



# **Education in the Field of Nuclear Physics and High Energy Physics at V.N.Karazin Kharkiv National University**



Igor O. Girka, Dean of the School of Physics and Technology

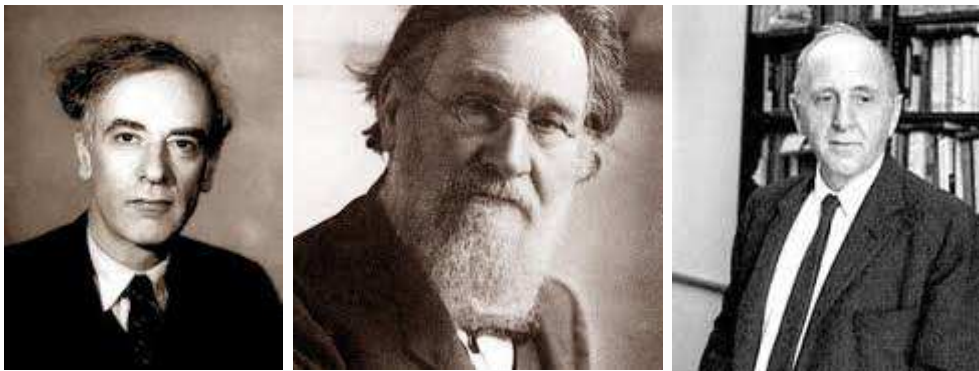
- Was founded in November 1804 (after Moscow, Dorpat, Vilnius). There were any universities neither in St.Petersburg (1819) nor in Warsaw (1816) at that time
- The opening ceremony was held on January 29, 1805
- Kyiv – 1834, Kazan – February 1805



«The future of mankind depends largely on cultural scientific technical development; and that this is built up in cultural, knowledge and research as represented by **true universities** ...»

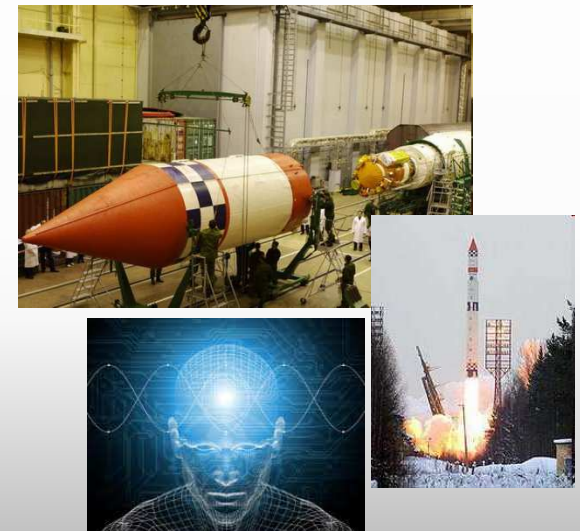
*Magna Charta Universitatum*

### Noble Prize Winners:



Leo Landau, Ilya Mechnikov, Simon Smith

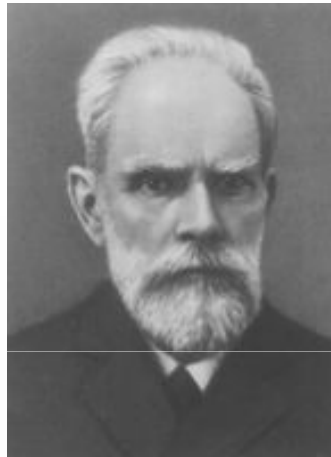
**Science is the basis** of new knowledge and new developments, technologies and equipment. It is the results of research activities that forms the basis of innovative development of competitive products in the educational and industrial sectors.







M.Ostrogradsky



O.Lyapunov



V.Steklov



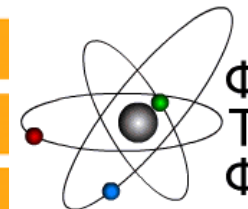
V. Drinfeld



I.Lifshits

Kharkiv University is well-known all over the world due to its alumni and Professors, especially in the field of Physics and Mathematics. Among those who brought a glory to the University one has first of all to mention Ostrogradsky, Lyapunov, Steklov, Drinfeld, Lifshits, etc.





University Rankings

Rankings Indicators

Refine:

Europe

Ukraine Guide

# RANK	UNIVERSITY	LOCATION	STARS™
2016	<div>University search</div>	Ukraine	<input type="checkbox"/> Rated only
382	<div> <div></div> <div>V. N. Karazin Kharkiv National University</div> </div>	<div></div>	
431-440	<div> <div></div> <div>Taras Shevchenko National University of Kyiv</div> </div>	<div></div>	
551-600	<div> <div></div> <div>National Technical University of Ukraine "Kyiv Polytechnic Institute"</div> </div>	<div></div>	
701+	<div> <div></div> <div>Donetsk National University</div> </div>	<div></div>	
701+	<div> <div></div> <div>National Technical University "Kharkiv Polytechnic Institute"</div> </div>	<div></div>	
701+	<div> <div></div> <div>Sumy State University</div> </div>	<div></div>	<div>3★</div> <div>RATING</div>

Ranking

6 of 6

(916 total items)

<

1

>

Results per page:

100

>

16.09.16.  
According to  
QS World  
University  
Rankings Kharkiv  
University comes  
to 500 best  
Universities in the  
world.



# V.N. Karazin Kharkiv National University

**14,000 undergraduate and graduate students**

**320 Doctors, Professors**

**More than 1000 Candidates of Sciences, Associate Professors**

**68 winners of the State Prize of Ukraine in Science and Technology**

**29 members of the National Academy of Sciences of Ukraine**

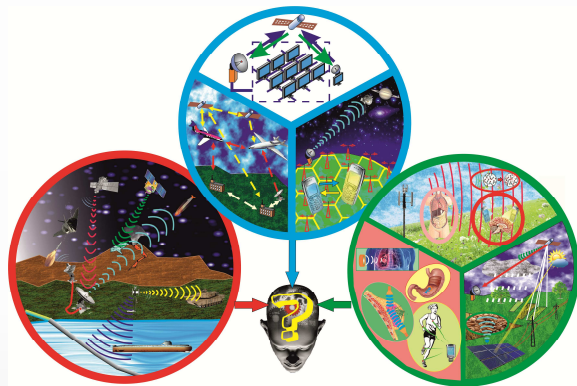




## V.N. Karazin Kharkiv National University

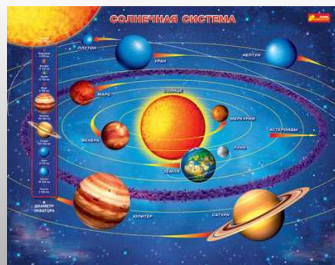
Every year :

- ❑ Researchers carry out more than 100 research projects
- ❑ About 450 scientific publication are included to Scopus scientometrics database



More than 30 world-famous scientific schools  
22 State Prize of Ukraine in Science and Technology  
since Ukraine's independence

The Fields Medal, International Medal for Outstanding  
Discoveries in Mathematics,



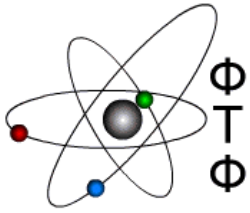




## V.N. Karazin Kharkiv National University

The *Central Scientific Library* of the University was founded in 1804. The general fund of the library counts more than **3 350 000** copies. Among them, there are more than **1.7 million** copies of scientific literature, 1.1 million copies of textbooks. The unique collection of rare books and manuscripts counts nearly 60,000 copies, including the collection of incunabula (issues printed before 1500), paleotyps (1501-1550 ), and considerable collections of Ukrainian and foreign printed ancient editions (XVI-XVIII centuries) and the editions of the prominent figures of science and classical literature. The collection of the manuscripts includes nearly 1000 copies.





