

## PUBLICATIONS

### ARTICLES

1. **Andrzejewski K., Kulikowska T., Marcinkowska Z., Pytel K.:** *Computational model of MARIA reactor based on Rebus code.* Raport IAE-129/A, Institute of Atomic Energy, Świerk, Poland (2007).
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15. Golubok D. S., Didyk A. Y., **Hofman A.:** *Radiation damage calculation for IBR-2 neutron irradiated amorphous Fe<sub>77</sub>Ni<sub>2</sub>Si<sub>14</sub>B<sub>7</sub> alloy.* Fizika i Chimia Obrabotki Materialov, **6**, 5 (2007), in Russian.
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110. **Sawicka A., Byszewska-Szpocińska E., Mikołajczak R.**, Konrad L., Sedlacek J., Mudra M.: *Radiolabeled Engineered Antibodies scFvTU20 as targeting agents for tumor diagnosis and therapy*. Radionuclides and Their Carriers for Medical and Industrial Applications, Institute of Nuclear Chemistry and Technology, Warsaw, November, 21, 2007.
111. **Słowiński B.**, Sobczak R., **Wojciechowski A.**: *Investigation of the correlation between the multiplicity, rapidity and impact parameter of hadron -nucleus interactions in the Ge V energy range*. 6th Conf. on Nuclear and Particle Physics, Luxor, November 17-21, 2007.

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113. **Słowiński B.:** *Observation of pionic degrees of freedom in quasifree channels of  $\pi A$  interactions at several Ge V/c.* 1st Workshop, Dubna, May 10, 2006. Proc., Dubna, 2007.
114. **Staniszewska J., Sasinowska J.:** *Application of ICP-OES in quality control of radiopharmaceuticals and radioactive products.* Sem. of Atomic Spectrometry, Ustroń, September 17-19, 2007.
115. **Stoch P., Stoch L.:** *Cs containing borosilicate waste Glassed.* NATO Adv. Res. Workshop, 8th Sem. Porous Glasses- Special Glasses. Porous Glass Technology for Detection of Chemical Agents, Wrocław, September 4-8, 2007.
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117. **Szczurek J., Chwaszczewski S., Czernski P., Łuszcz M.:** *Nuclear power component in foresight on energy in Poland.* Int. conf. Nuclear Energy for New Europe, Portorož, September 10-13, 2007.
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119. **Szteke W., Baran W., Wagner T., Hajewska E.:** *Radiological monitoring of the airports.* Conf. on Transport, 7th Framework, Warszawa, March 1-2, 2007, in Polish.
120. **Szuta M.:** *Comparison of fission gas products accumulated in the irradiated  $UO_2$  fuel with the radiogenic gas trapped in minerals containing fissile atoms.* 7th Int. Conf. on WWWR Fuel Performance, Modeling and Experimental Support, Albena, September 17-21, 2007.
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124. **Tulik P.:** *Application of recombination chambers at research irradiation facilities for BNCT at reactor MARIA in Poland.* Young Researcher BNCT Meet., Birmingham, September 20-21, 2007.
125. **Turek M., Pysznik K., Drożdżel A., Sielanko J., Mączka D.:** *Simulation of beam extraction from hollow cathode ion Source.* 5th Int. Conf. NEET, Zakopane, July 12-15, 2007.
126. **Wagner T.:** *Material Research Laboratory. Hot cells in Institute of Atomic Energy in Świerk.* Association Days-EURATOM- IFPiLM, Kudowa Zdrój, September 17-20, 2007, in Polish.
127. **Wierzchowski W., Wieteska K., Graeff W. (invited lecture):** *Synchrotron topographic investigations of SiC bulk crystals and epitaxial layers.* 2nd Polish-Japanese-German Crystal Growth Meet., Zakopane, May 20-24, 2007.
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129. **Wierzchowski W., Wieteska K., Balcer T., Malinowska A., Graeff W., Hofman W.:** *Application of back-reflection topographic methods for identification of dislocations in 6h and 4h SiC crystals.* 7th Polish Meet. of Synchrotron Radiation Users (7KSUPS), Poznań, September 24-26, 2007, in Polish
130. **Wieteska K., Chwaszczewski S.:** *Energy and economic development in Poland.* 14th Sem. Materials Investigation for Power Industry, Zakopane, July 20-22, 2007, in Polish.

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133. **Wiśniewski R., Wieteska K., Wilczyńska T.**: *Investigation of the electric thermopower of the Kr ion implanted manganin-Cu thermocouple*. 5th Conf. New Electrical and Electric Technologies and their Industrial Implementation, Nee T 2007, Zakopane, June 12-15, 2007.
134. **Wiśniewski R., Wilczyńska T.**: *Post pressure effects in castor and rapeseed oils phase changes*. 39th Congress of the Polish Physical Society, Szczecin, September 9-14, 2007, in Polish.
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138. **Wiśniewski Z., Górski L., Zasada D.**: *Investigation of structure and conductivity of superionic conducting materials on the basis of silver iodide*. 5th Polish Conf. Neutron Scattering and Complementary Methods for Condensed Matter Research, Chlewiska, June 3-6, 2007.
139. **Wojciechowski A., Szuta M.**: *Advance in the sub-critical calculations made for the Yalina thermal facility using Monte Carlo methodology*. Tech. Meet. on Low Enriched Uranium (LEU) Fuel Utilization in Accelerator Driven Sub-critical Systems, Rome, November 12-16, 2007.
140. **Wojdowska W.**: *Advantages of W188/Re188 generator and it's potential applications*. 2nd Training Conf. The Isotope Diagnostic and Therapy in Oncology, Szklarska Poręba, May 31 - June 2, 2007.
141. **Woźnicki Z.**: *The solution of continuous-time algebraic Riccati equations by means of the Sor -like method*. MAT TRIAD 2007 Workshop, Będlewo, March 22-24, 2007, in Polish.
142. Yuvchenko Y., N., Didyk A. Y., Vlasukova L. A., **Hofman A.**, Gracheva E. A.: *Thermal effects in <sup>209</sup>Bi (710 Me V) ion tracks at GaAs single crystal in frame of thermal peak*. Proc. 17th Int. Conf. Radiation Physics of Solids, Sevastopol, July 9-14, 2007.
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144. **Zielczyński M., Golnik N., Gryziński M. A.**: *Dosimetry of high-energy neutron radiation fields using recombination chambers*. 14th National Meet. of Polish Society of Radiation Research, Kielce, September 24-26, 2007, in Polish.

