

Ministry of Education, Research and Innovation
National Authority for Scientific Research

INSTITUTE OF ATOMIC PHYSICS

Florin D. Buzatu



60th Anniversary
10 years of EURATOM-Fusion

Măgurele - Bucharest, ROMANIA

December 2, 2009

Măgurele – Pole of Physics



BUCHAREST
↑
ring rail/road



IFA

LASERS & PLASMA
MATERIALS
EARTH
OPTOELECTRONIS

Space Sciences
Theoretical Physics
Particle Physics
Computing
Nat. Phys. Library

UNIVERSITY
(Faculty of Physics)
High School

ENGINEERING

NUCLEAR
 γ – Irradiator
Tandem acc.
Waste Proc.
Cyclotron
Reactor (decomm.)

Adv. Detectors
Life & Env.
Radioisotopes

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IFIN-HH gr. 1



Nuclear & Vacuum



INFM



FF-UB

Physics@Măgurele.RO

Optoelectronica

ISS

INFP

INFLPR

INOE

CITON

IFIN-HH gr. 2

IFA



IFA: Scientific Tradition & Performance

1st Reactor, Cyclotron and Betatron (1956)

- 1st Romanian Computer (1957)
- 1st Laser (1962 – I. Agârbiceanu)
- Tandem Accelerator (1974)
- Radioisotope Production Centre (1974)
- Nuclear Waste Processing Centre (1974)



Founding Fathers:



Eugen BĂDĂRĂU
1887-1975



Horia HULUBEI
1896-1972



Alexandru PROCA
1897-1955



Ion AGÂRBICEANU
1907-1971



Șerban ȚIȚEICA
1908-1985

IFA – short history



2008 New IFA

2006 IFA: CEEC

2001 IFA: CERES

1999 IFA: EURATOM-Fusion
Research Unit

1996 INCD: IFIN-HH, INFLPR, INFM, INFP

1990 ~~CSEN~~ IFA (ICEFIZ)

IRNE → Min. En. El.

1977 CSEN: ICEFIZ, IRNE

ICEFIZ: IFIN, IFTAR, IFTM, CFPS, CASS, FAN,
ITIM Cluj-Napoca, CFT Iași, Uzina G Rm. Vâlcea

1973 ICEFIZ: IFA, IFB, IFA-Cluj, ...

1956 IFA & IFB

1949 Inst. Fiz. Acad.



ROMANIAN EURATOM-FUSION ASSOCIATION

- Association EURATOM/MEdC: 25 December 1999
Contract of Association between EURATOM and MEdC
- Research Unit of the Association: IFA
- Participating institutions:
 - INFLPR, IFIN-HH, INOE – Măgurele
 - ICSI – Râmnicu Vâlcea
 - University Alexandru Ioan Cuza – Iași
 - University of Craiova
 - Technical University of Cluj-Napoca



Secretary of State Prof. Anton Anton and
Dr. Alejandro Zurita-Centelles, cut the exhibition ribbon

Collaborations: **UK:** Culham Science Centre for Fusion Energy. **France:** Institute for Magnetic Fusion Research – Cadarache. **Germany:** Forschungszentrum Karlsruhe, Forschungszentrum Juelich, Institute for Plasma Physics, Garching. **Belgium:** Nuclear Research Centre-Mol, Université Libre de Bruxelles. **Italy:** ENEA, Frascati. **Spain:** CIEMAT Madrid. **Netherlands:** Institute for Plasma Physics. **Czech Republic:** Institute for Plasma Physics, Prague.

Technological achievements

Combined Magnetron Sputtering and Ion Implantation (CMSII) Industrial Coating Unit

