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Belgrade, Serbia



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# The 20th Symposium on Condensed Matter Physics

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## BOOK OF ABSTRACTS

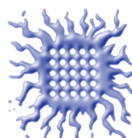
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Ministry of Education, Science and  
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*The 20th Symposium on Condensed Matter Physics - SFKM 2019, Belgrade - Serbia*

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## **XX SYMPOSIUM ON CONDENSED MATTER PHYSICS SFKM 2019**

*Conference presentations cover full range of research topics within the experimental, theoretical and computational condensed matter physics, including but not limited to the following:*

**Semiconductor physics.** Electronic structure, Quantum dots and wires, Photonic crystals, High magnetic fields phenomena, Ultra-fast phenomena.

**Surface, interface and low-dimensional physics.** Graphene, Carbon and other nanotubes, Topological insulators, Complex oxide interfaces, Transport in nanostructures.

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**Phase transitions, phase ordering and structural ordering of condensed matter.** Equilibrium and dynamic phenomena, Ferroelectricity, Multiferroics, Quasi-Crystals, Crystal surface morphology and dynamics, Crystal growth.

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**Statistical physics of complex systems.** Networks and other structures.

**Conference venue:**

Serbian Academy of Sciences and Arts, Knez Mihailova 35, Belgrade

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## **LIST OF INVITED SPEAKERS**

- Marco Aprili, PS-CNRS Université Paris-Sud, France
- Stefano Baroni, Scuola Internazionale Superiore di Studi Avanzati, Italy
- Wolfgang Belzig, University of Konstanz, Germany
- Emil Božin, Brookhaven National Laboratory, USA
- Harald Brune, Ecole Polytechnique Fédérale de Lausanne, Switzerland
- Liviu Chioncel, University of Augsburg, Germany
- Gyula Eres, Oak Ridge National Laboratory, USA
- Laszlo Forro, Ecole Polytechnique Fédérale de Lausanne, Switzerland
- Rudolf Gross, Walther Meissner Institute, Germany
- Rudi Hackl, Walther Meissner Institute, Germany,
- Igor Herbut, Simon Fraser University, Canada
- Kurt Hingerl, Johannes Kepler University, Linz, Austria
- Liv Hornekaer, Aarhus University, Denmark
- Zoran Ikonić, University of Leeds, UK
- Vladimir Juričić, Nordita, KTH Royal Institute of Technology and Stockholm University, Sweden
- Milos Knezevic, Berlin Institute of Technology, Germany
- Hechang Lei, Renmin University
- Marjana Ležaić, Forschungszentrum Jülich, Germany
- Zoran Mišković, University of Waterloo, Canada
- Francois Peeters, University of Antwerp, Belgium
- Axel Pelster, Technical University of Kaiserslautern, Germany
- Maria Peressi, University of Trieste, Italy
- Cedomir Petrovic, Brookhaven National Laboratory, USA
- Hyejin Ryu, Korea Institute of Science and Technology
- Milan Radović, Paul Scherrer Institute, Switzerland
- Nicolas Regnault, Ecole Normale Supérieure Paris, France
- Rastko Sknepnek, University of Dundee, UK
- Frank Steglich, MPICPFS Dresden and Zhejiang University
- Bosiljka Tadić, Jožef Štefan Institute, Slovenia
- Jack Tuszynski, University of Alberta, Canada
- Dieter Vollhardt, University of Augsburg, Germany
- Rok Zitko, Jožef Štefan Institute, Slovenia
- Qingming Zhang, Lanzhou University and Institute of Physics, Chinese Academy of Sciences

# **Computationally intelligent estimation of properties for polymer microphone diaphragms by photoacoustic measurement**

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**Abstract.** This paper presents the application of artificial neural networks for fast and precise characterization of electret microphones with polymer transducer (diaphragm) by photoacoustic measurements. The model consists of two neural networks: the first one for the classification of the microphone type and the second one for the determination of the detector parameters, related to its electronic and geometric features as well as to piezoelectric transducer properties. Obtained prediction has been used for estimation of polymer diaphragms properties by employment of Helmholtz model for sound propagation in small volumes.

Keywords: photoacoustic, artificial neural networks, microphone

## **REFERENCES**

<sup>1</sup> Aleksić, S.M., Markushev, D.K., Pantić, D.S., Rabasović, M.D., Markushev, D.D., Todorović, D.M.: Electro-acoustic influence of measuring system on the photoacoustic signal amplitude and phase in frequency domain. *Facta Universitatis* (2016). <https://doi.org/10.2298/FUPCT1601009A>

<sup>2</sup> Popović, M. et al., “Helmholtz Resonances in Photoacoustic Experiment with Laser-Sintered Polyamide Including Thermal Memory of Samples,” *Int. J. Thermophys.*, vol. 37, no. 12, pp. 1–9, 2016. <https://doi.org/10.1007/s10765-016-2124-3>