Introduction

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Siberia is an enormous area in north Asia spreading from the Urals in the west to mountainous ridges of the Okhotsk sea coast in the east, from the Arctic Ocean in the north to borders with Kazakhstan, Mongolia and China in the south. Three great rivers, the Ob, the Yenisei and the Lena, flow across the territory of Siberia. The world oldest and deepest Lake Baikal is found here. The world greatest lowland, the West-Siberian Plain, covers 2.7 million km of Siberian's territory. About a half of the planet's boreal forests grow here. Here is the world largest natural forest-swamp complex. Mountainous massifs and highlands occupy large areas in Eastern Siberia. Mountain systems border Siberia from the west, the east and the south, enclosing it from cyclones of the Atlantic and the Pacific Oceans, as well as from hot Central Asia.

The area of Siberia is greater than one-half of the area of the Russian Federation, almost equal to the area of Europe, almost a quarter of the entire Asia or 1/15 of the whole land of the Earth. Siberia contents 20 entities of the Russian Federation. Its population, residing mainly along the Transs-Siberian Railway and in the south, amounts to 15% of the whole Russia population.

Late in the 1950s, when the government of the USSR embarked upon accelerated development of natural resources and productive forces of Siberia, the necessity of thorough investigation of emerging problems, which meant drastic enhancement of the research potential of this region, became evident. The project of Siberian's science evolution was ranked among the other major national scale projects, such as Space exploration, development of oil and gas fields in Western Siberia, and was completed ahead of schedule (the first stage of construction of the Novosibirsk Science Center had been finished by 1964). The Siberian Branch was the first regional division of the Academy of Sciences. The basic principles underlying the organization of science in Siberia are:

- comprehensive character (multidisciplinarity) of science centers;
- outstripping development of priority trends of fundamental sciences;
- integration of science and education;
- active introduction of scientific results into industry, first of all in Siberia.

Novosibirsk Science Center, the largest at the SB RAS, includes about one-half of the Siberian Branch resources. According to the government's resolution of setting up the Siberian Branch of the USSR Academy of Sciences adopted in 1957, it was the first to be founded.

Novosibirsk Akademgorodok, situated 30 km to the south of city center, was intended as the world-first comprehencive science center. Here, accordint to the SB RAS founders' area, research teams authoritative in all major fields of basic science were formed.

The institute of Nuclear Physics SB RAS was founded in 1958 on the base of the headed by G.I. Budker Laboratory for new acceleration methods of the Institute of Atomic Energy headed at the time by I.V. Kurchatov. Academician G.I. Budker was the founder and the first Director of the

Institute. Since his death in 1977 to the present time, the Director of the now called "The G.I. Budker Institute of Nuclear Physics SB RAS" is Academician A.N. Skrinsky.

The total number of the Institute staff is approximately 2900 and among them there are about 450 researches, over 60 postgraduate students, 850 engineers and techniciants. Among the research staff there are 4 full members and 7 corresponding members of the Russian Academy of Science, about 50 Doctors of Science, 180 Candidates of Science. At the present time the Institute is the largest from the Russian Academy of Sciences.

The G.I. Budker Institute of Nuclear Physics is one of the world leading centers in several important fields of high energy physics, controlled thermonuclear fusion, synchrotron radiation, free electron lasers and applied physics. In majority of its research fields the Institute is unique in Russia.

The Institute takes an active part in the joint programs both with Russian and foreign institutes and organizations and intergovernmental organizations. One of these is ICTC. Since the ICTC foundation the Institute has got 7 grants in various fields of science. In particular, one of the grants was also the largest ICTC grant on the development and production of the superconducting magnet - a generator of slow positrons for the SPring-8 storage ring, Japan. All the obtained grants are either successfully completed or are in good progress and by present, some new grants are at the stage of consideration.

In 2000, it was suggested to held the IV ICTC SAC Seminar at the Budker INP. The preparatory work started in winter, 2001. The book of abstracts including both the invited reports and poster presentations was prepared prior to the beginning of the Seminar.

The Seminar was opened on 23rd April, 2001. 23 foreign researchers from the USA, Portugal, France, Republic of Korea, Germany, Italy, Georgia, Japan and 22 from Russian centers of Moscow, Sankt-Petersburg, Yakutsk, Tomsk, Snezhinsk, Gatchina, Dubna, Sarov took part in the Seminar. It is worth mentioning a pleasing fact that not only the leading and well known scientists took part in the Seminar but many young researchers and students whose participation was their first participation in the International Seminar.

The Seminar Scientific Program fully covered all the subjects included in the Concept of the Seminar: High Energy Physics, Astrophysics and Biological Science. 7 plenary and 35 oral presentations have been given in separate scientific sections and 12 oral reports have been presented on adjacent research subjects. Over 120 poster presentations have been given at the Seminar.

In the first two days of the Seminar there were given very interesting plenary reports by Academician A.M.Fridman and Professor E.G.Berezhko in Astrophysics, Academician V.V.Vlasov and Professor Alain Pompidou in biological science.

The Budker INP research activity was rather deserving presented with a very interesting report by the BINP Director, Academician A.N.Skrinsky, attention of participants was drawn by reports of Yu.M.Shatunov on the Status of VEPP-2000 Project, B.P.Tolochko on the SR use in studies of explosion processes, E.L.Goldberg on studies of paleoclimate the Earth, etc.

Participants of the Seminar had an opportunity to make an acquaintance with the BINP unique facilities during the technical tour to plasma installations, electron positron colliders VEPP-3M, VEPP-4 and VEPP-5. Some participants have visited the Siberian Synchrotron Radiation Center and the Center of Photochemical Research. In addition, excursions to RFC VB «Vector», Institute of

Cytology and Genetics and Institute of Bioorganic Chemistry of Siberian Branch of Russian Academy of Science have been arranged during the Seminar.

Participants of the Seminar noted the importance of such kind of discussions between scientists of various branches of science as high energy physics, biological science and astrophysics. This was a very good reason for new interesting ideas and works and personal contacts as well. It is worth quoting the member of Scientific Advisory Committee Professor Alain Pompidou (Paris University, France): *"The purpose of the Novosibirsk seminar, related to the SAC initiative gave the opportunity to raise links between physics and biosciences. Every one could express on their own topics but plenary sessions and fruitful discussions around the posters gave the opportunity of many exchanges and better knowledge between different scientists belonging to all kind of generations. The dynamism of the young students were impressive! The technical visits were very impressive. The warm welcome of the organizer, the professional management of the meeting and last but not least, the spectacular weather gave to this seminar a very special touch that I shall remind and recall."*

The present book of Proceedings of the IV ICTC SAC Seminar includes the majority of the Seminar plenary and oral presentation. Proceedings were prepared in the camera-ready style, therefore the format of some papers sent to the Organizing Committee in the format PS or PDF are slightly differed from the majority of papers.