

FINAL REPORT

I	The Name of the Institution to be evaluated	Horia Hulubei National Institute for Research and Development for Physics and Nuclear Engineering – IFIN-HH
II	Evaluation Period	10 -:-12 April, 2012
III	Members of the Team	
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The final report contains:

1) **Conclusions and recommendations:**

IFIN-HH Evaluation and Site Visit
April 10th -12th, 2012
Bucharest-Magurele

Before going to the conclusions related to the evaluation as such, the committee would like to warmly thank the director general, the scientific director, and the head of all departments and the whole staff of IFIN-HH for a very efficient and transparent organization of this three days visit. The discussions were held in a very interactive and open spirit and we have had access to all documents and were able to visit almost all equipments and infrastructures of relevance for this evaluation. Only time limitations have prevented us to enter in a more detailed analysis of part of the administration organization.

To summarize our evaluation labelled "A+", the committee would like to stress the outstanding evolution and level reached of the institute towards the best European standards in the field. This assessment is justified by the following conclusions:

- the impressive modernization of the infrastructure
- the installation and commissioning, done or underway, of large-scale state-of-the-art new equipment (computer grid, new cyclotron, new AMS machine, clean rooms, front-end micro-electronics and middle-size instrumentation related to many aspects of applied physics, chemistry and biology)
- the quality of research in nuclear and hadronic physics as well as in theoretical physics and in a number of applied physics, biology, environment and chemistry field; this opinion is supported by the quality and quantity of scientific publications and contributions to important international conferences.
- the visible and recognized role at the European level of the institute in the large number of strategic projects, such as LHCb and ATLAS at CERN, NuSTAR and CBM at FAIR, SPIRAL-II, AGATA, ISOLDE, etc.
- the excellent in-house programme at the tandem accelerator as well as at smaller-scale facilities (e.g. irradiation facility) and an important initiative in new areas like the underground laboratory for astro-particle physics
- the national role and responsibilities of IFIN-HH in nuclear-waste management (an example for many other European countries) and a clear roadmap for the de-commissioning of the existing reactor, building expertise in this branch, important branch for the whole country
- the initiative taken by IFIN-HH to prepare the future science in Romania in close collaboration with important other partners through the ELI-NP project, a challenging but truly world-class facility

Based on these scientific achievements, it is of utmost importance that the following recommendations are implemented in the near future:

- a significant increase of the core budget of the institute compared to the financing based on the research-project-oriented scheme to ensure a stable and sufficient part for the maintenance of the new infrastructure to achieve a significant increase of the salaries of the staff and to achieve the recruitment of new young fellows, which will be essential to fulfil the international commitment made for the ELI-NP project
- considering the high potential of applied research, the committee would like to encourage strongly the plan to develop innovations, build-up an effective office for technology transfer and marketing

- a modification of the entry regulations of the country for young academic students coming from outside the EU
- an important formal agreement is to be established with the major scientific universities in the country to ensure the flow of PhD students, which will form, through IFIN-HH, a state-of-the-art technology cluster, to continue being the nuclear-science leader of the country.

Bucharest-Magurele, April 12th, 2012-04-12

2) Observation related to the evaluation of each department (N=10 Departments)

Theoretical Physics Department (E1-E10)

The theoretical physics department consists of ten working groups (E1-E10) covering a very broad field ranging from mathematical physics over nuclear and particle physics to solid state physics and quantum computers. Members of the department are internationally very well connected and respected. Several groups publish on a regular basis papers with the international leaders in their field. This holds especially in the field of nuclear physics in which the department has a very long tradition. Many groups work in close collaboration with experimental groups from IFIN and from abroad. Such the department provides an important contribution to the experimental research. Some groups even work on technological developments like nanoscopic detectors for radio astronomy. This interaction is supported with common focussed seminars to which also experimental physicists are invited as speakers. This approach will become even more important with the ELI-NP project which will need quite some theoretical help.

