

The 4th International Conference on Basic and Applied Science

Future Science: Efforts and Challenges



17 November, 2025

Al-Azhar Conference Center (ACC), Nasr City, Cairo, Egypt

Conference Chairman

Prof. Dr. Samia Abo Farha

Dean of Faculty of Science

Vice Conference Chairman

Prof. Dr. Mona A. Mohamed

Vice - Dean for Education
and Student Affairs

Vice Conference Chairman

Prof. Dr. Walla Ahmed Moselhy

Vice - Dean for Postgraduate
Studies and Research

Conference Chairman

Prof. Dr. Abeer A. Emam



The 4th International Conference of Basic and Applied Science

“Future Science: Efforts & Challenges”

(4th ICBAS 2025)

Welcome to ICBAS 2025, themed "Future Sciences: Efforts and Challenges" – where future sciences meet real-world challenges! This global scientific event brings together researchers to explore cutting-edge advances in basic and applied sciences. It addresses major challenges like climate change, sustainability, and digital transformation, while promoting innovation, international collaboration, and support for young researchers. The conference aims to foster knowledge exchange and strengthen ties between academia and industry to shape a science-driven future.

The ICBAS 2025 is coming in 4th edition. It will be held in Al-Azhar Conference Center (ACC), Nasr City, Cairo, Egypt, 17th Nov., 2025.

2

The 4th ICBAS (2025)

Conference Welcome Remarks



It is my great honor and privilege to welcome you all to the 4th International Conference on Basic and Applied Science (ICBAS 2025), held under the inspiring theme: “Future Science: Efforts and Challenges.”

On behalf of our faculty, I extend a warm welcome to distinguished researchers, scientists, academics, and students from around the world. Your presence here today reflects the global spirit of scientific inquiry and collaboration that is at the heart of this conference

This year’s theme, “Future Science: Efforts and Challenges,” reflects our shared vision and the ambition that drives our academic community. Today, we gather not only to present our innovations and discoveries but also to address the pressing questions and obstacles the scientific world faces. It is through our collective efforts and open dialogue that we can shape the next generation of breakthroughs.

May this conference be a catalyst for new ideas, meaningful partnerships, and lasting contributions to the global scientific community. I wish you all a successful, enriching experience and look forward to the ways in which your work will help shape the future of science

I extend my deepest gratitude to the organizing committee, our dedicated faculty, sponsors, and partners who have made this conference possible. Your commitment ensures that ICBAS stands as a platform for collaboration, creativity, and impactful research.

.Thank you, and welcome to ICBAS 2025

Prof. Dr. Samia Abo Farha

Dean of Faculty of Science

3

The 4th ICBAS (2025)



Prof. Dr. Mona A. Mohamed

Vice Dean for Education and Student Affairs
Faculty of Science – Al-Azhar University (Girls Branch)

In the Name of Allah, the Most Gracious, the Most Merciful

It is my honor to extend warm greetings to our distinguished researchers, esteemed professors, and specialists from across Egypt and around the world, on the 4th International Conference on Basic and Applied Science (ICBAS 2025), held under the theme: “Future Sciences: Efforts and Challenges.”

This conference is far more than an annual academic gathering—it represents a high-level intellectual forum that reflects the dynamic research environment cultivated at the Faculty of Science, Al-Azhar University (Girls Branch). It embodies our unwavering commitment to strengthening the scientific research ecosystem, promoting innovation, and building bridges of collaboration among researchers at regional and international levels.

As Vice Dean for Education and Student Affairs, I firmly believe that advanced education cannot thrive without robust scientific research. Research is the backbone of academic excellence, the engine of knowledge production, and the key to addressing global challenges—from climate change and public health to artificial intelligence and sustainable technologies.

Our choice of the theme “Future Sciences: Efforts and Challenges” is both timely and necessary. In an era of rapid technological transformation, it is imperative that researchers lead the way in developing ethical, sustainable, and innovative solutions. This conference provides a unique platform for you, our respected researchers, to present your findings, engage in meaningful dialogue, and forge collaborations that transcend borders.

We are proud to host scholars whose work contributes not only to academic advancement but also to societal progress and human well-being. At Al-Azhar, we uphold the principle that science must serve humanity, grounded in values of integrity, responsibility, and Islamic ethics. To all participants, I wish a fruitful, inspiring, and intellectually enriching experience. May this conference spark new ideas, foster

lasting partnerships and contribute meaningfully to the future of science.

May Allah guide us all to what is best.



Prof. Dr. Walaa Ahmed Moselhy

Vice Dean of the Faculty of Science for
postgraduate studies and research,
Faculty of Science – Al-Azhar University
(Girls Branch)

In the name of God, the Most Gracious, the Most Merciful

Esteemed Guests, Esteemed Colleagues, and Young Researchers,

It is with great pride and pleasure that I welcome you all to our annual conference, which this year is themed around the highly significant theme: “Future Science ‘efforts and challenges.’”

This theme is not arbitrary; rather, it embodies our firm belief that basic sciences are the true engine driving development and innovation toward new horizons. In a world characterized by rapid changes and complex challenges, from the climate crisis to the Fourth Industrial Revolution, the role of researchers and scientists remains paramount in anticipating solutions and building the future.

Why “The Future Science”?

This year, our conference focuses on the pivotal points that form the foundation of human progress for decades to come:

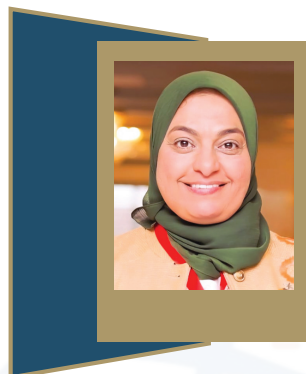
- * Innovation: Reviewing the latest research in artificial intelligence, data science, biotechnology, and their future applications.
- * Sustainability: Discussing the role of environmental science, green chemistry, and renewable energy sources in building a sustainable future for generations to come.
- * Integration: Fostering partnerships between different disciplines—physics, chemistry, mathematics, geology, and life sciences, to create a qualitative leap in scientific research.

Every page in this booklet represents the culmination of outstanding research efforts and reflects the researchers’ commitment to making scientific contributions with real and tangible impact.

I extend my sincere thanks and appreciation to all the organizing committees, faculty members, and participating researchers from within and outside the country. We hope that this conference will be a fruitful platform for exchanging knowledge, networking expertise, and building bridges of research collaboration that will pave the way for the “future Science” we all aspire to.

I wish you a successful conference and profound and inspiring scientific discussions.

Peace, mercy, and blessings of God be upon you.



Dr. Abeer Ahmed Emam

Conference Coordinator

Professor of physical chemistry, Faculty of
Science – Al-Azhar University (Girls Branch)

In the name of Allah, the Most Gracious, the Most Merciful

It is with great pride and deep gratitude that we gather today within the distinguished halls of our esteemed institution to celebrate the inauguration of the 4th International Conference on Basic and Applied Sciences, under the theme Future Sciences: Efforts and Challenges. This conference stands as the culmination of continuous effort, sincere dedication, and a shared vision aimed at advancing scientific excellence and fostering a culture of innovation and collaboration. From the very beginning, our aspiration has been to organize an event that truly reflects the academic stature of our college and the long-standing legacy of Al-Azhar University, an event that embodies the spirit of knowledge, research, and discovery.

Our goal has been to create a meaningful platform for scholars, researchers, and experts from diverse disciplines and regions to exchange ideas, present their latest findings, and explore future directions in science and technology. We believe that through constructive dialogue and collaboration, we can address the pressing challenges of our time and pave the way for a brighter, knowledge-driven future.

The success of this significant scientific event would not have been possible without the unwavering efforts and sincere commitment of many individuals who worked tirelessly behind the scenes. I extend my heartfelt appreciation to all members of the organizing and scientific committees, the dedicated staff, and the esteemed researchers and participants whose contributions made this conference a reality.

I would also like to express my deep gratitude to the leadership of Al-Azhar University for their continuous support and encouragement, which have been instrumental in bringing this vision to life. As we embark on this academic journey together, we hope that this conference will serve as a vibrant forum for inspiration, discovery, and collaboration - enriching the scientific community and motivating researchers to continue their pursuit of excellence. May its sessions and outcomes contribute to shaping a future guided by science, innovation, and shared progress.

May Allah grant us success and bless our efforts.

Conference Organizing Committees

Conference Chairman: Prof. Dr. Samia Abo Farha

Professor of Physical Chemistry, Dean of the Faculty of Science,
Al-Azhar University (Girls' Branch)

Vice Conference Chairman: Prof. Dr. Walaa Ahmed Moselhy

Professor of Medical Entomology, Vice-dean for Postgraduate Studies
and Research, Faculty of Science, Al-Azhar University (Girls' Branch)

Vice Conference Chairman: Prof. Dr. Mona Abd El-Geleil

Professor of Biochemistry, Vice-dean for Education and Student Affairs,
Faculty of Science, Al-Azhar University (Girls' Branch)

Conference Coordinator: Prof. Dr. Abeer Ahmed Emam

Professor of Physical Chemistry, Faculty of Science, Al-Azhar University
(Girls' Branch)



Organizers

Scientific Committee

Prof. Dr. Manal Elshaier
 Prof. Dr. Iman A. Mahdy
 Prof. Dr. Walaa Ahmed Hussein
 Prof. Dr. Taghreed Zaghloul Hamed
 Prof. Dr. Sahar M. Awad
 Prof. Dr. Sara Nabil
 Ass. Prof. Amira Yahia Mahfouz
 Ass. Prof. Nahed El-Desouky
 Ass. Prof. Al-Shaimaa M. Sadek
 Dr. Elham Ali Ahmed
 Dr. Daliaa Goda

Proceeding and documentation committee

Prof. Dr. Abeer Ahmed Faheim
 Dr. Lina Abdelaziz Mahmoud
 Ass. Prof. Hend Helmy Ali
 Ass. Prof. Walaa Tantawy Salama
 Ass. Prof. Doaa Ismail Abd El-Aziz

Media and Marketing

Prof. Dr. Iman A. Mahdy
 Dr. Fatma Ibraheem Mandouh
 Dr. Asmaa Mohammed Selim

Financial committee

Prof. Dr. Abeer Ahmed Emam
 Dr. Amal Gamal Al Mahdy
 Ass. Prof. Heba Mohamed El Saied
 Dr. Amira Mohamed Hyba
 Dr. Shima Mohamed Elshibly
 Dr. Shima Ahmed Abdelaziz

Logistics

Prof. Nouran A. Abououf
 Dr. Mona Khalil

IT & Technical services

Ass. Prof. Nahed Eldesouky
 Dr. Shereen A. El-aal
 Dr. Israa Alaa
 Dr. Doaa Rezk

Sponsors committee

Ass. Prof. Marwa El Sebai
 Ass. Prof. Shadia Shabry

Presenting committee

Prof. Dr. Monira Omar Zhran
 Ass. Prof. Seham Shahan Saleh

8.30 – 10.00	Registration
10.00 -1.00	Opening Ceremony (Hall Al-Fostat)
1.00-1.30	Conference Photos - Pray & Coffee Break
Session 1	
Chemistry and Materials Science	
Place	Hall Al-Fostat
Chairperson	Prof. Dr. Inas Elsabbagh, Prof. Dr. Eglal Mousa Prof. Dr. Rabab Abo Shahba, Prof. Dr. Azza Radwan
1:30-1:50	Synthesis of multifunctional surface-active agents as additives in eco-friendly emulsifiable cutting fluid formulations derived from oil manufacture waste products Prof. Dr. Eman Mohamed Kandeel, Toka Hassan, Mohamed Sadek Taher, Entsar Badr, Aziza El-Tabei
1:55-2:15	Structure-Activity Relationship in Vanadium Pentoxide Catalysts Assoc. Prof. Hassan Mohamed Nageh (K.N.)
2:20 -2:40	Hard and Soft Magnetic Ceramics from Laboratory to Industrial Scale Prof. Dr. Mohamed M. Rashad (K.N.)
2:45- 3.5	Nanoscience and Nanotechnology: From Lab to Fab for App Prof. Dr. Osama A. Fouad (K.N.)
3:10 – 3.30	Designing a Simple and Efficient Protocol for the Synthesis of Highly Functionalized bioactive heterocyclic Derivatives: Searching for pharmacological Agents Prof. Dr. Yousry Ammar (K.N.)



