



**7th International Conference on Sensors
and Electronic Instrumentation Advances**

&

3rd IFSA Frequency & Time Conference

Conference Programme

**22-24 September 2021
Palma de Mallorca, Mallorca
(Balearic Islands), Spain**

Organized by:



Message from Chairman

On behalf the Organizing Committee we would like to welcome you to the 7th *International Conference on Sensors and Electronic Instrumentation Advances (SEIA' 2021)* and 3rd *IFSA Frequency & Time Conference (IFTC' 2021)*, in Palma de Mallorca (Balearic Islands), Spain. This conference umbrella is a forum for presentation, discussion, exchange of information and latest research and development results in both theoretical and experimental research in appropriate areas. It brings together researchers, developers, and practitioners from diverse fields including international scientists and engineers from academia, research institutes, and companies to present and discuss the latest results in the field of sensors and measurements. The first SEIA conference was held in Dubai (UAE), 21-22 November 2015; the second – in Barcelona (Spain), 22-23 September 2016; the third – in Moscow (Russia), 20-22 September 2017, the fourth - in Amsterdam (The Netherlands), 19-21 September 2018, the fifth – in Canary Islands (Tenerife, Spain), 25-27 September 2020 and the sixth – in Porto (Portugal), 23-25 September 2021. Similar to the previous conference SEIA' 2020 the current conference SEIA' 2021 will be also in a hybrid format. Along with Regular, Poster and Special Session with in-person presentation, some live streams sessions with presentation in Zoom will be organized.

Next to all the technical subjects, a major function of this series of events lies in the opportunities for meeting colleagues. This aspect of our IFSA events has always been giving high marks and we continue to pay much attention to it. Coffee breaks, welcome cocktail reception, Gala Dinner are the best opportunity for social contacts.

Both conferences are organized by the *International Frequency Sensor Association (IFSA)* - one of the major professional association serving for the sensor industry and academy more than 20 years, in technical cooperation with the IFSA Group company: *IFSA Publishing S.L.* (Spain), and media partners: open access journals *MDPI Sensors* (ISSN 1424-8220), *MDPI Chemosensors* (ISSN 2227-9040), *MDPI Biosensors* (ISSN 2079-6374), and journal *Soft Measurements and Computing* (ISSN 2618-9976).

We trust that you will find the SEIA' 2021 and IFTC' 2021 conferences professionally rewarding and stimulating as well as enjoyable. Welcome to SEIA' 2021 and IFTC' 2021 !

Prof., Dr. Sergey Y. Yurish
SEIA' 2021 & IFTC' 2021 Chairman

Conference Venue

The Conference will take place on 22-24 September 2021 in the *Melia Palma Marina* hotel, conference room *Melia Meeting 9*.

Registration

The Registration Desk is open in the *Melia Palma Marina* event hotel:

- Tuesday, 21 September, from 20:00-21:30 (in the Welcome Cocktail area)
- Wednesday, 22 September, from 8:45-18:00 (near the room *Melia Meeting 9*)
- Thursday, 23 September, from 8:45-18:00 (near the room *Melia Meeting 9*)
- Friday, 24 September, from 8:45-12:00 (near the room *Melia Meeting 9*)

Language

The official language of the Conference is English. There will be no simultaneous interpretation.

Insurance and Liability

The conference organizers do not accept responsibility for any individual, medical, travel or personal insurance policies as necessary.

Conference Identification Tag

The Organizing Committee request that you wear your identification tag (badge) at all times during the conference. Your conference identification tag will serve as your admission to all conference paper presentation sessions.

Coffee/Tea Refreshment

Coffee/tea will be served at the times indicated in the programme.

Special Issues of journals

Selected papers from both conferences will be published in special issues of open access *Sensors & Transducers* journal (ISSN: 2306-8515, e-ISSN 1726-5479) in both: print and electronic formats; MDPI *Chemosensors* journal (ISSN 2227-9040), electronic format, or in MDPI *Biosensors* (ISSN 2079-6374), electronic format. All authors of selected papers will be invited after the conference by the Chairman to submit their extended papers into the appropriate journals.

