In organization of University of Sarajevo Faculty of Sciences and Mathematics, and within *Diaspora for Development* project of the Ministry for Human Rights and Refuges of Bosnia and Herzegovina and Government of Switzerland, in partnership with UNDPBiH and IOM BiH, we announce and invite you to attend the series of lectures by **Prof. Abdel F. Isakovic** (BSc University of Sarajevo '96, PhD University of Minnesota '03).

In addition to lectures, during this visit Prof. Isakovic will be available to undergraduate and graduate students to discuss their potential BSc/MSc theses, and to University of Sarajevo faculty about potential research collaborations.

P R O G R A M

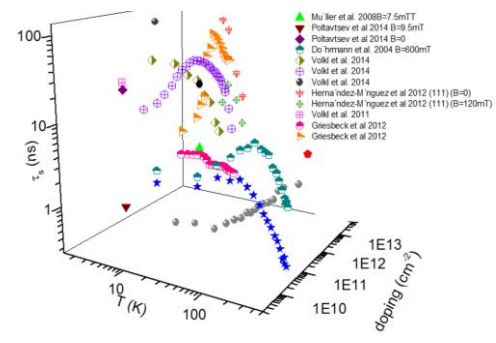
Wednesday, May 29th, (Department of Physics Library, 13:00 do 15:00h) → MEETINGS WITH STUDENTS AND FACULTY

We will discuss possible collaborations for the purpose of BSc/MSc theses and more advanced research projects.

Thursday, May 30th (ABG, 14:00h) Lecture and Workshop #1 → OPEN QUESTIONS IN MINIMAL ENERGY SPINTRONICS SYSTEMS

Minimal Energy Spintronics Systems are of considerable interest in *more-than-Moore* approaches to computing and in the development of Quantum Spintronics concepts. This workshop will be offered in two parts:

1. Review of basic concepts of both, semiconductor and metal-insulator spintronics, with focus on two main nanodevices, spin diodes and magnetic tunnel junctions. We will then focus on the present need to address open questions of interest to current computing technologies (energy for operation, memory optimization), as well as potential pathways for Quantum Spintronics.
2. A portion of the workshop will be dedicated to Open Quantum Systems, an area of research relevant to Quantum Spintronics and Computing.

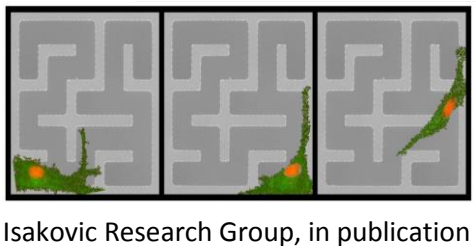


Spin relaxation in 2D QW system
Isakovic Research Group, in publication

Friday, May 31st (ABG, 11:00h) Workshop #2 → GEOMETRIC AND ELECTRICAL CONTROL OF THE DYNAMICS AND ELASTICITY OF BIOLOGICAL CELLS

There is an increased need for more efficient and reliable purification of cells in immunology and related areas of biomedical engineering research. In the first part of the workshop, we will present a new method for controllable electrical deformation of leukocytes with nanoparticles enhanced dielectrophoresis. In the second part of the workshop, we will discuss motility of the fibroblast cells on micropatterned substrates, where some surprising results point towards self-organization of the cell dynamics.

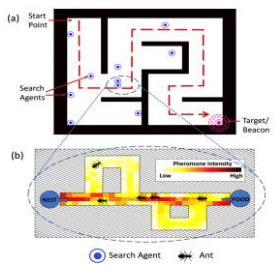
HFF cell navigating a maze and modifying its shape from lobopodial to ameoboid.



Isakovic Research Group, in publication

Friday, Jun 7th (ABG, 14:00h) Workshop #3 → BIO-INSPIRED OPTIMIZATION OF NETWORKS AND ROLE OF PHYSICS IN NETWORK ANALYSIS

Modern Wireless Sensor Networks and Internet of Things (IoT) require substantial optimization for energy efficient implementation. We will briefly cover some background on biologically inspired methods for optimization, and demonstrate how to implement these methods on specific examples. A portion of the workshop would be used to introduce physics and math majors and faculty into methods of network analysis based on some methods that stem from theoretical physics. Methods we intend to cover are Particle Swarm Optimization (PSO), Ant Colony Optimization (ACO) and Voronoi Tessellation.



Ant agents solving maze
Z. Husain *et al.*, ANTS 2018

Saturday, Jun 8th (ABG, 11:00h) Workshop #4 → RESEARCH GRANT PROPOSALS WRITING WORKSHOP

This workshop is motivated by the desire to help University of Sarajevo faculty members and graduate students to become more competitive in the area of grant proposal writing, with the focus on international standards and best practices. The topics of workshop will be of interest to a broad set of natural sciences, mathematics and engineering, but other disciplines are welcome to attend as well.

About the Guest Scientist The main themes of research in Prof. Isakovic Group are nanoscience, spintronics, bio-inspired complex systems and interactive education methods. He is affiliated with Physics Department at KUST (Khalifa University of Science and Technology, Abu Dhabi UAE), and Cornell University and Brookhaven National Lab. He has also contributed to build-up of KUST's Semiconductor Research Center and Biomedical Engineering Dept., and has led the effort to build KUST's Center for Nanocharacterization, US$ 3.5 mil research facility. The research methods utilized in his laboratory rely on a broad spectrum of nano-/microfabrication techniques and nanocharacterization methods, as well as computational work, such as DFT and bio-inspired computing.

Since 2010, he was awarded grants to the amount of US$1.2 mil. His research has led to over 50 refereed publications, more than 60 conference presentations, and more than 40 invited presentations. Prof. Isakovic has supervised a number of BSc/MSc/PhD students. His BSc/MSc graduates are now finalizing their PhDs at UC-Boulder, Univ. of Toronto, Univ. of Waterloo, Seoul Natl Univ and elsewhere, and he supervised 4 PhD students at KUST. He collaborates with colleagues from NYU-Abu Dhabi, Univ. College London, RMIT-Melbourne, Amsterdam, Cornell etc. He serves as a referee for a number of journals. In period Feb 2017 – Sep 2018, Prof. Isakovic served as Assoc. Dean for Research, and in summer 2018, as Acting Dean for CoAS at KUST.