

To the Instructions for the Teams of experts-evaluators

FINAL REPORT

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| I | The Name of the Institution to be evaluated | National Institute for Research - Development of Isotopic and Molecular Technology – ITIM Cluj-Napoca |
| II | Evaluation Period | 29-30 March 2012 |
| III | Members of the Team | |
| | 1st Evaluator information | |
| A | Name, Surname | Wolfgang Wenzel |
| B | Affiliation | Karlsruhe Technology Institute |
| | | |
| | 2nd Evaluator information | |
| A | Name, Surname | Tudor Luchian |
| B | Affiliation | Alexandru Ioan Cuza University, Iasi |
| | | |
| | 3rd Evaluator information | |
| A | Name, Surname | Remi Chauvin |
| B | Affiliation | Paul Sabatier University, Toulouse |
| | | |
| | 4th Evaluator information | |
| A | Name, Surname | Liliana Mitoseriu |
| B | Affiliation | Alexandru Ioan Cuza University, Iasi |
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| | 5th evaluator information | |
| A | Name, Surname | Caterina Vozzi |
| B | Affiliation | Istituto di Fotonica e Nanotecnologie - CNR, Milano |
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Conclusions and Recommendations

The National Institute for Research - Development of Isotopic and Molecular Technology – ITIM Cluj-Napoca is one of the most important national research institutes in Romania, and the only national R&D institute in the north-western part of Romania. It is therefore a major R&D pole in this area of the country. From the infrastructure viewpoint, the Institute presents impressive, state-of-the-art equipments and facilities situated at the highest international standards, and most of them were purchased in the last years through both national and international funding for selected high-quality research proposals. The type of the research carried out at ITIM is highly multidisciplinary, and all the R&D fields, from fundamental to applied and technologically-oriented research, are well represented. Notably, the quality of the R&D output is among the highest in Romania, and this is illustrated by the quality and relevance of scientific journal used as vectors of dissemination. During the visit, the evaluators were unanimous in noticing the global applicability of the structure, the high professional level of personnel, the durability of some expertise fields (in particular in isotope technology), the high adaptability and flexibility for the choice of relevant new research topics, as well as the excellent working spirit. Most of the addressed research themes are very bold, and high standards of research quality are at the forefront of all team leader strategies. Most of the teams engaged in R&D activities strive, and to a large extent succeed, in finding particular research niches which are relevant to the European research context, and therefore possess very good chances of becoming more and more important R&D actors at the international level. The young generation of scientists is well-represented, both in terms of numbers, and pro-active involvement within the research projects carried out. The management is efficient, clear-minded, highly adaptive, aware of the specific problems and able to solve them in a judicious manner. The recommended A+ certification is well deserved, and definitely expresses the high confidence of the Evaluation Team in the future performance of the Institute. The general recommendation is to keep the pace in doing only the best research attainable, to encourage young scientists to develop and implement their own research ideas, and, more broadly, to strive to be even more competitive in the international arena.

C1 Quality of R&D activities and results

C1.1 Publications and patents

The Institute activity addresses a large number of scientific topics in Physics and Chemistry, with a balance between basic and applied sciences. Some of the groups are more productive from the innovative point of view and moved fast towards topical R&D fields, others are closer to some industrial and environmental applications with higher funding opportunities, while some more traditional fields which were maintained and supported are today subjected to a revival process (e.g. the field of stable isotopes, due to a renewed interest in nuclear applications).

The Institute presented an important scientific production in the period of 2007-2011, with numerous publications in various journals, some of them being of high-impact factor (ACS Nano, Carbon, Phys. Rev. Lett., Chem. Phys. Lett., Phys. Rev. B, Nuclear Phys. B, J. Polym. Science, J. Nanopart. Res., Acta Crystallogr., J. Biomed. Optics,...).