'Advances in Sensors: Reviews' Book Series

The limited number of full-page papers published in the *Sensors & Transducers* journal will be selected by the journal's Editorial Board to extend into book chapters for the '*Advances in Sensors: Reviews*', Book Series, Vol. 8. This open

access book volume will be published in 2022. The first seven volumes published in 2012-2019 have accepted by all Sensors Community with a great enthusiasm.

Organizing Committee

Chairmen

Prof., Dr. Sergey Y. Yurish (*IFSA, Spain*)
Dr. Daneshmand Malayeri, Amin (*Asia-SAME, UAE*)

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Conference and Publication Manager

Mrs. Tetyana Zakharchenko (*IFSA Publishing, S.L., Spain*)

Welcome Cocktail

21 September 2021, Tuesday (20:00-21:30). The Welcome Cocktail will take place in the *Melia Palma Marina* hotel on the terrace. Do not miss this opportunity to say the first "hello" to attendees and committee members.

Please do not forget to collect your badge (ID tag) at the registration desk before the Welcome Cocktail. The registration desk will be opened in the *Melia Palma Marina* hotel's cocktail area from 20:00 to 21:30.

Gala Dinner

23 September 2021, Thursday (20:00-23:00). The Gala Dinner will take place in the *Melia Palma Marina* event hotel, conference room Melia Meeting M8.

Travel Measures in Spain due to COVID-19

The current requirements and rules for travelling in Spain are available at

<https://reopen.europa.eu/en>

Hygienic and Health Safety in the Event Hotel

In order to minimize the risk of infection with the spread of COVID-19, the Hotel has implemented protocols and policies in compliance with the recommendations of the health authorities and the obligations of applicable legislation, all in accordance with the program "Stay safe with Meliá "certified by Bureau Veritas. The Customer can find all the details of our COVID-19 policies and protocols by following this link: <http://www.melia.com/staysafewithmelia>

Nevertheless the foregoing, given the characteristics of COVID-19, the implementation and monitoring of the measures and protocols indicated by the Hotel, cannot be considered a total guarantee of protection against any contagion or spread of COVID-19. This is why, the Customer, also assumes the obligation to comply with the applicable legislation and recommendations regarding social distancing rules, use of masks, hygiene and any other that has been established into that effect by the competent authorities. The Customer is also liable to inform to those attending the booked event of the individual obligation of each of them in this regard.

If during the booked event, due to the conduct or behaviour of the attendees against the recommendations and applicable legislation in relation to the COVID-19, the Hotel considers that this endangers the health of the workers of the Hotel or other of clients of the Hotel, may adopt the necessary measures for the cessation of said conduct or behaviour, and may even proceed to the suspension of the booked event and without the Client having the right to receive any compensation for said concept.

Conferences' web sites:

<http://www.seia-conference.com>

&

<http://www.iftc-conference.com>

Keynote Speakers



Prof., Dr. Sergey Y. Yurish
*International Frequency Sensor Association
(IFSA), Barcelona, Spain*

Artificial Intelligence-Enabled Smart Sensors and Systems: How to Make it Smarter ?

Abstract

Today more and more companies are manufacturing smart sensors with embedded machine learning processing. However, such smart sensors require much higher level of integration. The presence of plenty of analog components in such sensors such as operation amplifiers, analog filters, voltage and current references, ADC, etc. significantly decreases the level of integration and increase the power consumption at low voltage power supply, especially at standard CMOS technological processes below 90 nm. In order to increase the level of integration, it was proposed to use frequency output sensing elements together with advanced frequency-to-digital converter (pure digital component), based on the novel, patented method of frequency-to-digital conversion. Such design approach allows to eliminate the complex analog blocks such as signal condition circuit and ADC, improve the metrological performances and significantly increase the level of integration.

