The 6th International Symposium on Negative Ions, Beams and Sources

September 3-7, 2018

Budker Institute of Nuclear Physics SB RAS,

Novosibirsk, Russia

Symposium booklet

Co-hosted by

Novosibirsk State University
*THE REAL SCIENCE

Sponsors

D-Pace

РФФИ

General Information

The 6th International symposium NIBS'18 (Negative Ions, Beams and Sources) will be held on September 3-7, 2018, and hosted by the Budker Institute of Nuclear Physics SB RAS and Novosibirsk State University. The symposium will be focused on the various aspects of the production and use of negative ions.

Presentation Information

Oral

All talks are allocated a time of 25 minutes for the presentation and 5 minutes for questions and discussion. Presentation formats are Microsoft PowerPoint and PDF. Any special content (video etc) will have to be embedded in the presentation. Please copy your oral presentation directly to the computer in Conference hall beforehand (during lunch or coffee breaks), or upload it to the NIBS'18 site with your InDiCo account *(by clicking **My Contribution → view→ pensil → add material → material type → slides → Choose file.***

The presentation file should be named as follows:
NIBS_<talknumber>_<lastname>, where ***<talknumber>*** is the number of the talk, shown in thy agenda part of this booklet, and ***<lastname>*** **-** the last name of the presenter, for example ***NIBS_MonO1_Ivanov.pptx*****.**
Attention: If you don't want to publish your presentation at Internet – please ask the local organizing committee to remove your files after the session.

Poster

Each poster presenter will be allocated the board **90 cm width by 120 cm height** (approximately portrait A0). There are two poster sessions on Monday and Tuesday. Both begin at 15:30 and are located on the third floor of BINP main building (downstairs from the BINP Conference hall). The posters should be mounted in the morning of the first session and removed at the end of the session or at latest the next morning

Publication

The contributions will be published by AIP after a peer review process. The AIP single column 8.5 x 11 inch style will be used in the proceedings. We kindly ask the authors to use the ***Microsoft Word templates,*** available at the AIP site https://aip.scitation.org/apc/authors/preppapers .

The maximum length will be 8 pages. All papers must be a minimum of 4 pages to comply with AIP publication requirements. It is also necessary to add a copyright release to each paper signed by at least one author.

The manuscript file should be named as follows:

NIBS_< papernumber>_<lastname>**,** where ***<papernumber>*** is the paper number, shown in this booklet, and ***<lastname>*** **-** the presenter last name, for example ***NIBS_P1-23_Sanin.docx*****.** The manuscripts are to be uploaded to the NIBS'18 site with your InDiCo account *(by clicking* ***My Contribution → view→ pensil → add material → material type →paper →Choose file)*** or submitted by email to Yu.I.Belchenko@inp.nsk.su by the 2nd of September 2018, the day before the start of the symposium.

During Symposium

- **The registration will take place in the BINP lobby on Monday September 3rd from 8:30 a.m. till 9:30 a.m.**

  The early arrived participants could register in the hotels "Golden Valley" and "Park Wood "on Sunday, September 2nd from 4:00 p.m. till 6:00 p.m.

- **A badge with your name is your pass to the Institute. Please show it to the security when you come in and come out to the Institute!**

- **All plenary Sessions take place in the Conference Hall (at 4th floor of the BINP main building).**

- **The Local Organizing Committee is located in the room 331 of the main building, third floor, tel. 329-47-45.**

- **Coffee breaks will be served in the foyer of the 4th floor (upstairs of the Main Conference Hall). Lunches are included in the registration fee and will be served at the BINP Canteen (~200m from the Main Building). Special lunch coupons will be provided upon the registration.**

- **Coffee machine and Snack kiosk are located in the main BINP building at the second floor.**

- **You can use your notebook and smartphone for Wi-Fi Internet connection ("BINP- guest" or "BINP-guest-WPA" network, the second one is preferable). The login name and password will be provided.**

- **Smoking area is located outside of the Institute near the main entrance (see the Institute plan at the booklet cover).**

- **Restaurants and cafeteria in Akademgorodok:**

  http://ssrc.inp.nsk.su/CKP/userdoc/cafe.html

Bus schedule during Symposium:

Monday 3/09/2018

8:15 from the hotels to the BINP

20:00 from the BINP canteen to the hotels

Tuesday 4/09/2018

08:30 from the hotels to the BINP

18:10 from the BINP to the hotels

Wednesday 5/09/2018

08:30 from the hotels to the BINP

17:10 from the BINP to Borvikha

21:00 from Borvikha to hotels

Thursday 6/09/2018

08:30 from the hotels to the BINP

18:10 from the BINP to the hotels

Friday 7/09/2018

08:30 from the hotels to the BINP

15:10 from the BINP to the hotels

Please, check the **bus departure schedule** from the hotel to the airport "Tolmachevo" in the Organizing Committee.

