

Scientific Program
Alferov Forum “Micro and Nanosystems Physics”
AFMNSP’2020



St. Petersburg, March 15-18, 2020

Dedicated to the 90th birthday of academician
Zhores Ivanovich Alferov
Nobel Prize Winner in Physics in 2000

<https://afmnspru/2020/en/>

March 15, 2020 (Sunday)

11:00 – 14:00 Visiting Cemetery in Komarovo (busses)

14:00 – 15:00 Opening the Memorial Plaque of Zh.I. Alferov at Michurinskaya street, 1A

16:00 – 18:00 Opening of exposition dedicated to Zh.I. Alferov (Alferov University)

19:00 – 22:00 Dinner in honor of the 90th anniversary of Zhores Alferov (by invitations)
(Admiralteyski prosp. 8)

March 16, 2020 (Monday)

Location in St.Petersburg RC RAS St. Petersburg, University embankment, 5

10:30-12:00 Memorial Plenary Session

Session Chair – **Sergey Ivanov**

10:30 – 10:40 – Opening Remarks

Roger David Kornberg, Forum Chair, University of Stanford, US,
2006 Nobel Prize Winner in Chemistry

10:40 – 11:30 - Official talks

Officials (preliminary): Plenipotentiary of the President of the Russian Federation in the NWFD, members of the Government of the Russian Federation, representatives of the Ministry of Science and Higher Education, representatives of the Government of St. Petersburg and Leningrad Region, representatives of the State Duma Committee on Education and Science, members of the Presidium of the Russian Academy of Sciences, Representatives of the largest scientific centers, scientific foundations, high technology industry. Figures of culture and politics.

11:30 – 12:00 – “Zhores Alferov and His School of Physics and Technology of Semiconductor Heterostructure Lasers”

Sergey V. Ivanov, *Ioffe Institute, Russia*

12:00 – 12:30 *Coffee break*

12:30 – 13:40 Plenary session of Nobel Laureates

Session Chair – **Robert Suris**

12:30 – 13:00 - “Nanoparticles and Nanomachines in Life Sciences”

Roger Kornberg, *University of Stanford, US (2006 Nobel Prize in Chemistry)*

13:00 – 13:30 - "En Route to Establishing a Zero Carbon Emission Society"

Hiroshi Amano, *Nagoya University, Japan (2014 Nobel Prize in Physics)*

13:30 – 13:40 - **Klaus von Klitzing**, *Max Planck Institute for Solid State Research, Germany (1985 Nobel Prize in Physics)* (video-conference)

13:40- 15:30 *Lunch*

15:30 – 16:55 Plenary session II “Development of Semiconductor Photonics and Nanoelectronics”

Session Chair – **Platon Karasev**

15:30 – 15:55 - “CW Room-Temperature AlGaAs Heterostructure Laser: Competition and Cooperation”

Morton Panish, *Alcatel-Lucent's Bell Labs, US*

15:55 – 16:20 - The title will be announced later

Gennadii Ya. Krasnikov, *JSC MERI, Russia*

16:20 – 16:45 - “From Quantum Dots to Quantum Technologies: A Success Story of German-Russian Friendship and Scientific Cooperation”

Dieter Bimberg, *Technical University of Berlin, Germany* (video-conference)

16:45 – 16:55 - “Discovery of Molecular Beam Epitaxy and Lessons Learned from Alferov”

Alfred Cho, *Alcatel-Lucent's Bell Labs, US* (video-conference)

16:55 – 17:20 *Coffee break*

17:20 – 18:10 Plenary Session III “Semiconductor Optoelectronic Technology”

Session Chair – **Hiroshi Amano**

17:20 – 17:45 - “Illuminating the World: Metalorganic Chemical Vapor Deposition of III-V Compound Semiconductor Devices”

Russell D. Dupuis, *Georgia Tech, US*

17:45 – 18:10 - "Heterostructure photovoltaics"

Viacheslav M. Andreev, *Ioffe Institute, Russia*

19:00 – 20:30 Concert “Honorary Citizens of St.Petersburg”. Zhores Alferov,
St. Petersburg State Academic Capella. Moika river emb., 20 (by invitations)

20:30 – 22:00 Reception in honor of Zh.I. Alferov

March 17, 2020 (Tuesday). Part I.

Location in Ioffe Institute, St. Petersburg, Politekhnicheskaya street, 26.

9:40 – 9:45 – Opening remarks – **Sergey V. Ivanov**, *Ioffe Institute, Russia*

9:45 – 11:00 - Invited session “Nanophotonics and nanoelectronics”

Session Chair – **Piotr Kop’ev**

9:45 – 10:10 – “Ultrahigh mobility semiconductor heterostructures for quantum transport basic research”

Vladimir Umansky, *Weizmann Institute of Science, Israel*

10:10 – 10:35 - “3D Heterostructures and the Evidence of True Electronic Quantum Dot”

Nikolai Ledentsov, *VI Systems GmbH, Germany & Ioffe Institute, Russia*

10:35 – 11:00 - “CW and Pulsed High Power Laser Diodes Based on Separate Confinement Quantum Well Heterostructures”

