

Contributions

His major contributions to mathematics, astronomy, astrology, geography and cartography provided foundations for later and even more widespread innovation in algebra, trigonometry, and his other areas of interest. His systematic and logical approach to solving linear and quadratic equations gave shape to the discipline of algebra, a word that is derived from the name of his book on the subject named “The Compendious Book on Calculation by Completion and Balancing”. This book was first translated into Latin in the twelfth century.

His book on the Calculation with Hindu Numerals was principally responsible for the diffusion of the Indian system of numeration in the Middle-East and then Europe. This book also translated into Latin in the twelfth century, as *Algoritmi de numero Indorum*. From the name of the author, rendered in Latin as *algoritmi*, originated the term *algorithm*. Khwarizmi systematized and corrected Ptolemy’s data in geography as regards to Africa and the Middle east. Another major book was his *Kitab surat al-ard* (“The Image of the Earth”; translated as *Geography*).

He also assisted in the construction of a world map for the caliph al-Ma’mun and participated in a project to determine the circumference of the Earth, supervising the work of 70 geographers to create the map of the then “known world”. When his work was copied and transferred to Europe through Latin translations, it had a profound impact on the advancement of basic mathematics in Europe. He also wrote on mechanical devices like the astrolabe and sundial.

Algebra

Kitab al-mukhtar fi hisab al-jabr wa-l-muqabala “The Compendious Book on Calculation by Completion and Balancing” is a mathematical book written approximately 830 CE.

Arithmetic

Khwarizmi’s second major work was on the subject of arithmetic, which survived in a Latin translation but was lost in the original Arabic.

Geography

Khwarizmi’s third major work is his *Kitab surat al-Ard* “Book on the appearance of the Earth”. It is a revised and completed version of Ptolemy’s *Geography*, consisting of a list of 2402 coordinates of cities and other geographical features following a general introduction.

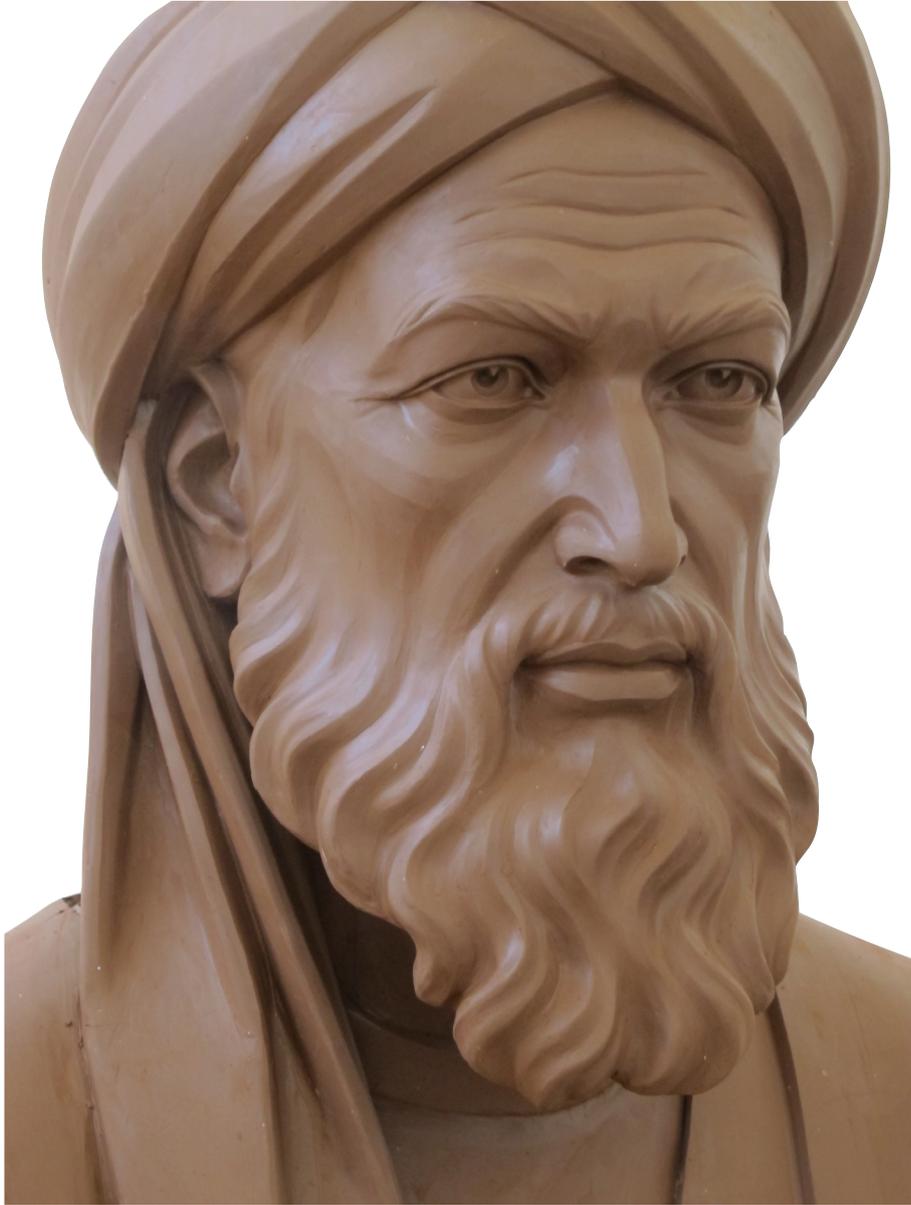
Astronomy

Khwarizmi’s *Zij al-sindhind* (astronomical tables) is a work consisting of approximately 37 chapters on calendrical and astronomical calculations and 116 tables with calendrical, astronomical and astrological data, as well as a table of sine values. This is one of many Arabic *zijes* based on the Indian astronomical methods known as the *sindhind*.

Jewish calendar

Khwarizmi wrote several other works including a treatise on the Hebrew calendar. It describes the -19 year intercalation cycle, the rules for determining on what day of the week the first day of the month Tishri shall fall; calculates the interval between the Jewish era (creation of Adam) and the Seleucid era; and gives rules for determining the mean longitude of the sun and the moon using the Jewish calendar. Similar material is found in the works of Biruni and Maimonides.

The Biography of Muhammad ibn Musa Khwarizmi



Muhammad ibn Musa Khwarizmi was a Persian Muslim mathematician, astronomer, astrologer and geographer. He was born in Persia of that time and died around 850. Historians have different interpretations on his life and the origin of his name Khwarizmi. He studied and wrote many books and treatises. His Algebra was the first book on the systematic solution of linear and quadratic equations. Consequently Khwarizmi is to be considered to be the father of algebra. His contributions not only made a great impact on mathematics, but on language as well. The word algebra is derived from al-abr, one of the two operations used to solve quadratic equations, as described in his book. The words algorism and algorithm stem from algoritmi, the Latinization of his name.

through retrofitting is a groundbreaking achievement. It is multi-dimensional initiative with economic, social, health and environmental aspects at its centre. In the context of the country of its adaptation, import substitution, import bill reduction, attainment of SDGs 7 & 13, cleaner environment, carbon credit, and innovation with grip on technology will be the hallmark.

COMSATS has recently established an ISO Certified Nanotechnology Lab, which aims to provide comprehensive research facilities for PhD students, deliver specialized training courses, and offer material testing services. The lab is dedicated to helping PhD students in their research and development through hands-on training while also running targeted “Train the Trainer” programs for technicians via short courses, workshops, and seminars focusing on critical areas such as Failure Analysis, Material Characterization, Corrosion Prevention, and specialized training on advanced equipment like Electron Microscopes.

In line with COMSATS’ approach of promoting technology-based solutions to address challenges faced by its Member States, COMSATS has developed its own TeleHealth Ecosystem. The tech-enabled clinics in distant locations provide essential health services covering General Medicine, Gynecology & Obstetrics, Dermatology, and Pediatrics. Moreover, COMSATS is Pioneer in Internet Services & Data Centre services along with cloud computing and software solutions. These services are offered to all Member States.

This year’s laureates have made transformative contributions across various fields of science and technology. Beyond technical achievements, these laureates are role models, especially for young scientists in developing countries. As we honor this year’s laureates, we must commit to creating environments where scientific talent can flourish. This requires investing in R&D infrastructure, implementing policies that attract and keep talent, building education systems that foster curiosity and critical thinking, and establishing international frameworks that encourage the free flow of ideas.

I congratulate all the laureates of 39th Khwarizmi International Award and 27th Khwarizmi Youth Award. Your work lights the way forward and demonstrates that when human ingenuity serves the common good, no challenge is insurmountable.

Ambassador Dr. Mohammad Nafees Zakaria
Executive Director
COMSATS



Commission on Science and Technology for Sustainable Development in the South (COMSATS)



On behalf of the Commission on Science and Technology for Sustainable Development in the South (COMSATS), I congratulate our esteemed Centre of Excellence, the Iranian Research Organization for Science and Technology (IROST), Iran, on organizing the 39th Khwarizmi International Award (KIA) along with the 27th Khwarizmi Youth Award (KYA). Named after the 9th-century Persian mathematician who gave us the foundations of modern computing and algorithms, this award carries forward a remarkable legacy of intellectual achievement that continues to drive scientific progress worldwide.

For nearly four decades, the KIA has recognized scientists, researchers and inventors whose work tackles humanity's most pressing challenges. It is a privilege to celebrate the remarkable achievements of this year's laureates that demonstrated how Science, Technology and Innovation (ST&I) can be powerful forces for real change by creating practical solutions that improve lives and strengthen communities. COMSATS proudly played its role as an active participant and collaborator.