Short Biography:

Dr. Sergey Y. Yurish is a president of *International Frequency Sensor Association (IFSA)* – one of the major professional association serving for sensor industry and academy more than 20 years. Dr. Yurish is a founder of three companies. He is editor-in-chief of international peer-reviewed journal *Sensors & Transducers* and editor of open access multivolume Book Series on 'Advances in Sensors: Reviews', 'Advances in Biosensors: Reviews' and 'Advances in Measurements and Instrumentation: Reviews' He has published more than 180 articles and papers in international peer reviewed journals and conference proceedings. Sergey Yurish holds 9 patents and is an author and co-author of 12 books. He delivered more than 90 speeches, tutorials and keynotes presentations at industries, peer institutions, and professional conferences in over 30 countries.



Prof., Dr. Carolyn Ren
University of Waterloo, Canada

Microwave Sensing for Microfluidic Platforms Towards Environmental, Pharmaceutical and Biomedical Applications

Abstract

Microfluidics presents tremendous potential to integrate multiple chemical or biological assays that are usually performed using different facilities at traditional laboratories, into one single platform by leveraging the continuous flow nature. Sensing is one of the key components required in typical microfluidic systems. Although optical sensing provides direct visualization of the fluids, electrical sensing offers unique advantages as an excellent alternative. Major advantages include fast response, possibility to sense a larger area than a typical field of view of microscopic imaging and suitability for point-of-care applications. Among the commonly used electrical sensing methods, microwave sensing is unique in the sense that it can also simultaneously heat the material. In this talk, I will introduce our work in microwave sensing towards water and wastewater quality control, drug compound screening and disease diagnosis.

Short Biography:

Dr. Ren received her PhD in Mechanical Engineering at the University of Toronto. She is currently a professor of Mechanical and Mechatronics Engineering at the University of Waterloo (UW) and is directing Waterloo Microfluidics Laboratory focusing on advancing fundamental knowledge of microfluidics and developing Lab-on-a-Chip technologies which have significant impact on a wide range of applications such as material synthesis, protein separation, and water quality sensing. Dr. Ren has received several awards from the engineering and research community, including: the prestigious Canada Research Chair in Droplet Microfluidics and Lab-on-a-Chip Technology from 2009 – 2019 election as a Member of the College of New Scholars, Scientists and Artists of Royal Society of Canada in 2018, being recognized as one of 20 leading female innovators in Women of Innovation (Dr. Ren is a co-founder of four start-up companies) in 2017, appointment as Fellow of the Canadian Society of Mechanical Engineering in 2014.



Prof., Dr. Arkady Zhukov
University of the Basque Country,
Spain

Giant Magnetoimpedance Effect of Magnetically Soft Microwires for Sensor Applications

Abstract

Studies of Giant magnetoimpedance, GMI effect have attracted considerable attention in the last few years owing to its suitability for sensor applications. The origin of the GMI effect is interpreted in terms of the skin effect of a magnetic conductor, assuming the dependence of the penetration depth of an AC current flowing through a soft magnetic conductor on the DC applied magnetic field. The extremely high sensitivity of the GMI effect even to weak magnetic fields has generated great interest for development of cost-effective, high-performance magnetic sensors. The recent trend towards miniaturization of devices has stimulated the development of thin (a few micrometers in diameter) magnetically soft amorphous microwires. In this paper we present our recent experimental results on influence of preparation and processing conditions on magnetic properties and GMI effect of Fe- and Fe-Co based glass-coated microwires. Excellent soft magnetic properties and GMI ratio up to 650 % have been obtained in properly processed low magnetostrictive Co-rich microwires. Although less expensive Fe-rich microwires exhibit rather high magnetostriction coefficient and consequently quite low GMI effect, magnetic softness and GMI effect can be substantially improved by appropriate processing. In both Fe and Co-rich microwires the maximum GMI ratio is observed for frequencies above 100 MHz.