The age structure of the department shows that a generation change is ongoing leading to a healthy mixture of old and young people in most groups. Positive is also the brain gain with many young people being appointed in the last five years. A less positive point is the small number of PhD students in view of the number of researchers. The problem with the very low number of physics students is posed by the systematic headhunting for the brightest students in Romania of Anglo-Saxon universities. That this brain drain now occurs at the level of leaving secondary school is a quite problematic evolution. A second problem is the administrative problems when hiring foreign PhD students (also non EU). Here administrative hurdles should be removed such that the attraction of bright foreign PhD students becomes possible as it happened in most EU countries. The contacts with the theoretical groups at the national universities and the number of PhD thesis advisors should be improved. Several younger researchers whom recently returned to IFIN-HH have indicated that they intend to do the necessary steps toward becoming thesis advisor.

The number of publication and citations is very good and compares very well with similar departments on a European scale. Most publications are in international journals of high quality. Nine of the ten working groups get additionally funds over research projects.

In conclusion it can be certified that the theoretical physics department fulfils the standards of similar institutes on a worlds scale and deserves **the grade excellent**.

The Nuclear Physics Department (E11-E15)

The Nuclear Physics department (E11-E15) and the Tandem Accelerator Division (SC1) share similar resources and form together the largest group of scientists at IFIN-HH. Since the reactor shut down they also own the biggest infrastructure of the Institute with the 9 MV Tandem accelerator. In the last years the Tandem itself was modernised with a pelletron securing smooth and further operation of the accelerator. Also its instrumentation was substantially innovated, as illustrated amongst others by the high efficiency Ge-LaBr₃ array and the plunger apparatus. Due to these investments the accelerator became over the last five years visible on an international level. It is true that one can say that it evolved from a national facility to become an international facility with a Program Advisory Committee (PAC) with international recognised experts. The number of international users is increasing rapidly over the last years. With about 5000 hours of operation and an oversubscription of beam time request of 150-200%, the available resources are completely used.

The experiments at the Tandem are made in nuclear structure and reactions spectroscopy, applied research and accelerator mass spectroscopy. In nuclear spectroscopy the group is specialised in the measurement of nuclear lifetimes. Therefore the Ge-LaBr₃ array is a unique instrument to measure lifetimes in the 10ns-10ps domain, which is complemented by a plunger device for shorter lifetimes. The uniqueness of the array makes it also the most demanded by international users. A major upgrade is planned and financed for this year which will reinforce the world leading position of IFIN-HH in the near future. To study nuclear reactions a scattering chamber with particle and neutron detectors is available as well as an activation set-up to determine small cross sections. Here threshold phenomena and neutron evaporation are studied in detail. As mentioned before the Tandem is also used by the department of applied nuclear physics (E14, E33) whom are installing a new 3MV Tandetron accelerator as well as an AMS 1MV Tandetron. Worth noticing is the AMS study of tritium in blankets from Tokomaks using the 9MV accelerator which is a new method to study the fusion plasma and received a wide international response.

As is clear from the many new instruments the fund rising by the groups working at the Tandem is excellent. In comparison with other EU national institutes it is fair to say that the committee was very impressed by the multitude of state-of-the-art instrumentation available in-house.

Besides the very strong in-house activities, this department participates in several international nuclear-physics collaborations, such as CERN-ISOLDE, NuSTAR@FAIR, SPIRAL-II, and at Dubna and Legnaro. Overall one can say that the department makes a strong contribution and impact in these collaborations and all activities reach high international visibility in excellent research programmes. Some smaller foreign activities, such as research on kaonic or exotic atoms (E15), are likely to fade out in the coming years due to completion of the experimental programmes. Other programmes, such as the investigation of cosmic-ray muons at the Slanic Prahova Salt Mine, have started with small projects and one can expect new ideas and growth in profile and strength in the coming years (E12). The participation in astroparticle experiments, such as KASKADE-Grande, Pierre-Auger-Observatory and Lopes, is well underway and returns many scientific results and publications to the department.

It is quite important to note that this department has a key function for the European project ELI-NP, which shall be realized at Magurele in the coming years: all preparatory work concerning the international facility, the international collaboration, and the physical-technical developments have started off from this department.

The age structure of the department is good and many physicist from abroad returned to Romania attracted by the good research conditions now available. There are also 20 PhD students. The number of publication in world leading journals and citations is very good and compares very well with similar departments on a world scale.

In conclusion, it can be certified that this department fulfils the standards of similar institutes on a words scale and deserves **the grade excellent**.