Monday, September 3

Time		Talk number	Presenter, paper title
8:30	10:00		**Registration, BINP Lobby**
1st session, Chairman Dr. Beatrix SCHUNKE			
9:30	9:40		Welcome from BINP Director **acad. Pavel Logachev**
9:40	10:10	**MonO1**	**Prof. Alexander IVANOV**, Negative Ion and Neutral Beams Injectors at the BINP
10:10	10:40	**MonO2**	**Prof. Giuseppe CHITARIN,** Start of SPIDER operation towards ITER Neutral Beams
10:40	11:10		Coffee break
2nd session, Chairman Dr. Werner KRAUS			
11:10	11:40	**MonO3**	**Dr. Dirk WÜNDERLICH**, Long Pulse Operation at ELISE: Approaching the ITER Parameters
11:40	12:10	**MonO4**	**Dr. Christian WIMMER,** Influence of External Magnets and the Potential Rods on the Plasma Symmetry in the ELISE Ion Source
12:10	12:40	**MonO5**	**Prof. Katsuyoshi TSUMORI**, Caesiated H- source operation with helium
12:40	13:40		Lunch (BINP canteen)
Third session, Chairman Prof. Dezhi CHEN			
13:40	14:10	**MonO6**	**Dr. Haruhisa NAKANO**, Effect of light-mass ion species on plasma characteristics in NIFS-RNIS
14:10	14:40	**MonO7**	**Prof. Motoi WADA**, Effects of impurity ions upon Cs recycling in a negative hydrogen ion source
14:40	15:10	**MonO8**	**Dr. Mamiko SASAO**, Study of H- extraction from a single-hole plasma electrode of C12A7 electride
15:10	15:30		Coffee break
15:30	18:00	**1 ÷ 31**	**Poster session #1** (see page 11)
18:00	20:00		**Welcome Party (BINP canteen)**

Tuesday, September 4

4th session, Chairman Prof. Mamiko SASAO			
9:00	9:30	**TueO1**	**Dr. Akira UENO**, Beam Intensity Bottleneck Specification and 100 mA Operation of J-PARC Cesiated RF-Driven H^- Ion Source
9:30	10:00	**TueO2**	**Dr. Katsuhiro SHINTO**, Progress of the J-PARC cesiated rf-driven negative hydro gen ion source
10:00	10:30	**TueO3**	**Dr. Dan FAIRCLOTH**, High Current Results from the 2X Scaled Penning Source
10:30	11:00		Coffee break
5th session, Chairman Dr. Dan FAIRCLOTH			
11:00	11:30	**TueO4**	**Dr. David KLEINJAN**, Arc current Transient Studies and Plasma Diagnostic for Multicusp Cesiated Surface Conversion H- Source at LANSCE
11:30	12:00	**TueO5**	**Dr. Olli TARVAINEN**, The RF H^- Ion Source Project at RAL
12:00	12:30	**TueO6**	**Dr. Jacques LETTRY**, Linac4 H^- source R&D: Cusp free ICP and magnetron discharge
12:30	12:40		**Group photo at BINP entrance**
12:40	13:40		Lunch (BINP canteen)
6th session, Chairman Prof. Katsuyoshi TSUMORI			
13:40	14:10	**TueO6**	**Dr. Werner KRAUS**, First Beam Extraction Experiments at BATMAN Upgrade
14:10	14:40	**TueO7**	**Prof. Ursel FANTZ,** Spectroscopic Investigations of the Ion Source at BATMAN Upgrade
14:40	15:10	**TueO8**	**Dr. Marco CAVENAGO**, The NIO1 negative ion source: investigation and operation experience
15:10	15:30		Coffee break
15:30	18:00	**32÷59**	**Poster session #2** (see page 13)
17:00	18:00		**IPC meeting**

