Development of international scientific and technical relations

International cooperation of the Academy of Sciences of the Republic of Uzbekistan in recent years

International scientific and technical cooperation of the Academy of Sciences of the Republic of Uzbekistan and its subordinate research institutions with foreign countries is carried out on the basis of documents signed between scientific organizations and centers of these countries, including bilateral agreements, memoranda, scientific exchanges, joint publications, and other forms of cooperation.

Cooperation with scientists from foreign organizations and the exchange of scientific information constitute an integral part of the modern scientific activity of researchers working in the scientific institutions of the Academy of Sciences. In recent years, scientific and technical cooperation between the Academy of Sciences and research institutes of the Commonwealth of Independent States (CIS) and the Chinese Academy of Sciences has intensified significantly.

For this purpose, a number of agreements and memoranda of cooperation have been signed with leading foreign scientific institutions, universities, and research centers to expand collaborative ties. In particular, during 2023–2025, a total of **207 agreements and memoranda** were signed.

Within the framework of these agreements, the implementation of joint scientific projects, ensuring academic mobility of scientists and young researchers, organization of international scientific forums, conferences, and seminars, as well as strengthening cooperation in the field of scientific publications and innovative developments are envisaged. As a result, the participation of Uzbek scientists in the international scientific arena has expanded, and the authority and competitiveness of national science have been consistently increasing.

In particular:

The main objective of the KALAM project is to study ancient settlements, architectural monuments, and archaeological sites under threat of illegal excavations in Iraq and Uzbekistan using GIS technologies. As research objects implemented by the National Center of Archaeology, the Kofirqala and Pashkhur sites were selected. The total budget of the project amounts to EUR 1,390,000, of which EUR 330,300 was allocated to Uzbekistan during the project implementation.

A project was implemented in cooperation with the Japanese company Chiyoda Technol Corporation to study the content of radium-226 in uranium ore tailings and the possibilities of its extraction. Within the framework of the project, the approximate amount of radium-226 in uranium ore tailings in Uzbekistan was determined, and methods for its extraction were identified.

A sustainable scientific direction has been formed in the field of transposed Poisson structures (solvable and perfect Lie algebras; Lie algebras of the Virasoro/Witt type; low-dimensional quasi-filiform Lie algebras), which has been reinforced by publications in

2024–2025.

– Results were obtained through international cooperation on the issues of reversibility/irreversibility of two-dimensional cellular automata (CA) (IJBC, 2023).

– Results were achieved in the field of holomorphic dynamics and families of endomorphisms (IMSc/NUS collaboration), published in *IMRN* and *Transactions of the AMS* (2024).

– Results in **biomathematics and multi-locus dynamical systems** were published in an international scientific journal in 2025.

During 2023–2025, within the framework of agreements concluded with foreign scientific organizations and ongoing joint projects, scientists of the Academy of Sciences of the Republic of Uzbekistan carried out a total of 2,029 international scientific visits. During these visits, scientists conducted research activities, delivered presentations at international symposia and conferences, and undertook short-term and long-term internships at leading foreign scientific centers.

In particular:

Junior Research Fellow of the Institute of Genetics and Plant Biology Shakhzodjon Tursunov completed a scientific internship at the Xinjiang Institute of Ecology and Geography (Xinjiang Uyghur Autonomous Region, People's Republic of China) from 3 September to 25 October 2025. The main objective of the internship was an in-depth study of the genetic basis of pathogen populations causing the widely распространённую yellow rust disease in wheat, as well as the identification of resistance mechanisms. During the internship, genetic diversity of yellow rust populations, pathogenicity tests, infection mechanisms, and methods for assessing wheat varieties' resistance to yellow rust were studied. Practical experience was gained in identifying disease-resistant genotypes using molecular and phenotypic assessment methods. The acquired knowledge and experience are of great importance for developing yellow rust-resistant wheat varieties under the conditions of Uzbekistan, early detection of disease spread, and reduction of yield losses.

Doctoral student of the "Applied Nanotechnologies" Laboratory of the U.A. Aripov Institute of Ion-Plasma and Laser Technologies Khojiakhmad Khojakbar ugli Zokhidov and Junior Research Fellow Farhod Ilkhom ugli Abdurakhmanov undertook a business trip from 15 October to 14 November 2025 to the TU Bergakademie Freiberg (Federal Republic of Germany), located in the city of Freiberg. During the visit, modern methods for analyzing solid materials were mastered, technologies for producing films using the ALD method were studied, and research on ALD-based film deposition was initiated at the Institute of Ion-Plasma and Laser Technologies.

Within the system of the Academy of Sciences, numerous joint projects were implemented with foreign organizations during 2023–2025.

In particular:

Project leader of the Institute of Genetics and Experimental Plant Biology of the Academy of Sciences of the Republic of Uzbekistan, Doctor of Biological Sciences, Professor Anvar

Gulmirzaevich Sherimbetov, and Chief Research Fellow, Doctor of Biological Sciences Bakhtiyor Shukhratovich Adilov, were on a business trip from 1 July to 15 August 2025 to the laboratory “Epidemiology and Integrated Protection of Fruit Trees from Diseases” of Qingdao Agricultural University (Shandong Province, Qingdao City, PRC). The visit was carried out within the framework of the Uzbekistan–China international joint applied project No. AL-8724052898-R2, entitled *“Study of genetic diversity, fungicide resistance, and pathogenicity-related genes of Colletotrichum species causing apple anthracnose and bitter rot in China and Uzbekistan, and development of control measures against them.”*

The Institute of Astronomy of the Academy of Sciences of the Republic of Uzbekistan, in cooperation with the Institute of Astronomy of the Czech Academy of Sciences, is conducting research based on astronomical observations to study gravitational and non-gravitational forces affecting the motion of asteroids. As a result of the joint research, shape models of 11 asteroids were created, 5 new binary asteroids were discovered for the first time, and 4 scientific articles were published in recent years in journals indexed in the Web of Science (WoS) database.

Implementation of Foreign Experience in the Republic

HPC technologies: Based on Belgian experience, a high-performance computing system designed for modeling problems in the field of materials science has been established in Uzbekistan and is being effectively managed.