A few groups provide a high number of publications that attracted a large number of citations and international visibility (teams E1, E3, E4, E6, E8, E11, E13). There are also publications in international journals of smaller impact and in non-ISI journals. An important number of books and book chapters in international publishing houses were presented. In the period of the economical crisis (2009), the scientific production suffered a serious decay which is clearly associated to the reduced funding level. However, it is important to notice that the groups “survived” to this situation and continued to develop their main research topics.

In the future, the Institute might identify and predominantly support a few advanced R&D topics, in which several teams can become international leaders.

Individual proposed marks

4.6

C1.2 Private/international funds

The researchers are strongly encouraged and supported by the Scientific Council and by their respective group leaders to publish their original results and to apply for funding in various domains. In the last years, a high rate of success in the national competitions for grants has been achieved for all the types of projects. At international level, funds from the participation to FP6, FP7 and bi-lateral collaborations were attracted.

A few groups (E1, E2, E7, E12) have specific activities that make them attractive for industrial collaborations thanks to the development of new procedures for performing environmental tests (mineral water and soil pollutants) and various analyses of societal importance (general checking of the drink and food alteration, determination of organic

indicators and metal traces, determination of isotopic ratios $^{18}\text{O}/^{16}\text{O}$, $^{13}\text{C}/^{12}\text{C}$ for wine certification, radioactivity analysis of volcanic tuffs,...). They were thus also able to attract private funds besides the public supports.

Individual proposed marks

4.8

C.1.3 International patents

A number of original products and technologies were developed by the Institute. Some of them were the subject for the demand of a large number of national patents and of a smaller number (six) of international patents. Although it is known that high (sometimes prohibitive) taxes are needed, this high potential for international patents should be supported and valorized at a still higher level by the Institute in the future. The Institute should be able to gain funds from the exploitation of the intellectual property and original products developed by the groups in international collaborations.

Individual proposed marks

4.5

C1.4 Start-ups and spin-offs

No start-ups and spin-offs were born yet inside the Institute (one spin-off is in preparation), although a few applied research directions exhibit a real high potential for such type of activities. In the future, the Institute should explore and support the creation of start-ups and spin-offs (e.g. in the fields of isotope technology, pharmaceuticals, food & wine analyses, etc.)

Individual proposed marks

3

C1.5 Sharing and dissemination

The Institute has a supportive policy for the scientific dissemination (journal articles, books, and participation to international and national conferences), and the R&D personnel is encouraged for starting national and international new collaborations in relevant topics. The publication in high impact journals is instigated, the quality of the publications playing an important role in the individual evaluation score of the researchers.

A few presentations of the Institute towards the public bodies and the society were also organized, and a steady collaboration with Universities was developed, in particular with the Babes-Bolyai University in Cluj Napoca.

Individual proposed marks

4.7

Average C1: **4.3**

C2 Human Resource Quality

C 2.1 Performance uniformity

The distribution of competences is well organized, with an extremely high sustained success rate for project applications, and the scientific outcomes are well managed. The solidarity between both the people and the teams is remarkable. The unique know-how of the isotope must be emphasized.

Individual proposed marks

4.6

C 2.2 Average age and brain gain

The age distribution is roughly bimodal with an average of 45. An effort to generate a balanced distribution has been undertaken by the administration, which is aware of the problem. The challenge is to recruit more Ph.D. students and to generate recruitment opportunities for foreign students. To enable young researchers, their experience abroad is well evaluated.

Individual proposed marks

4.4

C 2.3 The ratio of R&D staff/administrative staff

The 17% reverse ratio and high flexibility reflect a good planning and efficient organization of the auxiliary staff in supporting the overall R&D activities.

Individual proposed marks

5

Average C2

4.7

Summary comments:

The following points must be emphasized: well educated scientists, efforts to recruit more young scientists, in particular Ph.D. students, high number of eligible PIs, increasing number of young scientists on scientific boards.

C3 Quality of Infrastructure and Rate of Exploitation

C 3.1 Quality of infrastructures

The Institute features an excellent infrastructure, due to coordinated and coherent efforts both at the management and at the group and department levels to improve the infrastructure. This resulted in a large number of applications to all available funding sources for equipment. The infrastructure is complementary between the different departments, which is likely to generate further synergy in the future exploitation. The obtained state-of-the-art equipment at the European standard will permit the Institute to expand into new promising areas. The Institute is also already an accredited producer for several applications.