# V.N. Karazin Kharkiv National University

## School of Physics and Technology

We participate in European programs: ENEN, FUSENET

On March 4-6 2010, the University was accepted to ENEN Association as an Associated Member (like MEPhI) at the 8-th General Assembly meeting of ENEN.

**Effective Members**

The Effective Members are academic institutions or clusters of such institutions having a legal status and meeting all following criteria:

- Provide high-level scientific education in the nuclear field - as full time teaching and providing the bases for doctorate studies- based on internationally recognized research in nuclear engineering and/or nuclear sciences carried out jointly by the teaching staff, the students, doctoral and post-doctoral researchers in the same geographic location or in association with a nuclear research centre;
- Use selective admission criteria conforming with legal provisions and/or national practices.
- Be based in the European Union or in one of its candidate member countries.

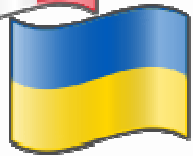
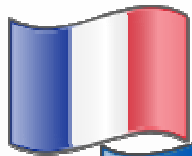
New Effective Members are elected by the General Assembly, by a majority of two-thirds of the votes cast, on the recommendation of the Board of Governors, according to the criteria defined here above.

**LIST OF EFFECTIVE MEMBERS (31 MEMBERS AS OF MARCH 2009)**

Atominstut der Oesterreichischen Universitaeten	ATI	Vienna, Austria
Katholieke Universiteit Leuven	KUL	Leuven, Belgium
Université Catholique de Louvain	UCL	Louvain-la-Neuve, Belgium
Ghent University	UG	Ghent, Belgium
Université Libre de Bruxelles	ULB	Brussels, Belgium
Vrije Universiteit Brussel	VUB	Brussels, Belgium
Czech Technical University in Prague	CTU	Prague, Czech
Helsinki University of Technology	TKK	Helsinki, Finland
Lappeenranta University of Technology	LUT	Lappeenranta, Finland
CEA-INSTN Centre d'Etudes de Saclay	INSTN	Saclay, France
Institut National Polytechnique de Grenoble	INPG	Grenoble, France
Ecole des Mines de Nantes	EMN	Nantes, France
Technische Universität München	TUM	München, Germany
Universität Stuttgart	IKE	Stuttgart, Germany
Clausthal University of Technology	TUC	Clausthal, Germany
Budapest University of Technology and Economics	BME	Budapest, Hungary
Consorzio Interuniversitario per la Ricerca Tecnologica Nucleare	CIRTEN	Pisa, Italy
Delft University of Technology	DUT	Delft, The Netherlands



**University cooperates with 197 higher educational institutions and educational organizations all over the world**



**Inter-university collaboration with 6 French higher education institutions**

- 1. University of Rennes II;**
- 2. University of Nice – Sophia Antipolis;**
- 3. University Claude Bernard Lyons 1;**
- 4. Ecole Polytechnique (Palaiseau city);**
- 5. University of Paris-Sud;**
- 6. University Lille 1, Sciences and Technologies**







**ON 15 MAY 2014, V. N. KARAZIN KHARKIV NATIONAL UNIVERSITY JOINED THE  
UNIVERSITY AGENCY OF THE FRANCOPHONIE (AUF).**

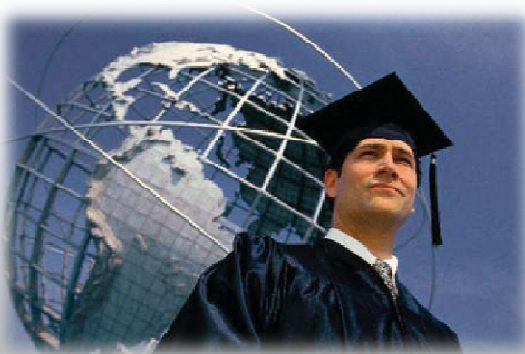
**RESOURCE CENTRE OF FRANCOPHONIE UNIVERSITY AGENCY  
WAS ESTABLISHED AT THE UNIVERSITY IN NOVEMBER 2014.**





## **ACADEMIC COOPERATION IN THE FIELD OF DOUBLE-DEGREE PROGRAMS**

- **School of Mathematics and Mechanical Engineering (University of Nice – Sophia Antipolis);**
- **School of Chemistry (University of Nice – Sophia Antipolis);**
- **School of Chemistry (University Lille 1) ;**
- **School of Physics and Technology(Ecole Polytechnique ).**

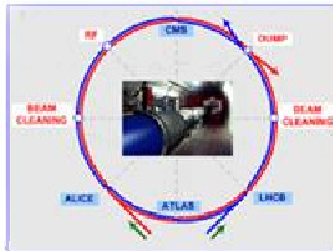






# Summer and Winter Schools

## Winter School on High Energy Physics



### Program and organizing committee :

M.-H.Schune, LAL/IN2P3 and PSud Univ., Orsay  
S. Barsuk, LAL/IN2P3 and PSud Univ., Orsay  
A. Stocchi, LAL/IN2P3 and PSud Univ., Orsay  
N. Shul'ga, ITP NSC KIPT, Kharkov  
A. Korchin, ITP NSC KIPT, Kharkov  
A. Doybnya, IHEP NSC KIPT, Kharkov  
I. Zalyubovsky, KhNU, Kharkov  
V. Pugatch, KINR, Kiev



**Trans-European School  
of High Energy Physics**  
*Basivka, Lviv Region, Ukraine*

**July 17-24, 2014**



**Trans-European School  
of High Energy Physics**  
*Kharkov Region, Ukraine*

**July 9-16, 2013**





# Cooperation with Paris-Sud



- 
- 22 April 2013 Agreement of cooperation was signed;
- Since 2013 **6** professors from Karazin University visited Paris-Sud and **4** professors from Paris-Sud visited Karazin University with lectures;
- Since September 2014 4 students from Karazin University School of Physics and Technology are studying at Paris-Sud (for 2 month);
- Séverine Fogel, the Head of University of Paris-Sud International Relations office visited Karazin University on 12 November 2014.

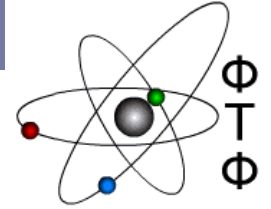




## COLLABORATION INTERESTS:

- Students and Academic staff exchange;
- Double-degree programs, cotutelle;
- French-Ukrainian International Laboratories;
- Joint research and publications;
- Partnership in Horizon 2020;
- Partnership in Erasmus+, Jean Monnet Programme.





