VAST

VIETNAM ACADEMY OF SCIENCE AND TECHNOLOGY

INSTITUTE OF PHYSICS

Introduction of Vietnam Institute of Physics and the present status of nuclear physics and applications in Vietnam

Le Hong Khiem

Contents

- An overview of Vietnam Academy of Science and Technology (VAST)
- The Institute of Physics - organization and activities
- The present status of nuclear physics and applications of nuclear technology in Vietnam and future plans

VIETNAM ACADEMY OF SCIENCE AND TECHNOLOGY

- Vietnam Academy of Science and Technology (VAST) was established according to the Government Decision in 1975.
- VAST is the scientific institution under the direct management of the Government.

- The missions of VAST are to **organize and implement** the natural science and technology research activities according to the key directions defined by the State.
- The objectives of which are to **better serve the country's policy** in science and technology development for the most benefit of the society in general and of science & technology in particular.

VAST has the following functions and rights:

- To participate in **mapping out of the strategy** in order to develop the natural sciences and technology.
- **To propose the national science & technology programs** and to direct their implementation as required by the State.
- **To organize the research activities** of natural sciences and technology, the activities of implementation, application and transfer of the research results into the production processes.
- To realize general research of the natural resources, the natural and environmental conditions **as scientific background** to plan the socio-economical development of the country.
- To participate in **planning the policy** of science, technology, education and training.
- **To prepare the qualified manpower** for the country in the fields of science and technology.
- To participate in the **evaluation and approval of the large and important projects.**
- **To carry out the international cooperation** in science and technology.

NATIONAL INSTITUTES OF VAST

	**1. Institute of Mathematics** Address: 18 Hoang Quoc Viet Road, Building A5, Cau Giay, Hanoi, Vietnam
	**2. Institute of Physics** Address: 18 Hoang Quoc Viet Road, Building 2H, Cau Giay, Hanoi, Vietnam
	**3. Institute of Chemistry** Address: Building A18, 18 Hoang Quoc Viet, Cau Giay, Hanoi, Vietnam

	**4. Institute of Mechanics** Address: 264 Doican, Badinh, Hanoi, Vietnam
	**5. Institute of Ecology and Biological Resources** Address: 18 Hoang Quoc Viet road, Cau Giay district, Hanoi
	**6. Institute of Natural Products Chemistry** Address: Building 1H, 18 Hoang Quôc Viet, Cau Giay, Ha Noi

NATIONAL INSTITUTES OF VAST

	**7. Institute of Geography** Address: A27 Building - 18 Hoang Quoc Viet Road – Cau Giay District – Ha Noi
	**8. Institute of Geological Sciences** Address: 84 Chua Lang – Dong Da – Hanoi – Vietnam
	**9. Institute of Geophysics** Address: Building A8 - 18 Hoang Quoc Viet, Cau Giay, Hà Noi

	**10. Institute of Oceanography** Address: 1 Cau Da, Nhatrang, Khanh Hoa, Vietnam
	**11. Institute of Marine Environmental and Resources** Address: N0 246 Da Nang Street, Hai Phong Citty, Viet Nam
	**12. Institute of Marine Geology and Geophysics** Address: A27 Building, 18 Hoang Quoc Viet Road, Ha Noi, Vietnam

NATIONAL INSTITUTES OF VAST

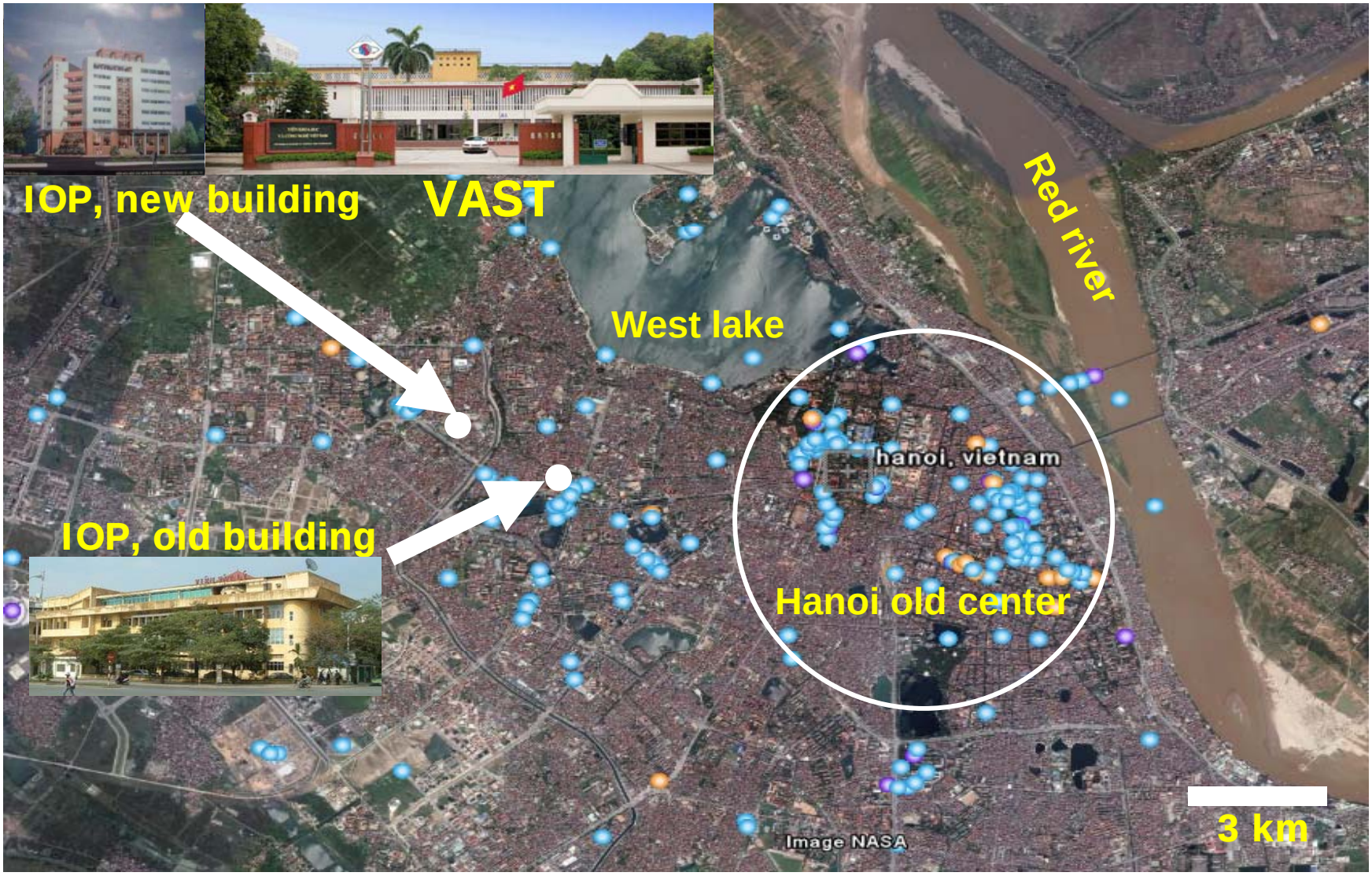
	**13. Institute of Energy Science** Address: Building A9 – No.18 Hoang Quoc Viet street - Cau Giay district - Hanoi
	**14. Institute of material Sciences** Address: 18 Hoang Quoc Việt, Cau Giay, Ha Noi
	**15. Institute of Information Technology** Address : A3 - 18 Hoang Quoc Viet Rd., Cau Giay Dist., Hanoi, Vietnam

	**16. Institute of Biotechnology** Address: Building A10, 18 Hoang Quoc Viet - Cau Giay – Ha Noi
	**17. Institute of Environmetal Technology** Address: A30 Building, 18 Hoang Quoc Viet Road, Cau Giay District, Hanoi, Vietnam
	**18. Institute of Chemical Technology** Address: 01 Mac Dinh Chi Street, District 1, Ho Chi Minh City

NATIONAL INSTITUTES OF VAST

	**19. Vietnam Space Technology Institute** Address: No 18, Hoang Quoc Viet Road, Cau Giay District, Hanoi, Vietnam
	**20. Institute for Tropical Technology** Address: No. 18, Hoang Quoc Viet Road, Cau Giay District, Hanoi, Vietnam
	**21. Institute for Applied Informatics and Mechanics** Address: 291 Dien Bien Phu, Ward 7, Dist. 3, HoChiMinh City
	**22. Institute of Tropical Biology** Address: 9/621 Ha Noi Highway, Linh Trung Ward, Thu Duc Dist., Ho Chi Minh City, Vietnam
	**23. Institute of Applied Material Sciences** Address: 01 Mac Dinh Chi Street, District 1, Ho Chi Minh City
	**24. Nhatrang Institute of Technology Research and Application** Address: 02 Hungvuong St., Nhatrang City, Vietnam
	**25. Dalat Institute of Biology** Address : Dalat City, Lam Dong, Vietnam

Institute Of Physics (IOP)



INSTITUTE OF PHYSICS (IOP)

- Brief Introduction to IOP
- Research Directions
- Postgraduate Programs
- Scientific Activities

Main building of IOP

Center for Nuclear physics

Center of theoretical physics

INSTITUTE OF PHYSICS

- The IOP was established by the Government in 1969.
- In1993, the institute was divided into two institutions : the current IOP and the current Institute for Material Sciences.
- By the end of 2009, the IOP has a staff of 216 including 8 full professors, 12 associate professors and 46 PhDs.

