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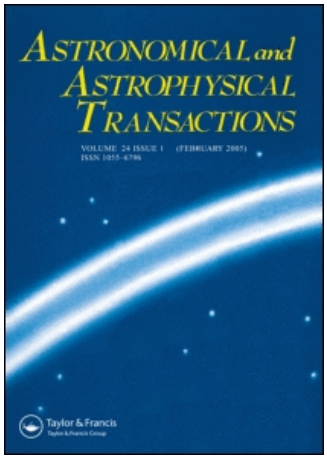

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The second congress of the astronomical society of the former soviet union

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CONFERENCE

THE SECOND CONGRESS OF THE ASTRONOMICAL SOCIETY OF THE FORMER SOVIET UNION

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Events which have taken place on the Second Congress of the Astronomical Society of the ex-USSR are reviewed shortly. There is information given about the AS status, main oral talks of the Congress, I. S. Shlovsky memorial session, Antarctic astronomy discussion, as well as organizing problems of astronomy in the former Soviet Union.

The Second Congress of the Soviet Astronomical Society (AS) was held in Moscow from 29 October to 1 November 1991. To the moment AS has existed for one and a half years joining astronomers of this formerly united country and has 440 individual members, i.e., about twenty percent of the total number of professional astronomers in the former USSR. The Astronomical Section of the Moscow branch of VAGO (All-Union Astronomy and Geodesy Society, more than 200 individual members) and the Association of Pedagogical College Astronomy Teachers (about 80 individual members) are associated members of the AS.

An exchange of information is one of the basic aims of any scientific society. This is why the AS has already organized two periodic publications, the *Bulletin of the AS* in Russian and an international journal *Astronomical and Astrophysical Transactions*. The latter is published by *Gordon and Breach Science Publishers*, which ensures speedy publication and a high technical level of the journal. One of the present aims of the AS is to organize periodic publications also for amateur astronomers.

In March 1990, the AS organized a symposium "Astrophysics Today", its first large-scale scientific meeting. Proceedings of the Symposium have been published in the first issue of volume 3 of this journal.

The II Congress was attended by 156 astronomers representing 11 states belonging to the former USSR. There were no delegates from Byelorussia and Kirghizia, where there is no professional astronomy and no members of the AS, as well as from Lithuania and Armenia. Five representatives of Armenia were unable to attend because of travel difficulties. Foreign members were represented by our colleague from Poland.

During the first three days of the Congress, leading astronomers delivered more than 30 review talks. About 30 posters were discussed at the Congress. The review talks covered almost every field of astronomy. L. P. Osipkov's talk was entitled "Stochastic and Dynamic Evolution of Galaxies", V. K. Abalakin discussed new results in astrometry. The talks of S. M. Kopeikin, "New Results in Relativistic Celestial Mechanics", and N. V. Emelyanov, "On the Motion of the Martian Satellites", reflected the present-day status of celestial mechanics.

A. M. Cherepashchuk discussed physical processes in close binaries at late evolutionary stages and also the results of the optical observations of X-ray binaries that consist of a neutron star and a possible black hole. A catalogue of close binaries at late evolutionary stages has been published recently at the Sternberg Astronomical Institute of Moscow University. Related objects, polars, were the subject of I. L. Andronov.

A special attention attracted the talk of R. A. Sunyaev devoted to new results obtained at space-born observatories *Kvant* and *Granat*. The detectors of these instruments cover the energy range from 3 keV to 1 MeV while the sensitivity is considerable in the range 30 keV–100 MeV. Among the most important results, one can mention an accurate measurement of the coordinates of the annihilation line (511 keV) source in the direction to the Galactic center, the discovery of the annihilation line in the Musca nova spectrum, the detection of the deuterium line (2.2 MeV) in a solar flare spectrum, as well as the observations of the spectra of X-ray sources: pulsars, bursters and black hole candidates.

G. S. Bisnovaty-Kogan and V. M. Chechetkin discussed physical processes occurring during a supernova explosion and the associated nucleosynthesis. Their talks ignited an active discussion of a possible compact remnant of the Supernova 1987A in the Large Magellanic Cloud.

A few other talks were also devoted to supernova remnants. V. S. Beskin and D. G. Yakovlev discussed physical processes in the magnetosphere and the deep interior of a neutron star. The subject of V. I. Slysh was the radio emission of supernovae, and T. A. Lozinskaya talked about the interaction of the matter ejected by supernovae with the interstellar gas.

An outstanding Soviet astrophysicist, I. S. Shklovsky, was an well-known specialist in physics of supernovae. The scientific session on 31 October, with N. S. Kardashev as a chairman, was dedicated to his memory. Pupils of I. S. Shklovsky presented reports on recent results in those fields of astrophysics where their teacher was especially active.

A special attention was paid to the review of G. V. Domogatsky and G. T. Zatsepin devoted to neutrino astrophysics, the branch of astrophysics that is successfully becoming an experimental science. For a long period, only a single installation of R. Davis (USA) has been being active in detecting solar neutrinos but now there are new installations, Kamiokande in Japan and IMB in the USA.

There are also two installations in Italy as well as an underground scintillation neutrino telescope and a gallium-germanium radio chemical detector at Baksan Observatory in Caucasus. A very important result of neutrino astrophysics is the detection of a short (of the duration about 10 s) pulse of neutrino emission from the Supernova 1987A which has confirmed the model of the gravitational collapse of massive stars (this model was developed in the sixties by V. S. Imshennik and D. K. Nadyozhin).