## School of Physics and Technology

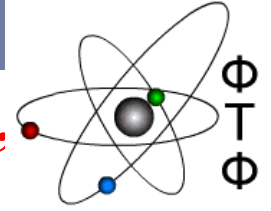
### *Our business card*

- 1/3 graduates of the School have defended their Candidate thesis. Among the graduates there are :
  - 31 academicians and member-correspondents of the National Academy of Sciences,
  - 2 Heroes of Socialist Labor and one Hero of Ukraine,
  - over 100 winners of different prizes: Lenin, State USSR, State Ukraine, the prizes of the Academy of Sciences.
  - each year our students are among the winners of All-Ukrainian students' tournaments in Physics.





# V.N. Karazin Kharkiv National University, School of Physics and Technology



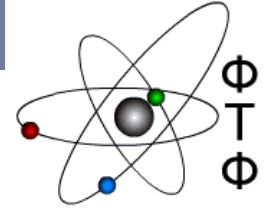
## ***K. Sinelnikov***

(1901) was a head of Soviet experiment on splitting the lithium nucleus in October, 1932. The experiment was carried out at Kharkiv Institute of Physics and Technology (NSC KhPhTI).

In 1962, he found the Chair of Plasma Physics at the School of Physics and Technology.



# V.N. Karazin Kharkiv National University, School of Physics and Technology



**A. Walter** (1905) was a member of the Soviet team on splitting the lithium nucleus.

In 1937, he found the Chair of Physics of Atomic Nucleus at Kharkiv University.

In 1962 this chair was rearranged into the Chair of Experimental Nuclear Physics at the School of Physics and Technology.



April, 1932: *John Cockcroft* (1897) and *Ernest Walton* (1903) focused a proton beam on lithium and bust its nucleus. This was the idea proposed by G.Gamov (1904). The era of accelerator-based experimental nuclear physics was born. Cockcroft and Walton were awarded by the Nobel Prize in 1951.

Photo: Courtesy Cavendish Laboratory, University of Cambridge



# Splitting an atomic nucleus



A. Leypunsky, K. Sinelnikov, A. Walter, G. Latyshev



## Разрушено ядро атома лития.

Крупнейшее достижение советских ученых.

МОСКВА, ТТ. СТАЛИНУ, МОЛОТОВУ, ОРДЖОНИКИДЗЕ, «ПРАВДЕ».

Украинский физико-технический институт в Харькове в результате ударной работы в XV годовщине Октября добился первых успехов в разрушении ядра атома.

10 октября высоковольтная бригада разрушила ядро лития; работы продолжаются.

Директор УФТИ Обреидов. Секретарь парткома Шенделев. Местком — Федоритяко.

Исследование атомного ядра является центральной задачей современной физики. Достижения передовых лабораторий всего мира ведут к моментальному взрыву на атомное ядро, сорванному и изысканным наиболее мощными действительными методами исследования.

В апреле этого года в печати появились сообщения о том, что в лаборатории Резерфорда (Манчестер), напавшейся в течение тридцати лет ведущей лабораторией в изучении строения атомного ядра, двумя английскими учеными, Неперфту и Болтоном, удалось разрушить ядро небольшого элемента, подвергнув его интенсивной бомбардировке водородными ионами. Ускоренной в специально разрядной трубке.

Украинский физико-технический институт (Харьков) работу по разрушению атомного ядра начал лишь в про-

шлом году. Однако коллективный метод работы в течение ударных темпов исследования позволил в течение этого короткого срока добиться решающих успехов.

10 октября научным сотрудниками УФТИ гг. И. Д. СИНЕЛЬНИКОВУ, А. М. ЛЕППУНСКОМУ, А. Н. ВАЛЬТЕРУ и Г. Д. ЛАТЫШЕВУ удалось в СССР и впервые в мире удачно осуществить разрушение ядра лития путем бомбардировки ядрами азотоида, ускоренных в разрядной трубке.

Успехи института открывают громадные возможности в исследовании строения атомного ядра. УФТИ ведет дальнейшие количественные опыты по исследованию ядра лития и строит более мощную установку для разрушения атомных элементов.

Директор УФТИ И. ОБРЕИДОВ.

First in USSR !

“High-voltage team” UPhTI

October 10, 1932





**George Gamov**



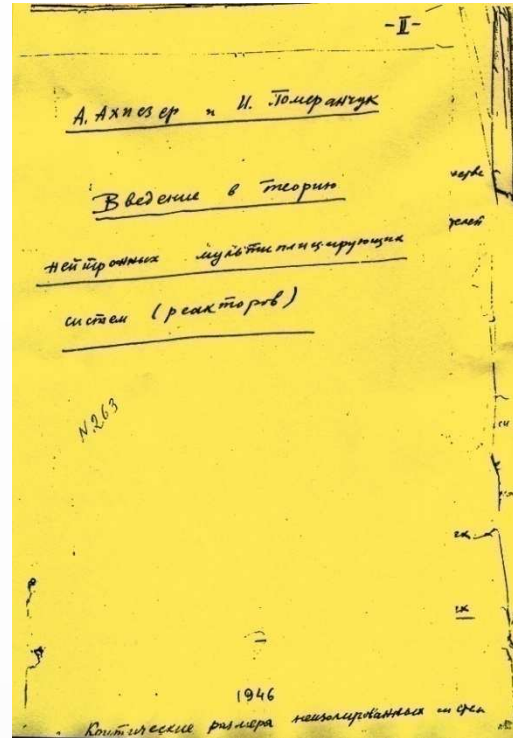
У ПАМ'ЯТЬ  
ВИДАТНОГО ЕКСПЕРИМЕНТУ-  
РОЗЩЕПЛЕННЯ АТОМНОГО ЯДРА,  
ЗАЙСНЕНОГО 10 ЖОВТНЯ  
1932 РОКУ ВЧЕНИМИ  
УКРАЇНСЬКОГО ФІЗИКО-  
ТЕХНІЧНОГО ІНСТИТУТУ  
АНТОНОМ ВАЛТЕРОМ  
ГЕОРГІЄМ ЛАТИШЕВИМ  
ОЛЕКСАНДРОМ ЛЕЙПУНСЬКИМ  
КИРИЛОМ СИНЕЛЬНИКОВИМ