INSTITUTE OF PHYSICS

- The IOP is responsible for both fundamental and applied physics.
- The principle tasks :

- **Carrying out fundamental research** of theoretical physics, condensed matter physics, nuclear physics, environmental physics, applied physics and others;
- Transferring new technologies;
- Forming the nucleus of an advanced g**raduate program** in physics, and to work with other universities of the country in creating a top level physics graduate curriculum;
- Establishing the fruitful **international collaborations** on physical science;
- Providing a **forum for scientific contacts** between Vietnamese physicists and their colleagues around the world.

INSTITUTE OF PHYSICS

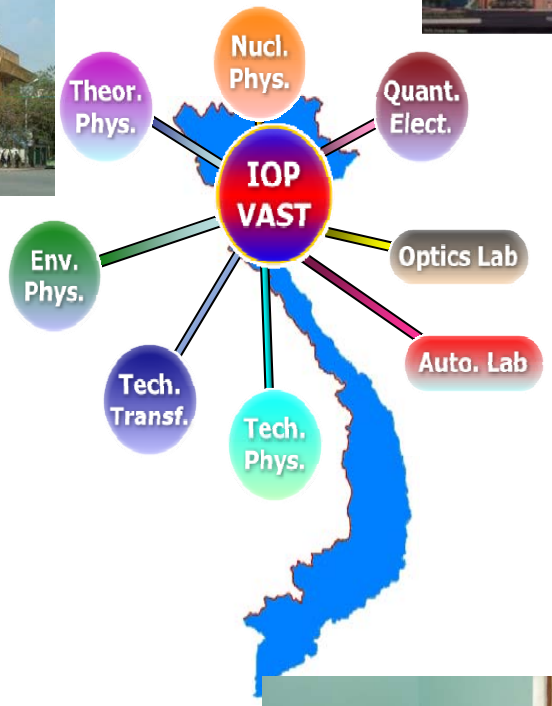
6 centers :

- Center for Theoretical Physics
- Center for Quantum and Electronics
- Center for Nuclear Physics
- Center for Environmental Physics
- Center for Technical Physics
- Vietnamese-Ukrainian Cooperative Center for Technology Transferring

3 laboratories :

- Laboratory of Automation
- Laboratory of computing
- Laboratory of Electronic Optics

Graduate school offers a master course and PhD course in various fields of physical science.



Center for Theoretical Physics

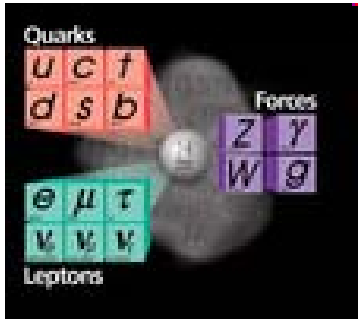
Theoretical Physics

- High Energy Physics
- Quantum Physics
- Condensed Matter Physics
- Computational and Soft Matter Physics

Center for Theoretical Physics

High Energy Physics :

- Particles Physics
- Standard Models, Supper symmetry
- Dark Matter
- Mathematics-physical Methods

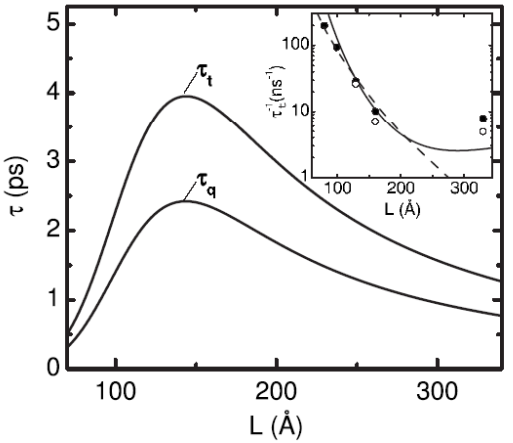


Center for Theoretical Physics

Condensed Matter Physics

- Nanostructures: disordered, coherent nonlinear effects, transport
- Electron-phonon interaction
- Strongly correlated electrons: phase transition, transport

PHYSICAL REVIEW B 77, 125335 (2008)



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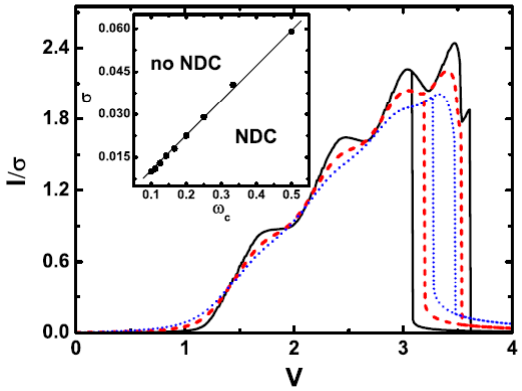
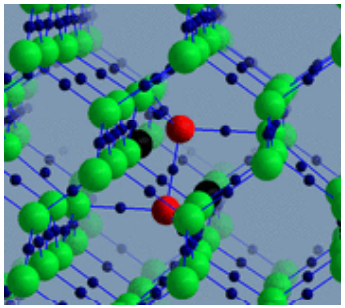
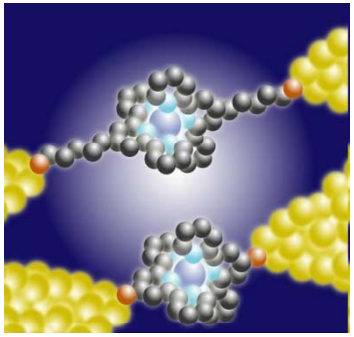


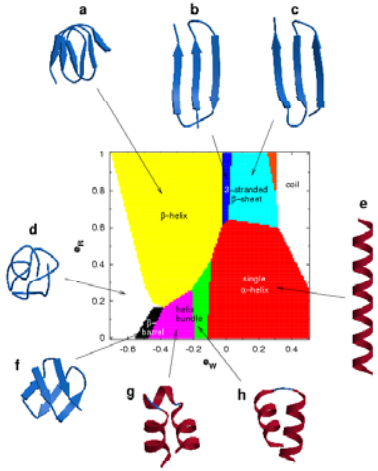
Center for Theoretical Physics

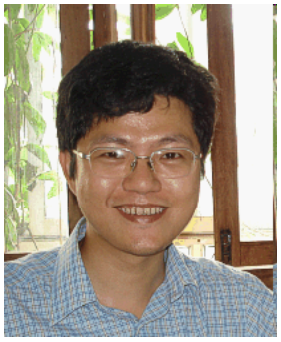


Computational & Soft Matter Physics

- Electronic structure of nano semiconductors: Tight-binding, Hartree-Fock calculations
- Electronic transport: Monte-Carlo simulation
- Protein folding, bio-physics



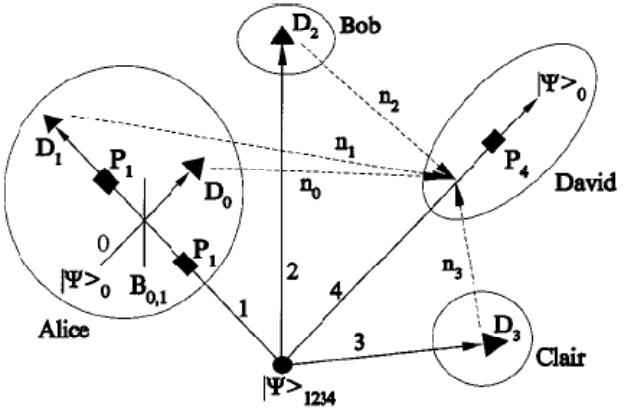




Center for Theoretical Physics

Quantum Physics

- Quantum information
- Teleportation of coherent states



Center for Nuclear Physics

Director : Le Hong Khiem

International Cooperation:

- DUBNA
- ORSAY
- POHANG
- RIKEN
- CNS (the University of Tokyo).

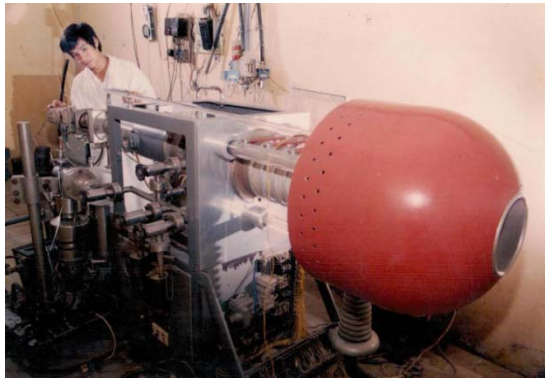
Main topics:

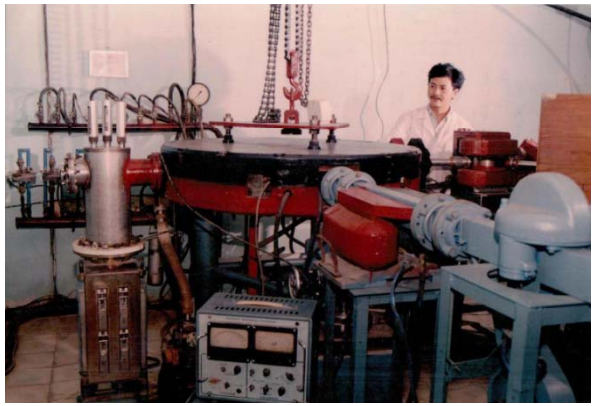
- Nuclear reaction using 2.5 GeV electron beam
- Nuclear reaction using 27 MeV electron beam
- Nuclear reaction using RIBs
- Applied nuclear physics (radioactivity, XRF,…)

Center for Nuclear Physics

Main facilities:

- Accelerator MICROTRON MT-17
- Isotopic neutron sources
- HP(Ge), X ray, Neutron and β - detectors





Center for Nuclear Physics

Current Research Programs

1) Studying the isomer states using low energy electron beam in collaboration with Joint Institute for Nuclear Research at DUBNA, Russia (T.D.Thiep's group).