Wednesday, September 5

7th session, Chairman Prof. Motoi WADA			
9:00	9:30	**WedO1**	**Dr. Federica BONOMO**, Uniformity of the Large Beam of ELISE during Cs Conditioning
9:30	10:00	**WedO2**	**Dr. Emanuele SARTORI**, Study of caesium - wall interaction parameters within a hydrogen plasma
10:00	10:30	**WedO3**	**Mr. Alessandro MIMO**, Studies of the Cs Dynamics in Large Ion Sources using the CsFlow3D Code
10:30	11:00		Coffee break
8th session, Chairman Dr. Jacques LETTRY			
11:00	11:30	**WedO4**	**Dr. Keerthi JAYAMANNA**, High brightness H^- ion source for accelerators developed at TRIUMF
11:30	12:00	**WedO5**	**Mr. David POTKINS**, Improvements to Siemens eclipse PET cyclotron penning ion source
12:00	12:30	**WedO6**	**Dr. Andrey SANIN**, Operating Experience and Updates of Negative Hydrogen Ion Source at BINP Tandem Accelerator
12:30	13:30		Lunch (BINP canteen)
9th session, Chairman Dr. Marco CAVENAGO			
13:30	14:00	**WedO7**	**Dr. Sergey RASTIGEEV**, Operation experience of the BINP Accelerator Mass Spectrometer
14:00	14:30	**WedO8**	**Mr. Riccardo AGNELLO**, Negative ion and helicon wave physics on the Resonant Antenna Ion Device (RAID)
14:30	15:00	**WedO9**	**Mr. Iaroslav MORGAL**, Characterization of the helicon plasma generated inside the Cybele negative ion source with different magnetic field configurations
15:00	15:30		Coffee break
10th session, Chairman Prof. Ursel FANTZ			
15:30	16:00	**WedO10**	**Dr. Daniele APRILE**, Complete compensation of criss-cross deflection in a negative ion accelerator by magnetic technique
16:00	16:30	**WedO11**	**Dr. Taneli KALVAS**, H^- beam formation and electron dumping strategies

16:30	17:00	**WedO12**	**Mr. Anton KOLMOGOROV**, Development of OPPIS Ion Source for Polarized Negative Ion Beam Production
17:15			**Bus from BINP to Borvikha resort**
17:45	22:00		**Symposium dinner** **NIBS AWARD Ceremony**

Thursday, September 6

11th session, Chairman Dr. Olli TARVAINEN			
9:00	9:30	**ThuO1**	**Dr. Seth VEITZER**, Fluid Modeling of Negative Hydrogen Ion Sources
9:30	10:00	**ThuO2**	**Dr. Andrew HURLBATT**, The Particle Tracking Code BBCNI for Negative Ion Beams and its Application to BATMAN Upgrade
10:00	10:30	**ThuO3**	**Mr. Max LINDQVIST**, Effects of the extraction voltage on the H^- beam optics for H^- ion sources
10:30	11:00		Coffee break
12th session, Chairman Dr. Byungkeun NA			
11:00	11:30	**ThuO4**	**Mr. Pranjal SINGH**, Role of angular orientation of dipoles on work function during caesium deposition on a metal surface – a phenomenological model
11:30	12:00	**ThuO5**	**Ms. Glynnis Mae SAQUILAYAN**, Methods of Beam Emittance Measurements of High Power Negative Ion Beams for NBIs
12:00	12:30	**ThuO6**	**Mr. Yasuaki HABA**, Development of a new beamlet monitor system: time resolution and phase space structure
12:30	13:30		Lunch (BINP canteen)
13th session, Chairman Prof. Alexander IVANOV			
13:30	14:00	**ThuO7**	**Dr. Alexander PANASENKOV**, Experimental study of electrostatic residual ion dump
14:00	14:30	**ThuO8**	**Prof. Yuri BELCHENKO**, Development of surface-plasma negative ions sources at BINP
14:30	15:00	**ThuO9**	**Mr. Oleg SOTNIKOV**, Negative Ion Beam production and Transport via the LEBT of the HV injector prototype
15:00	15:30		Coffee break
15:30	18:00		**Excursion to BINP Facilities**

