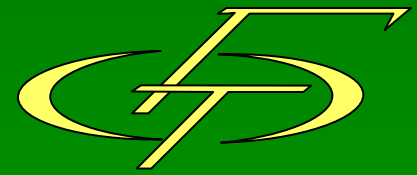




Belarusian
Physical
Society



Belarusian Events

E. ERSHOV-PAVLOV
BPS Scientific secretary

FINAL WYP05 MEETING

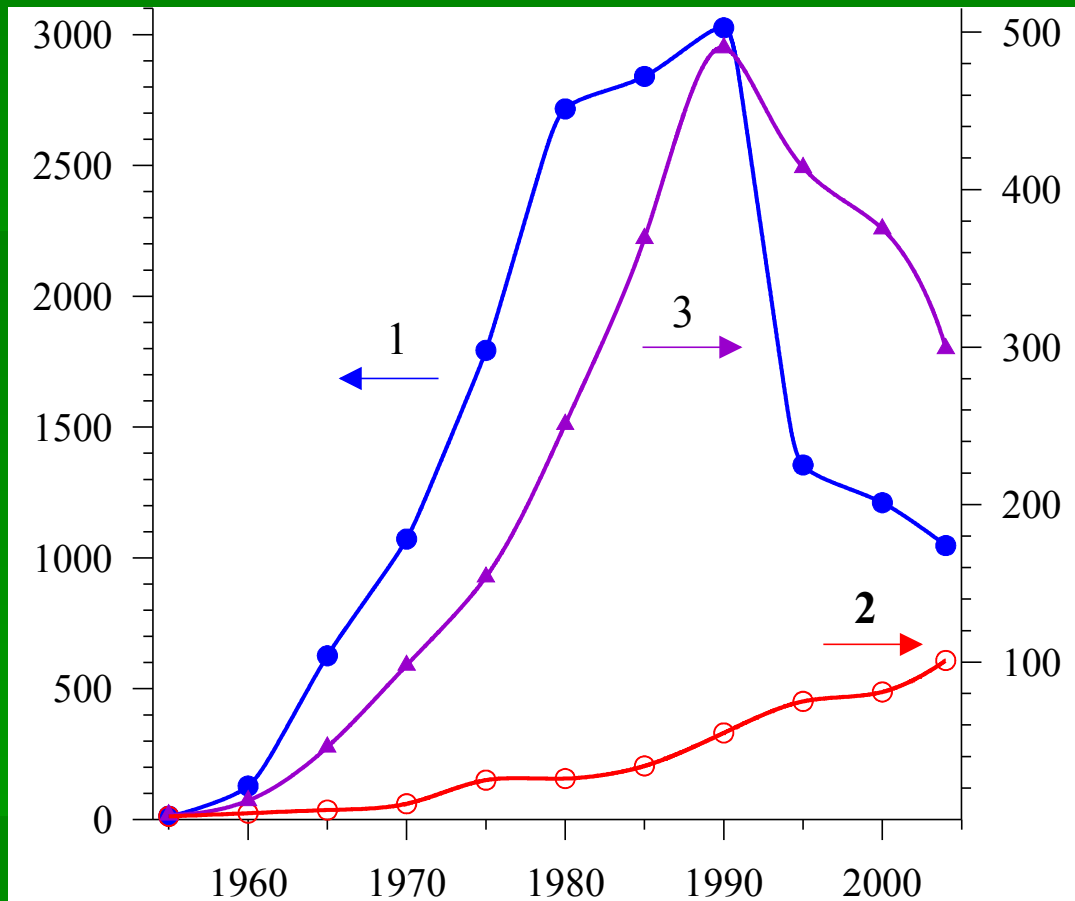
3-4 March 2006, Paris, France

Belarusian Physical Society

units 272 members from all regions and main cities of Belarus

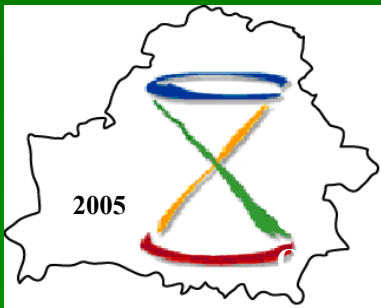


1996 – 134 members



Dynamics of total quantity of all physicists (1), doctors (2) and candidates (3) of Sciences in the Academy of Sciences of Belarus

Belarusian Physical Society



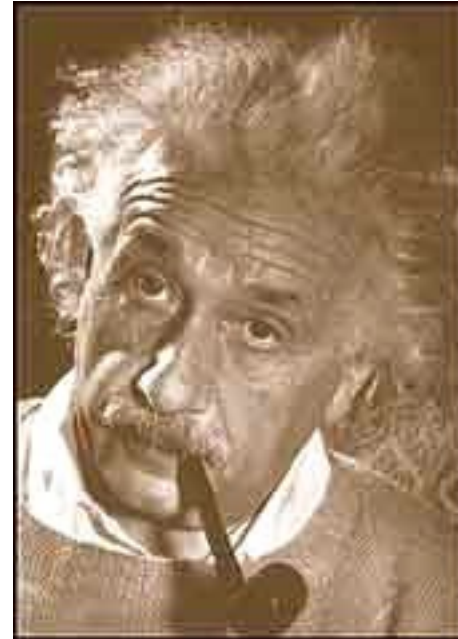
has initiated

THE FIRST CONGRESS OF PHYSICISTS OF BELARUS

8-10 June 2005

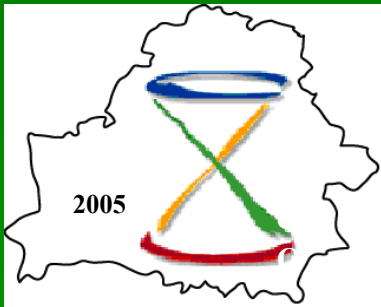
Minsk

Национальная академия наук Беларуси
Министерство образования Республики Беларусь
Институт физики им. Б.И.Степанова НАН Беларуси
Белорусский государственный университет
Белорусское физическое общество
Белорусский республиканский Фонд
фундаментальных исследований



КОНГРЕСС ФИЗИКОВ БЕЛАРУСИ
8-10 июня 2005 г., Минск

Программа

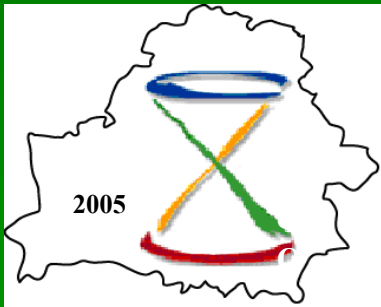


1st CONGRESS OF PHYSICISTS OF BELARUS

8-10 June 2005 Minsk

**234 physicists took part in the Congress work.
Among them there were:**

- **117** representatives of academic institutions,
 - **75** professors of high education schools
 - **34** secondary school professors,
 - **8** specialists from industry,
- and also 12 schoolchildren have been invited**