2) Studying the isomer states using high energy electron beam in collaboration with POHANG in South Korea (N.V.Do's group).

3) Studying the structure of exotic nuclei using RI beam (L.H.Khiem's group) in collaboration with Japanese institutions such as CNS, RIKEN.

Center for Nuclear Physics - Current Research Programs

1. *Photofission and Photonuclear Reactions:*

(In collaboration with Flerov Laboratory of Nuclear Reactions, JINR Dubna, Russia)

a. Photofission

- Study of the isomeric ratio in fragment ^{135}Xe produced in photofission of heavy elements ^{233}U, ^{238}U, ^{237}U, ^{232}Th, ^{243}Am and ^{248}Cm.

The study of the isomeric ratio allows to obtain important information about the dependence of the level density on angular momentum and probabilities of radiation transitions between the levels. Simultaneously the study on the isomeric ratio in fission fragments allows to discuss about the characteristics of the fission process, in part the role of different kinds of collective movement, affecting on the increasing the angular momentum of fragments at the scission moment of fissioning nuclei.

- Study of rare modes of radioactive decay in fission fragments: delay multineutron, decay of high spin isomeric states of fission fragments.

b. Photonuclear reaction

- Study of the isomeric ratios in photonuclear reactions in the DGR region. This study furnish valuable information about the energy level structure of nuclei and nuclear reaction mechanism involved. In the case the electromagnetic interaction between photon and nuclei is well known leading to theoretical calculations more simplified. We have investigated different photonuclear reactions as (γ,n), (γ,p), $(\gamma,2n)$, (γ,np). The attentions have been paid on the isomeric states with high spin.

Center for Nuclear Physics - Current Research Programs

2. Study of Nuclear Spectroscopy and Nuclear Data at Electron Accelerators in the energy range from 15 MeV to 2.5 GeV:

(In collaboration with Pohang Accelerator Lab.)

This collaboration initiated by

- Prof. Won Namkung, since 2000-present.

Type of collaboration

- Vietnamese research group led by Prof. Nguyen van Do (ACFA member: 1998-2004) and Korean colleagues have done common experiments at PAL, and the data processing will be carried out in Hanoi and Pohang.

Fields of study

- Study of Isomeric Ratios by Using Bremsstrahlung Photons.
- Study of Thermal Neutron Cross-sections and Resonance Integrals by Neutron Activation Method.
- Study of Complexity Nuclear Reactions (Spallation, Fission, Fragmentation,..) Induced by High Energy Bremsstrahlung Photons and Neutrons from 2.5 GeV Electron Linac

Main results

- Common publications
- Education and training young Vietnamese physicists.

Center for Nuclear Physics - Current Research Programs

3. Study of Charge Exchange Reaction using accelerator

(in collaboration with RCNP, Osaka, Japan)

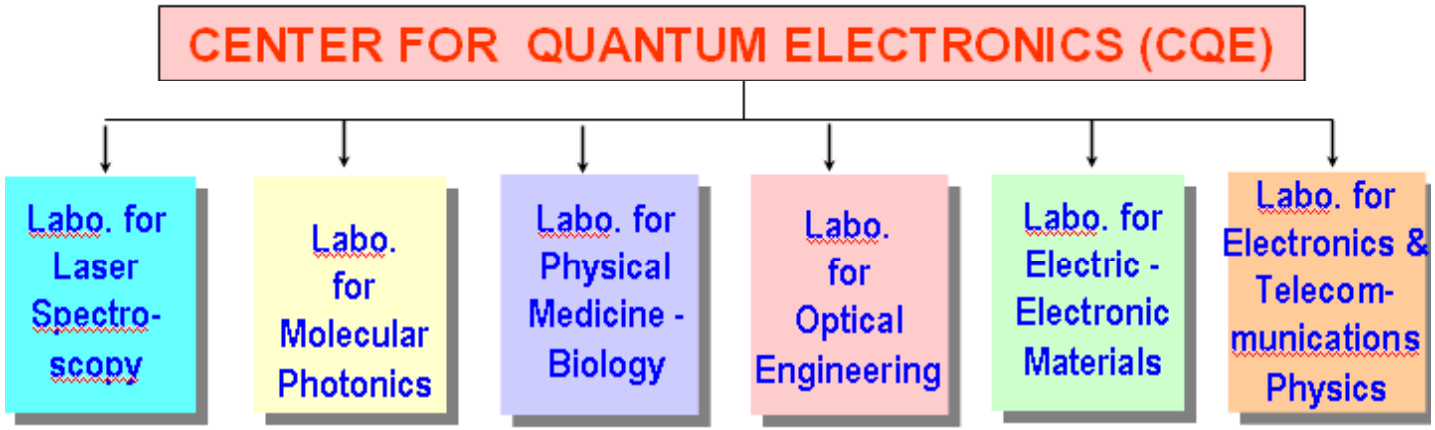
Charge exchange reaction of (^{3}He,T) are being studied. The advantages of this reaction type are that they can be used for accessing GT transitions at higher energies without Q-value limitation, especially when performed at intermediate incident energies above 100 MeV/nucleon and at angles around 0 degree they can be used as a means to map GT strengths over a wide range of excitation energies.

4. Study of Nuclear Reactions with Heavy Ions

(in collaboration with CNS, the University of Tokyo and RIKEN, Japan)

- This program was initiated by Professor S.Kubono at CNS since 2005 in order to help the young Vietnamese nuclear physicists.
- Study of nuclear reactions of astrophysical interest induced by proton rich radioactive beam using Japanese accelerators. Recently, we have performed ^{21}Na(alpha,p)^{24}Mg reaction using RIKEN AVF accelerator and CRIB spectrometer of CNS. The data analysis is now in progress. Another ^{22}Mg(alpha,p)^{25}Al is now under discussion and the proposal should be submitted to PAC in this year.

Center for Quantum and Electronics

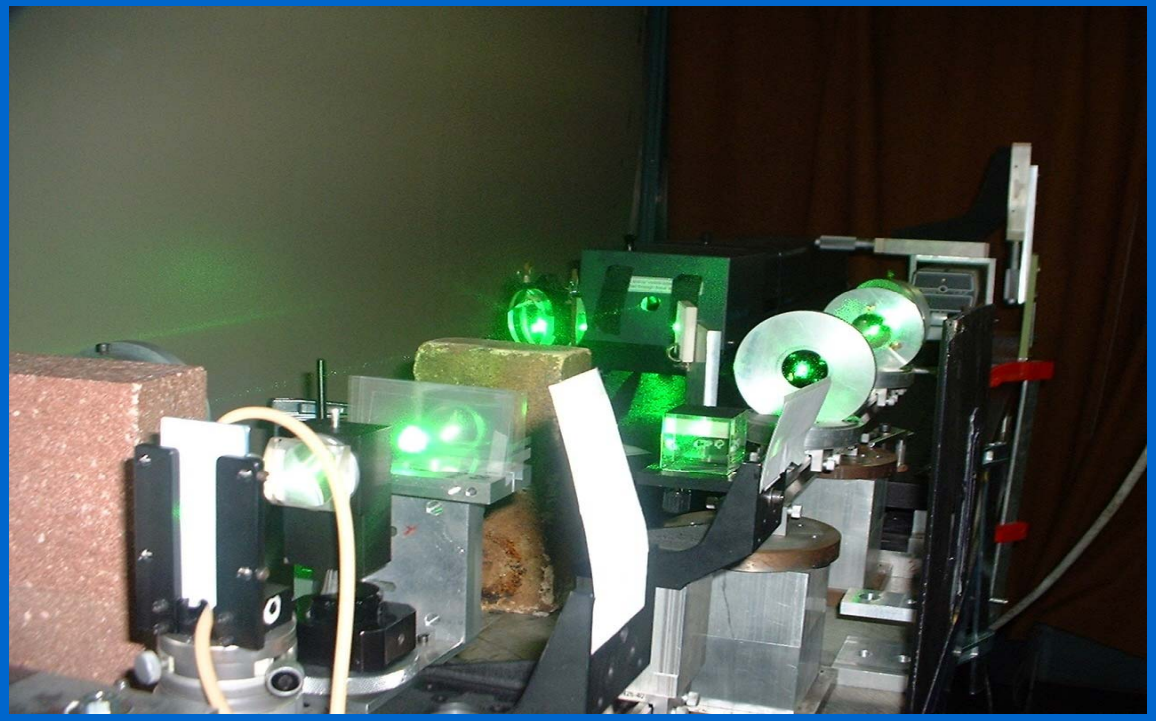


Main Research topics:

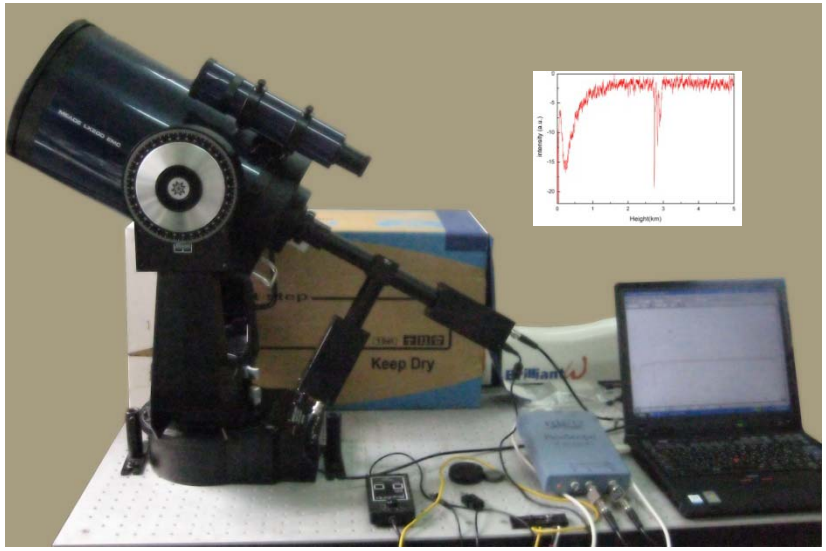
- Photonics
- Physics & technology of coherent light sources
- Physics & Technology of LIDAR for Atmospheric study
- Interaction between laser light and materials
- Laser spectroscopic methods
- Biophysics, Medical physics

