

# Newsletter

## PAKISTAN ACADEMY OF SCIENCES

Promoting Science, Technology and Innovation for Socio-economic Development

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## Signing of Memorandum of Agreement between Pakistan Academy of Sciences and National Academy of Sciences of Belarus on S&T Cooperation (November 26, 2024)



A Memorandum of Agreement between National Academy of Sciences of Belarus (NAS of Belarus) and Pakistan Academy of Sciences (PAS) on Science and Technology Cooperation was signed herein Islamabad on November 26, 2024 during official visit of the President of Belarus to Pakistan. Dr. Muhammad Aslam Baig, Secretary General PAS signed the Agreement on behalf of President PAS, while the Minister of Foreign Affairs of Belarus signed the Agreement on behalf of President of NAS of Belarus. The Agreement signing Ceremony was witnessed by the Prime Minister of Pakistan and the President of Belarus at the PM House in Pak Secretariat. According to the agreement, both the Academies shall provide comprehensive assistance to cooperation between the organizations of both countries in the following priority areas:

- energy and energy saving;
- agro-industrial technologies;
- industrial and construction technology and manufacturing;
- medicine and medical technology, pharmacy;
- chemical technologies, nano- and biotechnology;
- information and communications technology;
- artificial intelligence;
- water technologies;
- environmental management and protection, etc.

## Lecture and Informal Meeting with High-Level Chinese Delegation (January 20, 2025)

Pakistan Academy of Sciences (PAS) in collaboration with the COMSTECH, organized a Lecture and Informal Meeting with the High-Level Chinese Delegation, on January 20, 2025, at PAS Auditorium (3-Constitution Avenue, Sector G-5/2, Islamabad). The event featured a Keynote Lecture by Prof. Dr. Zhao Yufen, Academician of the Chinese Academy of Sciences and Director of the Institute of Drug Discovery Technology at Ningbo University, China. Prof. Dr. Noor Muhammad Butt, Fellow PAS, also delivered a talk on "Years MoU of Nanotechnology Cooperation of Preston University and NCNST Beijing, CAS", at the occasion. About 100 participants including Fellows and Members of the Academy, and scholars from various institutions attended the event either physically or virtually.

The delegation was led by Prof. Zhao Yufen, Academician, Chinese Academy of Sciences, Director, Institute of Drug Discovery Technology, Ningbo University, Ningbo, Zhejiang Province, China. Delegation accompanied by Prof. Liu Xinmin, Member, Expert Advisory Panel on Traditional Medicine, WHO, Chief Scientist, Institute of Drug Discovery Technology, Ningbo University, Ningbo, Zhejiang Province, China Co-Director, Sino-Pakistan Center on TCM, National Administration of TCM of China; Prof. Dr. Zhen Huang, Director, SeNA Research Institute, College of Life Sciences, Sichuan University, Chengdu, Sichuan 610065,

China; Dr. Wang Ning, Assistant Profesor, Ningbo University, No.818, Fenghua Road, Ningbo, Zhejiang, China; Mr. Huang Xuanyu, Sales Manager, Jingzhou Zhimei Health Technology Co., Ltd. Huaihua, Hunan Province, China; Mr. Liu Xianjiu, Chairman of Nongda Health Industry Group, Huaihua, Hunan Province, China; Ms. Wu Zhuyi, Ningbo University; and accompanying guests of Ms. Wu Zhuyi (Miss Pan Qiaodi & Mr.Lian Zhiao).

Prof. Dr. Kauser Abdullah Malik (President, PAS), and Prof. Dr. M. Aslam Baig (Secretary General, PAS) welcomed the visiting delegation and presented an overview of the organizational structure, aims and objectives, national & international collaboration, as well as salient achievements of the PAS since its inception. The meeting aimed to briefly discuss the role of PAS and the possibilities for the establishment of a long-term mutually beneficial relationship for scientific collaboration and scholarly research activities. The event provided a valuable platform for discussions on key areas of cooperation and potential collaborations between PAS and Chinese institutions. It was an excellent opportunity for our Fellows and Members to engage directly with leading experts in the field and to explore avenues for future research and institutional linkages.