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**Chwaszczewski S., Szczurek J., Czernski P., Klisińska M., Łuszcz M.:** *Characteristics of technology sectors*, In: Technological development scenarios of the fuel-energy system for assuring the polish energy security. Part 1: Study of the fuels and energy management for development of the Polish Energy Foresight within 2005-2030. Katowice, p. 72, Central Mining Institute (2007), in Polish.

**Chwaszczewski S., Szczurek J., Czernski P., Klisińska M., Łuszcz M.:** *Scenarios of the technological development for energy sector areas* In: Technological development scenarios of the fuel-energy system for assuring the polish energy security. Part 1: Study of the fuels and energy management for development of the Polish Energy Foresight within 2005-2030. Katowice, p. 109, Central Mining Institute (2007), in Polish.

**Chwaszczewski S., Szczurek J., Czernski P., Klisińska M., Łuszcz M.:** *Scenarios of the technological development for energy sector areas*, In: Technological development scenarios of the fuel-energy system for assuring the polish energy security. Part 2: Scenarios developed using on Polish Energy Foreside within 2005-2030, Katowice, pp. 184-194, Central Mining Institute (2007), in Polish.

**Chwaszczewski S.:** *Spent fuel management in Poland*. In: Safety related issues of spent nuclear fuel storage, pp. 37-54, Springer (2007).

**Broda R., Cassette P., Kossert K.:** *Radionuclide metrology using liquid scintillation counting*. Metrologia, Monograph BIMP, 44, 1-17, p. 36-S52 (2007).

**Pawlak D., Korsak A., Mikołajczak R., Janota B., Karczmarczyk U., Jakubowska E.:** *Preclinical Evaluation of therapeutic radiopharmaceuticals based on <sup>90</sup>Y and <sup>177</sup>Lu*. In: Technical reports series no. 458, IAEA, pp. 217-232 (2007).

Nickel F.: *Energy loss of swift ions in polycrystalline targets*. IAE Monographs vol. 11, Institute of Atomic Energy, Świerk, Poland (2007).

## PATENTS

*Method for determination of the dose rate ratio in two component radiation fields*. Application P 38243

*High pressure rotational rheometer with extrinsic measurement of intrinsic moment of viscosity forces*. Application P-382321

*Pharmaceutical gammaglobulin kit and way of produce of the gammaglobulin radiodiagnostic preparation*, PL 371 176, 27.09.2007 (J. Michalik, U. Karczmarczyk, A. Markiewicz)

*Electroless ruthenium plating of metals*, PL 193725, 30.03.2007 (M. Mielcarski)

*Radioactive core of iodine-125 ophthalmic applicator and the method of manufacturing*, PL 194367, 31.05.2007 (M. Mielcarski, T. Barcikowski)

## Ph. D.THESIS

M. Sc. **Izabela Cieszykowska**, Ph.D. Thesis: *Electrochemical processes of fixing of radionuclides applied in sealed sources for brachytherapy*, Institute of Nuclear chemistry and Technology, public defense October 27, 2007

M. Sc. **Wioletta Wojdowska**, Ph. D. Thesis: *Biodegradation of hydrocarbons vaccum fraction of crude oil*, Technical University of Lodz, public defense January 16, 2007

## SEMINARS ORGANIZED BY IAE

XIV SEMINAR  
MATERIALS INVESTIGATION FOR POWER STATIONS AND POWER INDUSTRY  
20-22 June 2007 Zakopane

CHAIRMAN: **E. Hajewska**

SCIENTIFIC PROGRAM COMMITTEE

**E. Hajewska** - LBM IEA Świerk-chairman

J. Buzek –European Parliament, Energy and Research Commission

O. Gajl - Ministry of Science and Higher Education

J. Pilarczyk-Institute of Welding

St. Soja-Ministry of Economy

St. Szpilowski – PAA

**K. Wieteska** – IAE

ORGANIZING COMMITTEE

**W. Szteke** – chairman

**J. Wasiak**- secretary

**W. Biłous , M. Przyborska , T. Wagner, J. Wojciechowska B. Zubowski**

This was the 14th seminar on the subject covered a range of application areas occurring during the exploitation of power plants as well as the exploitation of gas transport pipelines and in the underground gas storages. The attention to the security of gas installation was called. The technical supervision in the light of Poland's accession to the European Union are also discussed. The special session was destined to present some aspect connected with the future of nuclear energy in Poland. There were six sessions:

- Energy in Poland and European Union
- High temperature reactors
- The other problems of nuclear energy
- Diagnostic investigation in the power industry
- Welding-novelties and exploitation problems
- Operating problems of the gas pipelines- European standards and modern technologies

### PROGRAMME

#### I. Session

1. Buzek J.: *Safety atomic energy for Europe and Poland*
2. **Wieteska K., Chwaszczewski S.:** *Energy and economic development in Poland*

#### II. Session

3. Sławiński A.: *Materials research for energy technologies in FP.7*
4. **Chwaszczewski S.:** *High temperature reactors and its implementation in the industry*
5. Michalik J.: *Manufacture of the fuel components for high temperature reactors*
6. **Hajewska E., Szteke W., Baran W.:** *Materials problems occurring in the high temperature reactors(HTR.)*

#### III. Session

7. **Szczurek J.:** *Safety aspect of advanced nuclear power reactors*
8. **Hofman A., Didyk A. Ju ., Iwanow L. I., Szteke W., Hajewska E., Wagner T., Malczyk A., Wiczorkowski M.:** *The influence of neutron irradiation on the chemical composition of construction materials*
9. Kolano R., Szynowski J., Polak M.: *Rapidly-quenched Cu-based alloys and their application In nuclear engineering*

#### IV. Session

10. Wojas M.: *NDT employment in monitoring the state of material at High Temperature pressure equipment*
11. Zagórski A., Spychalski W., Mizera J.: *Continuous monitoring of propagating damages in the pipeline*
12. Komorowski J., **Szteke W., Zajaczkowski P.:** *Repair and modernization of the clampers of high-pressure pipelines*

13. Zajączkowski P., **Wasiak J., Biłous W., Szteke W., Przyborska M.**: *Diagnostics of thick wall elements of high pressure pipelines*
14. Zantowicz B.: *Investigations overview of selected critical parts of BC50 power generation set-13HMF and 10H2M steels*
15. **Borysiewicz M., Garanty I., Kozubal A.**: *Comprehensive assessment of hazard and risk generated by different fuel of electric energy production-results of completed and ongoing EU programmes*

#### V. Session

16. Pilarczyk J.: *Developments in welding and joining methods of metallic materials*
17. Szubryt M., Brózda J., Czaja G.: *Properties of bainitic T/P24 steel welded joints*
18. Pasternak J.: *Technological recommendations, properties and experience of welding joints on heat resisting martensitic steels designated into superheater for supercritical; parameters*