Laboratory of Laser Spectroscopy

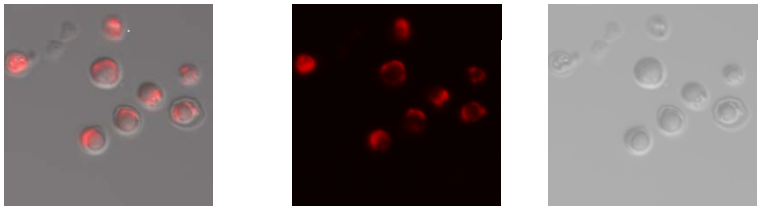
- ***Measurement of optical properties of materials.***
- ***Laser Diagnostics of combustion processes,***
- ***Laser spectroscopy (Raman, fluorescence, LIF …)***
- ***Physics & Technology of LIDAR for Atmospheric study***
- ***Application of NanoParticle in Bio-Medical***
- ***Biophysics, Medical physics...***



Laboratory of Laser Spectroscopy



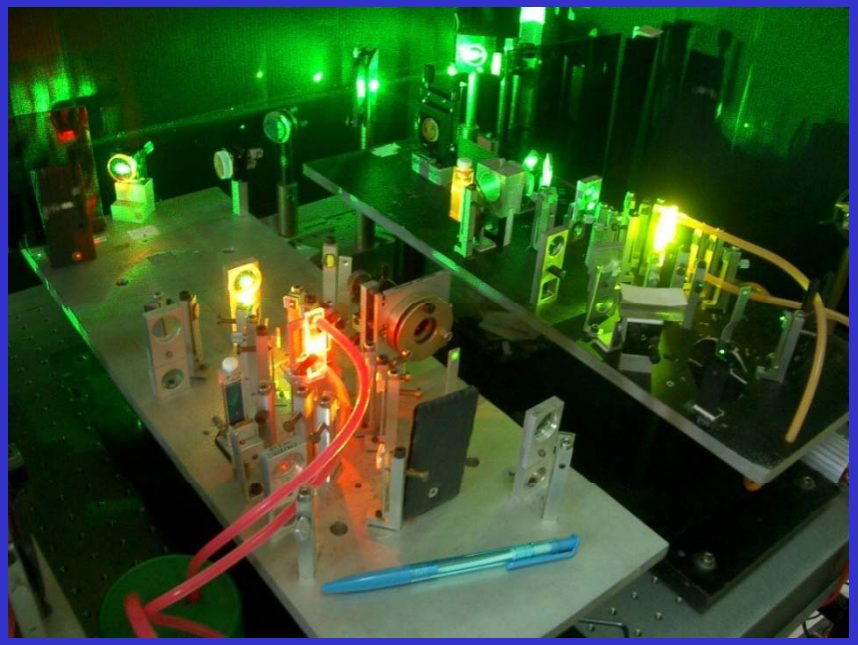
Lidar System



Synthesis of gold nano-particles

Laboratory of Molecular Photonics

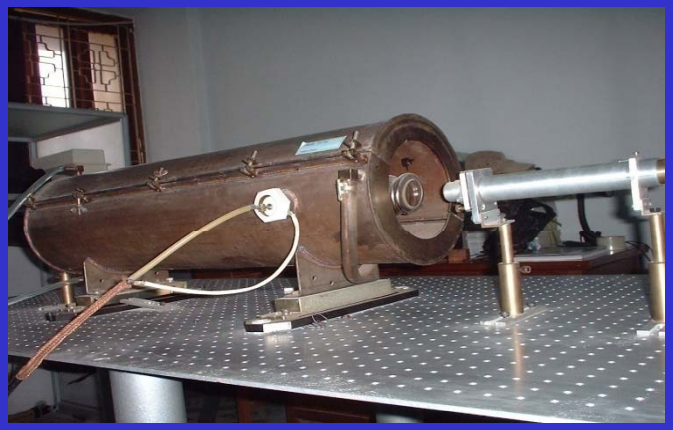
- ***Molecular Laser Physics and technology***
- ***Physics and technology of ultra-fast lasers***
- ***Time-resolved laser spectroscopy***
- ***Waveguide laser resonators and DFB thin film lasers***
- ***Measurement of optical and laser parameters***
- ***Solid state dye lasers***
- ***All solid state ultrafast Lasers***

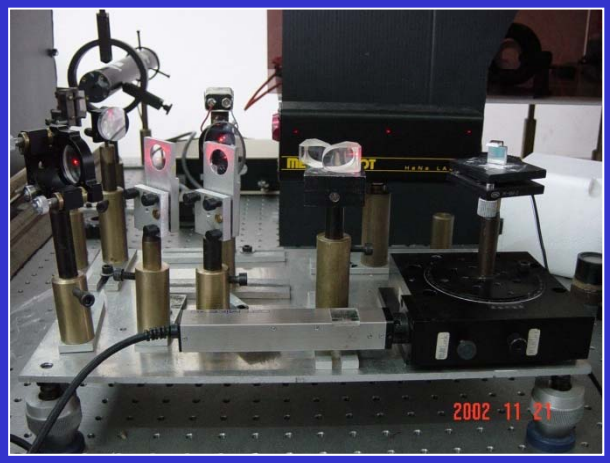


Picosecond $Nd^{3+}:YVO_4$ laser

Laboratory of Physical Medicine - Biology

- ***Phototherapy***
- ***Bio-Molecular Laser spectroscopy***
- ***Laser Projector Microscopy***
- ***Laser applications in Medicine***



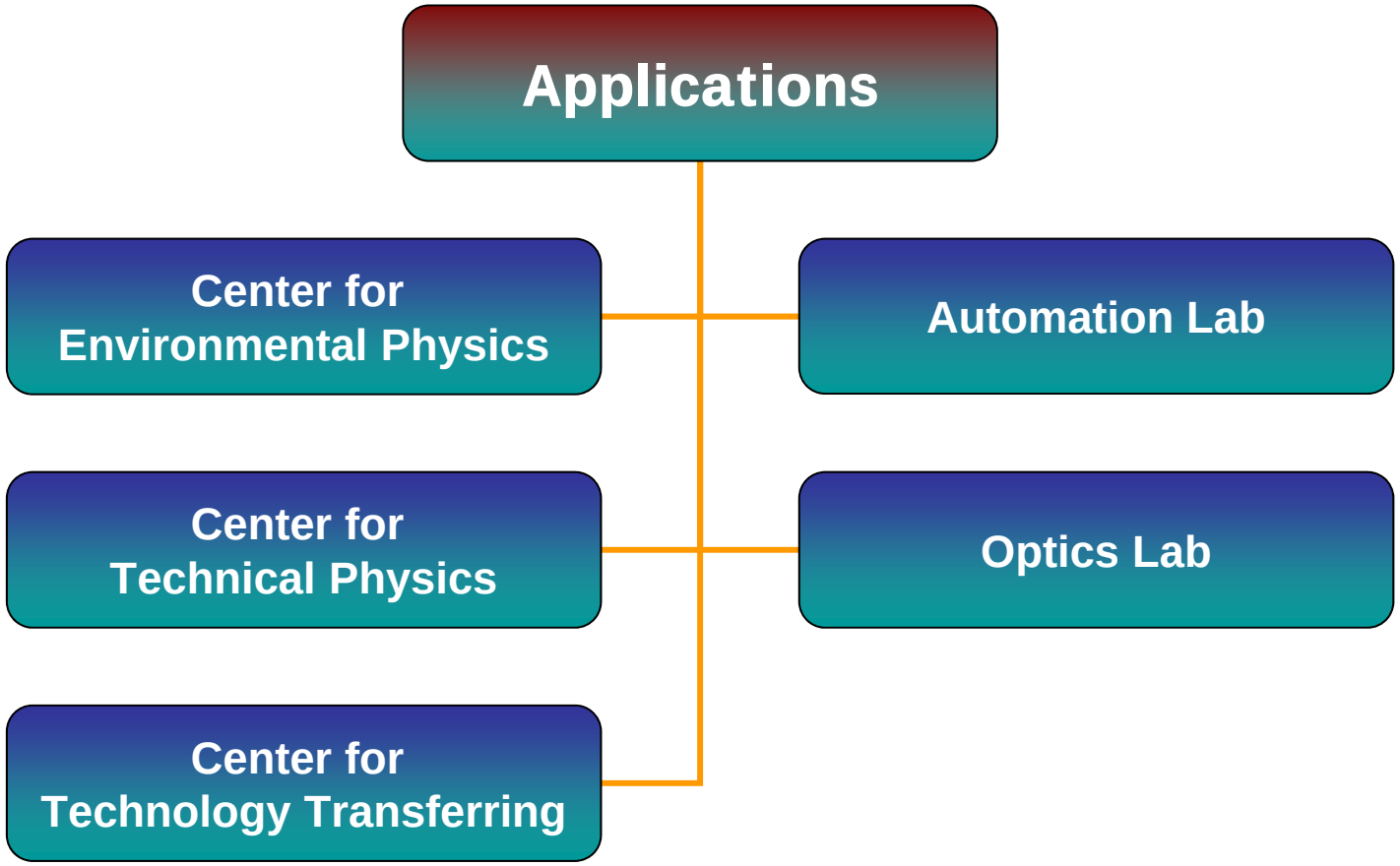


Laboratory of Electric - Electronic Materials

- ***Physics and Fabrication of Photonic and Electronics Materials***
- ***Photonic and electronic devices & components***

