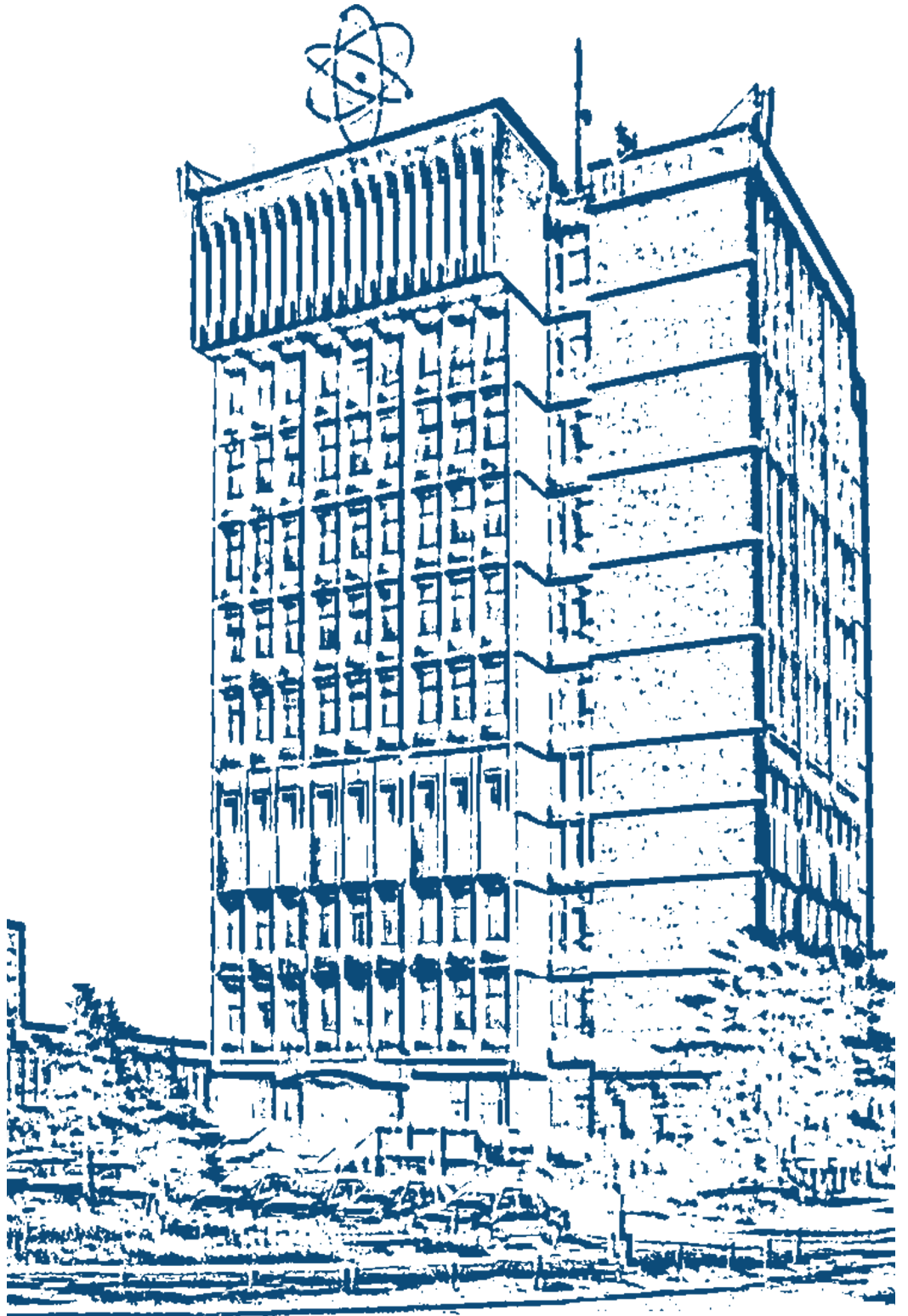


# Institute of Atomic Physics



2011

Bucharest-Magurele, ROMANIA

## BRIEF HISTORY



**Horia HULUBEI**

(1896-1972)

*Founding father of IFA*



**Eugen BĂDĂRĂU**

(1897 - 1975)



**Șerban ȚIȚEICA**

(1908-1985)

*The first Scientific Director of IFA*



**Ioan URSU**

(1928-2007)

*IFA Director 1968-1976*

*Founder of the modern  
Magurele Platform*

IFA is not just a simple acronym,  
IFA is the symbol of the Romanian physics.

**1949:** The Institute of Physics of the Romanian Academy was set up in Bucharest. Its founding father, Horia Hulubei (1896-1972), member of both the Romanian and French academies, had remarkable contributions in atomic and nuclear physics particularly to the development of X-ray spectroscopy.

**1956:** The Institute of Physics of the Academy split into the Institute of Atomic Physics (IFA) located at Magurele under the leadership of Horia Hulubei and the Bucharest Institute of Physics (IFB) directed by Eugen Badarau, member of the Romanian Academy and prominent specialist in plasma physics and electrical discharges in gases.

