Powerful Tool in Microfluidic Development

A. Bonyár, H. Sántha, B. Ring, M. Varga, J. Kovács, G. Harsányi

Budapest University of Technology and Economics, Hungary

### 65: Flexible Large Area Photodetectors for Human Machine Interfaces

P. Bartu<sup>2</sup>, R. Koeppe<sup>1</sup>, A. Neuling<sup>1</sup>, S. Isikatanlar<sup>1</sup>, S. Bauer<sup>2</sup>

<sup>1</sup>isiQiri interface technologies GmbH, Austria; <sup>2</sup>Johannes Kepler Universität, Austria

### 66: Determination of Nanometer Vibration Amplitudes by Using a Homodyne Photorefractive Crystal Interferometer

S. Zamiri<sup>2</sup>, B. Reiting<sup>2</sup>, T. Berer<sup>2</sup>, S. Bauer<sup>1</sup>, P. Burgholzer<sup>2</sup>

<sup>1</sup>Johannes Kepler Universität, Austria; <sup>2</sup>RECENDT GmbH, Austria

### 67: NDIR CO<sub>2</sub> Gas Sensor with Improved Temperature Compensation

J. Park<sup>1</sup>, H. Cho<sup>2</sup>, S. Yi<sup>3</sup>

<sup>1</sup>ALT Semicon LTD., Korea, South; <sup>2</sup>Chungju National University, Korea, South; <sup>3</sup>Chungju National University IMRE, Singapore

### 68: Portable LTCC Gas Viscometer for Determining Wobbe Number

C. Slater, T. Maeder, P. Ryser

Ecole Polytechnique Fédérale de Lausanne, Switzerland

### 69: Upgrade of a Computer-Writing Tool with MEMS Inertial Sensors

J. Zumer<sup>2</sup>, D. Reynaerts<sup>1</sup>, M. Boltezar<sup>2</sup>

<sup>1</sup>Katholieke Universiteit Leuven, Belgium; <sup>2</sup>University of Ljubljana, Slovenia

### 70: A PCB-Embedded Pressure Sensor for Wireless Wind Sail Monitoring

A. Rossetti<sup>2</sup>, R. Codeluppi<sup>1</sup>, A. Golfarelli<sup>1</sup>, M. Zagnoni<sup>3</sup>, A. Talamelli<sup>2</sup>, M. Tartagni<sup>2</sup>

<sup>1</sup>SORTRON, Italy; <sup>2</sup>Università di Bologna, Italy; <sup>3</sup>University of Glasgow, United Kingdom

### 71: Characterization and Testing of a Shock Absorber Embedded Sensor

C. Ferreira<sup>1</sup>, P. Ventura<sup>1</sup>, C. Grinde<sup>3</sup>, R. Morais<sup>2</sup>, A. Valente<sup>2</sup>, C. Neves<sup>1</sup>, M. Reis<sup>2</sup>

<sup>1</sup>Instituto Politécnico de Leiria, Portugal; <sup>2</sup>Universidade de Trás-os-Montes e Alto Douro, Portugal; <sup>3</sup>Vestfold University College, Norway

### 72: Microlamp for in-situ Tissue Spectroscopy for the Dosimetry of Photodynamic Therapy

J. Amor Rio<sup>1</sup>, E. Margallo-Balbás<sup>1</sup>, B. Song<sup>1</sup>, G. Pandraud<sup>1</sup>, D. Subbaiyan<sup>1</sup>, F. van Zaane<sup>2</sup>, D.

Robinson<sup>2</sup>, H. Zandbergen<sup>1</sup>, P. French<sup>1</sup>

<sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>Erasmus MC, Netherlands

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#### A4P-H Materials, technology & packaging

Time: 14:30 - 16:00

Room: Poster Area 4 (Boards 73 - 83)

Chairs: C. Diskus and G. Schrag

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### 73: Permittivity of LTCC Substrates Porousified with a Wet Chemical Etching Process

A. Bittner, U. Schmid

Technische Universität Wien, Austria

## Monday, September 6: Poster Session A4

### **74: A Maskless Exposure Device for Rapid Photolithographic Prototyping of Sensor and Microstructure Layouts**

D. Kattipparambil Rajan, J. Lekkala  
*Tampere University of Technology, Finland*

### **75: Reversed Processing of Dry Photoresist: Application to the Encapsulation of Chemical Sensors**

J. Courbat, D. Briand, N. de Rooij  
*Ecole Polytechnique Fédérale de Lausanne, Switzerland*

### **76: Electrodeposition of Copper Nano-Clusters at a Platinum Microelectrode for Trace Nitrate Determination**

Y. Li<sup>1</sup>, J. Sun<sup>2</sup>, C. Bian<sup>2</sup>, J. Tong<sup>2</sup>, S. Xia<sup>1</sup>  
<sup>1</sup>*Institute of Electronics, Chinese Academy of Sciences, China;* <sup>2</sup>*State Key Laboratory of Transducer Technology, Institute of Electronics, Chinese Academy of Sciences, China*

### **77: PLD-Grown WO<sub>3</sub> Nanostructures with Epsilon Phase for Gas Sensor Applications**

J. Lappalainen<sup>2</sup>, R. Viter<sup>1</sup>, J. Puustinen<sup>2</sup>, D. Gornostayev<sup>2</sup>, V. Smyntyna<sup>1</sup>  
<sup>1</sup>*I. I. Mechnikov Odessa National University, Ukraine;* <sup>2</sup>*University of Oulu, Finland*

### **78: Disposable Polymeric Micro-Cantilever Arrays for Sensing**

P. Urwyler<sup>2</sup>, O. Häfeli<sup>3</sup>, H. Schiff<sup>2</sup>, J. Gobrecht<sup>2</sup>, F. Battiston<sup>1</sup>, B. Müller<sup>4</sup>  
<sup>1</sup>*Concentris GmbH, Switzerland;* <sup>2</sup>*Paul Scherrer Institut, Switzerland;* <sup>3</sup>*University of Applied Sciences Northwestern Switzerland, Switzerland;* <sup>4</sup>*Universität Basel, Switzerland*

### **79: Silicon Nanowires Synthesis for Chemical Sensor Applications**

F. Demami, L. Ni, R. Rogel, A. Salaun, L. Pichon  
*University of Rennes1, France*

### **80: Flip Chip MEMS Microphone Package with Large Acoustic Reference Volume**

G. Feiertag<sup>2</sup>, W. Pahl<sup>1</sup>, M. Winter<sup>3</sup>, A. Leidl<sup>1</sup>, S. Seitz<sup>1</sup>, C. Siegel<sup>1</sup>, A. Beer<sup>1</sup>  
<sup>1</sup>*EPCOS AG, Germany;* <sup>2</sup>*University of Applied Sciences München & EPCOS AG, Germany;* <sup>3</sup>*Universität des Saarlandes & EPCOS AG, Germany*

### **81: NEG Thin Films for Under Controlled Atmosphere MEMS Packaging**

L. Tenchine<sup>2</sup>, X. Baillin<sup>2</sup>, C. Faure<sup>1</sup>, P. Nicolas<sup>2</sup>, E. Martinez<sup>2</sup>  
<sup>1</sup>*CEA DRT, France;* <sup>2</sup>*CEA, LETI-MINATEC, France*

### **82: Biosensor Packaging – Adaptation of the Surface Modification Procedure**

F. Gruhl, B. Rapp, M. Rapp, K. Länge  
*Karlsruhe Institute of Technology, Germany*

### **83: Dispensing and Hermetic Sealing Rb in a Miniature Reference Cell for Integrated Atomic Clocks**

F. Vecchio, V. Venkatraman, H. Shea, T. Maeder, P. Ryser  
*Ecole Polytechnique Fédérale de Lausanne, Switzerland*

## Notes

## Monday, September 6: Lecture Session A5

	Room 1	Room 2
Time	A5L-A Selective surface modifications	A5L-B Capacitive sensors
16:00	<p><b>Molecularly Imprinted Polymers (MIP) Based Electrochemical Sensor for Detection of Urea and Creatinine</b>                      B. Khadro<sup>4</sup>, C. Sanglar<sup>1</sup>, A. Bonhomme<sup>1</sup>, A. Errachid<sup>3</sup>, N. Jaffrezic-Renault<sup>2</sup>  <sup>1</sup>CNRS, France; <sup>2</sup>University of Lyon, France; <sup>3</sup>University of Lyon / University Claude Bernard, France; <sup>4</sup>University of Lyon, University Claude Bernard, France</p>	<p><b>Capacitive Sensors Uncovered: Measurement, Detection and Classification in Open Environments</b>                      H. Zangl                      Graz University of Technology, Austria</p>
16:15	<p><b>New Receptors for the Detection of Organic Contaminants in Sea Water</b>                      M. Koetke<sup>1</sup>, S. Hubo<sup>3</sup>, C. Vargas<sup>3</sup>, M. Fonka<sup>3</sup>, H. Rosenfeld<sup>1</sup>, B. Niemeyer<sup>2</sup>  <sup>1</sup>GKSS Research Centre, Germany; <sup>2</sup>GKSS Research Centre and Helmut-Schmidt-University/University of the Federal Armed Forces, Germany; <sup>3</sup>Helmut-Schmidt-University/University of the Federal Armed Forces, Germany</p>	
16:30	<p><b>Artificial Receptor Layers for Detecting Chemical and Biological Threats</b>                      P. Lieberzeit<sup>2</sup>, A. Findeisen<sup>2</sup>, J. Mähner<sup>2</sup>, R. Samardzic<sup>2</sup>, J. Pitkänen<sup>1</sup>, O. Anttalainen<sup>1</sup>, F. Dickert<sup>2</sup>  <sup>1</sup>Environics Oy, Finland; <sup>2</sup>University of Vienna, Austria</p>	<p><b>Modelling the Capacitive Coupling of Sensors Applied to the Contactless Inspection of Planar Electronics</b>                      M. Koerdel<sup>3</sup>, F. Alatas<sup>4</sup>, A. Schick<sup>2</sup>, S. Rupitsch<sup>1</sup>, R. Lerch<sup>1</sup>  <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; <sup>2</sup>Siemens AG, Germany; <sup>3</sup>Siemens AG &amp; Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany; <sup>4</sup>Technische Universität München &amp; Siemens AG, Germany</p>
16:45	<p><b>A Potassium-Selective Quartz Crystal Microbalance Sensor Based on Crown-Ether Functionalized Polymer Brushes</b>                      N. Schüwer, H. Klok                      Ecole Polytechnique Fédérale de Lausanne, Switzerland</p>	<p><b>Capacitive Flexible Force Sensor</b>                      J. Dobrzynska, M. Gijs                      Ecole Polytechnique Fédérale de Lausanne, Switzerland</p>
17:00	<p><b>Selective Detection of Benzene Traces at Room Temperature Using Metal Decorated Carbon Nanotubes</b>                      R. Leghrib<sup>1</sup>, A. Felten<sup>2</sup>, F. Demoisson<sup>3</sup>, F. Reniers<sup>3</sup>, J. Pireaux<sup>2</sup>, E. Llobet<sup>1</sup>  <sup>1</sup>Universitat Rovira i Virgili, Spain; <sup>2</sup>Universite de Namur, Belgium; <sup>3</sup>Université Libre de Bruxelles, Belgium</p>	<p><b>A Microfluidic Capacitance Sensor for Fluid Discrimination and Characterization</b>                      M. Demori, V. Ferrari, P. Poesio                      Università degli Studi di Brescia, Italy</p>
17:15	<p><b>Fast Algorithm for Calculating the Surface Concentration of Spherical Particles for Lithium-Ion Battery Simulations</b>                      M. Sommer<sup>1</sup>, D. Hrach<sup>1</sup>, B. Schweighofer<sup>1</sup>, M. Cifrain<sup>2</sup>  <sup>1</sup>Graz University of Technology, Austria; <sup>2</sup>Kompetenzzentrum Das virtuelle Fahrzeug Forschungsgesellschaft mbH, Austria</p>	<p><b>A Technique for Drift Compensation of an Area-Varying Capacitive Displacement Sensor for Nano-Metrology</b>                      D. Kang, W. Lee, W. Moon                      POSTECH, Korea, South</p>