We are living through a period of extraordinary socio-economic challenges. However, these challenges also create unprecedented opportunities for innovation. Integrating ST&I into development strategies has now become essential. Whether it is precision medicine revolutionizing healthcare or renewable energy transforming power systems, scientific breakthroughs are fundamentally reshaping our future.

At COMSATS, we are steadfast in our mission to promote technology-driven solutions across our 27 Member States. Utilizing the expertise available at its 25 Centres of Excellence, COMSATS enables knowledge sharing, capacity building, and fostering collaborative research and development addressing the Global South's specific needs.

COMSATS' overall focus is on bridging technological gaps and ensuring that innovations, particularly those originating in developing countries, are accessible and impactful. In line with this mission, COMSATS has fostered strong partnerships with international organizations, including The Commonwealth, UN entities, OIC, ANSO, TWAS, ICGEB, The South Centre, PIDF, and INSME, working collectively to advance ST&I for sustainable development.

COMSATS is a proponent of driving eco-friendly innovations. Development of indigenous technology by its partner AGEKO to convert the Internal Combustion Engine (ICE) vehicles to Electric Vehicles (EVs)



The Ministerial Standing Committee of the Organization Of Islamic Cooperation for Scientific and Technological Cooperation (OIC-COMSTECH)



I am delighted to learn that the Iranian Research Organization for Science and Technology (IROST) is organizing the 39th Khwarizmi International Award. It is a matter of distinct honor and personal privilege for me to be among the past laureates of this highly prestigious international award.

I wish to extend my sincere congratulations to IROST for the continued organization of this distinguished award while upholding the highest standards of excellence and international participation. Encompassing all fields of science and technology and remaining open to global participation, the Khwarizmi International Award is rightly regarded as one of the premier scientific honors, originating from the Islamic world.

In today's age of rapid technological transformation and increasing global interdependence, technological independence has become an essential strategic necessity for nations and regions. The ability to develop indigenous scientific and technological capacities, strengthen innovation ecosystems, and effectively translate research into sustainable and high-impact technologies is vital for economic resilience, national security, and inclusive socio-economic development. Initiatives such as the Khwarizmi International Award make a meaningful contribution to this imperative by recognizing original research, fostering innovation-led growth, and motivating future generations of scientists and technologists to serve their societies with excellence while remaining competitive on the global stage.

The absence of national or regional boundaries in this award yields far-reaching positive outcomes. It underscores the universal nature of knowledge in general, and of science and technology in particular. Moreover, it ensures that scientists from Islamic countries compete alongside the best minds globally to qualify for this esteemed recognition. In doing so, the award not only promotes excellence in science and technology within the Islamic world but also serves as a vital bridge connecting the scientific communities of Iran, the wider Islamic world, and the international community at large.

Please accept my sincere felicitations on the organization of the 39th Khwarizmi International Award, which I am confident will once again stand as a testament to your unwavering commitment to excellence, and to the promotion of a global culture of science and technology.

I also warmly congratulate the winners of this year's awards, and welcome them to this distinguished community of Khwarizmi Laureates.

Prof. M. Iqbal Choudhary, Mustafa (PBUH) Prize Laureate, H.I., S.I., T.I.
Coordinator General
OIC-COMSTECH



APCTT
Asian and Pacific Centre
for Transfer of Technology

Asian and Pacific Centre for Transfer of Technology (APCTT) of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)



I am deeply honoured to extend my heartfelt congratulations to the laureates of the 39th Khwarizmi International Award (KIA). This prestigious award continues to shine as a hallmark of scientific excellence, innovation, and creativity - inspiring generations of researchers and innovators.

As we enter a new era of rapid technological transformation and global interconnectedness—driven by Artificial Intelligence (AI) and other Fourth Industrial Revolution technologies—innovation emerges as a critical force in shaping a sustainable and inclusive future. The challenges before us—climate change, digital divides, resource scarcity, and emerging health and security risks—require bold, forward-looking solutions that harness science and technology for the greater good.

From breakthroughs in clean energy and smart agriculture to advances in AI, biotechnology, and sustainable mobility, innovation is the driving force that will enable societies to achieve the Sustainable Development Goals (SDGs). These solutions must be technologically advanced as well as economically viable, socially inclusive, environmentally responsible and ethically sound.

At the regional level, the Asian and Pacific Centre for Transfer of Technology (APCTT) of UN ESCAP provides a collaborative platform for knowledge-sharing, capacity-building, and multi-stakeholder engagement. Strengthening cooperation among countries is essential to accelerate technology transfer, foster innovation ecosystems, and ensure that no community is left behind.

The Khwarizmi International Award plays a pivotal role in nurturing young minds, encouraging creativity, and celebrating scientific achievements that push the boundaries of possibility. By honouring innovators who embody vision, responsibility, and excellence, the Award inspires future leaders to embrace innovation as a tool for building a greener, more resilient, and equitable world.

Once again, I extend my warmest congratulations to this year's KIA laureates and commend the organizers for their dedication and tireless efforts in making this event a resounding success. Together, let us champion innovation as the cornerstone of progress and a pathway to a brighter future for all.

Preeti Soni
Head
APCTT-ESCAP

World Association of Industrial and Technological Research Organizations (WAITRO)



On behalf of the World Association of Industrial and Technological Research Organizations (WAITRO), and in my capacity as President of WAITRO, it is a great honor to convey our strong support for the 39th Khwarizmi International Award. We commend the Iranian Research Organization for Science and Technology (IROST) for its continued dedication to celebrating scientific excellence and for preserving the enduring legacy of Muhammad ibn-Musa al-Khwarizmi, a pioneer whose intellectual contributions continue to shape modern science and technology. The Khwarizmi International Award stands as a distinguished international platform that recognizes transformative research and innovation across a wide range of scientific and technological fields. By honoring outstanding achievements, the Award not only acknowledges individual excellence but also promotes a culture of curiosity, creativity, and impact-driven research that is essential for addressing today's global challenges. WAITRO shares a common vision of advancing science and technology through international collaboration and co-creation. In an increasingly interconnected world, meaningful progress depends on cross-disciplinary approaches, open knowledge exchange, and the collective strength of working together across institutions, sectors, and borders. Through its global network, WAITRO remains dedicated to fostering cooperation among research and innovation organizations to generate sustainable solutions that benefit society at large. The spirit of innovation embodied by Al-Khwarizmi, grounded in rigor, openness, and forward-thinking, resonates strongly with WAITRO's mission. As new Laureates are recognized at the 39th Khwarizmi International Award ceremony, we celebrate their contributions and the inspiration they provide to the global scientific community. Their work serves as a powerful reminder of the role science and technology play in building a more resilient, inclusive, and sustainable future. We extend our sincere congratulations to all award recipients and express our best wishes for the continued success and growing global impact of the Khwarizmi International Award in the years to come.

Professor Hasan Mandal
President
WAITRO

Iranian National Commission for UNESCO



On behalf of the Iranian National Commission for UNESCO, we are honored to continue our presence and support for the Khwarizmi International Award, which is held annually to commemorate and honor the pioneers of science and technology from around the world. This event annually provides a unique opportunity to celebrate the leaders of science and technology worldwide and significantly contributes to the promotion of innovation and scientific exchange. We highly value this opportunity to accompany and support you in the path of promoting knowledge, innovation, and scientific advancement.

The Khwarizmi International Award is one of the most prominent global scientific platforms that enables researchers and elites to present their scientific achievements on an international stage, share their valuable experiences, and strengthen scientific and cultural collaborations. This event goes beyond being just an Award; it serves as a cornerstone for the development of science and technology worldwide.

At the Iranian National Commission for UNESCO, we firmly believe that investment in knowledge and technology is the foundation of sustainable development and the key to improving the quality of life in societies. Holding such events not only signifies respect for scientific endeavors but also serves as a platform to enhance the scientific capacities of the country and encourage the younger generation towards innovation and creativity.

Moreover, the Khwarizmi Award provides a valuable opportunity to establish international scientific networks that facilitate the development of research collaborations and the expansion of scientific and technological capacities. This plays an important role in attracting top talents and improving the country's research infrastructure.

With hopes for the continued success of the Award's participants and organizers, we wish for this event to remain a source of scientific growth and prosperity for both Iran and the world. We extend our gratitude to the tireless efforts of the Iranian Research Organization for Science and Technology and all those involved, and we wish all

Hassan Fartousi
Secretary General
Iranian National Commission for UNESCO



On behalf of the World Intellectual Property Organization (WIPO), I extend my warmest congratulations to the laureates of the 39th Khwarizmi International Award (KIA) and the 27th Khwarizmi Youth Award (KYA), which will be held in Tehran on February 16, 2026.

I am pleased to confirm that WIPO will provide WIPO National Awards to the winners of the above-mentioned contests: Prof. Hossein Roghani-Mamaqani, Prof. Alimorad Rashidi and Dr. Abdolreza Farhadian. It is a great pleasure to celebrate Iran's distinguished scientists and innovators on this occasion, commemorating the legacy of Muḥammad ibn Mūsā Al-Khwārizmī.

As you know, Al-Khwārizmī's contributions have had a truly global impact: his pioneering treatises introduced algebra and the Hindu-Arabic numeral system to later generations of mathematicians, and even today his name endures in the very terms algebra and algorithm. More than twelve centuries after his life, the spirit of Al-Khwārizmī continues to underpin modern mathematics and computation, from fundamental algebraic methods to cutting-edge computer science.

As the specialized United Nations agency for innovation and creativity, WIPO views intellectual property (IP) as a fundamental catalyst for economic advancement and social development. Nations such as the Islamic Republic of Iran are progressively embedding IP into their national development frameworks.

We welcome Iran's accession to the Vienna and Strasbourg Agreements, which will enhance global IP cooperation and accessibility for local innovators.

Tehran continues to be recognized among the world's leading science and technology clusters, ranking 63rd globally in the 2025 Global Innovation Index. The city's performance is driven by strengths in medical technology, patent filings, and academic excellence in engineering fields.