Friday, September 7

14th session, Chairman Prof. Chundong HU			
9:00	9:30	**FriO1**	**Ms. Roba MOUSSAOUI**, Negative-ion production study on nanoporous 12CaO.7Al2O3 electride surface in low pressure H2 plasma
9:30	10:00	**FriO2**	**Dr. Yahong XIE**, Performance of Radio frequency plasma generator for neutral beam injector
10:00	10:30	**FriO3**	**Dr. Jianglong WEI**, Modelling of beam transport and interactions with beamline components in the CFETR neutral beam test facility
10:30	11:00		Coffee break
15th session, Chairman Prof. Giuseppe Chitarin			
11:00	11:30	**FriO4**	**Prof. Vadim DUDNIKOV**, Negative ion radio frequency surface plasma source with solenoidal magnetic field
11:30	12:00	**FriO5**	**Mr. Michele FADONE**, Plasma characterization of a Hall Effect Thruster for a Negative Ion Source concept
12:00	12:30	**FriO6**	**Mr. Debrup MUKHOPADHYAY**, Negative Hydrogen ion density measurement in a permanent magnet based Helicon Ion source (HELEN-I) using cavity ring down spectroscopic technique
12:30	13:30		Lunch (BINP canteen)
16th session			
13:30	14:00		**Summary of NIBS2018**
14:00	14:30		**Invitation to NIBS2020**
14:30	15:00		**Symposium Closing**

Poster session #1

Monday, September 3, 15:30 – 18:00

Please, put your poster on the cork board according to its number

Poster number	Title	Primary Author
Fundamental and Modelling		
P1-01	Study of the Materials on Plasma Electrode Surface for Negative Ion Extraction in Hydrogen and Deuterium Operation	Mr. Shingo MASAKI
P1-02	Plasma Electrode Structure Suitable for H- Extraction from a Bernas Type Ion Source	Mr. Masaki ISHIKAWA
P1-03	Theoretical models of collisional transport in negative ion source sheath	Dr. Marco CAVENAGO
P1-04	Global Model of Multi-Chamber Negative Hydrogen Ion Sources with Multi-aperture Extraction System	Dr. Sergey AVERKIN
P1-05	Modelling and optimization of neutral beam injectors for fusion neutron source "DEMO-FNS"	Dr. Sergey ANANYEV
P1-06	A Simple Model of Source of Negative Ions by Cesium Sputtering	Dr. Dimitar YORDANOV
P1-07	Analysis of Plasma Impedance in the Linac4 H- Source	Ms. Wakaba KOBAYASHI
P1-08	Numerical Simulation for the Development of DC Arc-discharge Hydrogen Negative Ion Source for Medical Use	Mr. Shota YAMADA
P1-09	Evaluation of the temperature dependance of the Cesium deposition on the plasma grid in the JT-60 negative ion source	Dr. Masafumi YOSHIDA
H^- and D^- Sources for Fusion		
P1-10	Observation of low frequency oscillation in a filament-arc-based negative ion source	Dr. Kenichi NAGAOKA
P1-12	Langmuir Probe Investigations of Different Magnetic Filter Field Configurations at BATMAN Upgrade	Dr. Loic SCHIESKO
P1-13	Studies on the voltage hold off of the SPIDER driver coil at high RF power	Mr. Mauro RECCHIA

P1-14	Development of the Cs-seeded RF negative ion beam source in Korea	Dr. Min PARK
P1-15	Inductive RF drivers for neutral beam injectors at BINP	Dr. Igor SHIKHOVTSEV
Diagnostics		
P1-16	Calorimeters for high power ion and neutral beam injectors	Dr. Petr DEICHULI
P1-17	Thermal characterization of the SPIDER diagnostic calorimeter	Dr. Antonio PIMAZZONI
P1-18	Diagnostics of Caesium emission from SPIDER caesium oven prototype	Dr. Emanuele SARTORI
P1-19	Design of the Calorimeter for High-Power RF Negative Ion Source	Ms. Wendou YAN
P1-20	Experimental investigation of a high power long-pulse neutral beam profile diagnostic based on secondary electron emission	Mr. Kirill BARKALOV
P1-21	Initial results of optical emission spectroscopy based on a collisional radiative modeling in the RF hydrogen negative ion source in NFRI	Dr. Byungkeun NA
H^- Sources for Accelerators		
P1-22	Demonstration of 500 keV negative ion beam accelerations for 100s toward JT-60SA N-NBI ion source	Mr. Masahiro ICHIKAWA,
P1-23	High Voltage Negative Ion Beam Injector for Tandem Accelerator	Dr. Andrey SANIN
P1-24	Development of power supply systems for CW negative ion sources at BINP	Dr. Valerii SAVKIN
P1-25	Improvements in D^- ion extraction in a multicusp ion source	Mr. Anand Mathai GEORGE
P1-26	RF system test for CSNS external antenna negative hydrogen ion source	Dr. Weidong CHEN
P1-27	Influence of 30MHz and 2MHz RF plasma upon plasma electrode potential in the J-PARC RF-driven H- ion source	Mr. Katsuhiro SHINTO
P1-28	Influence of 2MHz rf source for high-intensity rf-driven H- ion source upon hydrogen plasma produced in and an H- beam extracted from the source	Mr. Katsuhiro SHINTO