The science performed at Magurele became widely acknowledged by the international scientific community, IFA setting a high standard for the Romanian scientific research.

In its first five years of existence, IFA succeeds outstanding performances, an absolute first in the eastern bloc countries:

- 1957** - inauguration of VVR-S nuclear reactor and of U120 cyclotron, both of Soviet manufacture;
- development of CIFA-1, the first Romanian electronic computer (with a speed of 50 instructions per second) by Victor Toma and his team;
- 1962** - the first Romanian laser, developed by Ion Agarbiceanu and his team, was put into operation.

In **1973** IFA was incorporated, along with other research and educational units throughout the country, into the Central Institute of Physics (ICEFIZ) belonging to the State Committee for Nuclear Energy (CSEN).

In **1977** ICEFIZ was reorganized by setting up the main physics research institutes and technological units, specializing in fields of activity as follows: Magurele Physics Platform – nuclear physics and engineering, laser and plasma, materials, earth physics, space sciences, nuclear equipment; Cluj-Napoca – molecular and isotopic technologies; Iasi – technical physics; Ramnicu-Valcea – heavy water.

In January **1990** IFA re-emerged as an institution with its own legal personality, in direct subordination to the Romanian Government, by taking over ICEFIZ research institutes following CSEN dissolution. Since October 1990, IFA has been directly subordinated to the Ministry of Education and Science.

In **1996**, from IFA spun off the national research and development institutes of today, five of which located at Magurele.

Since **1999**, when the Contract of Association with EURATOM was signed, the Institute of Atomic Physics has coordinated the participation of Romania in the European integrated scientific research in controlled thermonuclear fusion.

In the period **2001-2006** the Institute of Atomic Physics managed the CERES Programme - Basic Research of Socio-Economic Interest of the first National Plan for Research, Development and Innovation.

Between **2005-2008** IFA coordinated the Module “R&D Complex Projects” in basic and nuclear physics, socio-economics and humanistic sciences within the CEEX Programme - Research of Excellence.

Since 2005 IFA is subordinated to the National Authority for Scientific Research (ANCS) – Ministry of Education, Research, Youth and Sport.

In December **2008** IFA was reorganized by government decision with the view to playing a new and enhanced role in the development of the Romanian physics research.

The Institute of Atomic Physics (IFA) has certainly a **Past**, a bright one. Most personalities and the main achievements of the Romanian physics over the last decades are, more or less, related to IFA. **Today**, IFA has a new mission: to provide an appropriate framework for the development of the Romanian physics research, particularly in the atomic and subatomic field. IFA is a NAME, a SYMBOL which must last into the **Future**. IFA can ensure the consistence and the coherence of the entire Romanian physics. IFA can give us the hope of a future measuring at least the past. It rests upon all of us to successfully accomplish this aim.



**Dr. Florin-Dorian BUZATU**  
*IFA Director General*

## New IFA

### MISSION

To provide a stimulating scientific policy for the development of the Romanian physics research, particularly in the atomic and subatomic field, with the view to increasing the visibility and impact of physics in our society.

### MAIN OBJECTIVES

- To elaborate an adequate strategy aimed at strengthening the potential of the Romanian physics research and its role in the global community.
- To promote the scientific partnership at national and international level for a better performance and increased recognition of the Romanian physics research.
- To facilitate the knowledge transfer between the physics research and technology for the benefit of the national economy and of our society.
- To support education and training, especially for young scientists, with the view to providing the necessary expertise and resources for the development of the physics research in Romania.
- To improve the communication of physics in our society by more efficient and attractive means.

### MAIN ACTIVITIES

- Management of R&D programmes and projects
- Evaluation of the scientific output and research potential
- Prospective and strategic studies
- Scientific knowledge management
- Outreach activities

### HIGHLIGHTS

- Research Unit of the Romanian EURATOM-Fusion Association (since 1999)
- Coordinating the Romanian application for hosting ELI – the Extreme Light Infrastructure (2008-2009)
- Cooperation agreement with CEA, France (since 2009)
- Evaluation and strategy of the Romanian physics research – ESFRO project (2009-2011)
- Executive Agency for the F4E-RO Programme (since 2010)
- Management of the CERN-RO Programme (since 2011)
- IFA Seminars (since 2008)
- IFA Awards (since 2009)