Egyptian Knowledge Bank
بنك المعرفة المصري



Egyptian Knowledge Bank
بنك المعرفة المصري

Session 2

Biology & Agriculture

Place	Hall 1
Chairperson	Prof. Dr. Fawzya Abusere, Prof. Dr. Azza Kafagy, Prof. Dr. Karima Metwally
1:30-1:50	Biodiversity-Driven Innovations for Food, Energy, and Climate Security Prof. Dr. Muhammad Zafar (K.N.) (Virtual, Pakistan)
1:55-2:15	Advances and Challenges in DNA Typing for Forensic and Ecological Applications Prof. Dr. Metwally M. Montaser (K.N.)
2:20 -2:40	Genetically Modified Mosquitoes: An Innovative Approach in Mosquito Vector Control Prof. Dr. Abdelbaset Zayed (K.N.)
2:45- 3:00	The role of <i>Trigonella foenum-graecum</i> L. seed extract in the progression of type 2 diabetes in <i>Drosophila melanogaster</i> modeling Dr. Zeinab Boshra (Virtual, Russia)
3:00 – 3.20	Functional Omics: From Genome to Phenome Prof. Dr. Mohamed S. Salem (K.N.) (Virtual, USA)

Session 3

Nanomaterial & its applications

Place	Hall 2
Chairperson	Prof. Dr. Nahed Mahram, Prof. Dr. Iman A. Mahdy, Prof. Dr. Alexey Toporensky
1:30-1:50	Electric Field-Assisted Biomimetic Mineralization on Dental Enamel Prof. Dr. Pavel V. Seredin (K.N.) (Virtual, Russia)
1:55-2:15	Dark Pulse Generation in Erbium-doped Fiber Laser Systems Prof. Dr. Sulaiman Wadi Bin Harun (K.N.) (Virtual, Malaysia)
2:20 -2:40	Smart Self-assembly for Sustainable Nanophotonics and Optoelectronics Asso. Prof. Talha Erdem (K.N.) (Virtual, Turkey)
2:45- 3.05	Innovative Microneedle-Based Platforms Developed 3D Printing for Enhanced Transdermal Drug Delivery and Tissue Engineering Prof. Dr. Cem Bulent Ustundag (K.N.) (Virtual, Turkey)
3:10 – 3.30	Quantum Lifetimes of Excited Negative Ions: A New Experimental Approach. Prof. Dr. Guillermo G. Hinojosa-Aguirre (K.N.) (Virtual, Mexico)

10

Session 4

Mathematics & Computer Science

Place	Hall 3
Chairperson	Professor Dr. Samia Elareshiy, Professor Dr. Abeer Desoky
1:30-1:50	A Hyperbolic Fuzzy Framework with a Novel Score Function for Crime Hotspot Identification Asso. Prof. Palash Dutta (K.N.) (Virtual, India)
1:55-2:15	Power-Minimal Trajectory Planning with Structural Optimization for Industrial Robots Ahmed Mostafa Elhamrawy ¹ , Farouk Ahmed Elbarki ¹ , Eman Hamdy Haraz ¹ , Sallam Ahmed Kouritem ²
2:15-2:35	Cattaneo-Christov Effects on MHD Nanofluid over a Sensor Surface through a Squeezed Channel Rokaya Koritem, Shaimaa F. Ramadan, Khalid K. Ali, Khaled S. Mekheimer
2:35- 2.55	Magnetohydrodynamic Flow of Nanoparticles and Microorganisms in a Deformable (Stretching/Shrinking) Channel Alaa Sameh Abd Elsalam Ahmed, A. M. Abdelwahab, Khaled S. Mekheimer, Shaimaa F. Ramadan
3:00 – 3.30	Mixed physical informed neural networks in bio-fluid mechanics Prof. Dr. Khaled Saad Mekhaimer (K.N.)

3.30-4.00

Pray & Lunch break

11



Session 5

Biology & Agriculture

Place	Hall 1
Chairperson	Professor Dr. Rawhyya Abd Elatif, Professor Dr. Hala Fouad
4.00 – 4.20	Heat Islands Influence on Mosquito Diversity and Associated Environmental Variables in Giza Nile River Region Dr. Alaa Nagy, Manal Elshaier, Ahmad Elzeiny, Mohamed Soweilm, and Wedad Atwa
4.20-4.40	Evaluation of toxicity and biochemical alterations induced by some insecticides in <i>Spodoptera frugiperda</i> larvae Lina Abd Elazez, Wala Moselhey, and Shimma Husein

Session 6

Photonics & Laser

Place	Hall 2
Chairperson	Prof. Dr. Sawsan El-Mossalmy, Prof. Dr. Manal A. Mahdy Prof. Dr. Anke Killinger
4.00 – 4.20	Green Synthesis of Novel, Smart, and Hybrid Nanocomposites for the Applications of Reclamation of Aged Transformer Oil and Protection of Electro-Optical Sensors from High-Power Lasers Prof. Dr. Ahmed Asaad Khalil (K.N.)
4.25-4.45	From Devices to Systems: Practical Silicon Photonics for Sensing Applications. Prof. Dr. Mohamed Farhat O. (K.N.) (Virtual, Egypt)
4.50 – 5.10	Bio-inspired robots for medical applications Prof. Dr. Anke Klingner (K.N.)

12

Session 7

Theoretical Physics and Cosmology

Place	Hall 3
Chairperson	Prof. Dr. Kamilia Sedig, Prof. Dr. Nadia Abdel-Mohsen Prof. Dr. Alexey Golovnev
4.00 – 4.20	Geometry of Gravity Prof. Dr. Alexey Golovnev (K.N.) (Russia)
4.25-4.45	Distances and velocities in cosmology - a comparison of different approaches Prof. Dr. Alexey Vladimirovich Toporensky (K.N.) (Russia)
4.50 – 5.10 9:50- 10-10 Am Ohio Time	Heavy Element X-Ray Spectroscopy for Biomedical Applications. Prof. Dr. Sultana Nurun Nahar (K.N.) (Virtual, USA)

13



Poster

3.30-4.00

Poster Judges

Prof. Dr. Karima Salem - Prof. Dr. Abeer A. Emam - Prof. Dr. Wala A. Moselhy
Prof. Dr. Manal E.A.Elshaier - Prof. Dr. Nahed Al-Desouky

Marine Collagen as a Sustainable Biomaterial for 3D Organoid Culture and Regenerative Medicine

Ali Ezzat Elhagry*1, Mosab Rezk2, Mahmoud A Mohamed3, Hosni Hussien4

In vitro reproduction of equine oocytes

Rasha Mansour Abd El-hameed*1, Nehal Ali Abu El-Naga2, Omaina Mohamed Kandeel3

Comparative Study of Carbon Nanotube and Nano-Clay Incorporation into Pectin/Na-Alginate Bio-Based Hydrogels for Dye Removal

Hayam Mohamed Mahmoud Ahmed*1, Shaimaa S. Ali2, Eman Mohamed Shoukry2, Ghada Adel Mahmoud3, Asmaa Ali Sayed3, Neveen Mohamed Hegazy3

Environmentally friendly fouling release nanocomposite coatings for preventing the attachment of marine biofouling

Mohamed Sayed Selim1, Nesreen Abd Elhamid Fatthallah*1, Shima Anwar Higazy1, Zhifeng Hao2

Practical and Experimental Review on Eco-Friendly Recovery of Lithium, Cobalt, and Precious Elements from Spent Lithium-Ion Batteries Using Deep Eutectic Solvents (DES)

Randa Nasr Yamani*1, Moustafa M. Elmasri2

Effective Solution of Optimization Problems with an Enhanced Giza Pyramids Construction Algorithm

Naglaa Mohammed Moustafa*

An AI-miRNA Approach for Enhanced Differential Diagnosis of Ovarian Disorders

Mariam Fahim El hadidi*



KEYNOTE SPEAKERS



Biography

Prof. Dr. Sulaiman Wadi Harun

Department of Electrical Engineering, Faculty of Engineering,
University of Malaya, 50603 Kuala Lumpur, Malaysia
E-mail: swharun@um.edu.my
Tel: +603-79674290 (Lab), +6010-3637975 (Mobile)

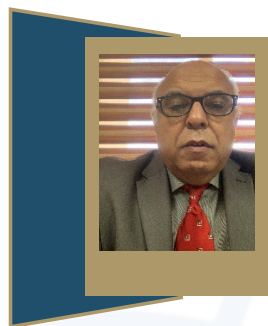
Prof. Dr. Sulaiman received B.Eng. Electrical and Electronics System Eng. From Nagaoka University of Technology, Japan in 1996, and received MSc from University of Malaya, Malaysia in 2001, he also received PhD from University of Malaya, Malaysia in 2004. He is a Head of Department of Electrical Engineering, Faculty of Engineering, University of Malaya, Kuala Lumpur, Malaysia. He got many national/international awards including URSI Young Scientist Award 2005, Malaysian Brain Gain Fellowship 2008, and Malaysia's Rising Star Award 2016 for best international collaboration and outstanding performance (Malaysian Ministry of Higher Education, Scopus and SciVal).

Dark Pulse Generation in Erbium-doped Fiber Laser Systems

Abstract

Dark pulse emission in fiber laser systems refers to a unique operating regime in which a series of intensity dips, or “dark pulses,” appear on a continuous-wave (CW) background—contrasting with the conventional “bright pulses,” which manifest as intensity peaks. A decade ago, dark pulses were often regarded as “a solution looking for a problem.” However, they have since attracted growing research

attention due to their intrinsic stability and promising applications in optical communication and sensing. Their distinctive propagation characteristics have further elevated interest in exploring dark pulses as viable alternatives to bright pulse generation. Early progress in this area was limited, primarily because achieving stable dark pulses required meticulous control over laser cavity parameters. The emergence of saturable absorbers (SAs), however, has significantly accelerated advancements in dark pulse generation. In this work, we present a comprehensive overview of experimental efforts focused on dark pulse formation, categorizing them into three principal types: Nonlinear Schrödinger Equation (NLSE) dark pulses, Cubic–Quintic Nonlinear Schrödinger Equation (CQNLSE) dark pulses, and domain-wall (DW) dark pulses. The discussion also encompasses the underlying formation mechanisms, the key challenges in achieving stable dark pulse operation, and prospective directions for future research in this rapidly developing field.



Biography

Prof. Mohamed Mohamed Rashad

Advanced Materials Institute, Central Metallurgical Research and Development Institute,
P.O. Box: 87 Helwan, Cairo, Egypt
Email: rashad133@yahoo.com

Prof. Rashad works a dean of Advanced Materials Institute, CMRDI, Egypt, Board of Nanotechnology Research Center, Ain Shams University, he published about 225 papers in prestigious Journals, 180 presentations in international and local conferences, and 5 books chapters, 60 MSc and PhD. He had many awards include the State Prize of Excellence in Advanced Science and Technology 2014, the Egyptian Academy Award in Environmental Studies 2014, and the First State Incentive Award for Advanced Sciences 2006. Prof. Rashad is the Principal Investigator, Co-PI, members of many multidisciplinary projects ~ 35 projects (International Joint Projects with USA, Sweden, Italy, Germany, South Africa, Belorussia, and India) in addition to Local projects. Prof. Rashad works deals with nanomaterials and nanotechnology, energy production and storage, magnetic materials, piezoelectric materials, optical materials, fuel cell, electronic & magnetic devices and smart materials.

Hard and Soft Magnetic Ceramics from Laboratory to Industrial Scale

Magnetic ceramics; ferrites are of magnificent prominence as high-frequency magnetic materials in the branches of communication and electronic devices and they now embrace a very wide diversity of compositions, properties and applications. There are basically two types of ferrites: soft ferrites (cubic structure) and hard ferrites (hexagonal structure). Soft ferrites are characterized by the chemical formula $MO.Fe_2O_3$, with M being a divalent element, e.g. magnesium, copper, iron, nickel, manganese or zinc. Hard ferrites are permanent magnetic materials based on the hexagonal crystallographic phases like M-type ferrites

BaFe₁₂O₁₉ and SrFe₁₂O₁₉ The report gave special focused to synthesis and applications of some spinel ferrites namely (CuFe₂O₄, Mn-Zn ferrites, CoFe₂O₄, LiFe₅O₈ and MgFe₂O₄, Mg-MnFe₂O₄, SnFe₂O₄ and Ni-ZnFe₂O₄). The exploitation of secondary resources fly ash for preparation of NiFe₂O₄, electronic wastes for formation of CuFe₂O₄ from electric cables and mill scale as well as Cu-Zn spent catalyst from fertilizer industry to produce

Cu_{0.5}Zn_{0.5}Fe₂O₄ as well as low grade manganese ore for synthesis of MnFe₂O₄ was also discussed. Otherwise, hard magnet (M- type such as BaFe₁₂O₁₉, SrFe₁₂O₁₉, Y-type hexaferrite (Ba₂Co₂Fe₁₂O₂₂) and garnet ferrite YIG (Y₃Fe₅O₁₅) as well as Z-type ferrite (Co₂Z; Ba₃Co₂Fe₂₄O₄₁) because of numerous applications of these ferrites in the different industrial fields have been successfully synthesized. Several techniques were applied for the preparation of these ferrites in order to obtain powder in both bulk and nanocrystalline phases. These techniques included solid state method, chemical co-precipitation, organometallic precursor, hydrothermal and sonochemical methods. Special attentions are also made to prepare thin and thick films of ferrites using electrochemical deposition technique for microwave applications. Furthermore, the utilization of Egyptian barite BaSO₄ and celestite SrSO₄ ores to production of barium M-type ferrite BaFe₁₂O₁₉ and strontium M-type ferrite SrFe₁₂O₁₉ powders have been studied. The materials produced were investigated using X-ray diffraction analysis (XRD), scanning electron microscope (SEM), Fourier transformer Infrared (FT-IR) and vibrating sample magnetometer (VSM). The results showed that the ferrites produced in well crystalline phases and high magnetization.

Keywords: Ferrites; Synthesis; Characterization; Magnetic properties; Applications



Biography

Prof. Dr Yousry A Ammar

Department of Chemistry, Faculty of Science, Al-Azhar University, Egypt

Dr Yousry A Ammar is a professor at Department of Chemistry, Faculty of Science, Al-Azhar University, Egypt. He finished more than 70 MSc and PhD as well as 10 in progress. He published more than 240 articles in national and international scientific peer-reviewed journals. He shared as author and co-author in more than 20 national and international conferences. He participated in three projects related to drugs and energy researches. He worked as a reviewer in many organic and medicinal chemistry journals. He was a member of the permanent scientific Committee (Organic Chemistry) for the Associate Professor and Professor grade promotion. 2016-2022.

Designing a Simple and Efficient Protocol for the Synthesis of Highly Functionalized bioactive heterocyclic Derivatives: Searching for pharmacological Agents

Abstract:

-Designing and developing synthetic routes to different organic molecules and bioactive heterocyclic compounds, via a simple practical approach, cost-effective and efficient methods.

-Modifications of some drugs, searching for pharmacological active compounds with less side effects

22



Biography

Prof. Dr. Muhammad Zafar

Professor of Plant Sciences (Plant Systematics)-
Director of Climate Change, Quaid-i-Azam
University, Islamabad, 45320, Pakistan
Email: zafar@qau.edu.pk
Tel. +92-333-5599777

Dr. Muhammad received M.Sc in biology from PMAS, Arid Agriculture University Rawalpindi Pakistan and he had M.Phil and Ph.D in Plant Systematics & Biodiversity from Quaid-i-Azam University Islamabad Pakistan. Dr. Muhammad had many awards include Best Performance Award (Highly Cited Scientist, 2023), Quaid-i-Azam University Islamabad, Best Research Paper Award 2022, Samarkand State University, Uzbekistan. , Gold Medal (Prof. Dr. Zabta Khan Shinwari Award) from Pakistan Academy of Sciences (PAS) in the field of Biotechnology in 2021 for outstanding research work in the subject and TTS Performance Based Awards for year 2016-2020. He published about 360 papers with impact factor and about 39 books. Dr. Muhammad Productive Scientist of Pakistan (PCST) for year 2010-2017.