WIPO supports Iran's innovation and IP ecosystem through various programs, including cooperation on branding initiatives and IP strategy.

Iran's partnership with the WIPO Academy has reached thousands, notably through Summer Schools and scholarship programs. We anticipate launching a new course on IP for Iranian Diplomats in 2026.

Additionally, I also take this opportunity to share with you that we are looking forward to receiving applications from innovative and creative Iranian small and medium-sized enterprises (SMEs) and startups for the 2026 edition of the WIPO Global Awards. We encourage you to promote this opportunity within your esteemed community of IP users now that the application period is open. For more information, please visit our webpage: <https://www.wipo.int/global-awards/>.

WIPO remains committed to strengthening Iran's IP ecosystem for the common good. As you build on of Muḥammad ibn Mūsā al-Khwārizmī legacy, we wish you continued success.

Daren Tang
Director General
WIPO



Ministry of Science, Research & Technology
Iranian Research Organization for
Science & Technology

Messages from the Sponsors

**39th KHWARIZMI
INTERNATIONAL
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Ministry of Science, Research & Technology
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The Sponsors of the Khwarizmi Awards and Internasional Messages

39th KHWARIZMI
INTERNATIONAL
AWARD | **27th** KHWARIZMI
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AWARD

Quotes from the Laureates of the Khwarizmi International Award



Dear Chairman,
I feel deeply honored to be a Laureate of the 37th Khwarizmi International Award, organized by the Iranian Research Organization for Science and Technology (IROST). Being a scientist from Türkiye, I am extremely grateful for the warm reception and hospitality extended by my Iranian colleagues and scientists. It is my sincere hope that this award program and ceremony will serve as a bridge that connects the two great Islamic cultures and nations.

Prof. İlhami Gülçin
Ataturk University, Türkiye



Dear Chairman,
I am delighted and honored to be the Laureate of the 36th Khwarizmi International Award in 2022. I wish to thank you warmly.

Prof. Jean-Laurent CASANOVA
Rockefeller University and the University of Paris; Laboratory of Human Genetics of Infectious Diseases, France



Dear Chairman,
Thank you to the Khwarizmi International Award committee and the jury members for bestowing upon me the prestigious 34th Khwarizmi International Award. I am honored and humbled to receive this international award from the jury. This award enormously enhances our cooperation with scientists in Iran in establishing the technology base for producing high-efficiency, large-area, all-printable perovskite solar cells, and their integration into photovoltaic modules for renewable energy applications.

Prof. Mohammad Khaja NAZEERUDDIN
École Polytechnique Fédérale de Lausanne (EPFL), Switzerland



Dear Chairman,
I have been granted many awards in my 40-year career as a distinguished professor of electrical engineering. However, KIA has a special place in my technical portfolio and is manifested as a significant recognition of my contributions to engineering and science, which I will cherish for the rest of my life.

Prof. Seyed Mohammad SHAHIDEHPOUR
Illinois Institute of Technology, Iranian Resident in the U.S.A



Dear Chairman,
It is a great honor to become this year's KIA laureate. Science and technology can transcend cultures, languages, and borders. I am proud to be a member of the international KIA community. I hope that the award leads to scientific collaboration and exchange of students between Iran and Australia. Thank you, KIA organization.

Prof. Katharina GAUS
University of New South Wales, Sydney, Australia

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Dr. Neda Shafiei	General Director, President's Office and Public Relations, IROST
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Farhang Kheiri	General Director, IT Department
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Dr. Alireza Allahyari	27 th Chairman of the Khwarizmi Youth Award

The Jury Members

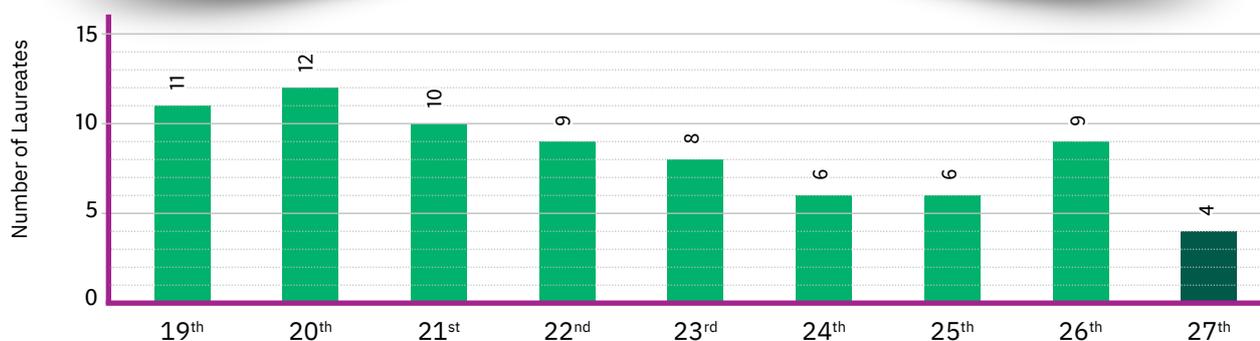
39th Khwarizmi International Award

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Dr. Hossein Karimi	Bojnord University
Dr. Alireza Allahyari	Executive Chairman of the 39 th Khwarizmi Award

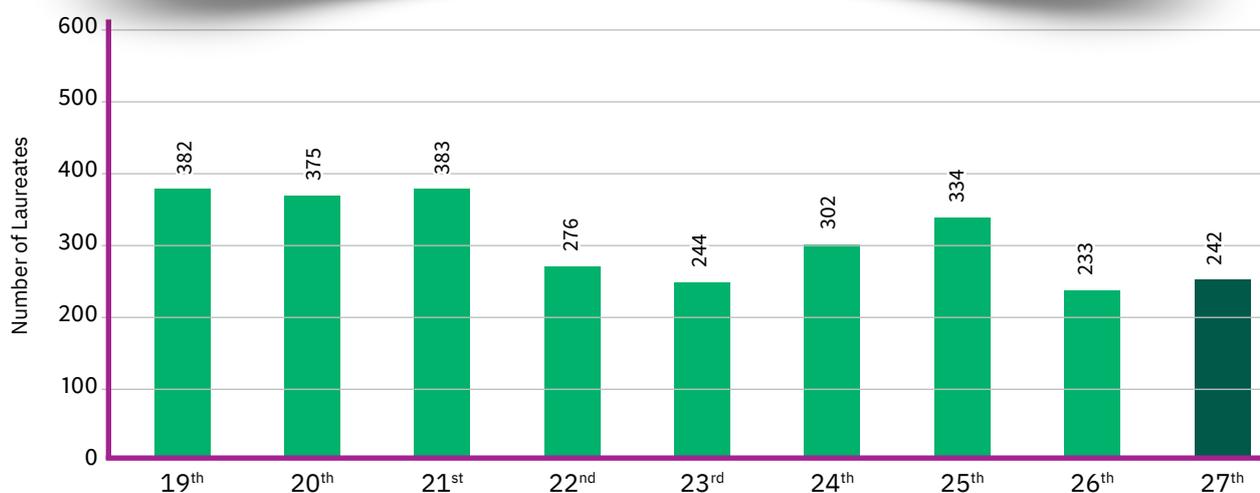
Laureates – The 27th Khwarizmi Youth Award

No.	Category	Scientific Committee	The First Place	The Second Place	The Third Place	Total
1	Applied Research	Electrical and Computer Engineering	--	--	1	1
		Mechanical Engineering	--	--	1	1
2	Research & Development	Electrical and Computer Engineering	--	--	1	1
3	Invention & Innovation	Chemical Technologies	--	--	1	1
Total			--	--	4	4

The total number of laureates over the last nine editions of the Khwarizmi Youth Award



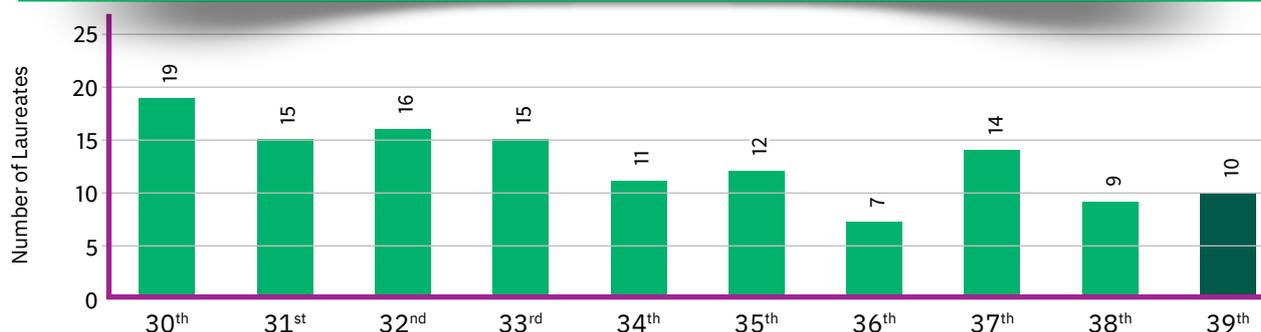
Total applications over the last nine editions of the Khwarizmi Youth Award