Hadronic Physics Department (E16-18)

The **Hadronic Physics Department** of IFIN-HH is based on a rich experience in: nuclear interactions, hadronic matter, nuclear structure and dynamics. The department is a result of an impressive conversion of the former intermediate energy reaction group. The members of this department have been involved in several international collaborations with expertise on detector R&D, front-end electronics development, simulations, detector construction and data analysis. The activities cover a large spectrum of topics such as CHIMERA at the LNS – Catania, FOPI at the Heavy Ion Synchrotron SIS at GSI Darmstadt and ALICE (A Large Ion Collider Experiment) at LHC-CERN.

The ALICE activity is, since few years, the most important one in the department. In this important topic that deals with exploring the baryonic free nuclear matter phase diagram in the region of high temperatures and low baryonic densities, the department has an important impact. For instance 24% of the ALICE-TRD (Transition Radiation Detectors) chambers were produced in this department and represents most likely the largest Romanian contribution to CERN in all times. The ALICE-TRD front end electronics has been designed with a crucial contribution from the department. Members of the department are actively involved in the data analysis and interpretation with the help of using GRID technologies.

The other important activity of the department deals with the CBM (Compressed Baryonic Matter) project at the future accelerator facility FAIR - GSI Darmstadt that will use beam energies between 10 and 40 GeV and will study nuclear matter at high baryonic densities and low temperatures, as it may exist in neutron stars. The department contribution is the development and construction of high counting rate TRD architectures.

The department has a state of the art infrastructure with a world class Detector Laboratory and Data Center (the department is involved in GRID activities) and also modern offices, Seminar Room and workshop.

With no doubt this department is to be ranked **excellent** as it has an outstanding impact and visibility in both science and technology within the various international collaborations where it is involved.

Elementary-Particle Physics Department (E19-20, E22-23)

The Elementary-Particle Physics department (E19-20, E22-23) is a medium-size department with several researchers and technicians. It focuses on international involvement in high-energy collisions at colliders, hadron physics, computational simulations, and preparations for the next-generation experiments at ILC and CLIC. Its main activities are participation in large-scale experiments at CERN's LHC experiments and in the future at PANDA at FAIR.

The participation in the ATLAS experiment at CERN is very strong, has a clear physics focus on SM-studies, and is highly visible in the international science community. The situation is similar for the LHCb collaboration. Concerning the CERN activities, this group is the core of a cluster of Romanian universities and has therefore an important role and high responsibility. Computing activities (simulations, grid software development, hardware maintenance, upgrades, etc.) are at the highest level. The work pursued at Frascati seems to be mostly technically driven and might be completed soon, with a new perspective at PANDA at FAIR. For the long term perspective, there is preparatory engagement on technical developments (calorimetry, magnet studies) for high-energy linear colliders.

From this group, there are a very large number of publications and conference contributions. The group has a clear strategic focus and performs extremely well. Although being founded in 1960, the generation change to a modern department was fully achieved. It raises remarkably large funds via the Romanian "capacities" programme and other sources for upgrades and investments of their experimental equipment. The group is active with teaching and education at several Romanian universities and it is very impressive to see how many graduate students were attracted.

Overall, the department and its activities are clearly at the world-class level. Its contributions to international collaborations and facilities have a very high impact and reputation.

Rated excellent.

The Department of Computational Physics and Information Technologies (E21,SC3)

The department is a key component of the research infrastructure of IFIN-HH with two missions: (1) providing computing resources and services for the scientific research in the fields of numerical modeling and simulation of physical phenomena; (2) coordinating the highest Grid resources in the country that is today hosted by IFIN and that provides the computing support for various national and international collaborations.

The team conducts studies on numerical modeling and simulations of physical phenomena, algorithm developments, computing optimization, and the investigation of topics of current interest in physics. Due to the interdisciplinary character of the field, the team involves specialists with different professional backgrounds, such as physicists, computer scientists, engineers in various specialties, and programmers. An impressive number of papers were published in the research areas of Mathematical modeling and numerical methods for physics, Numerical algorithms and simulations for particle physics as well as in design and application of flash algorithms for highly CPU-demanding data process such as in the new generation particle physics experiments. The published papers cover also various domains such as Neutrino physics, Neutron Noise Analysis for Reactor Safety and Neutron Detector design.

