



# The 4<sup>th</sup> International Workshop on Advanced Materials and Devices

10-13 August, Thai Nguyen, Vietnam

## PROGRAM AND ABSTRACTS

The 4<sup>th</sup> International Workshop on  
Advanced Materials and Devices  
IWAMD 2023

# Program and Abstracts

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## TABLE OF CONTENTS

TABLE OF CONTENTS .....	iii
ABOUT THE WORKSHOP .....	iv
General Information.....	iv
Publication.....	iv
Best Poster Award.....	iv
WORKSHOP ORGANIZATION.....	v
Organizers .....	v
Co-organizers .....	v
SPONSORS .....	vi
WORKSHOP COMMITTEE.....	vii
Chairmen .....	vii
International Advisory Committee .....	vii
Organizing Committee .....	vii
Program Committee.....	viii
Editors .....	viii
Secretariat .....	viii
INVITED SPEAKERS.....	ix
WORKSHOP VENUE.....	xi
WORKSHOP PLAN .....	xii
PROGRAM.....	1
Overall Program .....	3
Detailed Timelines for Parallel Sessions .....	7
Poster Presentations.....	25
ABSTRACTS .....	37
Note:.....	254
Note:.....	255
Note:.....	256

- 13:50 – 14:10 QMA-I5  
*Magnetic/gold nanocrescents like nano-heater and nano-probe*  
Xuan Hoa Vu, Thi Thu Ha Pham, Emmanuel Fort, Michael Levy, Tran Thu Trang, and Nguyen Van Dang  
Thai Nguyen University of Sciences, Vietnam
- 14:10 – 14:30 QMA-I6 (online)  
*Optimization and manipulation of quantum dot based single photon source for quantum applications*  
Gia Long Ngo, Jean-Pierre Hermier, and Ngoc Diep Lai  
LUMIN, ENS Paris-Saclay, Université Paris-Saclay, France
- 14:30 – 14:50 QMA-I7  
*Harnessing photonic bound states in the continuum for enhanced light-matter interactions in nanophotonics*  
Son Tung Ha, Mengfei Wu, Ramón Paniagua-Domínguez, Hai Son Nguyen, Cesare Soci, Hilmi Volkan Demir, and Arseniy I. Kuznetsov  
Institute of Materials Research and Engineering, Agency for Science, Technology and Research, Singapore
- 14:50 – 15:10 QMA-I8 (online)  
*Novel mechanisms for light-matter interaction using bound states in the continuum*  
Hai Son Nguyen<sup>1,2</sup>  
<sup>1</sup>Université de Lyon, Ecole Centrale de Lyon, CNRS, INSA Lyon, Université Claude Bernard Lyon 1, CPE Lyon, France; <sup>2</sup>Institut Universitaire de France (IUF), France

**BIN-2 Chairs: Trinh Chu Duc and Loi Tonthat**

- 13:30 – 13:55 BIN-K2  
*From microengineering to organ-on-a-chip: An Evolution of Biochip Technology*  
Loc Do Quang<sup>1</sup>, Hang Nguyen Thu<sup>2</sup>, Tung Bui Thanh<sup>2</sup>, and Trinh Chu Duc<sup>2</sup>  
<sup>1</sup> University of Science, Vietnam National University, Hanoi, Vietnam; <sup>2</sup> University of Engineering and Technology, Vietnam National University, Hanoi, Vietnam
- 13:55 – 14:15 BIN-I3  
*Multifunctional ultrasmall Au-Fe<sub>3</sub>O<sub>4</sub> nanoparticles for cancer therapy*  
Loi Tonthat  
Tohoku University, Japan
- 14:15 – 14:35 BIN-I4  
*3D-printing scaffolds with polycaprolactone/collagen/peptide enhance mouse mesenchymal stem vitality and bone regeneration*  
Van-Tinh Nguyen, Gun-Woo Oh, and Won-Kyo Jung  
VINMEC High-Tech Center, Vietnam
- 14:35 – 14:55 BIN-I5  
*SERS detection of phenol on CuO/Au core/shell nanowires*