## Participation of PAS in "Science Academies of Asia Forum (SAAF) 2024" regarding "Advancement of Science and Technology in Asia"

Presidents of National Academies of Sciences in Asia attended the "Science Academies of Asia Forum (SAAF) 2024" organized by the Korean Academy of Science and Technology (KAST) on November 21, 2024. As a representative of President PAS, Prof. Dr. Aslam Baig, Sec. General PAS, actively attended the Forum held at KAST, South Korea, and presented an overview of S&T activities in Asian Countries with special reference to the status of S&T-related activities and progress in Pakistan:

- Science & Technology in Asia
- R&D Investment
- Science & Technology in Pakistan
- STEM Policy in Pakistan
- Higher education role in Pakistan
- Agriculture land area Pakistan
- Agricultural Reforms in Pakistan

A Joint Declaration for the Advancement of Science and Technology in Asia was signed by the attendees during the meeting.



## 23<sup>rd</sup> Annual Meeting of the Science Council of Asia (SCA) at Dhaka, Bangladesh (November 30 to December 02, 2024)

The Science Council of Asia (SCA) is an international scientific organization founded in 2000 by Asian science academies and other national scientific organizations. SCA aims to provide scientists in all fields, including cultural and social as well as natural sciences and technology, a collaborative platform for promoting scientific exchange and cooperation in Asia, and to develop and promote a holistic vision focusing on sustainable development and improvement in quality of life. At present, SCA is comprised of 31 academic organizations in Asia, and SCA Conference has been held annually since 2001.

As President of the Science Council of Asia (SCA), Prof. Dr. Aslam Baig, Sec. General PAS, presided over the 23<sup>rd</sup> SCA Meeting held at Dhaka, Bangladesh from November 30, 2024 to December 02, 2024. The meeting discussed the schedule and agenda for the 24<sup>th</sup> SCA meeting to be held in Pakistan tentatively during November 2025. The conference was jointly organized by Bangladesh Academy of Sciences (BAS) and Science Council of Asia (SCA), and supported by the Ministry of Science & Technology, Government of the People's Republic of Bangladesh. Approximately 300 participants from 10 countries and regions joined the conference in person and online.

The conference theme was "Fourth Industrial Revolution and Future Society". The conference aimed to address the crucial challenges and opportunities arising from the Fourth Industrial Revolution to transform how we live, work, and interact with technology by blending the physical, digital, and biological worlds; and to create new efficiencies, drive innovation, and bring about a deeper integration between the digital world and the physical world.

Emeritus Prof Dr AK Azad Chowdhury, President, Bangladesh Academy of Sciences (BAS) and Chair, Organizing Committee, chaired the inaugural session; and Prof Dr Zahurul Karim, Vice-President, BAS and Chair, Program Committee welcomed the conference delegates and participants. During the inaugural session, opening remarks were delivered by Prof Dr Muhammad Aslam Baig, President, SCA; Prof Dr Haseena Khan, Secretary, BAS; and Prof Dr Mitsuishi Mamoru, President, Science Council of Japan. Prof Dr M Iqbal Choudhary, Coordinator General, OIC-COMSTech, was invited as a Special Guest while Prof Dr SMA Faiz, Chairman, University Grants Commission, Bangladesh was a Chief Guest at the occasion. At the end of the inaugural session, Prof Dr Liaquat Ali, Organizing Secretary, 23rd SCAC gave a Vote of Thanks to all the conference delegates, participants and

invited speakers. The foreign and local eminent speakers presented about sixty (60) lectures in twelve (12) technical sessions at this event.

During the concluding session, Emeritus Prof Dr AK Azad Chowdhury President of BAS, addressed the conference delegates/participants; followed by a brief open discussion moderated by Prof Dr Liaquat Ali, Organizing Secretary; remarks by Prof Dr Muhammad Aslam Baig, President, SCA; Prof Dr Zahurul Karim, Vice-President, BAS; and Prof Dr Haseena Khan, Secretary, BAS. The conference declaration was delivered by Prof Dr Shibusawa Sakae, SCA. Prof Dr Saleh Hasan Naqib, Vice-Chancellor, University of Rajshahi, Rajshahi, Bangladesh, was invited as a Chief Guest at the concluding session. At the end, Prof Dr Yearul Kabir, Co-organizing Secretary, 23rd SCAC gave Vote of Thanks to all the conference participants, visiting delegates and invited speakers.