1st CONGRESS OF PHYSICISTS OF BELARUS

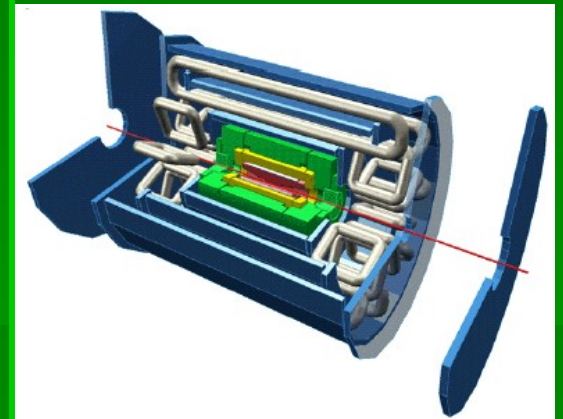
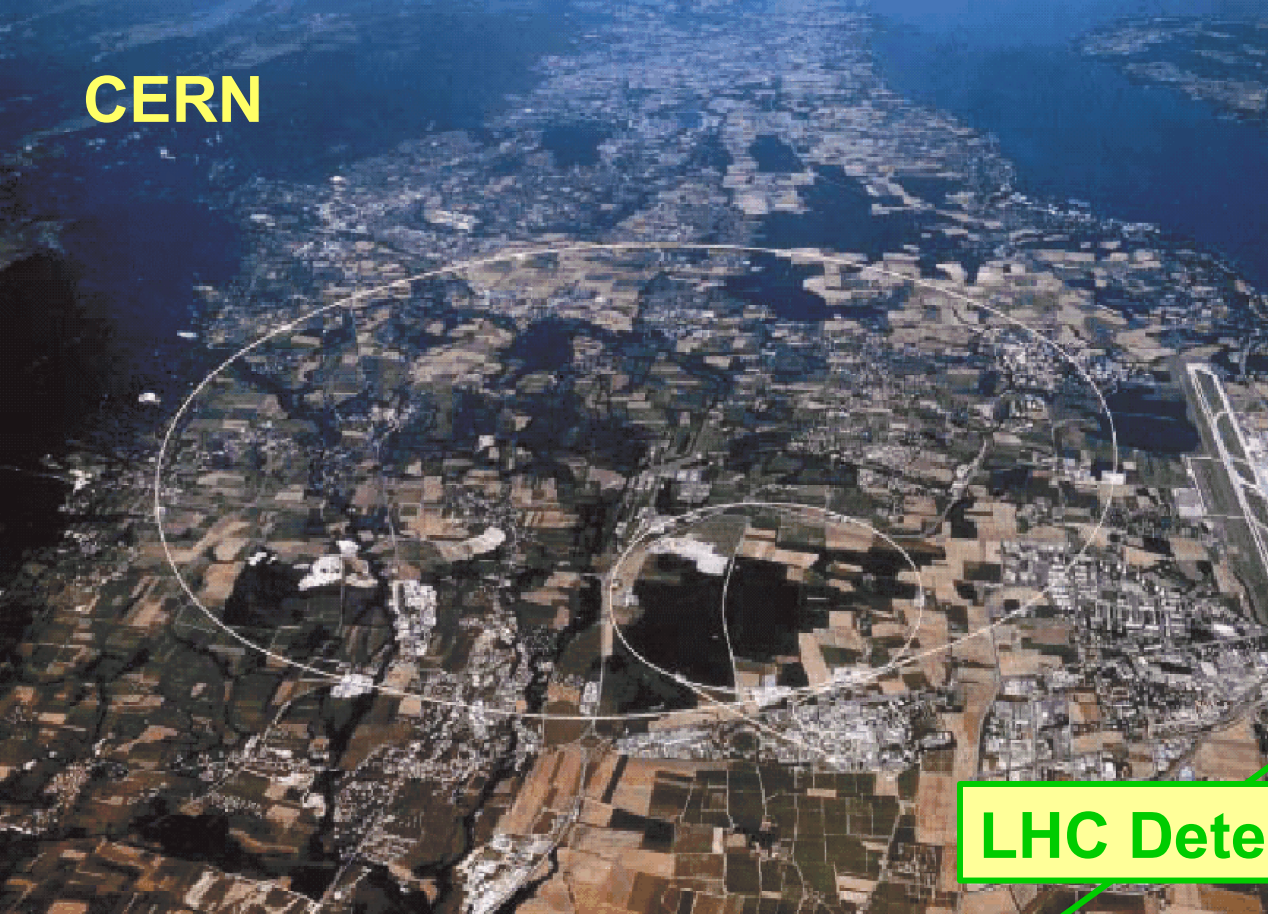
8-10 June 2005 Minsk

Main topics of the PROGRAM

(lectures and round tables)

- Development of Physics in Belarus
- Einstein and modern Physics
- Physics and education
- Physics and technical progress
- Physics in the system of natural and other sciences
- Problems and perspectives of the energy supply in Belarus
- Physics and an international scientific cooperation
- Main aspects of modern Physics being developed in Belarus: elementary particles, nuclear, atomic, molecular, condensed matter, optics, electronics, nanostructures, lasers, photochemistry etc.