Biodiversity-Driven Innovations for Food, Energy, and Climate Security

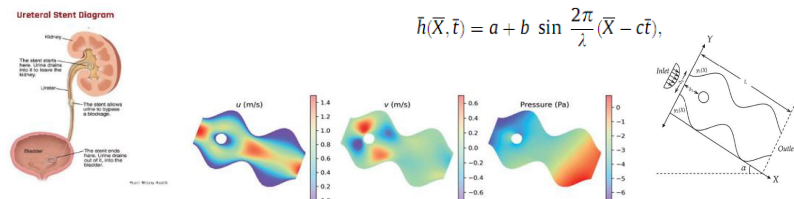
Biodiversity represents a vital foundation for addressing the escalating global crises associated with food insecurity, energy scarcity, environmental degradation, and climate change. As the planet experiences intensifying climate-related pressures rising temperatures, unpredictable weather patterns, more frequent extreme events, and widespread ecosystem degradation harnessing biological diversity across ecosystems offer a scientifically robust route toward sustainability, innovation, and resilience. This research underscores the pivotal role of biodiversity as a catalyst for adaptive solutions across multiple sectors. Ecologically rich systems encompass vast genetic, species, and functional diversity that can be leveraged for the discovery of novel bioactive compounds. These natural molecules form the basis

23



for developing environmentally sustainable pharmaceuticals that combat emerging health challenges while minimizing the ecological impacts associated with conventional chemical synthesis. Within the agri-food sector, biodiversity underlies the adaptability and resilience of production systems. Genetic variation among crops and their wild relatives provides the foundation for breeding climate-resilient varieties capable of withstanding drought, salinity, heat stress, and pest infestations pressures that are increasingly intensified by climate change. Diversified farming approaches, such as agro ecological and agroforestry systems, enhance soil fertility, optimize water use, and increase carbon sequestration while decreasing dependence on synthetic fertilizers and pesticides. These biodiversity-cantered systems strengthen food sovereignty, promote nutritional diversity, and advance ecological sustainability. In the energy domain, biologically sourced materials offer sustainable alternatives to fossil fuels the primary driver of global greenhouse gas emissions. Second-generation biofuels, derived from ligno-cellulosic biomass such as agricultural residues, non-edible plant matter, and microbial enzymes, provide a promising pathway toward decarbonizing the global energy landscape. Ongoing advancements in microbial biotechnology and enzymatic conversion processes are improving the efficiency and scalability of biofuel production, reducing lifecycle emissions, and bolstering energy security in a carbon-constrained future. Biodiversity-rich ecosystems also deliver essential ecosystem services that mitigate the impacts of climate change. These services including carbon sequestration, hydrological regulation, soil stabilization, and habitat maintenance are fundamental to both climate mitigation and adaptation efforts, ensuring the continued stability of Earth's life-support systems. It should be recognized not merely as an object of conservation but as a strategic resource integral to achieving sustainable food, energy, and climate security. Through integrated, science-driven biodiversity management and innovation, it is possible to build resilient socio-ecological systems capable of enduring the environmental challenges of the present and the future.

$$\bar{h}(\bar{X}, \bar{t}) = a + b \sin \frac{2\pi}{\lambda} (\bar{X} - c\bar{t}),$$



Biography

Prof. Dr. Khaled Mekheimer

Emeritus Professor of Applied Mathematics & Ex-Vice Dean of Post-Graduate Studies and Research, Al-Azhar University, Faculty of Science (Boys), Naser City 11884, Cairo, EGYPT.
Tel.: +202 24721547, +2 01006591799.



Prof. Mekheimer received a B.Sc. in Mathematics from Ain Shams University Cairo (1984), M.Sc. in Thermo-Elasticity from Al-Azhar University (1990), completed his doctorate in Bio-fluid Mechanics at Al-Azhar University in (1994). He is leading an active group in his field of interest "Bio-Fluids". Many of his student's research earned the prize of the best M. Sc Thesis. & Ph D. Thesis from the Egyptian Mathematical Society. He is an Advisory Board Member of the International Islamic Institute for Population Studies and Research, Al-Azhar University 2020, Editor-in-Chief of Al-Azhar Bulletin of Sciences Journal, and Journal of the Egyptian Mathematical Society, Associate Editor of the Discovery of Applied Sciences Journal /Engineering. Consequently, he has earned one of the State highest prizes namely the State Awards of Excellence Prize of Basic Science awarded by the ASRT (Academy of Scientific Research and Technology) of Egypt Recently Prof Mekheimer was included in the "Top 2% of world scientists" list published by Stanford University U.S.A. Fellow in The African Academy of Sciences (AAS) 2020. Member of the African Academy of Sciences Membership Advisory Committee, Membership of the National Mathematics Committee- Egypt 2022, and Secretary General of the Egyptian Mathematical Society.

Mixed physical informed neural networks in bio-fluid mechanics

Abstract

A better understanding of various biological phenomena can be gained by studying the transport of fluid related to those phenome-



na. The motion involved in such phenomena is described by the so-called governing equations, regardless of the approximation, which may lead to an exact solution for these models. Usually, a numerical technique must be used to obtain an approximate solution. This study aims to investigate the advantage of using mixed physics-informed neural networks (MPINN) to simulate these phenomena. A hypothetical scenario was considered where an obstacle appeared in the ureter channel during its peristaltic motion, known as kidney stone disease. The momentum conservation governing equations are used for an incompressible Newtonian fluid, and their dimensionless form is introduced. Contour plots for pressure and velocity fields are shown for different stone shapes. Additionally, shear stress at the lumen surface is calculated. Our findings demonstrate the effectiveness of MPINN in providing reliable results for such critical situations.

Keywords: Mixed Physical informed neural networks;
Governing equations; Kidney stone disease.



Biography

Prof. Mohamed Farhat

Professor, Director of Center for Nanotechnology,
Zewail City for Science, Technology and Innovation,
6th of October City, Giza, Egypt



Dr Mohamed Farhat is a full professor, Director of Center for Nanotechnology, and Director of Nanotechnology and Nanoelectronics Engineering Program at Zewail City of Science and Technology. He is also a founding member of Center for Photonics and Smart Materials (CPSM) at ZC. Based on his research work, 200 journal papers, mostly in IEEE and IEE journals, have been published, and 150 conference papers have been presented in the best national and international meetings. Additionally, two books have been published by the world-leading scientific publishers; Wiley (Computational Liquid Crystal Photonics: Fundamentals, Modelling and Applications, 2016) and Springer (Computational Photonic Sensors, 2018). Dr Farhat is a member of the National Committee for Education, Science and Culture at ASRT (2022-2025).. Dr Farhat has also been awarded Shoman prize for computational physics (2021), State Prize for Excellence in Engineering Sciences from the ASRT, Khalifa Award for Distinguished Arab professors (2022) and Zewail City Awards of Excellence in Scientific Research (2023) and Excellence in Teaching (2024).

From Devices to Systems: Practical Silicon Photonics for Sensing Applications.

Abstract:

Silicon photonics brings optical functionality onto CMOScompatible chips with compact, energyefficient, and scalable systems. This talk will introduce the building blocks of passive and active components and the main silicon photonics platforms-before highlighting application breadth. Then, the refractometric sensing with Mach-Zehnder interferometers and microring resonators will be presented, covering sensitivity and stability considerations. Further, midinfrared gas sensing will be discussed with coupling strategies and spectroscopic fingerprints that link devicelevel design to practical systems. The photonic chip sensors deliver a superior sensitivity through dense onchip integration and multiplexing, low power consumption, rapid labelfree readout, and CMOScompatible manufacturing. Therefore, reliable, scalable, and costeffective deployment across diverse settings can be achieved.



Biography

Prof. Sultana Nurun Nahar

Dept of Astronomy, The Ohio State U.

Columbus, OH 43210, USA .

Email: nahar.1@osu.edu

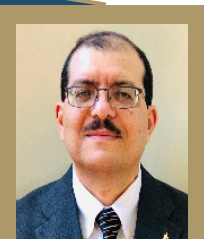
Prof. Sultana N. Nahar studies atomic processes. She is a member of the international Opacity Project. They are studying bio-signature spectroscopy of exo-planets and broad emission features of heavy elements that have been seen in the electromagnetic waves following the detection of gravitational waves in the merger of two neutron stars. They are also engaged to biomedical applications of high energy x-ray that are similar to study of black holes. She is an author with A.K. Pradhan for the textbook "Atomic Astrophysics and Spectroscopy" (Cambridge University press, 2011) widely used all over the world. She is the founder of the atomic database NORAD-Atomic-Data. After her study from University of Dhaka in Bangladesh as the top most student of her class, both in B.Sc.Hons. and M.Sc., she moved to USA for her Ph.D. degree from Wayne State University, Michigan where she received many awards, including Distinguished Alumni Award.

Heavy Element X-Ray Spectroscopy For Biomedical Applications

Abstract:

Irradiated X-rays interacting with heavy element constituents of radio-sensitive agents embedded in malignant tissue has been widely used for nano- and bio-medical applications, such as, for imaging, diagnostics, therapy. The interaction ejects electrons, also emits radiation, from the heavy elements, which can be used to kill the surrounding cells and for imaging. Since it has been found that x-ray irra-

diation in combination with radio-sensitizing nanoparticles in tumor is more effective in cell killing than the X-ray alone. Extensive investigations have been carried out to produce a larger number of electrons, but without much success. We have developed resonant nanoplasma theranostics (RNPT) method that produces a large number of electrons through x-ray spectroscopy. Monochromatic x-rays at resonant energies, particularly due to K- and L-shell transitions, can achieve such a goal. X-rays generated from these transitions in heavy element compounds are typically well separated and can also be used for creating a monochromatic x-ray source. The intensity of x-rays can be enhanced through Auger effect and Koster-Kronig cascades at resonant energies. I will discuss our study on the resonant energies for biomedical applications and devising a possible source of monochromatic x-rays.



Biography

Prof. Mohamed Salem

Associate Professor, Department of Animal and Avian Sciences, University of Maryland, College Park
Email: mosalem@umd.edu

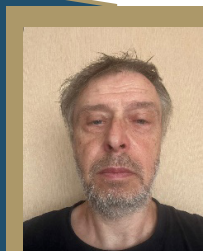
Dr. Mohamed Salem is a tenured Associate Professor in the Department of Animal and Avian Sciences at the University of Maryland (UMD), College Park, and a faculty member in the Biological Sciences Graduate Program, affiliated with the Computational Biology, Bioinformatics, and Genomics clusters. He is nationally and internationally recognized in aquaculture genomics, with a research program that integrates functional genomics, epigenomics, and microbiome science to address critical challenges in animal genetics and sustainable aquaculture. Dr. Salem has mentored over 15 graduate students and postdocs, many of whom have received prestigious fellowships or faculty and research appointments.

Functional Omics: From Genome to Phenome

Abstract:

We are entering a new era of discovery — one that unites genomic, epigenomic, and metagenomic insights to understand how complex traits emerge from molecular networks. Functional omics connects sequence to performance, revealing how genes, regulatory elements, and microbial partners shape growth, muscle quality, and stress resilience. Drawing on advances in rainbow trout genomics and microbiome research, this talk highlights how integrative omics and data-driven breeding tools are transforming aquaculture into a model for sustainable innovation. By bridging basic biology with practical application, functional omics provides a predictive framework for improving productivity, resource efficiency, and environmental resilience across animal systems.

30



Biography

Dr. Alexey Toporensky

Senior of scientific researcher- Sternberg
Astronomical Institute - Moscow State University
Email: atoporensky@gmail.com

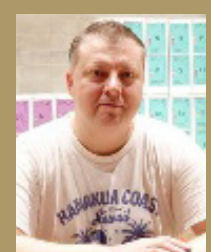
Dr. Alexy was born in 1967. He received master's degree in 1992 from Physical Faculty of Moscow State University, and PhD in 2001 from Sternberg Astronomical Institute, Moscow State University. From 1995 till present time he is working in Sternberg Astronomical Institute (currently as a senior scientific researcher). During this time, he wrote about 100 scientific paper, his number of citations about 2900. Most papers are devoted to cosmological dynamics in General Relativity and modified gravity. He wrote 4 methodological papers on topics in General Relativity which deal with questions less known or more difficult for students to understand while they study GR. These papers have been published in methodological journals or methodological sections of journals in physics.

Distances and velocities in cosmology - a comparison of different approaches

Abstract?

We start our presentation with pedagogical outlook of different distance measures used in cosmology. After that, we consider two most popular definitions of velocities of remote objects in General Relativity. Our work has two motivations. From a research point of view, we generalize the formula connecting these two velocities in FRW metrics found by Chodorowski to arbitrary synchronous spherically symmetric metrics. From a methodological point of view, our goal is to outline certain counter-intuitive properties of the velocity's definitions in question, which would allow to use them when it is reasonable and to avoid incorrect statements, based on inappropriate use of intuition

31



Biography

Prof. Dr. Pavel V. Seredin,

Professor & Head of Solid State and Nanostructure Physics
Department University of Voronezh State, Voronezh, Russia
E-mail: paul@phys.vsu.ru
Tel: +74732208363

Prof. Dr. Pavel is a Professor & Head of Solid State and Nanostructure Physics Department. He expert in biohybrid materials, biomimetics, semiconductor physics, and synchrotron radiation applications. He received D.Sc. in Physics & Mathematics From Voronezh State University in 2013, and received PhD in 2006. He works as a Head of Department University of Voronezh State. He got awards including President of Russia Grant (2011, 2017, 2019) for young scientists in Physics., and Voronezh Region Administration (2016) for monograph on A3B5 semiconductor heterostructures. He was a supervise PhD students; collaborate with international institutions (e.g., Benemérita Universidad Autónoma de Puebla, Mexico). He published More than 250+ papers (WoS/Scopus), h-index: 24 (WoS), 27 (Scopus), 30 (RSCI).

Electric Field-Assisted Biomimetic Mineralization on Dental Enamel

Abstract.