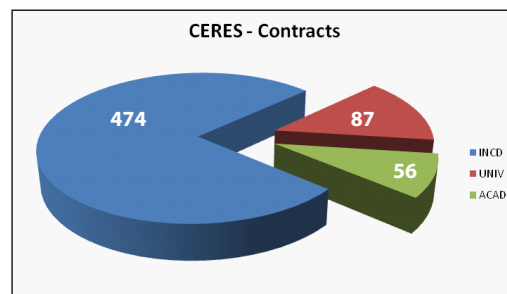
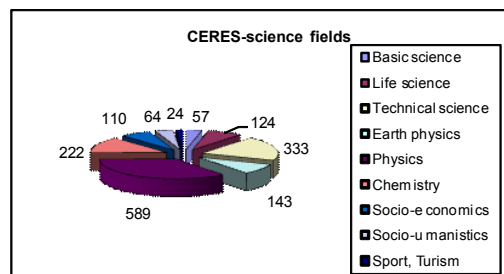


Dr. Theodor IONESCU-BUJOR  
 Director CERES Programme  
 Head of Romanian  
 EURATOM-Fusion Association  
 (1999-2008)  
 IFA Director General: 1999-2007

## CERES Programme – Basic Research of Socio-Economic Interest

In the period 2001-2006, the Institute of Atomic Physics managed the CERES Programme - Basic Research of Socio-Economic Interest (<http://www.infim.ro/ifa/>) - of the first National Plan for Research, Development and Innovation based on the financial contract with the Ministry of Education, Research and Youth.

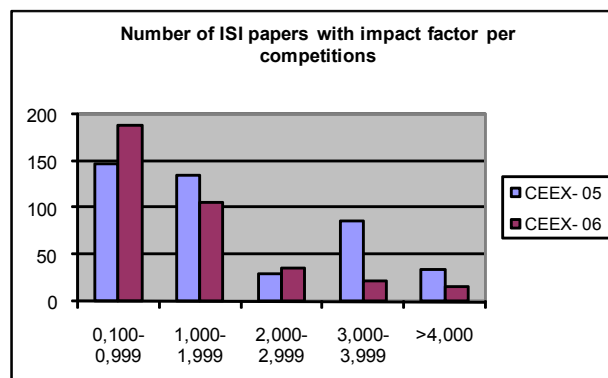
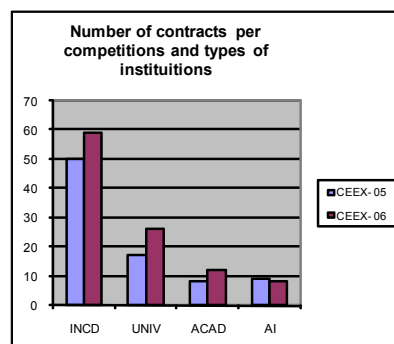
- 2001- 2004, annual project competitions organized by IFA
  - The total of project proposals submitted: 1666,
  - The total research contracts concluded by IFA with 87 institutions: 617,
  - The main institutions: National R&D Institutes - INCD (28), Research Institutes of the Romanian Academy- ACAD (16) and Universities - UNIV (11),
  - Contracts concluded in partnership: 464 with 555 institutions. The main partners of the research institutes were one or more universities,
  - Scientific papers: 2042 from which 1260 published in ISI journals.



## CEEX Programme – Research of Excellence

Between 2005-2008, the Institute of Atomic Physics coordinated the CEEX Programme – Research of Excellence (<http://www.infim.ro/ifa/>), Module I, areas: basic research, nuclear physics, socio-economic and humanistic sciences, through a management unit similar to that of the CERES Programme.

- 2005-2006, two competitions organized by the National Authority for Scientific Research:
  - The total research contracts signed by IFA with the winners of the competition: 189 (65 institutions),
  - The main institutions: National R&D Institutes - INCD (21), Research Institutes of the Romanian Academy - ACAD (16) and Universities - UNIV (15),
  - Partnerships: 574. The main partners of the research institutes were one or more universities,
  - Scientific papers published in ISI journals: 804.



## Romanian EURATOM-Fusion Association

### 5<sup>th</sup>- 7<sup>th</sup> Framework Programme (EURATOM-Fusion) of the European Union

The European Fusion Programme of EURATOM is accomplished in the successive Framework Programmes (Fusion) of the European Union. Romania was accepted to participate in the Fusion Programme of EURATOM since the first year in which access to the 5<sup>th</sup> Framework Programme was granted to the acceding countries after the Contract of Association was signed with the European Commission in 1999.

The Institute of Atomic Physics, nominated in 2000 as the Research Unit for unitary coordination of the activities within the projects concluded on the basis of the Contract of Association with EURATOM, ensured this coordination through the complex project "Research, development and specialization in the field of nuclear energy (nuclear fusion)" within the frame of the CORINT Programme, based on the contract between the IFA and the Ministry of Education, Research and Youth.

Romanian EURATOM-Fusion Association is visited every year by personalities from Joint European Torus (JET), EURATOM Association partners, European Fusion Development Agreement (EFDA) and European Commission. Our Association was visited by Dr. Jérôme Paméla - EFDA leader in 2008. Dr. Francesco Romanelli - EFDA Associated Leader for JET participated in the *Days of Romanian EURATOM-FUSION Association Meeting* in 2004, 2007 and 2009.