CERN



ATLAS

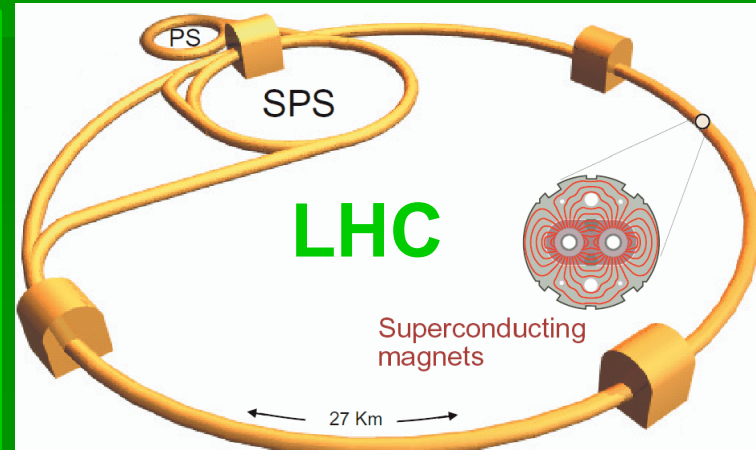
A Toroidal LHC Apparatus

LHC Detectors



CMS

Compact Muon Solenoid



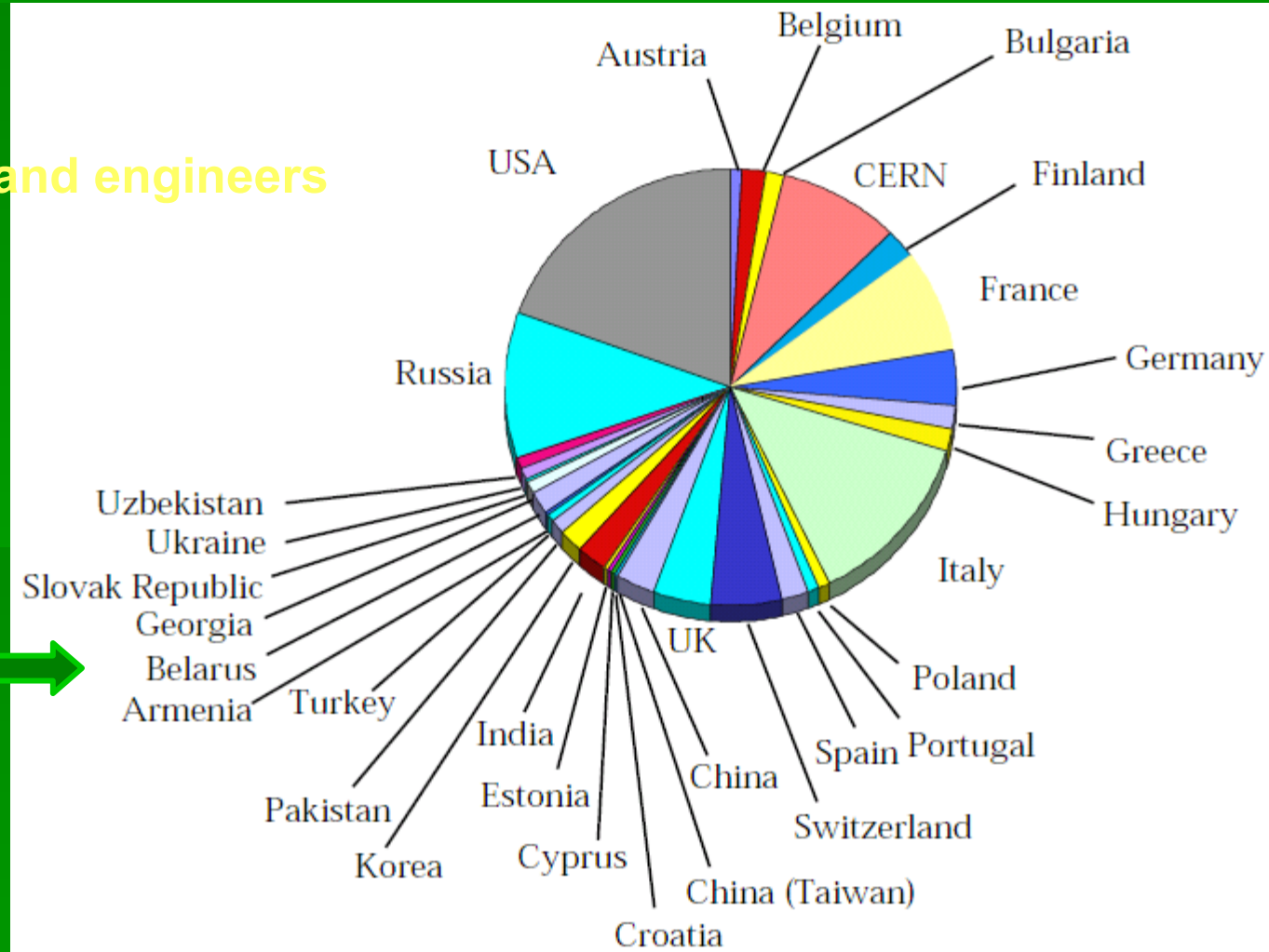


Compact Muon Solenoid International cooperation

1809 physicists and engineers

31 countries

144 institutions



VOLUME FREE ELECTRON LASER

An idea of this absolutely new type of FEL was generated in Belarus. The researches resulting in the creation of the volume free electron laser are performed since 80.

V.G.Baryshevsky, I.D.Feranchuk, Phys.Lett.102A (1984) 141

В.Г. Барышевский, ДАН СССР 299 (1988) 19

V.G.Baryshevsky, K.G.Batrakov, I.Ya. Dubovskaya, Journ. Phys. D. 24 (1991) 1250.

Emission of the first volume free electron laser (VFEL) was obtained in the Research Institute of Nuclear Problems at the Belarusian State University in 2001.

Volume free electron laser



KEY INSTITUTIONS IN BELARUS IN THE FIELD OF OPTICAL RESEARCHES

B.I.Stepanov Institute of Physics

Institute of Molecular and Atomic Physics

Institute of Electronics

Institute of Physics of Solids and Semiconductors

Physics Technical Institute

Belarusian State University

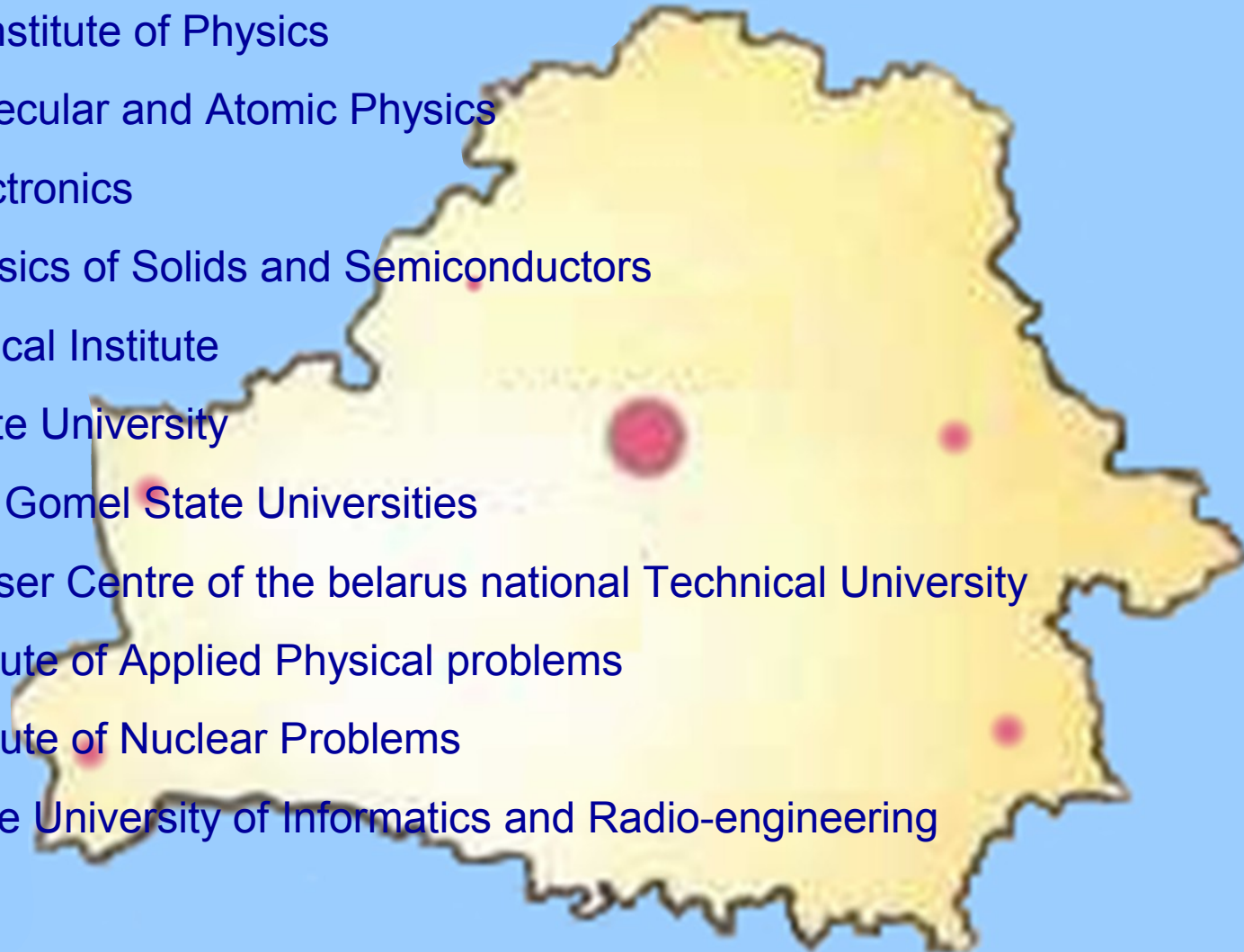
Brest, Grodno, Gomel State Universities

International laser Centre of the belarus national Technical University

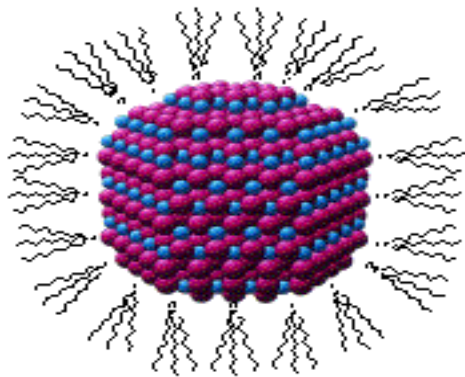
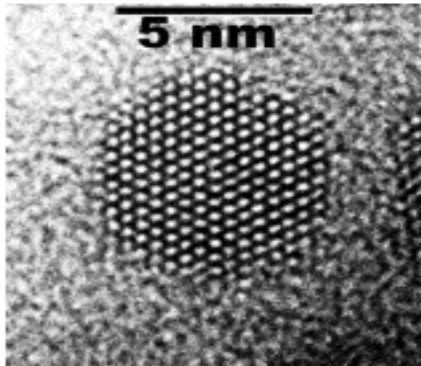
Research Institute of Applied Physical problems