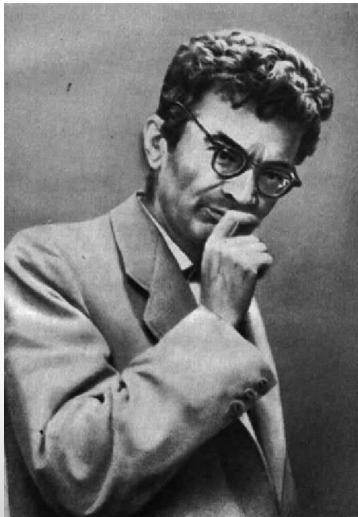
## 1946 UPhTI - Laboratory No.1



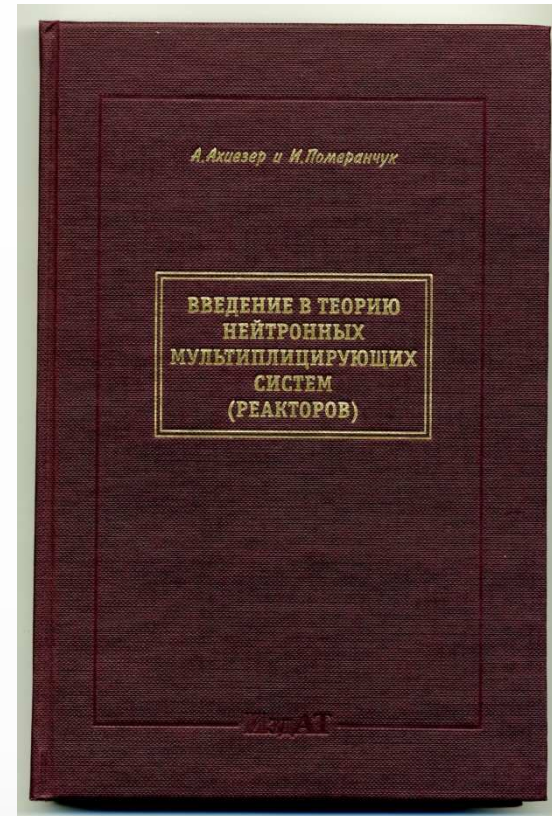
A.I. Akhiezer



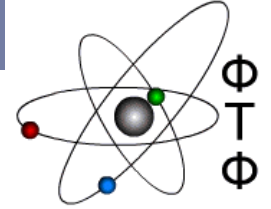
1946 - Lab. No.1



I.Ya. Pomeranchuk



2001 - IThEPh  
(Moscow)



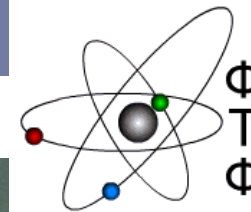
*Heads of the Departments in Kharkiv*

**Mykola Shulga**

*Head of the Department of Nuclear  
Physics and Medical Physics,  
**Academician of NASU**, State prize  
winner, Doctor of Sciences, Professor*





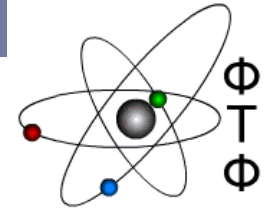


*Heads of the Departments in Kharkiv*

**Mykola  
Azarenkov**

*Head of the Department of Materials  
for Reactors Building and Physical  
Technologies, **Academician of NASU**,  
NASU prize winner, Doctor of  
Sciences, Professor*

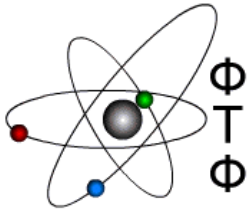




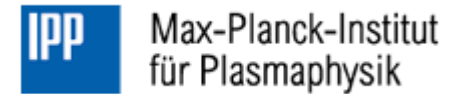
## LIST

### Of Academicians who lecture at Kharkiv University in 2016-2017 School of Physics and Technology (our graduates):

- *Azarenkov Mykola*, deputy rector of the University,
- *Voyevodin Victor*, director of Institute for Solid State Physics, material Science and Technologies, NSC KhIPhT, NASU,
- *Klepikov Vyacheslav*, director of Institute for Electrophysics and Radiation Technologies, NASU,
- *Slyusarenko Yuriy*, head of the Department at Institute for Theoretical Physics named after O.I.Akhiezer, NSC KhIPhT, NASU,
- *Shulga Mykola*, director of Institute for Theoretical Physics named after O.I.Akhiezer, NSC KhIPhT, NASU.



## School of Physics and Technology



**Our graduates** study and work at numerous scientific centers of **Europe**, such as:

- ITER,
- Max-Planck-Institut für Plasmaphysik, Germany,
- GSI Helmholtzzentrum für Schwerionenforschung GmbH, Germany,
- S-DALINAC at Institut für Kernphysik, Darmstadt Technische Universität, Germany,
- Helmholtz-Zentrum Berlin für Materialien und Energie, Germany,
- SIEMENS,
- Departamento de Fisica Teorica, Facultad de Fisica, Universidad de Valencia, Spain,
- INFN, Sezione di Padova and Dipartimento di Fisica “Galileo Galilei”, Università degli Studi di Padova, Italy,
- Universite Libre de Bruxelles, Belgium,
- Institut für Niedertemperatur- Plasmaphysik e. V. Greifswald, Germany.



## Directions and specialties:

There are currently four departments of the School (Department of Theoretical Nuclear Physics and Higher Mathematics named after AI Akhiezer, Department of Nuclear and Medical Physics, Department of Reactor Materials and Physical Technologies, Department of Applied Physics and Plasma Physics), about 200 students studying for the qualification of **BSc in the direction of "Applied Physics"**, as well as the qualification of MSc in the **specialties**:

- **Experimental Nuclear Physics and Plasma Physics**
- **Applied Physics**
- **Medical Physics**

The specified specialties contain the following specializations.

Specialty "Experimental Nuclear Physics and Plasma Physics":

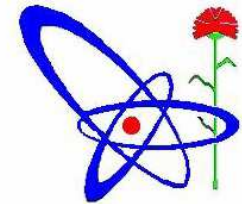
- ✓ specialization "Theoretical Nuclear Physics";
- ✓ specialization "Experimental Nuclear Physics";
- ✓ specialization "Plasma Physics".

Specialty "Applied Physics":

- ✓ specialization "Applied Physics";
- ✓ specialization "Physical Material Science";

Specialty "Medical Physics":

- ✓ specialization "Medical Radiation Physics";
- ✓ specialization "Medical Biophysics".

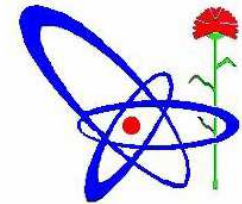


## **List of main subjects teaching at the Department**

**6 semester** 1. Interaction of ionizing radiation with a matter

**7 semester** 1. Nuclear Physics (structure of atomic nucleus)  
2. Physics of elementary particles  
3. Quantum electrodynamics  
4. Nuclear electronics

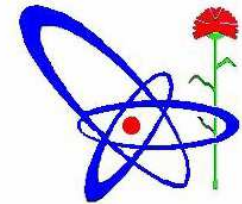
**8 semester** 1. Electrodynamics of nuclei  
2. Physics of elementary particles  
3. Quantum electrodynamics  
4. Theory of atomic nucleus



**List of main subjects teaching at the Department  
(continuation)**

- 9 semester**
1. Dosimetry of ionizing radiation
  2. Detectors of ionizing radiation
  3. Electrodynamic processes in Physics of High Energies
  4. Physics of nuclear reactors
  5. Nuclear spectroscopy
  6. Physics of neutrons
- 10 semester**
1. Methods of Experimental Nuclear Physics
  2. Applied Nuclear Physics
  3. Nuclear spectroscopy
  4. Ecology of nuclear fuel cycle

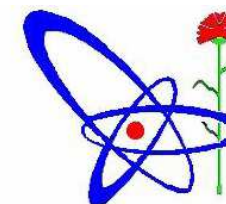




**Plan of the courses "Physics of neutrons and nuclear reactors"**  
**at the Department of Nuclear and Medical Physics KKhNU**

**Part 1: Fundamentals of Neutrons Physics**

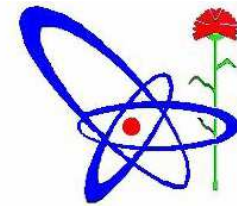
- 1.1. Introduction. Neutron discovery and its properties. Historical Review.
- 1.2. The main physical phenomena and processes involving neutrons.  $\beta$ -decay. Nuclear reactions: radiative capture and fission of heavy nuclei, neutron multiplication ( $n, 2n$ ), ( $n, 3n$ ), ..., production of other particles. Reaction cross sections.
- 1.3. The lifetime of free neutrons. Methods for neutron production. Neutron sources for research, technical and medical applications.
- 1.4. Detection and spectrometry of neutrons. Radiators. Acceptors. Detected particles. Short-range and long-range product. Construction of neutron detectors and spectrometers.
- 1.5. Industrial applications of neutrons. Activation analysis. Nuclear Geology. Neutron logging.
- 1.6. Medical applications of neutrons. Radiative therapy. Production of medical isotopes. The neutron tomography.
- 1.7. Chain reaction of nuclear fission. The spectrum of fission neutrons. Slow down and diffusion of neutrons in multiplying media. The possible implementation of a chain reaction.
- 1.6. Isotope sources of electricity.