The enamel of human teeth, composed of highly oriented apatite crystals in a unique hierarchical structure, lacks the ability to self-regenerate, which limits its functional lifespan. Developing strategies for effective mineralization and restoration of enamel remains a major challenge. Here, we present an electric field-assisted approach for accelerated deposition of biomimetic mineralizing coatings on

dental enamel surface composed of nanocrystalline carbonate-substituted hydroxyapatite (nCHAp), amino acids (AAs), and polydopamine (PDA). Electron and atomic force microscopy, together with synchrotron nano-IR imaging (SINS), revealed that the electric field enables control of coating morphology and thickness. Mineralization under these conditions produced densely packed hemispherical nanoagglomerates with a core-shell architecture: ordered nCHAp nanocrystals forming the core and an organic PDA/AA shell. The electric field accelerated dopamine polymerization and directed nCHAp assembly, suppressing intermediate phases. Machine learning analysis of hyperspectral SINS maps confirmed chemical heterogeneity of the agglomerates and the textured organization of nCHAp within the core. The resulting coatings displayed anisotropic properties reminiscent of natural enamel and achieved nearly twofold increases in surface hardness under various loads. This method provides tunable mineralized layers with structural and functional properties surpassing enamel, offering a promising pathway for clinical remineralization and restoration.



Biography

Professor. Anke Klingner

Physics Department at the German University
in Cairo, Egypt.

Anke Klingner is staff member of the Physics Department at the German University in Cairo, Egypt. She is member of the Medical Micro and Nano Robotics Laboratory at the German University in Cairo, Egypt. She received her Diploma in Physics from Technical University Dresden after studying Physics at the Technical University Dresden, Germany, and at Duke University, North Carolina, USA. The doctoral degree was obtained from Department of Applied Physics, Ulm university, Germany, in the field of electrowetting. She coordinated a DAAD-BMBF project and joined other research projects. She supervised student exchange with DAAD RISE program. Her research interests include physical modeling of microrobots and materials and materials characterization such as electrospinning, additive manufacturing and rheology.

Bio-inspired robots for medical applications

Anke Klingner¹, Mohamed Elwi Mitwally², Sara Thabit³, Mohand Mohamed Gamal Elshafiy⁴, Mohand Mohamed Galal Abdelrahman Mohamed⁴

1- Physics Department, Basics Science, Faculty of Media Engineering and Technology, The German University in Cairo, 11835 New Cairo, Egypt

2- Materials Engineering, Faculty of Engineering and Materials Science, The German University in Cairo, 11835 New Cairo, Egypt

3- Pharmaceutical Biology, Faculty of Pharmacy and Biotechnology The German University in Cairo, 11835 New Cairo, Egypt

4- Mechatronics, Faculty of Engineering and Materials Science, The German University in Cairo, 11835 New Cairo, Egypt.

Abstract.

The field of robotics is studying nature intensively since bio-inspired robots can offer solutions for applications in fields such as healthcare, exploration etc. An overview of the field is given, and three approaches are explained further: 1) tadpole and sperm-shaped microrobots for medical applications, 2) development of a modular robotic snake and 3) bio-hybrid microrobots. Additive manufacturing is used to get tools for tadpole microrobot production and for modules of robotic snake. Tadpole shape is influenced by angular speed and nozzle diameter. The modular robotic snake is designed to replicate serpentine locomotion by a sine wave-based actuation system, implemented in both a software simulation. A 2D schematic was developed to visualize the role of the Seeed-uino XIAO ESP32S3 microcontroller in driving multiple servos, each responsible for articulated motion across alternating planes. This was followed by the creation of a physics-based 3D simulation using Webots and Python to test the locomotion algorithm in a controlled virtual environment. The simulation currently utilizes 13 motors and serves as a reference for real-world implementation. The robotic snake's movement is governed by a sinusoidal function that incorporates phase offsets and amplitude modulation to replicate natural locomotion and hardware prototype. One of the key design challenges has been component miniaturization, particularly in sourcing a battery with a high enough discharge index in a sufficiently compact form. Applications may include search and rescue operations, pipe inspection, or terrain exploration where traditional wheeled robots are ineffective. Sperm-shaped microrobots are produced by electrospinning. Typically, they move at highest speed at actuation frequencies 3-4 Hz. Bio-hybrid microrobots are approached by co-feeding magnetic particles during growth of *C.Elegans*.



Biography

Prof. Dr. Prof Osama A. Fouad

Professor of

الأستاذ الدكتور أسامة فؤاد هو مؤسس ورئيس قسم مركبات وتكنولوجيا النانو، معهد المواد المتقدمة، مركز بحوث وتطوير الفلزات، مصر. حصل على درجة البكالوريوس في الكيمياء من جامعة القاهرة في عام 1990 بدرجة جيدة جداً مع مرتبة الشرف وانضم إلى مركز الفلزات في نفس العام كمساعد باحث. في عام 1991 منح وسام جامعة القاهرة للطلاب المتميزين الحاصلين على البكالوريوس. حصل على درجة الماجستير في الكيمياء غير العضوية من جامعة القاهرة في عام 1999 خلال السنوات الأكاديمية 1999 إلى 2002 حصل على منحة مونبوشو اليابانية لدراسة الدكتوراه في قسم الكيمياء والكيمياء التطبيقية، كلية العلوم والهندسة، جامعة ساكاي باليابان وحصل على درجة الدكتوراه عام 2002 حصل على جائزة الدولة التشجيعية في عام 2005 في العلوم التكنولوجية المتقدمة كأصغر باحث يحصل على الجائزة في تاريخها وجوائز الأفراد لعامي 2009 و 2011 للراحل الأستاذ الدكتور فوزي حماد والأستاذ الدكتور أسامة الخولي في مجالي علوم وتكنولوجيا المواد وبحوث ودراسات البيئة لجهوده المتميزة في المجالين. وفي عام 2024 حصل على جائزة التقدير العلمي من المركز. نشر الدكتور فؤاد أكثر من 100 ورقة بحثية في مجالات علمية عالمية رفيعة المستوى ومؤتمرات دولية.

Nanoscience and Nanotechnology: From Lab to Fab for App

36

Abstract

Nanoscience and nanotechnology have been emerged as a transformative discipline that bridging the gap between the lab-scale foundations and practical applications. These foundations explore the manipulation and understanding of materials at the nanoscale, where unique

physical and chemical properties enabling novel applications across various areas, including energy, environment, electronics, materials science, agriculture and healthcare. The transition from lab-based experiments to realistic applications necessitates a multidisciplinary approach which led to applications in various fields. Among these, renewable energy and environmental science, which benefits from nanomaterials designed for energy harvesting and storage and pollution remediation and climate change mitigation; electronics, where it enables the creation of smaller and faster devices; agriculture, where nanomaterials can be used for insect control and crop growth; healthcare, where nanotechnology facilitates targeted drug delivery and diagnostics. This abstract highlight the fundamental principles of nanoscience and nanotechnology, emphasizing their potential to solve global issues and challenges, while also reflecting on the ongoing efforts to translate innovative research going on in our research group into viable products and solutions in the real world where research meets application.

37



Egyptian Knowledge Bank
بنك المعرفة المصري



Biography

Dr Palash Dutta

Associate Professor at Dibrugarh University
Assam, India - 786004
E-mail: palash.dtt@gmail.com
TEL: +919678666094, +919435184995

Dr. Palash Dutta serves as Associate Professor at Dibrugarh University Assam, India, he received his Ph.D. Dibrugarh University in 2012, he has Expertise in Applied Mathematics and Uncertainty Modelling in Decision Making, he was awarded as top 2% Scientist of the World from 2021-2024 from Stanford University, USA. Dr Palash works as project Investigator/Coordinator in a research project. He has an impressive publication record with over 117 research articles in internationally renowned journals

A Hyperbolic Fuzzy Framework with a Novel Score Function for Crime Hotspot Identification

Abstract: Traditional fuzzy sets and their extensions, such as q-rung orthopair fuzzy sets (q-ROFS), face limitations in independently modeling optimistic and pessimistic degrees. To overcome this, we introduce a novel score function within a hyperbolic fuzzy set (HyFS) framework, which offers superior flexibility by allowing autonomous assignment of these degrees. We develop a new HyFS-based decision-making methodology and demonstrate its efficacy by identifying high-risk crime zones in Dibrugarh city. The results confirm our approach's practical relevance for complex real-world decisions, with promising applications in resource allocation and crime prevention strategies beyond predictive policing. **eywords:** Hyperbolic fuzzy set · Score function · Fuzzy MADM · EDAS · Crime-pron

38



Egyptian Knowledge Bank
بنك المعرفة المصري



Biography

Asst. Prof. Talha Erdem

Abdullah Gül University
Department of Electrical-Electronics Eng
Email: erdem.talha@agu.edu.tr,

Dr. Talha studied B. Sc. at Dep. of Electrical and Electronics Engineering, High Honor Student at Bilkent University Ankara, Turkey from 2005 to 2009, he studied M. Sc at Dep. of Electrical and Electronics Engineering, Ankara, Turkey from 2009 to 2011 and he had Teaching Assistantship at Dep. Of Electrical and Electronics Engineering from Nanyang Technological University, Singapore. Dr. Talha went Visiting Ph. D. Student at School of Electrical and Electronic Engineering in summer 2014. He received many awards include TÜBA-GEBIP Successful Young Scientist Award (awarded by Turkish Academy of Sciences) in 2023, BAGEP Young Scientist Award (awarded by Science Academy, Turkey) in 2023 and Newton International Fellowship (awarded by Royal Society, UK) 2016- 2018. He published about 51 SCI Journal Publications. His Number of Citations about 2248. Dr Talha developed a novel technique to separate the polymer backbones and employed a methodology to realize efficient and stable solids that will make these polymers suitable for LEDs

Smart Self-assembly for Sustainable Nanophotonics and Optoelectronics

Reducing the greenhouse gas emissions have already been accepted as the straightforward way to limit the environmental effects of the global warming. Toward this aim, significant efforts have been put forward in the field of photonics as well. However, the widespread use of these technologies has a cost: the dependence on rare earth elements. As part of the efforts to eliminate this dependence, our group works on the utilization of colloidal

39



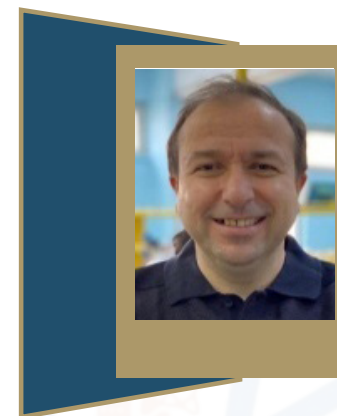
Egyptian Knowledge Bank
بنك المعرفة المصري



nanoparticles to produce nanophotonic structures and optoelectronic devices using controllable self-assembly methods, i.e., smart self-assembly. In this talk, we will first discuss our work where we tailored the electrostatic self-assembly of colloidal quantum dots on 2D surfaces using light [1]. Owing to the local heating due to laser irradiation, the quantum dots gain enough kinetic energy such that they can escape the electrostatic attraction. This approach allowed us to produce patterns having 100s of micrometers by a few centimeters. Next, we will present the opportunities that the light-assisted local heating offers for DNA-driven self-assembly. Within this framework, we will first explain our results on tailoring the optical transmission of the self-assembled networks made of DNA-functionalized gold nanoparticles [2]. Subsequently, we will continue with the control of 2D self-assembly of DNA-functionalized quantum dots as part of our efforts towards developing novel fabrication technologies [3]. We will then talk about our novel photodetector application made of the DNA-functionalized metal and semiconductor nanoparticles. Owing to DNA-DNA interaction, these photodetectors exhibit a negative responsivity.



Egyptian Knowledge Bank
بنك المعرفة المصري



Biography

Prof. Dr. Cem Bulent Ustundag

Professor in Department of Bioengineering,
Yildiz Technical University, Esenler, Istanbul, Turkiye

Dr Ustundag is a professor in the Department of Bioengineering at Yildiz Technical University. He received B.Sc. degree in Ceramic Engineering from Dumlupinar University, Turkey in 1999 and M.Sc. degree in Materials Science & Engineering from Gebze Technical University in 2003, and he has dual Ph.D. degree in Materials Science & Engineering from Yildiz Technical University (YTU), Turkey in 2011 and Biomaterials from Tohoku University, Japan in 2013. Dr. Ustundag served as the Head of Ceramics Program and was appointed as the Head of Technical Programs Department at YTU Vocational School. Dr. Ustundag was promoted to full professor in 2023. He has authored/co-authored over 46 research papers, 13 review papers, 2 book (co-editor), 10 book chapters, 7 patents and 11 patent applications, and over 100 national and international conference papers. In addition, he has consulted with Spinamer Ltd.

Innovative Microneedle-Based Platforms Developed 3D Printing for Enhanced Transdermal Drug Delivery and Tissue Engineering.

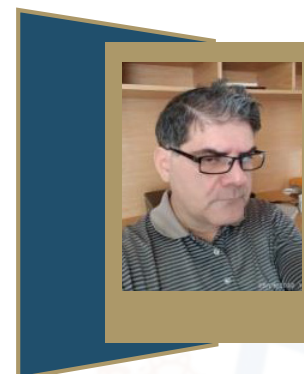
Abstract:

This study presents the design and comprehensive characterization of innovative microneedle (MN)-based therapeutic systems fabricated via Digital Light Processing (DLP) 3D printing, a technique offering a high-



ly precise and minimally invasive drug delivery platform. Photocross-linkable gelatin methacryloyl (GelMA) and GelMA–keratin methacryloyl (KerMA) composite hydrogels were used as bio-inks. The DLP printing process produced mechanically robust MN arrays with sharp, skin-piercing tips and customizable geometries suitable for targeted applications, including tympanic membrane (TM) perforation repair. To achieve multifunctionality, the MN patches were coated with antibiotic-loaded Poly(vinyl alcohol) (PVA) nanoparticles (NPs) containing either Amoxicillin (AMX) or dual-loaded Gentamicin (GEN) and Fibroblast Growth Factor-2 (FGF-2) coaxial NPs. Mechanical testing confirmed improved strength and elasticity in NP-integrated hydrogels, ensuring their structural integrity for practical use. Drug release experiments revealed a favorable burst release profile, approximately 80% of AMX within 6 hours and 60–64% of GEN/FGF-2 within 12 hours, following Korsmeyer–Peppas kinetics (Super Case II transport). Importantly, MN systems loaded with antibiotics exhibited marked antimicrobial activity against *Staphylococcus aureus* and *Escherichia coli*. Biocompatibility assessments using L929 fibroblasts and human adipose-derived mesenchymal stem cells (hADMSCs) confirmed excellent cytocompatibility across all formulations. These findings establish DLP 3D printed, NP-coated GelMA-based MNs as promising dual-action therapeutic platforms with significant potential for wound healing and targeted tissue regeneration.