## Monday, September 6: Lecture Session A5

	Room 6	Room 7
Time	A5L-C Optical devices	A5L-D Microfluidic systems
16:00	<p><b>An UV Linear Variable Optical Filter-Based Micro-Spectrometer</b>                      A. Emadi<sup>2</sup>, H. Wu<sup>2</sup>, G. De Graaf<sup>2</sup>, K. Hedsten<sup>1</sup>, P. Enoksson<sup>1</sup>, J. Correia<sup>3</sup>, R. Wolfenbuttel<sup>2</sup>  <sup>1</sup>Chalmers University of Technology, Sweden; <sup>2</sup>Delft University of Technology, Netherlands; <sup>3</sup>University of Minho, Portugal</p>	<p><b>Characterization of an on-Chip Reconfigurable 3D Optofluidic Microlens by Confocal Laser Scanning Microscopy</b>                      M. Rosenauer, M. Vellekoop                      Technische Universität Wien, Austria</p>
16:15	<p><b>Hybrid Optical MEMS Vibration Sensor</b>                      W. Hortschitz<sup>1</sup>, H. Steiner<sup>1</sup>, M. Sachse<sup>1</sup>, F. Kohl<sup>1</sup>, J. Schalko<sup>2</sup>, F. Keplinger<sup>2</sup>  <sup>1</sup>Austrian Academy of Sciences, Austria; <sup>2</sup>Technische Universität Wien, Austria</p>	<p><b>Lab-on-a-Chip Solutions Designed for Being Operated on Standard Laboratory Instruments</b>                      D. Mark<sup>1</sup>, M. Focke<sup>4</sup>, S. Lutz<sup>1</sup>, J. Burger<sup>1</sup>, M. Müller<sup>5</sup>, L. Riegger<sup>4</sup>, M. Rombach<sup>5</sup>, J. Hoffmann<sup>4</sup>, G. Roth<sup>5</sup>, O. Piepenburg<sup>3</sup>, Y. Park<sup>2</sup>, R. Zengerle<sup>5</sup>, F. von Stetten<sup>5</sup>  <sup>1</sup>HSG-IMIT, Germany; <sup>2</sup>LG Electronics Inc., Korea, South; <sup>3</sup>TwistDX, Korea, South; <sup>4</sup>Universität Freiburg, Germany; <sup>5</sup>Universität Freiburg / HSG-IMIT, Germany</p>
16:30	<p><b>Mechanical Tuning of Optical Race-Track Ring Resonators</b>                      S. Chakkalakkal Abdulla, L. Kauppinen, M. Dijkstra, M. De Boer, E. Berenschot, R. De Ridder, G. Krijnen                      University of Twente, Netherlands</p>	<p><b>Smart SU-8 Pillars Implemented in a Microfluidic Bioreactor for Continuous Measurement of Glucose</b>                      S. Talaei<sup>1</sup>, O. Frey<sup>1</sup>, S. Psoma<sup>2</sup>, P. van der Wal<sup>1</sup>, N. de Rooij<sup>1</sup>  <sup>1</sup>Ecole Polytechnique Fédérale de Lausanne, Switzerland; <sup>2</sup>University of Western Macedonia, Greece</p>
16:45	<p><b>Technology Platform for Hybrid Integration of MOEMS on Reconfigurable Silicon Micro-Optical Table</b>                      S. Bargiel, K. Rabenorosoa, J. Mascaro, C. Clévy, C. Gorecki, P. Lutz                      FEMTO-ST Institute, France</p>	<p><b>Optofluidic Microsystem for on-Chip L2-Waveguide Modulation Featuring Flow Stabilization and a Novel Input Coupling Region</b>                      E. Weber<sup>1</sup>, M. Rosenauer<sup>2</sup>, P. Verhaert<sup>1</sup>, M. Vellekoop<sup>2</sup>  <sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>Technische Universität Wien, Austria</p>
17:00	<p><b>Varifocal Liquid Lenses with Integrated Actuator, High Focusing Power and Low Operating Voltage Fabricated on 200mm Wafers</b>                      A. Pouydebasque<sup>1</sup>, C. Bridoux<sup>1</sup>, F. Jacquet<sup>1</sup>, S. Moreau<sup>1</sup>, D. Saint-Patrice<sup>1</sup>, C. Bouvier<sup>1</sup>, C. Kopp<sup>1</sup>, G. Marchand<sup>1</sup>, S. Bolis<sup>1</sup>, N. Sillon<sup>1</sup>, E. Vigier-Blanc<sup>2</sup>  <sup>1</sup>CEA, LETI-MINATEC, France; <sup>2</sup>ST Microelectronics, France</p>	<p><b>Oxygen Imaging in Microfluidic Devices with Optical Sensors Applying Color Cameras</b>                      B. Ungerböck<sup>2</sup>, G. Mistlberger<sup>2</sup>, V. Charwat<sup>1</sup>, P. Ertl<sup>1</sup>, T. Mayr<sup>2</sup>  <sup>1</sup>Austrian Institute of Technology GmbH, Austria; <sup>2</sup>Graz University of Technology, Austria</p>
17:15	<p><b>1D and 2D Phononic Crystal Sensors</b>                      R. Lucklum<sup>1</sup>, J. Li<sup>2</sup>, M. Zubtsov<sup>1</sup>  <sup>1</sup>Otto-von-Guericke-Universität Magdeburg, Germany; <sup>2</sup>Wuhan University of Science and Technology, China</p>	<p><b>Norland Optical Adhesive (NOA81) Microchannels with Adjustable Surface Properties and High Chemical Resistance Against IR-Transparent Organic Solvents</b>                      P. Wägli, A. Homsy, N. de Rooij                      Ecole Polytechnique Fédérale de Lausanne, Switzerland</p>

## Notes

## Tuesday, September 7: Keynote III

**B1L-A**      **KEYNOTE III**  
Time:        9:10 AM - 10:00 AM  
Room:        Room 1  
Chairs:      P. Hauptmann and R. Puers

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### **Micro-Sensors for Analysis Equipment: Research and Innovation**

S. van Herwaarden

*Xensor Integration, Netherlands*

## Tuesday, September 7: Lecture Session B2

	Room 1	Room 2
Time	B2L-A Resonant devices I	B2L-B Biomedical systems
10:00	<p><b>Piezoelectric Microelectromechanical Systems – Challenges and Opportunities</b> S. Tadigadapa <i>Pennsylvania State University, United States</i></p>	<p><b>COPD Diagnosis by a Gas Sensor Array</b> R. Capuano<sup>2</sup>, M. Santonico<sup>2</sup>, E. Martinelli<sup>2</sup>, G. Pennazza<sup>1</sup>, R. Paolesse<sup>2</sup>, A. Bergamini<sup>2</sup>, M. Gazzola<sup>2</sup>, C. Ciaprini<sup>2</sup>, C. Di Natale<sup>2</sup>, A. D'Amico<sup>2</sup> <sup>1</sup><i>Università Campus Bio-Medico di Roma, Italy</i>; <sup>2</sup><i>Università degli Studi di Roma Tor Vergata, Italy</i></p>
10:15		<p><b>Non-Invasive Optical Real-Time Measurement of Total Hemoglobin Content</b> U. Timm<sup>1</sup>, G. Leen<sup>1</sup>, E. Lewis<sup>1</sup>, D. McGrath<sup>1</sup>, J. Kraitl<sup>2</sup>, H. Ewald<sup>2</sup> <sup>1</sup><i>University of Limerick, Ireland</i>; <sup>2</sup><i>Universität Rostock, Germany</i></p>
10:30	<p><b>Detection of Explosives Vapours Using a Multi-Quartz Crystal Microbalance System</b> C. Barthet, P. Montméat, N. Eloy, P. Prené <i>CEA DAM, France</i></p>	<p><b>A Real-Time Monitoring System for Adherently Grown Cells</b> N. Moscell<sup>2</sup>, S. van Den Driesche<sup>2</sup>, W. Witarski<sup>1</sup>, F. Iuliano<sup>1</sup>, M. Vellekoop<sup>2</sup> <sup>1</sup><i>Slovak Academy of Sciences, Slovakia</i>; <sup>2</sup><i>Technische Universität Wien, Austria</i></p>
10:45	<p><b>Complex Loading and Simulation of Acoustic Thickness Shear Mode Resonator</b> R. Brünig<sup>1</sup>, M. Weihnacht<sup>2</sup>, G. Guhr<sup>1</sup>, H. Schmidt<sup>1</sup> <sup>1</sup><i>IFW-Dresden, Germany</i>; <sup>2</sup><i>InnoXacs, Germany</i></p>	<p><b>Development of a Human Blood Type Detection Automatic System</b> A. Ferraz, V. Carvalho, F. Soares <i>Minho University, Portugal</i></p>
11:00	<p><b>Systematic Studies on Globular Proteins Using Micromachined High Frequency Bulk Acoustic Wave Resonators</b> P. Kao, M. Chang, D. Allara, S. Tadigadapa <i>Pennsylvania State University, United States</i></p>	<p><b>A Middle Ear Microphone Design Based on the Physiology of the Ear</b> M. Sachse<sup>1</sup>, W. Hortschitz<sup>1</sup>, F. Kohl<sup>1</sup>, J. Schalko<sup>1</sup>, F. Keplinger<sup>2</sup> <sup>1</sup><i>Austrian Academy of Sciences, Austria</i>; <sup>2</sup><i>Technische Universität Wien, Austria</i></p>

## Tuesday, September 7: Lecture Session B2

	Room 6	Room 7
Time	<b>B2L-C Sensor signal processing</b>	<b>B2L-D Flow sensors</b>
10:00	<b>Spectral Measurement with a Linear Variable Filter Using a LMS Algorithm</b> A. Emadi <sup>1</sup> , S. Grabarnik <sup>2</sup> , H. Wu <sup>1</sup> , G. de Graaf <sup>1</sup> , R. Wolfenbuttel <sup>1</sup> <i><sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>ESA, Netherlands</i>	<b>Response Time of Thermal Flow Sensors</b> C. Sosna, T. Walter, W. Lang <i>Universität Bremen, Germany</i>
10:15	<b>MATLAB/Simulink Model of a MEMS Accelerometer Read-Out Circuit</b> S. Strache <sup>2</sup> , R. Wunderlich <sup>2</sup> , D. Droste <sup>1</sup> , S. Heinen <sup>2</sup> <i><sup>1</sup>Robert Bosch GmbH, Germany; <sup>2</sup>RWTH Aachen University, Germany</i>	<b>Highly Sensitive Smart Flow Sensor with Frequency and Duty Cycle Output</b> S. Dalola <sup>3</sup> , S. Cerimovic <sup>2</sup> , F. Kohl <sup>1</sup> , J. Schalko <sup>1</sup> , V. Ferrari <sup>3</sup> , D. Marioli <sup>3</sup> , F. Keplinger <sup>2</sup> <i><sup>1</sup>Austrian Academy of Sciences, Austria; <sup>2</sup>Technische Universität Wien, Austria; <sup>3</sup>Università degli Studi di Brescia, Italy</i>
10:30	<b>Comparative Study of Multi Stage Noise Shaping and Single Loop Sigma-Delta Modulators for MEMS Accelerometers</b> B. Almutairi, M. Kraft <i>University of Southampton, United Kingdom</i>	<b>Ultra-Low Pressure Sensor for Neonatal Resuscitator</b> C. Jacq <sup>1</sup> , T. Maeder <sup>1</sup> , E. Haemmerle <sup>2</sup> , N. Craquelin <sup>1</sup> , P. Ryser <sup>1</sup> <i><sup>1</sup>Ecole Polytechnique Fédérale de Lausanne, Switzerland; <sup>2</sup>University of Auckland, New Zealand</i>
10:45	<b>Miniaturized Chemical Imaging Sensor System Using an OLED Display Panel</b> K. Miyamoto <sup>2</sup> , K. Kaneko <sup>2</sup> , A. Matsuo <sup>2</sup> , T. Wagner <sup>2</sup> , S. Kanoh <sup>2</sup> , M. Schöning <sup>1</sup> , T. Yoshinobu <sup>2</sup> <i><sup>1</sup>Aachen University of Applied Sciences / IBN-2, Germany; <sup>2</sup>Tohoku University, Japan</i>	<b>A Single Chip, Offset Compensated Multi-Channel Flow Sensor with Integrated Readout Interface</b> M. Piatto <sup>1</sup> , M. Dei <sup>2</sup> , F. Butti <sup>2</sup> , P. Bruschi <sup>2</sup> <i><sup>1</sup>IEIT-CNR, Italy; <sup>2</sup>Università di Pisa, Italy</i>
11:00	<b>Novel Combination of Digital Light Processing (DLP) and Light-Addressable Potentiometric Sensors (LAPS) for Flexible Chemical Imaging</b> T. Wagner <sup>2</sup> , K. Miyamoto <sup>2</sup> , M. Schöning <sup>1</sup> , T. Yoshinobu <sup>2</sup> <i><sup>1</sup>Aachen University of Applied Sciences / IBN-2, Germany; <sup>2</sup>Tohoku University, Japan</i>	<b>Ultra Low Power Flow-to-Frequency SOI MEMS Transducer</b> N. André, B. Rue, D. Van Vynckt, L. Francis, D. Flandre, J. Raskin <i>Université catholique de Louvain, Belgium</i>

## Tuesday, September 7: Lecture Session B3

	Room 1	Room 2
Time	<b>B3L-A Electrochemical sensors</b>	<b>B3L-B Thermal transducers</b>
11:45	<p><b>A Capillary pH Electrode for Evaluating Long Term Culturing of Neural Cell Populations</b>                      K. Nurminen<sup>2</sup>, L. Ylä-Outinen<sup>1</sup>, S. Narkilahti<sup>1</sup>, J. Lekkala<sup>2</sup>  <sup>1</sup><i>Regea Institute for Regenerative Medicine, Finland;</i> <sup>2</sup><i>Tampere University of Technology, Finland</i></p>	<p><b>Dual-Inlet Micro-Calorimeter for Bio-Chemical Studies of Microliter Liquid Samples</b>                      T. Adrega, S. van Herwaarden  <i>Xensor Integration, Netherlands</i></p>
12:00	<p><b>pH Electrode Based on ALD Deposited Iridium Oxide</b>                      T. Ryytänen<sup>1</sup>, K. Nurminen<sup>1</sup>, J. Hämäläinen<sup>2</sup>, M. Leskelä<sup>2</sup>, J. Lekkala<sup>1</sup>  <sup>1</sup><i>Tampere University of Technology, Finland;</i> <sup>2</sup><i>University of Helsinki, Finland</i></p>	<p><b>In-situ Heat Input and High Resolution Thermal Expansion Sensing in a Miniaturized Side-Pumped DPSS Laser</b>                      M. Baumgart<sup>2</sup>, C. Glassl<sup>2</sup>, A. Tortschanoff<sup>1</sup>, G. Kroupa<sup>2</sup>  <sup>1</sup><i>Carinthian Tech Research AG, Austria;</i> <sup>2</sup><i>CTR Carinthian Tech Research AG, Austria</i></p>
12:15	<p><b>Oxide Cerium IsFETs Based Immune Biosensor for the Determination of T2-Mycotoxin</b>                      N. Starodub  <i>National University of Life and Environmental Sciences of Ukraine, Ukraine</i></p>	<p><b>Novel Reading Method for MEMS Micro-Pirani Pressure Sensors</b>                      M. Sisto, J. Viens, L. Le Noc, B. Tremblay, Y. Desroches, J. Caron, F. Provencal, F. Picard  <i>INO, Canada</i></p>
12:30	<p><b>Glass Microprobe with Multi-Electrode Styles Implemented by Silicon via Structure</b>                      Y. Lee, C. Lin, Y. Chang, W. Fang  <i>National Tsing Hua University, Taiwan</i></p>	<p><b>Millimeter Wave Detection by Thermopile Antenna</b>                      B. Szentpál<sup>2</sup>, P. Basa<sup>2</sup>, P. Fürjes<sup>2</sup>, G. Battistig<sup>2</sup>, I. Bársony<sup>2</sup>, G. Károlyi<sup>1</sup>, T. Berceli<sup>1</sup>  <sup>1</sup><i>Budapest University of Technology and Economics, Hungary;</i> <sup>2</sup><i>Hungarian Academy of Sciences Research Institute for Technical Physics and Materials Science, Hungary</i></p>
12:45		<p><b>Experimental Research on Temperature Characteristics of Two-Dimensional Micro Scanner</b>                      C. Zhang, H. Huang, Z. You  <i>Tsinghua University, China</i></p>

