6th IC4N 2019

Technical Program

SIXTH INTERNATIONAL CONFERENCE
FROM NANOPARTICLES AND NANOMATERIALS
TO NANO DEVICES AND NANOSYSTEMS

June 30 - July 3, 2019
Corfu Island, Greece

University of Texas at Arlington, University of Patras, Karlsruhe Institute of Technology, University of Science and Technology Beijing
## Tuesday, July 2, 2019

### 8:30 - 10:00  Keynote Lectures I & II Chairs: Vassilios Kapaklis, Krishnan Rajeshwar  
Hall: Kerkyra Ballroom  
8:30-9:15  Björgvin Hjörvarsson (Sweden)  
Uppsala University  
*Artificial Magnetic Atoms*  
9:15-10:00  Mercouri Kanatzidis (USA)  
Northwestern University  
*Chemistry and Devices from Halide Perovskites Semiconductors*  

### 10:00 - 10:30  Coffee Break (Conference Area Foyer)

### MORNING SESSION, 10:30-13:00

<table>
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| 10:30-11:00   | Lara Kühl Teles* (Brasil)  
Tailoring the Properties and Predicting the Energy Gap of 2D Materials: a View from First Principles  
Kuan Eng Johnson GOH* (Singapore)  
Using Artificial Intelligence and Computational Techniques to Assist the Engineering of 2D Materials  
Krishnan Rajeshwar* (USA)  
Fuel from the Sun: Where is that Pot of Gold?  
Stefano Bonetti* (Sweden)  
Terahertz Spin Dynamics in Metallic Thin Films  | Ryan Chiechi* (Netherlands)  
The Role of Self-Assembly in Switching Phenomena in Molecular Tunneling Junctions  
David Tiede* (USA)  
X-ray Characterization of Thin-Film Catalyst Structures Used in the Artificial Leaf and Dye-Sensitized Interfacial Charge Transfer  
Evangelos Papaioannou* (Germany)  
Spintronics and THz Radiation: Probing Ultrafast Spin and Charge Current Dynamics  | Ksenija Glusac* (USA)  
Biomimetic NADH Analogs for Photochemical CO2 Reduction  
Sebastian Wintz* (Switzerland)  
Topological Spin Textures as Spin Wave Emitters  | Yasser Shokr* (Germany)  
Steering of Magnetic Domain Walls by Single Ultrashort Laser Pulses  |
| 11:00-11:30   |                                             |                                                |                                                |                                                |
| 11:30-12:00   |                                             |                                                |                                                |                                                |
| 12:00-12:30   |                                             |                                                |                                                |                                                |
| 12:30-13:00   |                                             |                                                |                                                |                                                |

*INVITED LECTURE*
**AFtemoon Session, 15:30-19:30**

**15:30-16:00**
- **Fundamentals/Materials Genome FMG-5**
  - **Chair:** Charl Faul
  - **Hall:** Kerkýra
  - **Eli Kapon** (Switzerland)
    - Tailoring Quantum Dots and Photonic Crystals for Integrated Quantum Photonic Applications

**16:00-16:30**
- **Fundamentals/Materials Genome FMG-5**
  - **Chair:** Charlf Faul
  - **Hall:** Kerkýra
  - **Martin Beyer** (Austria)
    - Intrinsic Properties of Molybdenum Sulfide Clusters, The Key Constituents of a Potent HER Catalyst

**16:30-17:00**
- **Fundamentals/Materials Genome FMG-5**
  - **Chair:** Charl Faul
  - **Hall:** Kerkýra
  - **Stephan Reitzenstein** (Germany)
    - Deterministic Nanofabrication of Quantum-dot Based Single-photon Sources for Applications in Quantum Communication

**17:00-17:30** **Coffee Break (Conference Area Foyer)**

**17:30-18:00**
- **Fundamentals/Materials Genome FMG-5**
  - **Chair:** Charl Faul
  - **Hall:** Kerkýra
  - **Tomoya Ono** (Japan)
    - DFT Study on Carrier Transport in Electronic Devices

**18:00-18:30**
- **Functional Electroactive Materials & Nanostructures FEMN-1**
  - **Chair:** John Mangeri, Seungbum Hong
  - **Hall:** Kerkýra
  - **Seungbum Hong** (S. Korea)
    - Materials Imaging Initiative: A New Paradigm for Functional Materials

**18:30-19:00**
- **Functional Electroactive Materials & Nanostructures FEMN-1**
  - **Chair:** John Mangeri, Seungbum Hong
  - **Hall:** Kerkýra
  - **Jin He** (China)
    - A Physical Model for Nanoscale GaN Based HETMs