P1-29	Caesium capture by POCO CZR-2 Graphite on the penning-type H^- VESPA source at ISIS	Mr. Tiago MORAIS SARMENTO
H^- and D^- sources		
P1-30	Research and development of power feed-in system for RF negative ion source on ASIPP	Mr. Caichao JIANG
P1-31	Electromagnetic and thermal analyses of Faraday shield of various materials and structures for a ICP source	Mr. Peng CHEN

Poster session #2

Tuesday, September 7, 15:40 – 17:00

H^- and D^- sources		
P2-32	Design of the RF Negative Hydrogen Ion Source at HUST	Mr. Chen ZUO
P2-33	Towards efficient integration of cusp and dipole filter magnets in a compact H- source	Dr. Carlo BALTADOR
P2-34	Gasdynamic ECR ion source for negative ion production	Mr. Roman LAPIN
Fundamental and Modelling		
P2-35	Graphical representations of spectral data of negative ions	Mr. Vladislav KAZAKOV
P2-36	Carbon Film in Radio Frequency Surface Plasma Source with Cesiation	Prof. Vadim DUDNIKOV
P2-37	Polarized negative ion source with multiply spherically focusing surface plasma ionizer	Prof. Vadim DUDNIKOV
P2-38	Ultracold Muonium Negative Ion Production	Prof. Vadim DUDNIKOV
P2-39	H^- ion source emittance measuring device	Mr. Viktor KLENOV
P2-40	Injection of Atomic Hydrogen from a Thermal Cracker Cell to Plasma Grid Surface of H^- Ion Source	Mr. Yuji SHIMABUKURO
P2-41	Design of Negative Ion Source Using a Plasma Electrode of C12A7 Electride	Mr. Masumi KOBAYASHI

P2-42	Measurement of Negative Carbon Ions near a Plasma Deposited Carbon Thin Film by Laser Photodetachment	Mr. Yuito IKEDA
C^- Sources for Accelerators		
P2-43	Beam Current Stability Improvements of Negative Carbon Ions in a Multi-Cusp Ion Source	Mr. Stephane MELANSON
P2-44	Sputter negative ion source at BINP AMS facility	Mr. Eugene KONSTANTINOV
Beam Formation and Low Energy Transport		
P2-45	Improving the transported negative ion beam current in NIO1	Dr. Emanuele SARTORI
P2-46	Langmuir probe analysis in negative ion beams	Dr. Emanuele SARTORI
P2-47	Beam steering characteristics of ferromagnetic electrode	Dr. Masashi KISAKI
P2-48	Measurement of the space charge effect of a negative hydrogen ion beam	Mr. Iaroslav KOLESNIKOV
P2-49	Measurement of the negative ion beam with D-Pace OWS-30 wire scanner	Mr. Timofey BYKOV
Acceleration and Neutralization		
P2-50	A plasma target for neutralization of the negative ion beam	Mr. Ivan EMELEV
P2-51	Damage simulations for large laser mirrors of laser neutralizer under proton and deuterons bombarding	Mr. Magomedrizy ATLUKHANOV
P2-52	Secondary Electrons Problem Study for Beam Energy Recovery for fusion: Experimental apparatus	Dr. Vincenzo VARIALE
Lines and Facilities		
P2-53	MITICA Intermediate Electrostatic Shield: concept design, development and first experimental tests identification	Dr. Tommaso PATTON
P2-54	Development of Radio frequency based negative ion source test bed	Prof. Chundong HU

P2-55	Concept of plasma heating and current drive neutral beam system for fusion neutron source "DEMO-FNS"	Dr. Sergey ANANYEV
P2-56	40 years of negative ions at Fermilab	Dr. Dan BOLLINGER

