CHRONICLE

In 2000 two Conferences of the 6 m telescope users were held: on May 4 in St. Petersburg and on October 17 at the Special Astrophysical Observatory of RAS.

Conference of the 6 m telescope users of May 4, 2000, MAO RAS, St. Petersburg

The following members of the Programme Committee took part in the work: Yu.N. Gnedin, I.M. Kopylov, V.L. Afanasiev, Yu.Yu. Balega, D.A. Varshalovich, V.A. Gagen-Torn, A.V. Zasov, T.A. Kipper, I.S. Savanov, Eh.E. Khachikian.

The conference was held in the Big Hall of Pulkovo Observatory.

CONFERENCE PROGRAMME

• Director's report

Yu.Yu. Balega (SAO RAS)
BTA operation in the second half of 1999

• Scientific reports

1. Yu.N. Gnedin On the transformation of the 6 m Telescope Programme Committee
2. V.L. Afanasiev Spectral observations at BTA
3. Yu.N. Parijskij On the prospects of RATAN-600
4. I.V. Gosachinskij Spectral observations at RATAN-600
5. V.M. Bogod Observations of the Sun at RATAN-600
6. L.G. Romanenko Astrometrical studies of visual binary stars
7. A.A. Arkharov On the Russia-Italy project of supernovae investigation

The report of the SAO director and a review of the reports of the other conference participants are presented below.

SUMMARIES OF SOME REPORTS

Yu.Yu. Balega

On the BTA operation in the second half of 1999

In the 1999 second half-year 60 time requests (362 nights) for observing with the 6 m telescope were submitted to the Programme Committee, 6 requests for the Shein Mirror Telescope of the Crimean Observatory, and 1 for the 1 m telescope of SAO RAS.

The Committee allocated 161 nights to carry out 45 research programmes, 11 nights as the SAO director's reserve, and 12 technical nights of the telescope.

Table 1 gives the monthly number of hours of observations in 1999.

Table 1: *Observational time at BTA in 1999*

Month	BTA MS data (BTA MSD)	Observers' data (OD)
January	241.5	198
February	84.5	66.5
March	170	146.5
April	128	100.5
May	97	67.5
June	125	96
July	198	135
August	149	109.5
September	170	160
October	183	128.5
November	191	111.5
December	162	108.5
Total	1898	1428

As compared to the average data over the previous 5 years (BTA MSD — 1805 hours, OD — 1340 hours), 1999 was quite good. About 190 spectroscopic nights were numbered at the BTA site.

An analysis of the seeing made on the basis of the data obtained during 665 nights of observations in 1996–1999 shows that
1 % of nights had a seeing of 1″,
14 % from 1″ to 1.5″,
26 % from 1.5″ to 2″,
29 % from 2″ to 3″,
16 % from 3″ to 4″,
9 % from 4″ to 5″,
5 % > 5″.

Thus, the seeing better than 2″ occurs in 41 % of the cases, and in 70 % of cases it is better than 3″.

In the second half of 1999 the BTA MS recorded 1053 hours of work and the observers — 753 hours. This is consistent with the data of many years of observing: 55 — 60 % of BTA observational time falls on the second half of every year.

The performance of the 6 m telescope was stable, it was idle for technical reasons in no more than 1 % of time, not a single observational programme was

frustrated because of the breakdowns of the telescope or its auxiliary equipment.

In 1999, 40 % of the 6 m telescope observational time was alloted to the SAO astronomers, 30 % to other research institutions of Russia, 13 % to the CIS, and 17 % to other countries.

The most succesful programmes of the second half of 1999 were the followings:

- T.A. Lozinskaya (SAI, MSU) — Unique objects in IC 1613
- I.D. Karachentsev (SAO RAS) — Outlying regions of the Local group of galaxies
- N.N. Somov (SAO RAS) — Magnetic cataclysmic variables
- G. Weigelt (MPI, Bonn) — Interferometry of stars and galaxies
- S.I. Plachinda (CrAO) — Spectropolarimetry of cool stars
- J. Greiner (Gettingen) — Identification of X-ray sources
- V.A. Gagen-Torn (St.PU) — Galaxies with polar rings
- Yu.A. Shibanov (PhTI) — Spectra of the pulsar in the Crab nebula
- A.A. Tokovinin (SAI) — Orbits and masses of red dwarfs
- A.M. Mikaelian (Byurakan) — Extragalactic IRAS sources
- A.M. Fridman (IA RAS) — Velocity fields in Grand Design galaxies
- S.A. Pustilnik (SAO RAS) — The youngest galaxies
- A.V. Zasov (SAI, MSU) — Vorontsov-Veliaminov nests and chains
- V.G. Kurt (ACC PhI RAS) — Optical emission of nearby pulsars
- T.Yu. Magakian (Byurakan) — Anisotropy in young stars

The results of observations for each of the above programmes were demonstrated in the report.

