SHAMAKHY ASTROPHYSICAL OBSERVATORY – THE MAIN HISTORICAL MOMENTS

The 20th century was a period of dramatic and memorable events in the life of the Azerbaijani people. At the beginning of the century, this region, well-known in the world only for the extraction of petroleum, consequently became a region where culture, science, and technology developed rapidly. At this period, our people had given scores of eminent poets, writers, scientists, artists, singers to world culture, and in turn, tried to derive benefit on world culture. Azerbaijan held a special place in the former Soviet Union, where fundamental science reached a high level of development, and its educational and scientific institutions differed by high professional level and rating.

As is well known, Azerbaijan is considered the country of ancient astronomers. Famous petroglyphs of Gobustan and Gamigaya, also archaeological sites and excavations are clear proof of this truth. The scientific achievements of the Maragha Observatory and its founder Nasiraddin Tusi played a significant role in the development of world astronomy. Interest in the universe and astronomy had always been the focus of attention on this land.

In the 20th century, astronomy was received large-scale scope in Azerbaijan, like other branches of science. Creation of the Shamakhy Astrophysical Observatory, its high-altitude observation stations, space research institutes, the preparation of dozens of highly qualified researchers in the field of astronomy, in a literal sense, the formation of the national astronomical school, coincide with this period.

Astronomy held an important place along with all the natural sciences, which were studied and taught in secondary and high schools and other educational institutions, created at the beginning of the century in Azerbaijan. Azerbaijani youth studying natural sciences in other countries chose astronomy and geography often as their main specialties and studied these sciences in depth. Besides, due to the absence of an astronomical institution or observatory in Azerbaijan, such young people, like other amateur astronomers, could not seriously study this science, and therefore a professional school of astronomy not formed.

The issue of creating an astronomical observatory in Azerbaijan was raised in 1927. In the same year, a short-term expedition of the Leningrad Astronomical Institute (A.V. Markov and V. B. Nikonov) had visited Azerbaijan and got acquainted with the climate and relief of several zones with the participation of local expert I.A. Benashvili. The goal of the expedition was to choose a suitable place to create an observatory in Azerbaijan. This expedition got acquainted with the astroclimate of Khankendi, Shusha, and Lachin in July-August 1930. Although the conditions in the Lachin district were favorable, it was discovered that the number of clear nights was not enough. Research results of the expedition were published in 1932 in the bulletin of the Institute of Astronomy in Moscow.

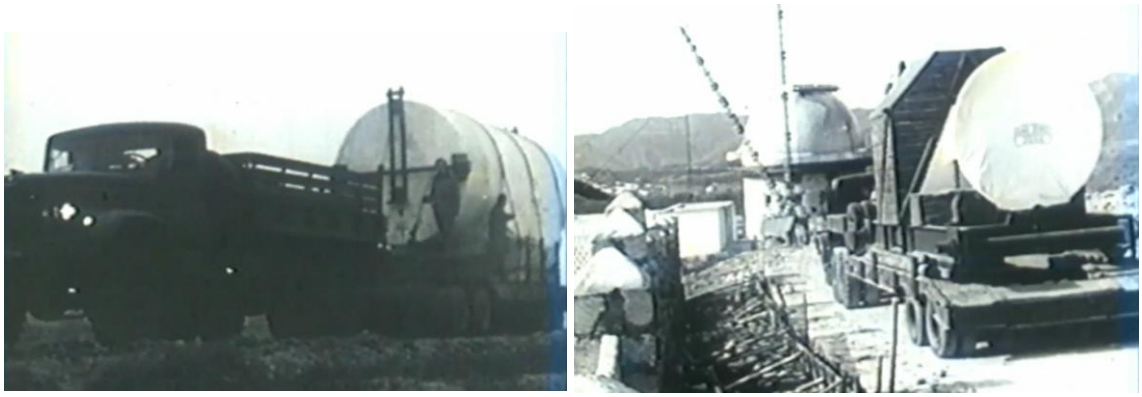
Regrettably, destructive processes of the 1930s delayed this process. However, with the return of the graduate of Leningrad State University H. Mammadbeyli to his homeland in 1938, significant progress in the field of astronomy was begun. In 1939-1946, the teaching of astronomy began at Azerbaijan State University and other higher educational institutions. The astronomical laboratory was founded at Azerbaijan State University, and the area for observations was allocated.