Concerning Grid computing, the IT professionals of the department are experienced in Grid technology and distributed computing. They participated during the reporting period in various national R&D projects on Grid technology and in European projects, and collaborated with groups from EU, USA and JINR-Dubna. The department team administrates, develops and operates the IT infrastructure necessary for the computing support of many international collaborations, of which the Worldwide LHC Grid Computing collaboration. The department has built the high performance computing infrastructure of IFIN, which consists of parallel clusters in Gigabit Ethernet and Infiniband technologies.

Due to the importance nowadays of computing and simulations, the department will certainly develop and increase in size within the coming years. The evaluation committee considers this department very active with high impact inside and outside the institute and strategic in many aspects for IFIN and for Roumania. This department is rated **excellent**.

Life and environmental physics department (E24-E27)

The Life-and-Environmental-Physics department (E24-E27) is a medium-size department of the IFIN-HH comprising four working groups (biophysics/radiobiology, environmental physics, environment monitoring, radionuclide metrology), which are funded by national, international and private sources. The scope covers a rather broad field of 10 different topics ranging from basic studies (e.g. biological response to ionizing particles) over detector developments to quantitative risk analysis for large infrastructures. The department operates quite modern, certified cell laboratories for in-vivo and in-vitro biocompatibility tests and it presently establishes ultra-low-background measurements in a nearby underground laboratory. The average annual budget is rather large due to successful attraction of a number of national and international research projects. The department is continuously and successfully involved in European framework programmes.

High visibility was achieved with expert systems developed at the institute, e.g. with the modelling of the nuclear radioactivity distribution after the Fukushima accident, when the forecast results were published on the web and later on found to be in excellent agreement with the real-world observations - a quite remarkable achievement. Environmental and occupational exposure dosimetry is of practical importance for the safety of Romanian people. Similarly, the computational modelling and risk assessment of tritium emission are of special national importance for Romania as the nuclear energy is produced from CANDU-type reactors.

The members of the department have published several book chapters, many papers and conference contributions, which are in quantity and quality comparable to other laboratories in the world. Ten national patents have been achieved in the past five years. Several young researchers and PhD students could be attracted, indicating that the topics are attractive for the next-generation scientists.

Overall, this department is very active and successful, internationally involved and recognized; it fulfils very important tasks from basic research to environmental and human safety.

Rated excellent.

Department of Radioisotopes and Radiation Metrology E28-29

The department consists of 3 research groups and 3 certified laboratories

- 1) Radionuclides metrology
- 2) Radiopharmaceuticals
- 3) Tritium and labelled compounds

The total staff is of about 39 members, 24 researchers, 3 technicians, 8 PhD. It has been noted that 12% of the budget comes from external resources (services). The Department has quite a number of facilities to handle radioactive materials. For example the CPR building is the only facility in the country equipped with hot cells with remote manipulators and clean areas for production of oral radiopharmaceuticals.

The department activities covers research, production (^{131}I , sealed ^{192}Ir and others radioactive sources, expertises and services. The laboratory for Testing and Certification of Compliance works on standards for health, energy and industry and has therefore multidisciplinary competences. It is worth noticing the visible contributions at the international level to Nuclear Data decay bases (2 joint research of EU EURAMET and EUREKA+ IAEA). There is quite important contribution to this metrology research for IFIN.

The main competence and activity are related radiochemistry and manufacturing radiopharmaceutical. A dedicated Cyclotron was acquired together with the applied nuclear physics department and will be used for the production of radio-isotope. Very active group.

The other important activity are related to tritium production and handling. Together with another institute and the Candu reactor they are the only producer of large amount of ^3H in EU, and asset for IFIN and Romania. One patent on tritium labeling. It is a key technology to be needed for fusion research. A new building is being built at IFIN-HH for this research purpose as well as new facilities in order to enhance and develop the expertise of the institute in this domain.

The resulting mark is **in between good and excellent.**

APPLIED NUCLEAR PHYSICS DEPARTMENT (E30-33, SC6)

The Applied Nuclear Physics Department consists of a rather large team of about 60 collaborators and is active in a big variety of research fields applying diverse methods of material analysis.