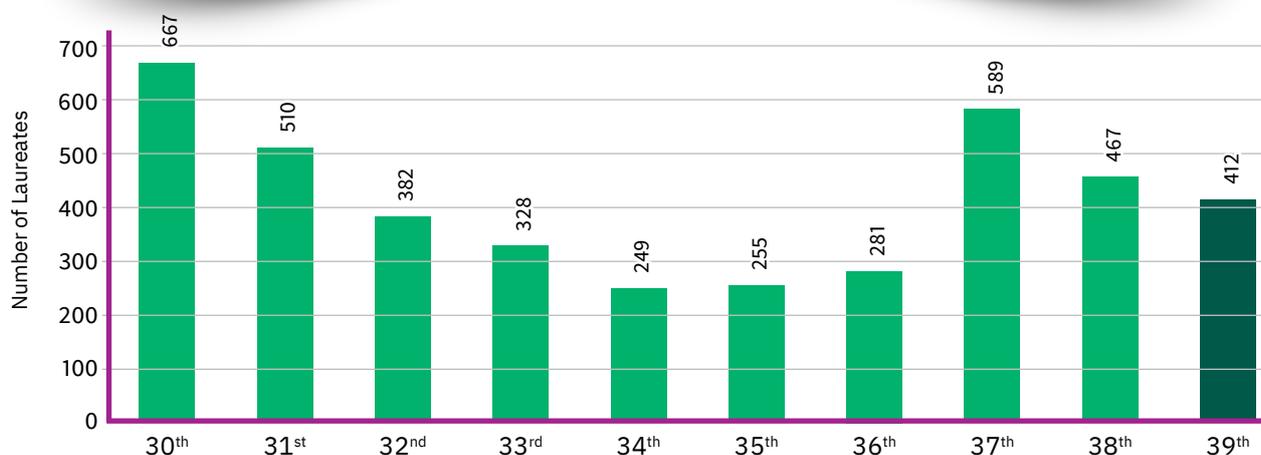
Laureates – The 39th Khwarizmi International Award

No.	Category	Scientific Committee	The First Place	The Second Place	The Third Place	Total
1	Outstanding Researcher	Irrigation and Development Engineering	--	--	--	1
		Chemical Technologies	1	--	--	1
		Water Management, Agriculture and Natural Resources	--	1	--	1
2	Applied Research	Advanced Materials, Metallurgy and Renewable Energies	--	--	1	1
		Arts	--	--	1	1
		Basic Sciences	--	--	--	1
3	Basic Research	Advanced Materials, Metallurgy and Renewable Energies	--	--	--	1
		Chemical Technologies	--	2	--	2
		Electrical and Computer Engineering	--	1	--	1
4	Research & Development					
		Total				10

The total number of laureates over the last ten editions of the Khwarizmi International Award



Total national and international applications over the last ten editions of the Khwarizmi International Award



The 27th Khwarizmi Youth Award

The call for the 27th Khwarizmi Youth Award commenced in May 2025, initiated by the Iranian Research Organization for Science and Technology (the Permanent Secretariat of the Khwarizmi Youth Award). This announcement was made through the award's website, the press, and various media channels, with registration for applicants closing in September 2025. More than 300 projects were submitted for the Young Khwarizmi Award. Of these, 242 projects were evaluated by 18 scientific committees according to established criteria, and 10 projects were recommended for further assessment by the award jury.

In the end, four projects were selected as winners of this edition of the award. This includes two projects from the applied research category in the fields of Electrical and Computer Engineering, and Mechanical Engineering; one project from the research and development category in the field of Electrical and Computer Engineering; and one project from the invention and innovation category in the field of Chemical Technologies. In conclusion, we would like to sincerely thank all researchers, technologists, and innovators who participated in this award. We also extend our gratitude to the members of the Scientific and the Executive Committees and the many colleagues at the Iranian Research Organization for Science and Technology who greatly contributed to the excellence and success of this award edition with their efforts, expertise, commitments and responsible follow-up.

The Permanent Secretariat
Khwarizmi Awards
February 2026

The 39th Khwarizmi International Award

The Khwarizmi International Award (KIA) was founded, in 1987, after the victory of the Islamic Revolution of Iran. Today, this scientific contest is recognized as the longest-running annual scientific award that has been held successfully for four decades in the Islamic Republic of Iran.

Given that numerous scholars collaborated on a significant number of Khwarizmi-winning projects over the last four decades, it can be estimated that the community of KIA Laureates comprises several thousand members. This scientific community has excellent expert knowledge, perseverance, management skills, experience, creativity, and self-esteem, all considered valuable assets for accelerating scientific progress and developing new technologies in the country.

By examining the long list of KIA Laureates, and members of the jury and scientific committees, the experts across various scientific disciplines can discover numerous distinguished scientists listed. This serves as additional evidence of the Khwarizmi Awards' value creation, purposefulness, efficacy, and competitiveness.

The call for participation in the 39th KIA opened in the spring of 2025. The announcement was published in seven languages, including Persian, English, French, Spanish, German, Russian and Arabic on the KIA website and distributed worldwide. The deadline for submissions closed in the fall of 2026. This award encompasses basic research, applied research, and research and development projects, as well as innovation and invention initiatives across all scientific and technical fields, excluding the humanities. Evaluations are conducted at both national and international levels by 18 scientific committees.

In this edition of the award, the KIA Secretariat received over 500 applications from both Iranian and International participants, with 294 national projects and 118 international projects reviewed and assessed by the relevant scientific committees. Of these, the scientific committees recommended 24 applications to the award jury for further assessment. After conducting a thorough scientific and technical assessment of the projects and ranking the shortlisted candidates, the jury ultimately selected one outstanding researcher and a total of seven national projects along with two international projects from the People's Republic of China and Malaysia, as the winners of the 39th Khwarizmi International Award.

The Khwarizmi Awards: A Mirror Reflecting National Scientific Achievements

The Khwarizmi Awards are a thoughtful approach to introducing the best national projects and recognizing outstanding scientists, researchers, innovators, and inventors who through their intellectual and practical knowledge and innovations, make today's world, with its ups and downs, brighter and more secure. These people of intellectual talent have excellent knowledge about the universe and its rules and develop scientific knowledge in many fields such as health, water management, agriculture, food resources, environment, engineering, communications, information, and the like for the betterment of their people and other nations.

The Secretariat of the Khwarizmi Awards treasures the records of projects submitted in each edition of the awards, the photos, videos, bulletins, rules and regulations, reports, and the hard and soft copies of the published documents. Today, this rich archive provides us with a valuable database that may allow the monitoring and observation of scientific development and research trends in different scientific fields over the last forty years in the country.

Considering the intellectual talents of more than 200 Iranian and foreign scientists residing in 50 countries in the world, it is realized that the Khwarizmi Awards would not only be a regular annual event, a ministerial policy, or just an international scientific event but they serve as proof of the competitiveness, and self-esteem of Iranian scholars and technologists and their constant efforts in leading the researchers and the youth to achieve sustainable development in the country. In the last 38 years, over 100 bodies, as well as private and public, scientific and economic, and national and international organizations, joined the long list of sponsors of the Khwarizmi Awards, which is another proof of these awards' competitiveness and success.



Ministry of Science, Research & Technology
Iranian Research Organization for
Science & Technology

The Secretariat Report on Khwarizmi Awards

39th KHWARIZMI
INTERNATIONAL
AWARD | **27th** KHWARIZMI
YOUTH
AWARD

Third Place in Invention & Innovation
Scientific Committee: Chemical Technologies

Research Work Title

Design and development of dual-purpose inhibitors for the control of corrosion and gas hydrate formation in oil and gas pipelines



Researcher | Dr. Abdolreza Farhadian

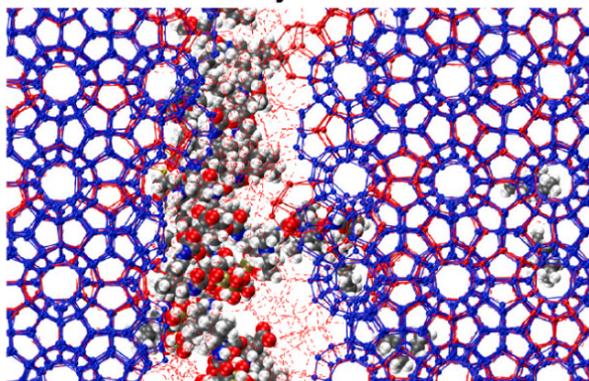
Supervisor | Dr. Mikhail Alekseevich Varfolomeev

Collaborating Institution | Kazan Federal University

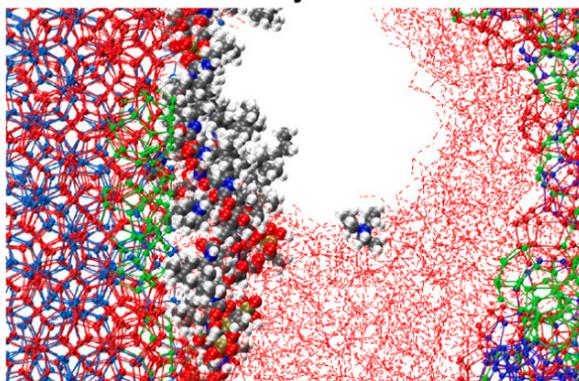
Abstract

Gas hydrate and corrosion inhibitors are widely used to ensure the safe and economical flow of hydrocarbons through oil and gas pipelines. However, incompatibility issues often arise when they are injected simultaneously into flowlines, as their molecular chemistries differ, leading to reduced performance. The project developed and synthesized novel dual-purpose inhibitors (DPIs) to overcome the incompatibility challenge between conventional inhibitors. A comprehensive experimental and computational investigation was conducted to evaluate the inhibition performance of the DPIs. The results of constant cooling tests revealed that these inhibitors significantly prevented natural gas hydrate formation. Moreover, molecular dynamics simulations demonstrated that the diffusion of gas molecules into the growing hydrate cages was hindered due to the adsorption of DPIs on the hydrate surface, which partially covered it and acted as a barrier to mass transfer. Additionally, interactions between the anionic parts of the inhibitors and neighboring water molecules reduced the water activity, thereby inhibiting the formation of hydrogen-bonded networks necessary for hydrate crystallization. Corrosion measurements further showed that the DPIs effectively suppressed the corrosion rate of mild steel in H_2S - CO_2 -saturated produced water from an oil field, achieving a maximum inhibition efficiency of 99.3% at 5000 ppm.

sI hydrate



sII hydrate



Third Place in Research & Development
Scientific Committee: Electrical and Computer Engineering

Research Work Title

Design and manufacture of medical suction devices



Researchers | Taha Hadavand, Ardeshir Ghods

Collaborating Organization | Pooyesh Paya Equipment Design Co.

