

Helmholtz International Summer School (HISS):

## Dense Matter in Heavy-Ion Collisions and Astrophysics

**Place:** JINR Dubna, Russia

**Date:** July 14 – 26, 2008

**Organizers:** D. Blaschke (Univ. Wroclaw & JINR Dubna)  
V. Voronov (JINR Dubna) and  
J. Wambach (GSI & TU Darmstadt)

**Website:** <http://theor.jinr.ru/~dm2008>

### Scientific Programme:

#### Monday, 14.07.

10:00 Opening (Sissakian / Voronov)  
10:10 Effective Field Theories for Hot and Dense Matter (Blaschke)  
11:10 *coffee break*  
11:30 Landau Hydrodynamics and Quarkonia in the Quark-Gluon-Plasma (Wong)  
12:30 J/psi suppression in the NA60 experiment (Arnaldi)  
13:30 *lunch break*  
15:30 Isolated Neutron Star Observations – Review (Popov)  
16:30 *coffee break*  
17:00 Problem Solving Seminars: Blaschke, Arnaldi  
18:00 Problem Solving Seminars: Wong, Popov  
19:30 *welcome buffet*

#### Tuesday, 15.07.

10:00 QCD at Finite Temperature and Density on the Lattice (Lombardo)  
11:00 *coffee break*  
11:30 Quark-Hadron Mixed Phase (Toneev)  
12:30 J/psi suppression in the NA60 experiment (Arnaldi)  
13:30 *lunch break*  
15:30 Heavy Quarkonia in the Quark-Gluon-Plasma (Wong)  
16:30 *coffee break*  
17:00 Problem Solving Seminars: Lombardo  
18:00 Problem Solving Seminars: Blaschke

#### Wednesday, 16.07.

10:00 Effective Field Theories for Hot and Dense Matter (Blaschke)  
11:00 *coffee break*  
11:30 QCD at Finite Temperature and Density on the Lattice (Lombardo)  
12:30 Goals and Status of the CBM Experiment (Senger)  
13:30 *lunch break*  
15:30 Magneto-rotational Evolution and Field Decay; Isolated Accreting NSs (Popov)  
16:30 *coffee break*  
17:00 Participant Contributions:

Illarionov (40'): Progress in Quantum MC calculations of the nuclear EoS  
Castillo (20'): Exactly solvable potentials and Romanovski polynomials in QM  
Iosilevsky (30'): Non-congruent phase transitions in neutron stars  
Makhaldiani (30'): Statistical description of extended particle systems

Thursday, 17.07.

10:00 Heavy-Ion Collisions at LHC: The ALICE Experiment (Marin)  
11:00 *coffee break*  
11:30 Goals and Status of the CBM Experiment (Senger)  
12:30 Status of the NICA Project at JINR Dubna (Sorin)  
13:30 *lunch break*  
15:00 Quark-Hadron Mixed Phase (Toneev)  
16:30 *coffee break*  
17:00 Participant Contributions:  
    Kiseleva (30'): Muon simulations in CBM  
    Lyuboshitz (30'): Spin correlations in Lambda-Lambda systems in RHIC  
18:00 Problem Solving Seminars: Senger, Marin

Friday, 18.07.

10:00 Compact Object Structure and Dense Matter Equation of State (Lattimer)  
11:00 *coffee break*  
11:30 Near-side Ridge and Early Parton Momentum Distribution (Wong)  
12:30 Condensates and Correlations in Nuclear Matter (Röpke)  
13:30 *lunch break*  
15:30 Results and Perspectives of RHIC Experiments (Hallman)  
16:30 *coffee break*  
17:00 Participant Contributions:  
    Tomasik (40'): Signatures of fireball fragmentation at the phase transition  
    Porębska (20'): Neutron star crust moment of inertia (calc. vs. observations)  
18:00 Problem Solving Seminars: Blaschke, Lattimer

Saturday, 19.07.

10:00 Results and Perspectives of RHIC Experiments (Hallman)  
11:00 *coffee break*  
11:30 Elliptic Flow Measurements at RHIC (Taranenko)  
12:30 Near-side Ridge and Early Parton Momentum Distribution (Wong)  
13:30 *barbecue party (Cafeteria)*

Sunday, 20.07.      *9:00–17:00 excursion to Sergiev Posad*

Monday, 21.07.

10:00 Condensates and Correlations in Nuclear Matter (Röpke)  
11:00 *coffee break*  
11:30 Evolution of Neutron Stars and Observational Constraints (Lattimer)  
12:30 BEC-BCS Crossover in Quark Matter (Zhuang)  
13:30 *lunch break*  
15:30 Neutrino Processes in Neutron Stars (Kolomeitsev)  
16:30 *coffee break*  
17:00 Participant Contributions:  
    Zablocki (30'): Pions in the quark matter phase diagram

Hohle (30'): Spectral behavior of the isolated neutron star RX J 0720 (M7)  
Hilger (30'): QCD sum rules and D-mesons at finite temperature

Tuesday, 22.07.

10:00 BEC-BCS Crossover in Quark Matter (Zhuang)  
11:00 *coffee break*  
11:30 Color Glass Condensate and Initial Stages of Heavy-Ion Collisions (Gelis)  
12:30 Round Table: Perspectives of Dense Matter in HIC and Astrophysics  
13:30 *lunch break*  
15:00 *excursion to the Baldin-Veksler Lab. for High Energy Physics (Nuclotron)*  
17:00 Fermi-Liquid Approach to Superfluid Systems (Kolomeitsev)  
18:00 Problem Solving Seminars: Zhuang

Wednesday, 23.07.

10:00 Thermal Statistical Model for Particle Production (Cleymans)  
11:00 *coffee break*  
11:30 Neutrino Processes in Neutron Stars (Kolomeitsev)  
12:30 Population Synthesis (Popov)  
13:30 *lunch break*  
15:00 Cooling of Compact Stars (Grigorian)  
16:30 *coffee break*  
17:00 Problem Solving Seminars: Gelis, Grigorian

Thursday, 24.07.

10:00 Evolution of Neutron Stars and Observational Constraints (Lattimer)  
11:00 *coffee break*  
11:30 Color Glass Condensate and Initial Stages of Heavy-Ion Collisions (Gelis)  
12:30 Probing Neutron Star Physics with Accreting Neutron Stars (Patruno)  
13:30 *lunch break*  
14:00 *excursion to the Flerov Lab. for Nuclear Reactions*  
15:30 Thermal Statistical Model for Particle Production (Cleymans)  
16:30 *coffee break*  
17:00 Pion decay constants in dense skyrmion matter (Lee)  
18:00 Participant Contributions:  
    Shtalberg (20'): Nuclear matter phase transitions in central HIC  
    Steinbeiss (20'): Neutrino oscillations and supernova evolution  
    Shahabasyan (20'): Semi-vortices in CFL quark matter stars

Friday, 25.07.

10:00 Cooling of Compact Stars (Grigorian)  
11:00 *coffee break*  
11:30 Probing Neutron Star Physics with Accreting Neutron Stars (Patruno)  
12:30 Supernovae and Proto-Neutron Star Evolution (Lattimer)  
13:30 Final Exam on Dense Matter (Porębska and Illarionov)  
14:00 *farewell buffet (Cafeteria)*