Short Biography:

Dr. Zhukov received Ph.D. degree from the Institute of Solid State Physics (Chernogolovka) of the Russian Academy of Science, Doctor of Science (habilitation) in Moscow State 'Lomonosov' University. Present employment: Ikerbasque Research professor at the University of Basque Country, Spain. He has published more than 600 referred papers in the international journals, 4 books and more than 20 book chapters (total citations number 9541, Citation H-index 54(WOS)/ 12421 and H=61 (Google scholar)). A. Zhukov chaired international conferences, gave a number of plenary, keynote and invited talks. He is an associate Editor of *IEEE Magnetic Letters* and *International Journal on Smart Sensing and Intelligent Systems*.



Prof., Dr. Svetlana Prokopchina
*Financial University under the Government
of the Russian Federation, Moscow, Russia*

Soft Sensors on the Basis of Bayesian Intelligent Technologies

Abstract

The relevance of creating soft sensors for a wide range of practical tasks is confirmed by examples of their use in various fields of activity. The most important issue in this case is the development of an effective methodology for their creation, focused on the functioning of sensors in real practical conditions, most often accompanied by significant information uncertainty. The presentation notes that not enough attention is paid to the development of the theory of the construction of electronic sensors, as well as their metrological support by developers. As a methodology for creating soft sensors for conditions of information uncertainty, it is proposed in the presentation a methodology of the regularizing Bayesian approach and technologies based on it. The effectiveness of the proposed approach is confirmed by the practice of its application for the creation of soft sensors, examples of which are given.

Short Biography

Dr. Svetlana Prokopchina is a professor of Moscow State University and Financial University of Government of Russian Federation. She is an academician of the International Academy of Informatization, International Academy of Ecology and Life Safety Sciences, International metrological Academy, Russian ecological Academy, International Academy of information processes and technologies. Since 2001 Dr. Prokopchina is a member of the Board of Directors of 'ROSNEFTEGAZSTROY'. She is a president of the interregional scientific public Association «Scientists for ecology» (since 1992). Dr. Prokopchina is the author of about 250 scientific papers and 11 monographs. She was awarded with state awards, has the gratitude of the Ministry of science and education of the Russian Federation. She is an international expert of the UNECE Energy Commission on information systems, energy and natural resources. Since 1998 she has co-chaired the annual International conference on *Soft Computing and Measurement (SCM)*. Since 2017 Dr. Prokopchina is the editor-in-chief of the scientific journal '*Soft Measurements and Computing*'. Since 1990 she has been managing various international and Russian projects on complex management systems.



Prof., Dr. Omar Elmazria
*Université de Lorraine – CNRS, Nancy,
France*

Surface Acoustic Waves Devices as Magnetic Field Sensors: State-of-the-Art, Trends and Potential Applications

Abstract

Interest in the development of sensors for the detection of magnetic field has never stopped growing, given the wide range of applications that can be addressed. Recent developments in the field of the IoT, the industry 4.0 and autonomous vehicles have generated new needs and in particular for wireless magnetic sensors with small size, lightweight, compactness, and lower power consumption or even self-powered (batteryless). Current researches focus on devices that can take advantage from MEMS technology to scale down the sensors. Surface acoustic wave (SAW) devices, are key components in communication systems and are widely used as filters, delay lines or resonators and are still relevant for the development of 5G compatible technologies or beyond. Because SAW devices are highly sensitive to external physical parameters and to any disturbance that may affect the velocity, distance travel or even the mode of wave propagation, they also offer very promising solutions as sensors in a wide range of applications including magnetic field detection. SAW sensors have the advantage of being robust, small, passive, wireless and even packageless in specific configurations. In reflective delay line (R-DL) configuration, they can integrate the identification code and operate as an RFID which allows simultaneous interrogation of several sensors. Combined with magneto-strictive layer, SAW sensor could exhibits a controlled sensitivity to magnetic field intensity and direction. In this presentation, an overview of general principle of the Magnetic SAW sensor (MSAW) in wired and wireless configurations and developments needed to implement this technology will be given. A review of recent works including from our group will be presented by positioning them with respect to the state of the art. The sensitivities, detection limits and range of detection will be specified for each structure and configuration considered. Finally, and depending on MSAW performances, examples of potential applications (existing or new ones) will be proposed and analyzed together with a future outlook of what MSAW technology can bring.