Abstract

Design, manufacture and supply of specialized medical suction devices suitable for specialized treatment departments, including: specialized and general operating rooms, specialized hospital departments, including ICU-CCU-POST CCU-NICU, dentistry, ambulance, beauty and liposuction are being mass-produced after obtaining the necessary permits from the relevant ministries. Considering the research and development unit and the production lines of these devices, this project has taken effective an effective step in creating employment and entrepreneurship.



Third Place in Applied Research
Scientific Committee: Mechanical Engineering

Research Work Title

Pantograph–catenary contact simulator



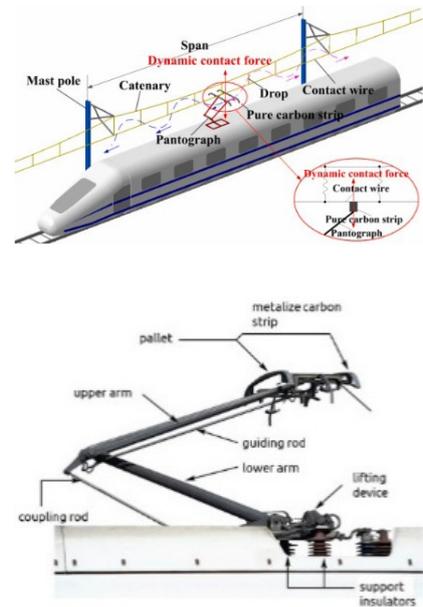
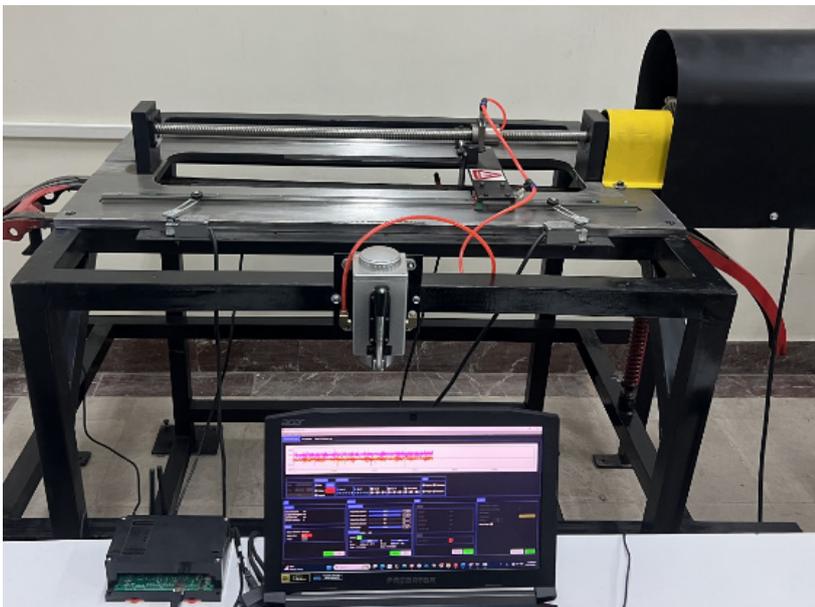
Researcher | Amin Esmaeili

Collaborator | Mehdi Esmaeili

Supervisor | Dr. Davood Younesian

Abstract

The pantograph is a key component of electric railway systems, responsible for transferring electrical current from the overhead contact wire (catenary) to the locomotive. Its carbon contact strip is in continuous contact with the overhead wire and, as a result, undergoes wear and damage due to abrasion, mechanical impacts, and temperature variations. In this project, a test device has been designed and built to reproduce the contact between the pantograph strip and the catenary under near realistic conditions. The goal is to satisfy the requirements and characteristics that make the carbon-strip–catenary contact as close as possible to actual operating conditions. The platform also allows mounting additional sensors, microphones, and cameras to conduct further experiments and obtain multi-modal data on the contact conditions. The output data from these sensors can be used as inputs to machine-learning algorithms to develop predictive models for damage and wear detection. Other applications include evaluating the performance of carbon-strip manufacturers and estimating the service life of the strips. Overall, this project represents a step toward developing intelligent pantograph condition-monitoring systems and enhancing safety and efficiency in electrified railway networks.



Third Place in Applied Research

Scientific Committee: Electrical and Computer Engineering

Research Work Title

Design of an advanced control algorithm for a blood electrolyte analyzer



Researchers | Hamed Pakzad Qadikolaei
Seyed Mohammad Reza Shojaee Langari

Collaborating Organization | Fanavaran Arman Alborz Co.

Abstract

The Blood Electrolyte Analyzer is an essential piece of diagnostic laboratory equipment designed to accurately measure the concentrations of sodium, potassium, and chloride ions in serum or whole blood samples. This project focuses on the design and development of a fully indigenous electrolyte analyzer, utilizing entirely domestic technical expertise, and encompassing end-to-end hardware and software development. The device employs an advanced control algorithm for managing sample handling, washing processes, and result analysis. By optimizing reagent consumption and reducing overall production costs, the system competes effectively with foreign commercial devices. The device has successfully obtained an Assembly License from the General Department of Medical Equipment (IMED). With strong potential for mass production and entry into the domestic market, this system represents a significant step toward achieving self-sufficiency in medical laboratory equipment and holds promise for future export opportunities.





Ministry of Science, Research & Technology
Iranian Research Organization for
Science & Technology

The Laureates of the **27th** Khwarizmi Youth Award

| **27th** KHWARIZMI
YOUTH
AWARD |

Second Place in Research & Development
Scientific Committee: Electrical and Computer Engineering

Research Work Title

Design and development of dedicated SPECT scanner for cardiac imaging

Representative | Dr. Mohammad Reza Ay



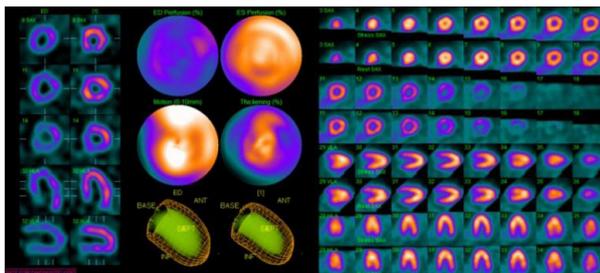
Collaborators | Saeed Sarkar, Mohammad Hossien Farahani, Behnoosh Teimurian, Arya Kazemzadeh, Ali Momenzadeh, Mohammad Ghorbanzadeh, Amir Dareyni, Nima Naderi, Mahyar Yousennezhad, Amir Hossien Alikhani

Institution | Tosee Sanayee Parto Negar Persia Co.

Collaborating Organization | Tehran University of Medical Sciences

Abstract

The dedicated cardiac SPECT (Single Photon Emission Computed Tomography) imaging system is one of the most accurate and widely used modalities for functional cardiac imaging in the field of nuclear medicine. In this technique, a radiopharmaceutical is administered to the patient, and after an appropriate uptake period, the tracer accumulates in the myocardial tissue. Subsequently, high-quality images of the radiotracer distribution within the heart are acquired using the SPECT system, enabling clinical assessment of myocardial perfusion and overall cardiac function. The dedicated cardiac SPECT system marketed under the name “ProSPECT” has been designed and manufactured based on state-of-the-art global technologies. This system is equipped with two high-performance scintillation detectors that rotate around the patient to acquire imaging data with high precision. Following the successful acquisition of all required regulatory approvals and certifications from the Ministry of Health and Medical Education, Prospect is currently installed in ten university-affiliated medical centers across the country and is actively providing diagnostic services to cardiac patients. All parts of the system, including the electronic, mechanical, detector, and image processing software subsystems, have been fully designed and developed by the Iranian expert team in collaboration with the Institute for Advanced Medical Technologies and Equipment at Tehran University of Medical Sciences. The clinical outcomes obtained from this system have been fully validated by nuclear medicine specialists.



Sample cardiac images using ProSPECT



ProSPECT

Basic Research

Scientific Committee: Advanced Materials, Metallurgy and Renewable Energies

Research Work Title

Crystalline covalent organic polymers/frameworks for energy applications



Researcher | Prof. Qichun Zhang

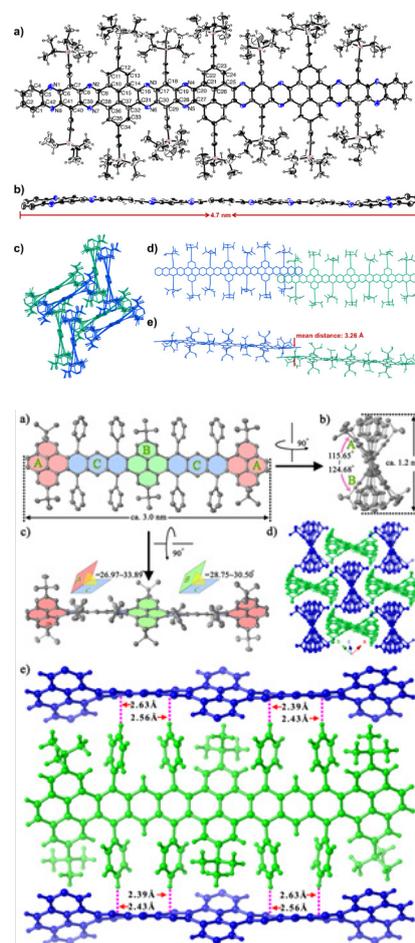
Country of Residence | People's Republic of China

Scientific Affiliation | City University of Hong Kong

Abstract

As one type of material, organic semiconductors (OSCs) have garnered extensive research interest due to their attractive properties, such as low-cost synthesis, light weight, mechanical flexibility, facile processability, tuning of functions by molecular design, and rich availability compared to inorganic materials. Especially, crystalline covalent organic polymers/frameworks (COPs/COFs) have attracted considerable attention from scientists in both fundamental research (e.g., synthesis, characterization, and theoretical simulation, etc.) and potential applications (e.g., gas absorption/separation, catalysis, energy-related devices, sensing, and imaging). The research mainly focuses on developing novel crystalline COPs/COFs and exploring their diverse applications in optoelectrical and energy-related devices. Prof. Qichun Zhang pioneered atomically precise 2D/3D crystalline materials, enabling fundamental breakthroughs in nonlinear optics and room-temperature phosphorescence. His highly ordered COFs and B–N polymers deliver exceptional performance in energy storage, green catalysis, energy harvesting, optoelectronics, and advanced sensing, with strong industrial potential.