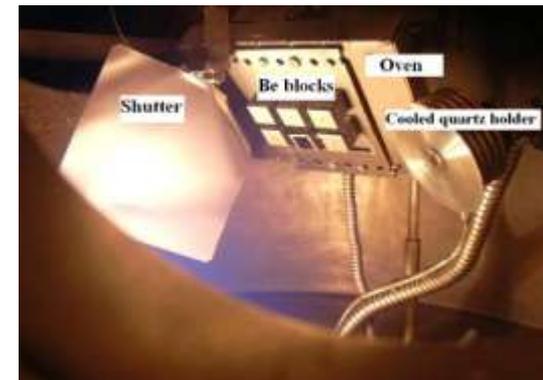


Tungsten coating of CFC tiles for the JET first wall

Production of Beryllium Coatings for Inconel Cladding



Beryllium tile Markers for the ITER-like Wall project

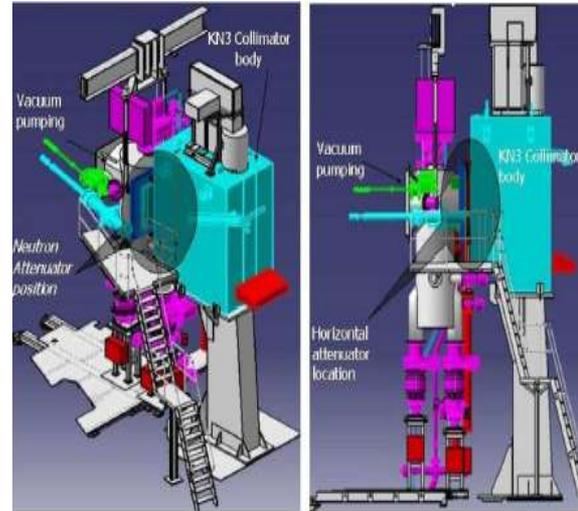


High Resolution X-Ray Tomography in Nuclear Energy Research

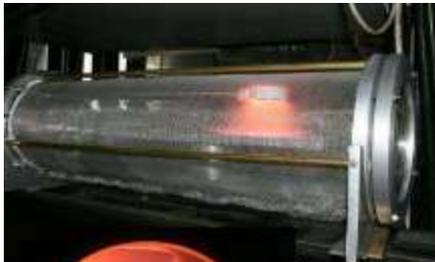
Technological achievements (cont.)



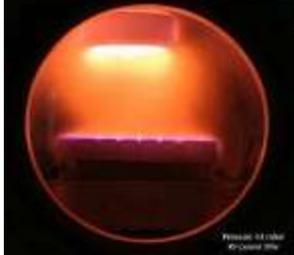
Pilot plant for tritium and deuterium separation



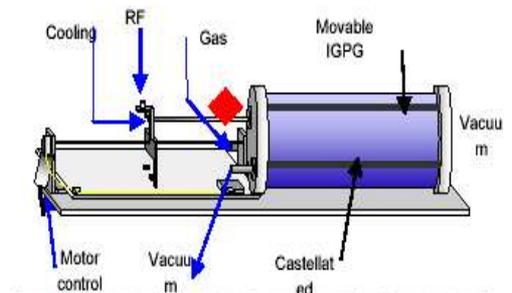
Upgrade of the neutron and gamma ray diagnostics at JET: gamma ray cameras neutron-attenuators



Inside-Gap Plasma Generator for wall cleaning applications



Development of a device and of the experimental procedures for cleaning the fuel and impurity retentions on the surface of the discharge chamber of the tokamak



Coordination of national programmes

CERES (2001-2006)

Basic Research of Socio-Economic Interest :

- The total of project proposals submitted: 1.666;
- The total research contracts concluded by IFA with 87 institutions: 682;
- The main institutions: National R&D Institutes (28), Research Institutes of the Romanian Academy (16) and Universities (11);
- Contracts concluded in partnership : 464 with 555 institutions. The main partners of the research institutes were one or more universities;
- Scientific papers: 2.042 from which 1260 published in ISI journals. ISI score per paper: 1.846.

Coordination of national programmes (cont.)

CEEX (2005-2008)

Research of Excellence:

- The total research contracts signed by IFA with the winners of the competition: 189 (65 institutions);
- The main institutions: National R&D Institutes (21), Research Institutes of the Romanian Academy (16) and Universities (15);
- Partnerships : 574. The main partners of the research institutes were one or more universities;
- Scientific papers published in ISI journals: 804.
ISI score per paper: 1.794.