### Highlights of the Romanian EURATOM-Fusion Association

- The Association EURATOM-MEdC was established in 25 December 1999 when the Contract of Association between EURATOM and MEdC was signed.
- All the fusion research activities carried out in Romania in the frame of the European Fusion Programme are mainly financed by MEdC and partly by EURATOM.
- Since its establishment, the activities of the EURATOM-MEdC Association were coordinated by: Dr. Theodor Ionescu-Bujor (1999-2008), Dr. Florin Spineanu (2008-2011), Dr. Madalina Vlad (2011)
- The Fusion Research Unit of EURATOM-MEdC Association is the Institute of Atomic Physics with research groups in the National Institutes for Physics and the Universities participating in the European Fusion Programme as follows:
  - National Institute for Laser, Plasma and Radiation Physics, Magurele
  - Horia Hulubei National Institute for Physics and Nuclear Engineering, Magurele
  - National Institute of Materials Physics, Magurele
  - National Institute for Cryogenics and Isotope Technologies, Râmnicu Vâlcea
  - University of Craiova
  - Technical University, Cluj Napoca
  - Alexandru Ioan Cuza University, Iasi

The European Commission with the advice of the Consultative Committee for the Euratom specific research and training programme in the field of nuclear energy (Fusion), is responsible for implementing the fusion programme. The research is carried out mainly in the laboratories of the fusion "Associations", within the framework of Contracts of Association (CoA) concluded between Euratom and Member States (and Associated Countries) or organisations in the Member States, and within the European Fusion Development Agreement (EFDA).

The Work Programme of EURATOM-MEdC Association is directly approved by the European Commission – a singular situation within the landscape of Romanian research.

The main results obtained by EURATOM-MEdC Association are the following:

- fundamental contributions to the understanding of the complex nonlinear effects in energy and particle transport produced by plasma turbulence and in the generation of coherent structures and flows. These results are presented in 50 papers, six of which published in Physical Review Letters with Romanian first authors.
- important contributions to nuclear data for fusion.
- major contribution to the enhancement project at the largest tokamak device Joint European Torus (JET) concerning plasma facing material coatings. The project named „ITER-like wall at JET” has the goal to prepare the next step in fusion research.



**Dr. Florin SPINEANU**  
*Head of Romanian EURATOM-Fusion Association (2008-2011)*



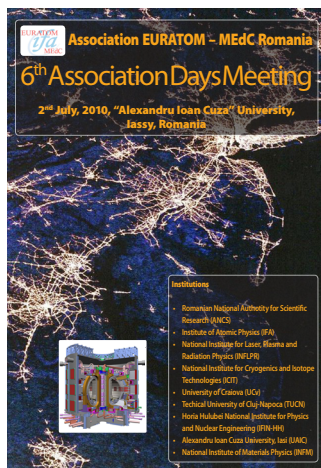
**Dr. Madalina VLAD**  
*Head of Romanian EURATOM-Fusion Association (2011)*



## EUROPEAN R&D PROGRAMMES

- development of several diagnostic methods and devices.
- contributions to first wall studies and to material science for fusion.
- fruitful collaboration of the Romanian researches with the most important fusion research centres (Culham Science Center for Fusion Energy, Culham, UK; Nuclear Research Centre-Mol, Belgium; Universite Libre de Bruxelles, Belgium; Institute for Magnetic Fusion Research - Cadarache, France; Max Planck - Institut für Plasmaphysik, Garching, Germany; Forschungszentrum Karlsruhe, Germany; ENEA, Frascati, Italy; Forschungszentrum Juelich, Germany; Institute for Plasma Physics, Prague, Czech Republic; CIEMAT Madrid, Spain; Institute for Plasma Physics, the Netherlands) based on the Mobility Agreement.

There were signed two Memorandums of Understanding: one with Forschungszentrum Karlsruhe, Germany, concluded in 2003 (renewed in 2007) and another with ENEA, Frascati, Italy, concluded in 2004.



### Associations Days

The main aims of these meetings are: the scientific exchange among the groups involved in EURATOM-MEdC Association, the presentation of their last results as well as of the principal achievements in the European fusion research, the public information on the trends in fusion programme provided by the representatives of the European Commission.

The Romanian Association provides an overview of the achievements obtained as well as the main directions and strategies envisaged and applied in order to make a reliable contribution to EURATOM-Fusion Programme.

In addition, invited talks from some of distinguished participants are included.

The meetings are attended by representatives from scientific, political and business environment in Romania and provide an opportunity to exchange ideas and develop a common vision on the evolving needs and prospects of the fusion field

The Days of the EURATOM-MEdC Association organized by the Institute of Atomic Physics were held at:

- IFA, Bucharest-Magurele (2004 - 1<sup>st</sup> Association Days Meeting, 2009),
- Al. I. Cuza University, Iasi (2005, 2010),
- Technical University of Cluj-Napoca (2006),
- National Institute for Cryogenics and Isotope Technologies, Ramnicu-Valcea (2007).