Yu. N. Gnedin informed about the decision of the General Physics Department of RAS to unite the Programme Committees of the 6 m telescope and radio telescope RATAN-600 into a single Programme Committee of the Big Telescopes of RAS (BTPC). The time distribution at the big optical telescopes and radio telescope RATAN-600 will be acomplished now by a united Committee.

The BTPC members: Yu.N. Gnedin (MAO RAS) — the chairman of the Committee, Yu.Yu. Balega, D.A. Varshalovich, V.V. Vlasyuk, V.A. Gagen-Torn, A.V. Zasov, I.M. Kopylov, I.S. Savanov, Eh.E. Khachikian, A.M. Cherepashchuk, B.M. Shustov, Yu.N. Parijskij, L.I. Matveenko, R.D. Dagkesamanskij, A.V. Stepanov. I.I. Romanyuk is appointed the Scientific Secretary. To improve the efficiency of the Committee's activity, Yu.N. Gnedin suggested a number of organizational events.

The reports of Yu.N. Parijskij, I.V. Gosachinskij and V.M. Bogod were devoted to the review of the present-date state of radio astronomical observations at the radio telescope RATAN-600. Yu.N. Parijskij reported on the operation of RATAN-600 as a whole, on the basic research programmes, placing primary emphasis on the programme "Gene of the Universe". He dwelled also on a number of distinguishig features of the RATAN-600 design and gave an overview of the directions in radio astronomy in which the radio telescope can be competitive. I.V. Gosachinskij surveyed the work on the investigation into the interstellar medium and demonstrated merits of the radio telescope. V.M. Bogod informed the Committee's members about the programme of solar observations at RATAN-600, introduced the audience to noval instrumental developments, demonstrated the results of co-operative international radio observations of the Sun.

L.G. Romanenko demonstrated her results of measuring radial velocities of visual binaries with BTA. The programme was carried out to advantage, and the author put forward a new one. A.A. Arkharov informed that MAO RAS had built a patrol telescope to search for supernovae. The telescope is erected in Italy. The author suggested that the information on a supernova explosion should be timely sent to SAO so that the BTA observations could be performed as soon as possible.

Conference of the 6 m telescope users of October 17, 2000, SAO RAS, Nizhnij Arkhyz

The following members of the BTPC took part in the conference: Yu.N. Gnedin, Yu.Yu. Balega, V.V. Vlasyuk, V.A. Gagen-Torn, A.V. Zasov, L.I. Matveenko, R.D. Dagkesamanskij, I.S. Savanov, A.V. Stepanov, Yu.N. Parijskij, Eh.E. Khachikian, A.M. Cherepashchuk, Eh.E. Khachikian, B.M. Shustov.

The conference stood in honour of the memory of the founder and the first director of the Special Astrophysical Observatory, the Committee's member since 1976, Kopylov Ivan Mikheevich, who passed away on July 29, 2000.

CONFERENCE PROGRAMME

• Director's report

Yu.Yu. Balega (SAO RAS)
BTA operation in the first half of 2000

• Scientific reports

1. *Yu.N. Gnedin* (MAO RAS)
Polarimetry of quasars and activity of galactic nuclei: magnetic fields in accretion disks.

2. *A.M. Cherepashchuk* (SAI MSU)
WR stars and cosmic gamma bursts

3. *B.M. Shustov* (IA RAS)
A model of galactic evolution

4. *M.G. Mingaliev* (SAO RAS)
On the present state of RATAN-600

5. *A.N. Burenkov* (SAO RAS) (Applicant's account)
Star formation regions in galaxies

The report of the director and a review of speaches of other conference participants are presented below.

SUMMARIES OF SOME REPORTS

Yu.Yu. Balega

On the 6 m telescope operation in the first half of 2000

In connection with the transformations that occured in the Programme Committee, I would like to say a few words about the previous membership of the Programme Committee. Prof. Yu.N. Gnedin would pursue a balanced policy, all the points discussed were generaly resolved by consensus of opinion. Over 7 years of activity, 14 meetings of the Committee have been held at which about 1000 time requests from 200 applicants have been considered. About 100 astronomers are permanent applicants for the 6 m telescope time. Since 1994 conferences of the 6 m telescope users have been held. Such meetings have no analogues at other institutions of Russia. The conferences are funded by the Russian Foundation of Basic Research, and on behalf of those present now I wish to express my deep gratitude to the Foundation. The Committee granted time requests proceeding first of all from the scientific significance of the programme. For instance, much time (about 50 nights) was alloted for the programme of academician D.A. Varshalovich (Refinement of fundamental constants from high resolution observations of quasar spectra). The work was done at SAO RAS in co-operation with Dr. V.E. Panchuk. It turned out to be the best astronomical publication of the year and one of the most important achievements of the new academician.