Prof. Qichun Zhang received his Bachelor of Science in 1992 from Nanjing University in China, an MSc in physical organic chemistry at the Institute of Chemistry, Chinese Academy of Sciences, an MSc in organic chemistry at the University of California, Los Angeles, and a Ph.D. in chemistry from the University of California, Riverside, in 2007. In January 2009, he joined the School of Materials Science and Engineering at Nanyang Technological University in Singapore. On September, 2020, Prof. Zhang moved to the Department of Materials Science and Engineering at City University of Hong Kong as a full professor. He is recognized as a highly cited researcher (top 1%) in 2023 and 2024 in Clarivate Analytics. To date, Prof. Zhang has published over 632 peer-reviewed ISI journal papers and holds 25 granted patents. He currently serves on editorial board of several prestigious scientific journals.



Basic Research

Scientific Committee: Basic Sciences

Research Work Title

Pioneering advancements in wide-bandgap semiconductor materials and devices



Researcher | Dr. Zainuriah Hassan

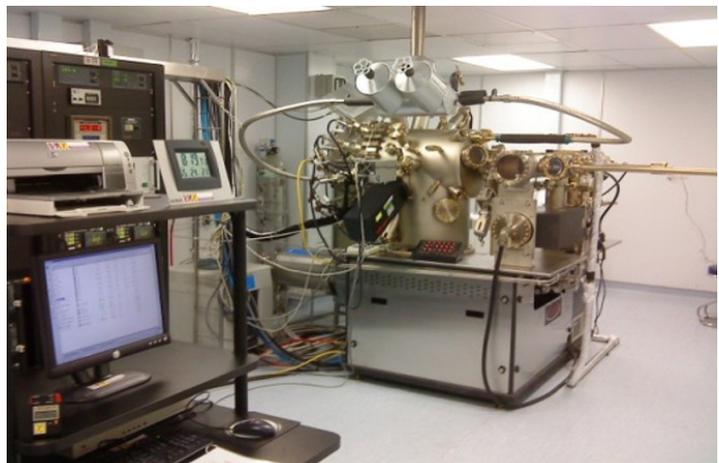
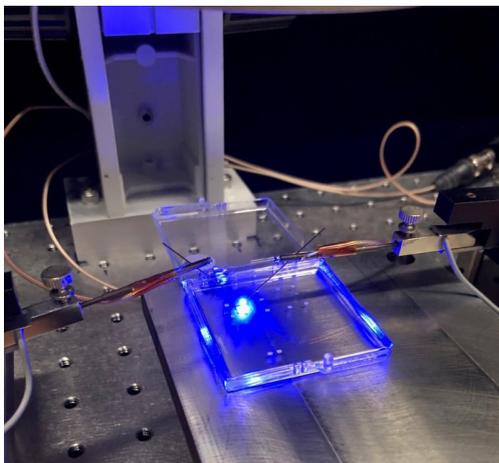
Country of Residence | Malaysia

Scientific Affiliation | Universiti Sains Malaysia (USM)

Abstract

Intensive material studies on wide band gap semiconductors, particularly III-nitrides (GaN and related alloys) and metal oxides such as ZnO, spanning from growth of amorphous, microcrystalline, epitaxial films, and nanostructures have been carried out for fundamental studies of their superior properties which contributed to enhanced performances when fabricated as devices. Novel growth technology, processing techniques, treatments, simulation work and optimization of device fabrication parameters have been carried out. Pioneer works on low dimensional structures and nanostructured porous binary, ternary, and quaternary III-nitrides (GaN, InGaN and InAlGaN) and metal oxides have been accomplished. These research activities have resulted in significant advancements in fundamental knowledge and development of these new generations of materials which offer significant advantages in areas such as short wavelength spectral range optoelectronics, sensors, high temperature and high frequency power devices, photovoltaics and other advanced technology applications for current industry demands.

Dr. Zainuriah Hassan is currently an Honorary Professor at the Institute of Nano Optoelectronics Research and Technology (INOR), Universiti Sains Malaysia (USM) and was the Director of INOR in 2016 and 2018-2021. She was also formerly the Director of the Centre for Research Initiatives in Natural Sciences, and Chair of the Engineering Physics Program at the School of Physics, USM. Dr. Hassan has produced more than 700 ISI/Scopus publications to date. She received the recognition as Top Research Scientist Malaysia (TRSM) in 2013 and elected as a Fellow of the Academy of Sciences Malaysia in 2016. In 2019, Dr. Hassan received the Ohio University Notable Alumni Award and was mentioned as a notable alumna of "Pioneers Scientific Advances in US and Malaysia".



Second Place in Basic Research
Scientific Committee: Chemical Technologies

Research Work Title

Development of carbon nanostructures in the oil and gas industry

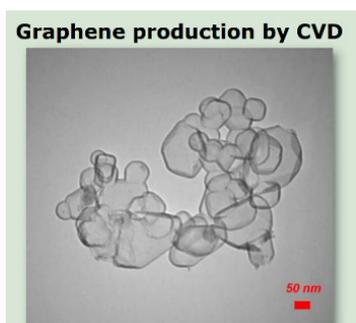


Representative | Dr. Alimorad Rashidi

Collaborating Organization | Research Institute of Petroleum Industry (RIPI)

Abstract

Carbon nanostructures such as graphene, owing to their exceptional properties (including high specific surface area and controllable porosity), are considered promising candidates for natural gas storage. In this project, the technical know-how of Adsorbed Natural Gas (ANG) technology using carbon nanostructures has been developed with the aim of natural gas storage for domestic applications. This technology stores gas within an adsorbent at low pressure and ambient temperature, which not only increases storage capacity but also significantly mitigates the safety issues associated with conventional Compressed Natural Gas (CNG) systems. The technology comprises two main components: (i) production of nanostructured adsorbents with tailored morphology depending on the application, and (ii) design of storage vessels adapted to the final use. The adsorbent developed in this project is a porous, quasi-graphitic carbon nanostructure with a high specific surface area of approximately $2500\text{--}3000\text{ m}^2\text{ g}^{-1}$, controlled porosity, and is synthesized using domestically sourced raw materials. Compared to commercial adsorbents, it exhibits significantly higher adsorption–desorption capacity. The adsorbent and storage system were designed and manufactured across scales ranging from laboratory to industrial, and storage tanks were developed in both composite and metallic configurations. Key challenges associated with ANG technology—including heat transfer limitations, adsorbent shaping, complete gas desorption, and adsorption capacity—have been addressed through nearly two decades of research and development. By engineering the adsorbent at the nanoscale, these challenges were effectively overcome. This technology has been implemented for domestic applications in Nigeria, where the required national standards and certifications were obtained. The successful development of this technology can contribute significantly to alleviating natural gas supply imbalances and reducing wintertime gas shortages faced by many industries



Second Place in Basic Research
Scientific Committee: Chemical Technologies

Research Work Title

Development of next-generation stimuli-responsive polymers and their applications



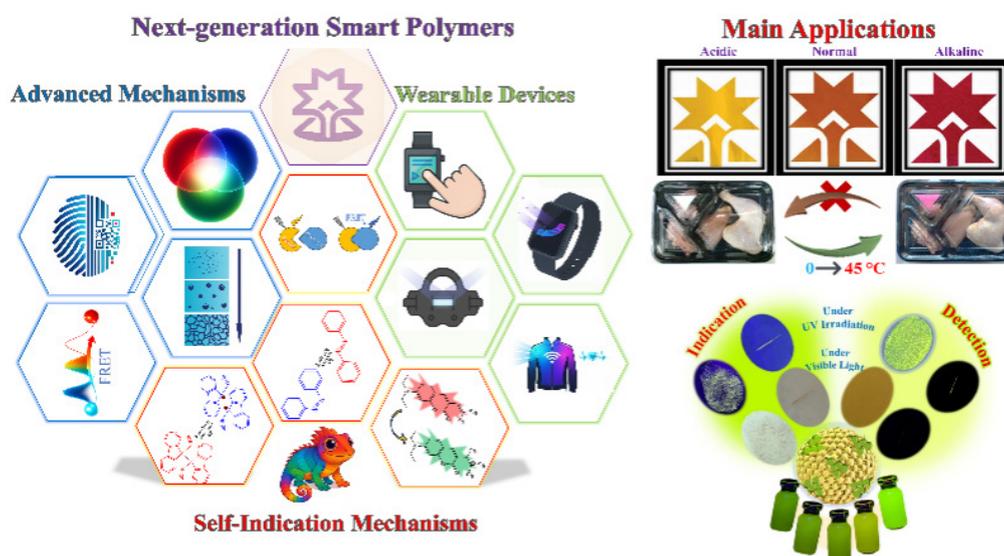
Representative | Dr. Hossein Roghani-Mamaqani

