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ARAB-GERMAN
YOUNG ACADEMY
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Arab-German Online Summer School

Materials for Energy and Quantum Technology

organized by the
**Arab-German Young Academy of Sciences and Humanities
(AGYA)**

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16 – 20 October 2021

Online

Central European Summer Time

AGYA Project Partners



Dr. Mahmoud Abdel-Hafiez
Uppsala University, Sweden
Goethe University Frankfurt, Germany



Dr. Mohammed Alkatan
The Public Authority for Applied
Education and Training, Kuwait

In cooperation with



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**Day 1** **Saturday, 16 October 2021**09:30 – 09:45 **Onboarding & Online Registration Welcome & Get-Together Activities**09:45 – 10:30 **Words of Welcome****Dr. Mahmoud Abdel-Hafiez***AGYA Member, Uppsala University, Sweden & Goethe University Frankfurt, Germany***Prof. Dr. Mahmoud M. Sakr***President, Academy of Scientific Research and Technology (ASRT), Egypt***Prof. Ahmed El-Gohary***President, Egypt-Japan University of Science and Technology (E-JUST), Egypt***Dr. Mohammed Alkatan***AGYA Member, The Public Authority for Applied Education and Training, Kuwait***Introduction of AGYA****Dr. Maha Nasr***AGYA Co-President, Ain Shams University, Egypt***Introduction of EYAS****Prof. Dr. Ahmed El-Guindy***AGYA Alumnus, EYAS Executive Member, Cairo University, Egypt***Chair: Dr. Mahmoud Abdel-Hafiez***AGYA Member, Uppsala University, Sweden & Goethe University Frankfurt, Germany*10:30 – 10:45 **Networking & Break**10:45 – 12:00 **Public Keynote Speech I****Theory of Materials, What Can Be Calculated and What Can't**[> Live Link](#)**Prof. Dr. Olle Eriksson***Uppsala University, Sweden***Chair: Prof. Dr. Lalla E. Drissi***AGYA Alumna, Mohammed IV University, Morocco*12:00 – 13:00 **Lunch Break**13:00 – 13:15 **Researcher's Session 1****Borophene and Pristine Graphene Nanosheets: A Comparative Theoretical Study****Amna Mahmoud***Minya University, Egypt*



13:15 – 13:30 **Theoretical and Experimental Investigation of the Feasibility of the Hybridization of Multi-Junction Solar Cells**

Farouk Badr

Mansoura University, Egypt

13:30 – 13:50 **The Engineering of Energy Gaps of Nanostructured Films for Higher Efficiency of Photovoltaic Cells**

Prof. Dr. Esam Hamed Ahmed

Taibah University, Saudi Arabia

Chair: Dr. Lobna Said

AGYA member, Nile University, Egypt

13:50 – 14:10 **Networking & Break**

14:10 – 15:15 **Computational Modeling of 1D and 2D Materials for Energy Applications**

[> Live Link](#)

Prof. Dr. Ahmed Maarouf

Imam Abdulrahman Bin Faisal University, Saudi Arabia

Chair: Prof. Dr. Ahmed El-Gunidy

AGYA Alumnus, Cairo University, Egypt

15:15 – 15:30 **Ultrafast Magnetization Dynamics in Magnetic Alloys**

Mohamed Elhanoty

Uppsala University, Sweden

15:30 – 15:45 **BODIPY Scaffolds in Solar Cell**

Israa Taha

Mansoura University, Egypt

Day 2 | Sunday, 17 October 2021

09:30 – 10:15 **Public Keynote Speech 2**

Using Light to Study Matter from Synchrotron X-Rays

[> Live Link](#)

Dr. Dibya Phuyal

University of Cambridge, England

Chair: Dr. Ali El-Gayar

AGYA member, University of Benghazi, Libya

10:15 – 10:30 **Networking & Break**



Researcher's Session 2

10:30 – 10:45 **Crystal Growth, Characterization and Phase Transition of PbCuTe₂O₆ Single Crystals**

Abanoub Hanna

Helmholtz Berlin, Germany

10:45 – 11:00 **Investigation of the Vortex Lattice in NbS₂ - A Potential FFLO Candidate**

Ahmed Alshemi

Lund University, Sweden

11:00 – 11:15 **Ionotronic Memristors: Non-Volatile Doping Control by Electric Current**

Stefan Marinkovic

University of Liege, Belgium

11:15 – 11:30 **On the Potentiality of X-T-X₃ Compounds (T = C, Si, and Ge, and X = F, Cl, Br) as Tetrel- and Halogen-Bond Donors**

Nayra Moussa

Minya University, Egypt

Chair: Mohammed Hammam

Misr University for Science and Technology, Egypt

11:30 – 12:30 **Lunch Break**

12:30 – 13:15 **On-Chip Nonlinear Light Manipulation** [> Live Link](#)

Dr. Mahmoud Gaafar

German Electron Synchrotron DESY, Hamburg, Germany

Chair: Dr. Mahmoud Abdel-Hafiez

AGYA member, Uppsala University, Sweden & Goethe University Frankfurt, Germany

13:15 – 13:30 **Networking & Break**

13:30 – 14:20 **Public Keynote Speech 3**

Electromigration: From Pain to Gain [> Live Link](#)