#### VI. Session

19. Kalinowski K., Dąbrowski A., Sobkiewicz D., Oracz H.: *New method of leak detecting In diagnostics of gas pipeline system*
20. Olma T., Winckowski J.: *Contemporary methods if emergency repair works on transit pipelines*
21. Witek M.: *Upgrade of pipelines operated in polish conditions in accordance with European Standards*

### WORKSHOP

#### RADIONUCLIDES AND THEIR CARRIERS FOR MEDICAL AND INDUSTRIAL APPLICATIONS

21 November 2007 Warsaw

#### CONTRIBUTORS:

ICHtJ - Institute of Nuclear Chemistry and Technology, Warsaw, Poland

**POLATOM - Institute of Atomic Energy, Radioisotope Centre POLATOM, Otwock-Świerk, Poland**

NPI - Nuclear Physics Institute, Academy of Science of the Czech Republic, Řež, Czech Republic

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Duke University - Duke University Medical Center, Durham, North Carolina, USA

IMC - Institute of Macromolecular Chemistry, Academy of Science of the Czech Republic, Prague, Czech Republic

NRI - Nuclear Research Institute, Řež, Czech Republic

IMG - Institute of Molecular Genetics, Academy of Sciences of the Czech Republic, Prague, Czech Republic

IMB - Institute of Molecular Biology, Slovak Academy of Science, Bratislava, Slovak Republic

FZR - Institute of Radiopharmacy, Forschungszentrum Rossendorf/Dresden, Germany

ITN - Instituto Tecnológico e Nuclear, Sacavem, Portugal

Aristotle University - School of Pharmacy, Aristotle University of Thessaloniki, Greece

#### SCIENTIFIC PROGRAMME INTRODUCTION

J. Narbutt (ICHtJ): *Chemical studies for design and production of new radiopharmaceuticals*

(POL-RAD-PHARM) – a research-training project in the 6. FP of EU, the action Marie Curie Host Fellowships for Transfer of Knowledge

#### Part 1. Radionuclides

- **E. Iller, A. Deptuła, H. Polkowska-Motrenko** (POLATOM and ICHtJ): *Synthesis and testing of gel metal-oxide composites as filling materials for W-188/Re188 generator columns*
- J. Ráliš, K. Eigner Henke, O. Lebeda, J. Kučka, J. Štursa, J. Kučera and F. Melichar (NPI): *Production of  $^{86}\text{Y}$  on cyclotron U-120M in Řež*
- J. Chojiński, K. Kilian, D. Hechner (HIL) : *The Warsaw PET Centre – possibilities for production of metallic PET radionuclides*
- **T. Dziel** (POLATOM): *Activity standardization of  $^{18}\text{F}$  and ionization chamber calibration for nuclear medicine.*
- B. Zielińska, C. Apostolidis, F. Bruchertseifer, A. Morgenstern (ITE): *Improved method for the production of  $^{225}\text{Ac}/^{213}\text{Bi}$  for targeted alpha radiotherapy*

**Part 2. Radionuclide carriers**

- M. Pruszyński, A. Bilewicz, M. Zalusky (IChTJ and Duke University): *Complexes of  $^{211}\text{At}$  with  $\text{Rh}^{3+}$  and  $\text{Ir}^{3+}$  as precursors of therapeutic radiopharmaceuticals*
- M Hrubý, J. Kučka, O. Lebeda, K. Ulbrich (IMC and NRI): *Thermoresponsive polymers for local radiotherapy*
- **Sawicka, E. Byszewska, R. Mikołajczak**, L. Kronrad, J. Sedlacek, M. Mudra (POLATOM, NRI, IMG and IMB): *Engineered radionuclide-labelled antibodies, preliminary  $^{125}\text{I}$  iodination results*
- E. Gniazdowska, P. Koźmiński, U. Kuenstler, H.-J. Pietsch (IChTJ and FZR): *Towards  $\text{Tc(III)}$ - or  $\text{Re(III)}$ -labelled peptides with tunable lipophilicity*
- L. Fuks, E. Gniazdowska, P. Koźmiński, D. Papagiannopoulou (IChTJ and Aristotle University): *Tricarbonyltechnetium(I) complex with substituted propanoic acid*
- L. Fuks, M. Neves (IChTJ and ITN): *Towards complexes with the  $[\text{}^{99\text{m}}\text{Tc}(\text{CO})_3]^+$  core for targeted radiotherapy*
- J. Palige, G. Zakrzewska-Trznadel, A. Miśkiewicz (IChTJ): *Generator-based radiotracers for industrial applications*

**IAE SEMINAR**

**Snopek B.:** *Radiological consequences assessment of anti-rocket shield installation in Poland - information about activities of the Nuclear Safety and Radiation Protection Commission, Council for Atomic Energy, March 1, 2007, in Polish.*

**Kilim S., Mađry M.:** *Thorium perspectives in nuclear energy, April 26, 2007, in Polish.*

**Zielczyński M.:** *Dosimetry of high energy radiation fields using recombination chambers, November 22, 2007, in Polish.*

Filipek S. (Institute of Physical Chemistry PAS, Warszawa): *On the synthesis and properties of new hydrides (deuterides) - possible applications in hydrogen storages, March 29, 2007, in Polish.*

**DEPARTMENT OF NUCLAER METHODS IN THE SOLID STATE PHYSICS SEMINARS**

1. Drożdź A. (UMCS Lublin): *Creation and utilization of ion beams for ion implantation, January 11, 2007, in Polish.*
2. Nowakowski R. (Institute of Physical Chemistry PAS, Warsaw): *High resolution investigation of physico-chemical processes on surface of solid state using STM and ATM, January 25, 2007, in Polish.*
3. **Jankowska-Kisielińska J.:** *On mechanisms of spin-glass and short-range formation in the Cu-Mn alloys, February 8; 22, 2007, in Polish.*
4. **Wiśniewski R.:** *High pressures as method for the solid-state investigation, May 11, 2007, in Polish.*
5. **Milczarek J. J.:** *The self-diffusion of water of water in porous media: neutron radiography studies, May 24, 2007, in Polish.*
6. **Wiśniewski Z.:** *Nanotechnology and the global warming, June 14, 2007, in Polish.*
7. Fritz-Popowski G. (University of Gratz): *Indirect Fourier transformation and its application to small-angle X-ray scattering data, July 24, 2007.*
8. **Czachor A.:** *Theory lattice dynamics, with Mg taken as an example-resume, October 11, 2007, in Polish.*
9. Guzdek A. (AGH Kraków): *Electrical and magnetic properties and superfine interactions in the  $\text{Y/Gd (M/L)}_2$ : M, L-Fe, Co, Ni compounds, October 25, 2007, in Polish.*

10. **Pęczkowski P.:** *Diffraction - interference phenomena supporting the wave nature of light and of material particles (neutrons, fullerenes)*, November 8, 2007, in Polish.
11. **Dobrzyński L.** (IPJ Świerk): *Charge, spin and electron momentum distribution - in the search of wave functions*, November 29, 2007, in Polish.