This event brought together a diverse group of scientists, experts, policymakers, and stakeholders to discuss the transformative impact of emerging technologies on society, economy, and governance; and to explore how the Fourth Industrial Revolution (driven by AI, robotics, IoT, blockchain, and other technologies) will shape the future, both globally and locally.





## Workshop on Review/Upgradation of National Energy Policies (December 5, 2024)

Pakistan Academy of Sciences (PAS) organized a workshop on the "Review/Upgradation of National Energy Policies" on December 5, 2024, bringing together key experts and policymakers to discuss advancements in the energy sector. The event was inaugurated by Prof. Dr. Aslam Baig, Secretary General of PAS, and Dr. Sara Qaisar, Director of the PAS Policy Unit, who emphasized the workshop's objectives. Notable attendees included Dr. Khalid Waleed (SPDI), Dr. Kashif Imran (USPCAS-E, NUST), Dr. Waqar A.

Butt (PAEC), Afzal Kamboh (PCRET), and Dr. Noor Jamal (PAEC), along with 24 participants comprising academicians, scientists from strategic commissions, stakeholders, and policymakers. The workshop aimed to review and upgrade the National Electricity and NEEC Policy to address emerging challenges, foster innovation, and align energy strategies with national development goals.



## Advisory Council Meeting of PAS-PSDP Project of Upgradation/Review of National Policies of Pakistan at PAS, Policy Unit, Islamabad (December 24, 2024)

The PAS/PSDP Advisory Council Meeting, held on December 24, 2024, chaired by Prof. Dr. Aslam Baig, Secretary General, PAS and Dr. Sara Qaisar, Director Policy Unit. Its agenda was reviewing the progress of various policy initiatives and identifying the key challenges faced in their implementation. Prof. Dr. Anwar ul Hassan Gillani, Major General (Retd.) Dr. Amir Ikram, Prof. Dr. Mudassir Israr, Dr. Ather Osama and a few other members attended this meeting. One of the significant accomplishments discussed was the completion of the National Science, Technology, and Innovation Policy 2022 and National Energy Policy 2021. Additionally, ongoing efforts to develop policies for climate change and drinking water were highlighted, with plans to review water, environmental, science diplomacy, and food security policies soon.

Council in policy discussions. The meeting also highlighted the necessity of incorporating diverse expertise and analytical tools like fishbone analysis to address complex issues. Workshops on climate and the environment, scheduled for February 2025, and water scarcity, scheduled for March 2025, were outlined as key opportunities to engage stakeholders in meaningful discussions.

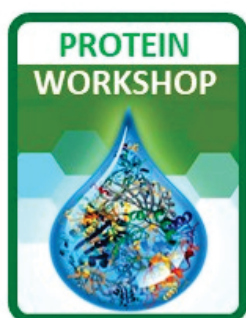
Looking ahead, the council set a timeline for the compilation of revised policy documents by May 2025. Discussions also centered around addressing the gaps between petroleum and power sector policies and integrating academia, industry, and government in shaping science and technology policies. The need for an increase in the R&D budget, which currently stands at 0.28% of GDP, was strongly advocated.

The meeting also included a review of the outcomes from the energy policy workshop, where challenges such as accountability gaps, governance issues, and unclear policy frameworks were identified. The council emphasized the need to integrate energy policies with national science and technology policies and suggested utilizing biomass and ethanol blending. There was strong advocacy for conducting cost-benefit analyses in decision-making processes to ensure the efficient use of resources. Stakeholder inclusion was a key focus, with the council emphasizing the importance of involving organizations such as the Pakistan Business Council and Agriculture

The meeting concluded with a call for public universities and provincial bodies to be included in future workshops, as their contributions are essential for creating a comprehensive and effective policy framework. The next steps include conducting the upcoming workshops, finalizing policy revisions by May 2025, addressing sectoral gaps, advocating for an increase in the science and technology budget, and focusing on long-term policy recommendations that prioritize systematic capability building.