Besides that, astronomical calendars were publishing at the university. Radio and television programs also have played a significant role in popularizing astronomy. The shaping of eminent astronomers T. Eminzade, H. Sultanov, R. Huseynov as qualified specialists coincided with these years. In the postwar period, again was raised the question of choosing a place for the construction of the observatory, and organized the expedition in several regions of the country. Astronomers from Leningrad and Moscow also took part in this work. The standing astronomical expedition was created in 1946 to study the astroclimate in several regions of Azerbaijan. As a result of researches carried out in 1953-59, along with astronomical observations, serious work was carried out on preparing staff in the field of astronomy, on designing future observatory, on supplying the observatory with telescopes and equipment, the structure of the observatory, etc.

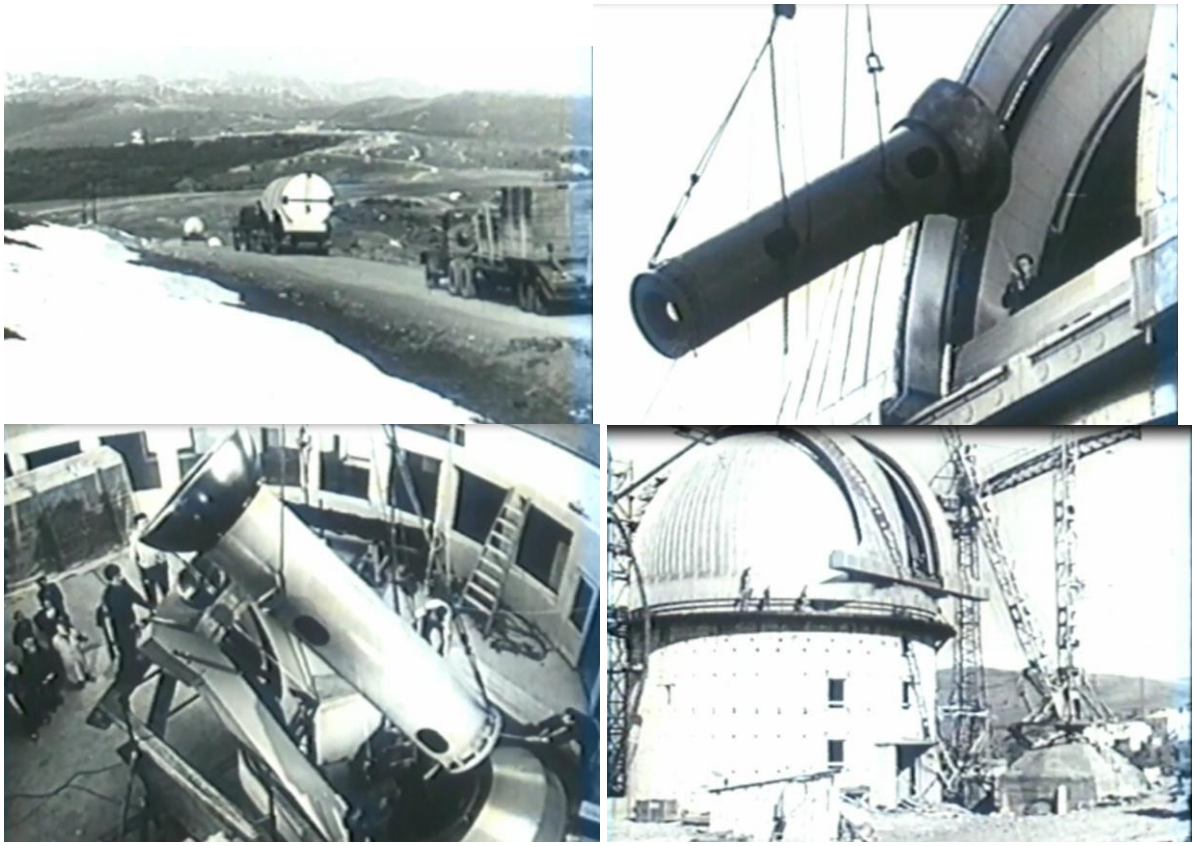
Academicians Yusif Mammadaliyev and Hajibey Sultanov had made a significant contribution to the establishment of the Shamakhy Astrophysical Observatory.