New IFA

Mission: to provide an adequate and stimulating scientific policy for the development of the atomic and subatomic field

Main activities:

- scientific evaluation and strategy
- international cooperation
- management of R&D programmes
- scientific knowledge management

Government Decision No. 1608/2008

Decision of the President of the National Authority for Scientific Research No. 9642/2009



Evaluation & Strategy

ESFRO Project (2009-2011)

“Evaluation of the Romanian research potential in physics and elaboration of the national strategy for international cooperation”



IFA (coordinator)

+ 10 national R&D institutes

+ 6 universities



AN CS Autoritatea Națională pentru Cercetare Științifică ifa
Institutul de Fizică Atomică

Lansarea Proiectului

Evaluarea potențialului românesc de cercetare în domeniul fizicii și elaborarea strategiei naționale de cooperare internațională



Conducător proiect:
Institutul de Fizică Atomică (IFA)

Parteneri:

1. Institutul Național de Cercetare-Dezvoltare pentru Fizică Nucleară (ICF), Măgurele, jud. Ilfov (INCFM)
2. Institutul Național de Cercetare-Dezvoltare pentru Fizică și Inginerie Nucleară "Horia Hulubei" (INCD-IPP), Măgurele, jud. Ilfov (IPHE-IPP)
3. Institutul Național de Cercetare-Dezvoltare pentru Fizică Laserilor, Plasmei și Radiației, Măgurele, jud. Ilfov (INCD-ILP)
4. Institutul de Științe Școlare - IISFRM, Măgurele, jud. Ilfov (ISS)
5. Institutul Național de Cercetare-Dezvoltare pentru Optoelectronică, Măgurele, jud. Ilfov (INO)
6. Institutul Național de Cercetare-Dezvoltare pentru Fizică Fără Ionizantă, Măgurele, jud. Ilfov (INF)
7. Universitatea "Reșterea Științelor" (URS)
8. Institutul Național de Cercetare-Dezvoltare pentru Fizică Teoretică, jud. ITD
9. Universitatea Babeș-Bolyai, Cluj-Napoca (UBB)
10. Institutul Național de Cercetare-Dezvoltare pentru Tehnologii Interdisciplinare și Moleculare, Cluj-Napoca (ITM)
11. Universitatea Babeș-Bolyai, Cluj-Napoca (UBB)
12. Universitatea Politehnică București (UPB)
13. Institutul Național de Cercetare-Dezvoltare pentru Tehnologii Avansate și Inginerie, Hărtoști, Vaslui (ICSI)
14. Institutul Național de Cercetare-Dezvoltare pentru Electronice și Matrice Condensate, Timișoara (INCEM)
15. Universitatea de Vest din Timișoara (UVV)
16. Universitatea din Craiova (UCV)

Vineri 25 septembrie 2009, ora 10⁰⁰, Sala de consiliu IFA (Bloc Turn, etaj 9)
Secretariat: tel. 021 457 4456; fax 021 457 4493. E-mail: a.ghita@ifm-mg.ro



General Cooperation Agreement



covering scientific cooperation between CEA units and Romanian Research Institutions

The fields of cooperation may include, but are not limited to:

Nuclear Energy, including

- Nuclear safety
- Development of new generation nuclear power reactors
- Spent fuel and radioactive waste management
- Exchange information relating to nuclear energy
- Education and training

New Technologies for Energy

including

- Fuel cells
- Solar cells
- Energy storage
- Hydrogen

Fundamental Research on Energy

including

- Nuclear fusion and fission
- Matter sciences
- Climate sciences

Technologies for Information and Health, including

- Micro and Nano-technologies
- Software technologies
- Biotechnologies
- Radiobiology and nuclear toxicology
- Radioprotection
- Medical imaging



General Cooperation Agreement (cont.)



The cooperation may include, but is not limited to, the following forms:

- a) Communication of general information and knowledge on the topics of this Agreement
- b) Exchange of information other than (a) on specific topics mutually agreed upon,
- c) Exchange of scientists, specialists and experts (short-term and long-term visits) between the Cooperating Partners,
- d) Access to the research infrastructures of the other cooperating partner(s) with their respective approval,
- e) Joint R&D projects and studies, in particular projects leading to submission of joint project proposals under international and EU Programs and initiatives,
- f) Bilateral research projects, submitted, selected, and financed under the Joint Calls procedure organized by the Parties,
- g) Participation of CEA to R&D programs performed by the Romanian Research Institutions and vice versa,
- h) Training of young scientists and PhD students,
- i) Supply of services by CEA to the Romanian Research Institutions and vice versa,
- j) Other forms of scientific cooperation which can be mutually agreed upon between the Parties.

IFA - the symbol of the Romanian physics

www.ifa-mg.ro

Thank You!