## Tuesday, September 7: Lecture Session B3

	Room 6	Room 7
Time	<b>B3L-C Wireless biomedical systems</b>	<b>B3L-D System design &amp; optimisation</b>
11:45	<p><b>A Wireless Powering System for a Vibratory-Actuated Endoscopic Capsule</b>                      R. Carta<sup>2</sup>, N. Pateromichelakis<sup>1</sup>, J. Thoné<sup>2</sup>, M. Sfakiotakis<sup>1</sup>, D. Tsakiris<sup>1</sup>, R. Puers<sup>2</sup>  <i><sup>1</sup>Forth, Greece; <sup>2</sup>Katholieke Universiteit Leuven, Belgium</i></p>	<p><b>Requirements and Design Considerations for the Measurement of Haptic Object Properties</b>                      T. Kern  <i>Continental Automotive GmbH, Germany</i></p>
12:00	<p><b>A Fast and Robust Algorithm to Assess Respiratory Frequency in Real-Time</b>                      P. Dupuis, N. André, P. Gérard, D. Flandre, J. Raskin, L. Francis  <i>Universite catholique de Louvain, Belgium</i></p>	
12:15	<p><b>Instrumented Wearable Belt for Wireless Health Monitoring</b>                      E. Sardini, M. Serpelloni  <i>Università degli Studi di Brescia, Italy</i></p>	<p><b>Advanced Simulation Tool for the Design of Sensors and Actuators</b>                      M. Kaltenbacher  <i>Alps-Adriatic University Klagenfurt, Austria</i></p>
12:30	<p><b>Mobile Phone Analysis of NT-proBNP Using High Dynamic Range (HDR) Imaging</b>                      P. Preechaburana, S. Macken, A. Suska, D. Filippini  <i>Linköping University, Sweden</i></p>	<p><b>Pressure Propagation in Encapsulated Pressure Sensor Systems</b>                      H. Fassbender, W. Thiel, W. Mokwa  <i>RWTH Aachen University, Germany</i></p>
12:45	<p><b>A WSN Smart Medication System</b>                      W. Hsu<sup>1</sup>, C. Kuo<sup>1</sup>, W. Chang<sup>1</sup>, J. Chang<sup>2</sup>, Y. Hou<sup>2</sup>, Y. Lan<sup>1</sup>, T. Sung<sup>2</sup>, Y. Yang<sup>1</sup>  <i><sup>1</sup>National Taiwan University, Taiwan; <sup>2</sup>National Taiwan University of Science and Technology, Taiwan</i></p>	<p><b>Texture Sensor for a Prosthetic Hand</b>                      N. Muridan, P. Chappell, A. Cranny, N. White  <i>University of Southampton, United Kingdom</i></p>

## Tuesday, September 7: Poster Session B4

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### B4P-E Physical and Optical Sensors & MEMS

Time: 14:30 - 16:00

Room: Poster Area 1 (Boards 01 - 38)

Chairs: I. Giouroudi and E. Reichel

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#### 01: Fabrication and Characterization of a SiC/SiO<sub>2</sub>/Si Piezoresistive Pressure Sensor

M. Fraga<sup>2</sup>, H. Furlan<sup>3</sup>, M. Massi<sup>1</sup>, I. Oliveira<sup>1</sup>, L. Koberstein<sup>3</sup>

<sup>1</sup>Technological Institute of Aeronautics, Brazil; <sup>2</sup>Technological Institute of Aeronautics & Institute for Advanced Studies, Brazil; <sup>3</sup>Universidade de São Paulo, Brazil

#### 02: A 3-D MEMS VOA Using Translational Attenuation Mechanism Based on Piezoelectric PZT Thin Film Actuators

K. Koh<sup>2</sup>, C. Lee<sup>2</sup>, T. Kobayashi<sup>1</sup>

<sup>1</sup>National Institute of Advanced Industrial Science and Technology, Japan; <sup>2</sup>National University of Singapore, Singapore

#### 03: A Novel Parallel-Field Double-Hall Microsensor with Self-Reduced Offset and Temperature Drift

S. Lozanova, C. Roumenin

Bulgarian Academy of Sciences, Bulgaria

#### 04: Cantilever Arrays with Integrated Actuation and Sensing for Parallel SPM

T. Sulzbach<sup>1</sup>, W. Engl<sup>1</sup>, R. Maier<sup>1</sup>, J. Diebel<sup>1</sup>, D. Dontsov<sup>2</sup>, E. Langlotz<sup>2</sup>, W. Schott<sup>2</sup>

<sup>1</sup>NanoWorld Services GmbH, Germany; <sup>2</sup>Sios Messtechnik GmbH, Germany

#### 05: Light Addressable Potentiometric Sensor Array: a New Approach for Light Beam Positioning

A. Ipatov, K. Zinoviev, N. Abramova, A. Bratov

Instituto de Microelectrónica de Barcelona-CNM-CSIC, Spain

#### 06: High-Sensitive Pyroelectric Detectors with Internal Thermal Amplification

Y. Querner, A. Schulze, V. Norkus, G. Gerlach

Technische Universität Dresden, Germany

#### 07: Optical Performance of B-Layer Ultra-Shallow-Junction Silicon Photodiodes in the VUV Spectral Range

L. Shi<sup>2</sup>, F. Sarubb<sup>2</sup>, L. Nanver<sup>2</sup>, U. Kroth<sup>3</sup>, A. Gottwald<sup>3</sup>, S. Nihtianov<sup>1</sup>

<sup>1</sup>ASML Netherlands B.V., Netherlands; <sup>2</sup>Delft University of Technology, Netherlands;

<sup>3</sup>Physikalisch- Technische Bundesanstalt, Germany

#### 08: Realization of Pressure Sensors Using FET Detection on a Thin Si Membran

O. de Sagazan, E. Jacques, T. Mohammed-Brahim

University of Rennes1, France

#### 09: Low Cost Pressure Sensors for Impact Detection in Composite Structures

H. Macicior<sup>1</sup>, E. Ochoteco<sup>1</sup>, G. Cabañero<sup>1</sup>, H. Grande<sup>1</sup>, O. Schwarzaupt<sup>2</sup>, M. Lehmann<sup>2</sup>, A. Bütter<sup>2</sup>

<sup>1</sup>Cidetec, Spain; <sup>2</sup>Fraunhofer LBF, Germany

#### 10: A Bipolar PIN Phototransistor with Modulated Base Doping

A. Marchlewski<sup>3</sup>, K. Schneider-Hornstein<sup>3</sup>, H. Zimmermann<sup>3</sup>, G. Meinhardt<sup>2</sup>, I. Jonak-Auer<sup>1</sup>, E. Wachmann<sup>1</sup>

<sup>1</sup>austriamicrosystems AG, Austria; <sup>2</sup>Blue Chip Energy GmbH, Austria; <sup>3</sup>Technische Universität Wien, Austria

#### 11: Lateral Displacement MEMS Sensor

V. Stavrov<sup>1</sup>, E. Tomerov<sup>1</sup>, G. Stavreva<sup>1</sup>, C. Hardalov<sup>3</sup>, A. Shulev<sup>2</sup>

<sup>1</sup>AMG Technology Ltd., Bulgaria; <sup>2</sup>IMBM, BAS, Bulgaria; <sup>3</sup>Technical University of Sofia, Bulgaria

#### 12: Sensing Properties of ITO Coated Optical Fibers to Diverse VOCs

C. Zamarreño, M. Hernández, I. Del Villar, I. Matias, F. Arregui

Universidad Pública de Navarra, Spain

#### 13: Optical Demultiplexer Device Operating in the Visible Spectrum

P. Louro<sup>2</sup>, M. Vieira<sup>3</sup>, M. Vieira<sup>2</sup>, S. Amaral<sup>1</sup>, J. Costa<sup>2</sup>, M. Fernandes<sup>2</sup>

<sup>1</sup>ISEL, Portugal; <sup>2</sup>ISEL, CTS-UNINOVA, Portugal; <sup>3</sup>ISEL, CTS-UNINOVA, DEE-FCT-UNL, Portugal

#### 14: Phase Stability Comparison of SAW Sensor Evaluation with Various CW Type Radars

A. Binder, R. Fachberger, M. Lenzhofer

Carinthian Tech Research AG, Austria



## Tuesday, September 7: Poster Session B4

### 15: Effect of the Thickness - Ratio of the Piezoresistive Composite Element for Measuring High - Pressure

P. Heinickel, R. Werthschützky  
*Technische Universität Darmstadt, Germany*

### 16: Design and Characterization of the Immersion-Type Capacitive Ultrasonic Sensors Fabricated in a CMOS Process

P. Tang, P. Wang, M. Li, M. Lu  
*National Tsing Hua University, Taiwan*

### 17: Biologically Inspired Autonomous Agent Navigation Using an Integrated Polarization Analyzing CMOS Image Sensor

M. Sarkar<sup>2</sup>, D. San Segundo Bello<sup>3</sup>, C. van Hoof<sup>3</sup>, A. Theuvsen<sup>1</sup>  
<sup>1</sup>*Delft University of Technology / Harvest Imaging, Netherlands;* <sup>2</sup>*Delft University of Technology / IEMC, Netherlands;* <sup>3</sup>*IMEC, Belgium*

### 18: Comparison Between Technologies for APDs Fabrication in Particle Detectors

A. Arbat, A. Comerma, J. Trenado, D. Gascon, A. Vilà, L. Garrido, A. Diègue  
*Universitat de Barcelona, Spain*

### 19: A 3mm Endoscopic Probe with Integrated MEMS Micromirror for Optical Coherence Tomography Bioimaging

X. Mu<sup>2</sup>, G. Zhou<sup>2</sup>, H. Feng<sup>1</sup>, Y. Xu<sup>1</sup>, A. Yu<sup>1</sup>, C. Tan<sup>1</sup>, W. Chen<sup>1</sup>, J. Xie<sup>1</sup>, F. Chau<sup>2</sup>  
<sup>1</sup>*Agency for Science, Technology and Research, Singapore;* <sup>2</sup>*National University of Singapore, Singapore*

### 20: Pyroelectric Effect in PZT Thick Films for Thermal Energy Harvesting in Low-Power Sensors

S. Dalola, V. Ferrari, D. Marioli  
*Università degli Studi di Brescia, Italy*

### 21: Position Feedback and Phase Control of Resonant MOEMS-Mirrors with One and Two Axes

A. Tortschanoff<sup>1</sup>, A. Frank<sup>1</sup>, M. Wildenhain<sup>2</sup>, T. Sandner<sup>2</sup>, H. Schenk<sup>2</sup>, A. Kenda<sup>1</sup>  
<sup>1</sup>*Carinthian Tech Research AG, Austria;* <sup>2</sup>*Fraunhofer IPMS, Germany*

### 22: Low-Cost Approach for Integrated Long-Wavelength Infrared Sensor Arrays

I. Herrmann<sup>2</sup>, K. Reinhart<sup>2</sup>, T. Pirk<sup>2</sup>, A. Feyh<sup>2</sup>, D. Oshinubi<sup>2</sup>, M. Eckardt<sup>2</sup>, E. Sommer<sup>2</sup>, U. Kunz<sup>2</sup>, V. Krüger<sup>2</sup>, F. Freund<sup>1</sup>  
<sup>1</sup>*Fachhochschule Hannover, Germany;* <sup>2</sup>*Robert Bosch GmbH, Germany*

### 23: SEM/FIB for Characterization of Nanosized Imagers

A. Vilà, A. Comerma, J. Trenado, A. Arbat, D. Gascon, L. Garrido, A. Diègue  
*Universitat de Barcelona, Spain*

### 24: A Simple Humidity Sensor with Thin Film Porous Alumina and Integrated Heating

L. Juhász<sup>2</sup>, J. Mizsei<sup>1</sup>  
<sup>1</sup>*BME EET, Hungary;* <sup>2</sup>*Budapest University of Technology and Economics, Hungary*

### 25: Novel Design for an Ultra High Precision 3D Micro Probe for CMM Applications

S. Buetefisch<sup>1</sup>, G. Dai<sup>1</sup>, H. Danzebrink<sup>1</sup>, L. Koenders<sup>1</sup>, F. Solzbacher<sup>2</sup>, M. Orthner<sup>2</sup>  
<sup>1</sup>*Physikalisch- Technische Bundesanstalt, Germany;* <sup>2</sup>*University of Utah, United States*