Collaborator | Dr. Milad Babazadeh-Mamaqani

Organization | Tabriz University of Technology (Sahand)

Abstract

The next-generation stimuli-responsive polymers, in addition to retaining the useful features and capabilities of previous generations, have been able to combine nanotechnology, green chemistry, and digital technologies to be highly efficient for future human life. These polymers address the requirements of the future smart human lifestyles in various fields, including medicine, clean energy, different industries, smart cities, and environment. These polymers can contribute to improving our lifestyle in different aspects, including security features, self-cleaning and self-healing surfaces, sensors and indicators, hygiene products, sustainable materials, wearable devices, smart fibers and membranes, displays, and energy and water storage systems. Stimuli-responsive polymers can be used in sensors that detect environmental changes. Next-generation smart polymer inks with advanced mechanisms can substantially enhance the security of confidential documents. The focus of the present project is on the application of next-generation stimuli-responsive or activatable polymers in indicators for the spoilage of food and pharmaceutical products, indicators for the storage conditions of materials, and yield and failure thresholds in polymers, and indicators for the presence of specific substances in the environment, gas leakage, and the presence of cracks or repaired cracks in various products. Among the challenges facing these polymers are long-term performance stability, scalability and low-cost mass production, safety and long-term environmental impacts, and integration with emerging technologies, such as the Internet of Things and nanomaterials. Overcoming these requires complex engineering and the interdisciplinary integration of fundamental sciences and various engineering disciplines.



Third Place in Applied Research

Scientific Committee: Arts

Research Work Title

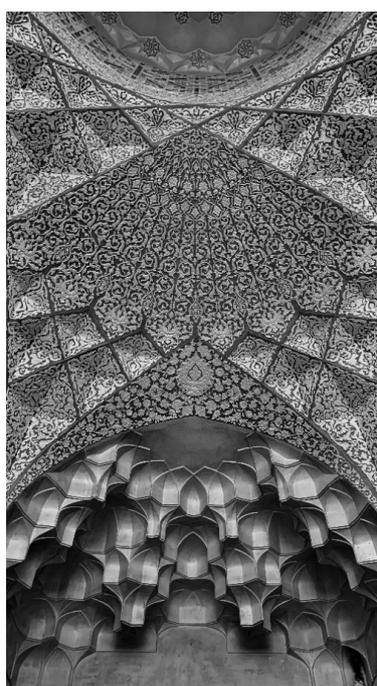
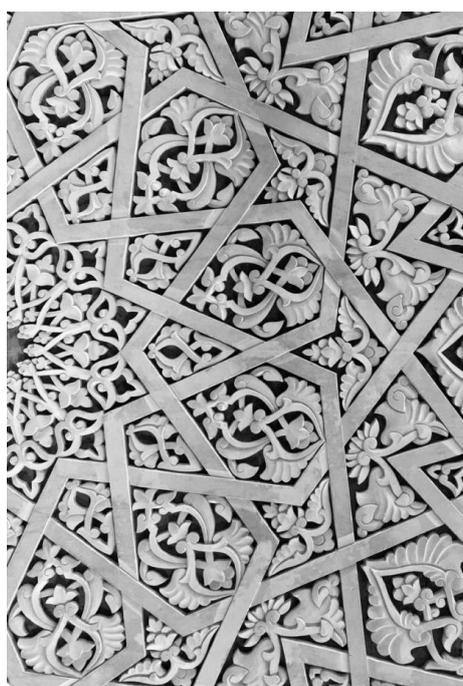
Architectural design, artistic supervision and decorative motifs of the Samen Al-Aimeh Mosque on Kish Island



Researcher | Dr. Jalil Jokar, Mohammad Vahid Saberi

Abstract

The decorations of the Samen-al-Aimma Mosque began in 2016 and was completed after six years and two months of uninterrupted work on January, 2023. This mosque, which is considered a postmodern architectural work, has decorations on about 15 percent of its total internal and external surfaces. Its decorations are unique and were designed with symbolic numerical coding. It is an architectural manifestation of the number 8, which has a high status in Islamic culture. The motifs used in this sacred building are Slimi, Khattai, and geometric designs, all of which were designed in a coherent but diverse system based on the number eight. This mosque is a prime example of the application of the wisdom of Islamic art in the construction and architecture of mosques. The techniques used to decorate this mosque include stucco, carving, and wood and metal latticework. In selecting Architectural materials, detailed laboratory studies were conducted by experts to ensure that the building has a high durability in the very humid climatic conditions of Kish.



Third Place in Applied Research

Scientific Committee: Advanced Materials, Metallurgy and Renewable Energies

Research Work Title

Recovery of silver from mining waste and tailings using an improved leaching method



Researcher | Dr. Seyed Hadi Banijamali

Collaborating Institution | Zarin Industrial and Mining Group

Abstract

The extensive accumulation of tailings and waste from mining industries in the country poses a serious threat to the environment. Recovering valuable metals from these secondary resources not only helps reduce environmental hazards but also creates significant economic value. This project is dedicated to developing a novel and fully indigenous process for recovering silver from mining tailings and waste. In this method, silver dissolution is based on sodium thiosulfate, and by utilizing innovative and entirely new additives that have been employed for the first time in the world, the process has been dramatically improved. This process completely avoids the use of cyanide, which causes severe and persistent contamination of water and soil, ecosystem poisoning, and long-term environmental risks, thereby minimizing the risk of environmental pollution. Additionally, by implementing a closed water cycle, fresh water consumption has been significantly reduced, preventing the waste of regional water resources. Multi-stage purification and selective precipitation steps, along with the high efficiency of the recovery process, ensure high-purity silver concentrate and enable the production of silver ingots with 99.99% purity at a low final cost. At the same time, accompanying heavy metals are safely managed, preventing their release into the environment. This process has been implemented on an industrial scale and is currently operational in six plants of the Zarin Industrial and Mining Group. Based on continuous research, this project has achieved economic and sustainable silver recovery alongside responsible waste management. By creating high added value from mining waste and tailings, the present project provides a practical model for the development of green and sustainable mining industries in the country. The final product of this project, the first domestically produced standard silver ingot with 99.99% purity, is currently offered on the Iran Mercantile Exchange.



Second Place in Applied Research

Scientific Committee: Water Management Agriculture and Natural Resources

Research Work Title

Pilot-scale production of various types of nanocellulose and microcrystalline cellulose (Avicel) from agricultural residues



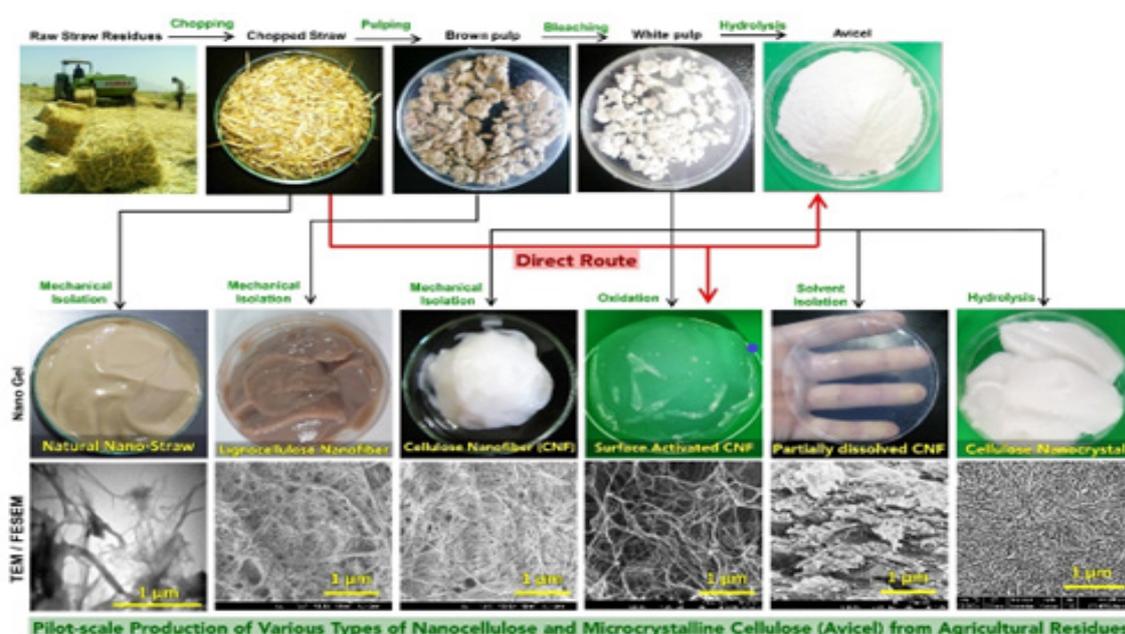
Researcher | Dr. Hossein Yousefi

Collaborator | Dr. Armin Jamali, Homa Karbalaei

Collaborating Organizations | Gorgan University of Agricultural Sciences and Natural Resources, Nanonovin Polymer Co.

Abstract

In the past decade, nanocellulose has attracted significant attention from various industries due to its unique properties, including its high abundance and low cost of raw materials in nature, outstanding chemical and mechanical characteristics, biocompatibility, and biodegradability. In addition, its wide range of applications has led to major investments by countries such as the United States, Canada, Japan, Finland, Sweden, and others. Therefore, the localization of nanocellulose production technology is an essential issue. The same applies to microcrystalline cellulose (Avicel), with the difference that this material has been produced on an industrial scale by some developed countries for decades, while the entire domestic demand is currently met through imports. What distinguishes this project from similar ones worldwide is the direct and low-cost production of nanocellulose and Avicel from sawdust and agricultural residues at the pilot scale, as indicated by the red arrow in the figure below. In this direct method, there is no need for separate stages of brown pulp production or bleaching processes; instead, agricultural residues are directly converted into the final product. Direct production results in shorter processing time, reduced water consumption, less wastewater generation, lower environmental pollution, reduced energy and chemical consumption, and ultimately a lower final product cost compared to conventional methods.