Laboratory of Electronic Physics &Telecommunication

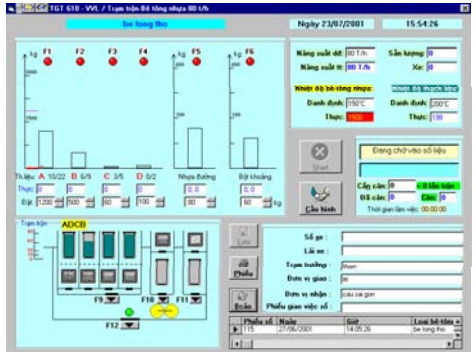
- ***Electronic physics***
- ***Telecommunication techniques***


Applications
Center for Environmental Physics
Automation Lab
Center for Technical Physics
Optics Lab
Center for Technology Transferring

Applications

Automation

- Measurement, control & analytic methods
- Signal processing controller, micro-controller, PSoC, FPGA
- Instrumentation physics and automation



Applications

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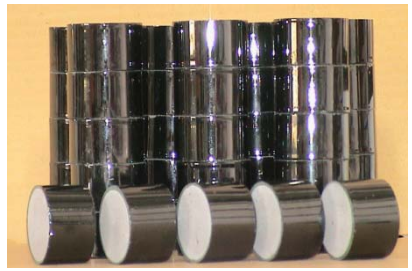
Technical Physics:

Design and manufacturing of medical instruments

Applications

Electric Materials:



- Lightning varistor ZnO
- Cellulose nano-composite Materials

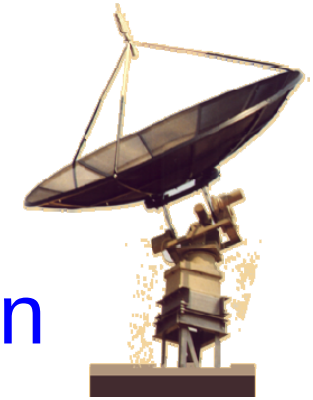
Applications

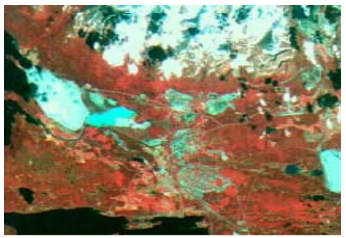
Enviroment apparatus:

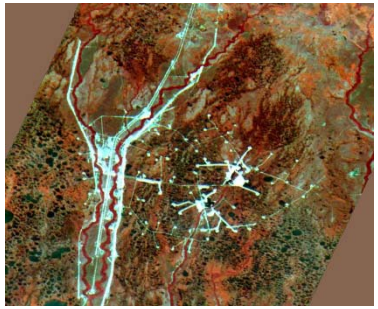
- Waste water treatment
- Application in hospitals

Applications

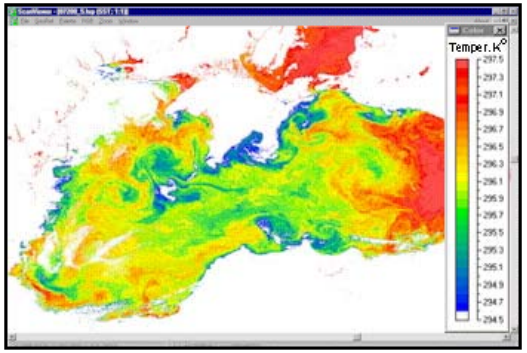
Environment:







- Scanex Satellite station
- Image processing



Applications

Optics:

- Design of telescope, microscope, night vision
- Cameras
- Application in security, defence

Graduate School of Physics

- **The graduate school in physics is organized jointly with the Vietnam National University of Education in Hanoi.**

- **Master program: 25 students / year**
- **Ph.D. program: 5-10 students/year**

Annual Schools

- Vietnam school on Phys.
- School on SMP
- School on Photonics
- School on Nuclear Physics

SCHOOL & WORKSHOP ON SIMULATION AND MODELING PHYSICS

Site of School & Workshop:

Institute of Physics and Electronics
10 Dao Tan, Ba Dinh, Hanoi, Vietnam.

Contact address:

School & Workshop on SMP
Institute of Physics and Electronics
10 Dao Tan, Ba Dinh, Hanoi
Phone: (84 4) 766 0220, (84 4) 766 2107

6th School on Simulation and Modeling Physics (Hanoi, November 27-29, 2007)

5th School & 4th Workshop on Simulation and Modeling Physics (Hanoi, November 22-23, 2006)

4th School on Simulation and Modeling Physics (Hanoi, December 22-23, 2005)

3rd School & 3rd Workshop on Simulation and Modeling Physics (Hanoi, December 1-3, 2004)

2nd School on Simulation and Modeling Physics

14th Vietnam School of Physics

13rd Vietnam School of Physics

[IPE Homepage]

Organizer:

Institute of Physics and Electronics (IPE)
(http://www.iop.vast.ac.vn/activities)

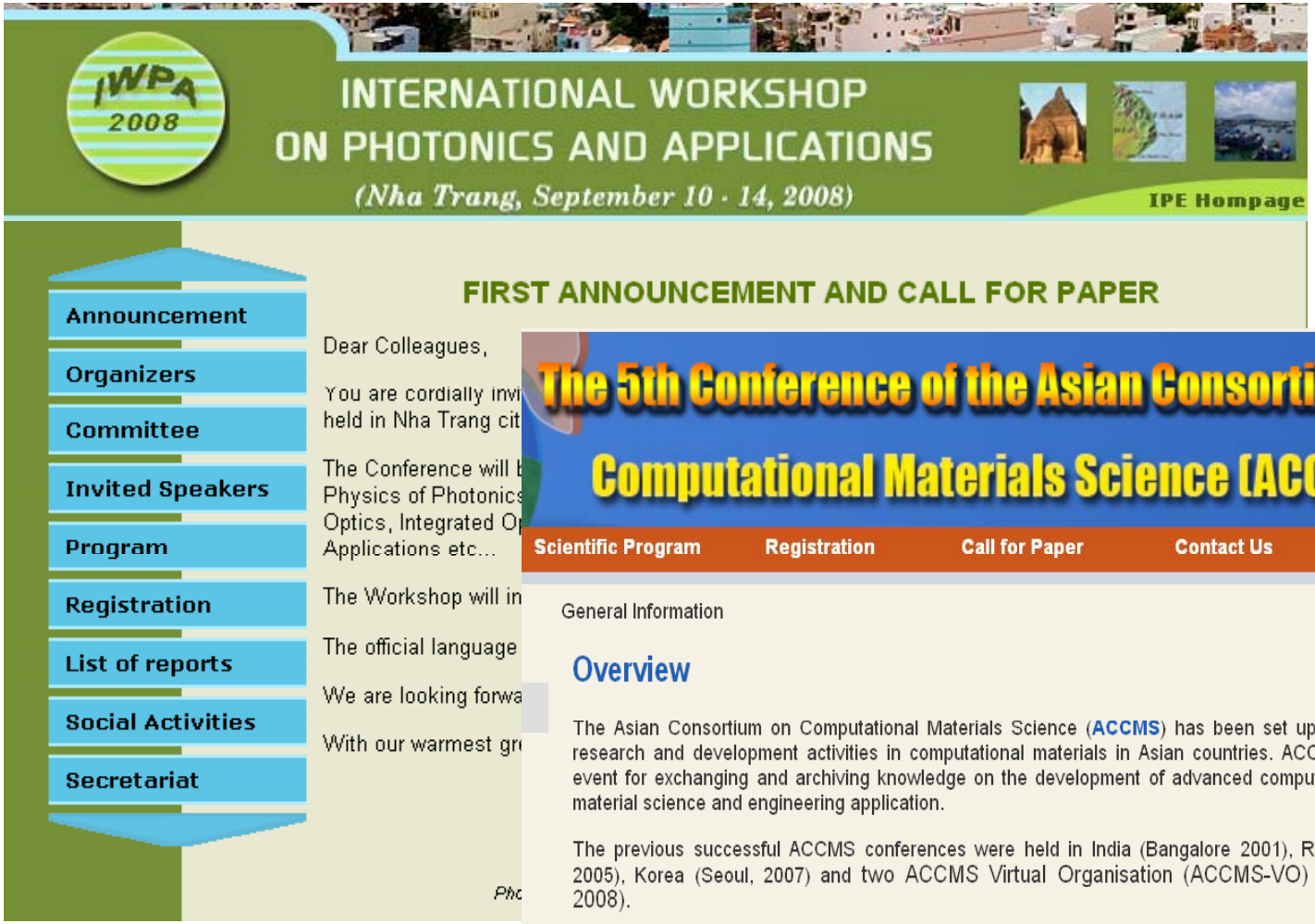
Lectures:

- Prof. Dr. Jean - Claude Brochon (Cachan University, Paris, France).
- Dr. Marie Pierre Fontaine Aupart (Paris-11 University, France).
- Prof. Dr. Jean Pierre Schermann (Paris- 13 University, France)
- Dr. Emeric Frejafon (INERIS-DRC-AIRE, France)