### 26: Acceleration Sensors Based on Polymer-Electronic Materials

A. Hense, C. Fromm, D. Zielke  
*Fachhochschule Bielefeld, Germany*

### 27: Heteropolar Ferroelectrets for Ultrathin Flexible Keyboards and Tactile Sensors

A. Kogler, G. Buchberger, S. Bauer, R. Schwödauer  
*Johannes Kepler Universität, Austria*

### 28: MEMS Caesium Vapour Cell for European Micro-Atomic-Clock

P. Knapkiewicz<sup>3</sup>, J. Dziuban<sup>3</sup>, R. Walczak<sup>3</sup>, L. Mauri<sup>1</sup>, P. Dziuban<sup>2</sup>, C. Gorecki<sup>2</sup>  
<sup>1</sup>*SAES Getters, Italy;* <sup>2</sup>*Université de Franche-Comté / FEMTO-ST, France;* <sup>3</sup>*Wroclaw University of Technology, Poland*

### 29: Fully Printed, Flexible, Large Area Organic Optothermal Sensors for Human-Machine-Interfaces

M. Zirkel<sup>2</sup>, G. Scheipl<sup>2</sup>, B. Stadlober<sup>2</sup>, A. Haase<sup>2</sup>, L. Kuna<sup>2</sup>, J. Magnien<sup>2</sup>, G. Jakopic<sup>2</sup>, J. Krenn<sup>2</sup>, A. Sawatdee<sup>1</sup>, P. Bodö<sup>1</sup>, P. Andersson<sup>1</sup>  
<sup>1</sup>*Acreo AB, Sweden;* <sup>2</sup>*Joanneum Research, Austria*

## Tuesday, September 7: Poster Session B4

### 30: Force Sensor Clip for Orthopedic Applications

U. Nolten<sup>2</sup>, H. Kempf<sup>1</sup>, U. Mattes<sup>1</sup>, W. Mokwa<sup>2</sup>

<sup>1</sup>Aesculap AG, Tuttlingen, Germany; <sup>2</sup>RWTH Aachen University, Germany

### 31: Experimental Investigation on the Exploitation of an Active Mechanism to Restore the Operability of Malfunctioning RF-MEMS Switches

J. Iannacci<sup>1</sup>, A. Repchankova<sup>1</sup>, A. Faes<sup>1</sup>, A. Tazzoli<sup>3</sup>, G. Meneghesso<sup>3</sup>, M. Niessner<sup>2</sup>

<sup>1</sup>Fondazione Bruno Kessler, Italy; <sup>2</sup>Technische Universität München, Germany; <sup>3</sup>Università degli Studi di Padova, Italy

### 32: Low Loss STS Based SPDT for X – Band Applications

K. Maninder<sup>1</sup>, A. Sharma<sup>1</sup>, D. Kumar<sup>2</sup>, S. Singh<sup>3</sup>, K. Rangra<sup>1</sup>

<sup>1</sup>Central Electronics Engineering Research Institute, India; <sup>2</sup>Kurukshetra University, India; <sup>3</sup>SAC, ISRO, India

### 33: Design and Characterization of a CMOS Compatible Poly-SiGe Low-G Capacitive Accelerometer

L. Wen<sup>2</sup>, L. Haspelslagh<sup>1</sup>, J. De Coster<sup>1</sup>, A. Witvrouw<sup>1</sup>, R. Puers<sup>2</sup>

<sup>1</sup>IMEC, Belgium; <sup>2</sup>Katholieke Universiteit Leuven, Belgium

### 34: FEM and Measurement Analysis for Flow Sensor Featuring Three Different Operating Modes

A. Talic<sup>1</sup>, S. Cerimovic<sup>2</sup>, F. Kohl<sup>1</sup>, R. Beigelbeck<sup>1</sup>, J. Schalko<sup>2</sup>, F. Keplinger<sup>2</sup>

<sup>1</sup>Austrian Academy of Sciences, Austria; <sup>2</sup>Technische Universität Wien, Austria

### 35: Vacuum Pressure and Gas Detection with a Silicon Based Micromechanical Squeeze Film Sensor

P. Schwarz, D. Feili, R. Engel, N. Pagel, H. Seidel

Universität des Saarlandes, Germany

### 36: Ghost Suppression in Ultrasonic Measurement with a Sparse Phased Array by Using Frequency Tuning of Piezoelectric Microsensors

K. Yamashita, K. Tomiyama, K. Yoshikawa, M. Noda

Kyoto Institute of Technology, Japan

### 37: A Linnik Scanning White-Light Interferometry System Using a MEMS Digital-to-Analog Converter

H. Liao, Y. Yang

National Taiwan University, Taiwan

### 38: Electrostatically Driven Optical Z-Axis Scanner with Thermally Bonded Glass Microlens

S. Bargiel, C. Gorecki, T. Verdot, K. Laszczyk, J. Albero, L. El Fissi

FEMTO-ST Institute, France

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#### B4P-F Micropower generation II

Time: 14:30 - 16:00

Room: Poster Area 2 (Boards 43 - 47)

Chairs: I. Giouroudi and E. Reichel

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### 43: Permanent Magnet Vibration Power Generator As an Embedded Mechanism for Smart Hip Prosthesis

R. Morais<sup>2</sup>, N. Silva<sup>5</sup>, P. Santos<sup>4</sup>, C. Frias<sup>3</sup>, J. Ferreira<sup>1</sup>, A. Ramos<sup>1</sup>, J. Simões<sup>1</sup>, J. Baptista<sup>2</sup>, M. Reis<sup>2</sup>

<sup>1</sup>Universidade de Aveiro, Portugal; <sup>2</sup>Universidade de Trás-os-Montes e Alto Douro, Portugal;

<sup>3</sup>Universidade do Porto, Portugal; <sup>4</sup>University of Trás-os-Montes e Alto Douro, Portugal;

<sup>5</sup>UTAD, Portugal

### 44: Mini Piezoelectric Power Generator with Multi-Frequency Response

S. Ko, C. Je, C. Jun

Electronics and Telecommunications Research Institute, Korea, South

### 45: Selective Electret Charging Method for Energy Harvesters Using Biased Electrode

T. Fujita<sup>2</sup>, T. Toyonaga<sup>2</sup>, K. Nakade<sup>2</sup>, K. Kanda<sup>2</sup>, K. Higuchi<sup>1</sup>, K. Maenaka<sup>2</sup>

<sup>1</sup>Japan Science and Technology Agency, Japan; <sup>2</sup>University of Hyogo, Japan

### 46: Integrated Solid-State Film Lithium Battery

L. Goncalves, J. Ribeiro, M. Silva, M. Silva, J. Correia

University of Minho, Portugal

### 47: A Scalable Micro-Power Converter for Multi-Source Piezoelectric Energy Harvesting Applications

A. Romani<sup>2</sup>, R. Paganelli<sup>1</sup>, M. Tartagni<sup>2</sup>

<sup>1</sup>IEIIT-CNR, Italy; <sup>2</sup>Università di Bologna, Italy

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**B4P-G Biosensors**

Time: 14:30 - 16:00

Room: Poster Area 3 (Boards 49 - 63)

Chairs: I. Giouroudi and E. Reichel

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**49: Human Olfactory Receptors Immobilization on a Mixed Self Assembled Monolayer for the Development of a Bioelectronic Nose**M. Sanmartí<sup>2</sup>, P. Iavicoli<sup>2</sup>, E. Pajot-Augy<sup>1</sup>, G. Gomila<sup>2</sup>, J. Samitier<sup>2</sup><sup>1</sup>INRA, France; <sup>2</sup>Universitat de Barcelona / IBEC, Spain**50: Performance of Different Cathode Catalysts in Microbial Fuel Cell Transducers for the Determination of Microbial Activity**N. Uría<sup>2</sup>, D. Sánchez<sup>1</sup>, R. Mas<sup>1</sup>, O. Sánchez<sup>2</sup>, F. Muñoz<sup>1</sup>, J. Mas<sup>2</sup><sup>1</sup>Instituto de Microelectrónica de Barcelona-CNM-CSIC, Spain; <sup>2</sup>Universitat Autònoma de Barcelona, Spain**51: A Rupture Detection Algorithm for the DNA Translocation Detection Through Biological Nanopore**T. Osaki<sup>3</sup>, J. Barbot<sup>1</sup>, R. Kawano<sup>3</sup>, H. Sasaki<sup>3</sup>, O. Français<sup>2</sup>, B. Le Pioufle<sup>1</sup>, S. Takeuchi<sup>3</sup><sup>1</sup>CNRS ENS de Cachan, France; <sup>2</sup>CNRS SATIE, Institut d'Alembert, ENS Cachan, France;<sup>3</sup>Tokyo University, Japan**52: Interferometric Detection of Prostate Specific Antigen Based on Enzyme Immunoassay**

H. Song, Y. Choi, H. Pyo, K. Chung, D. Lee, M. Jung, S. Park

Electronics and Telecommunications Research Institute, Korea, South

**53: Antibody Modified Gold Micro Array Electrode Based Electrochemical Immunosensor for Ultrasensitive Detection of Cortisol in Saliva and ISF**S. Arya<sup>2</sup>, G. Chornokur<sup>2</sup>, M. Venugopal<sup>1</sup>, S. Bhansali<sup>2</sup><sup>1</sup>Guided Therapeutics Inc., United States; <sup>2</sup>University of South Florida, United States**54: Carbon Nanotube Electrodes for Electrochemiluminescence Biosensors**

A. Sanginario, D. Demarchi, P. Civera, M. Giorelli, M. Castellino, A. Tagliaferro

Politecnico di Torino, Italy

**55: A Highly-Sensitive Leakage Current Microsensor by Using Denaturant: Detection of Target Protein by DPPC Liposome**P. Lorchirachoonkul<sup>1</sup>, T. Shimanouchi<sup>2</sup>, K. Yamashita<sup>1</sup>, H. Umakoshi<sup>2</sup>, R. Kuboi<sup>2</sup>, M. Noda<sup>1</sup><sup>1</sup>Kyoto Institute of Technology, Japan; <sup>2</sup>Osaka University, Japan**56: An Automatic Offset Correction Platform for High-Throughput Ion-Channel Electrophysiology**

F. Thei, M. Rossi, M. Bennati, M. Crescentini, M. Tartagni

Università di Bologna, Italy

**57: Evaluation of Pseudomonas Aeruginosa Biofilm Formation Using Piezoelectric Tuning Forks Mass Sensors**K. Waszczuk<sup>2</sup>, G. Gula<sup>1</sup>, M. Swiatkowski<sup>2</sup>, J. Olszewski<sup>2</sup>, Z. Drulis-Kawa<sup>1</sup>, J. Gutowicz<sup>1</sup>, T. Gotszalk<sup>2</sup><sup>1</sup>University of Wrocław, Poland; <sup>2</sup>Wrocław University of Technology, Poland**58: Biosensing Utilizing the Motion of Magnetic Microparticles in a Microfluidic System**I. Giouroudi<sup>2</sup>, S. van Den Driesche<sup>2</sup>, J. Kosel<sup>1</sup><sup>1</sup>King Abdullah University of Science and Technology, Saudi Arabia; <sup>2</sup>Technische Universität Wien, Austria**59: Label-Free Detection of Cardiac Biomarker Using Aptamer Based Capacitive Biosensor**

A. Qureshi, Y. Gurbuz, J. Niazi

Sabanci University, Turkey

**60: Love Wave Biosensor for Real-Time Detection of Okadaic Acid As DSP Phycotoxin**

F. Fournel, E. Baco, M. Mamani-Matsuda, M. Degueil, B. Bennetau, D. Moynet, D. Mossalayi,

L. Vellutini, J. Pillot, C. Dejous, D. Rebiere

Université de Bordeaux, France

**61: High Frequency QCM Based Sensor System for Sensitive Detection of Dissolved Analytes**B. Stehrer<sup>1</sup>, R. Schwödiauer<sup>1</sup>, S. Bauer<sup>1</sup>, I. Graz<sup>2</sup>, P. Pollheimer<sup>1</sup>, H. Gruber<sup>1</sup><sup>1</sup>Johannes Kepler Universität, Austria; <sup>2</sup>University of Cambridge, United Kingdom

## Tuesday, September 7: Poster Session B4

### 62: The Spring Constant Calibration of the Piezoresistive Cantilever Based Biosensor

G. Józwiak<sup>3</sup>, D. Kopiec<sup>3</sup>, P. Zawierucha<sup>3</sup>, T. Gotszalk<sup>3</sup>, P. Janus<sup>1</sup>, P. Grabiec<sup>1</sup>, I. Rangelow<sup>2</sup>

<sup>1</sup>Institute of Electron Technology, Poland; <sup>2</sup>Technische Universität Ilmenau, Germany;

<sup>3</sup>Wrocław University of Technology, Poland

### 63: Quantitative Impedance Analysis of Nanowires and Cancer Cells

F. Alexander Jr., E. Huey, D. Price, S. Bhansali

University of South Florida, United States

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#### B4P-H Materials and technology

Time: 14:30 - 16:00

Room: Poster Area 4 (Boards 67 - 82)

Chairs: I. Giouroudi and E. Reichel

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### 67: Phase-Sensitive and Fast-Scanning Laser Probe System for Diagnosis of High Frequency Acoustic Wave Devices

K. Hashimoto, N. Wu, T. Omori, M. Yamaguchi

Chiba University, Japan

### 68: A Full Wafer Dicing Free Dry Release Process for MEMS Devices

I. Sari, I. Zeimpekis, M. Kraft

University of Southampton, United Kingdom

### 69: Embedded Double-Layered Microchannel Fabrication for Microfluidic Devices Using Developer Permeability of Negative Thick-Film Resists