### IFA – Executive Agency for F4E-RO Programme

Fusion for Energy (F4E), the European Union's Joint Undertaking for ITER and the Development of Fusion Energy, was created under the Euratom Treaty by a decision of the Council of the European Union. The organization is established for a period of 35 years from 19 April 2007 and is located in Barcelona, Spain.

The main objective of F4E is to provide Europe's contribution to ITER, the world's largest scientific partnership which brings together seven parties that represent half of the world's population – the EU, Russia, Japan, China, India, South Korea and the United States.

*The Institute of Atomic Physics was designated by the National Authority for Scientific Research as the executive agency for financing, in the frame of F4E-RO Programme, the projects obtained by the Romanian institutions following the calls of European Fusion for Energy Agency.*

In this capacity, the Institute of Atomic Physics:

- provides the unitary coordination of the scientific, economic and administrative activities appropriate for ensuring the participation in the projects launched by Fusion for Energy Agency,
- administers the approved budget,
- prepares the information package on participation of Romanian institutions in the activities of F4E Agency.



**Dr. Gheorghe DINESCU**  
Director  
of F4E-RO Programme

## IFA ensures the management of Romania's participation in CERN

CERN, the European Organization for Nuclear Research, is one of the world's largest centres for scientific research in particle physics. It is also known as the place where the Web was created.

Founded in 1954, the CERN Laboratory sits astride the Franco-Swiss border near Geneva. It was one of Europe's first joint ventures and currently comprises 20 Member States.

Nearly 7000 scientists, half of the world physicists engaged in the field of elementary particles, work at CERN. They represent 500 universities and over 80 nationalities.

The innovative concept of open international scientific cooperation has been the foundation of CERN's successes since its establishment.

The Institute of Atomic Physics was entrusted with the management of R&D activities carried out by the Romanian research institutes with a view to implementing CERN programs and projects.








The Institute of Atomic Physics was assigned, according to Law no. 203/27.10.2010 that ratifies the Agreement between Romania and CERN concerning the status of candidate for accession to CERN, to ensure the management of the participation of Romanian institutions in CERN's programmes and scientific projects.

The evaluation and scientific monitoring of Romanian projects concluded with CERN is ensured by the „International Scientific Advisory Board”, which also provides its support to the Institute of Atomic Physics and to ANCS (The National Authority for Scientific Research) in elaborating and implementing a strategy in the field of high energy physics and CERN participation.

At present, Romania is financing its participation in CERN's experiments and programmes that are mentioned below:



**Dr. Francisc-Dionisie AARON**  
*Scientific secretary  
of CERN-RO Programme*

CERN Collaborations	Romanian Projects (2009-2011)	Participating Institutions
	Exotic states of matter, in medium effects and dynamics	Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH), Bucharest-Magurele
	Preparing simulation and preliminary analysis of data from ALICE experiment	Institute for Space Sciences (ISS), Bucharest-Magurele
	ATLAS experiment at the LHC: beginning of the data taking	<i>Coordinator:</i> IFIN-HH <i>Partners:</i> Politehnica University of Bucharest (UPB), National Institute for Research and Development of Isotopic and Molecular Technologies (ITIM), Cluj-Napoca
	LHCb experiment – from soft-QCD to b-physics results	Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH), Bucharest-Magurele
	National contribution to the development of the LCG computing grid for elementary particle physics	<i>Coordinator:</i> IFIN-HH <i>Partners:</i> Politehnica University of Bucharest (UPB), National Institute for Research and Development of Isotopic and Molecular Technologies (ITIM), Cluj-Napoca, Institute for Space Sciences (ISS), National Institute for Research & Development in Informatics (ICI), Bucharest – just for the year 2009, Alexandru Ioan Cuza University (UAIC), Iasi – since 2010
	Preshower Detector for DIRAC experiment	Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH), Bucharest-Magurele
	n_TOF Collaboration	Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH), Bucharest-Magurele
	Experimental and theoretical studies of exotic nuclei at ISOLDE	Horia Hulubei National Institute of Physics and Nuclear Engineering (IFIN-HH), Bucharest-Magurele



### The Cooperation Agreement between CEA and IFA opens up new opportunities to Romanian scientific research



Strengthening the scientific cooperation between France and Romania in the field of physics is an initiative designed to reinforce the importance of scientific dialogue and knowledge transfer as a base for developing a common pool of scientific knowledge and enhancing the competitiveness in this domain.

CEA, the French Alternative Energies and Atomic Energy Commission (Commissariat à l'Énergie Atomique et aux Énergies Alternatives), a prominent player in the European Research Area, is active in three main fields: energy, information and health technologies, and defense and national security.

*The General Cooperation Agreement for Scientific Research* concluded between CEA and IFA aims to strengthen cooperation between France and Romania in order to promote scientific research and technological development in fields such as Nuclear Energy, New Technology for Energy, Fundamental Research for Energy and Information Technology and Health.