Advisory Council Meeting of PAS-PSDP Project of Upgradation/Review of National Policies of Pakistan



## National Workshop Current Techniques for Protein Purification and Characterization School of Biological Sciences, University of the Punjab, Lahore-Pakistan



Faculty of the School of Biological Sciences, Punjab University and participants of the workshop "Current Techniques in Protein Purification and Chartacterisation" held on 2-6 Dec., 2024.

The School of Biological Sciences, Punjab University, Lahore organized a national workshop on "Current Techniques in Protein Purification and Characterization" on December 2-6, 2024. Supported by the Punjab Chapter, Pakistan Academy of Sciences, 22 researchers and faculty members from the institutions across the country like Jacobabad, Kohat, Peshawar, Swabi, Mardan, Gujrat, Multan, Mirpur (AJK) and Lahore participated. This workshop provided hands-on experience to many of the currently used techniques including production of recombinant proteins, their purification by ion-exchange chromatography and FPLC and characterization by electrophoresis, mass and CD spectroscopy, as well as substrate analysis by HPLC.

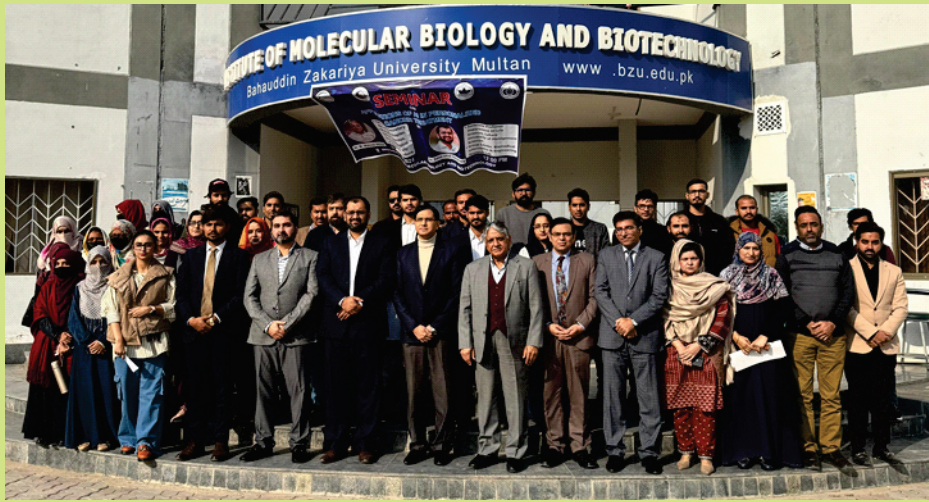
In the inaugural session Dr Sadaf Naz welcomed the participants, highlighting the significance of the workshop, while Prof Dr. M. Waheed Akhtar gave an overview of the activities of the PAS and its Punjab Chapter. Punjab University Vice-Chancellor, Prof Dr Muhammad Ali appreciated the efforts of the SBS faculty and wished the participants a fruitful learning from the workshop. On the successful conclusion of the workshop on 6 December, 2024, certificates were awarded to the participants, who opined that this workshop was highly useful and rewarding for them.



## Lectures Organised by Punjab Chapter of the Pakistan Academy of Sciences

After the first talk in the series of lectures on the emerging sciences organized by the Punjab Chapter, Pakistan Academy of sciences, delivered by Prof. Sadaf Naz, on the "Human Genome-Advances and Prospects", at the FCC, Lahore, next talk was delivered by Dr. Safee Ullah Chaudhry, Associate Prof. from LUMS, in the Institute of Molecular Biology and Biotechnology (IMBB), Bahauddin Zakariya University (BZU), Multan on 10 December, 2024. The title of his talk was "Application of AI in Personalized Cancer Treatment". The lecture was attended by the

faculty and the students from the IMBB, computer science and others related departments. The lecture dealt with the AI approaches in the diagnosis and treatment of cancer. The lecture came out to be extremely interesting as indicated from the very participative and lively discussion between the speaker and the audience. The impact of this rather extended talk was highly encouraging and as expected.



