PHYSICS OF NEUTRON STARS – 2001

St. Petersburg, Ioffe Physico-Technical Institute
June 6–8, 2001

PROGRAMME OF THE CONFERENCE

June 6, Wednesday

Session 1. WELCOME and GENERAL

Chairman: D.A. Varshalovich

10.00–10.10 **D.A. Varshalovich** (*Ioffe Institute, St. Petersburg*) Welcome

10.10–10.50 **G.S. Bisnovatyi-Kogan** (*Space Research Institute, Moscow*) Phase transitions in stars: stability, pulsations, convective Urca-shells and pre-supernovae

10.50–11.10 **A.F. Zakharov** (*Inst. Exper. Theor. Phys., Moscow*) From white dwarfs to black holes (70th anniversary of the theory of compact objects)

11.10–11.30 **I.V. Panov**, F.-K. Thielemann (*Inst. Theor. Exper. Phys., Moscow; University of Basel, Switzerland*) r-process in neutron star mergers and beta-delayed fission

11.30–12.00 Coffee break

Session 2. RADIOPULSARS

Chairman: M.E. Prokhorov

12.00–12.20 **A.D. Kuzmin** (*Pushchino Radio Astronomy Observatory*) Radio luminosity comparative analysis of the millisecond and normal pulsars

12.20–12.40 **I.F. Malov** (*Pushchino Radio Astronomy Observatory*) On the pulsed optical emission from radio pulsars

12.40–13.00 V.M. Malofeev, **O.I. Malov** (*Pushchino Radio Astronomy Observatory*) Detection of pulsed radio emission of first AXP 1E2259+58

13.00–13.20 **M.V. Popov**, V.I. Kondratev (*Astro Space Center, Moscow*) Observed parameters of microstructure in pulsar radio emission

13.20–13.40 **T.V. Smirnova** (*Pushchino Radio Astronomy Observatory*) Diffractive scintillations of PSR 0809+74 and 0950+08 at low frequencies

13.40–14.00 **V.A. Soglasnov**, M.V.Popov, V.I. Kondratev, S.V. Kostyuk (*Astro Space Center, Moscow*) Giant pulses from radio pulsars

14.00–15.00 LUNCH

Session 3. NEUTRON STARS AS X-RAY SOURCES. Part I

Chairman: A.D. Kuzmin

15.00–15.30 **M.G. Revnivtsev**, M.R. Gilfanov, E.M. Churazov, R.A. Sunyaev (*Space Research Institute, Moscow*) Short-term X-ray variability of neutron stars: current status and perspectives

15.30–15.50 **S.A. Grebenev**, S.V. Molkov, A.A. Lutovinov, R.A. Sunyaev (*Space Research Institute, Moscow*) X-ray bursts with signs of strong photospheric radius expansion of a neutron star

15.50–16.10 **A.A. Lutovinov**, S.A. Grebenev, S.V. Molkov (*Space Research Institute, Moscow*) Review of X-ray bursters in the Galactic Center Region

16.10–16.30 **S.V. Molkov**, S.A. Grebenev, A.A. Lutovinov (*Space Research Institute, Moscow*) X-ray spectral variability of the LMXB and Z-source GX340+0

16.30–17.00 Coffee break

Session 4. NEUTRON STARS AS X-RAY SOURCES. Part II

Chairman: S.A. Grebenev

17.00–17.20 **A.M. Bykov** (*Ioffe Institute, St. Petersburg*) Hard-energy emission from supernova remnants

17.20–17.40 A.M. Bykov, **A.M. Krassilchtchikov** (*Ioffe Institute, St. Petersburg*) A model of sub-Eddington accretion onto a magnetized neutron star

17.40–18.00 **A.N. Baushev**, G.S. Bisnovatyi-Kogan (*Space Research Institute, Moscow*) Theoretical interpretation of the X-ray pulsar spectra consisting of several cyclotron harmonics

18.00-18.20 **A.V. Serber** (*Institute of Applied Physics, Nizhny Novgorod*) Cyclotron scattering with mode switching in accretion column of a magnetized neutron star

18.20–18.40 S.I. Blinnikov, E.I. Sorokina, **D.I. Kosenko**, K.A. Postnov (*Sternberg Astronomical Institute, Moscow; Inst. Theor. Exper. Phys., Moscow*) X-ray emission from young SN remnants

June 7, Thursday

Session 5. INTERNAL STRUCTURE AND EVOLUTION

Chairman: I.F. Malov

10.00–10.40 **P. Haensel** (*Copernicus Astronomical Center, Warsaw*) Unified equations of state of dense matter and neutron star structure