Y. Hirai, Y. Nakai, K. Sugano, T. Tsuchiya, O. Tabata

Kyoto University, Japan

### 70: Detail Study on the Rear 45 Micromirror Smoothness on (100) Si Substrates

Y. Xu, A. Michael, C. Kwok, G. Peng

University of New South Wales, Australia

### 71: PVDF and EMFi Sensor Materials – a Comparative Study

S. Rajala, J. Lekkala

Tampere University of Technology, Finland

### 72: Synthesis and Application of Photo Curable Perfluoropolyethers As New Material for Microfluidics

C. Hannig, M. Dirschka, K. Länge, S. Neumaier, B. Rapp

Karlsruhe Institute of Technology, Germany

### 73: Fast Prototyping of Monolithic Micro-System on Epi-Fluorescent Microscopes

P. Preechaburana, D. Filippini

Linköping University, Sweden

### 74: Fabrication of Polymer-Based Micro Devices: Formulation and Study of the Paste

N. Serra, T. Maeder, O. Gentsch, P. Ryser

Ecole Polytechnique Fédérale de Lausanne, Switzerland

### 75: Combined Testing for MEMS Characterization

A. Schifferle<sup>2</sup>, A. Neels<sup>1</sup>, O. Papes<sup>2</sup>, A. Dommann<sup>1</sup>, E. Mazza<sup>2</sup>

<sup>1</sup>CSEM, Switzerland; <sup>2</sup>ETH Zürich, Switzerland

### 76: Design and Fabrication of a Tuning Fork Shaped Voltage Controlled Resonator with Additional Tuning Electrodes for Low-Voltage Applications

N. Chekurov, L. Aaltonen, J. Gronicz, M. Kosunen, I. Tittonen

Aalto University, Finland

### 77: Influence of Seed Layer on Crystallinity and Orientation of Pulsed – DC Sputtered AlN Thin-Films for Piezoelectric Actuators

A. Tran, H. Schellevis, H. Pham, C. Shen, L. Sarro

Delft University of Technology, Netherlands

### 78: Cu Based Patch Antenna on Polymer Substrate for Flexible Wireless Sensor Systems Applications

D. Feili, N. Pagel, V. Ngo, P. Schwarz, H. Seidel

Universität des Saarlandes, Germany

### 79: A Tri-Axial Accelerometer with Structure-Based Voltage Operation by Using Series-Connected Piezoelectric Elements

K. Kanda<sup>2</sup>, Y. Iga<sup>1</sup>, J. Matsuoka<sup>3</sup>, Y. Jiang<sup>1</sup>, T. Fujita<sup>2</sup>, K. Higuchi<sup>1</sup>, K. Maenaka<sup>2</sup>

<sup>1</sup>Japan Science and Technology Agency, Japan; <sup>2</sup>University of Hyogo, Japan; <sup>3</sup>Yamaha

Corporation, Japan

## Tuesday, September 7: Poster Session B4

### **80: Advanced Structures for Heat Transfer Studies on Diaphragms**

F. Kohl<sup>1</sup>, R. Beigelbeck<sup>1</sup>, J. Kuntner<sup>3</sup>, J. Schalko<sup>2</sup>, A. Talic<sup>1</sup>, S. Cerimovic<sup>2</sup>

<sup>1</sup>Austrian Academy of Sciences, Austria; <sup>2</sup>Technische Universität Wien, Austria; <sup>3</sup>Vienna University of Technology, Austria

### **81: Hybrid Low Temperature Wafer Bonding and Direct Electrical Interconnection of 3D MEMS**

S. Kühne, C. Hierold

ETH Zürich, Switzerland

### **82: Development of Novel Sensors Based on Oxide Nanowires**

M. Sheng, Y. Zhou, G. Patzke

Universität Zürich, Switzerland

## Tuesday, September 7: Lecture Session B5

	Room 1	Room 2
Time	B5L-A Label-free biosensors	B5L-B Thermal devices
16:00	<p><b>Label-Free Detection of H1N1 Virus for Point of Care Testing</b>                      B. Schwarz<sup>1</sup>, N. Schweizer<sup>2</sup>, F. Pröll<sup>2</sup>, G. Proll<sup>2</sup>, G. Gauglitz<sup>2</sup>  <sup>1</sup>Eberhard Karls Universität, Germany; <sup>2</sup>Universität Tuebingen, Germany</p>	<p><b>Smart Temperature Sensors in Standard CMOS</b>                      K. Makinwa                      Delft University of Technology, Netherlands</p>
16:15	<p><b>A Novel Method for Simultaneous Readout of Static Bending and Multimode Resonance-Frequency of Microcantilever-Based Biochemical Sensors</b>                      K. Nieradka<sup>2</sup>, T. Gotszalk<sup>2</sup>, G. Schroeder<sup>1</sup>  <sup>1</sup>Adam Mickiewicz University in Poznan, Poland; <sup>2</sup>Wroclaw University of Technology, Poland</p>	
16:30	<p><b>Label-Free Detection of Breast Cancer Marker HER-2/neu with an Acoustic Biosensor</b>                      F. Gruhl, M. Rapp, K. Länge                      Karlsruhe Institute of Technology, Germany</p>	<p><b>Miniaturized Ceramic Differential Scanning Calorimeter with Integrated Oven and Crucible in LTCC Technology</b>                      W. Missal<sup>2</sup>, J. Kita<sup>2</sup>, E. Wappler<sup>5</sup>, F. Gora<sup>4</sup>, A. Kipka<sup>4</sup>, T. Bartnitzek<sup>3</sup>, F. Bechtold<sup>3</sup>, D. Schabbel<sup>1</sup>, B. Pawlowski<sup>1</sup>, R. Moos<sup>2</sup>  <sup>1</sup>Fraunhofer IKTS, Germany; <sup>2</sup>Universität Bayreuth, Germany; <sup>3</sup>VIA electronic GmbH, Germany; <sup>4</sup>W. C. Heraeus GmbH, Germany; <sup>5</sup>wsk Mess- und Datentechnik GmbH, Germany</p>
16:45	<p><b>Label-Free DNA Hybridization and Denaturation Detection by Means of Field-Effect Nanoplate SOI Capacitors Functionalized with Gold Nanoparticles</b>                      M. Abouzar<sup>1</sup>, A. Pedraza<sup>1</sup>, M. Schöning<sup>2</sup>, A. Poghosian<sup>1</sup>  <sup>1</sup>Aachen University of Applied Sciences, Germany; <sup>2</sup>Aachen University of Applied Sciences / IBN-2, Germany</p>	<p><b>Thermal Effects to Enhance the Responsivity of Pyroelectric Infrared Detectors</b>                      V. Norkus, A. Schulze, Y. Querner, G. Gerlach                      Technische Universität Dresden, Germany</p>
17:00	<p><b>Cell Toxicity and Preparation of Streptavidin-Modified Iron Nanoparticles and Glutathione-Modified Cadmium-Based Quantum Dots</b>                      J. Chomoucka<sup>1</sup>, J. Drbohlavova<sup>1</sup>, P. Babula<sup>3</sup>, V. Adam<sup>2</sup>, J. Hubalek<sup>1</sup>, I. Provaznik<sup>1</sup>, R. Kizek<sup>2</sup>  <sup>1</sup>Brno University of Technology, Czech Rep.; <sup>2</sup>Mendel University, Czech Rep.; <sup>3</sup>University of Veterinary and Pharmaceutical Sciences, Czech Rep.</p>	<p><b>Temperature Dependence of the Resonance Frequency of Thermogravimetric Devices</b>                      E. Iervolino<sup>4</sup>, M. Riccio<sup>2</sup>, A. van Herwaarden<sup>3</sup>, A. Irace<sup>2</sup>, G. Breglio<sup>2</sup>, W. van der Vlist<sup>1</sup>, P. Sarro<sup>1</sup>  <sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>Università degli Studi di Napoli Federico II, Italy; <sup>3</sup>Xensor Integration, Netherlands; <sup>4</sup>Xensor Integration &amp; Delft University of Technology, Netherlands</p>
17:15	<p><b>Self-Assembled Molecular Gate Field Effect Transistor for Label Free Sialic Acid Detection at Cell Membrane</b>                      A. Matsumoto<sup>1</sup>, N. Sato<sup>2</sup>, H. Cabral<sup>2</sup>, K. Kataoka<sup>2</sup>, Y. Miyahara<sup>1</sup>  <sup>1</sup>National Institute for Materials Science, Japan; <sup>2</sup>University of Tokyo, Japan</p>	<p><b>Room Temperature Infrared Imaging Array Fabricated Using Heterogeneous Integration Methods</b>                      M. Pisani, K. Ren, P. Kao, S. Tadigadapa                      Pennsylvania State University, United States</p>

## Tuesday, September 7: Lecture Session B5

	Room 6	Room 7
Time	<b>B5L-C On-chip analysis devices</b>	<b>B5L-D Ultrasensitive magnetic probes</b>
16:00	<p><b>Time-Resolved Mapping of Neurotransmitter Fluctuations by Arrays of Nanocavity Redox-Cycling Sensors</b>                      E. Kätelhön, B. Hofmann, M. Banzet, A. Offenhäusser, B. Wolfrum  <i>Jülich Forschungszentrum GmbH, Germany</i></p>	<p><b>Electron Spin Resonance Sensors</b>                      G. Boero  <i>Ecole Polytechnique Fédérale de Lausanne, Switzerland</i></p>
16:15	<p><b>An Electrowetting on Dielectrics Based Lab-on-a-Chip Utilizing an Integrated High Fundamental Frequency Quartz Crystal Resonator As a Biosensor</b>                      T. Lederer, B. Stehrer, S. Bauer, B. Jakoby, W. Hilber  <i>Johannes Kepler Universität, Austria</i></p>	
16:30	<p><b>SOPC Design of an Impedance Analyser Without Current Measurement</b>                      A. Hamed, E. Tisserand, P. Schweitzer, Y. Berviller  <i>LIEN-UHP Nancy, France</i></p>	<p><b>Spatially Resolved Measurement of Magnetic Flux Density Using a 32×32 CMOS-Integrated Hall Sensor Array</b>                      J. Stephan, P. Gieschke, O. Paul, P. Ruther  <i>Universität Freiburg, Germany</i></p>
16:45	<p><b>MEMS Silicon-Based Micro-Evaporator with Diamond-Shaped Fins</b>                      M. Mihailovic<sup>1</sup>, C. Rops<sup>2</sup>, J. Creemer<sup>1</sup>, P. Sarro<sup>1</sup>  <i><sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>TNO, Netherlands</i></p>	<p><b>Magnetic Microwires for Orthogonal Fluxgates Electroplated with Pulse Current</b>                      M. Butta<sup>1</sup>, P. Ripka<sup>1</sup>, G. Infante<sup>2</sup>, M. Vazquez<sup>2</sup>, O. De Abril<sup>2</sup>  <i><sup>1</sup>Czech Technical University in Prague, Czech Rep.; <sup>2</sup>Materials Science Institute of Madrid, CSIC, Spain</i></p>
17:00	<p><b>Microfabricated Gas Chromatograph for Sub-ppb Determinations of TCE in Vapor Intrusion Investigations</b>                      H. Chang, S. Kim, T. Sukaew, F. Bohrer, E. Zellers  <i>University of Michigan, United States</i></p>	<p><b>Ultrasensitive Core for Magneto-optical Fluxgate Magnetometer with High Space Resolution</b>                      V. Skidanov, P. Vetoshko  <i>Institute for Design Problems in Microelectronics RAS, Russia</i></p>
17:15	<p><b>Variation in Microneedle Geometry to Increase Shear Strength</b>                      P. Khanna, H. Silva, S. Bhansali  <i>University of South Florida, United States</i></p>	<p><b>Harmonic Frequency Characterisations of a CMOS Micro Fluxgate Sensor for Low Magnetic Field Detection</b>                      W. Huang, J. Jeng, C. Lu  <i>National Taipei University of Technology, Taiwan</i></p>

## Wednesday, September 8: Lecture Session C1

	Room 1	Room 2
Time	C1L-A Optical chemical sensors	C1L-B Cantilever based sensors
09:00	<p><b>Ferromagnetic and Permanent Magnetic Spheres As Platform for Single- and Dual-Analyte Optical Sensors</b> K. Koren, G. Mistlberger, S. Borisov, I. Klimant <i>Graz University of Technology, Austria</i></p>	<p><b>Unconventional Uses of Cantilevers for Chemical Sensing in Gas and Liquid Environments</b> I. Dufour<sup>3</sup>, F. Josse<sup>2</sup>, S. Heinrich<sup>2</sup>, C. Lucat<sup>3</sup>, C. Ayela<sup>3</sup>, F. Ménéil<sup>3</sup>, O. Brand<sup>1</sup> <i><sup>1</sup>Georgia Institute of Technology, United States; <sup>2</sup>Marquette University, United States; <sup>3</sup>Université de Bordeaux, France</i></p>
09:15	<p><b>Tunable Mid-IR Lasers: a New Avenue to Robust and Versatile Physical Chemosensors</b> M. Brandstetter, A. Genner, K. Anic, B. Lendl <i>Technische Universität Wien, Austria</i></p>	
09:30	<p><b>An Optical Sensor Array on a Flexible Substrate with Integrated Organic Opto-Electric Devices</b> T. Mayr<sup>1</sup>, T. Abel<sup>1</sup>, E. Kraker<sup>2</sup>, S. Köstler<sup>2</sup>, A. Haase<sup>2</sup>, C. Konrad<sup>2</sup>, M. Tscherner<sup>2</sup>, B. Lamprecht<sup>2</sup> <i><sup>1</sup>Graz University of Technology, Austria; <sup>2</sup>Joanneum Research, Austria</i></p>	<p><b>Integrated Piezoresistive Gauge in a Piezoelectric Cantilever</b> M. Cueff, E. Defay, G. Le Rhun, F. Perruchot, A. Suhm, M. Aid <i>CEA, LETI-MINATEC, France</i></p>
09:45	<p><b>Real-Time Detection of Formaldehyde by a Fluorescence-Based Sensor</b> M. Descamps<sup>2</sup>, T. Bordy<sup>2</sup>, J. Hue<sup>2</sup>, S. Mariano<sup>1</sup>, G. Nonglaton<sup>2</sup>, E. Schultz<sup>2</sup>, T. Tran-Thi<sup>1</sup>, S. Vignoud-Despond<sup>2</sup> <i><sup>1</sup>CEA Saclay / LFP, France; <sup>2</sup>CEA, LETI-MINATEC, France</i></p>	<p><b>Contactless Electromagnetic Switched Interrogation of Micromechanical Cantilever Resonators</b> M. Bau, V. Ferrari, D. Marioli, E. Tonoli <i>Università degli Studi di Brescia, Italy</i></p>
10:00	<p><b>Improvement of an Evanescent Field IR-Absorption Sensor by Utilizing a Photonic Taper Structure</b> J. Kasberger<sup>3</sup>, A. Saeed<sup>1</sup>, B. Jakoby<sup>2</sup>, K. Hingerl<sup>1</sup> <i><sup>1</sup>CD Lab for Surface Optics / Johannes Kepler University Linz, Austria; <sup>2</sup>Johannes Kepler Universität, Austria; <sup>3</sup>RECENDT GmbH, Austria</i></p>	<p><b>A Straightforward Determination of Fluid Viscosity and Density Using Microcantilevers: Analytical and Experimental Studies</b> M. Youssry, N. Belmiloud, B. Caillard, C. Ayela, C. Pellet, I. Dufour <i>Université de Bordeaux, France</i></p>
10:15	<p><b>Magnetic Nanoparticle-Enhanced SPR Biosensor</b> Y. Wang, J. Dostalek, W. Knoll <i>Austrian Institute of Technology GmbH, Austria</i></p>	<p><b>GaAs Spin Injector Microcantilever Probe Assembly via a Releasable "Epitaxial Patch Technology"</b> S. Arscott<sup>2</sup>, E. Peytavit<sup>2</sup>, D. Vu<sup>1</sup>, A. Rowe<sup>3</sup>, D. Paget<sup>3</sup> <i><sup>1</sup>Ecole Polytechnique de Paris, France; <sup>2</sup>IEMN-CNRS-University of Lille, France; <sup>3</sup>Polytechnique de Paris, France</i></p>