Research Institute of Nuclear Problems

Belarusian state University of Informatics and Radio-engineering

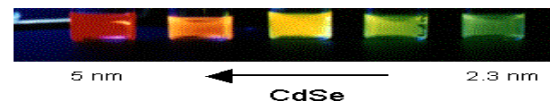
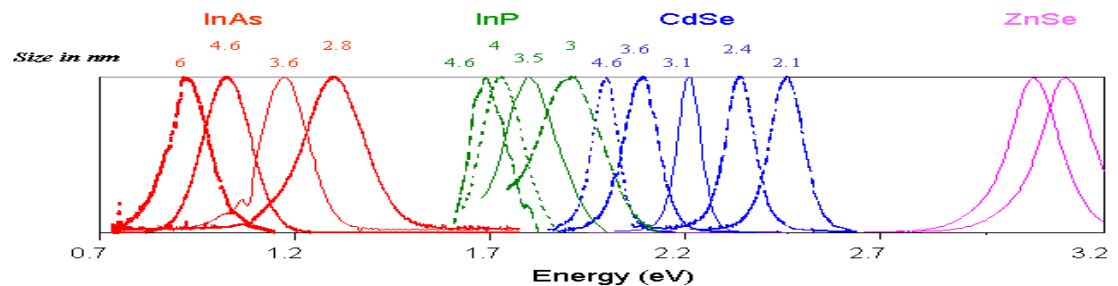


An overview of CdSe nanocrystals



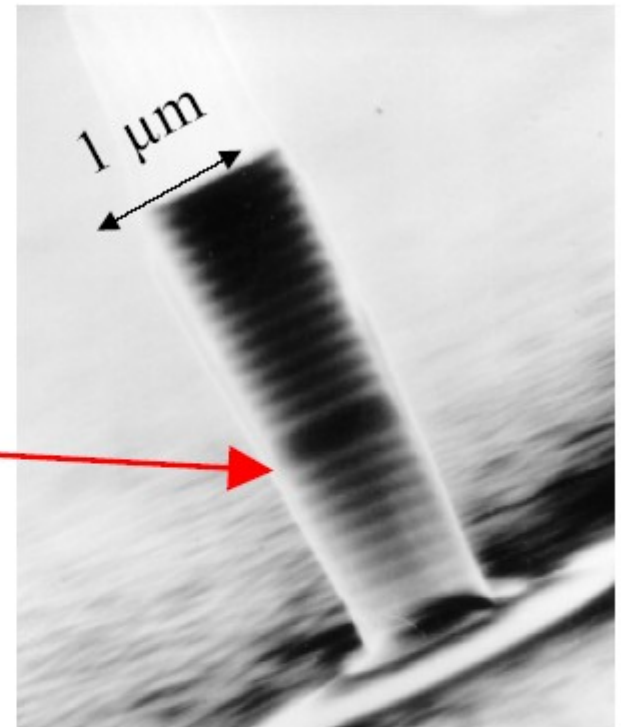
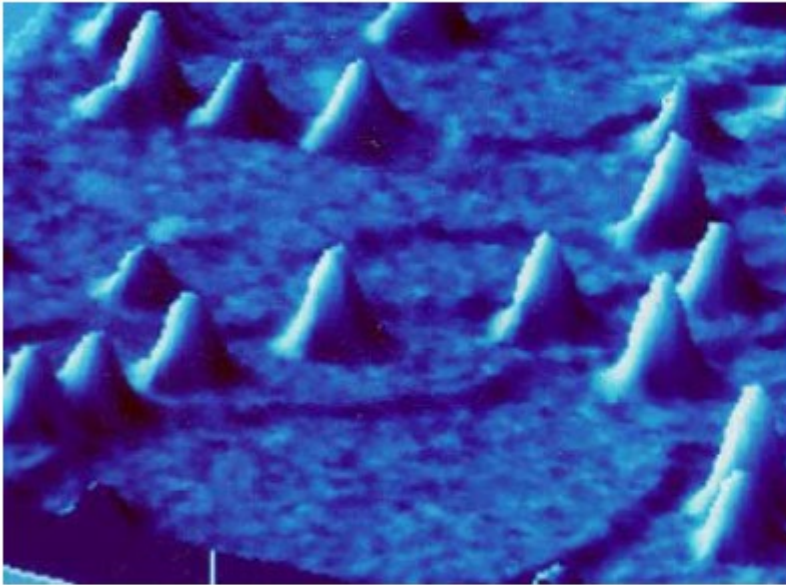
- 2 to 10 nm diameter
- Highly crystalline and defect free
- size-dependent properties