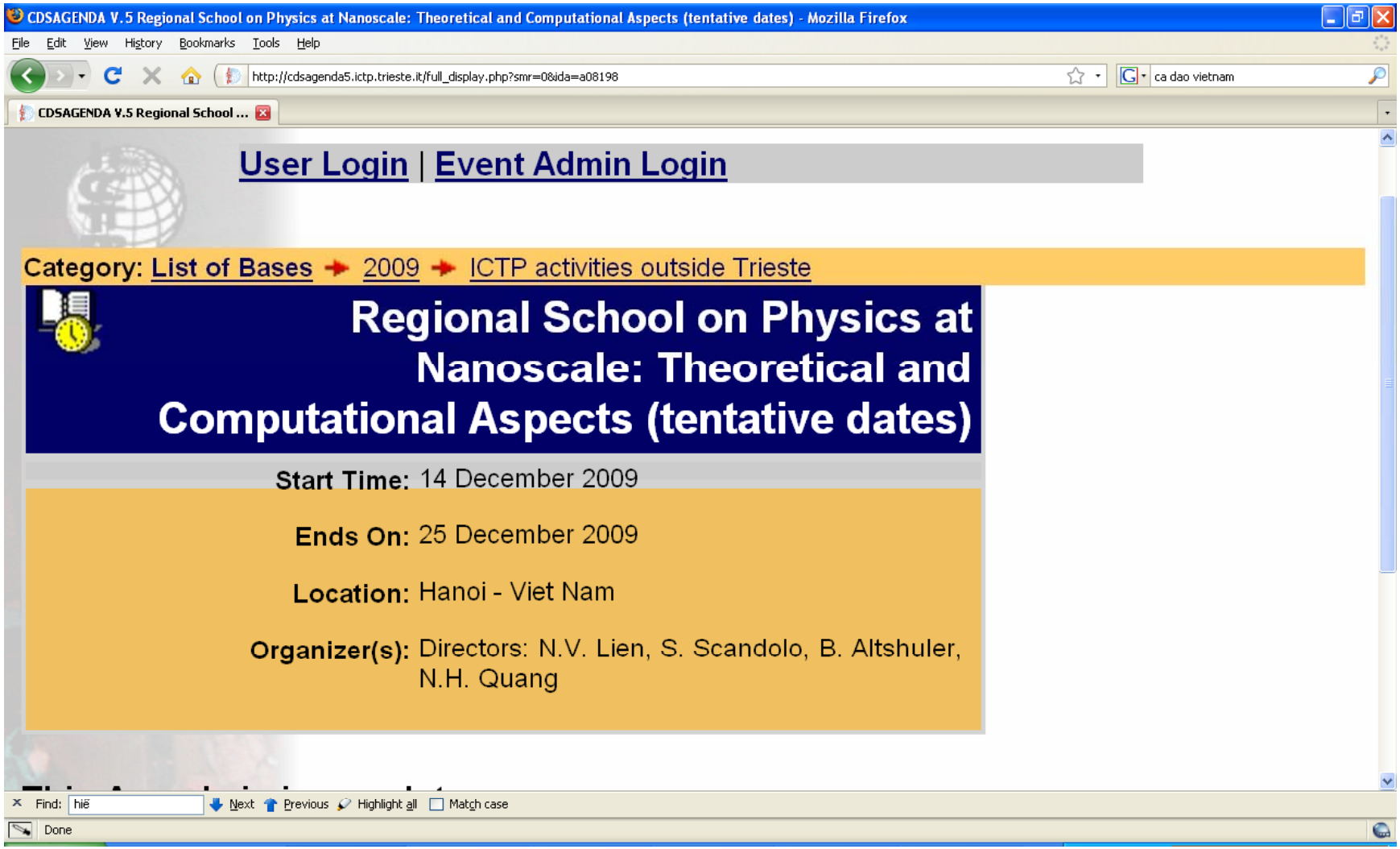
Topics:

1. Dr. Marie Pierre Fontaine Aupart
   - HELP TO DIAGNOSIS BY FLUORESCENCE IMAGING OF CYTOLOGIC SLIDES
2. Prof. Dr. Jean Claude Brochon:

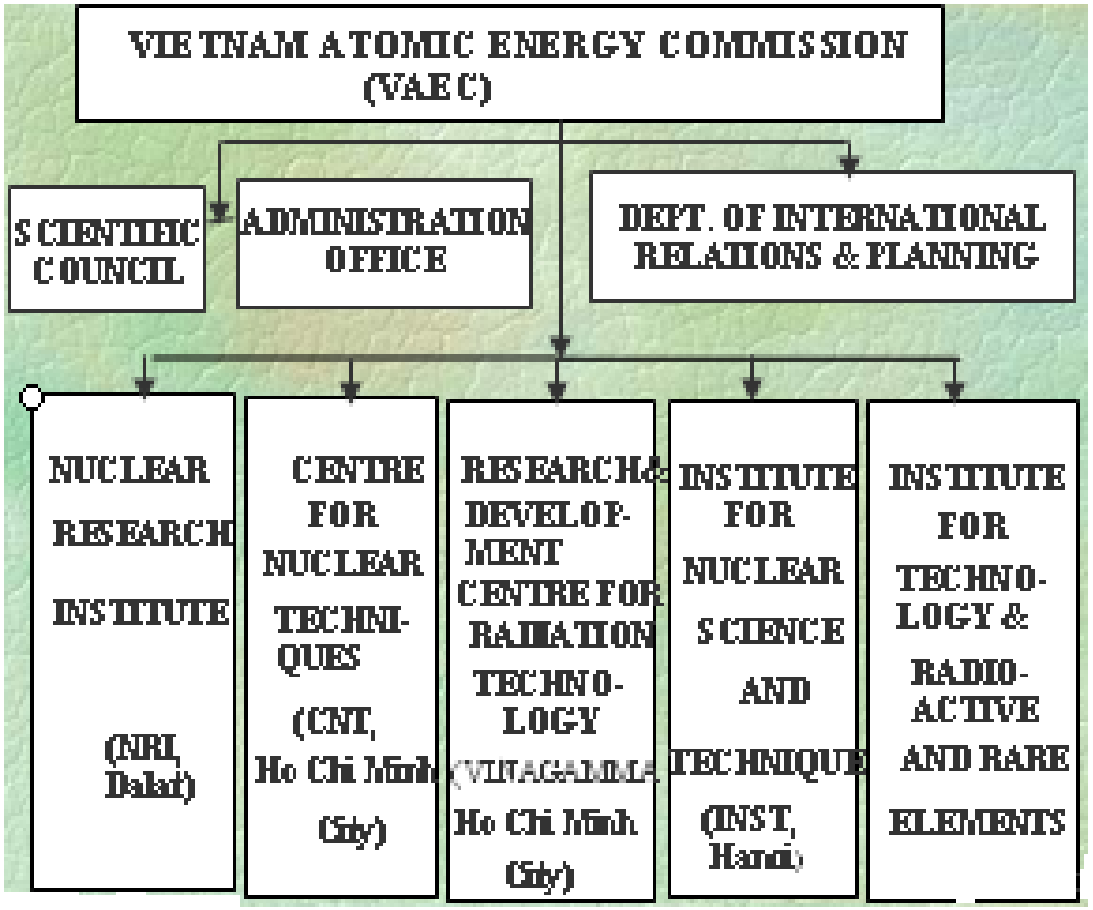
International Conferences



ICTP's school in 2009



VIETNAM ATOMIC ENERGY COMMISSION



INSTITUTE FOR NUCLEAR SCIENCE AND TECHNOLOGY

The Institute has function to carry out research and development for peaceful uses of nuclear power and nuclear techniques in different branches of the National Economy of Vietnam.

- Center for Nuclear Power

  -Defining the nuclear share in national power supply

  -Evaluating the economic and technical viability of a national nuclear power development program

  -Conducting of nuclear safety analysis

  -Studying of nuclear power technologies

  -Participating in study of strategy for development of nuclear technique and nuclear power in Vietnam

- Center for Application of Nuclear Techniques

  -Non- destructive Testing (NDT) for metallic and non- metallic materials using gamma and X - ray radiography, Ultrasonic, Eddy current and other techniques. Field of activities: oil - gas, civil construction, transport industries ...

  -Nuclear analysis: neutron and gamma activation, X - rays fluorescence analysis, gamma spectrometry, Solid state track detector technique

- Center for Basic Research and Computation

  -Development of intranet and computer networking support for Nuclear study and related topics.

  -Establishment and Administration of the INST 's Network.

  -Application Training, research, development and services in Informatics technology.

  -To carry out fundamental research on theoretical nuclear physics, radiation material science and plasma physics.

  -To carry out education of post-doctors in professions on theoretical physics and nuclear-atomic physics.