#### RADIOISOTOPE CENTRE POLATOM SEMINARS

1. **Byszewska E.:** *New diagnostic kit IgG -HYNIC labeled with technetium 99m for inflammation imaging in soft tissues and osteoarticular system*, November 29, 2007, in Polish.
2. **Iller E.:** *Determination of activation conditions of gels in nuclear reactor MARIA and its radiochemical and metrological evaluations*, November 29, 2007, in Polish.
3. **Koczarski R.:** *Development of uncertainty evaluation methods for radioactivity measurements performed using the National standard of Radionuclide Activity Unit calibration equipment*, December 4, 2007, in Polish.
4. **Tymiński Z.:** *Analysis of RC POLATOM research programme 2007 based on Annual Incidence Rates of Cancer in Poland*, December 4, 2007, in Polish.
5. **Listkowska A.:** *Study of measurement procedure for determination of SR 90 impurities in Y-90 eluents*, December 6, 2007, in Polish.
6. **Pijarowska J.:** *Elaboration of the preparation technology of albumin microspheres as a potential radionuclide carriers for diagnostic and therapeutic use*, December 6, 2007, in Polish.
7. **Mikołajczak R.:** *In vitro investigations in the selected cell lines (MCF-7, COLO-205, VERO, H460, AR 42J, CTLL-2) of the affinity and internalization of radiolabelled peptides. Investigation of radiolabeled peptides binding to the cancer cell membrane preparation*, December 6, 2007, in Polish.
8. **Sawicka A.:** *Engineered radionuclide-labeled monoclonal antibodies*, December 13, 2007, in Polish.
9. **Dziel T.:** *Development of radionuclides standardization methods by means of liquid scintillators technique with use of Monte Carlo calculations*, December 13, 2007, in Polish.
10. **Cieszykowska I.:** *Development of the optimum conditions of  $^{57}\text{Co}$  in rhodium in aspect of manufacturing of  $^{57}\text{Co}$  active for Mössbauer sources*, December 18, 2007, in Polish.
11. **Piasecki A.:** *Development of joining methods of materials used as windows and holders in manufacturing procedures of sealed radioactive sources: laser welding of titanium foils with solid titanium Or stainless steel capsules-fluxes soldering of titanium or beryllium foils with solid titanium or stainless steel capsules*, December 20, 2007, in Polish.
12. **Zakrzewska E.:** *Development of formulation of EDTMP kit for labeling with low specific activity lutetium*, December 20, 2007, in Polish.
13. **Broda R.:** *International inter-laboratory and internal comparisons of measurements of radionuclide activity*, December 20, 2007, in Polish.
14. **Broda R.:** *Application and keeping of the national standard unit of the radioactivity of radionuclides*, December 20, 2007, in Polish.

## LECTURES AND SEMINARS DELIVERED OUT OF THE IAE

**Czachor A.:** *Neutron scattering on elementary excitations in disordered magnets using the Green's function method-the equal-access-splitting.* Institute of Theoretical Physics, University of Wrocław, December 12, 2007, in Polish.

**Milczarek J.J.:** *Neutron radiography studies of porous media,* Institute of Technology and Chemical Engineering, Poznań University of Technology, January 26, 2007, in Polish.

**Słowiński B.:** *General physics. Radiation phenomena in materials. Physics background of nuclear power.* Lectures in Warsaw University of Technology, in Polish.

**Słowiński B.:** *Nuclear energy,* Warsaw University of Technology, December 12, 2007, in Polish.

**Bielewicz M.:** *Measurements of high Energy Neutrons on U/Pb assembly "Energy plus Transmutation".* Int. Centre of theoretical Physics, Trieste, November 25, 2007.

## POLISH AND INTERNATIONAL RESEARCH PROJECT

Grant no 3 T10C 022 29, 2005-2007. *Investigation of defect structure, lattice deformation and polytypic structure in single crystals and implanted layers of silicon carbide,* W. Wierzchowski, Institute of Electronic Materials Technology in cooperation with **K. Wieteska**

Contract: FI6R-CT-2004-508843, 2005-2008. *European approach to nuclear and radiological emergency management,* EURATOM acronym: EURANOS, **M. Borysiewicz**

*International experiment "Energy plus Transmutation" on Research of Physical aspects of electronuclear method of energy production and transmutation of radioactive wastes of nuclear energetic in high energy beam of particles from synchrophasotron or nuclotron accelerator in JINR, Dubna , Prof. A. I. Malachov, Dr M. I. Krivopustov in cooperation with M. Szuta, E. Strugalska-Gola, S. Kilim, A. Wojciechowski M. Bielewicz;* 1999-2007

Project: Coordinated Research Project on *Analytical and Experimental Benchmark Analyses of Accelerator Driven System (ADS).* IAEA Research Agreement No: 13396, 2005 - 2010, **M. Szuta, Z. Woźnicki, E. Strugalska-Gola, S. Kilim, A. Wojciechowski, A. Polański**

*European Approach to Nuclear and Radiological Emergency Management EURANOS,* integrated project, 2004 – 2007, **M. Borysiewicz**

CONRAD (*COordinated Network for Radiation Dosimetry*), FP6-12684 (2005-2007), Coordinated by Delft University, The Netherlands, Work Package 6 *Complex mixed radiation fields at workplaces,* Contract no: FP6-12684 (2005-2007), **N. Golnik**

*Development of recombination methods for the dosimetry of high-energy radiation fields, with regard to the new international recommendations.* 2 P05D 065 30, 10.04.2006 - 09.04.2009, **N. Golnik**

*Optimization of the neutron beam spectrum and collimation at the boron neutron capture therapy facility, using numerical modeling of the converter/moderator/filter system and neutron transport in the patient head phantom.* PZB/MEiN/01/2006/43, 2007-2009, **N. Golnik**

EUTERP – *European Training and Education in Radiation Protection Platform,* **N. Golnik**

Project N508 048 31/2569: *Neutron transmutation doping of multicrystalline silicon for photovoltaic applications.* **J. J. Milczarek**