Photoluminescence of semiconductor nanocrystals



SINGLE PHOTON SOURCES

30 nm
↔



Quantum dots

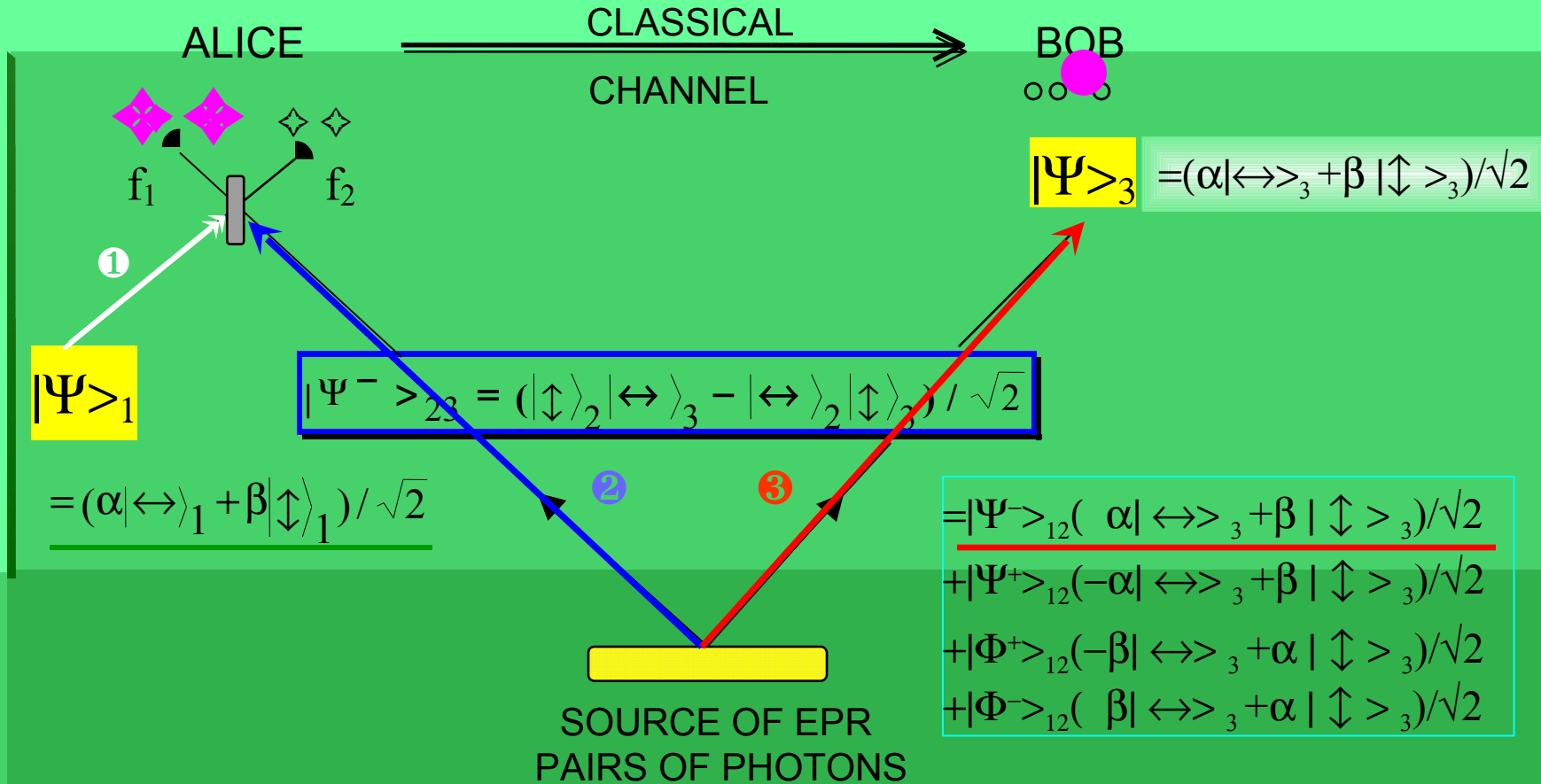
+

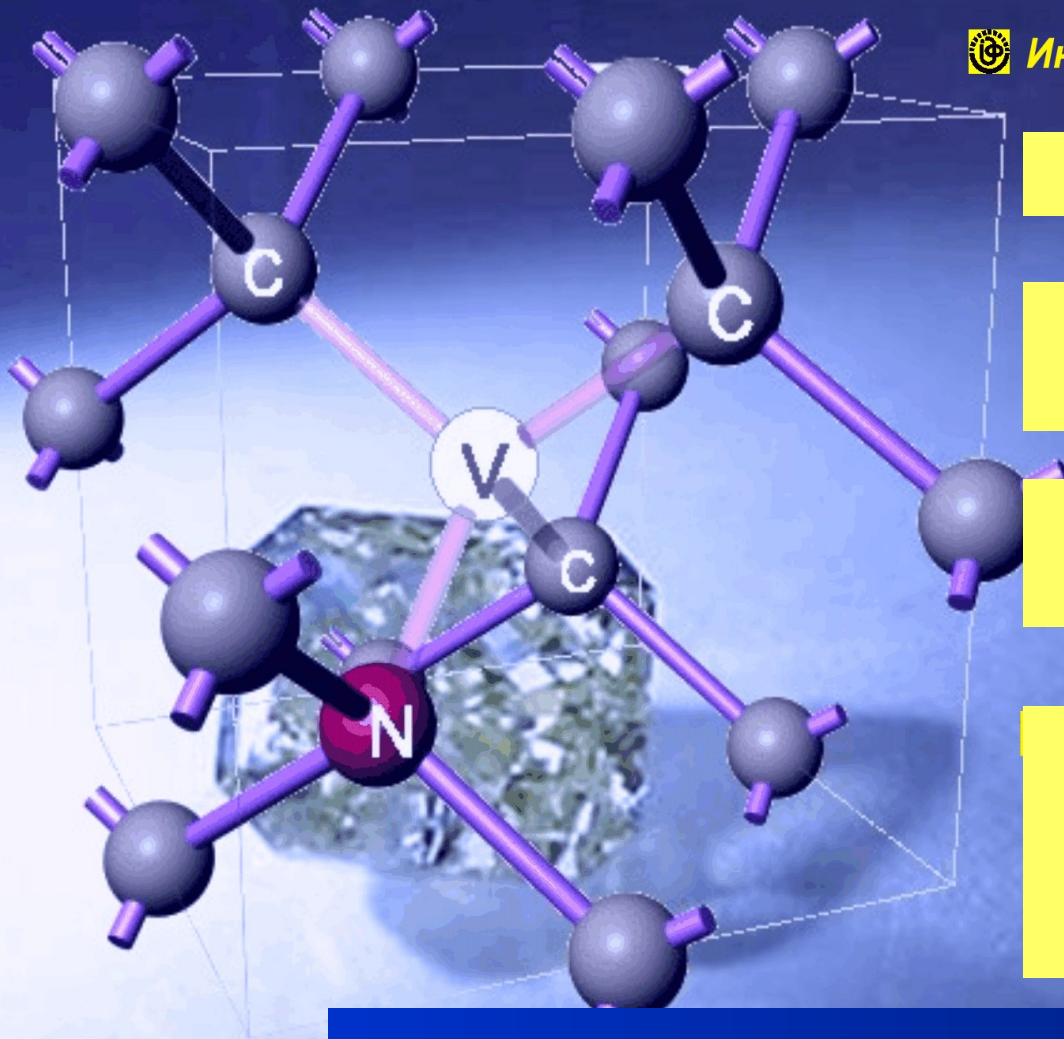
3D microcavities

⇒ **Efficient single photon source**

ENTANGLEMENT - NEW QUANTUM RESOURCE

Teleportation





NV-center in diamond

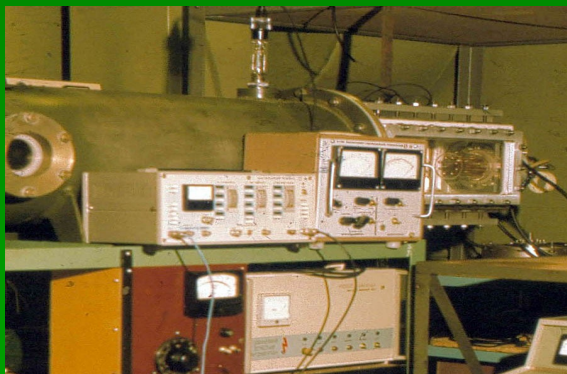
Photostability at room temperature

Electron spin $S=1$ in the ground state

Possibility of observation of a single center and a single nuclear spin ^{13}C

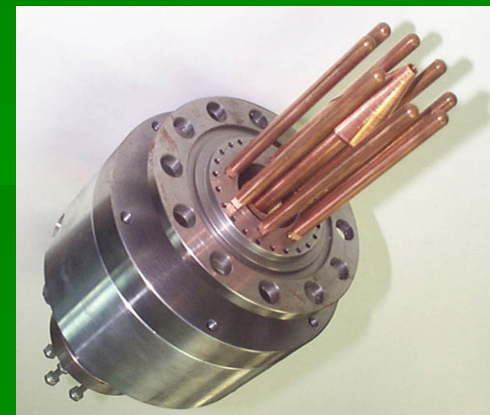
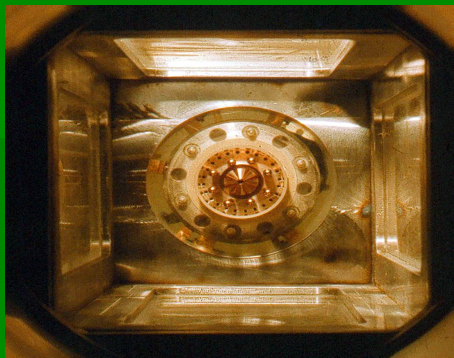
Processor on spin states of the NV-center in diamond for a quantum computer