The agreement enables the funding, both from the Commission for Atomic Energy and the Romanian Government, of joint projects that will ensure a sustained participation in European projects and will provide us the opportunity to carry out work stages in the research units of CEA, which encompasses almost the whole technological research & development units operating in the field of energy in France, particularly nuclear energy.

This leaves open the possibility of concluding bilateral projects with the research units within the Commission for Atomic Energy, based on mutual interest and reciprocal advantage



December 2<sup>nd</sup>, 2009: the signing of the Cooperation Agreement



Dr. Mihaela BAIBARAC  
Scientific secretary  
of IFA-CEA Programme

#### IFA-CEA Cooperation Programme

Following the call launched on May 3<sup>rd</sup>, 2010 for research projects proposed by the Romanian institutions together with units of CEA - France, the first of its kind in the recently established partnership between IFA and CEA, a total of 9 joint research and development projects are currently funded.

The Romanian project coordinators are:

- 3 national R&D institutes in physics from Magurele campus (nuclear, materials, lasers and plasma)
- SCN Pitesti (subsidiary of Romanian Authority for Nuclear Activities – RAAN)
- 3 universities in the country (Gh. Asachi, Iasi; West Univ., Timisoara and Univ. of Craiova).

The projects cover a broad thematic areas in the following field of cooperation:

- nuclear energy (3)
- new technologies for energy (2)
- information technology and health (4).

The projects have a duration of 3 years and benefit from mixed financing provided equally by the National Authority for Scientific Research and CEA respectively.

The second call for R&D projects was launched on October 3<sup>rd</sup>, 2011.



## Extreme Light Infrastructure (ELI)

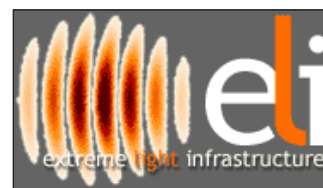
**ELI** will be the first research infrastructure in the world dedicated to the study of the laser-matter interaction at extremely high intensities (ultra-relativist regime), multiple times more powerful than all the existing facilities in the world. This ambitious project will revolutionize scientific research, being the gateway to ultra-fast processes investigation ( $10^{-18}$  –  $10^{-21}$  seconds).

**ELI** will also help to the promotion of new technologies like the relativistic micro-technology and the development of high-power compact laser accelerators.

**ELI** is expected to have an important social impact, bringing large benefits in many fields like medicine (oncology treatment, medical imaging and hadrons therapy methods), environment protection (new ways to treat nuclear wastes), ultra-fast electronics, etc. (<http://www.extreme-light-infrastructure.eu>).

European Union authorities have entrusted the Czech Republic (CZ), Hungary (HU) and Romania (RO) the construction of this pioneering laser facility.

Each of the three countries will host a different ELI "pillar" on its territory: "Beamlines" (near Prague, CZ), "Nuclear Physics" (Bucharest-Magurele, RO) and "Attoseconds" (Szeged, HU).



*ELI-PP Steering Committee  
Prague, Oct. 2009*

### Striving to achieve an ambitious goal: bringing ELI in Romania

IFA has involved itself from the very beginning in Romania's candidature for hosting ELI, the establishment of the location for the future infrastructure being one of the objectives of European project ELI-PP (Preparatory Phase).

**March 2008** - the first ELI seminar in Romania, intended to mobilize the scientific community in order to prepare the candidature, was held at IFA.

**May 2008** - Gerard Mourou, the "father" of ELI, delivered a presentation of the project in IFA's Council Room.

**June 2008** - IFA elaborated a questionnaire, transmitted to dozens of institutes, for the purpose of involving the participation of the Romanian scientific, technical and economic community in ELI.

**July 2008** - for a better preparation of the application for hosting ELI, IFA was assigned by the National Authority for Scientific Research (ANCS) to coordinate this activity.

**20 September 2008** - submission of the application file.

**21 November 2008** - the application file for hosting ELI was presented at the first Steering Committee of the ELI-PP project held in Paris; here, the brochure "Romania is ready for ELI" and the movie with the same name impressed the representatives of the 12 member states in the consortium. At that time, just one site was envisaged for ELI construction.

**17 April 2009** - presentation of the Romanian application for hosting ELI before the international experts panel in Stresa, Italy.

**17 July 2009** - the ELI-PP Steering Committee in Budapest, when the integrated proposal of the Czech Republic and Hungary was to be approved. Romania's delegation succeeded, through inconceivable efforts, to include Romania into the integrated proposal.

**1 October 2009** - the ELI-PP Steering Committee in Prague approved the integrated proposal of CZ, HU and RO for hosting ELI and mandated the three countries to declare their leadership and to forward their plan at the European Competitiveness Council.

**3 December 2009** - ELI's construction in the three countries was accepted by the European Competitiveness Council in Brussels.

