The great European project with the involvement of Romania : the infrastructure of extreme light.

Curriculum by Mr. Dr. Cristian Florea, responsible with foreign affairs in this project.

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Former research scientist in the Institute of Atomic Physics Bucharest-Magurele and tenure in the department of Physics, « Politechnica » University Bucarest in the years '70 – '80, C.F. became starting with 2006 Associated Professor in the Solid State Laser Laboratory of INFLPR Institute of Bucharest.

C.F. is university professor in France starting from early '90. He is full professor of applied physics at ESIEE – University Paris Est and invited professor at LOA- Laboratory of Applied Optics – UMR 7639 of CNRS, common laboratory of ENSTA and Polytechnical School of Palaiseau ; LOA is the laboratory who launched in 2007 the European project of the extreme light.

In 1997 – The Laboratory of Applied Optics (LOA) from Palaiseau, Unit of joint Research (URM 7639) of CNRS, the common laboratory of X and ENSTA starts a scientific collaboration with the Institute of Lasers (INFLPR) from Bucharest.

February 2007 – LOA and INFLPR decide a collaboration in order to apply a project dedicated to the performance of a laser which has to become the most powerful of all times (10-100 PW[1] in 2013-2015 and in 2020 a power of 1000 PW = 1 EW (N.B.: with an important coefficient of repetition).

May 2007: The National Authority of Scientific Research (ANCS) which conducts the research field in Romania, signs a letter of commitment in order to perform the Project ELI (Extreme Light Infrastructure) initiated by France and by other 12 European countries.

July 2007: The Project ELI is designated as "The Great Structure of European Research" by PCRDT7 (FP7) and receives European financing of ten million euros for the "Preparatory Phase" (2008-2011). Romania among other 12 countries of EU, benefits as well of this financing. The total cost of the project that must be supported by the countries which have signed the letters of commitment is estimated of more than 400 million of euros in five years (2008-2013).

September 2007 – The ambassador of Romania in Paris pays a visit at the site LOA from Palaiseau.

October 2007 – The Embassy of Romania in France organizes a reunion dedicated to the French-Romanian cooperation in the heart of ELI between the scientists of LOA and the Romanian authorities of the Education and Research Ministry represented by the Romanian Ministry of National Education.

Beginning of November 2007 – A team of French researchers from LOA led by Gerard MOUROU, the European coordinator of ELI performs a visit in Bucharest and opens the Project ELI; during this visit the French team is received by the president of the National Authority of Scientific Research (ANCS).

The end of November 2007 – Mission at Bucharest of a team of French scientists from ENSTA and ESIEE in order to contact the Romanian partners liable to benefit of a technological transfer in the lasers field.

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[1] PW = 10^{15} W = a million of Gigawatts so of more than the power generated by all electrical power plants of the world; it has to be noticed that this power is delivered in impulses of a billiondiems of billiondiems of second (10^{-18} s = 1 attosecond) and the coefficient of repetition is inferior to one Hz.

Mid December 2007 – The Romanian Embassy in France organizes o reunion where are invited French and Romanian scientists concerned with the cooperation in the intense lasers' field (INFLPR Bucharest and LOA from Palaiseau) and the tutorial authorities: ANCS of the Romanian party, CNRS and the three important schools (X = the Polytechnics school from Palaiseau, ENSTA = The National Superior School of Advanced Techniques and ESIEE = The Superior School of Engineers in Electronics and Electrotechnics) of the French party. On the occasion of this reunion, the above-mentioned authorities analyzed and proposed a few objectives of the French-Romanian cooperation in the intense lasers' field:

i) Sessions of preparation of the Romanian specialists in France at the headquarters LOA from Palaiseau in order to form mixed research French-Romanian teams;

ii) Setting into practice of a technological transfer in the field of ultra intense lasers;

iii) During this reunion Gerard MOUROU, as European coordinator of ELI and professor at X and ESIEE, proposes a letter to the assistance in which Cristian FLOREA, full university professor at ESIEE Paris and invited professor of LOA from Palaiseau and of INFLPR from Bucharest, should be named responsible of a scientific bilateral project between France and Romania. In order to emphasize the common success within the European project ELI, in which, we must point out, several EU countries are involved, it is proposed that this French-Romanian bilateral project be called: "Extreme Light" (La Lumiere Extreme).

The end of December 2007 – The Romanian president of ANCS and the state secretary in the research field, Mr. Anton ANTON , organize a reunion at which they invite Mr. Cristian FLOREA and the directors of the three Romanian institutions that might be concerned with the project "Extreme Light" (i.e. The Institute of Lasers – INFLPR, The Institute of Nuclear Physics – IFIN and The Institute of Materials – INFM): this reunion had as declared objective: the creation of a future center of extreme light on the site of the city Magurele, Romania. This center could shelter the ultra powerful laser of the European project ELI. The Romanian dignitary stressed out in this context that the success of the extreme light project could become a national objective for Romania.

Beginning of January 2008 – Mission in Bucharest of a team of French scientists from ENSTA and ENSIEE in order to carry out a technological transfer in the field of lasers (this mission was regularly continued, improved and sustained ever since).

End of January 2008 – The Romanian president of ANCS, pays a visit to Palaiseau at the headquarters of LOA and has a preliminary discussion with the French scientists concerned with the French-Romanian extreme light program.