Magnetoplasma compressor of a compact geometry

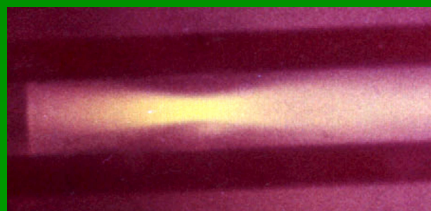


Experimental setup

$C_0 = 1200 \mu\text{F}$,
 $U_0 = (2 \div 5) \text{ kV}$
 W_0 — up to 15 kJ



Discharge device

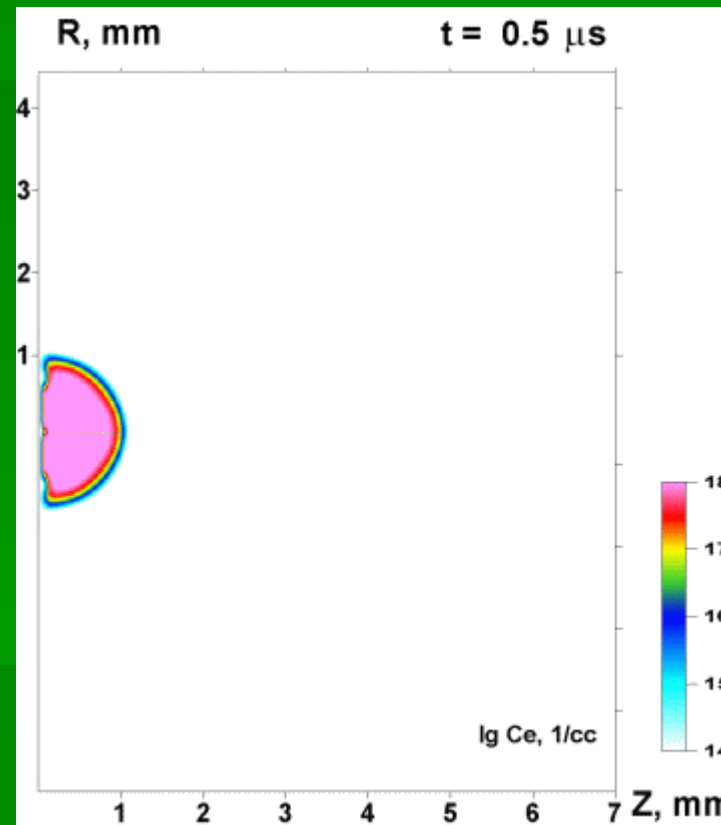
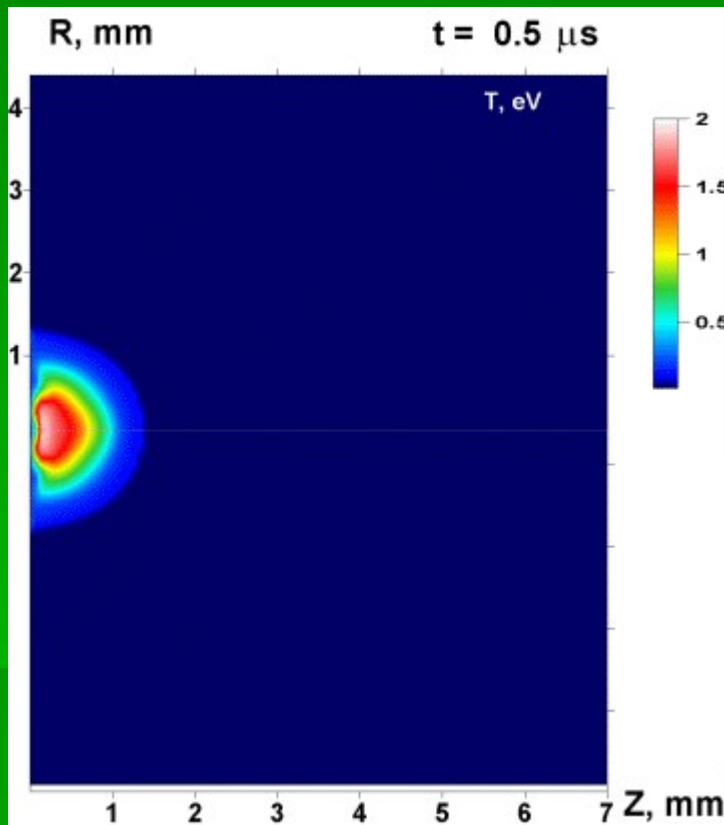


Compression plasma flow:
length — 10 – 12 cm;
diameter — 1 – 2 cm

Plasma parameters:

discharge duration	— 140 μsec ;
peak current	— 50 \div 120 kA;
plasma velocity	— 30 \div 70 km/sec;
electron density	— $10^{16} \div 10^{18} \text{ cm}^{-3}$;
plasma temperature	— 2 \div 4 eV

Results of the gas dynamics simulation for laser-induced plasma at DPM (evolution of the temperature and electron density)



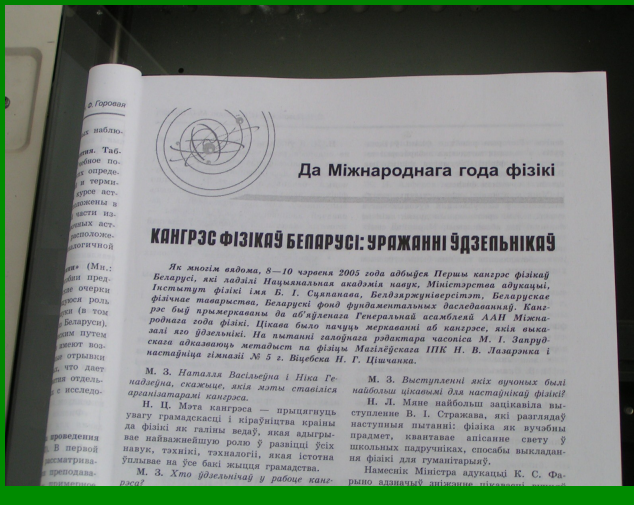
SPM

DPM

Temperature, eV

Electron density, cm⁻³





Горизонты науки и техники Встретились физики

В Минске впервые прошел знаменательный для отечественной науки Конгресс физиков. В его работе участвовали видные белорусские ученые, работающие в иттенно развивающихся областях физики элементарных частиц и фундаментальных взаимодействий, физики твердого тела и полупроводников, физики плазмы и плазменных технологий, оптики и оптических технологий, лазерной физики, электроники и радиофизики. Последнее десятилетие ознаменовано также становлением и бурным развитием физики микро- и наноструктур...

2005-й объявлен ООН Международным годом физики. Выбор неслучаен: исполняется 100 лет с тех пор, как Альберт Эйнштейн опубликовал научные статьи, заложившие основу крупнейших разделов современной физики — теории относительности, квантовой теории и теории броуновского движения. Физика играет важнейшую роль в развитии других наук, техники и технологий, оказывает большое влияние на культуру и многие другие стороны жизни общества. Нет сомнений, что в наступившем XXI столетии роль физики будет непрерывно возрастать, особенно в решении таких глобальных проблем, как энергосбережение, охрана окружающей среды и здравоохранение.

Физические общества разных стран, куда входят ученые, инженеры и преподаватели, совместно с госструктурами проводят международные и национальные научные конференции, конкурсы и олимпиады среди студентов и учащихся средних школ, различные дискуссионные и информационно-просветительские акции.

Анатолий ПРИЦЕПОВ.

“ВЕЧЕРНИЙ МИНСК” * 16 июня 2005 года

Комтас, які дазваляе арыентавацца ў зменлівым асяроддзі

На мінулым тыдні ў Мінску прайшоў Першы кангрэс фізікаў Беларусі. Гэтая шматлікая мерапрыемства стала рэальным Беларускай фізічнай супольнасці на спробу ААН прыцягнуць увагу да фізічнай навуцы: як вядома, 2005 год абвешчаны Міжнародным годам фізікі. Сярод арганізатараў кангрэса — Нацыянальнае акадэмічнае таварыства навукоўцаў Беларусі, Міністэрства адукацыі Рэспублікі Беларусь, фізічны дэпартамент універсітэта, Беларускае фізічнае таварыства і Беларускае рэспубліканскае фонд фундаментальных даследаванняў.