## Wednesday, September 8: Lecture Session C1

	Room 6	Room 7
Time	C1L-C Nanomaterials	C1L-D Acceleration sensors
09:00	<p><b>WCNTs Modified with Porphyrin Units for Chemical Sensing Applications</b>                      L. Lvova<sup>2</sup>, A. Paris<sup>2</sup>, M. Mastroianni<sup>2</sup>, G. Pomarico<sup>2</sup>, M. Santonico<sup>2</sup>, G. Pennazza<sup>1</sup>, C. Di Natale<sup>2</sup>, R. Paolesse<sup>2</sup>, A. D'Amico<sup>2</sup>  <sup>1</sup>Università Campus Bio-Medico di Roma, Italy; <sup>2</sup>Università degli Studi di Roma Tor Vergata, Italy</p>	<p><b>Design and Modeling of a Flexible Contact-Mode Piezoresistive Detector for Time-Based Acceleration Sensing</b>                      V. Rajaraman<sup>1</sup>, B. Hau<sup>1</sup>, L. Rocha<sup>2</sup>, P. French<sup>1</sup>, K. Makinwa<sup>1</sup>  <sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>University of Minho, Portugal</p>
09:15	<p><b>Bio-Fuel Cell Based on Modified Carbon Nanotubes with Immobilized Enzymes</b>                      M. Bogner, M. Schnaithmann, J. Sägebarth, H. Sandmaier                      Universität Stuttgart, Germany</p>	<p><b>Modelling and Testing of a MEMS Accelerometer Controlled and Read-Out Beyond the Pull-in Instability Limit</b>                      G. Langfelder<sup>1</sup>, T. Frizzi<sup>1</sup>, A. Tocchio<sup>1</sup>, E. Lasalandra<sup>2</sup>, A. Longoni<sup>1</sup>  <sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>ST Microelectronics, Italy</p>
09:30	<p><b>Combined Optical and Electrical Biosensing with Novel Metal Nanowire Arrays</b>                      R. Mackenzie<sup>1</sup>, B. Dielacher<sup>1</sup>, C. Fraschina<sup>1</sup>, T. Sannomiya<sup>1</sup>, V. Auzelyte<sup>2</sup>, J. Vörös<sup>1</sup>  <sup>1</sup>ETH Zürich, Switzerland; <sup>2</sup>Paul Scherrer Institut, Switzerland</p>	<p><b>A Digital Output Accelerometer Using MEMS-Based Piezoelectric Accelerometer Connected to Parallel CMOS Circuit</b>                      T. Kobayashi<sup>1</sup>, H. Okada<sup>2</sup>, T. Masuda<sup>3</sup>, R. Maeda<sup>1</sup>, T. Itoh<sup>2</sup>  <sup>1</sup>National Institute of Advance Industrial Science and Technology, Japan; <sup>2</sup>National Institute of Advance Industrial Science and Technology &amp; JST-CREST, Japan; <sup>3</sup>University of Tokyo, JST-CREST, Japan</p>
09:45	<p><b>Physical Vapor Deposition of Copper Oxide Nanowires</b>                      E. Comini, G. Faglia, M. Ferroni, D. Zappa, G. Sberveglieri                      Università degli Studi di Brescia, Italy</p>	<p><b>Characterization of a Pull-in Based µg-Resolution Accelerometer</b>                      R. Dias<sup>3</sup>, E. Cretu<sup>2</sup>, R. Wolffenbuttel<sup>1</sup>, L. Rocha<sup>3</sup>  <sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>University of British Columbia, Canada; <sup>3</sup>University of Minho, Portugal</p>
10:00	<p><b>Tunnel Diodes Fabricated for Rectenna Applications Using Self-Assembled Nanodielectrics</b>                      M. Celestin, S. Krishnan, D. Goswami, L. Stefanakos, S. Bhansali                      University of South Florida, United States</p>	<p><b>Force Balanced Accelerometer Using MOSFET with Position Controlled Floating Gate Electrode</b>                      M. Suzuki<sup>1</sup>, T. Kong<sup>1</sup>, R. Taguchi<sup>1</sup>, J. Kogure<sup>1</sup>, S. Aoyagi<sup>1</sup>, H. Tokunaga<sup>2</sup>  <sup>1</sup>Kansai University, Japan; <sup>2</sup>M. T. C. Corp., Japan</p>
10:15	<p><b>Effects of Dielectric Deposition on the Electrical Characteristics of Mim Tunnel Junctions</b>                      R. Ratnadurai, S. Krishnan, E. Stefanakos, Y. Goswami, S. Bhansali                      University of south florida, United States</p>	<p><b>A CMOS-MEMS Accelerometer with Tri-Axis Sensing Electrodes Arrays</b>                      M. Tsai, Y. Liu, C. Sun, C. Wang, W. Fang                      National Tsing Hua University, Taiwan</p>

## Wednesday, September 8: Lecture Session C2

	Room 1	Room 2
Time	C2L-A Optical fiber sensors	C2L-B Nanosensors & NEMS
11:00	<p><b>Optical Fiber Sensors Based on Layer-by-Layer Nanostructured Films</b>                      F. Arregui<sup>2</sup>, I. Matias<sup>2</sup>, J. Corres<sup>2</sup>, I. Del Villar<sup>2</sup>, J. Goicoechea<sup>2</sup>, C. Ruiz Zamarreño<sup>2</sup>, M. Hernández<sup>2</sup>, R. Claus<sup>1</sup>  <sup>1</sup>Nanosonic, Inc., United States;  <sup>2</sup>Universidad Pública de Navarra, Spain</p>	<p><b>Homogeneous Biosensor Based on Optical Detection of the Rotational Dynamics of Anisotropic Nanoparticles</b>                      S. Schrittwieser<sup>1</sup>, J. Schotter<sup>1</sup>, T. Maier<sup>1</sup>, R. Bruck<sup>1</sup>, P. Mueller<sup>1</sup>, N. Kataeva<sup>1</sup>, K. Soullantika<sup>2</sup>, F. Ludwig<sup>3</sup>, A. Huetten<sup>4</sup>, H. Brueckl<sup>1</sup>  <sup>1</sup>Austrian Institute of Technology GmbH, Austria; <sup>2</sup>LPCNO-INSA, France; <sup>3</sup>Technische Universität Braunschweig, Germany; <sup>4</sup>Universität Bielefeld, Germany</p>
11:15		<p><b>Gas Sensing with Vertical Functionalized InAs Nanowire Arrays</b>                      P. Offermans, M. Crego-Calama, S. Brongersma                      Holst Centre/IMEC, Netherlands</p>
11:30	<p><b>Fiber-Optic Voltage Sensor Using Fiber Gyro Technology</b>                      K. Bohnert, S. Wildermuth, A. Frank, H. Brändle                      ABB Switzerland Ltd, Switzerland</p>	<p><b>Growth Characterization of Vertically Aligned Carbon Nanofibers on Top of TiN Buffer Layer for Nanoelectromechanical Devices</b>                      F. Ghavanini, M. Damian, D. Rafieian, P. Lundgren                      Chalmers University of Technology, Sweden</p>
11:45	<p><b>Intensity Referencing in an Extrinsic Optical Fiber Temperature Sensor</b>                      A. Apelsmeier<sup>3</sup>, R. Gleixner<sup>2</sup>, M. Mayer<sup>2</sup>, M. Shamonin<sup>2</sup>, B. Schmauss<sup>1</sup>  <sup>1</sup>Friedrich-Alexander-Universität Erlangen-Nürnberg, Germany;  <sup>2</sup>Hochschule Regensburg, Germany;  <sup>3</sup>University of Applied Sciences Regensburg, Germany</p>	<p><b>Electrical Initialization to Erase History in Hysteretic Carbon Nanotube Transistors for Sensing Applications</b>                      M. Mattmann<sup>1</sup>, D. Bechstein<sup>1</sup>, C. Roman<sup>1</sup>, K. Chikkadi<sup>1</sup>, T. Helbling<sup>1</sup>, L. Durrer<sup>1</sup>, R. Pohle<sup>2</sup>, M. Fleischer<sup>2</sup>, C. Hierold<sup>1</sup>  <sup>1</sup>ETH Zürich, Switzerland; <sup>2</sup>Siemens AG, Germany</p>
12:00	<p><b>Lossy Mode Resonances Supported by TiO<sub>2</sub>-Coated Optical Fibers</b>                      M. Hernández, C. Zamarreño, I. Del Villar, I. Matias, F. Arregui                      Universidad Pública de Navarra, Spain</p>	<p><b>ZeptoFarad Resolution CMOS Read-Out Circuit for Nanosensors</b>                      M. Carminati, G. Ferrari, F. Guagliardo, M. Sampietro                      Politecnico di Milano, Italy</p>
12:15	<p><b>Fiber-Optic Interferometric Sensor of Magnetic Field for Structural Health Monitoring</b>                      Z. Djinovic, M. Tomic, C. Gamauf                      Integrated Microsystems Austria, Austria</p>	<p><b>Ultrasensitive Nanowire Pressure Sensor Makes its Debut</b>                      B. Soon<sup>1</sup>, P. Neuzil<sup>1</sup>, C. Wong<sup>2</sup>, J. Reboud<sup>1</sup>, H. Feng<sup>1</sup>, C. Lee<sup>3</sup>  <sup>1</sup>Agency for Science, Technology and Research, Singapore; <sup>2</sup>Agency for Science, Technology and Research &amp; Nanyang Technological University, Singapore; <sup>3</sup>National University of Singapore, Singapore</p>