DALAT NUCLEAR RESEARCH INSTITUTE

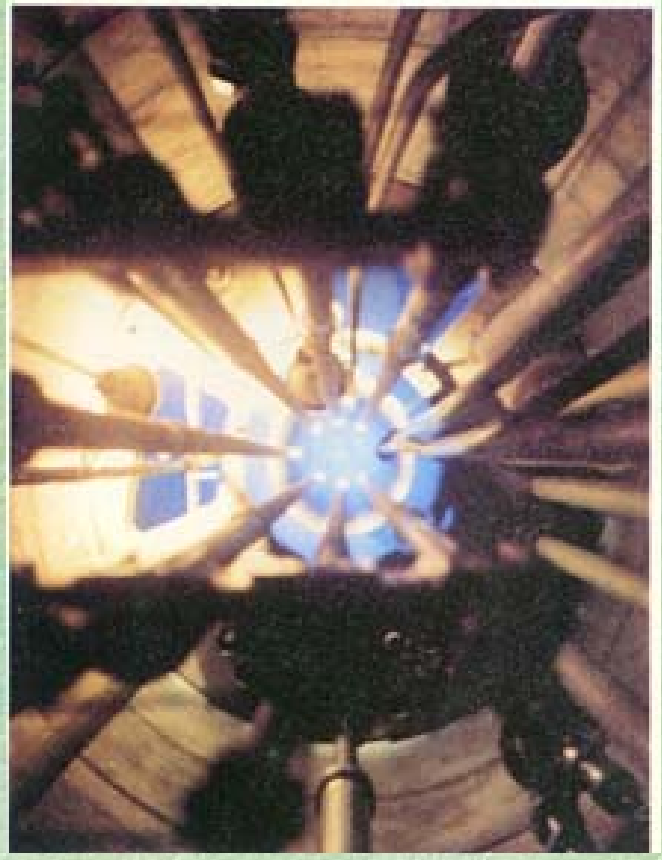
- The reactor was built in 1960 but stopped working in 1968 and its fuel bars were removed and transferred to the US during 1974-75. It was restored in 1982 with assistance from the former Soviet Union and the International Atomic Energy Agency and started operating on March 20, 1984.
- It has served research on nuclear and neutron physics as well as on nuclear applications.
- The nuclear reactor is unique of its kind in the world : Russian design core and control system harmoniously integrated into the left-over infrastructure of the former American-made Triga Mark II research reactor.

Dalat Nuclear Research Institute

- **Reactor characteristics**
- Reactor type: pool-type, water-cooled, water-moderated
- Nominal power: 500 kW thermal
- Fuel elements: hexagonal, Russian-standard type VVR-M2, U-Al alloy, 36% U-235 enrichment
- Actual core loading: 89 fuel elements (3576 g U-235)
- Reflector: berylium (25 kg) and former Triga graphite reflector
- Thermal neutron flux at 500 kW
- at central neutron trap: 2.1×10^{13} n.cm^{-2}.s^{-1}
- in active core: 4.0×10^{12} n.cm^{-2} . s^{-1}
- at rotary rack: 3.0×10^{12} n.cm^{-2} . s^{-1}

Dalat Nuclear Research Institute

Since 1984 the reactor has been extensively used for



- Research on fabrication procedure & production of radioisotopes
- Neutron activation analysis
- Exploitation of horizontal beam tubes
- Research & development in reactor physics and engineering
- Training of personnel
- Other application: silicon doping, fabrication of XRF excitation source (Ge-71)etc.

Dalat Centre for Applications of Nuclear Technique in Industry

- Centre for Applications of Nuclear Technique in Industry is the State Organization under Vietnam Atomic Energy Commission. The CANTI was established as the Self-reliance institution separated from the Nuclear Research Institute. Application of Nuclear Technique in Petroleum Industry is one of main goals of CANTI. The Tracer Laboratory of CANTI has implemented a lot of field services successfully, particularly in oil production.

- **The main applications/services in oil field carried out by CANTI are as follows:**

  Interwell Tracer Test in Water Flooding Investigation;
  Single Well Tracer Test for Determination of Injectivity in Injection Well;
  Determination of Residual Oil Saturation by Interwell and Single Well Tracer Test;
  Flow Rate Measurement;
  Residence Time Distribution Study;
  Leak Test;
  Corrosion Rate Monitoring in the pipe by Thin Layer Activation Technique;
  Manufacture and installation of the Well Head Sampler;
  Determination of the Origin of Produced Water by Tracer, Hydro-geochemistry and Stable Isotopes;
  Modeling and Simulation;
  Computed Tomography in Industry.

- **On-going Tracer Projects:**

  Tracer services in BSM Sutu Den Reservoir, Cuulong JOC;
  Tracer services in LM Sutu Den Reservoir, Cuulong JOC
  Tracer services in BSM Rangdong Reservoir, JVPC;
  Tracer services in LM Rangdong Reservoir, JVPC;
  Tracer services in BSM Bach ho, Vietsovpetro JV;
  Tracer services in BSM Rong, Vietsovpetro JV.

The Research and Development Center for Radiation Technology (VINAGAMMA)

- VINAGAMMA is located in Ho Chi Minh City
- **Main functions of VINAGAMMA**
  - To carry out research and develop applications of radiation technology.
  - To provide radiation processing services such as sterilization of medical products and pasteurization of foodstuff; supply products used in medicine and agriculture for socioeconomic development.
  - To design, construct and provide consulting services of investment of irradiator facilities; directly import and export technologies and equipment in the field of radiation technology.
  - To establish technical infrastructure and train personnel in the field of radiation technology.
  - To co-operate with domestic and oversea organizations for research, training and service in the field of radiation technology.
- **Facilities**

  2 industrial scale irradiators:

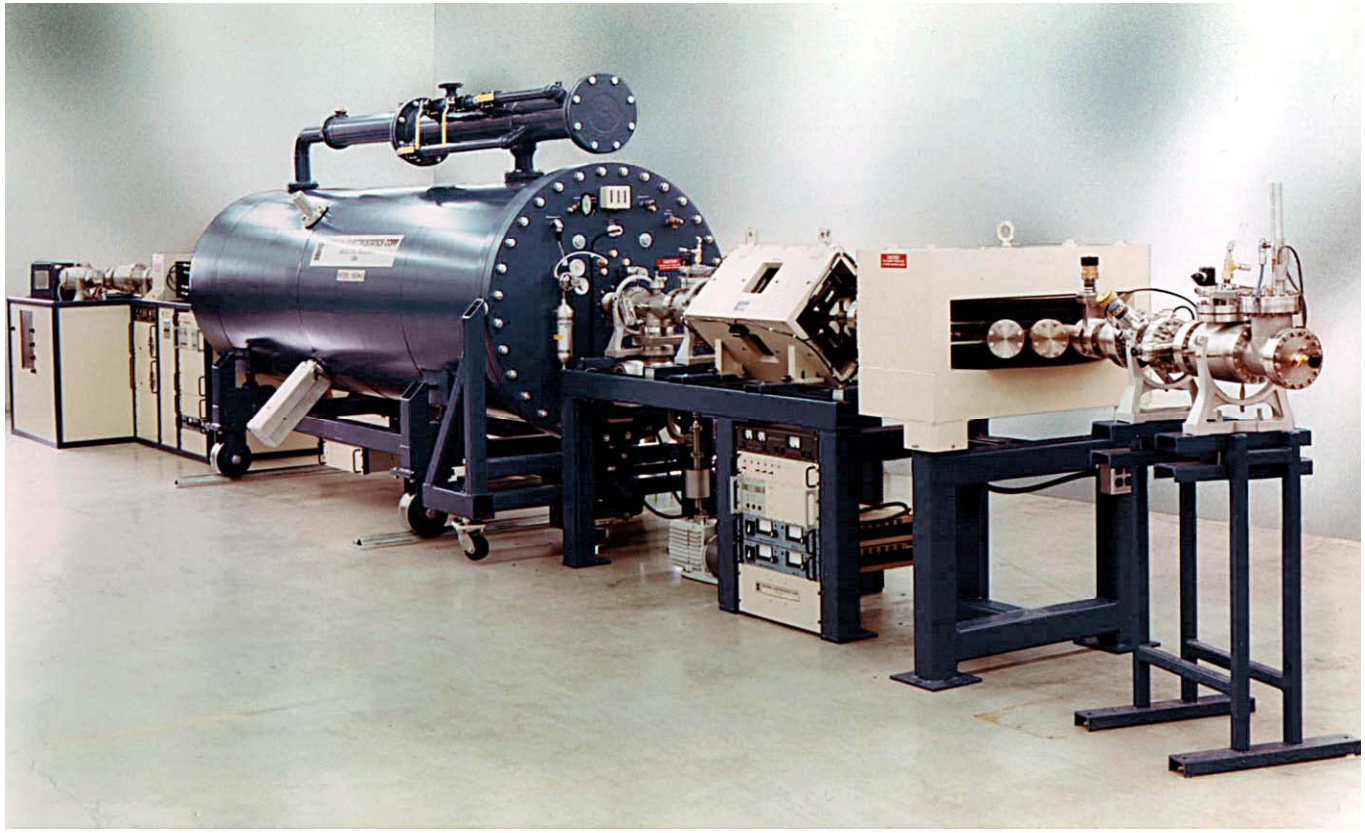
  - Gamma irradiator SVST-Co60/B

  - Electron beam accelerator UELR-10-15T

NATIONAL EDUCATION ON NUCLEAR SCIENCE & TECHNOLOGY

- Hanoi University of Science (Vietnam National University in Hanoi) which is the largest university in Vietnam to provide human resources related to nuclear activities, has Department of Nuclear Physics. This department was established in 1956 and currently produces around 15 graduates annually in nuclear physics and 20 graduates in Nuclear Technology.
- The Hanoi University of Technology (HUT) has Department of Nuclear Engineering and Environmental Physics. The department was established in 1970 and currently produces about 10 graduates annually with a basic degree in nuclear engineering.
- The Hochiminh city University of Science(Vietnam National University in Ho Chi Minh city) has Department of Nuclear Physics. Annually about 10 graduates with a basic degree in nuclear physics has been produced.
- Dalat University is the other university which offers courses on nuclear science and it produces about 10 graduate students annually.

Accelerator at HUS (in process)



Pelletron Model 5SDH-2
with Dual Ion Source Injector
1.7 MV Tandem
Protons, Helium and Heavy Ion Beams

NATIONAL ELECTROSTATICS CORP.