The gallium–germanium detector of the Baksan Observatory has the sensitivity of 0.233 MeV and can detect the neutrinos produced by the proton–proton reactions, i.e., the basic thermonuclear processes owing to which the Sun shines. Preliminary results indicate that the neutrino flux is lower than might be expected basing on the standard model of the Sun.

Deeply submerged neutrino Čerenkov detectors are now under construction on Lake Baikal in Sibiria and on the Hawaii Islands (project DUMAND). These detectors will admit the search for local neutrino sources with better sensitivity in the range from tens GeV to hundreds TeV.

Several interesting reviews were devoted to evolution of galaxies and cosmology. B. V. Komberg proposed an evolutionary scenario assuming that quasars (as an early, very active phase of the evolution of a massive galaxy nucleus) have been gradually transformed into other types of active galactic nuclei. He also proposed a model that explains the existence of several generations of quasars by invoking different merging rates of galaxies.

The discovery of gravitational lenses not only provided another confirmation of general relativity but also opened new possibilities for astronomical observations. In particular, this offers an opportunity of an independent measurement of the Hubble constant and the curvature of the Universe. A fascinating talk of A. A. Minakov about gravitational lenses was especially interesting because of his demonstration of an acrylic plastic lens that models the effect of the gravitational lens.

U. Haud reviewed the available observational evidence of the hidden mass and M. Yu. Khlopov discussed theoretical understanding of its origin. All galaxies—spiral and elliptical, normal and dwarf ones—probably possess halos of invisible matter. Various observations indicate that at least ninety percent of the mass of the Universe is in a non-luminous form.

During a general discussion, V. V. Burdhyuzha reported about the international astronomical observatory in central regions of Antarctica (at the heights of about 3.5 km above the sea level), the plans of whose construction were discussed at the General Assembly of IAU in Buenos Aires (July 1991). In these regions, the water vapor in the air is frozen out, which provides excellent seeing conditions for infrared astronomy. Furthermore, observations of the Sun, variable stars and galatic nuclei can be performed without interruption for many days during summer and winter seasons. The Congress has formed a workgroup on antarctic astronomy headed by V. V. Burdyuzha for the purposes of the coordination of the efforts of organizations in the former USSR aimed at development in this direction.

Of course, one hardly can even mention all interesting discussions during the three days of active scientific sessions. Nowadays, when the situation in this country is difficult for all fundamental sciences including astronomy, these three days offered a unique opportunity to attend brilliant reviews, discuss new results and simply meet friends and colleagues to one's heart's content.

The last day of the Congress was devoted to general problems of astronomy in ex-USSR and organizational problems of the AS. The most troublesome are newly appeared obstacles in organizing observations that add to "traditional" technical difficulties and shortage of modern telescopes and equipment. Caucasus and Crimea are no longer suitable locations for astronomical observations. Only observatories in Central Asia still satisfy international standards in seeing conditions. Therefore, the basic aim of modern astroecology is to preserve atmospheric conditions favorable for astronomical observations at existing observatories in Central Asia.

Unfortunately, the search for optimal locations for astronomical observatories in ex-USSR is now complicated not only by increasing background sky illumination but also by political and national problems. In our decaying empire, new independent states encroach on the observatories located in their mountain areas. The Congress unanimously supported the appeal to the heads of new independent states to restrain from the nationalization of the observatories and to facilitate their normal functioning.

The Congress also made an appeal stating that astronomy, as well as some other fundamental sciences, is in a disastrous state in this country. General reasons for the crisis in these sciences are the growing technological backwardness, humiliatingly low salaries, and a clearly anti-scientific social attitude. The situation is especially dangerous for the sciences like astronomy which is more vulnerable because its development depends on the efforts of only a few dozens of leading scientists and technologists who invent, produce, maintain and run unique installations like the 6-m telescope. Scientific schools and groups that have been formed during decades can degenerate and decay in months. Much time and effort will be required in future to revive rich traditions of Russian and Soviet astronomy.

Astronomy is a strong stimulator of education and many nations are proud of their astronomical achievements. In our country now, the problem is the very survival of fundamental sciences, including astronomy. Therefore, astronomers appeal to all people and organizations involved to support astronomy and provide help to those few university and Academy of Sciences centers that are active in astronomical research, to continue research and to make their results accessible to the scientific community.

Another problem discussed at the Congress was the proliferation of astronomical education. The publishing of astronomical literature, both scientific and popular, has nearly halted now. Old publishing houses stop functioning while new ones are active in publishing solely astrological texts. Traditional centers of proliferation of astronomical knowledge, the planetariums, are in the danger of closing or complete transformation. Some planetariums which occupied former churches and mosques have lost their buildings, others try to survive having drastically changed their activities and now offer lectures on pseudo-scientific subjects.

Astronomers are concerned with an active spread of pseudo- and anti-scientific beliefs and theories. The mass media regularly discuss astrology, UFOlogy, magic, etc. The public interest in mysterious phenomena is understandable but it would be more awarding to transform it into a true curiosity that stimulates creative power. Poorly educated journalists can be blamed for this but professional astronomers also cannot avoid the responsibility when they refrain from spending time and effort in popularizing the beauty of their science.

Numerous organizational problems were also discussed at the Congress, the financing being among them. The members of the AS pay the annual membership fee of five percent of their average month salaries, the fee for the foreign members is $30 per year. The resulting funds are far from being sufficient for the activities of the AS and the Society has to look for a sponsorship to reach a firm financial status. We can only hope that our society will not be a passive witness of the deterioration of astronomy in this country.