Project 3T08D04630: *Glassy materials for radioactive and toxic waste immobilization*, 2006 – 2009, **P. Stoch**

Project 3T10C 00628: *Rheological properties of the new phase of castor oil and the design of the original rheometer*. 2005 – 2007, R. Siegoczyński, **R. Wiśniewski**, A. Rostocki, **T. Wilczyńska**

*Project of collaboration on ion implantation with JINR Dubna, Contract number 07-5-1013-2001-2008*,  
**R. Wiśniewski**

Project 3T08D 4530: *Structure and properties of diphase conductors of silver*, 2006 – 2007, **Z. Wiśniewski**

Project N 505 0875 33: *Rheological properties of the new high-pressure castor oil phase. Project and realization of a original rotational rheometer*, 2007 – 2009, **R. Wiśniewski**, **T. Wilczyńska**, D. Tefelski

*Improvement of electrical characteristics of special alloys and products based on the alloys by heavy ion implantation*. Cooperation agreement Institute of Atomic Energy Świerk, Poland with Joint Institute for Nuclear Research, Dubna, Russia, no. 3760-5-06/08, 2006 – 2009: Aleksandr J. Didyk (IJNR), **R. Wiśniewski** (IAE)

#### RADIOSOTOPE CENTRE POLATOM RESEARCH PROJECT

*Development of methods for preparation and investigation of receptor specific ligands labeled with radioactive isotopes for oncological diagnostics, molecular imaging and targeted receptor therapy*, 2 P05A 024 28, 2005-2008, R. Mikołajczak

*New technology of isotope generators  $^{188}\text{W}/^{188}\text{Re}$  preparation based on the materials for filling of chromatographic columns obtained by sol-gel method*, 3 T09B 042 29, 2005-2008, E. Iller

*Electrochemical processes of fixing of radionuclides applied in sealed sources for brachytherapy*, 1 T09B 046 30, 2007, M. Mielcarski

*Development of techniques for preparation of biodegradable microspheres as potential radionuclide carriers for isotope diagnostics and therapy*, R05 025 01, 2006-2009, E. Byszewska-Szpocińska

*Engineered radionuclide-labeled antibodies*, EUREKA/54/2005, 2006-2009, R. Mikołajczak

*New diagnostic kit IgG -HYNIC labeled with technetium -99m for inflammation imaging in soft tissues and osteoarticular system*, 6 T09 2004 C/06358, 2004-2007, J. Michalik, E. Byszewska-Szpocińska

Research agreement IAEA 12880: *Development of generator technologies for therapeutic radionuclides*, 2004-2008, R. Mikołajczak

6th Framework Programme Priority FP6-2003-Lifescihealth-I-LSH-2003-1.2.2-2- A Network of Excellence for *Identification of New Molecular Imaging Markers for Diagnostic Purposes (DIMI-Diagnostic Molecular Imaging)*; FP6-2003-Lifescihealth-I-LSH-2003-1.2.2-2; 512146

## SPECIAL PROGRAMMES AND RESEARCH DEVICES

*The financial support for the Hot Laboratory of the Material Research Laboratory of IAE*

Head of project: **W. Szteke**

Project no: 624/E-80/SPUB/ZR6/058/2007

**JOINT SCIENTIFIC AND TECHNOLOGY PROJECT  
SCIENTIFIC AND TECHNOLOGICAL COOPERATION JOINT PROJECT**

**COST (European Cooperation in the field of Scientific and Technical Research) Projects**

D18 WG-4 Lanthanides used in therapy. *Radiolanthanides emitting particles and stable lanthanides emitting radiation under the influence of exterior irradiation*, 2004-2008

D38 WG-3 *Metal based system for molecular imaging applications. Isotope probes for molecular imaging*, 2006-2011

BM 0607 *Targeted radionuclide therapy*, 2007-2011

**IAEA Research Agreement**

*Development of therapeutic radiopharmaceuticals based on  $^{177}\text{Lu}$  for radionuclide therapy*, 2006-2009

**FRANCE**

LABORATORIE LEON BRILLOUIN

CEN, Saclay

*Inelastic Magnetic Neutron Scattering at the Magnetic Brillouin Zone Boundary in the Mn (20%Fe) Alloy; Anisotropy of Spin Wave Dispersion in the FCC Mn (37%Fe) Alloy*,

B. Hennion

Polish side partners: **K. Mikke, J. Jankowska-Kisielińska**

**RUSSIA**

JOINT INSTITUTE FOR NUCLEAR RESEARCH, DUBNA

*Investigation of surfactants aggregation in micellar water solutions*

A. Rajewska

*Determination of Dosimetric Parameters of Medical High-Energy Radiation Beams*

Prof. E. A. Krasavin .

Polish side Partner: **M. Zielczyński**

*Experiments on the Accelerator Complex of the LHE JINR (project ENERGY-TRANSMUTATION)*

Prof. A. I. Malachov, Dr M.I. Krivopustov

Polish side partners: **Z. Strugalski, E. Strugalska-Gola, A. Wojciechowski, M. Bielewicz**

Laboratory of High Energies

*Study of Transmutation of Radioactive Waste of Nuclear Energy Arrangements*

Prof. A. I. Malakhov

Polish side partner: **B. Słowiński**

BAUMAN STATE TECHNICAL UNIVERSITY, MOSCOW

B. E. Vintaikin

INSTITUTE OF METAL PHYSICS, MOSCOW

*Investigation of Atomic and Magnetic Microdynamics, Structural Effects Close to Martensitic Phase Transitions and Kinetics of Phase Decompositions in the 3d Metal Alloys*

E. Z. Vintaikin

Polish side partners: **K. Mikke, J. Jankowska-Kisielińska, J. J. Milczarek**

**ROSTOV STATE UNIVERSITY, ROSTOV-ON-DON***Iterative methods*

prof. L. A. Krukier

Polish side partner: **Z. I. Woźnicki****INSTITUTE OF NUMERICAL METHODS AT RUSSIAN ACADEMY OF SCIENCES, MOSCOV***Reactor Physics Numerical Methods*

prof. V. Lebedev, prof. Y. Neczepurenko

Polish side partner: **Z. I. Woźnicki****SWITZERLAND**

CERN

*Measurements of Dose Equivalent in High-Energy Radiation Fields. Radiation Protection Group of CERN*

Dr T. Otto

Polish side partners: **N. Golnik, M. Zielczyński****GERMANY**

Consortium FEMOTOPHYSICS for the collaboration of Poland with FAIR Program.