The realization of ELI-RO project was entrusted mainly to the research institutes in Magurele (especially IFIN-HH, INFLPR and INFM) which, together with other research and educational institutions across the country, will have the chance to include Romania on the European and even on the worldwide map of large research infrastructure facilities. IFA can and will continue to support the implementation of ELI project in Romania and is ready to contribute even more to the success of this major enterprise.



*Romanian application  
for hosting ELI, Nov. 2008*



The project "Evaluation of the Romanian research potential in physics and elaboration of the national strategy for international cooperation" (ESFRO) within the Sectoral Plan of the Ministry of Education, Research and Innovation was awarded by the National Authority for Scientific Research to the consortium comprised of **IFA** (coordinator), **10 national research institutes** and **6 universities**:

- Institute of Materials Physics, Magurele, Bucharest (INFM)
- Horia Hulubei Institute of Physics and Nuclear Engineering, Magurele, Bucharest (IFIN-HH)
- Institute for Laser, Plasma and Radiation Physics, Magurele, Bucharest (INFLPR)
- Institute for Space Sciences, Magurele, Bucharest (ISS)
- Institute of Optoelectronics INOE 2000, Magurele, Bucharest (INOE 2000)
- Institute for Earth Physics, Magurele, Bucharest (INFP)
- Institute for Technical Physics, Iasi (IFT)
- Institute of Isotopic and Molecular Technologies, Cluj-Napoca (ITIM)
- Institute for Cryogenics and Isotopic Technologies - Rm. Valcea (ICSI)
- Institute for Electrochemistry and Condensed Matter, Timisoara (IEMC)
- University of Bucharest (UB)
- Politehnica University of Bucharest (UPB)
- Babes-Bolyai University, Cluj-Napoca (UBB)
- West University of Timisoara (UVT)
- University of Craiova (UCV)
- Alexandru Ioan Cuza University, Iasi



The duration of the project was two years: from September 2009 until August 2011.

The main results obtained:

- a methodology to identify and evaluate the main thematic areas for research in Physics, that might be adaptable/extensible to other fields of research, based on criteria and indicators of scientific performance, human resources, infrastructure, competitive financing (through projects) and socio-economic impact.
- a database of Physics research in Romania (<http://esfro-db.ifa-mg.ro/>), built with information extracted from Web of Science and information from partner institutions involved in the project (for the period 2001-2010) and using our own algorithms; this database enables visualising different indicators and correlations, as well as statistical analysis that are useful in the process of decision-making.
- a "snapshot" of the current potential of Physics research in Romania, by identifying 25 thematic areas (according to Science Citation Index Expanded classification, Thomson ISI) with special scientific visibility. According to international statistics, physics provides about a third of Romania's ISI publications and half of the citations, thus ranking Romania no. 32 in the world (out of 127) and no. 5 in Eastern Europe (out of 23).
- development of a strategy for Physics research in Romania, especially for 11 thematic subdomains, based on the performance, potential and development perspectives analysis of the respective field of research, by identifying the themes, subjects, priorities, short term objectives (for 2012-2014) and medium ones (for 2015-2020). Also, appropriate measures and recommendations for implementing the strategy have been proposed.
- evaluation of Romania's participation in large international Physics collaborations and development of a short-term strategy (2012-2014) as well as a medium-term one (2015-2020) in order to strengthen its participation in projects and programmes such as: EURATOM-Fusion, CERN, FAIR, JINR, SPIRAL-2, KM3NeT and ELI.

The project's results were presented in two conferences of large participation (that took place on November 5<sup>th</sup>, 2010, and August 30<sup>th</sup>, 2011 respectively) and can be found on the institute's website.



## New IFA: focus on cross-fertilization

## SEMINARS

*By focusing on the vital role of the knowledge transfer, the Institute of Atomic Physics provides a framework for scientific communication with a view to exploring collaboration and enhancing cross-fertilization in Physics.*

In 2010, IFA hosted a cycle of seminars related to ELI titled **PULSE and IMPULSE of ELI** held by

Marian APOSTOL (Horia Hulubei National Institute of Physics and Nuclear Engineering, Magurele):

- **Electron Pulses Accelerated by Laser Beams** (April 2010)
- **Gamma Laser Controlled by High External Fields** (May 2010)
- **Electron-Positron pairs created from vacuum by external fields** (December 2010)

Mihai GANCIU (National Institute of Lasers, Plasma and Radiation Physics Magurele):

- **Electron Pulses Accelerated by High-Intensity Polaritonic Laser Beams** (May 2010)
- **Electron pulse coupling with dielectric targets by Cruise Effect for high-intensity external field controlled lasing** (July 2010)
- **Compton Backscattering by a polaritonic pulse** (November 2010)

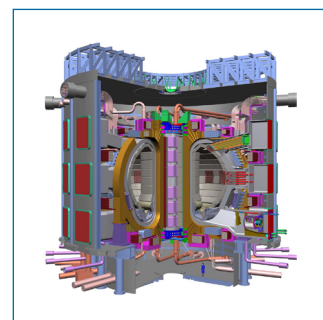


November 2010:  
**THALES Electron Devices and Romanian Research Projects**

January 2010:

**European Programme in Controlled Thermonuclear Fusion: current and future problems of the MEDC Association**

Florin SPINEANU  
(Head of Research Unit, EURATOM-MEDC Association)



February 2011:

**High-Performance Scientific Computing: requirements and resources**

Mihnea DULEA  
(IFIN-HH, Magurele)



March 2011:

**Turning basic research results into applications**

Michel MOISAN  
(Université de Montréal, Québec)



Post-doctoral fellowships in physics awarded by IFA in partnership with Embassy of France in Romania and THALES-Romania



## IFA Awards: the beginning of a tradition

2009 marked the beginning of a tradition to be held annually within which IFA awarded, in première, distinctions to:

- personalities who have contributed to the prestige of physics and in particular to that of IFA;
- winners of international Olympiads in Physics and related fields at university and high-school level, as well as their coordinating professors.

In 2010 and in the years to come, IFA medals and diplomas of honour were and will continue to be conferred upon:

- personalities of the Romanian physics in appreciation of their activity and achievements many of which associated with IFA;
- professors, coordinators of the physics Olympics lots at university and high-school level, in appreciation of their significant contribution in fostering and promoting a culture of performance in Physics by training the new generations;
- winners at the International Physics and Astrophysics Olympiads, in appreciation of their sustained endeavour and outstanding results.



# IFA IN MASS-MEDIA



**Dr. Florin Buzatu, director general IFA: „Propun să consolidăm un edificiu – Fizica Românească”**

Interviul de Florin Buzatu (IFA) este unul din cele de acest gen, care este deosebit de interesant din punct de vedere științific și profesional. Într-un interviu din 2009 se vorbește despre proiectele de consolidare a fizicii românești și despre rolul IFA în acest proces.

**www.marketwatch.ro**

**Fizicienii de la Măgurele luptă pentru a aduce laserul viitorului pe pământ românesc**  
 (The physicists from Magurele are fighting for bringing the laser of the future on Romanian land), 20 May 2010

**Dr. Florin Buzatu, director general IFA: Propun să consolidăm un edificiu – Fizica Românească**  
 (Dr. Florin Buzatu, IFA Director General: I propose to consolidate an edifice – Romanian Physics), 21 Sept. 2010

**Rezultatele evaluării fizicii din România**  
 (The results of the evaluation of Romanian physics), 28 Jan. 2011



**Florin Buzatu: gândiți-vă la contracte românești pentru ITER**  
 (Florin Buzatu: think about concluding Romanian contracts for ITER), 18 March 2009

**Teorie românească de succes în SUA - așteaptă verificarea ELI**  
 (A successful Romanian theory in USA – awaits ELI checks), 7 March 2011

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**Florin Buzatu: gândiți-vă la contracte românești pentru ITER**  
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“L’Institut de Physique Atomique (IFA) de la plateforme de Magurele-Bucarest, avec d’autres instituts nationaux de recherche dans le domaine des lasers et de la physique nucléaire, a apporté sa contribution dès le début de ce projet.

En mars 2008, le premier séminaire ELI, en Roumanie, a été organisé à l’IFA et deux mois plus tard, toujours à l’IFA, le professeur Gérard Mourou, “le père” de ce projet, a enchanté la communauté scientifique par ses idées novatrices qui repoussent la frontière de la connaissance dans le domaine de l’interaction laser/matière.

Depuis, cinq séminaires sur ce thème se sont tenus à l’IFA, et en même temps l’IFA s’est impliqué de manière significative pour renforcer la candidature de la Roumanie à la construction de l’un des piliers de ELI à Magurele.”

“Les chercheurs de la Plateforme de Magurele ont déjà commencé à planifier et à proposer des expériences et des études scientifiques liées à ce projet très complexe.

Le 8 avril 2010 a débuté à l’IFA une série de quatre séminaires portant sur deux problèmes importants soulevés par le projet ELI : le mécanisme d’accélération des électrons par les impulsions lasers et la possibilité de la réalisation pratique d’un laser gamma.

Ces séminaires ont été initiés par M. Marian Apostol, chercheur scientifique principal en physique théorique à l’IFIN-HH et M. Mihai Ganciu, chercheur scientifique principal à l’Institut de Physique des Lasers, Plasmas et Radiations (INFLPR) de Magurele.”



**A gauche : premier séminaire ELI à l’IFA en mars 2008**  
**A droite : Gérard MOUROU Coordinateur de ELI**  
 www.bulletins-electroniques.com/actualites/64048.htm  
 Crédits : IFA



**A gauche : Mihai GANCIU Chercheur Senior**  
**A droite : Marian APOSTOL Chercheur Senior**  
 www.bulletins-electroniques.com/actualites/64048.htm  
 Crédits : IFA

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