In 1963 the place of the future observatory was accurately determined. Observatory, created on the initiative of the eminent Azerbaijani scientists Hasan Aliyev and Yusif Mammadaliyev, is located in the northeast of the Great Caucasus Mountains, approximately 150 km from Baku (on the eastern slope of Pirqulu mountain, about 1500 m above sea-level geographical coordinates 48º 35' 04" E, 40º 46' 20" N). An optimal place for the creation of the observatory by the unanimous decision of specialists was chosen Pirgulu mountain of Shamakhy district. Here, the number of clear nights reaches 190-200 per year. Subsequent social and political events in the region showed that the selection of a place for the construction of the observatory at that time was a wise and far-sighted decision. If the observatory would have been constructed in Nagorno-Karabakh or the Kelbajar-Lachin zone, its future would be very tragic. Two Refracting telescopes with a diameter of 108 and 120 mm and a focal length of 1620 and 1630 mm, respectively, were installed to measure the astroclimate indicators in the Pirqulu settlement. On the other hand, works on the creation of observatory at that time were carried out in three directions: preparation of staff, the creation of the necessary infrastructure, the purchase of telescopes and other equipment. These works were carried out mainly in the Department of Astrophysics headed by H. Sultanov, which created in 1954 under the institute of Physics and Mathematics of the Academy of Sciences of the Azerbaijan SSR.

General view of Shamakhy Astrophysical Observatory 1970s



Construction of a 2-meter telescope



Construction of a 2-meter telescope

Finally, in November 1959 the relevant decision on the establishment of the observatory was made on the basis of the Astrophysical sector. According to preliminary projects, at the ShAO should have been installed 125-centimeter reflector, Horizontal Solar Telescope, Vertical Solar Telescope, Chromospheric Telescope, Coronagraph to observe the solar corona, Planetary telescope with a diameter of 70 cm and Radiotelescope. Besides, it was planned to carry out a water supply system, telephone and telegraph communications, and major overhaul of Shamakhy-Pirgulu road.

Government decision on the establishment of Shamakhy Astrophysical Observatory was made in late 1959. On 17 November of the same year, a decree № 975 of the Council of Ministers of the Azerbaijan SSR "On the organization of Shamakhy Astrophysical Observatory" was signed. The decision of the Academy of Sciences of the Azerbaijan SSR No. 1 of January 13, 1960 "On the organization of the Shamakhy Astrophysical Observatory of the Academy of Sciences of the Azerbaijan SSR" was made on the basis of this decree. The activity of the ShAO as an institution began since that time. Name of the observatory, its structure, academic council, director, deputy director for scientific work, scientific secretary, also the establishment of the city base was approved in this decision. According to the decision, H.Sultanov, who made a great contribution to the creation of the observatory, was approved to the post of director of the Observatory.

СОВЕТ МИНИСТРОВ АЗЕРБАЙДЖАНСКОЙ ССР

ПОСТАНОВЛЕНИЕ

от 17 ноября 1959 года № 975

Об организации Шемахинской астрофизической обсерватории Академии Наук Азербайджанской ССР

Совет Министров Азербайджанской ССР ПОСТАНОВЛЯЕТ:

1. Принять предложение Академии Наук Азербайджанской ССР об организации на базе Сектора астрофизики и Шемахинской астрономической станции - Шемахинской астрофизической обсерватории Академии Наук Азербайджанской ССР и именовать ее «Шемахинская астрофизическая обсерватория Академии Наук Азербайджанской ССР».

2. Поручить Академии Наук Азербайджанской ССР утвердить по согласованию с Министерством финансов республики структуру и штат вновь организованной Шемахинской астрофизической обсерватории Академии Наук Азербайджанской ССР в пределах численности и фонда заработной платы сектора астрофизики и Шемахинской астрономической станции.

Председатель Совета Министров Азербайджанской ССР — М.Искендеров

Управляющий делами Совета Министров Азербайджанской ССР — Н.Новрузов

Decision on the establishment of the Shamakhy Astrophysical Observatory

Shamakhy Astrophysical Observatory was named after the eminent Azerbaijani astronomer Nasraddin Tusi by the decision of the Cabinet of Ministers of the Azerbaijan SSR in 1981.

С о в е т М и н и с т р о в
Азербайджанской ССР

П О С Т О Н О В Л Е Н И Е

№ 406
от 8 сентября 1981 г., гор. Баку

О присвоении имени Мухаммеда Насирэддина Туси Шемахинской астрофизической обсерватории

Совет Министров Азербайджанской ССР **постановляет**:

Присвоить имя Мухаммеда Насирэддина Туси Шемахинской Астрофизической обсерватории Академии наук Азербайджанской ССР и впредь именовать ее Шемахинская астрофизическая обсерватория имени Мухаммеда Насирэддина Туси.