Thi Ha Tran, Minh Phuong Le, Van Tan Tran, Quang Hoa Nguyen, Van Thanh Pham, Cong Doanh Sai, An Bang Ngac, Viet Tuyen Nguyen, and Nguyen Hai Pham

University of Science, Vietnam National University, Hanoi, Vietnam

14:55 – 15:10 BIN-O2

*Utilizing response surface methodology for optimizing quercetin loaded niosome by ethanol injection method*

Hien Minh Nguyen<sup>1,2</sup>, Nguyen Thien Han Le<sup>1,2</sup>, Tran Phuoc Tuan Nguyen<sup>1,2</sup>, Binh Minh Do<sup>1,2</sup>, Ngoc Trong Nghia Chau<sup>1,2</sup>, Tan Thi Pham<sup>2,3</sup>, and Minh Tri Le<sup>1,2</sup>

<sup>1</sup>School of Medicine, Vietnam National University Ho Chi Minh City, Vietnam;

<sup>2</sup>Vietnam National University Ho Chi Minh City (VNUHCM), Vietnam; <sup>3</sup>Ho Chi Minh City University of Technology (HCMUT), Ho Chi Minh City, Vietnam

**EMD-3 Chairs: Nguyen Quang Chinh and Susumu Horita**

13:30 – 13:55 EMD-K3

*Sustainable Graphene production, ink formulations and printing advanced chemoresistive sensing devices*

Tran T. Tung, Kamrul Hassan, Anh Tuan Tran, Ramesh K, Ehab Mohamed A. E. Salih, and Dusan Losic

School of Chemical Engineering, The University of Adelaide, South Australia

13:55 – 14:15 EMD-I5

*Ultrafine-grained metals: Their advantages in the use of micro-devices and description of grain size strengthening by a modified Hall-Petch equation*

Nguyen Quang Chinh

Eötvös Loránd University, Budapest, Hungary

14:15 – 14:35 EMD-I6

*Creating, reading, and deleting Skyrmions in a magnetic tunnel junction*

Shaohai Chen

Institute of Materials Research & Engineering, Agency for Science, Technology & Research (A\*STAR), Singapore

14:35 – 14:55 EMD-I7

*Effect of ammonia gas in annealing process on reduction of residual OH-bonds and improvement of electrical properties of low-temperature silicon oxide films*

Susumu Horita

Japan Advanced Institute of Science and Technology, Japan

14:55 – 15:10 EMD-O3

*A first principles analysis on the effects of AGNR passivation towards adsorption of Hydrogen atoms*

Kyle Alfred Paz, Al Rey Villagrancia, and Melanie David

De La Salle University, Philippines

**EMD-4 Chairs: Peng Song and Shin-Ichiro Kuroki**

13:30 – 13:50 EMD-I8

*SiC CMOS integrated circuits and image sensors for extreme environment applications*

Van Son<sup>1</sup>, Dinh Khanh Manh<sup>1</sup>, Nguyen Thi Yen Lan<sup>1</sup>, Ngo Duy Minh<sup>1</sup>,  
Do Xuan Hai<sup>2</sup>, Than Thi Trang Uyen<sup>3</sup>, Hoang Thi My Nhung<sup>1</sup>, and  
Nguyen Hoang Nam<sup>1</sup>

<sup>1</sup>VNU University of Science, Vietnam; <sup>2</sup>Vietnam Military Medical University,  
Vietnam; <sup>3</sup>Vinmec Hightech Center, Vinmec, Vietnam

09:35 – 09:50 BIN-O5

*A novel nanoemulsion in ethanol-water solution using Trisodium citrate as emulsifying agent: formation and application in Si-QD/SiO<sub>2</sub> and NiFe<sub>2</sub>O<sub>4</sub>/SiO<sub>2</sub> core-shell structure synthesis*