Генеральная Асамблея Арганізацыі Аб'яднаных Нацый аб'явіла 2005 год Міжнародным годам фізікі непадзольна: сабета апынулася 100 гадоў з таго часу, як Альберт Эйнштэйнам фізіка адукацыяныя навуковыя працы, якія аказалі асцом найбуйнейшых раздзелў сучаснай фізікі — тэорыі адноснасці, квантавай тэорыі і тэорыі броўнаўскага руху.

Поспех таго асаваў з таго часу, як Альберт Эйнштэйнам фізіка адукацыяныя навуковыя працы, якія аказалі асцом найбуйнейшых раздзелў сучаснай фізікі — тэорыі адноснасці, квантавай тэорыі і тэорыі броўнаўскага руху.

З прытанымі да фізічнай фізіцы адукацыяныя навуковыя працы, якія аказалі асцом найбуйнейшых раздзелў сучаснай фізікі — тэорыі адноснасці, квантавай тэорыі і тэорыі броўнаўскага руху.

да тагата Умова», — падкрэсліў Аляксандр Міхалевіч.

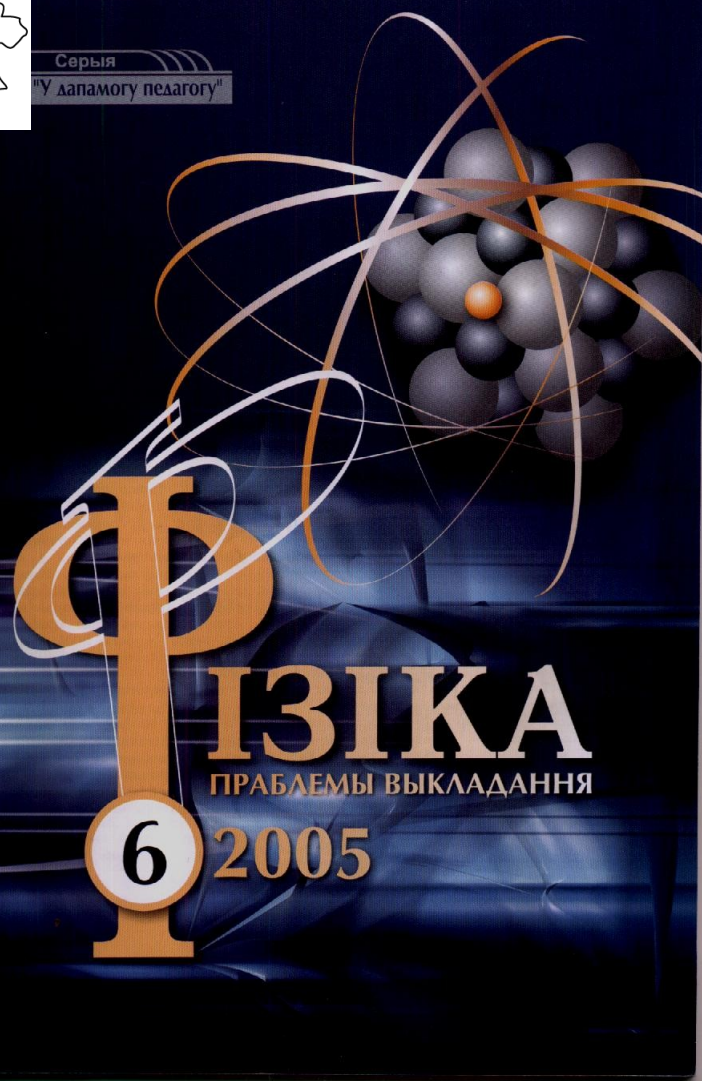
Як падкрэсліў Уладзімір Іосіфавіч Недаліка, “XXI стагоддзе было стагоддзем фізікі, а XXI стагоддзе, як мяркуецца, будзе стагоддзем інфармацыйных і біяадукацыяныя. Але навуковыя асцом іх развіцця былі аказаныя менавіта дзякуючы даследаванням у фізіцы. І ў XXI стагоддзі значэнне фізікі не памяншэнца. Гаворка ўсё сучасных навуку не можа абходзіцца без асцом акрыянасці ў галіне фізікі. Нават у медыцыне выкарыстанне найноўшых фізічных метадаў дыягнастыкі на асцом акрыянасці дазваляе акаспіраваць усё новае і новае прыродзі”.

Рашэнні будучымі навуцы непабавнае дае выхад у практыку. Так, у Інстытуце фізікі імя В.І.Сіпаева НАН Беларусі распранявалі тэхналогіі і стварэнне сістэмаў апрацоўкі звесткаў абсталявання для даследвання выкарыб медыцынскіх рэзультатаўных крыніц: стварэнне новай прабор, які прымянява апрацоўка на асцом акрыянасці іх аналзаваў, — рэзультаты стамулятар, прызначаны для лічбавых апрацоўкаў асцом акрыянасці; распранявалі развіццяныя лазерныя тэрмадынамічныя апараты; стварэнне нова асцом акрыянасці куру “Варыям”. У Інстытуце фізікі цэрагата асцом і паўправаднікаў НАН Беларусі распранявалі прымяненне для вытворчасці алмазных прылад рэзкі тэхналогіі матэрыялаў і плазмерамічных элементаў. У Інстытуце электронікі плазменнай апрацоўкі характарыстараў асцом акрыянасці крышталічных індуктарыя.

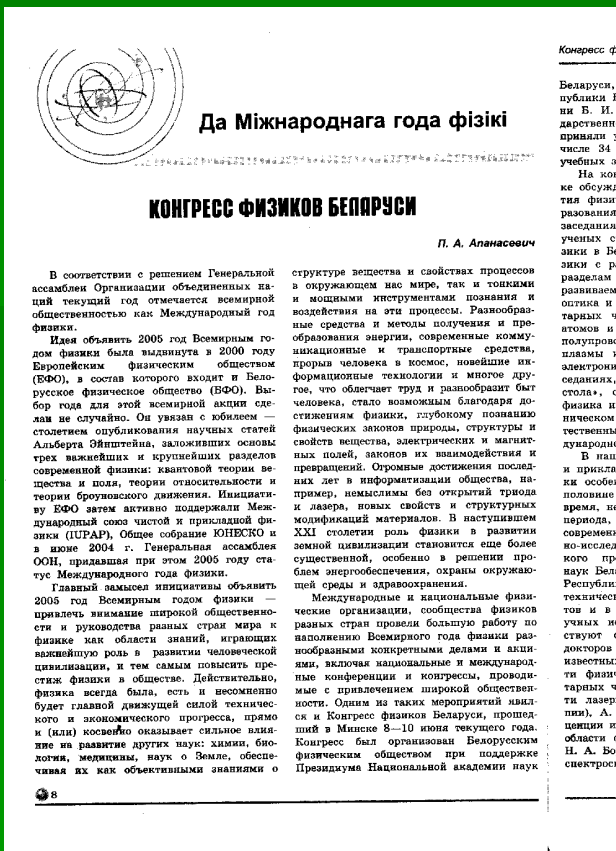
- PHYSICS: Education problems, No 3, 2005
- Evening Minsk, 16 June, 2005
- Teacher's Newspaper, 14 June, 2005



Серія
"У лапамому педагогу"