Brief Biography

Omar Elmazria is a Full Professor at Université de Lorraine, Nancy, France within Institut Jean Lamour (IJL UMR CNRS 7198) for research and Polytech Nancy for teaching. He is an emeritus member of the IUF (Institut Universitaire de France) and was guest Professor at several Universities around the world (SFU, Canada IoA, Chinees Academy of Sciences UCF, USA). Omar Elmazria is the head of Micro and Nano-systems group within the Institut Jan Lamour and his current research focuses on SAW devices for communication systems and sensing applications. He is the author and co-author of 5 patents and more than 200 technical papers in the refereed international journal. He is member of Technical Program Committee of several international conferences including: IEEE IUS group 4 (Microacoustics – SAW, FBAR & MEMS) IEEE MTT-26-RFID-Wireless-Sensor-and-IoT IEEE ICEMI (Co-chair from 2005) SAW Symposium IFTC from 2019. He is also co-founder of IEEE Sensors France Chapter in 2018 and member of the board of IEEE Sensors France Chapter. In 2017, he was a recipient of the URSI-France medal from the International Union of Radio Science.

Sponsors and Media Partners:



Programme at Glance

Time/Date	22.09.2021 Wednesday	23.09.2021 Thursday	24.09.2021 Friday
	<i>Melia Meeting 9 Conference Room</i>		
8:45-9:00	Registration	Registration	Registration
9:00-9:15	* Opening Session	* Daily Notices	* Daily Notices
9:15-10:00	Keynote Speaker I Sergey Y. Yurish, <i>International Frequency Sensor Association (IFSA), Spain</i>	Keynote Speaker III Arkady Zhukov, <i>University of the Basque Country, Spain</i>	Keynote Speaker V Omar Elmazria, <i>Université de Lorraine – CNRS, Nancy, France</i>
10:00-10:30	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>
10:30-12:30	Regular Session <i>Sensor Instrumentation & Measurements</i>	Regular Session <i>Optical & Fiber Optical Sensors</i>	Regular Session <i>Frequency & Time</i>
12:30-13:30	<i>Lunch on your own</i>	<i>Lunch on your own</i>	<i>Lunch on your own</i>
13:30-15:30	Regular Session <i>Chemical & Biosensors I</i>	Regular Session <i>Sensor Applications I</i>	Virtual Session <i>Sensor Applications II (in Zoom)</i>
15:30-16:00	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Poster Session & Farewell Cocktail (15:30-16:30)</i>
16:00-16:45	Keynote Speaker II Carolyn Ren, <i>University of Waterloo, Canada (in Zoom)</i>	Keynote Speaker III Svetlana Prokopchina <i>Financial University, Moscow, Russia (in Zoom)</i>	
16:45-18:00	Virtual Session <i>Chemical & Biosensors II (in Zoom)</i>	Special Session <i>on Soft Sensors & Measurements (in Zoom)</i>	-
18:00-20:00	-	-	-
20:00-23:00	-	<i>Gala Dinner</i>	-

* Must attend sessions.

Technical Conference Programme

Day 1

22 September 2021, Wednesday

Regular Session: Sensor Instrumentation & Measurements

(Melia Meeting 9 Conference Room):