Much attention is given to the analysis of papers based on the 6 m telescope observations. About 20 volumes of annualy published data have been collected.

Every year, about 80 papers appear in international and Russian journals. Now we pass to the analysis of the 6 m telescope operation in the first half of 2000. 61 time requests were submitted for the 6 m telescope observations and 5 for the Shein Mirror Telescope of the Crimean Observatory. The Committee allotted 158 nights to carry out 45 scientific programmes, 11 nights were the director's reserve and 12 technical nights.

The monthly number of observing hours in the first half of 2000 is presented in Table 1. In the table are given the data of the Maintenance Service of the BTA complex (BTA MS), i.e. the time the telescope was in operation, and the observers' data — the time spent for observing real space objects.

The time loss due to the breakdowns of the telescope and auxiliary apparatus were as usual, about 1 %. Thus, the failure to fulfil programmes is caused by bad weather.

In the period under review, the following programmes had a success:

1. G. Zhao (Bejing) — Nucleosynthesis in the Universe
2. V.L. Afanasiev (SAO RAS) — Dispersion of galaxy velocities
3. A.V. Moiseev (SAO RAS) — Double-barred galaxies

Table 2: *Observational time at BTA in the first half of 2000*

Month	BTA MS data (BTA MSD)	Observers' data (OD)
January	128	92.5
February	158.5	130
March	106.5	90
April	138.5	119.5
May	130	78.5
June	98	76
Total	795.5	586.5

4. S. Akopyan (Byurakan) — Spectrophotometry of SBS galaxies

5. A. Mikaelian (Byurakan) — Investigation of IRAS sources

6. A.M. Fridman (IA RAS) — Velocity field in spiral galaxies

7. D.B. Bizyaev (SAI) — Spiral galaxy disks

8. Yu.A. Shibanov (PhTI) — Spectra of the pulsar in the Crab nebula

9. V.V. Sokolov (SAO RAS) — Optical identification of gamma-bursters

10. A. Guarnieri (Bologna) — Investigation of optical transients

11. N.E. Piskunov (Uppsala) — Magnetic mapping of CP stars

The results of observations for each of the above-mentioned programmes were outlined in the report.

The reports made by Yu.N. Gnedin, A.M. Cherepashchuk, B.M. Shustov reviewed the current problems of observational astronomy.

Now we present the report of one of the time applicants.

A.N. Burenkov (SAO RAS)

Investigation of chemical composition of star formation regions in clumpy irregular galaxies

Clumpy irregular galaxies (CIG) were first isolated as a separate class by Casini and Heidman (1976) in 1976, basically by their extremely peculiar morphology, which is reflected by the authors by their name. Numerous bright star formation regions in CIGs points to extremely vigorous processes of star formation throughout the volume of an individual galaxy (Heidman, 1985). The further studies of CIGs show that these are giant galaxies with luminosity from -19^m to -21^m, relatively gas-rich galaxies (from 4 % to 11 %), with masses of the brightest star formation regions up to $10^9\,M_\odot$; the morphology peculiarity and the star formation burst over the entire volume of a galaxy can be explained in most of the cases by intimate interaction (Mr7 and Mr8) or even by merging (Mr297) (Bottinelli et al., 1975; Burenkov, 1988; Burenkov, Khachikian, 1990; Burenkov et al., 1990), which is suggested by the complex velocity field in CIGs (Duflot et al., 1976).

Since 1999 a programme has been carried out at BTA for detailed spectrophotometry of CIGs, which is aimed at investigation of chemical composition gradient in a galaxy. The main problem in the study of relative abundances of heavy elements in local star formation regions in CIGs is the comaparatively low electron temperature of the zone O^{++} ($T_e \leq 8000°$ K). This problem can be resolved provided spectra are obtained with a high signal-to-noise ratio ≥ 50, sufficient for measuring the weak emission line [OIII]λ 4363. The present-day emission detectors of BTA are capable of doing this under photometric weather conditions. About 80 spectra have so far been obtained in the blue and red spectral ranges for the star formation regions in 7 galaxies. Processing of the spectra has been performed and the data are being analysed. In our opinion, the programme has been fulfilled at a level of 30–40 %.

References

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