First Place in Applied Research
Scientific Committee: Chemical Technologies

Research Work Title

Development of membrane technology for gas separation in the gas and oil industry



Researcher | Dr. Seyed Ali Ghadimi

Collaborator | Dr. Somayeh Norouzbahari, Seyed Behrouz Sadatnia, Sam Salimi Beni, Danial Salimi Beni

Collaborating Organizations | Iran Polymer and Petrochemical Institute, Hirbod Oil and Gas Co., Kharazmi University

Abstract

According to statistics published by the World Bank, approximately 23 billion cubic meters of flare gas were burned in Iran in 2024, placing the country second globally after Russia in terms of gas flaring. The recovery and utilization of such gases using advanced and efficient technologies, such as membrane separation technology can create outstanding economic, environmental, and even energy security benefits. Membrane separation processes offer advantages, e.g. compact and modular design, environmental compatibility, elimination of rotating equipment, and reduced requirement for continuous monitoring and maintenance. These favorable characteristics make membrane technologies particularly reliable for operation in remote areas and under challenging operational conditions. The main objective of this project has been the development of indigenous technology for the production of membranes, modules, and membrane-based gas separation units at an industrial scale for the first time in Iran, enabling the effective recovery and utilization of flare gases. The successful implementation of this project has not only prevented the loss of millions of dollars' worth of the country's hydrocarbon resources along with reduced greenhouse gas emissions, particularly carbon dioxide into the atmosphere, but also has practically confirmed the nation's technological and industrial capabilities in the oil, gas, refinery, and petrochemical industries. The development pathway of this technology has begun at the laboratory scale and following nearly a decade of research, development, and engineering efforts, has emerged as an effective industrial technology in the field of membrane-based gas separation in Iran. The outcomes of this project have led to the design, fabrication, and installation of membrane gas separation units in petrochemical complexes across the country, ultimately enabling ending routine gas flaring at these facilities. Furthermore, in light of the current energy imbalance in the country, one of the main objectives of this project is the recovery of valuable hydrocarbon resources from flare gases in Iran's oil and gas fields.



Outstanding Researcher

Scientific Committee: Irrigation and Development Engineering

Development of skill-based education in Iran



Researcher | Professor Javad Farhodi

Field | Hydraulic Structure Engineering

Scientific Affiliation | University of Tehran

Biography and Achievements

Professor Javad Farhodi was born in 1944 in Maragheh. After completing his primary and secondary education in his hometown, he graduated from the Pre-Service Teacher Training College in Tabriz and began teaching. In 1976, he moved to the United Kingdom for further studies, where he earned a Master's degree in Water and Soil Engineering and a PhD in Hydraulic Structure Engineering. Afterward, he began his career at the University of Urmia and transferred to the University of Tehran in 1998.

In addition to his academic activities, Professor Farhodi has served at high levels of management and policy-making in water engineering and higher education, such as Deputy Minister of Energy for Water and Deputy Minister of Science, Research and Technology for Research, paving the way for an effective link between academic knowledge, macro-level policymaking, and the implementation of national projects in the water and higher education sectors. He is an influential figure in the country's water engineering, with more than four decades of continuous scientific, educational, and executive contributions in water engineering, hydraulics, and water structures. By combining theoretical knowledge, field experience, and a strategic perspective on macro-level water issues, he has played an effective role in the development of water engineering knowledge and addressing the country's challenges in this field.

He has published over 100 articles in both international and domestic scientific research journals, delivered dozens of presentations at national and international conferences, as well as authored and translated numerous scientific works in the fields of water engineering, hydraulics, erosion and sedimentation, and technical standards for the country's water industry, demonstrating his extensive research efforts. By assuming the responsibility of the presidency of Urmia University and being involved in founding the National University of Applied Science and Technology, he has been instrumental in enhancing vocational training, improving university structures, and aligning education with societal and industrial needs. He has also supervised and mentored many postgraduate students' theses and translated and edited three encyclopaedias in the fields of agriculture and life sciences, as well as water and soil sciences. Additionally, he is a member of the Iranian Academy of Sciences. He has played an important role by assuming the responsibility of the presidency of Urmia University and being involved in the establishment of the country's comprehensive university of applied sciences.

He is a member of the Academy of Sciences of the Islamic Republic of Iran. Some of his accolades include being recognized as a National Distinguished Professor, a Top National Hydraulics Expert, a Senior Researcher at the University of Tehran, Vice President of the International Commission on Irrigation and Drainage, and a Water Sector Distinguished Elite by the National Elite Foundation.



Ministry of Science, Research & Technology
Iranian Research Organization for
Science & Technology

The Laureates of the **39th** Khwarizmi International Award

39th KHWARIZMI INTERNATIONAL AWARD

Chairman's Foreword

In the Name of ALLAH



The Khwarizmi International Award, named after one of the pioneering figures of computational science, today symbolizes the spirit of curiosity and innovation that has distinguished Iranian scholars throughout history. In its 39th edition, this prestigious scientific event has provided a dynamic platform for identifying, honoring, and promoting researchers and technologists whose ideas and achievements contribute to the advancement of science and technology in Iran and globally.

This year, the award received a positive response from Iran and over thirty other countries, featuring remarkable projects that are not only scientifically competitive on an international scale but also have the potential to address societal challenges. Emphasizing the “Innovation Value Chain,” this edition aimed to bridge the gap between fundamental research and practical applications, outlining a clear path for realizing the social and economic impact of selected projects.

In a world where shared challenges such as climate change, health crises, and technological inequalities necessitate multinational collaboration, the Khwarizmi International Award strives to go beyond recognizing individual achievements. It aims to build a network of researchers, technologists, and industry leaders who contribute to addressing these pressing issues. One of the award's core values is creating a forum for scientific dialogue and experience exchange among Iranian and foreign researchers.

The rapid advancement of emerging technologies, including artificial intelligence, biotechnology, and nanotechnology, presents numerous opportunities but also raises new ethical and social questions. The Khwarizmi Award believes that researchers owe more to society than just scientific excellence; they must also adhere to ethical standards in their work. In particular, we encourage young researchers to confront grand scientific and technological challenges with greater boldness. The path of innovation often involves trial and error; failures along the way should be viewed not as endings, but as opportunities to learn and reframe our approaches. The award not only celebrates successes but also acknowledges the courage to explore the unknown.

The forthcoming bulletin will showcase some of the most outstanding scientific and technological achievements from the 39th Khwarizmi International Award and the 27th Khwarizmi Youth Award. We hope that these exemplary projects will inspire other researchers and technologists and represent a significant step towards realizing the grand vision of a “developed and knowledge-based Iran.”

I would like to extend my heartfelt thanks to the Ministry of Science, Research and Technology, my colleagues at the Iranian Research Organization for Science and Technology, the Permanent Secretariat of the Khwarizmi Awards, the jury, members of the scientific committees, and our national and international sponsors. May researchers and innovators in our country continue to prosper and thrive.

Professor Alireza ASHORI
Chairman

The 39th Khwarizmi International Award

Minister's Foreword

In the Name of ALLAH



In a world that is transforming at a dizzying pace, science, technology, and innovation serve as the enduring capital of nations. Today, the frontiers of knowledge and technology shift every moment. In such a competitive landscape, countries that place creativity at the core of their development lead the way.

The Khwarizmi International Award embodies the belief that Iran has a vital voice in contributing to the global stage of science, technology, and innovation. Now entering its 39th year, this event serves not merely as an award but as a bridge between Iran's illustrious past and a technologically crafted future.

Khwarizmi, the great Iranian scholar whose name is immortalized in the history of science and technology, reminds us that knowledge and innovation know no borders. The Khwarizmi Award demonstrates this truth by bringing together researchers and innovators from over thirty countries, proving that science and technology act as a universal language of humanity, even in the most challenging circumstances.

Knowledge-based companies are at the forefront of technological transformation. They have shown that Iranian innovation and technology not only compete but also lead in the realms of the fourth and fifth industrial revolutions. Knowledge management and the establishment of a knowledge-based economy are key to our entry into emerging technologies.

I extend congratulations to researchers, technologists, and innovators who have made Iran proud through their tireless efforts. I remind that you are the country's real capital. Every invention, every new technology, and every innovation is a cornerstone of the future in which our children will live.

Although our path is long and arduous, with such talent, technologies, and determination, no summit is out of reach. Seizing this opportunity, I express my heartfelt thanks to the chairman of the 39th Khwarizmi International Award, the jury, the Iranian Research Organization for Science and Technology, and all colleagues who have contributed to the success of this significant science and technology event.

Professor Hossein SIMAEI
Minister of Science, Research
and Technology

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سی و نهمین جشنواره بین المللی خوارزمی

وزارت علوم، تحقیقات و فناوری
سازمان پژوهش‌های علمی و صنعتی ایران
بهمن ۱۴۰۴

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ
يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ
وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ
وَاللَّهُ بِمَا تَعْمَلُونَ خَبِيرٌ

In the Name of Allah
“Allah will raise up in ranks those
who believed among you and those
who have been given knowledge.
Allah is aware of what you do.”

Holy Qur`an, Surah al-Mojadele, Ayah 11

IN THE NAME OF ALLAH



Ministry of Science, Research & Technology
Iranian Research Organization for
Science & Technology

THE **39**th KHWARIZMI INTERNATIONAL AWARD

THE **27**th KHWARIZMI YOUTH AWARD

February 2026