Prof. M. Waheed Akhtar, Fellow PAS; and Dr. Safee Ullah Ch., Associate Prof. from LUMS, with the faculty and the students of BZU, Multan.

## Khyber Pakhtunkhwa Chapter of Pakistan Academy of Sciences Arranged an International Conference on "Climate Change Impact on Agriculture, Water and Ecological Resources" (December 17-18, 2024)

The emissions of greenhouse gases into the air, because of extensive uses of fossil fuels, are responsible for climate change. Pakistan is the most vulnerable country to climate change because of its detrimental impact on agriculture, water and ecological resources. Climate change has enhanced the temperature and caused abrupt changes in precipitations. All these parameters are closely linked to agricultural production, water availability and quality and ecological resources. Climate change has the greatest impact on agriculture yields and food security, particularly in dry and semi-arid regions of the globe.

Simultaneously, climate change can also affect aquatic ecosystem and its ecological resources through different dimensions such as changes in the amount and time patterns of precipitation; impact on water quality through changes in runoff; river flows; retention and thus loading of nutrients; and through extreme events such as floods and droughts. The survival and health of ecological

resources are closely linked with all these parameters particularly the availability and quality of water. Looking into the impact of climate change on agriculture, environment and human beings, it is important to take efficient and accurate mitigative measures along with proper adaptative policies.

Pakistan Academy of Sciences (PAS), Khyber Pakhtunkhwa Chapter has arranged an international conference (December 17-18, 2024) in collaboration of University of Peshawar (UOP). It covered a wide range of themes related to climate change. The Chief Guest of this event was Prof. Dr. M. Naeem Qazi, Vice Chancellor UOP. The keynote speakers included Prof M. Qasim Jan (TI, SI, HI, Fellow PAS and Fellow TWAS), Prof Khan Bahadar Marwat (SI, Fellow PAS), Prof. M. Tahir Shah (TI) and Prof M. Nafees. Prof. Qasim Jan delivered his talks on reducing environmental risks and ensuring green development in mountain regions.

Prof. Khan Bahadar Marwat talked on phyto-invasion impacts biodiversity and climate change. Similarly, Prof. Tahir Shah shared a presentation on exploitation of mineral and energy resources and their role in the environmental degradation and climate change and Prof. M. Nafees (Ex-Chairman) talked on the impact of climate change on biodiversity in Pakistan. Prof Sardar Khan (TI, Fellow PAS) gave a brief introduction of the Pakistan Academy of Sciences and highlighted its contributions towards the promotion of science and its application for the welfare of the humanity. Foreign speakers including Prof. Huan Qing, Prof. Lei Ming and Prof Li Gang delivered their talks related with different themes of the event online. The students enrolled at different universities were also attended this conference. As members of the organizing committee, Dr. Shahla Nazneen and Dr. Saeeda Yousaf worked hard to make this event successful. The Vice

Chancellor Prof. M. Naeem and Prof. Qasim Jan presented shields and certificates to the speakers at end of the event. Prof. Sardar Khan (Chief Organizer) of the conference thanked the Pakistan Academy of Sciences for financial support, the organizing committee, keynote speakers, speakers and all authors and co-authors who contributed their work and abstracts.

This conference provided an opportunity for both faculty and students to exchange their ideas and knowledge with each other that may helpful to minimize the climate change impact on agriculture, water and ecological resources. The speakers proposed some significant recommendations and mentioned some strategies for controlling climate change and protecting the ecological resources from degradation.