**B. Słowiński**, member as a representative of IAE

Gesellschaft für Schwerionenforschung , Darmstadt

*Proton-Antiproton-Darmstadt-PANDA Collaboration: GSI-international program of construction of new multi-purpose detector for investigation of fundamental properties of matter***B. Słowiński**, member**BELGIUM**

FREE UNIVERSITY OF BRUSSELS

*Reactor Physics*

prof. R. Beauwens

Polish side partner: **Z. I. Woźnicki****NUCLEAR PHYSICS INSTITUTE OF THE ACADEMY OF SCIENCES, PRAHA,***Nuclear Reactions of Intermediate Energy in Extended Heavy Targets*

Prof. R. Mach

Polish side partner: **B. Słowiński****EGYPT**

NUCLEAR RESEARCH CENTER, CAIRO

*Radiation Materials Investigation Using Beams of Heavy Ions, Neutrons and Gamma Rays*

Prof. M. N. H. Comsan

Polish side partner: **B. Słowiński****EDUCATION**

IAE provides access to nuclear facilities for education purposes. In 2007 over 5000 visited Institute of Atomic Energy in order to obtain information on atomic energy, nuclear techniques and their applications in industry, agriculture, health and environment protection. The visitors represented universities, engineering colleges, secondary school and various scientific and technical organizations. The main topic of interest was reactor MARIA research reactor and with its installations and facilities. Another point of interest was Material Research Laboratory and its research activity for power industry.

Each visit comprised the lecture on the principles of the nuclear reactor operation and the applications of the neutron radiation. In total 132 lectures on the nuclear energy have been delivered at the MARIA reactor and 74 similar lectures on the methods of materials testing were given at the Material Research Laboratory.

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EDUCATION FOR PERSONNEL FOR NUCLEAR POWER AND NUCLEAR MEDICINE.  
POSTGRADUATE STUDIES OF NUCLEAR METHODS AND ENGINEERING

**S. Chwaszczewski** –Member of Council Association as a representative of Institute of Atomic Energy  
**B. Słowiński** – Member as a representative of the Faculty of Physics, Warsaw University of Technology.

VISITORS in IAE

V. K. Lukyanov - Joint Institute for Nuclear Research, Dubna, Russia  
A. Yu. Didyk - Joint Institute for Nuclear Research, Dubna, Russia  
W. K. Semina - Joint Institute for Nuclear Research, Dubna, Russia

TRAINING OF STUDENTS

Adam Michalak, Grzegorz Paw 10 – 25.09.2007, AGH University of Science and Technology, Kraków

Eftichia Koumariou (Greece), 01.10.2006 - 31.07.2007  
(Cooperation program in culture, education and associated fields between the Republic of Poland and the Government on the Republic of Greece

Loi Cheng Hang Humphrey (China), 02.07.2007 – 12.08.2007  
(research training based on the agreement of the International Association for the Exchange of Students for Technical Experience (IAEST)).

Sebastien Marcinek (France), 13.05.2007 – 15.08.2007, DUT Measures Physiques, IUT L. Pasteur, Schiltigheim, France

Katarzyna Jakubik 02.07.2007 – 31.08.2007, Department on Chemical and Process Engineering, Warsaw University of Technology.

LONG TERM VISITS OF IAE STAFF MEMBERS TO FOREIGN COUNTRIES

T. Kochański	Joint Institute for Nuclear Research, Dubna , Russia	December 2008
A. Rajewska	Joint Institute for Nuclear Research, Dubna , Russia	December 2008
A. Hofman	Joint Institute for Nuclear Research, Dubna , Russia	December 2008
D. Mączka	Joint Institute for Nuclear Research, Dubna , Russia	Contract: 2006 – 2008.
L. Dąbrowski	Institute for Nuclear Research and Nuclear Energy, Sofia, Bulgaria	December 2007
S. Potemski	Institute of Environment and Sustainability of The Joint Research Centre, Ispra , Italy	January – December 2007

## VISITS OF RADIOISOTOPE CENTRE POLATOM STAFF TO FOREIGN COUNTRIES

Participation in EMIL European Network in Torino – Training, Imaging probes, Chemical separation techniques.  
Italy – Torino, 16 – 21 April, 2007.

**R. Lipka, A. Jaroń**

DIMI/EMIL annual meeting- 2 nd Int. Conf. - European Society for Molecular Imaging.  
Italy – Neapol, 12– 15 April, 2007.

**E. Byszewska–Szpocińska, D. Pawlak**

DIMI/EMIL summer school in Prague  
Czech Republic – Prague, 29 – 31 August, 2007.

**A. Sawicka**

## PARTICIPATION IN SCIENTIFIC COUNCILS, COMMITTEES AND OTHERS

## POLISH ACADEMY OF SCIENCES COMMITTEES

Committee of Medical Physics and Radiobiology of Polish Academy of Sciences

**N. Golnik**

Polish Academy of Sciences, Energy Studies Committee

**S. Chwaszczewski**

## INTERNATIONAL ORGANISATIONS, ASSOCIATIONS AND SOCIETIES

International Organization of Medical Physics President of the Polish National Member Society, M, 2002.

**N. Golnik**

International Radiation Protection Association

**N. Golnik, B. Filipak, K. Józefowicz, M. Zielczyński**

International Organization for Standardization. Working Group WG-19

**N. Golnik, K. Józefowicz, M. Zielczyński, B. Filipiak** (Working Group WG-14)

International Society of Neutron Capture Therapy, International Society for Cf-252 Brachytherapy

**N. Golnik (Member)**

European Radiation Dosimetry Group (EURANOS)

**N. Golnik**

International Linear Algebra Society (ILAS)

**Z. I. Woźnicki**

Society for Industrial and Applied Mathematics (SIAM)

**Z. I. Woźnicki**

Gesellschaft für Angewandte Mathematik and Mechanik (GMM)

**Z. I. Woźnicki**

World Scientific and Engineering Society

**Z. I. Woźnicki**

Technical Committee on Nuclear and Hazardous Waste Verification (TC 5)

**P. Stoch**

Joint Institute for Nuclear Research, Dubna , Laboratory of High Energies

**B. Słowiński** (as a referee for scientific publications)

International Scientific Collaboration PANDA, GSI, Darmstadt

**B. Słowiński** (Member)

American Association for the Advancement of Sciences

**M. Szuta**

American Chemical Society

**M. Szuta**

World Energy Committee: European Regional Study Working Group on the Future of Nuclear Energy in Europe

**S. Chwaszczewski** (Member)

Members of European Association of Nuclear Medicine (EANM)