Chairman: Prof. Dr. Arkady Zhukov
University of the Basque Country, Spain

- 1. A review of energy consumption measurement systems with applications in wireless sensor networks**
Filip Barišić (*Croatia*)
- 2. Comfort prognosis by microclimate simulation and measurement**
Bernhard Kurz and Christoph Russ (*Germany*)
- 3. Strain measurement within thin fibers based on subjective laser speckle patterns**
Alexander Spaett, Ricardo Gridling and Bernhard G. Zagar (*Austria*)
- 4. A small-scale extensometer for precise strain measurements of thin fibres with millinewton resolution**
Ricardo Gridling, Alexander Spaett and Bernhard Zagar (*Austria*)
- 5. Detecting drifts and offsets in environmental monitoring** (video)
Goncalo Jesus, Anabela Oliveira and Antonio Casimiro (*Portugal*)
- 6. 3-D measurement of abdomen by Moiré analysis and its use for abnormal respiratory conditions by deep learning** (video)
Yuki Mochizuki and Norio Tagawa (*Japan*)
- 7. Optimization of environmental sensors placement in geophysical research**
Anton Sokolov, Khaoula Karroum, Hervé Delbarre, Yann Ben Maissa and Mohamed Elhaziti (*France, Morocco*)

Regular Session: Chemical & Biosensors I

(Melia Meeting 9 Conference Room):

Chairman: Prof., Dr. Sebastian Zlotnik
Military University of Technology, Poland

1. Optimization of impedance based microsensors for biological analysis

Julien Claudel, Rémi Bettenfeld, Djilali Kourtiche and Mustapha Nadi
(France)

2. Stochastic sensors for the molecular recognition and determination of heregulin- α in biological samples

Catalina Negut, Raluca Ioana Stefan van Staden, Sebastian Gheorghe and Marius Badulescu *(Romania)*

3. Enantioanalysis – a step forward for early detection of gastric cancer

Raluca-Ioana Stefan-van Staden, Ruxandra Maria Ilie-Mihai and Damaris Cristina Gheorghe *(Romania)*

4. THz sensor array of multi sensor system for thin subsurface layer analysis

Janez Trontelj, Andrej Švigelj and Domen Višnar *(Slovenia)*

5. Role of cobalt in Co-ZnO nanoflower gas sensors for the detection of low concentration VOCs

Yifan Luo, Ahmadou Ly, Driss Lahem, Chao Zhang and Marc Debliquy *(Belgium, China)*

6. Study of the Prospects for the Use of Ionic Liquids and Non-Aqueous Salt Solutions for Low-Temperature Operation of Serial Electrochemical Geophysical Sensors

Ivan Egorov, Dmitry Zaitsev and Vadim Agafonov *(Russia)*

Virtual Session: Chemical & Biosensors II (in Zoom):

Chairman: Prof., Dr. Sergey Y. Yurish

International Frequency Sensor Association (IFSA), Barcelona, Spain

- 1. A Highly sensitive silver film based surface enhanced fluorescence imaging sensor**
Zhiyou Wang and Maojin Wang (*China*)
- 2. Quantification of double strand methylated DNA, using rGO and AuNPs decorated screen printed electrode**
Mina Safarzadeh and Genhua Pan (*UK*)
- 3. The application of gas sensor with biohydroxyapatite to study the volatile profile of nasal secretion**
Tatiana Kuchmenko, Ruslan Umarchanov, Anastasiia Shuba, Dariya Menzhulina and Anton Chernitskiy (*Russia*)
- 4. Basic study on blood coagulation measurement in an extracorporeal circulation circuit by LED photoacoustic method using an extracorporeal circulation device (video)**
Takahiro Wabe, Ryo Suzuki, Akimitsu Fujii, Yohsuke Uchida and Yasutaka Uchida (*Japan*)
- 5. Electrical properties measurement of Graphene-based composites using an Open-ended Coaxial Probe Technique (video)**
Hind Bakli, Mohamed Moualhi and Mourad Makhlouf (*Algeria*)

Day 2
23 September 2021, Thursday

Regular Session: Optical & Fiber Optical Sensors
(Melia Meeting 9 Conference Room):