Elemental and structural analysis involves radiology and irradiations using X-rays and/or ion micro-beams as well as fast neutron irradiation. Amongst others this includes archaeometry and investigations in the domain of Cultural Heritage. Attractive positron annihilation spectroscopy is applied to study electronic properties of materials, but is also used to develop new experimental techniques for measuring positronium interactions in various magnetic environments and to study new interesting and challenging subjects like transport properties in thin polymer films. An important nuclear activation analysis program is applied to engineered nano-particles and in studies of material modifications under various impacts. Very modern accelerator mass spectrometry equipment is applied to studies in nuclear physics, environmental physics and atmospheric physics and will further benefit from the new MV-Tandatron. Also, for the future, more extended applications in other fields are planned. The department is also active in impressive development of various new detectors. It is worth noticing that detectors for LHC, SPIRAL2 and FAIR are amongst those.

It might be concluded that the number of activities in this department is a bit on the high side. However, there is a broad range of new instrumentation available and high potential for future development of this department. With its expertise, it may play an important role for the preparation and later on for the scientific-applied exploitation of ELI-NP. The groups are expert to drive their own program and are presently underway to catch up the international state of the art. This is also in line with efforts to attract more young collaborators and to improve visibility.

All in all one can conclude that the department is making impressive progress in catching up with international competitors. Its present performance should at least **be rated between “good” and excellent.**

IRASM TECHNOLOGICAL IRRADIATION DEPARTMENT (E34, SC7-8)

The technological irradiation department IRASM is one of the youngest, but simultaneously –for the more general public - one of the most visible departments of IFIN-HH. It is involved in numerous activities with applications in medicine, agriculture, food, environmental problems and society - reaching from sterilization of medical devices via preservation and consolidation of cultural heritage artifacts and cultural heritage authentication to characterization of food security.

The laboratory fulfills international standards and operates modern equipment which is up-to-date, including ISO-certification. As such IRASM is unique, not only in Romania, but also with respect to other European countries. IRASM has good visibility via publications as well as projects and workshops involving the International Atomic Energy Agency (seven IAEA grants of which two are led by IFIN-HH). The ^{60}Co source is very efficiently used (duty factor close to 100%).

The average age of the team members is relatively low. The number of collaborators has increased in recent years to a level which seems to be adequate. The team impresses by strong enthusiasm: A rather ideal synthesis of basic science, applied science and services has evidently been reached within this multidisciplinary group.

There exist already important relations with industrial companies. Considering the pronounced potential of its combination of basic and applied research, there is room to strengthen these relations with view to even more efficient technology transfer and marketing. The heritage program is original, valuable and has high social impact. This constitutes excellent publicity for the IFIN-HH and is an ideal subject for more regular presentations in national and international newspapers and journals.

The department serves as an example of best international standard and has to **be rated as excellent**.

E35-E36 (SC9-10) Radioactive Waste management and Reactor decommissioning department

Radioactive Waste management

In this domain the total staff members is of about 37, with a large fraction having higher education (20), and 8 of those are researchers +2 senior Engineers and 2PhD

The scientific production is rather good (29 papers, 52 conferences). In addition one may note three calibrations adopted by IAEA plus 1 patent application.

Research activities of this department deal with:

- a) Storage of waste package for long periods
- b) Disposal of waste demonstrating safety and conformity with national environmental Regulations

Its R&D program has as main goals the characterization of waste including qualifications of new type of packages and/or radioactive matrix testing using physico-chemical methods.

It has also the responsibility of data base collection from collection to disposal (FOXPRO). In the future its mission is to replace liquid disposal (a crucial problem) and to put in operation improved technology for graphite conditioning and processing for metallic Al waste.

This department has a very well defined roadmap and has reached already the first milestone of the 2009-2011 programs, namely reconditioning the old historical waste present on the IFIN-HH site.

Another important asset of this department for the nation benefit is its responsibility in an underground waste disposal at Baita Bihor (DNDR). This work is carried out with competence and modern methodology (quality control).

In conclusion this department plays a very important and needed role both for the IFIN-HH and for the rest of the country. These tasks of national importance which require high technical responsibilities should be supported in terms of staff expansion and modernization of infrastructures. **These competences and achievements needs to be acknowledged officially.**

Decommissioning of the Nuclear reactor

The members of this department were formed and trained to conduct this very important task related to the existing old research reactor VVR-S. This is a pioneering activity in Romania.