Председатель Совета Министров
Азербайджанской ССР — Г.Сеидов

Управляющий Делами Совета Министров
Азербайджанской ССР — А.Ахундов

Decision to name the observatory after N.Tusi.

Scientific-research works carried out at the Shamakhy Astrophysical Observatory, since its establishment, has been followed with great interest not only in our republic but abroad. Namely, these successes caused the visit of the President of the USSR Academy of Sciences Academician M.V. Keldysh to the observatory during his visit to Azerbaijan in 1974.

President of the USSR Academy of Sciences Academician M.V. Keldysh in 2 meters telescope

World-renowned scientists came to our observatory and got acquainted with the scientific research carried out here. Among them, we can list names of Chairman of State Commission on Piloted Flights of USSR, our compatriot Kerim Kerimov, academician of the USSR Academy of Sciences V.V. Sobolev, academician of the USSR Academy of Sciences, Nobel laureate in physics V.L.Ginzburg, academician of the USSR Academy of Sciences Yu .B. Zeldovich, Soviet cosmonauts V.F.Bykovsky, V.N.Kubasov, N.N. Rukavishnikov.

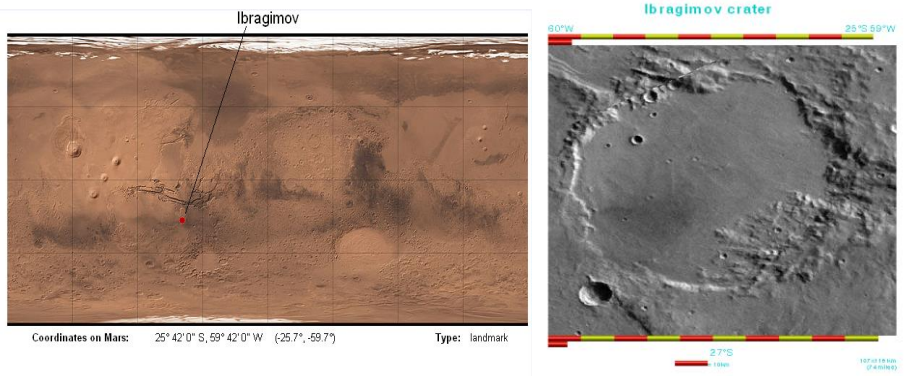
Academician V.V. Sobolev, Academician V.L. Ginzburg and the staff of the observatory

The leadership of Azerbaijan in the last thirty years of the XX century and at the beginning of the XXI century is directly related to the name of the eminent statesman and politician Haydar Aliyev. Haydar Aliyev, who has always kept in the center of attention the activities of the Shamakhy Astrophysical Observatory, during his leadership in Azerbaijan, had visited this scientific center and met with scientists. The visit of Haydar Aliyev to the observatory in 1974, and the orders he gave in due time, are bearing fruit till now. Most of the scientists working at the observatory today are graduates of the Department of Astrophysics at the current Baku State University, which was created by his decree. It should be noted that to improve the living conditions of scientists carrying out scientific research at the observatory, a 5-story building consisting of 40 apartments had been built by the orders of Haydar Aliyev.

Haydar Aliyev in the observatory

Since its establishment, the development of astronomy in Azerbaijan had always been in the center of attention of international scientific structures, as a result of which the asteroids discovered in 1970-2020 were named after eminent Azerbaijanis: "Azerbaijan", "Nizami", "Javid", "Muslim Magomayev", "Tusi", "Nasimi" and others.