## Prof. Dr. Sardar Khan (TI) (Fellow PAS) Elected as a Fellow of The World Academy of Sciences (TWAS)

The World Academy of Sciences (TWAS) has elected Prof Sardar Khan as a fellow for advancement of science. He is a full Professor and Chairman Department of Environmental Sciences, University of Peshawar (UOP). He remained as Vice Chancellor of Kohat University of Science and Technology and Khushal Khan Khattak University, Karak. He also remained Director of the Directorate of Advanced Studies, UOP. Dr. Khan has been working as adjunct Professor in Hunan Agriculture University, and Chinese Academy of Sciences, China. Previously, he has received national and international awards including civil award-Tamgha-e-Imtiaz, Gold Medal, Young International Scientist award, Best University Teacher, Productive

Scientists of Pakistan, Research Productivity Awards and High citation award. He is a productive scientist of Pakistan in the field of Earth and Environmental Sciences and ranked among the top 2% highly cited scientists.





## **“The New Age of Physics: Emerging Trends and Innovations” Seminar Organised by the Department of Physics at Air University, Islamabad (December 20, 2024)**

The Department of Physics at Air University, Islamabad, successfully hosted the event “The New Age of Physics: Emerging Trends and Innovations” on December 20, 2024. With over 300 participants, including students, faculty, and guests from various institutions, the seminar offered a vibrant platform for exchanging ideas and exploring advancements in physics, from the subatomic realm to large-scale phenomena shaping human existence.

The event featured insightful discussions highlighting the dynamic nature of physics and its evolving trends. It was attended by prominent figures such as Dr. Muhammad Atif, Dean of the Faculty of Basic and Applied Sciences, Prof. Dr. Asghari Maqsood (SI), Fellow of the Pakistan Academy of Sciences (Organizer), and Dr. Rubina Nasir, the Organizing Secretary. Dr. Asghari Maqsood welcomed participants and emphasized the importance of innovation and collaboration in advancing physics.

A captivating talk by Prof. Dr. Pervez Amirali Hoodbhoy explored the interplay between the microscopic world of atoms and the macroscopic forces governing human life, illustrating how physics provides a framework for understanding the universe. Interactive sessions allowed students to engage directly with experts, sparking thought-provoking questions about quantum mechanics, astrophysics, and energy research. Discussions on topics like quantum computing, particle physics, and dark matter inspired participants, showcasing the revolutionary potential of emerging technologies.

The event concluded with an optimistic outlook, as the Dean highlighted Air University's research facilities. Shields and certificates were awarded to speakers and students. Special thanks were extended to the organizing team and the Pakistan Academy of Sciences for their support.



## **Prof. Dr. Zhu Yongguan (Foreign Fellow, PAS) Elected as Vice President of International Science Council (ISC)**

The International Science Council announced on its website that Zhu Yongguan, an academican of the Chinese Academy of Sciences, has been elected its vice-president for membership with a high number of votes, serving from 2025 to 2028. The ISC is the most comprehensive scientific organization globally, with the broadest membership coverage and the most diverse range of disciplines, according to the China Association for Science and Technology. The non-governmental organization brings together 40 international scientific unions and associations, along with over 140 national and regional scientific organizations, including academies and research councils. Zhu, an environmental soil scientist and biologist, was recommended by the China Association for Science and Technology. Born in August 1967 in Tongxiang, Zhejiang province, he graduated from Zhejiang A&F University in 1989 and obtained a master's degree in 1992 from the Institute of Soil Science, Chinese Academy of

Sciences, in Nanjing, Jiangsu province. He then attained a doctor's degree from Imperial College London, Britain, in 1998. Zhu was elected as an academican of the CAS in 2019 and currently serves as the director of the Research Center for Eco-Environmental Sciences at the CAS. He has been honored with prestigious awards such as the second prize of the 2023 National Natural Science Award and the Von Liebig Award from the International Union of Soil Sciences.

