General Information

The Institute of Semiconductor Physics (ISP) of the National Academy of Sciences of Ukraine (NASU) was established in 1960 on the basis of several departments and laboratories of the Institute of Physics of the NASU as a leading research center specializing in semiconductor materials and devices science. ISP consists of 8 divisions, each containing of 3 to 5 departments. There is a self-financing Special Design-and-Technology Bureau (SKTB) with a Pilot Production Line at the Institute. There also are the following subdivisions develop their activity at ISP: (i) the center “Diagnostics of Semiconductor Materials, Structures and Applied Systems”; (ii) the center “Cryogenic Sensors and Thermometry”; (iii) the testing laboratory for holographic safety elements; (iv) the central testing laboratory for semiconductor materials science; (v) the center for testing the photoconverters and photoelectric batteries. The Technology Park “Semiconductor Technologies and Materials, Optoelectronics and Sensor Technique” was also created on the premises of ISP in 1999. ISP’s research and development results include new methods of optical and electrical characterization and certification of semiconductor materials and devices, and a variety of sensors for measurements of temperature, magnetic field and pressure, chemical and biological sensors, microwave devices, high-resolution photoresists, high-efficiency silicon-based solar elements and optoelectric devices, including liquid-crystal, electroluminescence displays and indicators.

Institute’s Focus

ISP is engaged in fundamental and applied research in the following areas:
- semiconductor materials science;
- interaction between electromagnetic radiation and matter;
- semiconductor optics, spectroscopy and photonics;
- physics of low-dimensional structures, micro- and nanoelectronics;
- optoelectronics and solar energetics;
- technologies and materials for sensors
- infrared engineering and microwave electronics.

Valuable Technology Offerings

A broad-ranging of technologies and devices for transfer and commercialization, offered by ISP, include various physical, chemical and biological sensors, and diagnostic systems, microwave devices, solar elements, optoelectric devices, electroluminescence displays, low-cost self-assembling technology for nanoelectro-mechanical systems (NEMS), ultra-fast light-emission sources, etc.

Scientific Cooperation and Technology Transfer

The Institute is quite active in international scientific cooperation and grant competitions. A number of projects were executed in the framework of STCU, NATO, EU INTAS and INCO-COPERNICUS programs, and Network of Excellence of the 6th Framework Program. Continuing those traditions, ISP is also involved in several international projects that are now funding by EU 7th Framework Program. As cooperative, educational and training activities of ISP, noteworthy is NIS-NEST project, which aims to contribute towards closer and mutually beneficial collaboration between the EU and the Eastern European partner countries, in the field of novel exploratory research within the 7th Framework Program for Research and Technological Development of EU.

ISP has established a strong collaboration with a number of university, research centers and industries in Ukraine and abroad. Some of them are the SRI “ORION” and SRI “MICRODEVICES” both in Kyiv, University of Florida and Arkansas University (USA), Southampton and Nottingham Universities (UK), Institute of Solid State Physics (Sofia, Bulgaria), Institute of Microelectronics and Nanotechnology (France), Institute for Research in Metrology (Turin, Italy), Institute of Low Temperature and Structure Research (Wroclaw, Poland), Ioffe Physico-Technical Institute (Russia), Institute for Electrotechnique (Bratislava, Slovakia), Institute for Technical Physics and Materials (Budapest, Hungary), Technical University (Darmstadt, Germany).

ISP in cooperation with Ukrainian small trade and R&D enterprises supplied some materials and devices to the business customers and universities in the USA, UK, France, Italy, Switzerland, Germany, China, Poland and Russia. Some of them are the thin-film optical germanium and cryogenic temperature sensors.

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The Institute of Semiconductor Physics (ISP) of the National Academy of Sciences of Ukraine (NASU) was established in 1960 on the basis of several departments and laboratories of the Institute of Physics of the NASU. Today it is recognised as a leading research center specializing in semiconductor materials and devices. ISP consists of 8 divisions, each containing of 3 to 5 departments.

FOCUS AND EXPERTISE

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- The center for testing the photoconverters and photoelectric batteries.

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PARTNERSHIP OPPORTUNITIES

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bling technology for nano-electro-mechanical systems (NEMS), ultra-fast light-emission sources, etc.

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a) Analyzer of toxic admixtures in water solutions “Multierzymsensor MEC - 3”
b) Analyzer of ionic composition of liquid mixtures “ICNT - 2”
c) Analyzer of somatic cells in milk “ACK-1”
d) Surface plasmon resonance spectrometer “PLASMON CIP-6”
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**PRIMARY SCIENTIFIC DIRECTIONS**

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- Physics of low-dimensional structures, micro- and nanoelectronics
- Optoelectronics and solar power engineering
- Technologies and materials for sensors
- Infrared engineering and microwave electronics

**DISTINCTIVE COMPETENCIES**

- The center “Diagnostics of Semiconductor Materials, Structures and Applied Systems”
- The center “Cryogenic Sensors and Thermometry”
- The testing laboratory for holographic safety elements
- The central testing laboratory for semiconductor materials science
- The center for testing the photoconverters and photovoltaic batteries
- The laboratory of non-conventional and renewable energy sources

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ISP’s research and development results include new methods of optical and electrical characterization and certification of semiconductor materials and devices, and a variety of sensors for measurements of temperature, magnetic field and pressure, chemical and biological sensors, microwave devices, high-resolution photo resistors, high-efficiency silicon-based solar cells and optoelectronics devices, including liquid-crystal, electroluminescence displays and indicators.

**Space vehicles photovoltaic panels**

Developed and manufactured by ISP NASU and SDTB ISP NASU in the framework the project "Mikrosuputnyk" of National Space Program of Ukraine. Spacecraft KS5MF2 of “Mikrosuputnyk” was launched into orbit 26.12.2004.

Intended purpose - use in the power supply system of spacecraft KS5MF2 of class “Mikrosuputnyk”

**Test equipment for space vehicle photovoltaic panels «KPA Mars-BF»**

Developed and manufactured by ISP NASU and SDTB ISP NASU in the framework the project "Mikrosuputnyk" of National Space Program of Ukraine.
Intended purpose - testing of functionality PP at various stages of their manufacturing and operation activity, including at plant-manufacturer of spacecraft and launch technical complex. Used in Center for testing of solar cells and photovoltaic panels of ISP NAS for testing of space and terrestrial photovoltaic modules installed power to 640 W.

Center For Testing Of Solar Cells And Photovoltaic Modules was established in 2006 by ISP NASU for check-out and testing of silicon solar cells, space and terrestrial photovoltaic panels.

Setup for accelerated thermocyclic testing Developed and manufacture by ISP NASU and SDTB ISP NASU in the framework the project "Mikrosuputnyk" of National Space Program of Ukraine.

Intended purpose - setup intended for accelerated resort environmental test development design and testing space and terrestrial solar sells and photovoltaic panel.

**PARTNERING OPPORTUNITIES**

A broad range of technologies and devices for technology transfer and commercialization are offered by ISP. This include various physical, chemical and biological sensors, and diagnostic systems, microwave devices, solar cells, optoelectronics devices, electroluminescence displays, low-cost self-assembling technology for nano-electro-mechanical systems (NEMS), ultra-fast light-emission sources, etc.

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a) Space vehicles KS5MF2 "Mikrosuputnyk" photovoltaic panels  
b) Test equipment for space vehicle photovoltaic panels "KPA Mars-BF"  
c) Center For Testing Of Solar Cells And Photovoltaic Modules