Keywords: 3D printing; biomaterials; hydrogels; microneedle systems; drug delivery.



Biography

Prof. Dr. Guillermo Guadalupe Hinojosa Aguirre

Colonia Chamilpa, Cuernavaca 62210, Morelos, M/exico

Official email: hinojosa@icf.unam.mx

Personal email: guillermohin@gmail.com

Tel: +52 (777) 429 9318

Dr. Guillermo was a Visiting professor on sabbatical at the University of Nevada, Reno 2015-2016. He works as Professor level B (Titular B Researcher, after winning tenure) at ICF, UNAM 2010 and a Professor level A, at ICF, UNAM 2003. Dr. Guillermo received his B. S.c in Physics from University of Guadalajara in 1991. Dr. Guillermo had his M. Sc (1993) and Ph. D (1998) in Physics (degree earned by qualifying exams) from National Autonomous University of Mexico -UNAM. He was a member of the admission committee of the graduate school of physics at UNAM,(2020) and also member of the admission committee of the graduate school of physics at UAEM in 2020. He has about 56 scientific articles in major journals and about 24 conference proceedings.

Quantum Lifetimes of Excited Negative Ions: A New Experimental Approach

Abstract

Negative ions consist of a neutral atom or molecule that has captured an extra electron despite of being neutral. The nature of this electronic bond in completely quantum mechanical



and is very difficult to realize from the theory, since it implies very accurate methods that have to consider electronic correlation. The study of this species is complicated by their transient populations and the difficulties in insulating them. Their strangeness contrasts with their abundance in Nature: they are a common find in applied plasma, in the interstellar space and in several atmospheric environments, such as in earth's troposphere and in Titan's ionosphere. If it wasn't enough, negative ions generate excited metastable states that decay via auto-detachment in several time scales. In this work, I will present a new method to determine the lifetime of excited states of negative ions in the time scale of tens to hundreds of nano-seconds, a time scale that is difficult to approach with spectroscopic methods given the limitations imposed by the experiment. The novelty of the present approach consists in using electron loss collision induced cross-sections in the energy scale of some few keV. This advance also helps resolve a decade-long discrepancy on the cross sections.



Biography

Prof. Dr. Ahmed Asaad I. Khalil

Chairman of Laser Sciences and Interactions
Department,

National Institute of Laser Enhanced Sciences
(NILES), Cairo University, Giza, Egypt.

Professor. Ahmed Khalil received his B.Sc. in Physics (in 1990) from the Cairo University. and Master Thesis in Laser Physics (in 1996) in the field of Laser Semiconductor Interactions. He received his PhD in Laser sciences, Laser Experimental Physics V Institute, Ruhr University Bochum – Germany through DAAD Scholarship. He did postdoctoral studies for laser sciences (Aachen, Germany) in the field of Laser Industrial Applications. He worked as a scientific Advisor for the Damam University v. Rector and Academic. He worked as a Chairman of Laser Sciences and Interactions Department, National Institute of Laser Enhanced Sciences, NILES, Cairo University, Giza, EGYPT .

Green Synthesis of Novel, Smart, and Hybrid Nanocomposites for the Applications of Reclamation of Aged Transformer Oil and Protection of Electro-Optical Sensors from High-Power Lasers

Abstract

Laser-based devices can focus energy over long distances, potentially damaging sensors remotely. Our work describes a one-step methane chemical vapor deposition technique for producing graphene nanosheet/carbon nanotube (GNS/CNT) hybrid nanocomposites. X-ray diffraction, TEM, and SEM analysis revealed that all samples included a homogenous dispersion of flake-like graphene and tubular



CNTs. Metal oxides and carbon nanostructures interact to produce significant UV-near-IR absorption. This makes the hybrid appealing for applications such as photothermal, photocatalytic, sensing, and optical limiting. TGA revealed that Mo improves thermal stability by enhancing carbide-based carbon protection, allowing for precise control of heat resistance by compositional tuning. These GNS-CNT hybrids are promising for photonic devices, high-power laser protection, and other advanced optical and electrical applications. Open-aperture Z-scan studies revealed strong broadband OPL responses under nanosecond laser excitation. In addition, we obtained aluminium oxides and silicates from the sludge produced from drinking water treatment and examined both quantitatively and qualitatively using different spectroscopic techniques. For electrical equipment (transformer) to last a long time, insulating oils are essential. The lifespan of a transformer is impacted by the ageing and degradation process of insulating oils under operating conditions. The optimum conditions were verified at 65°C, which significantly improved the breakdown voltage, water content, colour, acidity, interfacial tension, dielectric dissipation factor, furanic compounds content, total dissolved gases, and sulphur content. It was found that the parameter values after the treatment process meet the IEC 60296-2020 standard for evaluating unused mineral insulating oils for transformers and switchgear.

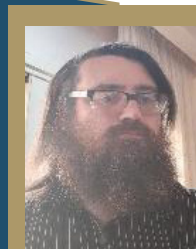
Biography

Prof. Alexey Golovnev

Centre for Theoretical Physics

British University in Egypt Sherouk City, Cairo, Egypt

Email : agolovnev@yandex.ru



Alexey Golovnev, was born on 3 July 1980, in Saint Petersburg, Russia. His research interests include General relativity and modified gravity; nonlocal gravity; torsion and non-metricity. Massive gravity; bimetric gravity; extra dimensions and brane-worlds; quantum gravity; eternal inflation. He had bachelor's degree in physics (with Honours) from Saint Petersburg State University, Saint Petersburg, Russia 1996-2000,) and received his master's degree in theoretical and mathematical physics (with Honours 2000-2002). From 2002-2005 he was PhD student at the high energy physics department of Saint Petersburg State University. In 28 December 2006 - he've got his PhD in theoretical physics. He worked as researcher at Asia Pacific Center for Theoretical Physics in Pohang, South from January – May 2018. He was lectures at ITMO University, Saint Petersburg in Autumn 2018. From September 2019 to September 2023 he was senior lecturer, Since September 2023 – he worked as research professor at the Centre for Theoretical Physics of the British University in Egypt, Cairo

Geometry of Gravity

Abstract:

I will describe the Riemannian geometry foundations behind the theory of General Relativity, its relations to the principle of equivalence, as well as its beauty and its potential issues if we believe in quantum physics. Then I will give a brief review of modified gravity models based on different types of geometry, including various types of teleparallel gravity.



Biography

Prof. Metwally Montaser

Professor Molecular Biology, Zoology
Department, Faculty of Science, Al-Azhar
University, Cairo, Egypt
Email: metwally@azhar.edu.eg
+20-100-7247913

Prof. Metwally Montaser received his B Sc in Zoology: Zagazig Univ., 1991. M Sc Degree in Histology, Cytology and Genetics: Cairo Univ., 1999. In 2003 he received Ph.D. Degree in Genetic Engineering: ZAG-BOKU, Vienna, Austria / Al-Azhar Univ., Egypt. 2018. Professor of Molecular Biology: Al-Azhar Univ., Egypt

2022 Vice Dean Faculty of Science, Al-Azhar University, Cairo 11884, Egypt.

2021 Head of Zoology Department Faculty of Science, Al-Azhar University, Cairo 11884, Egypt. 2014 Associate Professor Biotechnology Department, Faculty of Science, Taif University, Taif 21974, KSA. 2013 Assistant Professor Zoology Department, Faculty of Science, Al-Azhar University, Cairo 11884, Egypt.

2008 Assistant Professor Biotechnology Department, Faculty of Science, Taif University, Taif 21974, KSA. 1994 Demonstrator Faculty of Science, Al-Azhar University, Cairo 11884, Egypt.

Advances and Challenges in DNA Typing for Forensic and Ecological Applications

DNA is tightly packed with nuclear proteins and safeguarded within the cell nucleus, similar to how bone capsules protect the nervous system. Even minute biological traces can yield DNA, which can be partially or

fully amplified into millions of copies. Although environmental factors may degrade parts of the DNA molecule, they do not alter its nucleotide sequence. DNA can also be analyzed in mixed samples using barcoding techniques. These properties make DNA the most reliable molecule for identifying and barcoding living organisms.

Achieving 100% accuracy in genome identification remains challenging, with implications for ecologists, forensic experts, pathologists, and researchers. My lecture will highlight recent publications on DNA typing, addressing sample-related challenges and species-level considerations.

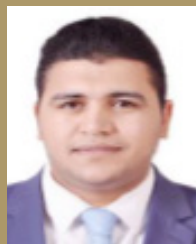
STR analysis remains the gold standard for human identification but struggles with highly degraded or complex mixtures, whereas SNP and mtDNA approaches offer better performance on compromised samples but with reduced discriminatory power.

At the species level, DNA barcoding and genomic approaches have expanded applications beyond human forensics to wildlife crime detection, biodiversity monitoring, and disaster victim identification. Publications emphasize the importance of standardized protocols and reference databases to ensure accurate species assignment, particularly when analyzing non-human DNA from plants, animals, and

microbial sources. Emerging technologies such as microhaplotypes, epigenetic markers, and AI-driven workflows promise enhanced resolution for species differentiation and tissue origin determination.

Despite these innovations, challenges persist in interpreting complex mixtures, avoiding contamination, and maintaining ethical standards related to genetic privacy. Future directions include integrating multi-omics data, improving probabilistic genotyping software, and developing portable sequencing platforms for rapid, field-based analysis. These advancements aim to balance technological progress with reliability and ethical responsibility, ensuring DNA typing remains a cornerstone for both forensic science and ecological research.

Keywords: DNA typing, sampling, species, challenges.



Biography

Dr. Hassan Nageh

Assistant Professor, Head of “Advanced Nanomaterials, Polymeric, and Industrial Catalysis” research group

E-mail: science_as2000@yahoo.com

Or hassan.nageh@bue.edu.eg

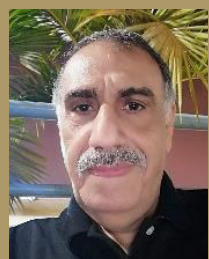
Dr. Hassan worked as an assistant Professor, Head of “Advanced, Nanomaterials, Polymeric, and Industrial Catalysis” research group, from 2020 – up to now He received his M. Sc. Faculty of Science, Alexandria University, Egypt in 2015, Dr Hassan also received Ph.D. (MEXT Scholarship), Graduate School of Chemical Sciences and Engineering, Hokkaido University, Japan in 2018. Dr Hassan had Postdoctoral Fellow (Young Scientist program by Hokkaido University), Institute for Catalysis, Hokkaido, University, Japan from Dec. 2018 – April 2019 and Postdoctoral Fellow, Nanotechnology Research Centre (NTRC) at the British University in Egypt (BUE), Egypt from 2019-. 2020. Dr Hassan worked more than 13 years in chemistry research for academia (March. 2022), Supervise Master/Ph.D. postgraduate students from Ain Shams, Helwan, Bani-seuif, and Banha Universities (ongoing). Dr Hassan worked as Program director and founder of NTRC studentship (2021 – ongoing), Project member > 8 national and international research project (2012 - 2024), Dr Hassan has teaching experience and trainer in undergraduate and postgraduate levels.

Structure–Activity Relationship in Vanadium Pentoxide Catalysts Abstract

Abstract:

Homogeneous catalysts offer high activity but face challenges in separation, recyclability, and product purity, while heterogeneous cata-

lysts improve reuse and separation yet may suffer from mass transfer limitations. Nanocatalysts bridge both types, providing high surface area, elevated surface energy, and enhanced catalytic activity for diverse applications. This talk explores the morphology-dependent photocatalytic performance of Nanomaterials such as V_2O_5 . Its preparations via co-precipitation and hydrothermal methods produced nanoflakes (CVO) and hollow micro-nano spheres (HVO), respectively, both exhibiting orthorhombic V_2O_5 with band gaps (2.30-2.36 eV). In comparison to CVO, HVO showed improved properties such as pore volume that was 3.7 times larger, BET surface area that was 2.7 times greater ($52.7 \text{ m}^2\text{g}^{-1}$), and smaller crystallite size of 32.2 nm. Under 100 ppm MB concentration, HVO achieved 80% dye removal efficiency, while CVO showed negligible activity. The hollow spherical morphology and outer shell texture provided enhanced surface area and mesoporous structure, establishing hydrothermal synthesis as the preferred route for active V_2O_5 photocatalysts in water treatment applications.



Biography

Prof. Dr. Abdelbaset Zayed,

Professor of medical Entomology at Faculty of
Science, Al-Azhar University (girls branch),

Dr. Abdelbaset is a consultant of vector control and insecticide resistance. Dr. zayed is also a consultant of research institute of medical entomology (MoH & P, Egypt). He worked as a head of the department of zoology, Al-Azhar University, Assiut branch from 2003 to 2007. He is a member of the Supreme Council of Professor Promotion in Al-Azhar University in addition he was a member of the Integrated Vector Management Committee, Ministry of Health and Population, Egypt (2014- 2017). He was Principle Investigator in 3 projects with TDR and WHO/EMRO. Also, he was Principle Investigator in more than 8 research projects in NAMRU3 from 1997 to 2014. He published many researches in national and international journals.

Genetically Modified Mosquitoes: An Innovative Approach in Mosquito Vector Control

Traditional mosquito control strategies such as insecticides, larvicides, habitat management, and biological control are increasingly limited by the emergence of insecticide resistance, environmental challenges, and the adaptive resilience of vector populations. These constraints have driven the exploration of genetic-based alternatives as sustainable and complementary vector control tools.