**19:00-19:30**
- **Functional Electroactive Materials & Nanostructures FEMN-1**
  - **Chair:** John Mangeri, Seungbum Hong
  - **Hall:** Kerkýra
  - **Jong Min Yuk** (S. Korea)
    - In-situ Graphene Liquid Cell Electron Microscopy

**19:30** **Social Hour (Open to all participants)**

**ENVIRONMENTAL APPLICATIONS AND IMPLICATIONS EAI-1**
- **Chair:** Athanasios Mitropoulos, Rami Rtimi
- **Hall:** Krokidis

**15:30-16:00**
- **Environmental Applications and Implications EAI-1**
  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Armin Kleibert** (Switzerland)
    - Enhanced and Metastable Magnetism Directly Probed in Individual Nanoparticles

**16:00-16:30**
- **Environmental Applications and Implications EAI-1**
  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Fabrice Wilhelm** (France)
    - Element-specific Characterization of Co:FePt Nanocomposite Magnet Films

**16:30-17:00**
- **Environmental Applications and Implications EAI-1**
  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Stefanos Mourdikoudis** (UK)
    - Dimpled SiO2 Nanostructures Decorated with Magnetic Iron Oxide Nanoparticles for As Detection and Removal in Aqueous Medium

**17:00-17:30** **Coffee Break (Conference Area Foyer)**

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- **Environmental Applications and Implications EAI-1**
  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Metamaterials**
    - Antennas for Nanoscale Applications
  - **Antonio García Martín** (Spain)
    - Anisotropic Thermal Magnetoresistance in Radiative Heat Transfer

**18:00-18:30**
- **Environmental Applications and Implications EAI-1**
  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Alexandre Dmitriev** (Sweden)
    - Magnetic, Chemical and Electrical Steering of Light at the Nanoscale

**18:30-19:00**
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  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Vassiliós Kapaklis** (Sweden)
    - Magnetic Metamaterials

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- **Environmental Applications and Implications EAI-1**
  - **Chair:** Athanasios Mitropoulos, Rami Rtimi
  - **Hall:** Krokidis
  - **Denys Makarov** (Germany)
    - Curvilinear Magnetism

**MAGNETISM AT THE NANOSCALE MNS-4**
- **Chair:** Evangelos Papaioannou
- **Hall:** Ithaca/Paxi

**15:30-16:00**
- **Magnetism at the Nanoscale MNS-4**
  - **Chair:** Evangelos Papaioannou
  - **Hall:** Ithaca/Paxi
  - **Armin Kleibert** (Switzerland)
    - Enhanced and Metastable Magnetism Directly Probed in Individual Nanoparticles

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  - **Chair:** Evangelos Papaioannou
  - **Hall:** Ithaca/Paxi
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    - Curvilinear Magnetism
THE EFFECT OF NANOBUBBLES ON HEAVY METAL IONS ADSORPTION BY ACTIVATED CARBON

George Z. Kyzas¹, Athanasios C. Mitropoulos¹,*

¹ Hephaestus Advanced Laboratory, Eastern Macedonia and Thrace Institute of Technology, GR-654 04 Kavala, Greece

* Corresponding author and presenter: amitrop@teiemt.gr

It is fact that apart from the adsorption capacity of each material used in wastewater treatment, another important factor is the optimum contact time. The shorter the adsorption time (until equilibrium) is, the more cost effective is the whole process. The whole process is conducted in aqueous phase, given that the wastewaters are in a water medium. Water decontamination is of high importance issue and many different technologies have been developed for this purpose. A promising one is the adsorption of pollutants (dyes, heavy metals, pharmaceutical compounds, phenols, etc.) onto porous materials. This wastewater treatment method is considered the most cost effective, especially when low cost adsorbents are selected. In this work, Nanobubbles (NBs) enriched deionized water is suggested for the investigation of heavy metal removal efficiency. Lead ions (Pb(II)) were selected as model pollutants. As model adsorbent material, activated carbon was synthesized using a novel source. Lignite (from Greek power industry) was supplied and after appropriate modifications was transformed to activated carbon with very high yield percentage (67%). The main scope of the present study is to examine how NBs affects the adsorption capacity or kinetics. The adsorption capacity of Pb(II) was found to be approximately similar either in the presence ($Q_{\text{max}} = 171 \text{ mg/g}$) or absence of NBs in water ($Q_{\text{max}} = 167 \text{ mg/g}$). On the contrary, the major effect of NBs was to accelerate the adsorption process by 366%. A mechanism was proposed too [1].

Fig. 1 Illustration of the effect of NBs on adsorption kinetics of Pb$^{2+}$ by activated carbon.


Acknowledgement: This research has been co-financed by the European Union and Greek national funds through the Operational Program Competitiveness, Entrepreneurship and Innovation, under the call RESEARCH – CREATE – INNOVATE (project code: T1EDK-02692, entitled: Nanoreinforced Concrete for Pavement Deicing).