Nikita A. Pikhtin, *Ioffe Institute, Russia*

11:00 – 11:20 *Coffee-break*

11:20 – 12:35 - Invited session “Energy harvesting and efficient using”

Session Chair – **Viacheslav Andreev**

11:20 – 11:45 - “Electric Energy Storage in Molten Silicon and Recovery through Thermophotovoltaic Technology. A Proposal in Context”

Antonio Luque, *TU Madrid, Spain*

11:45 – 12:10 - “Power Semiconductor Electronics and Pulse Switching Technique in Ioffe Institute”

Aleksey F. Kardo-Sysoev, *I.V. Grekhov, Ioffe Institute, Russia*

12:10 – 12:35 – “Cyclotron Resonance Masers. Achievements and Trends”

Grigorii G. Denisov, *A.G. Litvak, IAP RAS, Russia*

12:45 – 13:15 – **Opening the Memorial Plaque at the Museum-office of Zh.I. Alferov at Ioffe Institute**

13:30 – 15:30 *Lunch*. Restaurant “Vodopad”, busses from the Main Building of Ioffe Institute.

March 17, 2020 (Tuesday). Part II.

Location in Alferov University, St. Petersburg, Khlopina street, 8/3

15:30 – 16:45 - Invited session “Nanophotonics and nanoelectronics”

Session Chair – **Gennadii Krasnikov**

15:30 – 15:55 - “Submicron Silicon IR sources”

Zakharrii F.Krasilnik, *S.A. Dyakov, N.V. Kryzhanovskaya, A.V. Novikov, M.I. Petrov, M.V. Stepikhova, IPM RAS, Russia*

15:55 – 16:20 - “2D Compounds at the Atomic-Scale Thickness Limit: Atomic and Electronic Structure and Transport Properties”

Alexander A. Saranin, *IACP FEB RAS, Russia*

16:20 – 16:45 - “Vertical Cavity Surface Emitting Lasers for Atomic Sensors”

Victor M. Ustinov, *SEC for Microelectronics RAS, Russia*

16:45 – 17:15 *Coffee-break*

17:00-18:40 - Invited session “Life sciences”

Session Chair – **Andrey Vasin**

17:00 – 17:25 – “From structure to biological function”

Vladimir O. Popov, *Research Centre of Biotechnology of RAS, Russia*

17:25 – 17:50 – “Modern Achievements in Neuroscience and Brain-Computer Interfaces”

Vladimir Zelman, *Ksenia Ershova, USC Keck School of Medicine, US & Skolkovo IST, Russia*

17:50 – 18:15 - “Laser Printing of Biomaterials and Living Cells”

Boris Chichkov, *Leibniz Universität Hannover, Germany*

18:15 – 18:40 - “Micro- and Nanostructures for Remote Controlled Drug Delivery”

Gleb Sukhorukov, *Queen Mary University of London, UK*

15:45 – 17:30 - Student lectures at Peter the Great St.Petersburg Polytechnic University

St. Petersburg, Politekhnicheskaya street, 29

15:45 – 16:35 - “BN as a new material for DUV and IR nanophotonics”

Bernard Gil, *University of Montpellier II - CNRS, France*

16:40 – 17:30 - “Development of Semiconductor Optoelectronics in Ioffe Institute in XX and XXI Centuries”

Sergey V. Ivanov, *Ioffe Institute, Russia*

16:15 – 18:00 – Student lectures at ETU “LETI” Location - St. Petersburg, Prof. Popov str., 5

16:15 – 17:05 - “Illuminating the World: Metalorganic Chemical Vapor Deposition of III-V Compound Semiconductor Devices”

Russell D. Dupuis, *Georgia Tech, US*

17:10 – 18:00 - The title will be announced later

Yurii V. Gulyaev, *IRE RAS, Russia*

18:50 - 19:20 Opening the Memorial Plaque of Zh.I. Alferov at the Main building of Peter the Great St.Petersburg Polytechnic University, St. Petersburg, Politekhnicheskaya street, 29

19:30 – 21:00 - Gala concert (White Hall of the Polytechnic University)

Greeting talks of organizers

Movies about Zh.I. Alferov

Concert

March 18, 2010 (Wednesday) – Locations of the events are in parallel in Ioffe Institute, Alferov University, Peter the Great St.Petersburg Polytechnic University, ETU “LETI”

Poster sessions of young scientists in frame of Alferov Forum “Micro and Nanosystems Physics” (morning, duration of 2 hours), visiting laboratories, round tables, meetings with colleagues

Ioffe Institute: Poster sessions of young scientists “Micro and Nanosystems Physics and Technology” (starts on March 17, in parallel with oral sessions at Ioffe Institute) *Location - Library Hall.*

Alferov University:

Poster sessions of young scientists “Semiconductor, laser, and nanobiotechnologies” (starts on March 17, in parallel with oral sessions at lectures at Alferov University) *Location – Conference Hall Lobby*

Peter the Great St.Petersburg Polytechnic University:

Poster sessions of young scientists “Life Sciences” *Location – New Research Building, Small Hall*

ETU “LETI”: Poster sessions of young scientists “Micro and Nanosystem Technology” (starts on March 17, in parallel with lectures at ETU “LETI”)