Genetic Modification Strategies

1- Population Suppression

It's aim to Reduce mosquito numbers in the wild by either RIDL (Release of Insects carrying a Dominant Lethal gene): genetically engineered male

mosquitoes mate with wild females, producing offspring that die before adulthood, leading to population decline or Gene Drive Systems: Use CRISPR-Cas9 or similar molecular tools to bias inheritance and rapidly spread genes that reduce fertility or alter sex ratios within mosquito populations.

2- Population Modification (or Replacement)

Through prevent mosquitoes from transmitting pathogens by specific genes are introduced to make mosquitoes resistance to pathogens such as Plasmodium (malaria parasites) or dengue virus. Otherwise by integration of Wolbachia bacteria.

Biosafety and Ethical Considerations

Deployment of genetically modified mosquitoes requires careful assessment of, Biosafety (potential effects on ecosystems and non-target species), Ethics (informed consent and public engagement in affected communities and Regulation (strong oversight to ensure safe field implementation and monitoring).

Future Perspectives

Emerging technologies promise to refine and strengthen genetic control approaches:

- CRISPR-based gene drives - Precision-guided sterility systems
- Multi-gene resistance engineering - Ecological modeling for impact prediction

Together, these innovations represent a forward-looking, science-driven framework for sustainable mosquito control and reduction of vector-borne diseases.

Keywords: Genetic control, Genetically Modified Mosquitoes, Wolbachia bacteria, CRISPR-Cas9



Egyptian Knowledge Bank
بنك المعرفة المصري



Oral & Poster Abstract



1009-ICBAS-(Oral)

“Biology & Agriculture Science / Zoology”

The role of *Trigonella foenum-graecum* L. seed extract in the progression of type 2 diabetes in *Drosophila melanogaster* modeling.

Zeinab Boshra Hussein*

Ural federal university

Abstract

We tested the extract from fenugreek seeds (*Trigonella foenum-graecum* L.) to minimize the symptoms of type 2 diabetes using the *Drosophila melanogaster* model. Individuals grown on a glucose-enriched medium were cultured without adding the extract to the nutrient substrate or on a substrate containing the extract. The analysis revealed the concentration of the extract (4%) that resulted in the highest survival rate. On days 21 and 28 of life, individuals grown with excess glucose and subsequently cultured on a medium containing the extract showed a significant decrease in survival rate. Accordingly, *Trigonella foenum-graecum* L. extract has an antidiabetic effect when used for a long time. The extract from Fenugreek seeds (*Trigonella foenum-graecum* L.) possesses an antidiabetic effect upon prolonged use, which is manifested by a reduction in the glucose level and an increase in the survival rate of the model organism (*Drosophila melanogaster*) when raised on a high-glucose medium. These results confirm the potential of *T. foenum-graecum* as a natural geroprotector and adaptogen for minimizing the manifestations of Type 2 Diabetes.

Keywords: Diabetecs, drosophila melanogaster, fenugreek, glucose

56

1016-ICBAS-(Oral)

“Biology & Agriculture Science / Zoology”

Heat Islands Influence on Mosquito Diversity and Associated Environmental Variables in Giza Nile River Region

Alaa Nagy¹, Ahmed El-Zeiny², Mohamed Sowilem², Wedad Atwa¹, Manal Elshaier¹

¹ Zoology and Entomology Department Faculty of Science, Al-Azhar University (Girls)

² National Authority for Remote Sensing and Space Sciences

Abstract

Urban Heat Island (UHI) areas are characterized by high land surface temperature, low humidity, and sparse vegetation, which are thought to enhance mosquito-borne illness transmission. In this study, Remote Sensing (RS) and Geographical Information System (GIS) integrating with entomological surveys were used to identify UHI areas and study their influences on mosquito larval habitats and water quality in the Nile Valley zone of Giza governorate. Entomological survey was conducted inside and outside UHI areas along the study area. A total number of 20 sites (13 sites inside and 7 sites outside UHI areas) were inspected during the period of 6th –9th December 2019. Mosquito larvae and water were sampled and transported to laboratory for identification and analysis. Along with field trip, Landsat-8 (OLI) images were processed to determine and assess Land Surface Temperature (LST), UHI, Land Use/ Land Cover (LULC), and variable spectral indices. Results showed that the total area of permanent UHI in the study area is equal to 28.93 km². Majority of mosquito larval species recorded higher mean levels inside than outside UHI, except *Culex (Cx) pipiens*. Levels of pollution (Turbidity, Salinity, and Heavy metals) were recorded as higher in the habitats located in the UHI areas. Spectral indices revealed that UHIs were characterized by small vegetation coverage and increased built-up land. Consequently, low humidity levels were noticed in habitats of UHI. It could be concluded that UHI areas in Giza Governorate's Nile Valley zone are considered high-risk areas regarding environmental pollution and disease transmission.

Keywords: Mosquito, water quality, remote sensing, urban heat islands

57



1032-ICBAS-(Oral)

"Biology & Agriculture Science / Zoology"

Evaluation of toxicity and biochemical alterations induced by some insecticides in *Spodoptera frugiperda* larvae

Zeinab M. Biomy¹, Walaa A. Moselhy¹, Shaymaa H. Mahmoud² and Lina A. Abuolkhshab¹

¹Zoology & Entomology Department, Faculty of Science, Al-Azhar University, Cairo, 11884, Egypt

²Zoology Department, Faculty of Science, Menoufia University, Menoufia, Egypt.

Abstract

Spodoptera frugiperda is a major pest that severely affects various crops. This study aims to evaluate the effects of four insecticides (chlorfenapyr, Angian, Indosafe, and spinetoram) against the 3rd instar larvae of *S. frugiperda*. The results indicated that the four tested insecticides produced a high mortality rate 24 h post treatment with significant variation in the effectiveness of each against larvae under laboratory conditions. Indosafe recorded the highest mortality rate, followed by spinetoram, chlorfenapyr, and Angian with LC₅₀ value of 10.355, 20.165, 23.78 and 208.820 respectively. Results of slope values indicated variability in insect population's susceptibility to the tested insecticides using leaf-dipping method. The biochemical response of *S. frugiperda* larvae to the LC₅₀ concentrations of the four tested insecticides was assessed via the determination of total protein content, protease and lipase activities. Significant decrease in protease and lipase activities was observed in treated larvae compared with the control, except for lipase activity, which showed a significant increase at the LC₅₀ concentration of chlorfenapyr. Additionally, a significant reduction in total protein content was recorded in all treated larvae relative to the control group. These findings suggest that the used insecticides, particularly Indosafe, effectively disrupt key metabolic processes in *S. frugiperda* larvae, providing insight into their potential as efficient control agents in integrated pest management programs. Keywords: *Spodoptera frugiperda*, insecticides, susceptibility, larval mortality, biochemical response, integrated pest management.

Keywords: *Spodoptera frugiperda*, insecticides, susceptibility, larval mortality, biochemical response, integrated pest management.

1003-ICBAS(Poster)

"Biology & Agriculture Science / Zoology"

An AI-miRNA Approach for Enhanced Differential Diagnosis of Ovarian Disorders

Mariam Fahim El hadidi

Department of Zoology and Entomology. Faculty of Science (Girls), Al-Azhar University – Cairo,

Abstract

It is indeed quite difficult to make a clear distinction between various ovarian disorders, largely due to the fact the symptoms tend to be similar and the sources of reliable diagnostic indicators are very limited. In order to overcome this widely experienced clinical challenge, our research presents a novel artificial intelligence platform, which combines a range of data types, including clinical profiles, ultrasound images, and microRNA (miRNA) expression patterns in serum. Combining these modalities, it is expected that the precision of differential diagnosis in ovarian pathology can be enhanced. The approach we use includes a mixed patient population and takes advantage of stratified k-fold cross-validation, which provides strong model training and validation. Sophisticated machine learning methods will be created to enable electronic combination of multi-modal information. Interestingly, we believe that the model will help identify some of the miRNA signatures that have gone undetected before and are strongly linked to the development of premature ovarian insufficiency (POI), which may help illuminate disease mechanisms. Notably, we are also implementing Explainable AI methods, particularly SHAP value analysis, to improve the transparency of the model and promote trust in the clinic. This will enable us to detect and understand the most predictive features of all types of data, and, ultimately, initiate earlier and more successful intervention. Altogether, this framework may represent a paradigm shift in the field of gynecological diagnostics, successfully connecting molecular biology and AI to deliver actionable and real-time information to clinical practice.

Keywords: Artificial Intelligence (AI), microRNA (miRNA), Ovarian Disorders, Differential Diagnosis, Machine Learning, Multi-modal Data Fusion, Explainable AI (XAI), Polycystic Ovary Syndrome (PCOS), Premature Ovarian Insufficiency (POI), Precision Medicine.



Egyptian Knowledge Bank
بنك المعرفة المصري



1035-ICBAS-(Poster)

“Biology & Agriculture Science / Zoology”

In vitro reproduction of equine oocytes

**Rasha Mansour Abd El-hameed¹; Nehal Ali Abu- Elnaga¹;
Omaira Tawfeek Kandeel²**

¹Zoology and Entomology Department Faculty of Science, Al- Azhar University (Girls)

²National Research Centre

Abstract

Equine are an important domestic animals providing many materials for human. It has played an important role in human history, serving not only as working animals but also as essential contributors to agriculture. Equines have been used for thousands of years for transportation, agricultural work, and other purposes. Equine population is declining and at risk of extinction, so there is need for genetic conservation of these breeds. In recent years, researchers have introduced several methods to improve the reproductive efficiency of equines. The modern animal reproduction technology such as In vitro assisted reproductive techniques have been improved in the last years. Immature oocytes are matured in vitro (IVM), fertilized by intra-cytoplasmic sperm injection (ICSI), and cultured until day 8-10 of development at lab (in vitro). This review summarizes the in vitro assisted reproduction of equines oocytes including in vitro maturation (IVM), in vitro fertilization (IVF), mitochondrial distribution (MD) and gene expression to improve equine oocytes development and help it from the risk of extinction.

Keywords : In vitro, maturation, fertilization, Mitochondria and gene expression.



Egyptian Knowledge Bank
بنك المعرفة المصري

1037-ICBAS-(Poster)

“Biology & Agriculture Science / Zoology”

Marine Collagen as a Sustainable Biomaterial for 3D Organoid Culture and Regenerative Medicine

Ali E. Elhagry¹, Mosab N. Rizk², Mahmoud Ali Mohamed³, Hosni A M Hussein⁴

¹Center of Excellence for Stem Cells and Regenerative Medicine, Zewail City for Sciences and Technology, Giza, Egypt

²MBBCH at Mansoura Manchester Medical School, Mansoura University,

³Department of Microbiology, Faculty of Science, Al-Azhar University, Assiut.

⁴Department of Pathology, University of Cambridge, Tennis Court Road, Cambridge, CB2 1QP, Britain.

Abstract

The demand for sustainable and biocompatible biomaterials has driven increasing interest in marine-derived collagen as an alternative to traditional mammalian extracellular matrix (ECM) sources. Collagen obtained from marine fish is abundant, cost-effective, and poses a lower risk of zoonotic disease transmission, immunogenicity, and ethical concerns compared to bovine or porcine sources. In the present study, collagen was successfully isolated from marine fish skin through acid-solubilization and enzymatic extraction, followed by purification and characterization. Structural integrity was confirmed by Fourier-transform infrared spectroscopy (FTIR), SDS-PAGE, and scanning electron microscopy (SEM), demonstrating preservation of the native triple-helical structure and fibrillar morphology. Thermal stability and solubility analyses revealed favorable physicochemical properties suitable for use as a biomaterial in three-dimensional (3D) culture systems.

To evaluate its biological functionality, the extracted collagen was employed as a scaffold for organoid culture. Results showed that fish collagen supported stem cell adhesion, proliferation, and self-organization into organoid-like structures, comparable to those cultured on commercially available ECM substitutes such as Matrigel. Furthermore, the scaffold promoted cellular differentiation and maintenance of tissue-specific phenotypes, highlighting its potential to mimic the native microenvironment. Collectively, these findings demonstrate that marine fish collagen provides a sustainable, safe, and efficient platform for organoid engineering. Its application may advance regenerative medicine, tissue engineering, and disease modeling, while simultaneously addressing limitations associated with mammalian-derived ECMs.

Keywords: Marine collagen; Biomaterial; Organoid culture; Extracellular matrix (ECM); Tissue engineering; Regenerative medicine.



1030-ICBAS (Oral)

“Chemistry / Organic Chemistry”

Synthesis of multifunctional surface-active agents as additives in eco-friendly emulsifiable cutting fluid formulations derived from oil manufacture waste products

Eman Mohamed Kandeel¹, Toka Hassan¹, Mohamed Sadek Taher¹, Entsar Badr¹, Aziza El-Tabei²

¹ Chemistry Department, Faculty of science Al-Azhar university

² Egyptian Petroleum Research Institute (EPRI)

Abstract:

This work aims to participate in the solution of the environmental pollution problem by recycling waste oil from spent bleaching earth (SBE) that is disposed of in landfill sites and formulating metal cutting fluids (MCFs) dependent on more eco-friendly alternatives. Therefore, we prepared different types of emulsifiers based on recovered vegetable oil and confirmed their chemical structure by spectroscopic analysis. The individual and mixed emulsifiers at different ratios of amphoteric/nonionic were used as additives in the preparation of different MCF formulations. According to the results, the mixed emulsifiers at different ratios of amphoteric/nonionic (Formulas A, B, and C) displayed stable emulsions compared to individual emulsifiers. A corrosion test was performed on stable soluble oil emulsions but only Formulas B, and C demonstrated good corrosion protection. The results showed that formula B was better than formula C at lowering the particle size (49.89 nm), surface tension (28.5), and contact angle (21.80 on CS, 19.63 on Al, and 14.74 on WC). The results also demonstrated that formula B was successful in lowering the friction coefficient as the sliding velocity increased. The cytotoxicity test proved that B is safe for the environment and human in comparison to the commercial sample and this is in agreement with the sustainable development goals of Egypt 2030.