Phi Thi Huong<sup>1</sup>, Hoang V. Huy<sup>1</sup>, Doan H. Anh<sup>2</sup>, Nguyen H. Nam<sup>1</sup>, Tran T. Hong<sup>3</sup>, and Luu M. Quynh<sup>2</sup>

<sup>1</sup>Nano and Energy Center, VNU University of Science, Hanoi, Vietnam; <sup>2</sup>Faculty of Physics, VNU University of Science, Hanoi, Vietnam; <sup>3</sup>Faculty of Environmental Sciences, VNU University of Science, Hanoi, Vietnam

09:50 – 10:05 BIN-O6

*Understanding mechanism of photo-induced enhanced Raman scattering on ZnO/Au nanorods*

Van Tan Tran, Minh Phuong Le, Quang Hoa Nguyen, Van Thanh Pham, Cong Doanh Sai, Nguyen Hai Pham, Viet Tuyen Nguyen, Thi Ha Tran, and An Bang Ngac

University of Science, Vietnam National University, Hanoi, Vietnam

10:05 – 10:20 BIN-O7

*Investigation of the remineralization ability of biphasic calcium phosphate in artificial saliva*

Nhi-Thao Ngoc Dang<sup>1,2</sup> and Thi-Hiep Nguyen<sup>1,2</sup>

<sup>1</sup>International University, Vietnam; <sup>2</sup>Vietnam National University, Ho Chi Minh City, Vietnam

**EMD-7 Chairs: Takehito Nakano and Ivan Škorvánek**

08:30 – 08:50 EMD-I16

*Non-volatile multi-state switching of magnetisation states induced by electric-field-driven in an micropatterned multiferroics*

Do Thi Huong Giang, Vu Nguyen Thuc, Ho Anh Tam, Nguyen Van Tuan, Nguyen Thi Ngoc, Van-Hai Dinh, Le Van Lich, and Nguyen Huu Duc  
VNU University of Engineering and Technology, Vietnam National University, Hanoi, Vietnam

08:50 – 09:10 EMD-I17

*Neutron diffraction studies on s- and p-electron magnets*

Takehito Nakano

Ibaraki University, Japan

09:10 – 09:30 EMD-I18

*Ultra-rapidly annealed Ni-rich nanocrystalline Fe-Ni-Nb-B alloys with excellent magnetic softness*

Ivan Škorvánek<sup>1</sup>, Jozef Marcin<sup>1</sup>, Branislav Kunca<sup>1</sup>, and Peter Švec<sup>2</sup>

<sup>1</sup>Institute of Experimental Physics, Slovak Academy of Sciences, Slovakia;

<sup>2</sup>Institute of Physics, Slovak Academy of Sciences, Slovakia

09:30 – 09:45 EMD-O9

*Exploration of transition metal oxides-based analog memristors with self-rectifying characteristics for artificial synaptic applications*

## SERS detection of phenol on CuO/Au core/shell nanowires

Thi Ha Tran, Minh Phuong Le, Van Tan Tran, Quang Hoa Nguyen, Van Thanh Pham, Cong Doanh Sai, An Bang Ngac, Viet Tuyen Nguyen\*, and Nguyen Hai Pham  
Vietnam National University, University of Science, Hanoi, Vietnam  
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Phenol, which is a stable and toxic chemical substance widely used in industry, is very harmful to human health with both acute and chronic effects. Due to the danger of phenol, EPA has set a limit of 1 µg/l of phenol in water for safety guidance. Detection of phenol at trace concentration is challenging even for advanced techniques such as HPLC, MS... In this research, we suggest using CuO/Au core/shell nanowires as sensitive surface enhanced Raman scattering platforms to quickly detect phenol at extremely diluted concentration. The prepared SERS substrates based on CuO/Au nanowires can detect phenol at concentration as low as  $10^{-7}$  M. The results showed that the enhancement of Raman signal of phenol by CuO/Au nanowires is a promising technique for quick detection of phenol in civilian water.

**Keywords:** CuO nanowires, core/shell structures, sputtering, surface enhanced Raman scattering (SERS).