**Plan of the courses "Physics of neutrons and nuclear reactors"  
at the Department of Nuclear and Medical Physics KKhNU**

**Part 2: Physics of Nuclear Reactor**

- 2.1. Introduction. Power and Ecology. Renewable "sources" of energy. Place of nuclear power in the energy consumption in Ukraine and in the whole world at present and in the long term. The main problems of nuclear power.
- 2.2. The conversion of energy in nuclear reactors. The fundamental unit of the nuclear reactor and the elemental composition of the core. Classification of nuclear reactors. Neutron cycle in thermal nuclear reactor.
- 2.3. Features of fissile and fertile nuclei. The release of fission energy. The main characteristics of the fission products.
- 2.4. Comparative analysis of thermal reactors and fast reactor-breeders. Neutron cycle in thermal nuclear reactor - the main physical processes.
- 2.5. The main provisions of the theory of neutron moderation. Moderating properties of substances. Moderating abilities of multi-component medium. Natural neutron moderators: advantages and disadvantages.
- 2.6. The Fermi theory of the thermal neutron age in reactor medium. The moderation length. The moderation neutron spectrum (Fermi spectrum) in homogeneous non-absorbing medium.
- 2.7. The Fick law for thermal neutron diffusion in a homogeneous medium. The diffusion length, area and length of neutron migration. The spectrum of neutrons in thermal reactors.
- 2.8. The multiplication factor of neutrons in the reactor (Formula of 4 factors). Multiplicative properties of the medium: the constant  $\eta$ . The utilization efficiency of thermal neutrons  $\Theta$ . Temperature effects on multiplicative properties of the medium.
- 2.9. The effective multiplication factor and the reactivity of the reactor. "Geometric parameters" (buckling). The condition of the reactor criticality, ways to achieve it and sustain. The reactivity margin of reactor.
- 2.10. Elementary reactor kinetics equation (Neutron balance equation). Period of a nuclear reactor. Delayed neutrons and their role in the operative reactor control.
- 2.11. The main dynamic processes in a nuclear reactor. Burn-out of nuclear fuel. Reproduction of nuclear fuel and reproduction rate. Temperature effects in a nuclear reactor.
- 2.12. Steady poisoning of the nuclear reactor. The reactor poisoning at the transient regimes, "iodine pit". Slagging of the nuclear reactor. Burnout of burnable poisons.
- 2.13. Nuclear-physical and chemical parameters of the nuclear fuel. The physical mechanism of the neutron reflecting. Neutron-physical characteristics of the materials of the reflector, coolant and moderator.
- 2.14. The structure of the active zones of heterogeneous nuclear reactors such as PWR, RBMK CANDU, BN-600. Fast reactors and the possibility of closed fuel cycle realization.
- 2.15. Generation IV reactors. Subcritical assembly driving by an accelerator (ADS). Traveling wave reactor: the Feoktistov criterion, advantages and problem points of the concept.

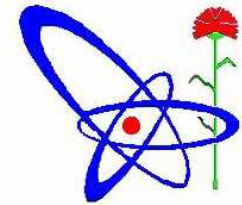


## Basic equipment



### **Accelerator «Nadezhda»:**

(particle energy – 1 MeV,  
Beam current – 100  $\mu$ A,  
Pulse duration – 70 ns).



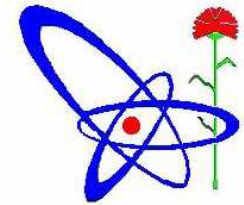
## Basic equipment



Electrostatic accelerator IG-410 -  
Basic education installation  
Laboratory of Nuclear Physics and cosmic rays





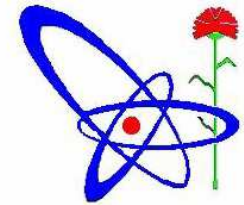


## Basic equipment

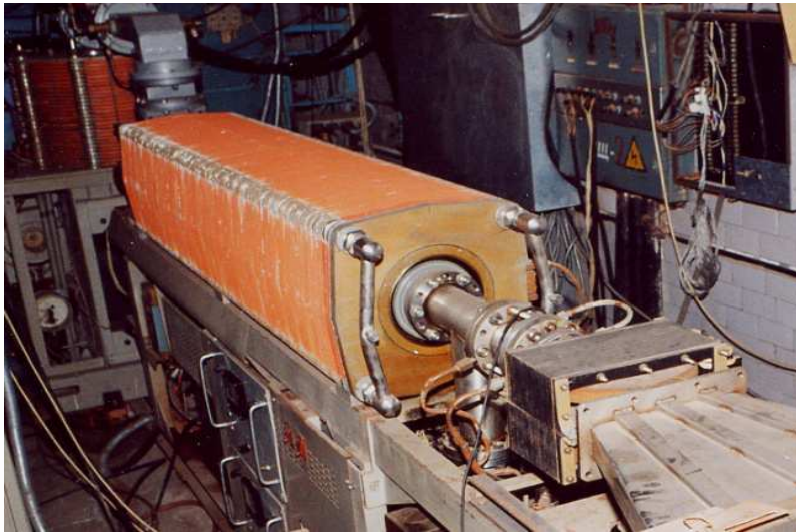


Electron accelerator  
LEA-6 MeV

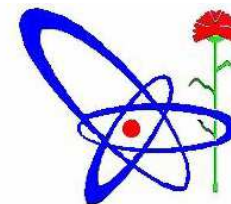




## Basic equipment



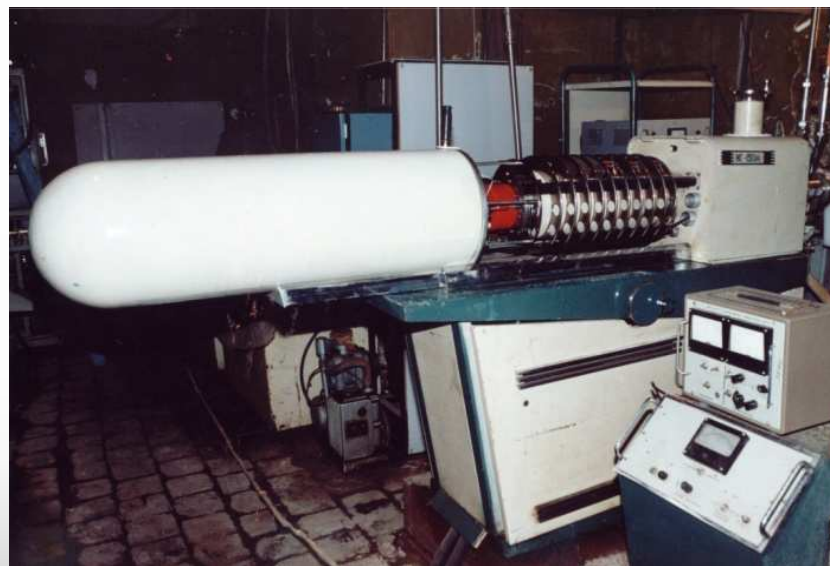
Researchers of the Department nearby accelerator of electrons for applied studies with energy of 9 MeV