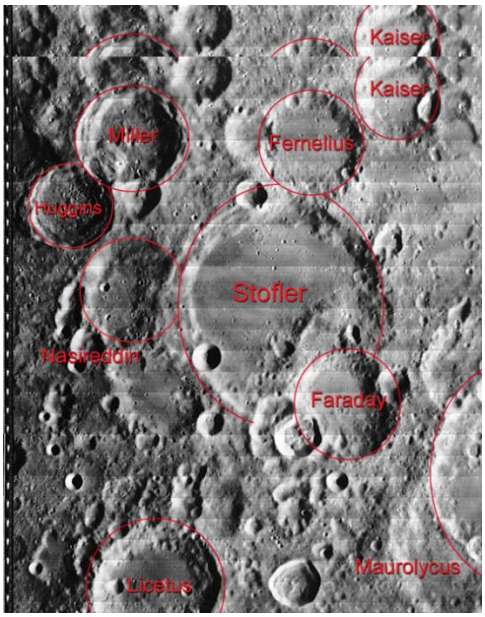
Azerbaijani astrophysicist-observer Nadir Ibragimov had made great strides in studying planets (Mars, Venus, and the Io satellite of Jupiter) as a result of his observations on the 2-m telescope of the ShAO. He made numerous large-scale images of Mars during the opposition of Mars (the shortest distance between Earth and Mars) and made a map of the planet. He spoke about volcanic processes on the Io satellite of Jupiter and lightning on Venus planet. The General Assembly of the International Astronomical Union in the city of Patras, Greece, in October 1982, highly appreciated the researches of the Azerbaijani astronomer Nadir Baba oglu Ibrahimov and naming in his honor one of the craters of Mars planet. Along with the craters of Copernicus, Kepler, Keldish, and Jules Verne, the crater of Ibragimov is on Mars now. Launched in January 1973, to study the Moon and outer space, Soviet automatic interplanetary station Luna-21, with which communication subsequently lost, was reconnected to the station as a result of searching on a 2-meter telescope.



Ibragimov crater

left, N. Ibragimov

One of the craters on the Moon, only natural satellite of the Earth, is named after the eminent scientist Nasraddin Tusi. In 1990-97, the crisis was felt in the history of Azerbaijani astronomy, as in all areas. However, in subsequent years, the crisis was resolved, and the activity of the observatory was returned to their normal course.



N.Tusi crater

The attention and care of Heydar Aliyev to Observatory in Soviet times is continued by his worthy successor, the President of the Republic of Azerbaijan, Mr. Ilham Aliyev. Generally, caring for the development of science in Azerbaijan, Ilham Aliyev had issued decrees and orders in September 2008 and July 2009 on the reconstruction of Shamakhy Astrophysical Observatory and the improvement of its material-technical base.

www.president.az
Azərbaycan Prezidenti
Rəsmi İnternet səhifə

Azərbaycan Milli Elmlər Akademiyasının Nəsirəddin Tusi adına Şamaxı Astrofizika Rəsədxanası haqqında Azərbaycan Respublikası Prezidentinin sərəncamı (05-09-2008 10:25)

Dünyanın ən böyük rəsədxanalarından biri olan və müasir dövrün prioritet problemləri ilə uzlaşdırılmış elmi proqram əsasında fəaliyyət göstərən Şamaxı Astrofizika Rəsədxanasında səma cisimlərinin tədqiqi kimi aktual fundamental məsələ ilə yanaşı, seysmik proseslərin proqnozu, ətraf kosmik mühitin, günəş və geomaqnit fəallığının yerüstü texnoloji sistemlərin fəaliyyətinə, insan da daxil olmaqla, bioloji orqanizmlərə təsiri öyrənilir.

Şamaxı Astrofizika Rəsədxanasında əldə olunmuş elmi nəticələr dünya alimləri, Beynəlxalq Astronomiya İttifaqı tərəfindən layiqincə qiymətləndirilmiş, rəsədxananın 20-dək əməkdaşı nüfuzlu beynəlxalq elmi təşkilatlara üzv seçilmiş, bir sıra kiçik planetlərə, Marsda və Ayda bir neçə kraterə Azərbaycan mütəfəkkirlərinin, elm və mədəniyyət xadimlərinin adları verilmişdir.

Lakin fəaliyyət göstərdiyi müddətdə Şamaxı Astrofizika Rəsədxanasının elmi-texniki avadanlığı fiziki və mənəvi aşınmaya məruz qalmış, inzibati binaları, laboratoriyaları, əməkdaşlar üçün yaşayış evləri, yol infrastrukturu, kommunikasiya xətləri yararsız vəziyyətə düşmüşdür.