Accelerator at HUS (in process)

Accelerator at HUS (in process)

Pelletron Model 5SDH-2
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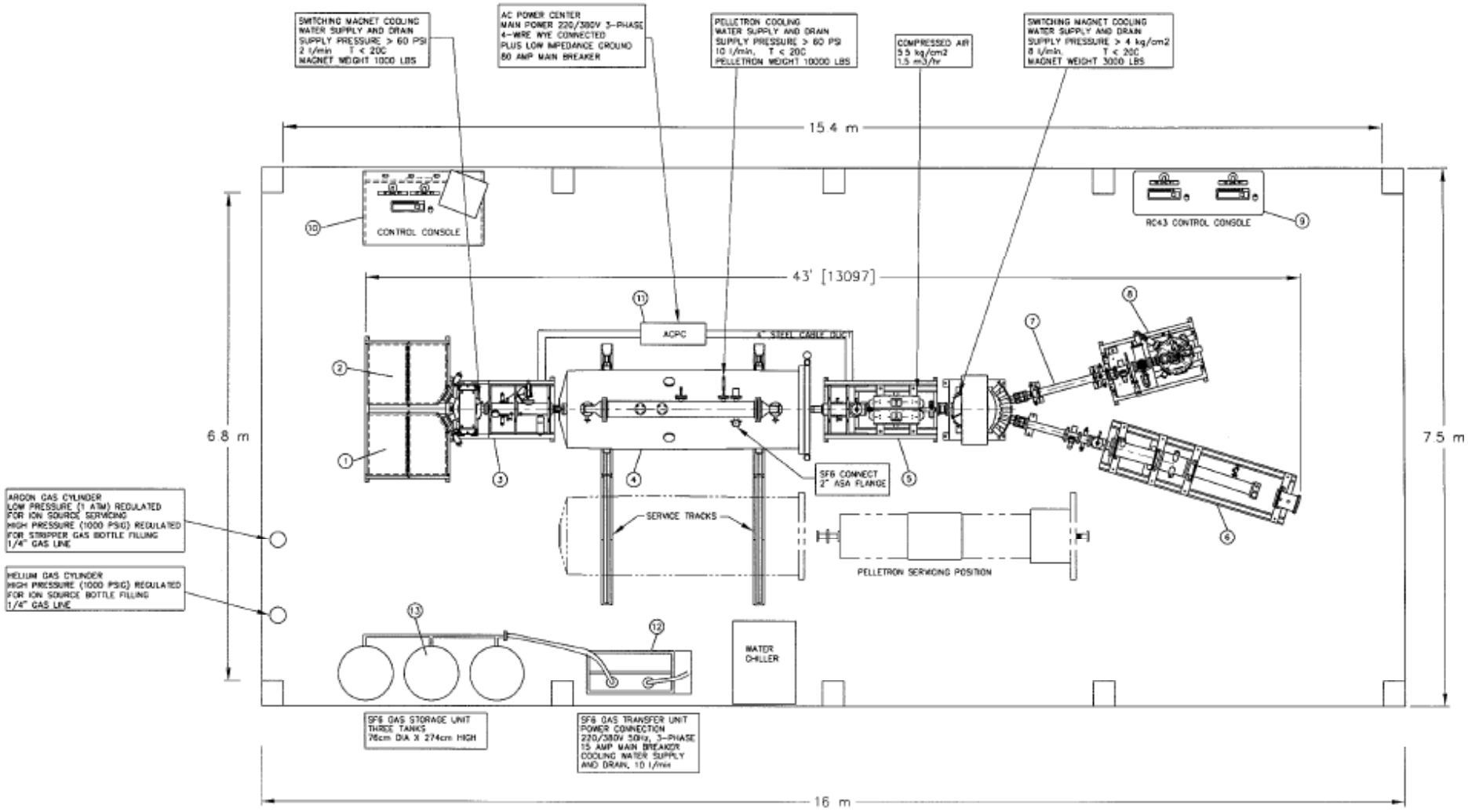
NATIONAL ELECTROSTATICS CORP.



Cyclotron Center

Inside of the center

Cyclotron

Control room

Beam transport line

Beam transport line

PET (FDG) hot cell

PET (11C) hot cell

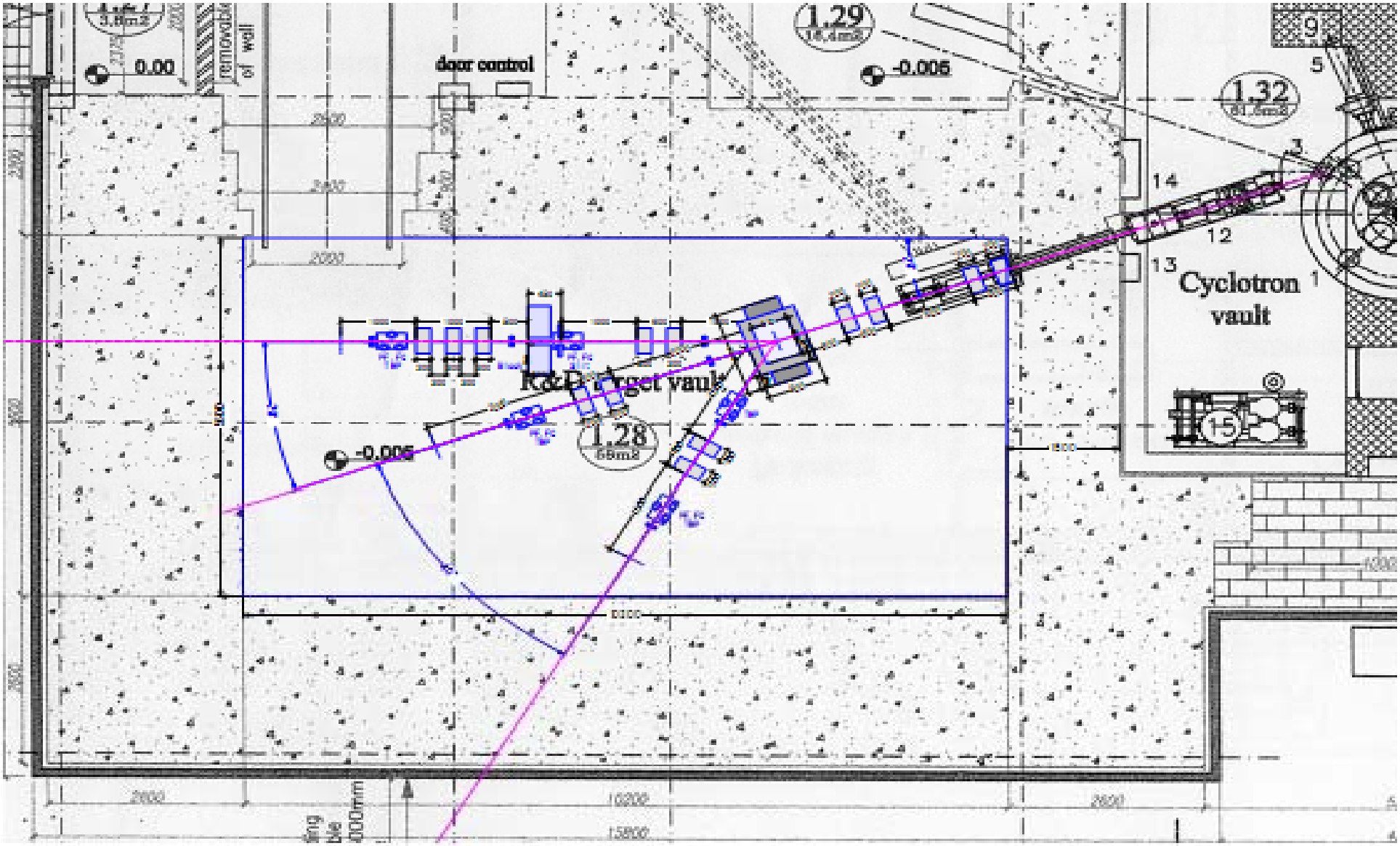
PET target vault

Solid target vault

SPECT hot cell

R&D room

PROPOSED DESIGN FOR R&D BEAM LINE



Future Nuclear Power Plants in Vietnam

- Vietnam has expanded a national plan to **build nuclear power plants** over the next 20 years.
- Prime Minister has approved a goal **to generate 15-20 percent of the country's total power output from nuclear power by 2050**, and the **Law on Atomic Energy** took effect on January 1 of this year, creating a legal framework for the plan.
- Under Vietnam's original plan, the nation would build two plants with a combined capacity of 8,000MW to come on line during 2020-2024.
- There are now plans to build additional plants during 2024-2030, each consisting of four 1,000MW reactors fueled by about 30 tones of 4-per-cent low-enriched uranium. Electricity of Vietnam (EVN) would oversee the construction of the first nuclear plant in Ninh Thuan province's Phuoc Dinh village.
- The Government had initially earmarked US$6 billion for each plant, but funding remained an issue, he added. The EVN has invited nuclear power companies from Japan, France, South Korea, Russia and the US to discuss possible investments. Once commenced, it would take six years to complete construction of a reactor.
- Vietnam and Japan **forged ties to co-operate in nuclear power** back in 1997. More than 300 Vietnamese have studied in Japan and the same number of Japanese experts have come to Vietmam to further promote bilateral co-operation in the field.

CONCLUSIONS

- An overview of an organization of VAST has been presented.
- The Institute Of Physics has been introduced in more detail including center for Nuclear Physics. The current activities of the centers have been given with detail information.
- The current status of nuclear physics in the country as well as education related to nuclear science and its applications have been mentioned.
- *Our Institute of Physics is play an important role in development of physics in Vietnam including nuclear science. The implementing of our functions, we greatly appreciate the role of the international cooperation and I do hope that the collaboration between international community, especially Asian Nuclear Physics Society and Vietnam in the field of nuclear science will be continued to grow and consolidate in the future.*

Thank you for your attention !