Chairman: Prof., Dr. Bernhard Kurz
Hochschule München, Germany

- 1. Preparation and characterization of β -Ga₂O₃-based photo-detectors for UV detection applications**
Halima Ghorbel and Luc Damé *(France)*
- 2. Fiber-optic Mach-Zehnder interferometer for refractive index measurement based on MEMS optofluidic platform**
Zoran Djinović, Agnes Kocsis and Miloš Tomić *(Austria, Serbia)*
- 3. Numerical studies of a side-hole optical fiber with modified geometry as a refractive index sensor**
Michał Dudek, Kinga Köllő, Paweł Marć and Leszek Jaroszewicz *(Poland)*
- 4. Filter-free measurements of carbonaceous particles using photoacoustic spectroscopy (PAS) operating at 880 nm (video)**
Goufrane Abichou, Soulemane H. Ngagine, Tong N. Ba, Gaoxuan Wang, Pascal Flament, Karine Deboudt, Sébastien Dusanter, Alexandre Tomas, Markus W. Sigrist and Weidong Chen *(France, Switzerland)*
- 5. Fiber-optic rotational seismograph as adequate device for recording rotational components caused by artificial events**
Lessen Jaroszewicz, Anna Kurzych, Michał Dudek and Paweł Marć *(Poland)*

Regular Session: Sensor Applications I

(Melia Meeting 9 Conference Room):

Chairman: Prof., Dr. Omar Elmazria,
Université de Lorraine – CNRS, Nancy, France

1. **Potential of dual energy X-ray transmission on food safety**
Christine Bauer, Rebecca Wagner and Johannes Leisner (*Germany*)
2. **Remote sensing of greenhouse gases in the atmospheric column using laser heterodyne radiometers (LHR)** (video)
Weidong Chen (*France*)
3. **Delay impact in the stability of the digital GMI sensor operating in closed-loop** (video)
Papa Silly Traoré, Mamaye Inès Corrêa and Cheikh Ahmadou Bamba Mbodji (*Senegal*)
4. **Regressing relative fine-grained change for sub-groups in unreliable heterogeneous data through deep multi-task metric learning** (video)
Niall O' Mahony, Sean Campbell, Lenka Krpalkova, Joseph Walsh and Daniel Riordan (*Ireland*)
5. **Facile and electrically reliable electroplated gold contacts to p-type InAsSb bulk-like epilayers**
Sebastian Zlotnik, Jarosław Wróbel, Jacek Boguski, Małgorzata Nyga, Marek Kojdecki and Jerzy Wróbel (*Poland*)
6. **Comparison between RGB images and Munsell Color Sheets to determine the status of different grass species during the leaf flushing** (video)
Pedro V. Mauri, Lorena Parra, Salima Yousfi, Barbara Stefanutti, Jaime Lloret and Jose F. Marín (*Spain*)
7. **Technology and corporate social responsibility: from “Sustainable Indicators” to “Sustainable Technology”**
Vojko Potocan and Sonja Treven (*Slovenia*)

Special Session: Soft Sensors and Measurements
(*in Zoom*):

Chairman: Prof., Dr. Svetlana Prokopchina
*Financial University under the Government of the Russian Federation,
Moscow, Russia*

- 1. Methods and measurement tools based on smart sensors**
S. S. Sergeev, M. D. Krysanov and S. V. Prokopchina (*Russia*)
- 2. Digital models of smart distributed measuring systems**
Vladimir V. Alekseev, Natalia V. Orlova, Anastasia A. Minina
(*Russia*)
- 3. Cognitive measurements and fuzzy reasoning in monitoring and decision support system for bridge maintenance**
Sergei Koltunov and Maria Koroleva (*Russia*)
- 4. Two-phase flow measurement based on wavelet cross-correlation of photonic density meter signals**
Galina Malykhina, Dmitry Tarkhov and Lotfi Zarour (*Russia*)

Day 3
24 September 2021, Friday

IFTC Session: Frequency & Time
(*Melia Meeting 9 Conference Room*):