**R. Mikołajczak** (Member of Radiopharmacy Committee of EANM since 2001), E. Iller, D. Pawlak

Society of Radiopharmaceutical Science, SRS

**R. Mikołajczak**

International Research Group in Immuno-Scintigraphy and Therapy, IRIST

**R. Mikołajczak**

Country Coordinator of European Radiopharmacy Courses

**R. Mikołajczak**

Council for Atomic Energy Matters

**R. Mikołajczak** (Member 2005 – 2008)

2nd Section (Radioactive measurement) Consultative Committee for Ionizing Radiation (CCRI) in the International Bureau of Weights and Measures (BIPM) in Sevres, France

**R. Broda** (Member since 1995)

International Committee of Radionuclide Metrology (ICRM), LSCWG

**R. Broda** (Member since 1978)

Nuclear Medicine Review

**R. Mikołajczak** (Member of Editorial Board since 2001)

Journal Nuclear Engineering and Design

**A. Strupczewski** (permanent Board Member)

Institute of Nuclear Materials Management

**J. Koziel** (Member)

Journal of Powder Diffraction

**L. Górski** (Corresponding Member of the Editorial Staff)

International Scientific Journal of Nuclear and Radiation Physics, Cairo, Egypt

**B. Słowiński**

#### POLISH ORGANISATIONS, ASSOCIATIONS AND SOCIETIES

President of Polish Nuclear Society

**S. Chwaszczewski**

Polish Society of Medical Physics Vice President, 2005

**N. Golnik**

Atomic Council of Polish Atomic Energy Agency

**N. Golnik** (Member of Radiological Protection Commission)

Polish Society of Radiation Research

**N. Golnik, M. Zielczyński**

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Commission on Nuclear Safety and Radiological Protection

**N. Golnik**

Polish Physical Society

**A. Czachor, K. Mikke**

Polish Neutron Scattering Society

**A. Czachor, K. Mikke, J. J. Milczarek, J. Jankowska-Kisielinska**

Polish Committee for Standardization

**J. Licki** (Member of Problem's Commission no 280 – Air Quality)

**M. Szuta** (Member of Problem's Commission no 266 –Nuclear Instrumentation)

**J. Wojnarowicz** (Member Technical Committees since 1997)

Society of Electricians of Poland, Nuclear Power Section

**E. Strugalska-Gola**

The Ministry of Education

**S. Słowiński** (referee for high School manuals of physics)

Committee of the Nuclear Methods for Condensed Phase Physics: Council for Atomic Energy Matters

**A. Czachor, J. J. Milczarek, K. Wieteska**

Polish Synchrotron Scattering Society

**K. Wieteska**

Polish Solar Energy Society, Polish Photovoltaics Society

Polish Society of Solar Energy PTES-ISES

**C. Pochrybniak**

Committee on Nuclear Energy

**S. Chwaszczewski**

Council for Atomic Energy Matters

**G. Krzysztozek**

Polish Journal of Medical Physics and Engineering, I, 2005

**M. Zielczyński**

Polish Association of Nuclear Medicine, PTMN

**R. Mikołajczak, E. Byszewska-Szpocińska, D. Pawlak, A. Sawicka, J. Pijarowska**

Polish Pharmacopoeia Committee, Radiopharmaceutical Committee,

**R. Mikołajczak** (Member since 2006)

SCIENTIFIC, TECHNICAL AND ECONOMIC INFORMATION CENTRE  
**Ewa Szlichcińska**

LIBRARY biblioteka@cyf.gov.pl

**Ewa Szlichcińska M. Sc.**

**Gabryela Kosicka**

The library contains 17.790 volumes and 1040 journal volumes, 60 current journals in the field covered by IAE research activity and serves as the national source of literature on nuclear techniques and radioactive waste management.

PUBLISHING ACTIVITY

**Grażyna Swiboda M. Sc.**

**Jadwiga Pustola**

Publications IAE:

6 IAE Raports A, 1 IAE Monograph, IAE Annual Report 2006

POPULARIZATION ACTIVITY

**Gabryela Kosicka**

**Hanna Gryzińska**

The activity of the Scientific, Technical and Economic Information Centre consists of:

- collecting and disseminating information in the field of occupational nuclear energy, physics of condensed matter, radiation protection and environment
- preparing modern information materials, organization exhibitions, fairs and presentations
- publishing activity
- provides organization and support for visitors of the IAE
- standardization activity

RADIOISOTOPE CENTRE POLATOM LIBRARY

**Małgorzata Rozum**, biblioteka@polatom.pl

Tel. 022 718 07 08

The library contains 12.047 volumes and 214 journal volumes, 47 current journals (including 41 polish journals and 6 foreign) in the fields of radiology and nuclear medicine, isotopes and radiation applications, chemistry.

**Promotion of IAE**

Participation in ENEX 10 th International Power Industry Fair and Fair of Renewable Sources of Energy, Kielce, February 12-14, 2007

Participation in International Poznan Fair: Innovations, Technologies, Machines: Science for Economy, Poznań, July 20-23, 2007

STANDARDIZATION ACTIVITY TK nr 266 for Nuclear Instrumentations

Roman Trechciński	Ph.D.,D.Sc
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Klemens Kruszewski M. Sc.

Stefan Wójtowicz Ph.D.,D.Sc

The Standardization Committee for Nuclear Instrumentations has been active since January 2003. The Technical Committees are composed of expert affiliated to national administration, agencies, business, employers, consumers, professional, science and technology high education associations and PKN employers.

President of the Polish Committee for Standardization in accordance with solution of the Normalization Council of PKN, recommended to organize in the Institute of Atomic Energy at Świerk, appropriate technical committee for standardization of nuclear instrumentations and for designing the Polish Standards for nuclear instrumentations, apparatus for nuclear reactor and radiological needs.

The Technical Committee nr 266 for Nuclear Instrumentations collaborate with the following international organizations:

CENELEC/SR 45; CENELEC/SR 45A ; CENELEC/SR 45B; CENELEC/TC 45A; CENELEC/TC 45B; IEC/TC 45; IEC/TC 45/SC 45A; IEC/TC 45/SC 45B.

Standardization documents completed in 2007:

pr PN-EN 61582

Radiation protection instrumentation - in vivo counters classification, general requirement and test procedure for portable and installed equipment.

pr PN-EN 60761-4

Equipment for continuous monitoring radioactivity in gaseous effluents -Part 4: Specific requirements for iodide monitors.

pr PN-EN 60761-1

Equipment for continuous monitoring radioactivity in gaseous effluents -Part 1 General requirements.

pr PN-EN 60601-2-II

Medical electrical equipment-Part 2-II; particular requirements for the safety of gamma beam therapy equipment.

pr PN-EN 6035

Radiation protection instrumentation-alpha beta and alpha/beta (beta energy>60 keV ) contamination meter and monitors.