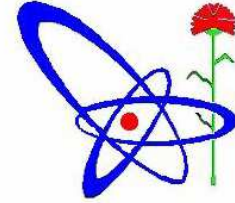
## Basic equipment



Neutron generator  
NG-150M





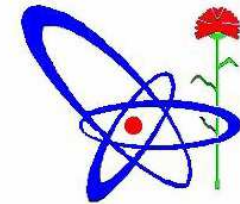


## Basic equipment



- **Low background installation**

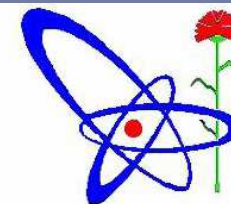




## Basic equipment

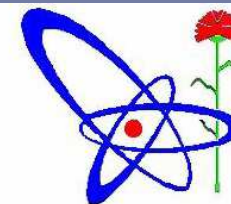


Assembly with two Pu(Be)  
neutron sources ( $5 \times 10^7$  n/s  
each)



### **Laboratory workshop on dosimetry**

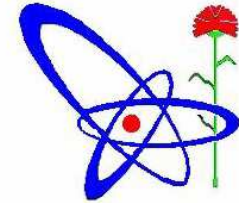
- 6. Дозиметр рентгеновского и гамма-излучений на основе воздухоэквивалентных ионизационных камер.
- 1. Beta-radiometer for powdery solids and liquids.
- 2. Beta-radiometer for determining the contamination of arms, towels, clothes, surface work space and countertops.
- 3. The scintillation alpha radiometer based on scintillator ZnS (Ag).
- 4. Air-equivalent scintillation dosimeter of gamma-radiation and exploratory geological dosimeter for radioactive ores based on scintillator NaJ (Tl).
- All-wave counter of neutrons.
- 6. Dosimeter of x-ray and gamma-radiation on the basis of air-equivalent ionization chambers.



## Laboratory workshop on dosimetry

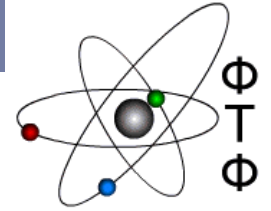






## **Laboratory workshop on Applied Nuclear Physics**

- **1. Measuring the differential cross section of elastic scattering of ions on Pt 14N for  $E = 100$  MeV**
- **2. Studying the phenomenon of the albedo of the beta particles.**
- **3. Studying the interaction of gamma rays with a matter. Patterns of pair production.**
- **4. Determination of the effective average energy of the beam and the study of the energy spectrum of the electron beam by LEA-6 transmission.**
- **5. Determination of the density of the materials by Compton scattering.**
- **6. Calibration of energy scales and studying the energy resolution of Ge (Li) detectors of large volume.**



## **All-Ukrainian Students Physicists Tournament**

**2010** I place – team “Fiztekhn”

**2011** I place – team “Fiztekhn-original”,  
II place – team “Fiztekhn-light”

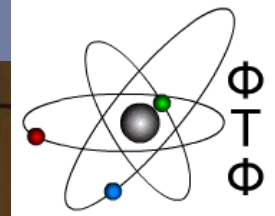
## **3rd International PT-2011 (Dolgoprudny, MIPhT, Russian Federation) I place**

**2011** II place – team “Fiztech”

**2012** II place – team “Fiztekhn-original”

**2013** I place – team “Whaat?”

**2015** I place – team “Fedor Konyukhov”  
III place – team “Whaat?”



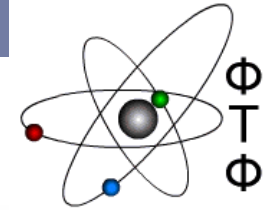
## VI IPT



Kharkiv team took part in 6<sup>th</sup> International Physicists Tournament held at Ecole Polytechnique Fédérale de Lausanne, Switzerland. Kharkiv team came to the final with the best ranking.

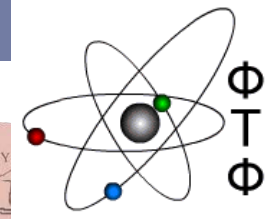
In final fight Kharkiv students got the **second** place among the teams from Great Britain, France, Sweden, Denmark, Switzerland, Poland, Russian Federation, Singapore.





Kharkiv team took part in the 7<sup>th</sup> IPT held in Warsaw University, Poland. Our team reached the final of the best rated.

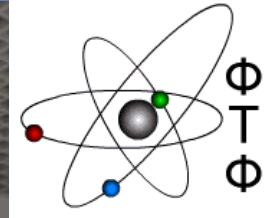




## VII IPT

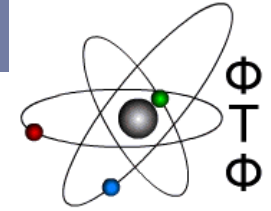


At the end of the tournament our students have won the *first* place. The following countries took part: Nankai University, China; Technical University of Denmark; L'École polytechnique, France; University of Warsaw, Poland; Moscow Institute of Physics and Technology, Russian Federation; Nanyang Technological University, Singapore; Chalmers University of Technology, Sweden; L'Ecole polytechnique fédérale de Lausanne, Switzerland; Nottingham University, UK; Iran



According to science metric ranking SciVerse Scopus from March 6, 2014 two graduates from Kharkiv University were among the ten best young scientists of Ukraine : **Illya Shapoval** – third place – and **Serhiy Kandybey** – fourth place