Chairman: Prof., Dr. Sergey Y. Yurish

International Frequency Sensor Association (IFSA), Barcelona, Spain

- 1. A new 3,5 picosecond multi-channel combined universal frequency counter & time interval analyzer in a benchtop format**
Staffan Johansson (*Sweden*)
- 2. A novel measurement method of phase noise based on the digital linear phase comparison approach** (video)
Wei Zhou, Huifang Liu, Bayi Qu (*China*)
- 3. Equivalent phase allocation method based on spaceless frequency measurement** (video)
Wenhao Zhang, Miao Miao, Hong Zhu and Yubo Xin (*China*)
- 4. Investigation of the Eigen frequency of a cantilever microbeam immersed in a fluid under the piezoelectric effect** (video)
Victory Elias and Georges Nassar (*France*)
- 5. Research on the relationship between phase synchronization degree and frequency stability in atomic clock circuit** (video)
Feng Nana, Miao Miao, Zhou Wei and Li Zhiqi (*China*)
- 6. Clock laser stabilisation for deployable strontium Optical Clocks** (in Zoom)
Qiushuo Sun, Alok Singh, Jonathan Jones, Markus Gellesch, Kai Bongs and Yeshpal Singh (*UK*)
- 7. Fidelity of different GNSS in time transfer** (video)
Gihan G. Hamza (*Egypt*)
- 8. Smart interpreter for the common generic GNSS time transfer standard data files** (video)
Gihan G. Hamza (*Egypt*)

9. **Attenuation of acoustic waves in langasite crystals** (video)
Farkhad Akhmedzhanov, Temur Mustafaeu and Jamoliddin Nazarov
(*Uzbekistan*)
10. **Anisotropy of effective photoelastic constants in lithium niobate crystals** (video)
Farkhad Akhmedzhanov, Ulugbek Abdirakhmonov and Vladimir Avdievich
(*Uzbekistan*)

Virtual Session: Sensor Applications II (in Zoom):

Chairman: Prof., Dr. Sergey Y. Yurish
(*International Frequency Sensor Association (IFSA), Barcelona, Spain*)

1. **Intelligent sensor network components for home monitoring of vital parameters**
Ulrich Fischer-Hirchert, Jens-Uwe Just and Fabian Theuerkauf
(*Germany*)
2. **Gravitational search algorithm-based multi-hop routing scheme for energy efficient heterogeneous clustered scheme** (video)
Tanvi Sood and Kanika Sharma (*India*)
3. **Static calibration and dynamic verification of a 3-axis accelerometer using the method of variable projection**
Elliot Lang, Mathias Rollett, Ernst Theussl and Paul O'Leary
(*Austria*)
4. **Expanded-beam fiber-optic connector based on ball lenses**
Vladimir Shapar, Volodymyr Lysenko and Alla Savchuk (*Ukraine*)
5. **Multilayer amorphous lead oxide-based X-ray detector**
Oleksandr Grynko, Emma Pineau, Tristen Thibault, Giovanni DeCrescenzo and Alla Reznik (*Canada*)

Poster Session (*Melia Meeting 9* Conference Room):
24 September 2021 (15:50-16:30)

- 1. Performances and calibrations of new disruptive UVC sensors for new space applications**
Imene Sidi Boumeddine, Faustine Bouyssou, Luc Damé, Halima Ghorbel, Xavier Arrateig, Mustapha Meftah, Pierre Gilbert and Pierre Maso (*France*)
- 2. Temperature sensing with erbium-doped multi-component tellurite glasses**
Roman Yatskiy (*Czech Republic*)
- 3. Differential Eddy Current sensor probe development for solder joint inspection of photovoltaic modules**
Martin Lenzhofer, Lukas Neumaier and Juergen Kosel (*Austria*)
- 4. Novel sensing technique for non-destructive composites monitoring**
Valentina Zhukova, Paula Corte-Leon, Alexandra Allue, Koldo Gondra, Mihail Ipatov, Juan Maria Blanco, Julian Gonzalez and Arcady Zhukov (*Spain*)
- 5. Assessing the sensitivity of site index models developed using repeated airborne laser scanning data to height metrics and plot size**
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