Prof. Dr. Alejandro V. Silhanek

University of Liege, Belgium

14:20 – 15:30 **Digital Lab Tour & Video Documentation of Research Steps**

Dr. Mohamed Abdellah

Uppsala University, Sweden

Chair: Dr. Lobna Said

AGYA member, Nile University, Egypt

**Day 3 | Monday, 18 October 2021**

9:00 – 09:30

Current Research Activities at Qatar University**Prof. Dr. Mariam AlMaadeed***Qatar University Vice President for Research and Graduate Studies*

09:30 – 10:30

**Advanced Modelling of Materials for Clean Energy Applications:
Hydrogen Storage Materials and Next-Generation Batteries****Prof. Dr. Rajeev Ahuja***Director of the Indian Institute of Technology (Ropar), India***Chair: Dr. Mahmoud Abdel-Hafiez***AGYA member, Uppsala University, Sweden & Goethe University Frankfurt, Germany*

10:30 – 11:00

Networking & Break

11:00 – 11:15

Researcher's Session 3**Ferroelectric HfZrO Thin Films Deposited by Single Target Sputtering
for NVM and MEMS Applications****Mohammed Hachemi***Grenoble Alpes, France*

11:15 – 11:30

Disordered Rocksalt Cathode Materials for Li-ion Batteries**Mohamed Kamel***Fayoum University, Egypt*

11:30 – 11:45

Inkjet Printing for Flexible Chemical Gas Sensor Based on PEDOT: PSS/ MWCNT**Bassant Abdelaliam***Alexandria University, Egypt***Chair: Dr. M. Abdellah***Uppsala University, Sweden*

11:45 – 13:00

Lunch Break

13:00 – 14:00

Public Keynote Speech 3**Materials for electrochemical energy storage****Prof. Dr. Ruediger Klingeler***KIP, Heidelberg University, Germany***Chair: Dr. Mohamed Abdellah***Uppsala University, Sweden*



14:00 – 14:30

Networking & Break**Researcher's Session 4**

14:30 – 14:45

Solvents for Stable Tin Halide Perovskites**Mahmoud Mohamed***Helmholtz Berlin, Germany*

14:40 – 15:00

Ultrafast Dynamics of Terahertz Spintronic Emitters**Afnan Alostaz***Peter Grünberg Institute, Jülich, Germany***Chair: Dr. Mahmoud Abdel-Hafiez***AGYA member, Uppsala University, Sweden & Goethe University Frankfurt, Germany***Day 4 | Tuesday, 19 October 2021**

9:30 – 10:30

Public Keynote Speech 4**Modern Applications of Plasma Science and Engineering: An Industrial Perspective** [> Live Link](#)**Dr. Ali Abdou***Halliburton, Houston TX, USA***Chair: Dr. Abdelrahman Zakaria***Kyosho Institute, Fukuoka, Japan*

10:30 – 11:00

Networking & Break**Chair: Dr. Mohamed Abellah***Uppsala University, Sweden*

11:00 – 11:15

On Thermodynamics of Sr₂Ni(SeO₃)₂Cl₂ Spin-1 Chain**Ahmed ElGhandour***Heidelberg University, Germany*

11:15 – 11:30

Lanthanide Metals (Pr, In, Gd, and Nd)doped-Iron Selenide QDs 19 SC: Synthesis, Crystal Structure, Electric and Magnetic Properties**Nurhan Ghazal***Zewail City, Egypt*

11:30 – 11:45

Preparation and Characterization of Fe-based Superconductors: The Case of 11 System**Marwa Abdelhakam***Beni-Suef University, Egypt*



11:45 – 13:00

Lunch Break

13:00 – 13:45

Semiconductor Nanocrystals Synthesis and Applications in Optoelectronics: Perovskites and Current Challenges [> Live Link](#)**Dr. Yasser Hassen***Research Associate at the University of Oxford, UK***Chair: Dr. Abdelrahman Zakaria***Kyosho Institute, Fukuoka, Japan*

13:45 – 14:15

Networking & Break**Researcher's Session 5**

14:15 – 14:30

Manipulating the Magnetic Properties of 3D Transition Metals with RF-Sputtered Amorphous Carbon Thin Films**Shoug Alghamdi***Leeds University (UK), England*

14:30 – 14:45

Synthesis and Characterization of Nanocomposites-Based Ferrite for Energy Storage Applications**Hala Abdallah***Assiut University, Egypt*

14:30 – 15:00

Investigation of Aloe Vera Latex used as Natural Dye in TiO₂ based Heterojunction and Liquid-Electrolyte Dye Sensitized Solar Cells**Salma Hnawi***Cady Ayyad University, Jordan***Chair: Mohamed Hammam***MUST, Egypt***Day 5 | Wednesday, 20 October 2021**

9:00 – 10:00

SEM Imaging Basics Tips & Tricks [> Live Link](#)**Dr. Ramzy Abdelaziz***Aalto University, Finland*

10:00 – 10:45

Flexible Graphene from Production to Energy Related Applications: E-JUST Activity**Prof. Dr. Ahmed Abdelmonem***E-JUST, Egypt*

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10:45 – 11:15

How to Get a PhD Scholarship in Japan

Dr. Abdelrahman Zakaria

Kyosho Institute, Fukuoka, Japan

11:15 – 12:00

**Closing & Award Ceremony for Excellent Student's Contributions and
Wrap-Up: Ideas for Curriculum Development**

Chair: Dr. Mahmoud Abdel-Hafiez

AGYA member, Uppsala University, Sweden & Goethe University Frankfurt, Germany