#### **The opinion of the CENELEC standard:**

EN-6060-2-9; 1996. Medical Electrical Equipment Part 2 -9. Particular requirements for the safety of patient contact dosimeters used in radiotherapy with electrically connected radiation detectors.

Standardization Commission for Interfaces and Buildings Electronics Systems, Area No 173

#### **Standardization Commission for Interfaces and Buildings Electronics Systems, Area No 173**

prPN-prEN 14908-5	Open data Communications In building automation, controls and building management-control network protocol-part 5: Implementation guideline
prPN -prEn 15500	Control for HVAC applications-electronic individual zone control equipment
prPN -prEN 50174-1	Information technology-cabling installation-part 1: Specification and quality assurance,
prPN -prEn 50174-2	Information technology-cabling installation-part 2: Installation planning and practices inside buildings
prPN-prEN-50491-3	General requirements for home and building electronic systems( HBES) and building automation and control systems (BACS) – part 3: Electrical safety requirements
prPN -prEN 50491-5-1	General requirements for home and building electronic systems( HBES) and building automation and control systems (BACS) – part 5-1: EMS requirements, conditions and tests set-up
prPN -prEN 50491-5-2	General requirements for home and building electronic systems( HBES) and building automation and control systems (BACS) - part 5-2 EMC requirements for HBES/BACS (class A) used in residential
prPN -prEN 50491-5-3	General requirements for home and building electronic systems( HBES) and building automation and control systems (BACS) -part 5-3 EMC requirements for HBES/BACS (class B) used in residential, commercial and light industry environment

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prPN -prEN 50491-5-4	General requirements for home and building electronic systems( HBES) and building automation and control systems (BACS) -part 5-4: EMC requirements for HBES/BACS used industry environment
prPN -prEN ISO 16484-5	Building automation and control systems-part 5: Data communication protocol
PN-EN 50090-5-3:2007	Home and building electronic systems(HBES)-part 5-3 Media and media dependent layers-radio frequency
PN-EN 50173-1:2007(U)	Information technology-generic cabling systems-part 1: general requirements
PN-EN 50173-2:2007(U)	Information technology-generic cabling systems-part 2: Office premises
PN-EN 50173-3:2007(U)	Information technology-generic cabling systems-part 3: Industrial premises
PN-EN 50173-4:2007(U)	Information technology-generic cabling systems-part 4: Homes
PN-EN 50173-5:2007(U)	Information technology-generic cabling systems-part 5:Data centers
PN-EN 50310:2007	Applications of equipotential bonding and earthing in buildings with information technology equipment
Pn -EN 50346:2004/A1 :2008/(U)	Information technology-cabling installation-testing of installed cabling
PN -EN ISO 16484 -3:2007	Building automation and control systems(BACS)-part 3: Functions
prPN -EN 14908-1	Open data communication in building automation, controls and building management-control network protocol-part 1: Protocol stack
PN-EN 13312-1:2007	Open data communication in building automation, controls and building management-home and building electronic system-Part 1: Product and system requirements
PN-EN 13321-2:2007	Open data communication in building automation, controls and building management-home and building electronic system-Part 2KNXnet/IP communication
PN-EN 14597:2007	Temperature control devices and temperature limiters for heat generating systems
PN-EN 14908-2:2007	Open data communication in building automation, controls and building management-home and building electronic system-control network protocol-Part2:Twisted pair communication
PN-EN 14908-3:2007	Open data communication in building automation, controls and building management-home and building electronic system-control network protocol-Part 3: Power line channel specification
PN-EN 14908-4:2007	Open data communication in building automation, controls and building management-home and building electronic system-control network protocol-Part 4: IP Communication
PN-EN 15232:2007(U)	Energy performance of buildings-impact of building automation, controls and building management
PN-EN 500065-4-7:2007	Signaling on low-voltage electrical installation in the frequency range 3 kHz to 148,5 kHz and from 1,6 MHz to 30 MHz-Part 4-7: Portable low voltage decoupling filters-safety requirements
PN-EN 50090-2-2002/ A2/2007	Home and building electronic systems(HBES)-Part:2-2-System overview-general technical requirements
PN-EN 50090-5-1:2007	Home and building electronic systems(HBES)-Part 5-1: Media and media dependent layers-power line for HBES Class 1
prPN -EN 15232	Energy performance of buildings-impact of building automation, controls and building management
prPN -EN 50173-2	Information technology-generic cabling systems-Part 2: Industrial premises
prPN -EN 50174-3	Information technology-generic cabling systems-Part 3: Industrial premises
prPN -EN 50173-4	Information technology-generic cabling systems-Part 4:Homes

prPN -IEC 62050VHDL Register Transfer Lever (RTL) synthesis

prPN -IEC 62243 Artificial intelligence exchange and service tied to all test environments(AI-ESTATE)

### COMPUTER CENTRE

**A. Szarek, I. Wasilewski, G. Jaworski, P. Zduńczyk**

Computer network in the Institute of Atomic Energy is based on the star topology with individual twisted pair or fiber optic cables coming from each node and terminating at central network concentrator or hub/switch.

The total lengths the fibre-optic cable is about 3600 meters. There are about 220 connected workstations, mostly PC computers. Network is split into 3 virtual LANs. Two of them cover both segments of thick ethernet cable. The third is a special area called demilitarized zone (DMZ) consisting of two servers. VLANs are connected by a second layer switch Cisco 2950-24.

Communication with the internet is realized through the SDSL link with a speed of 2Mbit/s. Router Lucent Technologies DSL-HST-E that connects the institute's network to internet node in NETIA, is separated from the switch by a firewall. Firewall is an OpenBSD server running packet filter.

There are two machines working in DMZ. One of them is a PC machine on FreeBSD Unix, that acts as a name resolver (DNS), mail, http and ftp server. The second one is Hewlett Packard 9000 A-400 used for complex mathematical computation.

Local network, server area and the internet are strictly separated from each other. Communication between VLANs is routed, NATed and protected by a firewall:

- Communication between machines in the local network and internet can be initiated only by a local machine.
- Communication between machines in the local network and DMZ can be initiated only by a local machine.
- Computers can access the FreeBSD server from the internet only for specific services such as e-mail, ftp and http.
- HP A-400 machine can be accessed only from the local network or from the safe FreeBSD server.

Those rules guarantee easy access to the internet and local servers for local users and good protection against intrusion. In addition e-mail service is protected by the Kaspersky Anti-Virus Business Optimal scanner.