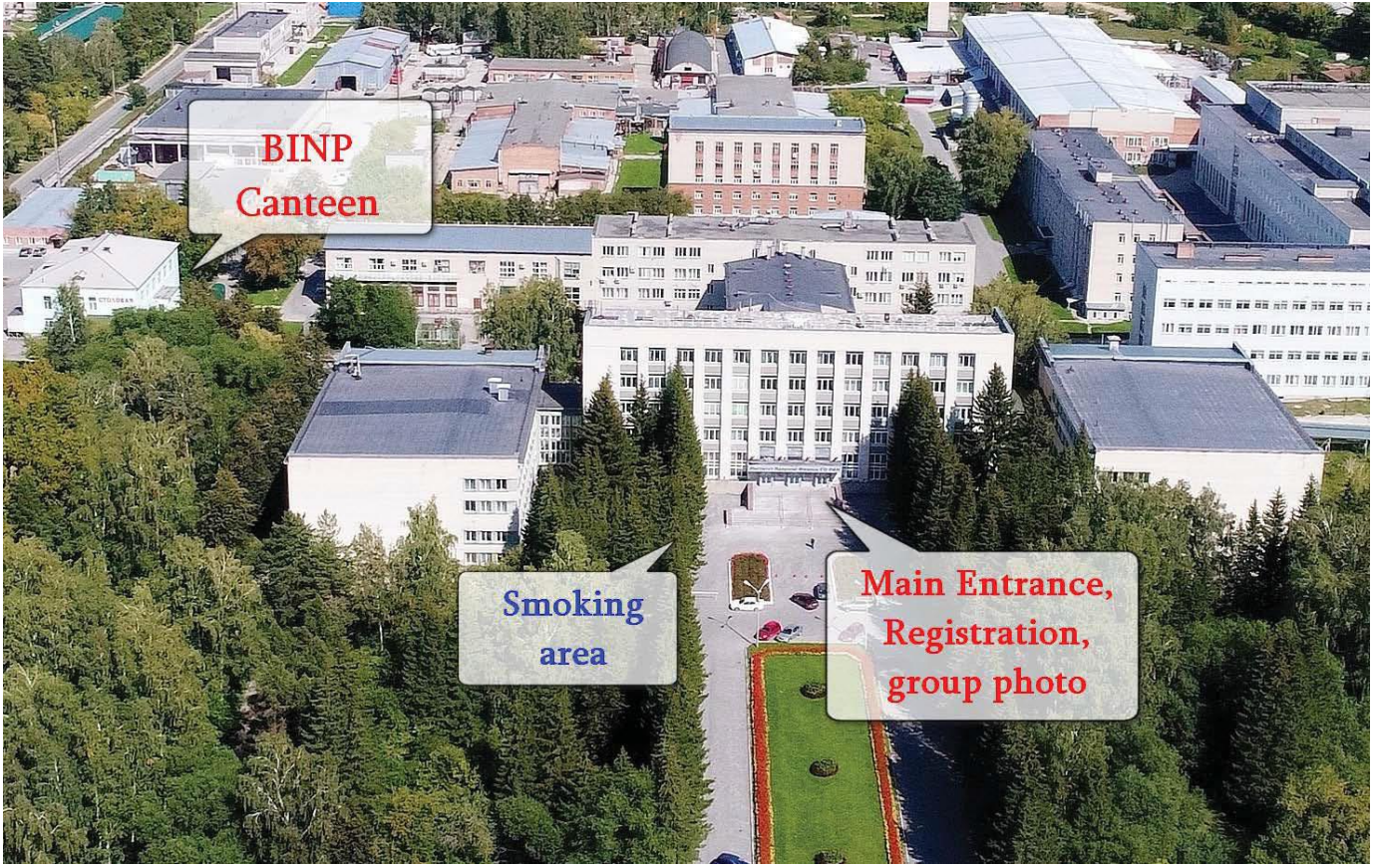
Contacts

Scientific secretary:
Dr. Andrey Sanin
Office: +7 (383) 329-45-74
E-mail: sanin@inp.nsk.su

Chair
Prof. Yuri Belchenko
Office: +7 (383) 329-41-12
E-mail: belchenko@inp.nsk.su

For technical/organizational questions:
Dr. Maxim Kuzin
Office: +7(383) 329-41-67
E-mail: m.v.kuzin@inp.nsk.su

Emergency:
The emergency number is **01** for the calls made from stationary phones, and **002** or **112** for mobile phones. The calls made to this number, shared by paramedics, police and firefighters, are free of charge. One should speak in Russian.


BINP
Canteen
Smoking
area
Main Entrance,
Registration,
group photo