Strateji kosmik tədqiqatlarda və bütövlükdə Azərbaycan elminin inkişafında, respublikada kosmik sənayenin yaranmasında əhəmiyyətini nəzərə alaraq, Şamaxı Astrofizika Rəsədxanasının yenidən qurulmasını təmin etmək məqsədi ilə **qərara alıram:**

1. Azərbaycan Milli Elmlər Akademiyasının Nəsirəddin Tusi adına Şamaxı Astrofizika Rəsədxanasının maddi-texniki bazasının gücləndirilməsi və əsaslı təmir-tikinti işlərinin aparılması məqsədi ilə təxirəsalınmaz tədbirlərin görülməsi üçün Azərbaycan Respublikasının 2008-ci ilin dövlət büdcəsində nəzərdə tutulmuş Azərbaycan Respublikası Prezidentinin Ehtiyat Fondundan 5,0 milyon (beş milyon) manat vəsait ayrılsın.
2. Azərbaycan Milli Elmlər Akademiyası Şamaxı Astrofizika Rəsədxanasında aparılacaq əsaslı təmir-tikinti işlərinin müasir standartlara uyğun, yüksək keyfiyyətlə həyata keçirilməsini, zəruri avadanlıq və texnikanın alınması üçün müvafiq tədbirlərin görülməsini təmin etsin.
3. "Azərenerji" Açıq Səhmdar Cəmiyyəti, "Azəriqaz" Qapalı Səhmdar Cəmiyyəti və "Azərsu" Açıq Səhmdar Cəmiyyəti Şamaxı Astrofizika Rəsədxanasının elektirk enerjisi, təbii qaz və su ilə etibarlı təminatı üçün zəruri tədbirləri həyata keçirsinlər.
4. Azərbaycan Respublikasının Rabitə və İnformasiya Texnologiyaları Nazirliyi Şamaxı Astrofizika Rəsədxanasının telefonlaşdırılmasını və sürətli internet şəbəkəsinə qoşulmasını təmin etsin.
5. Azərbaycan Respublikasının Ekologiya və Təbii Sərvətlər Nazirliyi Şamaxı Rayon İcra Hakimiyyəti və Azərbaycan Milli Elmlər Akademiyası ilə birlikdə Şamaxı Astrofizika Rəsədxanasının ətraf ərazilərinin təbii landşaftının qorunması və xüsusi mühafizə zolağının yaradılması üçün müvafiq tədbirlər görsün.
6. Azərbaycan Respublikasının Maliyyə Nazirliyi bu Sərəncamın birinci bəndində göstərilən vəsaitin Azərbaycan Milli Elmlər Akademiyasının hesabına köçürülməsini təmin etsin.
7. Azərbaycan Respublikasının Nazirlər Kabinetinə tapşırılsın ki:
7.1. 2009-cu ilin dövlət büdcəsində bu Sərəncamın icrası ilə bağlı əlavə maliyyə vəsaitinin nəzərdə tutulmasını təmin etsin;
7.2. bu Sərəncamdan irəli gələn digər məsələləri həll etsin.
8. Bu Sərəncam imzalandığı gündən qüvvəyə minir.

İlham Əliyev,

Azərbaycan Respublikasının Prezidenti.

Bakı şəhəri, 5 sentyabr 2008-ci il.

Azərbaycan Milli Elmlər Akademiyasının Nəsirəddin Tusi adına Şamaxı Astrofizika Rəsədxanasının yenidənqurulması barədə Azərbaycan Respublikası Prezidentinin sərəncamı (21-07-2009 19:03)

Azərbaycan Milli Elmlər Akademiyasının Nəsirəddin Tusi adına Şamaxı Astrofizika Rəsədxanasının maddi-texniki bazasının gücləndirilməsi və təmir-tikinti işlərinin aparılması məqsədi ilə ötən ildən etibarən tədbirlərin həyata keçirilməsinə başlanılmışdır. Bu sahədə müəyyən işlər görülsə də, obyektin müasir tələblər səviyyəsində tam yenidənqurulmasının başa çatdırılması üçün əlavə maliyyə vəsaitinin ayrılmasına zərurət yaranmışdır.

Şamaxı Astrofizika Rəsədxanasının maddi-texniki bazasının gücləndirilməsi, yenidənqurma və təmir-tikinti işlərinin davam etdirilməsi məqsədi ilə **qərara alıram:**

1. Azərbaycan Milli Elmlər Akademiyasının Nəsirəddin Tusi adına Şamaxı Astrofizika Rəsədxanasının maddi-texniki bazasının gücləndirilməsi, yenidənqurma və təmir-tikinti işlərinin davam etdirilməsi üçün Azərbaycan Respublikasının 2009-cu ilin dövlət büdcəsində nəzərdə tutulmuş Azərbaycan Respublikası Prezidentinin Ehtiyat Fondundan 3,0 (üç) milyon manat vəsait ayrılsın.