It deals with an accurate inventory and spent fuel management in cooperation with Universities and International organizations (IAEA, DOE, and EURATOM). The work has to realize incompliance with existing regulations and implementation of a waste management system is on its way. Innovative technology in Gamma rays spectrometry with controlled uncertainties based on tomography and at low cost are under development.

This project is a unique opportunity for the country to build up competences and technical facilities needed in this strategic domain in the future.

The achieved results are impressive and are already exported to other European countries in the form of expert seminars. Financial and staff support are essential for the success of this enterprise.

This department deserves the grade **excellent and an extension of its personnel.**

3) Justification of the mark awarded, for each of the 5 criteria, highlighting strengths and weaknesses, in accordance with the minutes/report of the visit.

C₁	The quality of R&D activities and their results	5
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The number of publications is impressive. It is comparable to other world class institutes in basic research. The standard of publications (quality, impact, number) and participations to International Conferences is such that the level of sharing and dissemination of scientific results meets the standard of best EU institutes of similar sizes in the research fields covered by IFIN-HH.

The institute has been quite successful in participating and attracting funding from EU FP7 and other European and International institutions (IAEA, EURATOM, DOE, CERN...).

For this institute with dominant basic science research, maturation is needed before collecting the benefit in terms of spin off. However we believe that IFIN-HH has a high potential of attracting private funds. They have already hired an engineer in marketing and are developing contracts with industrial partners. We support the plan to develop an effective office for technology transfer and marketing. A good way is also to contribute to the creation of an incubator with University and Industrial partners for the region of Bucharest.

We also would like to indicate the high cost of international patents which make such development practically quite difficult. Here a national initiative to take over these costs is needed.

Progress is to be achieved also to increase the flow of PhD and Master students by increasing the cooperation with universities.

For this criterion we would like to stress the outstanding evolution and level reached by the Institute, in the considered period of time, towards the best European standards in R&D activities. It really is remarkably and quite unique on a European scale.

To keep this level it is of outmost importance to increase the core part of the budget and insure a stable funding of middle terms (5y) projects and collaborations.

C₂	Human resources Quality	5
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Considering the broad spectrum of fundamental and applied research activities and the variation in funding different sectors, IFIN-HH human resources are fairly uniform.

With few exceptions the average age is quite good and in the last five years IFIN-HH was very successful to stop the brain drain and even to achieve the return of young fellows from abroad. This is a huge improvements compared to the previous decade.

For the ratio of administrative support to scientists, we noted on the average a ratio of about 4 or more which is somewhat larger than comparable institutes in EU. However it seems that also general support staff (guards, construction workers, drivers, etc...) is counted as administrative staff.

Some administrative difficulties with immigration regulations to recruit expertise and young fellows from outside Romania have to be overcome.

In average, the IFIN-HH personnel have high motivation and good skills. Continuing efforts are necessary to maintain a good age structure and to insure higher salaries to high level engineers and scientific project leaders.

Tremendous efforts have been made these recent years to improve the quality of IFIN-HH large and medium sizes infrastructures through building renovation, construction and new equipments. This is a big success since a large numbers of building have reached good EU standards. There is still room for improvements in particular in radiobiology and nuclear waste management departments.

Attention have to paid to the development of multiple computer GRID systems and coordination of the number of high tech small instruments is needed for applied physics researches

For the rather large facilities and installations (Tandem accelerator, Irradiations facilities, clean rooms and high tech micro-electronics devices) full exploitation have been reached .New facilities are being completed (New Cyclotron , AMS , etc..) and will replace timely and nicely overloaded existing installations

The situation of the existing and upcoming infrastructures is really quite satisfactory with big successes in the realized upgrades. One has now to pay attention to the complementary use of middle size type of equipments by all departments in applied areas without duplication.

As far as we can see, there is a general positive motivation in the staff members in all departments which take advantage of a very large autonomy in research and local staff recruitments within their own independent budget. Annual evaluation of each staff member has been put into operation and is used to justify ranking and salary increase.

All of that is judged by the committee efficient and positive.