## All-Ukrainian Students Olympiads in Physics

2010

**I place – Andriy Bozhko**

**III place – Igor Vakulchik**

2011

**III place – Andriy Bozhko**

**III place – Oleksiy Maystrenko**

2012

**I place – Andriy Bozhko**

**II place – Dmytro Rubanov**

**II place – Vladyslav Syroter**

2013

**II place – Andriy Bozhko**

**II place – Dmytro Rubanov**

**II place – Oleksiy Maystre**

2014

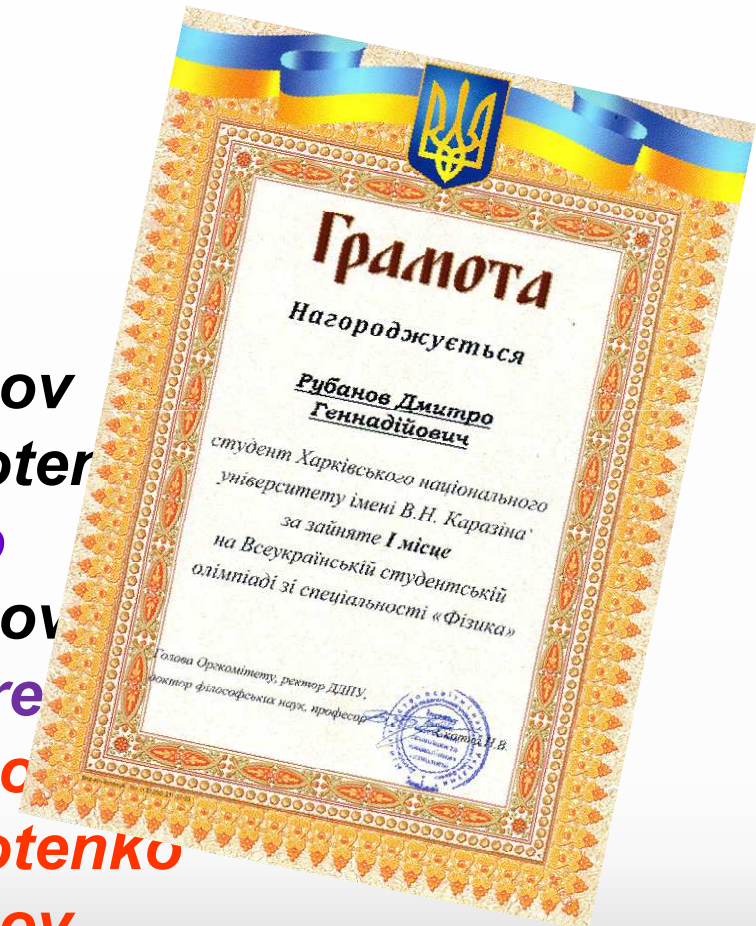
**II place – Dmytro Rubanov**

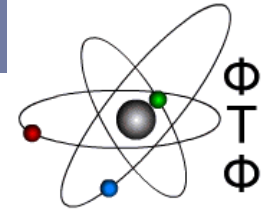
**II place – Vladyslav Syrotenko**

2015

**I місце – Dmytro Rubanov**

**II місце – Oleg Savchenko**

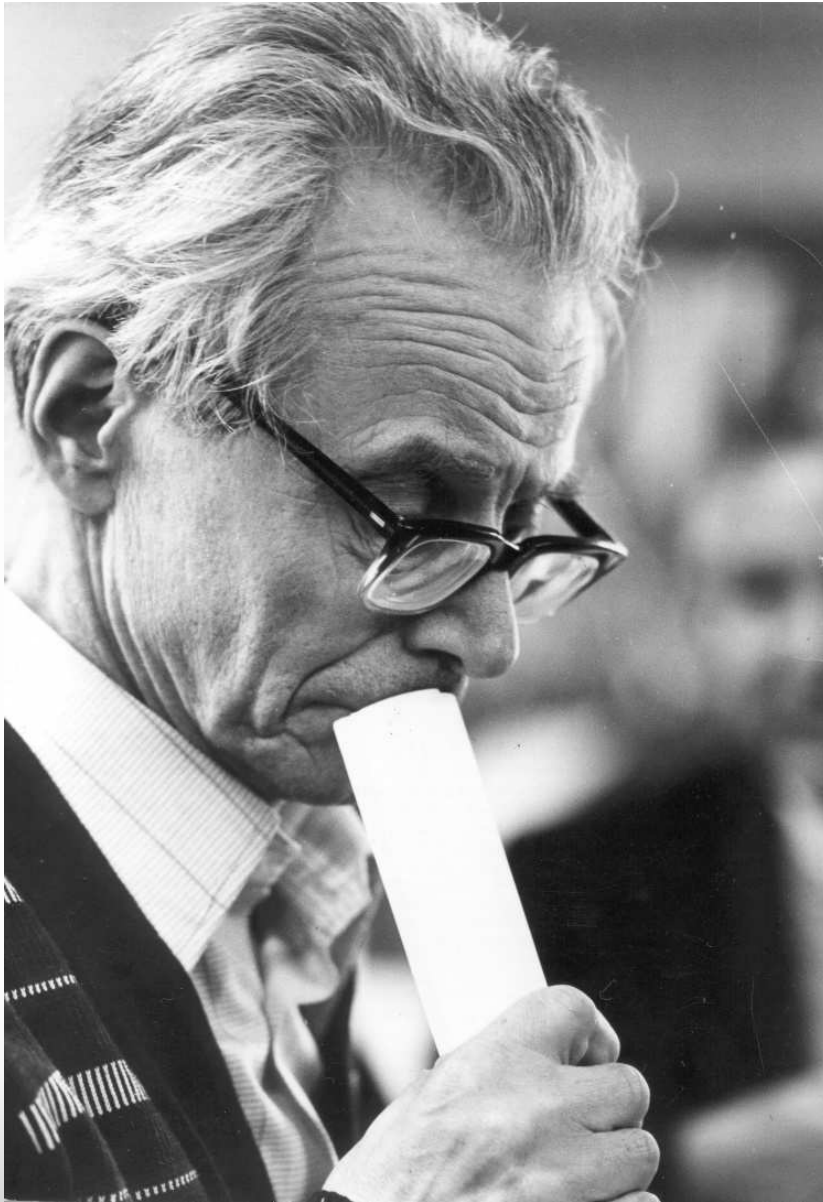
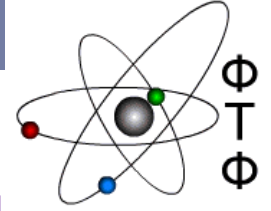




**XI International Students  
Olympiad in Theoretical  
Mechanics, April 14-17,  
2015, Byelorussian State  
university of Transport  
(Homel, Byelorussia)**

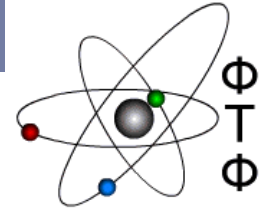
**Dmytro  
Rubanov**  
**first** place (**gold  
medal!**) **Vadym  
Kurylenko** third  
place (**bronze medal!**)