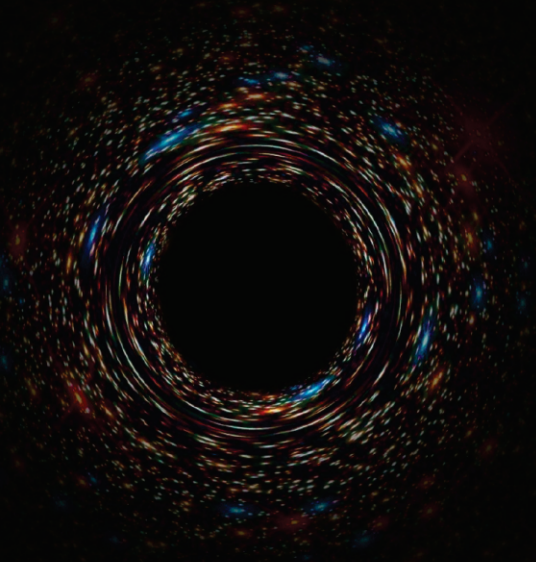


## Book Entitled: "Kainat: Aik Hairat Kadah" Published by Prof. M. Suhail Zubairy (Fellow, PAS)

Recently, Prof. M. Suhail Zubairy (Fellow, PAS) published a book entitled Kainat: Aik Hairat Kadah. This is a unique book in Urdu that explains the fundamentals of quantum mechanics, relativity and cosmology in a language that is accessible to anyone without a background in physics and mathematics. The book can be ordered directly from Sanjh Publications via email (sanjhpks@yahoo.com) or by telephone at 03334051741.

# کائنات: ایک حیرت کدہ

کوانٹم میکینکس اور نظریہ اضافیت سے وابستہ قوانین فطرت کا بیان عام فہم زبان میں



محمد سہیل زبیری

کائنات: ایک حیرت کدہ

محمد سہیل زبیری

سانچہ

تہذیب کی ابتدا سے انسان نے اس کائنات کو سمجھنے کی کوشش کی ہے۔ ہزاروں سالوں تک پھیلے ہوئے اس سفر میں یہ کائنات کافی پراسرار نظر آتی رہی۔ بہت سے ایسے مظاہر تھے جو ناقابل فہم اور مافوق الفطرت دکھائی دیتے تھے۔ پھر سولہویں صدی میں جدید سائنسی انقلاب کا آغاز ہوا۔ تمام رازوں سے پردہ اٹھنے لگا اور آہستہ آہستہ قوانین فطرت کھلنے لگے۔ انیسویں صدی کے آخر تک یہ احساس پیدا ہونا شروع ہوا کہ فطرت کے تمام قوانین سمجھے گئے اور یہ



قوانین اصولی طور پر زمین اور کائنات میں ہونے والے تمام واقعات کی وضاحت کر سکتے ہیں۔ پھر بیسویں صدی کے آغاز میں دو انقلابات رونما ہوئے جنہوں نے کائنات کے بارے میں ہمارے تصورات کو چھوڑ کر رکھ دیا۔ جس کائنات کو ہم بہت اچھی طرح سمجھنے لگے تھے اور جو ہماری سوچوں سے ہم آہنگ تھی، معلوم ہوا کہ وہ تو ایسے قوانین کے تحت کام کر رہی ہے جو بہت پراسرار اور آکثر واقعات ناقابل فہم ہیں۔ جگہ، وقت، مادے اور حقیقت کے بارے میں سائنسی تصورات اس سے بہت مختلف ہیں جیسے وہ ہم کو نظر آتے ہیں۔ اس کتاب کا مقصد ان قوانین اور ان کے اثرات کو عام فہم زبان میں ان لوگوں تک پہنچانا ہے جو کائنات کے اسرار کو جاننے میں دلچسپی تو رکھتے ہیں لیکن سائنس اور ریاضی کے مضامین پر دسترس نہیں رکھتے۔ یہ کتاب کوانٹم میکینکس کی بنیادوں اور نظریہ اضافیت اور ان کے نتائج سمجھنے کی خواہش رکھنے والے کسی بھی شخص کے لیے دلچسپی کا باعث ہوگی۔ یہ کتاب طبیعیات کا پس منظر رکھنے والے طالب علموں کے لیے بھی موزوں ہو سکتی ہے جو ان بنیادی مسائل کو سمجھنا چاہتے ہیں جن پر فزکس کے عام کورسز میں شاذ و نادر ہی بات کی جاتی ہے۔ اردو میں لکھی گئی اس موضوع پر یہ ایک منفرد کتاب ہے۔

سانچہ

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