Keywords: Eco-Friendly Cutting Fluid (MCFs) Waste Oil Recycling Spent Bleaching Earth (SBE) Emulsifiers Amphoteric/Nonionic Ratio Emulsion Stability Corrosion Protection Wetting Performance Friction Coefficient Cytotoxicity

1006-ICBAS-(Poster)

“Chemistry / Environmental Sustainability and Natural Resources Protection”

Environmentally friendly fouling release nanocomposite coatings for preventing the attachment of marine biofouling

Mohamed Sayed Selim¹, Nesreen Abd Elhamid Fatthallah^{*1}, Shima Anwar Higazy¹, Zhifeng Hao²

¹ Egyptian Petroleum Research Institute

² Guangdong Provincial Key Laboratory of Plant Resources Biorefinery, School of Chemical Engineering and Light Industry, Guangdong University of Technology, Guangzhou 510006, PR China

Abstract

Since the use of tributyltin compounds in antifouling coatings was prohibited in 2003, the search for environmentally friendly alternatives has intensified. Because of their nonstick, environmental, and economic benefits, fouling-release nanocoatings have garnered considerable attention. They use physical anti-adhesion terminology to deter any fouling attachment. Superhydrophobic surfaces exhibit micro/nano-roughness and low surface free energy characteristics, which can facilitate the fabrication of dynamic antifouling surfaces. Polydimethylsiloxane/graphene-derived nanocomposite coatings have been designed to combat biofouling adhesion with ecological and eco-friendly effects, rather than biocidal solutions. Graphene-based nanofillers can be used as functional coating nanofillers that would release fouling and confer surface robustness were facilely created. Several gram-negative and gram-positive bacteria and fungi strains were employed to assess the coatings' efficacy. Biological tests evaluated the microbial viable cell percentages and the coating's toxicity against sailfin molly fish. Histological alteration of fish liver hepatocytes was also evaluated. Well-dispersed silicone/GO-based nanocomposite (2.0 nanofiller wt.%) surface demonstrated the highest water contact angle ($150^\circ \pm 1^\circ$), micro/nano-rough topology, lowest SFE (19.6 mN/m), the lowest biodegradability percentages against microbial colonization (4.0-12.0%), and non-toxicity against non-target fish (at 0.0-3.0% nanofiller wt.%) after 30 days of experiments. Long-term durability and self-cleaning performance are among the advantages of developing effective and stable modeling alternatives. Superhydrophobic polymeric/graphene nanocomposites can develop durable and eco-friendly antifouling coatings.

Keywords: Antifouling coatings, superhydrophobic, Fouling-release, Graphene-based nanofillers, microbial strains, fish toxicity, histology



1013-ICBAS-(poster)

" Chemistry / Inorganic Chemistry "

Comparative Study of Carbon Nanotube and Nano-Clay Incorporation into Pectin/Na-Alginate Bio-Based Hydrogels for Dye Removal

Hayam M. Ahmed*¹, Shaimaa S. Ali¹, Eman Shoukry¹, Ghada A. Mahmoud²,
Asmaa A. Sayed², Neveen M. Hegazy²

¹ Chemistry Department - Faculty of Science Al-Azhar University (Girls)

² Polymer Chemistry Department, National Center for Radiation Research and Technology, Egyptian Atomic Energy Authority

Abstract

This study investigated the enhancement of dye removal efficiency through a comparative analysis of carbon nanotube (CNT) and nanoclay (NC) incorporated in Pectin/Na-alginate bio-based hydrogel. The hydrogels were synthesized via gamma irradiation, with the incorporation of CNT and NC studied. Fourier transform infrared (FTIR) analysis confirmed successful hydrogel synthesis, revealing slight spectral changes upon the incorporation of CNT and NC into the hydrogel matrix. X-ray diffraction (XRD) analysis indicated the amorphous nature of the prepared nanocomposite hydrogels. Thermal properties demonstrated the superior performance of CNT-incorporated hydrogels compared to NC-incorporated and unmodified hydrogels. Atomic force microscopy (AFM) revealed surface morphology changes with the incorporation of CNT and NC. Additionally, the efficiency of dye removal, specifically for Malachite Green (MG) and Touliden Blue (TB) dyes, was evaluated. Results indicated the enhanced performance of CNT-incorporated hydrogels for MG dye removal, while NC-incorporated hydrogels showed superior performance for TB dye removal. The Pseudo-secondorder model emerges as the optimal kinetic model for both dyes on both hydrogels, indicating a chemisorption mechanism characterized by strong bonding. Isotherm studies further support these findings, with the Freundlich model demonstrating superior applicability in describing heterogeneous surface energies and multilayer adsorption processes observed in MG and TB dye adsorption. Thermodynamic analysis underscores CNTs@PC/Na-Alg/PAAc's preference for MG dye removal and NC@PC/Na-Alg/PAAc's effectiveness in TB dye removal. This study underscores the potential of CNT and NC incorporation in improving the dye removal capabilities of Pectin/Na-alginate bio-based hydrogels, offering valuable insights for environmental remediation applications.

Keywords: Adsorption; characterization; bio-based hydrogel; nanocomposite; Radiation dye removal.

1031-ICBAS (Poster)

"Chemistry/Analytical Chemistry"

Practical and Experimental Review on Eco-Friendly Recovery of Lithium, Cobalt, and Precious Elements from Spent Lithium-Ion Batteries Using Deep Eutectic Solvents (DES)

Randa N. Yamani, Moustafa M. Elmasri

Inorganic Analysis and Electrochemistry Lab, National Institute of Standards

Abstract

The rapid growth of lithium-ion battery (LIB) production has intensified the need for sustainable management of spent cells and the recovery of valuable metals, including lithium (Li), cobalt (Co), and nickel (Ni). Conventional acid-based recycling methods are effective but environmentally damaging, producing large volumes of secondary waste. Deep Eutectic Solvents (DES) have emerged as a promising, eco-friendly alternative for metal extraction and regeneration. This review provides a practical and experimental perspective on the recovery of Li, Co, and Ni from spent LIB cathodes using DES systems. The discussion covers the chemistry and preparation of DES types, their leaching behavior toward LiCoO₂ and LiNi_xMn_yCo_zO₂ (NMC) cathodes, and comparative assessments of standard mixtures such as Choline Chloride–Urea, Choline Chloride–Oxalic Acid, and Choline Chloride–Glycerol. Emphasis is placed on reproducible laboratory methods, metrological validation of ICP-OES measurements, and control of electrochemical characterization. The review also highlights solvent recyclability, waste minimization, and the circular-economy implications of DES-based recycling. Finally, current challenges—including high viscosity, incomplete metal dissolution, and the lack of standardized analytical protocols—are discussed, along with recommendations for developing scalable, traceable, and environmentally responsible recycling technologies.

Keywords: Battery recycling; deep eutectic solvents (DES); lithium-ion batteries (LIB); eco-friendly leaching; solvent reusability; sustainable materials recovery



1023-ICBAS-(Oral)

“Mathematics & Computer Science / Applied Mathematics”

Magnetohydrodynamic Flow of Nanoparticles and Microorganisms in a Deformable (Stretching/Shrinking) Channel

Alaa Sameh Abd Elsalam Ahmed*¹, A. M. Abdelwahab², Khaled S. Me-kheimer³, Shaimaa F. Ramadan²

¹ Faculty of Science (Girls), Al-Azhar University

² Faculty of Science, Al-Azhar University

Abstract

This paper develops a better understanding of blood flow in arteries, drug delivery systems using nanoparticles and the movement of microorganisms in biological system by studying the magnetohydrodynamics (MHDs) flow and heat transfer of viscous incompressible electrically conducting micropolar fluid containing nanoparticles and motile microorganisms in a channel with stretching and shrinking walls. This study can also be applied in Industrial processes, like colling of electronic devices. The fluid motion is assumed to be two-dimensional, steady and laminar. The impacts of magnetic field, radiation and chemical reactions will be considered. The governing nonlinear partial differential equations are reduced to a set of nonlinear ordinary differential equations (ODEs) in dimensionless form by using appropriate similarity transformations. Our system of equations is solved numerically by using the method of Rung-Kutta-Merson with Newton iteration in a shooting and matching technique. Mathematica package version 13.2 is used for solving the system. The effects of some variable parameters on velocity, concentration of microorganisms, micro-rotation vector, temperature and concentration of nanoparticles have been mentioned for a channel with stretching upper wall ($a_2 \geq 0$), and lower wall is stretching /shrinking ($a_1 \geq 0$ (<0)). The research is supported by validation process of our results.

Keywords: Hydromagnetic, nanoparticles, microorganisms, Stretching, Shrinking

1024-ICBAS-(Oral)

“Mathematics & Computer Science / Applied Mathematics”

Cattaneo-Christov Effects on MHD Nanofluid over a Sensor Surface through a Squeezed Channel

Rokaya Koritem*¹, Shaimaa F. Ramadan¹, Khalid K. Ali², Khaled S. Me-kheimer²

¹ Mathematics Department, Faculty of Science (Girls), Al-Azhar University, Nasr City 11754, Cairo, Egypt² Mathematics Department, Faculty of Science (Men), Al-Azhar University, Nasr City 11884, Cairo, Egypt.

Abstract

The use of nanoparticles on sensor surfaces is becoming more prevalent in medical applications, where they play an important role in improving sensor sensitivity and efficiency. This work looks at the magnetohydrodynamic (MHD) flow of a non-Newtonian nanofluid through a porous compressed channel over a sensor surface, using the Cattaneo Christov (C-C) model for heat and mass transfer. The impacts of Brownian motion, thermophoresis, porous media, and magnetic fields are investigated. Governing nonlinear partial differential equations are converted into ordinary differential equations using similarity variables and numerically solved using the Runge-Kutta-Merson method and a shooting strategy. The effects of various factors on velocity, temperature, concentration, with the presence of Brownian motion, thermophoresis, and preamable velocity parameters have been made. Results indicate that velocity is enhanced by increasing Hartmann number and porosity but reduced by suction and squeezing. Temperature rises with Brownian motion and thermophoresis but declines with increasing Prandtl number and thermal relaxation time. Concentration profiles are significantly influenced by mass relaxation, Schmidt number, and nanoparticle dynamics.

Keywords: Cattaneo-Christov model; Sensor surface; Nanoparticles; Squeezing flow; MHD.



1036-ICBAS-(Oral)

"Mathematics & Computer Science / Applied Mathematics"

Power-Minimal Trajectory Planning with Structural Optimization for Industrial Robots

Ahmed M. Elhamrawy¹, Farouk Elbarki¹, Eman H. Haraz¹, Sallam A. Kouritem²,

¹Department of Engineering Mathematics and Physics, Faculty of Engineering, Alexandria University, Alexandria 21544, Egypt

²Department of Mechanical Engineering, Faculty of Engineering, Alexandria University, Alexandria 21544, Egypt

Abstract

This paper presents a comprehensive framework for optimizing the trajectory and mechanical design of an industrial robotic arm with a strong emphasis on energy savings and environmental sustainability. The proposed method integrates motion planning and stress analysis to achieve minimal power consumption and enhanced structural efficiency across all joints. Each joint trajectory is formulated using a sixth-order polynomial equation, to ensure smooth, rest-to-rest transitions. MATLAB was used as the primary simulation platform to model joint behavior, execute optimization algorithms, and perform mechanical evaluations. A standard genetic algorithm (GA) was implemented to minimize the total energy required during task execution, simultaneously exploring various cross-sectional profiles (circular, square, and rectangular) in both solid and hollow configurations. The inclusion of realistic constraints such as self-weight, actuator mass, and payload ensured accurate stress and fatigue assessments under operational conditions. One of the key findings is that hollow rectangular links significantly outperform other geometries, enabling a considerable reduction in both structural weight and joint power demands by up to 57.4% and 65%, respectively, compared to solid circular ones. This translates into a lower carbon footprint and reduces operating costs, aligning the robotic design process with sustainable engineering goals. By minimizing both energy usage and material consumption, the proposed approach not only improves operational efficiency but also contributes to broader ecological objectives. The integration of trajectory optimization with mechanical analysis offers a practical pathway to designing intelligent, lightweight, and eco-friendly robotic systems for future industrial applications.

Keywords: robotic manipulator; Trajectory optimization; Dynamic analysis; Stress analysis; Genetic algorithm; Power minimization

1038-ICBAS-(Poster)

"Mathematics & Computer Science / Applied Mathematics"

Effective Solution of Optimization Problems with an Enhanced Giza Pyramids Construction Algorithm

Naglaa, M. Mohamed

Mathematics Department, Faculty of Science (Girls), Al-Azhar University, Nasr City

Abstract

Many real-world optimization problems can be solved by various algorithms that are not fast in convergence or gain enough accuracy. Meta-heuristic algorithms are used to solve optimization problems and have achieved their effectiveness in solving several real-world optimization problems. Meta-heuristic algorithms try to find the best solution out of all available solutions in the possible shortest time. A good meta-heuristic algorithm is characterized by its accuracy, convergence speed, and ability to solve high dimensions' problems. Giza Pyramids construction (GPC) has recently been introduced as a physics-inspired optimization method. This paper suggests an enhanced Giza Pyramids construction (EGPC) by adding a new parameter based on the step length of each individual and iteratively revises the individual's position. The EGPC algorithm is suggested for improving the GPC exploitation and exploration. Experiments were performed on 23 benchmark functions and four IEEE CEC 2019 benchmarks to test the performance of the proposed EGPC algorithm. The experimental results show the high competitiveness of the EGPC algorithm compared to the basic GPC algorithm and another four well known optimizers in terms of improved exploration, exploitation, convergence rate, and the avoidance of local optima.

Keywords: Benchmark test functions; Giza Pyramids construction; algorithm IEEE CEC 2019 benchmarks; Meta-heuristic algorithms; optimization; Wilcoxon rank-sum.



Sponsors



Egyptian Knowledge Bank بنك المعرفة المصري

إن بنك المعرفة المصري هو مبادرة أطلقها السيد الرئيس عبد الفتاح السيسي وذلك خلال العيد القومي للعلم عام 2014. ومن خلال تلك المبادرة، بدأت المجالس المتخصصة التابعة لرئاسة الجمهورية العمل على بدء مشروعات قومية عديدة تعني بتطوير التعليم

يمنح بنك المعرفة المصري كل المصريين من كل الأعمار الفرصة للوصول إلى أكبر قدر من المعرفة والمحتوى الثقافي والعلمي سواء كان ذلك أساسي أو تطبيقي أو في مجال التكنولوجيا أو العلوم الإنسانية أو الإدارية.