2. Azərbaycan Respublikası Maliyyə Nazirliyi bu Sərəncamın birinci bəndində göstərilən vəsaitin Azərbaycan Milli Elmlər Akademiyasının hesabına köçürülməsini təmin etsin.

3. Azərbaycan Respublikası Nazirlər Kabinetinə tapşırılsın ki, bu Sərəncamdan irəli gələn məsələləri həll etsin.

İlham Əliyev,
Azərbaycan Respublikasının Prezidenti.
Bakı şəhəri, 21 iyul 2009-cu il.

Based on these orders, the living space of the Shamakhy Astrophysical Observatory was renovated, the main building and telescope buildings also were repaired, the control system of the 2-meter telescope was completely modernized and automated, new modern light-receivers were purchased, and large-scale works on improvement were carried out. New apartments for scientists living in the observatory, as well as guest houses that meet high standards for scientists coming to the observatory from abroad, were built on the territory of the observatory. Besides, new communication lines that meet modern standards were laid (gas, water, electricity, telephone, etc.). The President of the Republic, who regularly kept the repair- construction work at the center of attention, visited observatory several times during this period.

President of the Republic of Azerbaijan mister Ilham Aliyev at the Observatory

More than 50 monographs, books, text-books, catalogues, scientific-popular books have been published on different branches of astronomy in ShAO.
120 issues of “Circular of ShAO” were published within 40 years. Since 2006 “Astronomical Journal of Azerbaijan” is published and there are apperaed 9 volumes untill 2015.
The employees of ShAO have published more than 2500 articles in local and foreign scientific periodicals.

Publication of the Observatory

In the 1960s, the rapidly developing Shamakhy Observatory needed to establish an observation station at higher point. In 1969, the Batabat branch of the ShAO was established in the Shahbuz region of the Nakhchivan Autonomous Republic at altitude of 2060 m above sea level. In 1974, Solar coronagraph was installed in the Batabat section, and the observation of solar spicules begun. This work was led by Russian astronomer G.Nikolsky (IZMIRAN). In 1990, the Zeiss-600 telescope was installed in the Batabat section with participation of the staff of the Crimean Astrophysics Observatory V. Lyuti and others.

Since 1969, the permanent expedition of the Pulkovo Observatory was operating in the Aghdara settlement of the Ordubad region of the Nakhchivan Autonomous Republic. The purpose of the expedition was to create an astronomical station capable of high-precision position observations. At this point located at an altitude of about 2100 m above sea level, under the leadership of the X.Potter, the expedition was carried out significant work for the creation of an astronomical station, and also experimental observations were conducted. Already in the early 1980s, two important telescopes - astrograph AFR-1 and the lunar-planetary telescope with a long-focus meniscus, were put into operation in the Aghdara Astronomical Station (AAS).

In the 1980s, Leningrad astronomers made valuable position observations at the AAS. Surface observations of Halley's Comet in the framework of the joint Soviet-American program VEGA have a special place among them. Unfortunately, the destructive processes in the region in the late 1980s, especially the blockade of Nakhchivan by Armenia, had a very negative impact on the activities of the AAS. In 1991, X.Potter and his staff left the station.

Directors of Shamakhy Astrophysical Observatory:

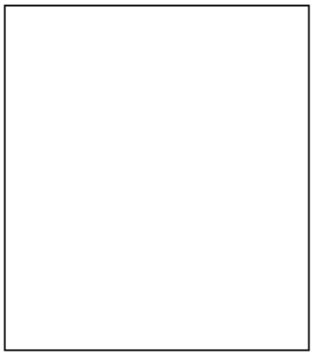
07.1956 – 04.1981
Academician Sultanov G.F.

04.1981 – 01.1982
PhD, Guseynov O.X.

01.1982 – 03.1985
PhD, Abbasov A.R.

acting director
03.1985 – 07.1985
PhD, İsmayılov Z.A.

07.1986 – 12.1988
PhD, Rustamov K.A.



12.1988 – 07.1997
PhD, Ahmadov Sh.B.

07.1997 – 06.2015
Correspondent member,
Guliyev A.S.

06.2015 –
Correspondent member,
Dzhalilov N.S