as to the structure of these stars. General confidence in the theory of the late stages in evolution was enhanced.

The theoreticians played the next round: two years prior to the corresponding observations, Schwartzmann predicted that a pulsar in a binary system would periodically radiate x-ray pulses due to accretion.

Much work was done within a short time after the observations of binary (including eclipsing-binary) x-ray sources—in Hercules, in Cygnus, and elsewhere. Syunyaev and Basko examined the vaporization of a gas under the action of a flux of x-rays. Syunyaev and Shakura considered the spectrum of the disk. Syunyaev suggested quasiperiodic fluctuations as offering a way to investigate the "black hole."

Novikov and the American physicist Thorne developed a consistent relativistic theory of disk accretion. Lyutyĭ, Cherepashchuk, and Kurochkin, specialists on variable and binary stars at the Shternberg Institute (the State Astronomical Institute of Moscow State University), became involved and, together with members of our group, interpreted the optical observations of the "ordinary companions" of relativistic stars. A new and extremely rapidly developing branch of astronomical science, to which Soviet astrophysicists have rendered meritorious service, has emerged.

General information may be found in "The Theory of Gravitation and the Evolution of the Stars," by Ya. B. Zel'dovich and I. D. Novikov (Nauka, 1972). This book is significantly stronger in the area that is the subject of this paper than the book by the same authors "Relativistic Astrophysics" (Nauka, 1967). On the other hand, recent results are being set forth in a steadily rising stream of communications in "Astrophysical Journal Letters," "Astrophysical Journal," "Astronomy and Astrophysics," "Astrophysics and Space Science," "Astronomicheskiĭ Tsirkulyar," "Astronomicheskiĭ Zhurnal," "Astrofizika," and other journals and to an even greater degree in preprints of the work of Soviet and foreign scientists.

F. I. Fedorov. The Development of Physics in Belorussia.

Before the October Revolution, there were no higher educational institutions or scientific-research agencies on the territory of Belorussia. The Belorussian State University was opened in 1921 by decree of V. I. Lenin. The Belorussian Academy of Sciences was founded in 1929, but it was a long time before it acquired scientific-research facilities in the physicomathematical profile. Only in 1955 was the Institute of Physics and Mathematics organized in the Belorussian Academy of Sciences, and before that date research in these sciences was pursued only in the department of the Belorussian State University.

Note should be taken of the great assistance rendered our republic in the matter of staff training by the scientific agencies and colleges of Moscow and Leningrad, where young Belorussian physicists completed their graduate studies under the guidance of prominent scientists.

At the present time, the principal scientific centers in the BSSR at which physical research is done are the Institute of Physics (IP) and the Institute of Solid-State and Semiconductor Physics (ISSSP) of the Belorussian Academy of Sciences, together with the Physics Department of the V. I. Lenin Belorussian State University.

The Institute of Physics of the Belorussian Academy of Sciences is one of the foremost scientific agencies of our country in the fields of optics and spectroscopy. Many of the results obtained here have been widely recognized both in the USSR and abroad. We shall enumerate a few of them. The Institute has developed engineering methods for computing the optical properties of lasers that are now generally accepted and widely used. A new class of active substance for lasers —complex organic compounds of the dyestuff type—has been discovered. Lasers with smooth output-frequency tuning have been developed on the basis of these substances. For this discovery, the Director of the Institute of Physics of the Belorussian Academy of Sciences, Academician of the Belorussian Academy B. I. Stepanov, was awarded a 1972 USSR State Prize jointly with A. N. Rubinov and V. M. Mostovnikov.

A general consistent phenomenological theory of the optical properties of transparent, absorbing, magnetic, and optically active anisotropic media was developed on the basis of direct tensor-calculus methods. A theory of the propagation of elastic waves in crystals was developed, and an effective method of calculating Debye temperatures for crystals of arbitrary symmetry was elaborated.

The foundations of a theory of the luminescence of complex molecules have been laid. A spectroscopy of negative luminous fluxes has been created. A universal relation has been established between the absorption and luminescence spectra of complex molecules and semiconductors.

The phenomenon of vapor-fluorescence extinction by foreign gases was discovered. A new type of luminescence—sensitized anti-Stokes annihilation fluorescence—has been observed.

Dispersion filters of a qualitatively new type have been created for the infrared region of the spectrum, where they offer substantial advantages.

New methods have been developed for the production of shock waves and supersonic erosive plasma jets. Machines that model complex plasma formations have been built. Spectroscopic and laser methods for low-temperature-plasma diagnostics have been developed.

Theoretical research in quantum-field theory and the general theory of relativity is conducted at the Theoretical Physics Laboratory of the Institute of Physics and in the Belorussian State University Theoretical Physics Department. A general method of projective operators has been developed in the theory of particles with arbitrary spin. A new parametrization, with the aid of three-dimensional complex vector parameters, has been proposed for real and complex Lorentz groups. The tetradic formalism in GTR has been developed in combination with the method of stratified spaces.

Extensive research is being done in solid-state physics at the ISSSP of the Belorussian Academy of Sciences. The nature of the chemical bond in solids and their physical and chemical constants are objects of study; phase transitions, crystal-growth processes, and the optical properties of semiconductors are being investigated. The ISSP is the foremost scientific agency

working on the problem of the chemical bond in solids.

Since 1964, the Institute of Physics of the Belorussian Academy of Sciences has been publishing the All-Union "Journal of Applied Spectroscopy," which is translated in the United States. Belorussian physicists have published about 20 original monographs, many of which have been translated and published abroad.

Although the scientific agencies of the BSSR that deal with physics do not have a long history, the results that they have produced indicate that we may relay on new achievements in the future.