ويحتوي بنك المعرفة المصري على كتب ثقافية لعامة الناس وتتضمن كتباً تستهدف الأطفال يتم استخدامها من خلال أجهزة الكمبيوتر والهواتف الخلوية الذكية والتابلت في كل أنحاء الدولة. ومن ثم، بدأ المجلس التخصصي للتعليم والبحث العلمي في اتخاذ خطوات جادة لتنفيذ هذا المشروع عن طريق القيام بزيارات محلية وأجنبية وذلك بعد دراسة كل احتياجات المجتمع المصري وسوق النشر العالمي. وبعد تقييم كل المؤسسات والكيانات الكبيرة التي تعمل في هذا المجال، تمت مفاوضات من أجل استكمال هذا المشروع.

يتضمن بنك المعرفة المصري أربع بوابات فرعية، القراء، الأكاديمي، والتعليم، والأطفال. يعتبر بنك المعرفة المصري أحد الخدمات التعليمية الأكثر تطوراً حول العالم وتشمل مجموعة كبيرة من الأدوات. قام بنك المعرفة المصري بالتعاون مع العديد من مقدمي التكنولوجيا ليضمن لمستخدميه خبرة بحث عالية الجودة، ومثمرة، وموفرة للوقت، ومتعددة الاختصاصات، وتتميز بالدقة.



وزارة البحث العلمي
أكاديمية البحث العلمي

أكاديمية البحث العلمية والتكنولوجيا

تأسست أكاديمية البحث العلمي والتكنولوجيا في سبتمبر 1971 بموجب المرسوم الرئاسي رقم 2405 باعتبارها السلطة الوطنية المسؤولة عن العلوم والتكنولوجيا في مصر. في عام 1998، أعيد تنظيم الأكاديمية بموجب المرسوم الرئاسي رقم 377 الذي حدد مهامها ووظائفها وأنشطتها. تعد الأكاديمية بمثابة بيت الخبرة المصري. فهي تجمع بين علماء وخبراء مصريين بارزين من الجامعات ومؤسسات البحوث والقطاع الخاص والمنظمات غير الحكومية وواضعي السياسات والعلماء المصريين البارزين في الشتات لمناقشة مشاكل البلاد، واقتراح وتنفيذ الدراسات العلمية والخطط الأساسية الإستراتيجية المستقبلية لمعالجة هذه المشكلات.

تتبنى الأكاديمية خطة شاملة لتطوير العلوم والتكنولوجيا المصرية لدعم الوزارات والمؤسسات البحثية الوطنية ذات الصلة في إنشاء نظام متكامل للبحث العلمي معاً لزيادة عدد العلماء المدربين في مصر، وإعطاء العلم دوراً رائداً في الاقتصاد القائم على التنمية والاقتصاد القائم على المعرفة. وتعمل الأكاديمية على ترويج وتشجيع مشاركة الإناث والشباب في العلوم والتكنولوجيا والقيادة العلمية.

الرؤية

• أكاديمية وطنية عالمية وبيت خبرة وطني في مجال العلوم والتكنولوجيا والابتكار تتعاون مع باقي عناصر منظومة العلوم والتكنولوجيا والابتكار في تحسين وضع مصر العلمي والاقتصادي والريادي

الرسالة

• تهيئة بيئة مواتية ومشجعة للعلوم والتكنولوجيا والابتكار ودعم الدورة الكاملة للابتكار.

من مهام الأكاديمية :

• تداول مشاكل البلد ووضع الحلول العلمية، ووضع الدراسات الإستراتيجية والرؤى وخرائط الطريق التكنولوجية من خلال 20 مجلساً علمياً متخصصاً، و 300 من زملاء ASRT، و 20 لجنة وطنية، و 200 عضو

• تقدير التميز في مجالات العلوم والتكنولوجيا والابتكار (جوائز الدولة، مؤشرات العلوم والتكنولوجيا، تقييم العلوم والتكنولوجيا، المراقبة والقياس)

• توفير المرافق الأساسية المركزية الوطنية (النشر العلمي، تدويل المجالات المحلية، المكتبة الرقمية، الشبكة القومية للمعلومات، GLORIAD، مركز الحوسبة السحابية، الشبكة والحوسبة الفائقة، العلوم الإلكترونية، بنك المعرفة المصري ... إلخ).

• دعم الصناعة الوطنية ونقل التكنولوجيا وتعميق التصنيع المحلي (مكتب براءات الاختراع المصري، مكتب مساعدة حقوق الملكية الفكرية، صندوق تمويل النماذج الأولية السريعة، الشبكة الوطنية لمكاتب تسويق التكنولوجيا والابتكار (TICOs)، حاضنات التكنولوجيا الإقليمية (Intilac)، التحالفات المعرفة والتكنولوجية (KTA).



INSTRUCARE SCIENTIFIC

Instrucare Scientific Instruments

Instrucare is a leading company specializing in the supply, installation, and maintenance of analytical, testing, and measurement instruments. The company provides complete laboratory solutions for universities, research centers, and industrial sectors.

Instrucare represents several renowned international manufacturers offering advanced technologies such as OES, XRF, ICP, SEM, UT-M, BET, particle size, FIB, and CT systems.

With a highly trained technical team and strong commitment to customer satisfaction, Instrucare ensures excellent after-sales support and reliable performance for all supplied systems.

www.instrucare-eg.com

Said@instrucare-eg.com

74

AF CREATIVE GIVEAWAYS

Afkarbay

وكالة إعلانية لجميع الهدايا الدعائية للشركات والمؤسسات، تأسست في 2021.

رئيس مجلس الإدارة: د أحمد أنور عبد السلام،
تساعد شركتنا المؤسسات على بناء الولاء مع عملائها عن طريق تقديم الهدايا التسويقية التي تحمل علامتها التجارية.

نبذة عن المنتجات

- تصنيع وطباعة جميع أنواع الشنط.
- جميع انواع ال يونيفورم : تشيرتات _ كابات _ زي مدرسي.
- جميع انواع مجات البورسلين والمجات الحرارية.

www.facebook.com/share/16dnMPjeAC

75



NAWAH
scientific

Nawah Scientific is the MENA region's largest private research hub, offering full-service laboratory solutions for Life sciences, Pharma and Food Industries. Researchers and biotechs gain access to our ISO 17025-accredited labs, staffed by a multidisciplinary teams of scientists specialized in diverse Life Science fields. With customers in 30+ countries across the globe.

Nawah has 4 main Units

- Life Science Research
- Pharma R&D and Analysis
- Food Safety & Analysis
- Certified Reference Material

Why Nawah Life Science?

- **ISO 17025-Certified Excellence:**

Compliance with international standards for testing and calibration, ensuring reliable, reproducible results for regulatory submissions or peer-reviewed research.

- Academic Rigor
- Labs are led by professors with decades of field-specific expertise.

Operated by a team of Specialized Researchers, your experiments are executed by subject-matter experts (PhD/MSc-level molecular biologists, chemists, microbiologists, etc.), who provide deep analytical insight, troubleshoot challenges, and deliver reliable data.

- **Multidisciplinary Expertise:**

No need to juggle multiple vendors—solve complex challenges under one roof, we operate across numerous field, our key labs are:

- | | |
|----------------------------|----------------------|
| • Nanotechnology Lab | • Phytochemistry Lab |
| • Analytical Chemistry Lab | • Cell Culture Lab |
| • Molecular Biology Lab | • Microbiology Lab |
| • Organic Chemistry Lab | • Animal House |
| • Biomarkers Lab | |

Learn more at www.nawah-scientific.com

76

The 4th ICBAS (2025)



نقابة المهن العلمية

تسعى نقابة المهن العلمية إلى:

- تنشيط البحث العلمي.
- نشر الثقافة العلمية بين العلميين.
- تقديم نموذج ريادي في تطوير البيئة العلمية والعملية.
- تأهيل العلميين لسوق العمل من خلال برامج تدريبية معتمدة.
- توطيد العلاقة بين خريجي كلية العلوم ونقاباتهم من خلال رفع الثقة المتبادلة.
- المشاركة في الأعمال التي تخدم كافة العلميين.
- الإسهام في دراسة مشاكل الإنتاجية واقتراح الحلول لها.
- تقديم نموذج ريادي في تطوير البيئة العلمية والعملية.
- المشاركة المجتمعية للعلميين وتقديم كافة الأنشطة التي تخدم الأعضاء وأسرتهم.
- العمل على رفع المستوى الأدبي والفني والصحي والمادي لأعضاء النقابة.

من هم العلميين:

- العلميين هم الفئة المشتغلين بالمهن العلمية (كيمياء، فيزياء، جيولوجيا، إدارة علمية، حاسب آلي، علوم طبية تطبيقية، علوم حياة) من خريجي كليات العلوم وكليات الحاسبات والمعلومات الحاصلين على درجة البكالوريوس أو الدبلومات المهنية أو على درجة الماجستير أو الدكتوراه.

تشكل أعمال النقابة تحت اللجان الآتية:

- اللجنة العلمية: وتختص بتنظيم الدورات التدريبية للعلميين وعمل المؤتمرات العلمية.
- اللجنة الاجتماعية: وتختص بالمشاركة المجتمعية للعلميين وتقديم الأنشطة التي تخدم الأعضاء وأسرتهم.
- لجنة التنظيم: وتختص بتنظيم جميع أنشطة النقابة لتظهر بالشكل الذي يليق بالعلميين.
- لجنة التسويق والميديا: وتهتم بإظهار جميع أنشطة وخدمات النقابة للنور ليستفيد منها كل مستحق بإدارة الصفحات الإلكترونية للنقابة وإدارة المطبوعات وتوثيق الأنشطة.
- لجنة الموارد البشرية: وتهتم بتقييم كافة لجان النقابة لخلق روح المنافسة وتختص أيضا باستقبال الأعضاء الجدد وتوزيعهم على اللجان.
- لجنة العلاقات العامة والتوظيف: وتهتم بعقد بروتوكولات التعاون وإنشاء المعارض الموسمية وتكوين واستغلال العلاقات المفيدة في كل قطاع من قطاعات الحياة (الطبي والعلاجي - التعليمي - الترفيهي - الاجتماعي - التجاري - الوظيفي) وتقوم على إنشاء بنك التوظيف.

esspegypt.com

Email: esspegypt@gmail.com

77

The 4th ICBAS (2025)



مركز الحاسب الآلى

مركز الحاسب الآلى جامعة الأزهر بفرع البنات

- وحدة ذات طابع خاص
- حاصل على الأيزو - معتمد دولياً فى منح شهادة الـ ICDL & ICDL Teacher
- معتمد من المجلس الأعلى للجامعات المصرية فى منح شهادة التحول الرقمى FDTE

تأسس المركز بالجهود الذاتية على يد أ. د / عفاف أبو الفتوح صالح مدير المركز وبدعم من فضيلة الإمام الأكبر أ. د / أحمد الطيب شيخ الأزهر الشريف عام 2006م.

ويرأسه فضيلة أ. د / رئيس جامعة الأزهر وبنوبه معالى أ. د / نائب رئيس الجامعة للدراسات العليا والبحوث ويضم المجلس فى عضويته معالى أ. د / نائب رئيس الجامعة لفرع البنات وقامات علمية كبيرة ومتخصصة.

يقوم المركز بتقديم خدماته فى مجال الحاسب الآلى من دورات تدريبية للنهوض بمستوى أعضاء هيئة التدريس ومعاونيهم وموظفى الجامعة وطلابها فى مجالات الأمن السيبرانى والتعلم الرقمى ورخصة المدرب المعتمد TOT والتحول الرقمى وصيانة أجهزة الحاسبات ويتعاون المركز مع المجلس الوطنى للتدريب والتعليم من خلال جهاز تشغيل شباب الخريجين بمحافظة القاهرة فى اختبارات المعلوماتية فى مجالات عدة وعمل الملتقيات وورش العمل لتأهيلهم لسوق العمل.

ويقدم المركز للجامعة وكلياتها خدمات عديدة منها ورش عمل مجانية سنوية ودورات للموظفين بالإضافة بأعمال الصيانة لأجهزة الحاسب ومشتمالاتها بأسعار رمزية.

ويسعى المركز جاهداً فى الفترة القادمة لهذا العام الجامعة بتقديم ندوات وبرامج عن الذكاء الاصطناعى والتعليم الآلى والأمن السيبرانى والبرامج الإحصائية وبرامج لها أهمية فى سوق العمل.

[/https://azharclassroom.com](https://azharclassroom.com)

78



Rockal - Al Alamia for
Insulation & Rockwool

ROCKAL Is a leading Egyptian producer of building insulation materials.

ROCKAL offers reliable and effective insulation products for construction companies, contractors in Egypt, Gulf & Europe

With experience of more than 20 years in the insulation business by our founders and 15 years of experience as manufacturers and distributors of different insulation materials we have good overview of the market needs and requirements which by years of experience ,we managed to deliver with maximum efficiency.

ROCKAL is proud to offer up-to-date state of the art manufacturing technologies that support the construction revolution and mega projects all over the world and reflect on price as well.

Our Vision

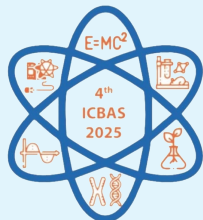
By following a strict quality policy and Considering international standards and a modern management strategy, we are striving to be a market leader in the stone wool sector.

Our Mission

Providing a wide range of insulation materials and reliable solutions that facilitate making a choice that is best for the project in both price and quality.

<https://rockal.org/>

79



Welcome to ICBAS 2025

About The Conference

The 4th International Conference on Basic and Applied Sciences “Future Sciences: Efforts and Challenges” organized by the Faculty of Science (Girls) – Al-Azhar University, aims to bring together researchers, scholars, and innovators to exchange ideas, share experiences, and explore solutions to the challenges shaping the future of science and technology.

With appreciation to all participants, sponsors, and organizing committees for their valuable contributions to the success of this Conference.