10.40–11.10 **D.G. Yakovlev**, O.Y. Gnedin, A.Y. Potekhin (*Ioffe Institute, St. Petersburg; Inst. Astronomy, Camridge, UK*) Thermal relaxation in young and old neutron stars

11.10–11.30 **A.Y. Potekhin**, D.G. Yakovlev (*Ioffe Institute, St. Petersburg*) Thermal structure and cooling of neutron stars with magnetized envelopes

11.30–11.50 **A.D. Kaminker**, P. Haensel, D.G. Yakovlev (*Ioffe Institute, St. Petersburg; Copernicus Astronomical Center, Warsaw*) Masses of isolated neutron stars and superfluid gaps in their cores: constraints from observations and cooling theory

11.50–12.10 **K.P. Levenfish**, P. Haensel, D.G. Yakovlev (*Ioffe Institute, St. Petersburg; Copernicus Astronomical Center, Warsaw*) Viscous damping of neutron star pulsations

12.10–12.30 Coffee break

12.30–13.00 **J.L. Zdunik** (*Copernicus Astronomical Center, Warsaw*) Accreting strange stars

13.00–13.40 Session 6. POSTERS

Chairman: V.S. Beskin

A.A. Belyanin, **E.V. Derishev** (*Institute of Applied Physics, Nizhny Novgorod*) Self-sustained neutron haloes in the inner parts of hot accretion disks

Yu.N. Gnedin, S.O. Kiikov (*Pulkovo Observatory, St. Petersburg*) Magnetocavitation mechanism of gamma-ray burst phenomenon

D.V. Khangoulian, S.V. Bogovalov (*Moscow Engineering Physics Institute*) Shock fronts at the termination of anisotropic relativistic winds

A.B. Koptsevich, P. Lundqvist, J. Sollerman, Yu.A. Shibanov, S. Wagner (*Ioffe Institute, St. Petersburg; Stockholm Obs., ESO, Germany; Heidelberg Univ., Germany*) First detection of the Vela pulsar in IR with VLT

E.N. Narynskaya, N.V. Mikheev (*Yaroslavl State University*) Familon emissivity of magnetized plasma

S.B. Popov, M.E. Prokhorov (*Sternberg Astronomical Institute, Moscow*) Evolution of isolated neutron stars in globular clusters: number of Accretors

M.Yu. Timofeev (*Astro Space Center, Moscow*) Some features of weak and strong pulses of pulsars

13.40–14.40 LUNCH

Session 7. OBSERVATIONS OF ISOLATED NEUTRON STARS

Chairman: B.V. Komberg

14.40–15.10 **Yu.A. Shibanov** (*Ioffe Institute, St. Petersburg*) Multiwavelength observations of isolated NSs: thermal emission vs nonthermal

15.10–15.30 **A.B. Koptsevich**, G.G. Pavlov, S.V. Zharikov, V.V. Sokolov, Yu.A. Shibanov, V.G.Kurt (*Ioffe Institute, St. Petersburg; Penn State Univ., USA; Obs. Astr. Nacional. de Inst. de Astronomia de UNAM, Mexico; Special Astrophysical Observatory; Astro Space Center, Moscow*) Multiband photometry of the PSR B0656+14 and its neighborhood

15.30–15.50 **V.N. Komarova**, V.G. Kurt, T.A. Fatkhullin, V.V. Sokolov, Yu.A. Shibanov, A.B. Koptsevich (*Special Astrophysical Observatory; Astro Space Center, Moscow; Ioffe Institute, St. Petersburg*) Multiband photometry of Geminga

15.50–16.10 **E.I. Chuikin** (*Ioffe Institute, St. Petersburg*) Separation of millisecond and submillisecond pulsations in hard gamma radiation from the Geminga pulsar

16.10–16.40 Coffee break

Session 8. DISCS, QPOs, MAGNETOSPHERES

Chairman: K.A. Postnov

16.40–17.10 **L.G. Titarchuk** (*Naval Res. Lab., USA*) Spectral and timing properties of neutron star and black hole systems. Theory and observations

17.10–17.30 **Yu.N. Gnedin**, S.O. Kiikov (*Pulkovo Observatory, St. Petersburg*) The origin of QPOs in X-ray binaries

17.30–17.50 **V.S. Beskin**, R.Yu. Kompaneetz (*Lebedev Physical Institute, Moscow; Moscow Institute of Physics and Technology*) On the 2D structure of a thin accretion disk