We did not have time to evaluate the administrative procedures during our visit, concentrating on R&D evaluation. However IFIN is member and/or co-leader of work-packages in a number of EU FP7 programs. From these examples one can say that IFIN-HH administration handled its part of these EU-FP7 programs very professionally.

If we have to judge by the number of successful new projects, the number of renovations and new instruments and facilities and some discussions during the visit, this looks very satisfactory.

We did not have time to enter into the evaluation of the administrative efficiency during our visit, since we were mainly focused on R&D evaluation. The same holds for the administrative and support staff efficiency but by looking how well this visit was prepared and how well it was run efficiently by all the departments and staff, we have a very good opinion.

Therefor we consider that both the research and support and probably the administration (we did not have discussed administration during the visit) are conducted using best European and International best practices. The management support best ethical practices

We have had the impression during the discussions in each of the 10 department visited that the staff members seem well informed about the general strategy for the institute and on the main projects and decisions. This is an important key to success and performance

The organization of IFIN-HH involves strongly the director general and its deputies (administrative, scientific) who works very closely with the 10 department directors and the scientific council .Decisions to our best knowledge are open and clearly communicated to the departments and staff. All the visits and discussions did not reveal any problem in this area.

In summary we have a strong positive judgment on the IFIN-HH management and leadership due to a clear strategy, pragmatism, and oriented towards excellence.

An increase of the salaries of the high tech engineers and research staff as well as increase of the core basic budget with regards to the variable competitive projects funding and stability of financial resources are required to meet EU standards.

There is a clear development plan which builds on the experience of the institute, which is open for worldwide participation. This plan is based on three pillars

1) Strong in house program

2) Strong involvement in ESFRI (FAIR, SPIRAL2) and other International collaborations (CERN, IAEA, etc.)

3) New world class facility in Romania RO@ELI

The autonomous departments and large success in the funding of competitive projects testify of a stimulating environment. Some key areas (Computing GRID, Accelerators, Micro-electronics and detectors, nuclear waste...) are well chosen and pursued according to a defined strategy.

Nurturing applied research innovations may need a specific incubator structure.

The recruitment policy follows largely international standards. It is oriented towards the recruitments and stabilization of excellent future project leaders and successful brain drain return of Romanian young fellows at the institute has been achieved. The institute has strong competences and resources in almost all key areas.

Structural projects (like PhD center) will further improve the overall environment of IFIN-HH

Build on a long and successful history IFIN-HH is an excellent and reliable collaborator with high international visibility. There is a strong involvement of the management to develop and strengthen collaborations of high research potential at the EU level (FAIR, CERN-LHC, SPIRAL2-GANIL), strong involvement in FP7 (Hadron3, ENSAR, NuPNET) and international agreements with IN2P3-CNRS (Fr), INFN(It).

The ELI project is very important in the future to bring IFIN-HH and Romania to the center of Europe. This project needs full support and open wide opportunities.



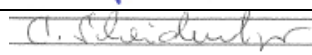
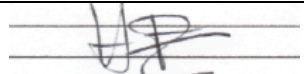

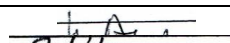

So far critical mass has been achieved, but this problem is always to be looked at carefully, a few % increase of research staff in major EU projects is needed as well as a major effort for the RO@ELI where IFIN-HH is far from the critical mass which has to be built in the next 5 years.

The implementation of clear operational strategy around in house and participation to major scientific EU ventures need long term commitments in particular in terms of budget stability and a 5 years recruitment plan to be able to make ELI project a success.

Overall technical considerations, observations, conclusions:

Due to the limited 3 days durations of the visit the evaluation of the administrative procedures , size of administration and support services has not been discussed.

Proposed certification level: A+

Nr. crt.	Name, Surname	Signature
Evaluation TEAM		
1	Evaluator 1 - Sydney Gales	
2	Evaluator 2 - Jan Jolie	
3	Evaluator 3 - Christoph Scheidenberger	
4	Evaluator 4 - Hans Borner	
5	Evaluator 5 - Faical Azaiez	
Observers		
1	Coordinating Authority	
2	CCCDI Representative-Alexandru Emil Aldea	
3	ANCS Representative – Elena Stoica	

Date: May 6th, 2012