## Wednesday, September 8: Lecture Session C2

	Room 6	Room 7
Time	C2L-C Thin films	C2L-D Micropower generation
11:00	<p><b>TiO<sub>2</sub> ALD Nanolayer As Evanescent Waveguide for Biomedical Sensor Applications</b>                      A. Purniawan, P. French, G. Pandraud, P. Sarro  <i>Delft University of Technology, Netherlands</i></p>	<p><b>A Single-Magnet Nonlinear Piezoelectric Converter for Enhanced Energy Harvesting from Random Vibrations</b>                      M. Ferrari, V. Ferrari, M. Guizzetti, D. Marioli  <i>Università degli Studi di Brescia, Italy</i></p>
11:15	<p><b>Micro Pirani Vacuum Gauges Manufactured by a Film Transfer Process</b>                      G. Schelcher<sup>2</sup>, E. Lefeuvre<sup>2</sup>, S. Brault<sup>1</sup>, F. Parrain<sup>2</sup>, E. Martincic<sup>2</sup>, E. Dufour-Gergam<sup>2</sup>, A. Bosseboeuf<sup>2</sup>  <sup>1</sup>KFM Technology - IEF, France;  <sup>2</sup>Université Paris-Sud 11, France</p>	<p><b>Energy Harvesting for Autonomous Wireless Sensor Nodes in Aircraft</b>                      D. Samson<sup>1</sup>, M. Kluge<sup>1</sup>, T. Becker<sup>1</sup>, U. Schmid<sup>2</sup>  <sup>1</sup>EADS Innovation Works, Germany;  <sup>2</sup>Technische Universität Wien, Austria</p>
11:30	<p><b>Low-Firing Thick-Film Piezoresistive Sensors for Medical Instruments</b>                      T. Maeder, C. Jacq, P. Ryser  <i>Ecole Polytechnique Fédérale de Lausanne, Switzerland</i></p>	<p><b>High-Performance Piezoelectric Thick Film Based Energy Harvesting Micro-Generators for MEMS</b>                      T. Zawada<sup>1</sup>, K. Hansen<sup>1</sup>, R. Lou-Moeller<sup>1</sup>, E. Ringgaard<sup>1</sup>, T. Pedersen<sup>2</sup>, E. Thomsen<sup>2</sup>  <sup>1</sup>MEGGITT, Ferroperm Piezoceramics, Denmark; <sup>2</sup>Technical University of Denmark, Denmark</p>
11:45	<p><b>Nanofilm Metal Layers As Vacuum Quality Sensors</b>                      S. Mäder<sup>1</sup>, T. Haas<sup>1</sup>, U. Kunze<sup>3</sup>, T. Doll<sup>2</sup>  <sup>1</sup>adlantis Dortmund GmbH, Germany;  <sup>2</sup>adlantis Dortmund GmbH &amp; Johannes Gutenberg-Universität, Germany;  <sup>3</sup>Ruhr Universität Bochum, Germany</p>	<p><b>Nonlinear Electromagnetic Generators with Polymeric Materials for Power Harvesting from Vibrations</b>                      E. Sardini, M. Serpelloni  <i>Università degli Studi di Brescia, Italy</i></p>
12:00	<p><b>An ALD Etch-Back Method to Fabricate High Aspect Ratio Nanopillar Arrays for Photonic Crystal Sensors</b>                      Y. Huang, G. Pandraud, P. Sarro  <i>Delft University of Technology, Netherlands</i></p>	<p><b>Combined Optimization of Electrical and Mechanical Parameters of In-Plane and Out-of-Plane Gap-Closing Electrostatic Vibration Energy Harvesters (VEHs)</b>                      R. Guillemet<sup>2</sup>, P. Basset<sup>2</sup>, D. Galayko<sup>1</sup>, T. Bourouina<sup>2</sup>  <sup>1</sup>Université Paris 6 / LIP6, France;  <sup>2</sup>Université Paris-Est / ESYCOM-ESIEE, France</p>
12:15	<p><b>Solid-Phase Microextraction Using Silica Fibers Coated with Tenax-TA Films</b>                      B. Alfeeli, D. Hogg, M. Agah  <i>Virginia Polytechnic Institute and State University, United States</i></p>	<p><b>A Multi-Source Micro Power Generator Employing Thermal and Vibration Energy Harvesting</b>                      H. Töreyn<sup>1</sup>, E. Topal<sup>2</sup>, H. Kūlah<sup>2</sup>  <sup>1</sup>Georgia Institute of Technology, United States; <sup>2</sup>METU-MEMS Research and Application Center, Turkey</p>

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**C3P-E Chemical sensors**

Time: 14:00 - 15:30

Room: Poster Area 1 (Boards 01 - 22)

Chairs: S. Rupitsch and S. van den Driesche

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**01: Fiber Bragg Grating Applied Multi-Functional Sensor Based on Pulsed Photoacoustic Technique**

A. Yarai

*Osaka Sangyo University, Japan***02: Colorimetric Detection of Formaldehyde: a Sensor for Air Quality Measurements and a Pollution-Warning Kit for Homes**S. Mariano<sup>2</sup>, W. Wang<sup>1</sup>, G. Brunelle<sup>1</sup>, Y. Bigay<sup>3</sup>, T. Tran Thi<sup>2</sup><sup>1</sup>CEA Saclay, France; <sup>2</sup>CEA Saclay / LFP, France; <sup>3</sup>Start up ETHERA MINATEC Entreprises, France**03: Fabrication and Characterization of Gas Detection Microfluidic System**V. Martini<sup>2</sup>, S. Bernardini<sup>2</sup>, M. Bendahan<sup>2</sup>, K. Aguir<sup>2</sup>, P. Perrier<sup>1</sup>, I. Graur<sup>1</sup><sup>1</sup>Aix-Marseille Université, France; <sup>2</sup>IM2NP CNRS UMR 6242, France**04: Merging Ethylene NDIR Gas Sensors with Preconcentrator-Devices for Sensitivity Enhancement**A. Sklorz<sup>1</sup>, A. Schäfer<sup>2</sup>, W. Lang<sup>2</sup><sup>1</sup>Friedrich-Wilhelm-Bessel-Institut Forschungsgesellschaft mbH, Germany; <sup>2</sup>Universität Bremen, Germany**05: Electrochemical Detection of the Neurotransmitter Dopamine by Nanoimprinted Sub- $\mu$ m Microelectrodes and CMOS Circuitry with Near 100% Collection Efficiency**

C. Huang, M. Lu

*National Tsing Hua University, Taiwan***06: New Potentiometric Sensors Based on Two Competitive Recognition Sites for Determining Tetracycline Residues Using Flow-Through System**F. Moreira<sup>2</sup>, A. Kamel<sup>1</sup>, R. Guerreiro<sup>2</sup>, V. Azevedo<sup>2</sup>, G. Sales<sup>2</sup><sup>1</sup>Ain Shams University, Egypt; <sup>2</sup>Instituto Superior de Engenharia do Porto, Portugal**07: H2 Sensing Performance of Optical Fiber Coated with Nano-Platelet WO3 Film**

J. Ou, H. Yaacob, J. Campbell, K. Kalantar-Zadeh, W. Wlodarski

*RMIT University, Australia***08: High Performance CO2 Measurement Based on Pressure Modulation**X. Wang<sup>2</sup>, H. Rodjgard<sup>2</sup>, B. Oelmann<sup>1</sup>, H. Martin<sup>2</sup>, B. Larsson<sup>2</sup><sup>1</sup>Mid Sweden University, Sweden; <sup>2</sup>SenseAir AB, Sweden**09: A Miniaturized System for Ultratrace Uranium Analysis in Waters**B. Khadro<sup>2</sup>, N. Jaffrezic-Renault<sup>1</sup><sup>1</sup>University of Lyon, France; <sup>2</sup>University of Lyon, University Claude Bernard, France**10: Mis – Field Effect Sensors for Low Concentration of H2S for Environmental Monitoring**

L. Kalinina, A. Litvinov, I. Nikolaev, N. Samotaev

*National Research Nuclear University MEPhI, Russia***11: Gas Monitoring with a Fabry-Perot Based Bolometer: Cross-Sensitivity to Water Vapor**J. Mayrwöger<sup>3</sup>, W. Reichl<sup>1</sup>, C. Krutzer<sup>2</sup>, B. Jakoby<sup>3</sup><sup>1</sup>E+E Elektronik, Austria; <sup>2</sup>Integrated Microsystems Austria, Austria; <sup>3</sup>Johannes Kepler Universität, Austria**12: Optimization of the Lateral Field Excited Platform for Liquid Sensing Applications**C. Peters<sup>1</sup>, R. Fernandez<sup>2</sup>, R. Lucklum<sup>1</sup>, J. Fochtmann<sup>1</sup>, D. McCann<sup>3</sup>, J. Vetelino<sup>3</sup>, A. Arnau<sup>2</sup><sup>1</sup>Otto-von-Guericke-Universität Magdeburg, Germany; <sup>2</sup>Universidad Politecnica de Valencia, Spain; <sup>3</sup>University of Maine, Orono, United States**13: Fish Freshness Decay Measurement with a Colorimetric Artificial Olfactory System**F. Dini<sup>2</sup>, R. Paolesse<sup>2</sup>, D. Filippini<sup>1</sup>, A. D'Amico<sup>2</sup>, I. Lundström<sup>1</sup>, C. Di Natale<sup>2</sup><sup>1</sup>Linköping University, Sweden; <sup>2</sup>Università degli Studi di Roma Tor Vergata, Italy**14: A New Detection Method of Sevoflurane Utilizing Cataluminescence of Gamma-AI2O3 Activated with Tb3+**T. Okabayashi<sup>1</sup>, M. Ozaki<sup>2</sup>, M. Nakagawa<sup>2</sup><sup>1</sup>Chiba Institute of Science, Japan; <sup>2</sup>Okayama University of Science, Japan

## Wednesday, September 8: Poster Session C3

### 15: Modeling Vapor Detection in a Micro Ion Mobility Spectrometer for Security Applications

R. Cumeras, I. Gràcia, E. Figueras, L. Fonseca, J. Santander, M. Salleras, C. Calaza, N. Sabaté, C. Cané  
*Instituto de Microelectrónica de Barcelona-CNM-CSIC, Spain*

### 16: Detection of Carbon Monoxide with a Metalloporphyrin Film on Quartz Microbalance and Love Wave Device

V. Blondeau-Patissier<sup>1</sup>, M. Vanotti<sup>1</sup>, R. Paolesse<sup>4</sup>, J. Friedt<sup>3</sup>, S. Ballandras<sup>2</sup>  
<sup>1</sup>FEMTO-ST Institute, France; <sup>2</sup>FEMTO-ST Institute and Sensor, France; <sup>3</sup>Sensor, France; <sup>4</sup>Università degli Studi di Roma Tor Vergata, Italy

### 17: PHEMA Functionalized Gold Nanoparticle Films for Vapor Sensing

J. Tang<sup>2</sup>, E. Skotadis<sup>2</sup>, V. Tsouti<sup>1</sup>, D. Tsoukalas<sup>2</sup>  
<sup>1</sup>Institute of Microelectronics, NCSR Demokritos, Greece; <sup>2</sup>National Technical University of Athens, Greece

### 18: Microsystem in LTCC Technology for Measurements of Gas Concentration in a Sub-PPM Range

T. Pisarkiewicz<sup>1</sup>, W. Maziarz<sup>1</sup>, A. Rydosz<sup>1</sup>, J. Mueller<sup>2</sup>, M. Mach<sup>2</sup>  
<sup>1</sup>AGH University of Science and Technology, Poland; <sup>2</sup>Technische Universität Ilmenau, Germany

### 19: Temperature Compensated NDIR CH<sub>4</sub> Gas Sensor with Focused Beam Structure

J. Park<sup>1</sup>, S. Yi<sup>2</sup>  
<sup>1</sup>ALT Semicon LTD., Korea, South; <sup>2</sup>Chungju National University IMRE, Singapore

### 20: Graphene Based Chemical Sensor Fabrication by Means of Focused Ion Beam

T. Polichetti, M. Miglietta, I. Nasti, V. La Ferrara, E. Massera, G. Di Francia  
*ENEA, Italy*

### 21: Laser-Spectroscopic, Ultra Low Volume and Low Level Carbon Monoxide Sensor

A. Hangauer<sup>3</sup>, J. Chen<sup>3</sup>, R. Strzoda<sup>1</sup>, M. Fleischer<sup>1</sup>, M. Amann<sup>2</sup>  
<sup>1</sup>Siemens AG, Germany; <sup>2</sup>Technische Universität München, Germany; <sup>3</sup>Technische Universität München & Siemens AG, Germany

### 22: Application of the QCM in Lead Acid Batteries Electrolyte Measurements

A. Cao-Paz, L. Rodríguez-Pardo, J. Fariña  
*Universidad de Vigo, Spain*

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#### C3P-F Modeling & theory

Time: 14:00 - 15:30  
Room: Poster Area 2 (Boards 25 - 38)  
Chairs: S. Rupitsch and S. van den Driesche

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### 25: Electro-Thermal Simulation and Characterization of Preconcentration Membranes

R. Inglés<sup>3</sup>, J. Pallares<sup>3</sup>, I. Gràcia<sup>1</sup>, A. Gué<sup>2</sup>, J. Ramirez<sup>3</sup>  
<sup>1</sup>Instituto de Microelectrónica de Barcelona-CNM-CSIC, Spain; <sup>2</sup>LAAS-CNRS, France; <sup>3</sup>Universitat Rovira i Virgili, Spain

### 26: Forcefields Based Molecular Modeling on the Mechanical and Physical Properties of Emeraldine Base Polyaniline

X. Chen<sup>1</sup>, C. Yuan<sup>2</sup>, C. Wong<sup>1</sup>, K. Zhang<sup>3</sup>  
<sup>1</sup>Delft University of Technology, Netherlands; <sup>2</sup>Delft University of Technology / TNO IenT, Netherlands; <sup>3</sup>Philips Lighting, Netherlands

### 27: Surface Bound Adsorption in a Microfluidic T-Sensor: Numerical Comparison and Optimization of 2D and 3D Models

R. Winz, W. Wiechert, E. von Lieres  
*Research Center Jülich, Institute of Biotechnology 2, Germany*

### 28: Development of High Frequency Annular Array with a Novel Structure for Medical Imaging

Y. Qian, N. Harris  
*University of Southampton, United Kingdom*

### 29: Ferromagnetic Hysteresis Modeling for Sensor and Actuator Applications

W. Baumgartinger<sup>2</sup>, M. Kaltenbacher<sup>1</sup>, M. Jungwirth<sup>2</sup>  
<sup>1</sup>Alps-Adriatic University Klagenfurt, Austria; <sup>2</sup>University of Applied Science Wels, Austria

### 30: Tailoring 2D Phononic Crystal Sensor Properties by Lattice Symmetry Reduction

M. Zubtsov, R. Lucklum  
*Otto-von-Guericke-Universität Magdeburg, Germany*

## Wednesday, September 8: Poster Session C3

### 31: RTD Fluxgate Behavioral Model for Circuit Simulation

B. Andò<sup>2</sup>, S. Baglio<sup>2</sup>, A. Bulsara<sup>1</sup>, S. La Malfa<sup>2</sup>  
<sup>1</sup>SPAWAR, United States; <sup>2</sup>Università di Catania, Italy

### 32: A Study of Prediction of Static Fracture Strength of MEMS Structure for Strength Design Scheme

K. Nagayoshi<sup>1</sup>, J. Gaspar<sup>2</sup>, O. Paul<sup>2</sup>, H. Izumi<sup>1</sup>, S. Kamiya<sup>1</sup>  
<sup>1</sup>Nagoya Institute of Technology, Japan; <sup>2</sup>Universität Freiburg, Germany

### 33: The Effect of Thermoelastic Damping on the Total Q-Factor of State-of-the-Art MEMS Gyroscopes with Complex Beam-Like Suspensions