17.50-18.10 **S.V. Bogovalov**, F.A. Aharonian (*Moscow State Engineering Physics Institute; Max-Planck-Institut für Kernphysik, Heidelberg, Germany*) Gamma-rays from pulsar winds

18.10–18.30 S.V. Bogovalov, **D.V. Khangoulian** (*Moscow Engineering Physics Institute*) Interaction of the anisotropic pulsar winds with the interstellar medium

June 8, Friday

Session 9. NEUTRON STARS IN THE GALAXY AND BEYOND

Chairman: Yu.N. Gnedin

10.00–10.40 **A.M. Cherepashchuk** (*Sternberg Astronomical Institute, Moscow*) Wolf-Rayet stars and relativistic objects

10.40–11.00 **M.E. Prokhorov**, K.A. Postnov (*Sternberg Astronomical Institute, Moscow*) Distribution of NS and BH masses and mechanism of SN explosion

11.00–11.20 **S.B. Popov**, M.E. Prokhorov, M. Colpi, R. Turolla, A. Treves (*Sternberg Astronomical Institute, Moscow; University Milano-Bicocca, Italy; University of Padova, Italy; University of Como, Italy*) Isolated neutron stars as X-ray sources: accretion vs. cooling

11.20–11.40 V.D. Pal'shin, **A.I. Tsygan** (*Ioffe Institute, St. Petersburg*) The manifestations of different acceleration mechanisms of binaries containing neutron stars

11.40–12.00 **A.G. Kuranov**, K.A. Postnov, M.E. Prokhorov (*Sternberg Astronomical Institute, Moscow*) The evolution of binary stars in a globular cluster

12.00–12.30 Coffee break

Session 10. NEUTRINO PROCESSES

Chairman: G.S. Bisnovatyi-Kogan

12.30–13.00 **A.A. Gvozdev**, I.S. Ognev (*Yaroslavl State University*) Efficiency of e^+e^- pairs production by neutrinos in Kerr BH collapsars with strong magnetic field; Dynamic effects in a collapsar envelope due to neutrino propagation through a strongly magnetized plasma

13.00–13.20 M.V. Chistyakov, **A.V. Kuznetsov**, N.V. Mikheev (*Yaroslavl State University*) Three-vertex loop processes in strong magnetic field

13.20–13.40 **M.V. Chistyakov**, N.V. Mikheev (*Yaroslavl State University*) Photon-neutrino processes in the strongly magnetized plasma

13.40–14.00 **D.A. Rumyantsev**, A.V. Kuznetsov, N.V. Mikheev (*Yaroslavl State University*) Lepton pair production by high-energy neutrino in an external electromagnetic field

14.00–15.00 LUNCH

Session 11. GAMMA RAY BURSTS. Part I

Chairman: A.M. Cherepashchuk

15.00–15.30 **K.A. Postnov** (*Sternberg Astronomical Institute, Moscow*) Relation of gamma-ray bursts to formation of compact stars

15.30–15.50 Ya.N. Istomin, **B.V. Komberg** (*Lebedev Institute, Moscow; Astro Space Center, Moscow*) GRB as the result of the interaction of supernova ejecta with NS companion of a closed binary

15.50–16.10 **D.D. Frederiks** (*Ioffe Institute, St. Petersburg*) Short gamma ray bursts

16.10–16.30 **E.V. Derishev**, V.V. Kocharovsky, Vl.V. Kocharovsky (*Institute of Applied Physics, Nizhny Novgorod*) On the competition between synchrotron and Compton emission of electrons in relativistic shocks

16.30–16.50 **V.B. Ignatiev**, A.G. Kuranov, K.A. Postnov, M.E. Prokhorov (*Moscow State University, Sternberg Astronomical Institute*) Gravitational wave background from coalescing compact stars in eccentric orbits

16.50–17.20 Coffee break

Session 12. GAMMA RAY BURSTS. Part II

17.20–17.50 **V.V. Sokolov** (*Special Astrophysical Observatory*) On the gamma-ray burst progenitors

17.50–18.10 **T.A. Fatkhullin**, V.V. Sokolov (*Special Astrophysical Observatory*) The modeling of spectra of GRB host galaxies

18.10–18.30 B.E. Stern, **Ya.Yu. Tikhomirova**, R. Svensson (*Inst. Nuclear Res., Moscow; Astro Space Center, Moscow; Stockholm Observatory*) Evidence for a strong evolution of GRBs and constraints on the GRB intrinsic luminosity function with new GRB statistical data

18.30–18.40 **D.A. Varshalovich** (*Ioffe Institute, St. Petersburg*) Closing