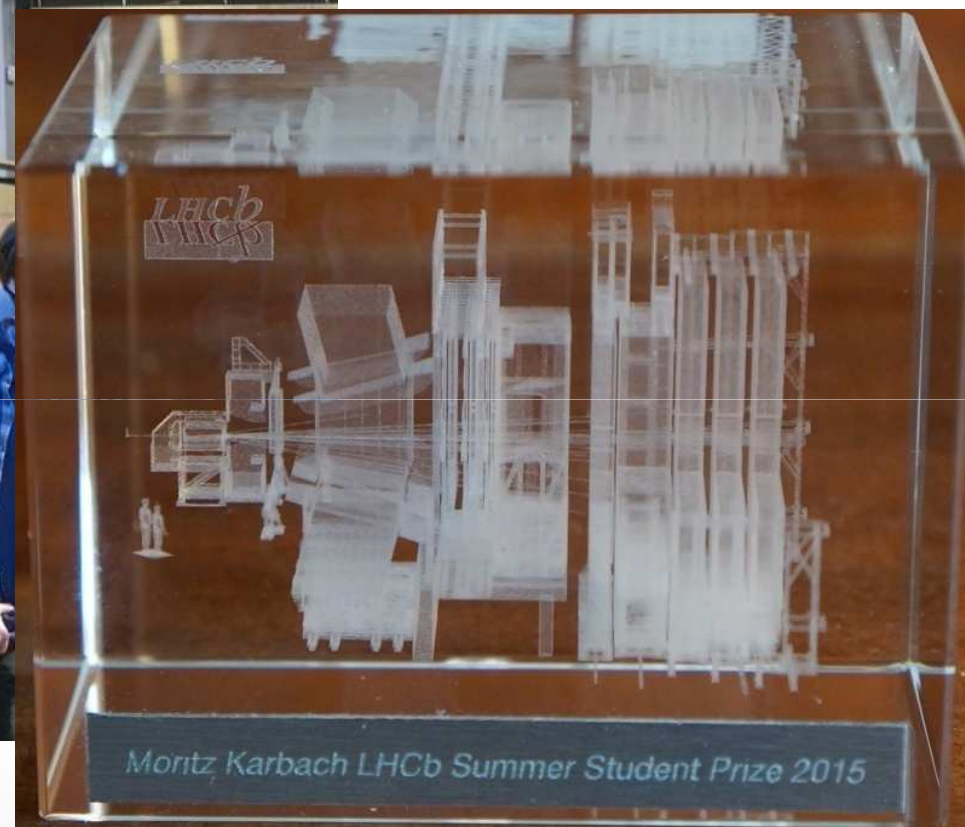
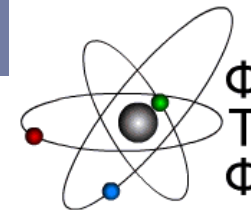
**On November 13, 2015, Students scientific conference of the School “Actual problems of modern physics” took place. It was devoted to 90-years anniversary of Academician Dmytro Volkov, who established super symmetry and super gravity. Dmytro Volkov graduated from Kharkiv University in 1952.**



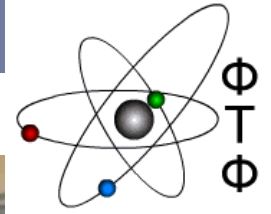


In summer 2014, a student of the Department of Theoretical Nuclear Physics and Higher Mathematics named after O.I.Akhiezer Tatiana Moskalets won the competition to participate in the CERN Summer Student Program.





In Summer, 2015 a student of the Department of Nuclear and Medical Physics **Vitaliy Lisovskiy** was awarded a grant for participation in **CERN Summer Student Program**. His report on the results of research in the framework of collaboration LHCb was recognized as the best among several dozens of students from all over the world. He was awarded the Moritz Karbach Prize.



*The Moritz Karbach  
LHCb Summer Student Prize 2015*  
*as recognition for outstanding performance*

*Is Awarded To*

*Vitalii Lisovsky*

by the CERN LHCb Group

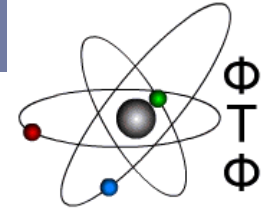
8 September 2015

*G. R. Wilkinson*

LHCb spokesperson

*R. All*

CERN LHCb Team Leader

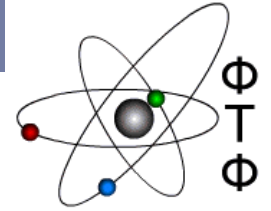


During 2015, students of the School were among the winners of International contests for *five* times.



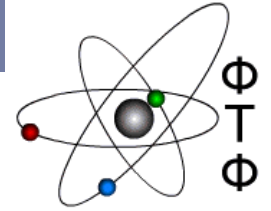
October 22, 2015 the Prize for the best students research carried out in a laboratory of Ecole Polytechnique was given to *Ivan Maliyov* who is joint student of the Ecole and the Department of Nuclear and Medical Physics.





November 5, 2015: students and graduates of the School at the meeting of students of Paris-Saclay University, who have its fellowships: ***Ivan Maliyov, Mykola Zlygostev, Oleksandr Grygorenko, Anastasiya Prokaeva, Vitaliy Lisovskiy.*** (some more are not in the picture)





***Maria Romanova*** – a winner  
(second place) in volley-ball tournament of  
2015 Tournoi sportif des grandes ecoles  
militaires. Bravo Polytechnique!  
And third place in the tournament among  
the Universities and Grand Ecole TOSS.





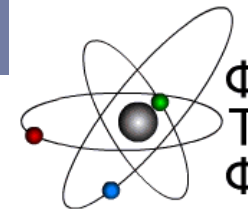
February 29 – March 2, 2016, traditional **Winter School in High Energy Physics** took place. The lecturers were:

**Achille Stocchi** - LAL, IN2P3/CNRS and Paris-Sud University, Orsay, France, **Marie-Helene Schune** - LAL, IN2P3/CNRS and Paris-Sud University, Orsay, France, **Maxim Titov** - CEA/IRFU, Saclay, France, **Stephane Monteil** - LPC-Clermont, IN2P3/CNRS & University Blaise Pascal, **Nicolas Delerue** - LAL, IN2P3/CNRS and Paris-Sud University, Orsay, France, **Sergey Barsuk** - LAL, IN2P3/CNRS and Paris-Sud University, Orsay, France, **Oleksiy Nurmagambetov** - AITP NSC KIPT & KNUK, Kharkiv, Ukraine, **Taras Zagoskin** - AITP NSC KIPT, Kharkiv, Ukraine, **Sergiy Ivashin** - AITP NSC KIPT, Kharkiv, Ukraine, **Volodymyr Kotlyar** - AITP NSC KIP, Kharkiv, Ukraine, **Sergiy Fomin** - AITP NSC KIPT & KNUK, Kharkiv, Ukraine



# Winter School on High Energy Physics

V.N. Karazin Kharkiv National University



February, 29 - March, 2, 2016

V.N. Karazin Kharkov National University,  
Kharkov, Ukraine



## Topics :

Instrumentation for high energy physics  
Standard Model and beyond  
Higgs boson search  
Strong interaction  
Weak interaction  
Neutrino physics

## Program and organizing committee :

A. Stocchi, LAL/IN2P3 and PSud University, Orsay, France  
N. Shul'ga, ITP NSC KIPT, Kharkov National University, Kharkov, Ukraine  
M.-H. Schune, LAL/IN2P3 and PSud University, Orsay, France  
S. Barsuk, LAL/IN2P3 and PSud University, Orsay, France  
S. Fomin, ITP NSC KIPT, Kharkov National University, Kharkov, Ukraine

31, Kurchatov ave.,  
Department of Nuclear and Medical Physics,  
School of Physics and Technology,  
V.N. Karazin Kharkov National University,  
Kharkov, 61108, Ukraine

Tel.: +38 057 335 25 66

e-mail: [spfomin@gmail.com](mailto:spfomin@gmail.com)  
[shchus@karazin.ua](mailto:shchus@karazin.ua)

[www-htuni.univer.kharkov.ua/ftf/index.htm](http://www-htuni.univer.kharkov.ua/ftf/index.htm)





# TO BE CONTINUED







## Contacts

61022, Ukraine, Kharkiv  
 Svobody Square, 4  
 Tel.: + 380 57 705 12 48  
 fax: +380 57 705 12 48  
 univer@karazin.ua

## University in the Internet



[www.univer.kharkov.ua](http://www.univer.kharkov.ua)



[www.facebook.com/Karazin.University](https://www.facebook.com/Karazin.University)