T. Künzig<sup>2</sup>, M. Niessner<sup>2</sup>, G. Wachutka<sup>2</sup>, G. Schrag<sup>2</sup>, H. Hammer<sup>1</sup>  
<sup>1</sup>SensorDynamics AG, Austria; <sup>2</sup>Technische Universität München, Germany

### 34: Silicon Nanophotonic Components for an Integrated Refractometric Sensor Array

P. Muellner<sup>2</sup>, R. Bruck<sup>2</sup>, R. Hainberger<sup>2</sup>, M. Karl<sup>1</sup>, M. Baus<sup>1</sup>, T. Wahlbrink<sup>1</sup>  
<sup>1</sup>AMO GmbH, Germany; <sup>2</sup>Austrian Institute of Technology GmbH, Austria

### 35: New Compensation Technique for the Soft Tissue Stiffness Measurements Using Two Sensor Probes Configuration

A. Fath El Bab<sup>1</sup>, K. Sugano<sup>2</sup>, T. Tsuchiya<sup>2</sup>, O. Tabata<sup>2</sup>, M. Eltaib<sup>3</sup>, M. Sallam<sup>1</sup>  
<sup>1</sup>Assiut University, Egypt; <sup>2</sup>Kyoto University, Japan; <sup>3</sup>Qassim University, Saudi Arabia

### 36: Geometrical Aspects of Dielectric Charging

D. Elata  
Technion - Israel Institute of Technology, Israel

### 37: Finite Element Analysis of Piezoelectric Microgenerator - Towards Optimal Configuration

R. Dauksevicius<sup>2</sup>, G. Kulvietis<sup>2</sup>, V. Ostasevicius<sup>1</sup>, I. Milasauskaite<sup>1</sup>  
<sup>1</sup>Kaunas University of Technology, Lithuania; <sup>2</sup>Vilnius Gediminas Technical University, Lithuania

### 38: Shear Wave Sensors for Viscoelastic Properties

E. Reichel<sup>2</sup>, J. Vermant<sup>2</sup>, B. Jakoby<sup>1</sup>, C. Kirschhock<sup>2</sup>  
<sup>1</sup>Johannes Kepler Universität, Austria; <sup>2</sup>Katholieke Universiteit Leuven, Belgium

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#### C3P-G Microfluidics & labs-on-a-chip

Time: 14:00 - 15:30  
Room: Poster Area 3 (Boards 49 - 57)  
Chairs: S. Rupitsch and S. van den Driesche

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### 49: A Mobile Device for Screening the Cytomegalovirus at the Newborn's Bed

T. Mangeat<sup>3</sup>, J. Guerrini<sup>5</sup>, H. Benalia<sup>3</sup>, C. Pieralli<sup>3</sup>, A. Rouleau<sup>3</sup>, W. Boireau<sup>2</sup>, A. Coaquette<sup>1</sup>, G. Herbein<sup>1</sup>, C. Davrinche<sup>4</sup>, L. Pazart<sup>5</sup>, B. Wacogne<sup>3</sup>  
<sup>1</sup>Besançon University Hospital, France; <sup>2</sup>Clinic-Innovation Proteomic Platform, FEMTO-ST Institute, France; <sup>3</sup>FEMTO-ST Institute, France; <sup>4</sup>INSERM U 563, Paul Sabatier University, France; <sup>5</sup>INSERM-CIT 808, Besançon University Hospital, France

### 50: GMI Magnetic-Particle Concentration Detection in Continuous Flow

A. Garcia-Arribas<sup>2</sup>, F. Martinez<sup>1</sup>, E. Fernandez<sup>2</sup>, I. Ozaeta<sup>1</sup>, G. Kurlyandskaya<sup>2</sup>, A. Svalov<sup>2</sup>, J. Berganzo<sup>1</sup>, J. Barandiaran<sup>2</sup>  
<sup>1</sup>Ikerlan-IK4, Spain; <sup>2</sup>Universidad del Pais Vasco, Spain

### 51: Modelling and Evaluation of a Thermal Microfluidic Sensor Fabricated on Plastic Substrate

G. Patsis<sup>2</sup>, A. Petropoulos<sup>1</sup>, G. Kaltsas<sup>2</sup>  
<sup>1</sup>NCSR Demokritos - IMEL, Greece; <sup>2</sup>TEI of Athens, Greece

### 52: Microfluidic System for Cell Fusion

M. Grabowski, A. Buchenauer, A. El Hasni, T. Klockenbring, S. Barth, W. Mokwa, U. Schnakenberg  
RWTH Aachen University, Germany

### 53: In-Depth Imaging of Dielectrophoresis by Digital in-Line Holographic Microscopy

M. Haapalainen, V. Kaikkonen, A. Mäkynen  
University of Oulu, Finland

### 54: Microfluidic Device for Refractive Index Measurement of Fluid Sample

S. Yoon, S. Yang  
Gwangju Institute of Science and Technology, Korea, South

## Wednesday, September 8: Poster Session C3

### 55: Micromachined Gas Calibration Sources Based on Nanometric Depth

#### Microchannels

S. Zampolli<sup>2</sup>, I. Elmi<sup>2</sup>, F. Mancarella<sup>2</sup>, M. Messina<sup>2</sup>, G. Marra<sup>2</sup>, E. Cozzani<sup>2</sup>, M. Belluce<sup>1</sup>, F. Tamarri<sup>2</sup>, M. Sanmartin<sup>2</sup>, G. Cardinali<sup>2</sup>, M. Severi<sup>1</sup>

<sup>1</sup>CNR - IMM Bologna, Italy; <sup>2</sup>IMM-CNR, Italy

### 56: Characterization of a Vertical Lamination Micromixer for IR Spectroscopy

W. Buchegger<sup>2</sup>, M. Kraft<sup>1</sup>, M. Vellekoop<sup>2</sup>

<sup>1</sup>Carinthian Tech Research AG, Austria; <sup>2</sup>Technische Universität Wien, Austria

### 57: Integration of Holographic Sensors Into Microfluidics for the Real-Time pH Sensing of *L. casei* Metabolism

L. Bell, A. Seshia, C. Davidson, C. Lowe

University of Cambridge, United Kingdom

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### C3P-H Physical sensors, actuators & MEMS

Time: 14:00 - 15:30

Room: Poster Area 4 (Boards 61 - 96)

Chairs: S. Rüpitsch and S. van den Driesche

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### 61: Thermal Analysis of a Ag/Ti Based Microheater

T. Guan, R. Puers

Katholieke Universiteit Leuven, Belgium

### 62: High-Q CMOS MEMS Resonator Oscillator Fabricated in a MPW Batch Process

S. Tseng<sup>2</sup>, M. Lu<sup>2</sup>, Y. Hung<sup>1</sup>, Y. Juang<sup>1</sup>

<sup>1</sup>Chip Implementation Center, Taiwan; <sup>2</sup>National Tsing Hua University, Taiwan

### 63: CMOS-Integrated Sensor Chip for in-Plane and Out-of-Plane Shear Stress

P. Gieschke, O. Paul

Universität Freiburg, Germany

### 64: Field Effect Transistor Based on Protons As Charge Carriers

J. Matovic<sup>2</sup>, N. Adamovic<sup>2</sup>, Z. Jaksic<sup>1</sup>, U. Schmid<sup>2</sup>

<sup>1</sup>IHTM - Belgrade University, Serbia; <sup>2</sup>Technische Universität Wien, Austria

### 65: Two - Way SMA Actuators for Space Application: Performances and Reliability

J. Matovic<sup>2</sup>, K. Reichenberger<sup>1</sup>

<sup>1</sup>Magna Steyr, Austria; <sup>2</sup>Technische Universität Wien, Austria

### 66: Piezo-Hall Characterization of Integrated Hall Sensors Using a Four-Point Bending Bridge

M. Herrmann, P. Ruther, O. Paul

Universität Freiburg, Germany

### 67: Liquid RF MEMS Variable Inductor

I. Elgmati<sup>1</sup>, P. Calmon<sup>1</sup>, A. Boukabache<sup>1</sup>, P. Pons<sup>1</sup>, H. Boussetta<sup>2</sup>, A. Kallala<sup>2</sup>, K. Besbes<sup>2</sup>

<sup>1</sup>LAAS-CNRS, France; <sup>2</sup>Microelectronics and Instrumentations Laboratory, Tunisia

### 68: Integrated GMR Angle Sensor for Electrical Commutated Motors Including Features for Safety Critical Applications

W. Granig, M. Weinberger, C. Reidl, M. Bresch, M. Strasser, G. Pircher

Infineon Technologies Austria AG, Austria

### 69: Influence of Process Route on Membrane Profile and Q-Factor of an Acoustic Resonator Sensor

N. Staack, A. Flewitt

Cambridge University, United Kingdom

### 70: In-Plane and Out-of-Plane MEMS Motion Sensors Based on Fringe Capacitances

A. Tocchio<sup>1</sup>, G. Langfelder<sup>1</sup>, A. Longoni<sup>1</sup>, E. Lasalandra<sup>2</sup>

<sup>1</sup>Politecnico di Milano, Italy; <sup>2</sup>ST Microelectronics, Italy

### 71: Micromachined Pressure Sensor Based on Sapphire for High Temperature Applications

S. Fricke<sup>3</sup>, A. Friedberger<sup>1</sup>, H. Seidel<sup>3</sup>, U. Schmid<sup>2</sup>

<sup>1</sup>EADS Deutschland GmbH, Germany; <sup>2</sup>Technische Universität Wien, Austria; <sup>3</sup>Universität des Saarlandes, Germany

### 72: Magnetic Flux Leakage Measurement Setup for Defect Detection

J. Atzlesberger, B. Zagar

Johannes Kepler Universität, Austria

## Wednesday, September 8: Poster Session C3

### 73: AlGaIn/GaN C-HEMT Structures for Dynamic Stress Detection

G. Vanko<sup>2</sup>, M. Držák<sup>1</sup>, M. Vallo<sup>2</sup>, T. Lalinský<sup>2</sup>, V. Kutis<sup>3</sup>, S. Stancík<sup>3</sup>, I. Rýger<sup>2</sup>, I. Kostic<sup>2</sup>  
<sup>1</sup>International Laser Center, Slovakia; <sup>2</sup>Slovak Academy of Sciences, Slovakia; <sup>3</sup>Slovak University of Technology, Slovakia

### 74: A Nickel Electrostatic Curved Beam Actuator for Valve Applications

D. Petrov<sup>2</sup>, W. Lang<sup>2</sup>, W. Benecke<sup>1</sup>  
<sup>1</sup>Fraunhofer ISIT, Germany; <sup>2</sup>Universität Bremen, Germany

### 75: Miniature Flow-Through Resonator Cell for Density and Viscosity Sensing

F. Lucklum<sup>1</sup>, E. Reichel<sup>2</sup>, B. Jakoby<sup>1</sup>  
<sup>1</sup>Johannes Kepler Universität, Austria; <sup>2</sup>Katholieke Universiteit Leuven, Belgium

### 76: Computational Study of NEMS Diaphragm Sensor Using Triple Nano-Ring Resonator

B. Li, C. Lee  
National University of Singapore, Singapore

### 77: Overload-Resistant Pressure Sensors in the Nominal Range of 10 mbar (1 kPa)

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### 78: Strain Sensing on Steel Surfaces Using Vacuum Packaged MEMS Resonators

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### 79: Limits of a Single Active Transistor-Based Amplifier Designed for Co-Integrated M-NEMS/CMOS Oscillator Purposes

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### 80: Investigation on Suspended Gate Field Effect Transistor As Humidity Sensor

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### 81: Simple Inductively Coupled Resonance Sensor for ECG and Heart Rate Monitoring

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### 82: GaAs 3-Axis Coriolis Vibrating Micro Rate Gyro: Concept and Preliminary Characterization

I. Roland<sup>1</sup>, S. Masson<sup>1</sup>, O. Ducloux<sup>1</sup>, O. Le Traon<sup>1</sup>, A. Bosseboeuf<sup>2</sup>  
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### 83: A Novel Tuneable Band-Pass Filter Based on a Single Square-Ring MEMS Resonator

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### 84: A10MHz Micromechanical Lamé-Mode Bulk Oscillator Operating in Nonlinear Region

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### 85: Mechanically Coupled Bulk-Mode Dual Resonator Mass Sensor

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### 86: A Double Membrane Sensor for Liquid Viscosity Facilitating Measurements in a Large Frequency Range

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### 87: A Novel Low Cost Spring-Less RF MEMS Switch Prototype

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### 88: A PVDF-Based Flexible Cardiorespiratory Sensor with Independently Optimized Sensitivity to Heartbeat and Respiration

Y. Jiang<sup>1</sup>, H. Hamada<sup>1</sup>, S. Shiono<sup>2</sup>, K. Kanda<sup>2</sup>, T. Fujita<sup>2</sup>, K. Higuchi<sup>1</sup>, K. Maenaka<sup>2</sup>  
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### 89: A Novel Fluid Dynamic Inline Viscometer Suitable for Harsh Process Conditions

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### 90: Optical Velocimetry in Cryogenic Two-Phase Flows

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### 91: Binary Gas Sensor Based on Acoustic Cavity Resonator

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### 92: Design of a Novel Closed-Loop SOI MEMS Resonant Electrostatic Field Sensor

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### 93: A Non-Linear Resonator for Sensing Applications

C. Deng<sup>2</sup>, R. Turnbull<sup>2</sup>, C. Anthony<sup>1</sup>, M. Ward<sup>1</sup>, S. Collins<sup>2</sup>

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### 94: Design and Experiment of a Laterally Driven Micromachined Resonant Pressure Sensor for Barometers

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### 95: Quality Factor Enhancement in AlN-Actuated MEMS by Velocity Feedback Loop

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### 96: 2.2 MHz Piezoresistive MEMS Oscillator Operating in Air

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