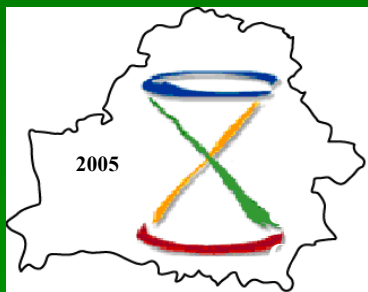
PHYSICS: Education problems



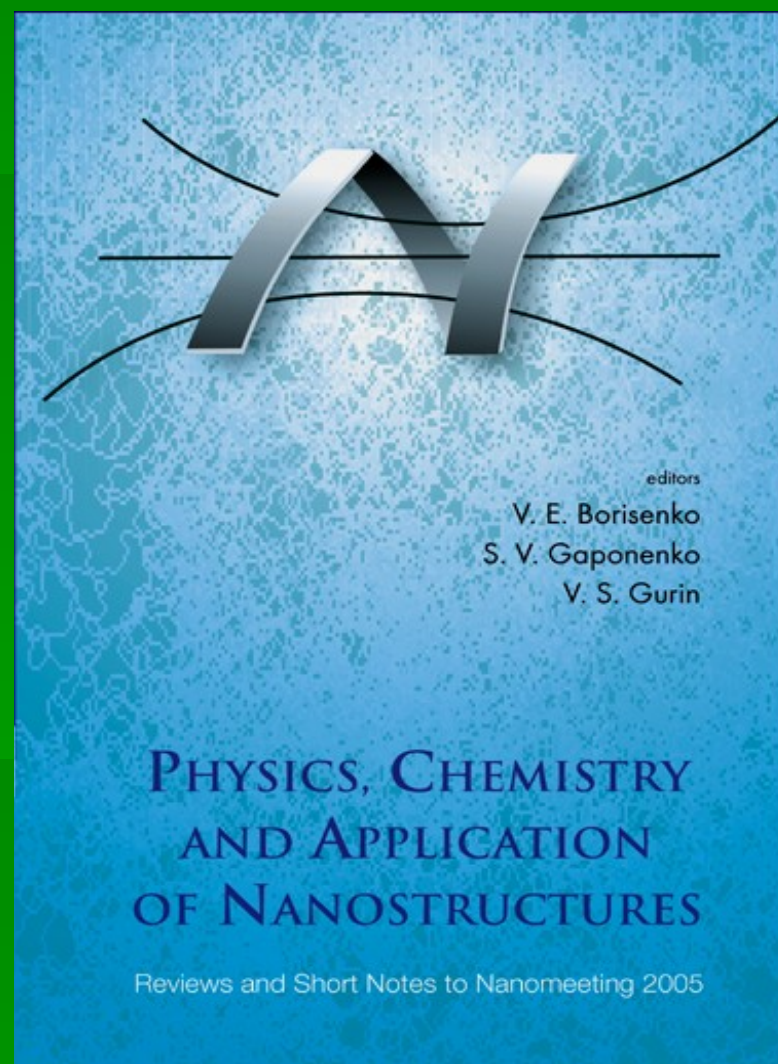
P. Apanasevich. Congress of Physicists of Belarus. Phys.: Edu.Problems No 6, 2005

Also:

*K. Farino (deputy minister). On School Physics and its Perspectives. No 4, 2005
Congress of Physicists of Belarus: Opinions of the Participants. No 5, 2005*



**International
Conference
Nanomeeting
-2005
24 – 27 May,
2005
Minsk, Belarus**





International Conference Nanomeeting-2005 24 – 27 May, 2005 Minsk, Belarus





During WYP 2005 the BPS members

took part in the emissions of the Belarusian TV devoted to Physics, among them:

- Pluses and minuses of the nuclear energetic (13.02)
- Physics for medicine (19.02)
- Enigmas of the Universe (26.02)
- From micro-electronics to nano-electronics (10.04)
- Scientific discoveries (17.04)
- Peaceful atom (29.05)
- Lasers on the way from researches to practice (24.07)
- Plasma – unusual applications and new properties (07.08)
- Nano-technology – technology of the future (14.08)
- Unusual materials for modern industry (09.10)
- Simple and complex optics (27.11)
- To the jubilee of the great discoveries (WYP2005) (11.12)



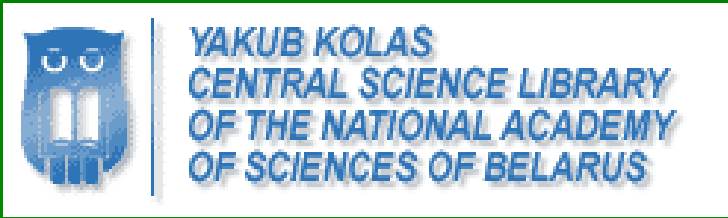
Belarusian Physical Society

has organized a series of exhibitions of the scientific and popular literature related to the International Year of Physics.

The literature was exposed at the libraries of the Institute of Physics and the Institute of Molecular and Atomic physics

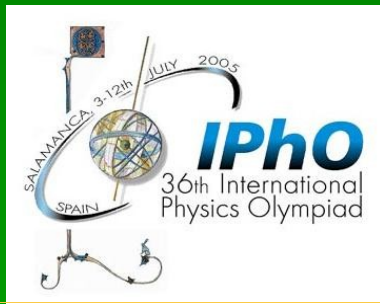
The exhibitions started at the dates corresponding to the issue dates of the famous Einstein`s papers 100 years ago, i.e.:

1. Quantum theory of radiation. Opening - January 2005 , duration approximately 1 month - 69 books and papers.
2. Brownian movement. Opening - 24 February 2005, duration 2 months - 27 books and papers.
3. Special relativity theory. Opening - 12 May 2005 . duration 4 month. 68 books and papers.



PHYSICS DAYS and an Exhibition-Presentation of scientific books from Yakub Kolas Central Science Library, devoted to the World Year of Physics 2005. Minsk, 6 December 2005

BELARUS Young Physicists in 2005



FIRSTNAME	LASTNAME	DENOMINACION	AWARD
Andrew	Gilewsky	BELARUS	Silver
Kanstantsin	Sakharchuk	BELARUS	Bronze
Maksim	Hlod	BELARUS	Mention
Dzianis	Khmialniuk	BELARUS	Mention
Andrei	Polaz	BELARUS	Mention



**International Young
Physics' Tournament**
Winterthur, Switzerland,
14-21 July 2005

IYPT FINAL RESULTS

RANK	TEAM	POINTS
1	Germany	53.4
2	BELARUS	53.3
3	USA	48.9



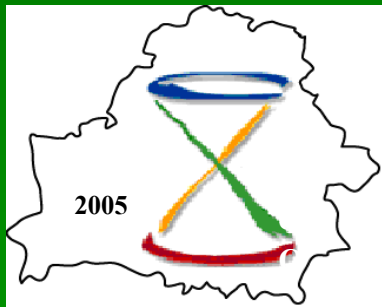
Intel International
Science and
Engineering Fair
The World's Future Scientists
and Engineers



Participants from Belarus:

- **Elena Abramova, Anna Mukhortova.** "Single waves at shallow water: a technique to determine a wave profile" (Award of the Society of Exploration Geophysicists)
- **Vladimir Kozlovskii.** "Gravitational model of changes in trajectories of relativistic jets of active galaxy nuclei"

Instead of Conclusion



Main decisions of the **1st CONGRESS OF PHYSICISTS OF BELARUS** **8-10 June 2005 Minsk**

- To highly increase activity of the physical community for popularization of Physics and Astronomy in mass media (TV, press etc.)
- To perfect the concept of the physical education from secondary to high schools including the education content, standards, manuals and education process.
- To strengthen an international cooperation of Belarusian physical institutions and universities with the European physical community at different levels, including joint projects in FP6 and FP7.
- To increase an interaction of the scientific physical community with institutions of the educational system in a development of the professional training process including physical tournaments, olympiads, special seminars etc.
- To organize in 2006 a conference “Physics and education”, and the next Congress in three years.