February 4, 2008 – The visit of the French president at Bucharest at the invitation of his homologous; the two presidents announce the setting into practice of a strategic partnership between France and Romania. During the press conference, the Romanian president mentions as main point of discussion the scientific cooperation between the two countries within this strategic partnership.

February 20, 2008 – Meeting kick-off: Official collaboration kick-off of ELI in Paris at the headquarters of poly-technicians; the festivity "ELI" is organized at the Romanian Embassy in France. During the collaboration kick-off, Romania, France and the Czech Republic present their intentions to set up on their national territories, the great laser ELI. The Romanian president of ANCS, as official representative of the Romanian government, communicates officially the intention to have in Romania an important part of ELI. If such a structure were installed in Romania, then it could support politically, scientifically and financially (in a significant manner) the project ELI.

II. EVOLUTIONS (starting with April 2008)

On April 22nd, the Romanian Prime Minister meets in Paris his French homologous. During this meeting, the two prime ministers draw up an official document by which the French-Romanian strategic partnership is set up. In this official document, the scientific and technological collaboration refers explicitly to the bilateral project of the extreme light in the European context. In the same day, Mrs. MOUROU and FLOREA could meet at the Romanian Embassy in Paris, the Prime Minister, Mr. TARICEANU. On this occasion it appeared the idea to propose to the French and

Romanian authorities the constitution of a mixed piloting team of the French-Romanian bilateral team in the field of extreme light. In an interval of several months (the latest in September 2008) this piloting team should draw up a document with the subject the French-Romanian cooperation. This report could guide the political authorities in decision-taking of both countries. We must also mention that on September 20th 2008, Romania must hand in the documents for the candidature in order to shelter a large part of ELI (i.e. the laser of tens PW) and to constitute thus a great European pole for the research in the central and oriental area of the old continent.

This piloting commission should appeal to the French and Romanian personalities in the scientific research field and in the university and academic fields. It should appeal to the experts in the field of the great international projects that should contain the legal and financial aspects of the extreme light French-Romanian program.

This mixed team should prepare:

i) the objectives (research and formation of Romanian specialists at the headquarters in Palaiseau);

ii) the calendar (the stages and the dates that must be respected);

iii) the means (financing).

The setting of a ultra powerful laser that could bring a lot of essential answers in several priority fields of today:

- the treatment of cancer disease (proton-therapy);
- accelerators of hyper relativistic particles;
- environment and durable development (furtive in the visible optics)
- the quantum teleportation, informatics and quantum cryptography.

The decision will be taken by the political authorities of the two countries.

As a piece of information, it is estimated that the country that installs this laser will create on its territory thousands of high-qualified jobs (in 2015). In 2020, Europe will create more than 20 thousand jobs in the fields of ultra intense lasers' use and the old continent could thus have worldwide "the leadership" passing in front of United States and Japan.

It is estimated that in 2015 only the benefits from the proton-therapy could bring for a country such as Romania, benefits of more than a billion euros and for a country such as France, annual benefits of more than two billion euros.

May 19 and 20, 2008 – The professor Gerard MOUROU drom X and ENSTA – ParisTech, European coordinator of the program ELI and the professor Cristian FLOREA from ESIEE – The University Paris East paid a visit to Bucharest and were received by the secretary of state in the Research field and by the president ANCS, the professor Anton ANTON.

During this visit, the above-mentioned scientists could meet as well:

i) the responsible of the concerned Romanian institutions (i.e. the lasers physics – M.I. MORJAN, the nuclear physics – M.N. ZAMFIR and atomic physics M.F. BUZATU);

ii) M.I. HAIDUC – The president of the Romanian Academy;

iii) M.C. PREDA – the scientific counselor of the president;

iv) M.A. CURAJ – the scientific counselor of the prime minister.

The French scientific delegation was received by M.F. DELAHOUSSE the first counselor of the French Embassy in Bucharest. In the name of the French authorities, the French high official expressed his satisfaction to unify the efforts of the French diplomacy with the success of the French-Romanian scientific cooperation in the field of extreme light. The

French Embassy in Bucharest drew up an official statement dedicated to this scientific mission in Romania and this official document was transmitted to the French authorities through the usual diplomatic means.

Thus, an official document is available on the site: http://www.ambafrance-ro.org/?id2=000100052233&lng

On May 19, 2008, during this reunion that took place at the headquarters of ANCS in Bucharest, where were present Mr. Farine – the responsible with scientific and university matters of the French Embassy in Romania, the president ANCS and the state secretary in the research field of the Romanian government, the professor A.ANTON named Dr. E TOMA as representative of ANCS in the piloting commission of the extreme light program. The Romanian state secretary proposed as well the names of some scientists that are to be involved (form the Romanian party) in order to be part of the piloting commission of the extreme light program. This program is situated at the boundary between the lasers physics and the nuclear and atomic physics. In this commission we find the names of some Romanian scientists of unquestionable high reputation that contributed to the success of the French-Romanian cooperation in the fields of lasers and atomic and nuclear physics. On the other hand, the competent authorities from France (The ministry of Research and Higher Education, CNSR and the High Schools involved) are on the verge to establish the list with the French scientists that will be part of this piloting commission.