Individual proposed marks

4.9

C 3.2 Rate of exploitation

The Institute develops a broad exploitation of its infrastructure for basic and applied science, and for training young researchers. Some of the equipment is brand new and some facilities are not yet completely available, but plans to complement these facilities have been launched and necessary extensions are already partially funded. The Institute has a fast growth rate of exploitation, but the use of facilities is heterogeneous between departments. Funds for sustained use should be provided (e.g. liquid helium for SQUID).

Individual proposed marks

4.6

Average C3

4.7

Summary comments:

Due to its outstanding efforts, the Institute possesses a large fraction of new equipments, which will permit it to extend its scientific output in the coming years. In a few cases however, the procurement seems to be opportunity-driven, and it may be better to first develop a coherent research plan before purchasing the equipment. Along these lines, the Institute needs to invest in the training of operators for new equipment by partnering with experienced groups (outside Romania if required: it is indeed unlikely that some of the very complex new equipment can be exploited by self-training). An alternative would be a specific recruitment of persons who are already familiar with the equipment of interest. The Institute should critically evaluate the prospects of groups which do not have state-of-the-art equipment yet.

C4 Management Efficiency and Quality of Research Environment

C4.1 Staff evaluation and Motivation

The Institute is characterized by flat hierarchies, a friendly cooperative climate, and a very high motivation of the junior researchers & PIs. In ad-hoc staff-interviews, an extremely high satisfaction with the Institute working conditions and management was expressed. Considering the performance-based evaluation principle for both researchers and groups in the Institute, which adheres to the national rules for promotions, this –at least apparent-satisfaction is a remarkable point.

Individual proposed marks:

5

C4.2 Administrative procedures

The administrative procedures of the Institute appear well-balanced in a challenging research domain and financing climate. Overheads are used to support startup of new projects and to assist groups that experience temporary financial problems. The Institute has a policy for performance-based investment decisions (at the group level), and performance-based salaries, which vary by at most 50% within one staff-level category. It is finally noteworthy that there is a well formulated policy to hire high-quality staff, also from abroad.

Individual proposed marks

4.8

C4.3 Satisfaction of R&D staff

Throughout the visit, the Evaluators found a very high overall motivation of the research staff at all levels. Good travel opportunities are offered to younger researchers, and teams and PIs enjoy high academic freedom. The management exerts a strong impetus for the pursuit and development of own ideas, and competitive salaries contribute to the overall high satisfaction of the staff.

Individual proposed marks

5

C4.4 Administrative (operational) efficiency

The scientific council meets monthly for assessing performances and planning future activities. Given the changing nature of the research-financing opportunities in the reported period, yearly strategy sessions contributed to a well-balanced long-term planning. The Institute makes use of a functional and apparently satisfactory enterprise management

system. In particular, purchasing requests are evaluated and processed rapidly, and reimbursement for travel expenses occurs in short delay.

Individual proposed marks

4.8

C 4.5 Transparency of Decisions

The transparency of management decisions appears satisfactory for the R&D staff. The internal evaluations of proposals are open, and the overall situation of the Institute, as well as medium- to long-term prospects, are steadily communicated to the staff. The rules are transparent for assignment of the 1st authorship, and obtaining invitations for oral presentations makes it very likely that further requests will be granted.

Individual proposed marks

4.8

4.6 Involving staff in decision making

All departments, each of which comprising an average of 4-5 research groups, feature joint laboratory meetings where the situation of the groups and orientation decisions are discussed. A wide freedom is offered for the proposal of new projects on the basis of own ideas, which are discussed first at the group level, and subsequently at the Institute-level.

Individual proposed marks

4.3

C4.7 Ethics and good behavior

The procedures for assignment of co-authorship are well established, and R&D results are reported in a standardized form that is evaluated by the Institute administration. The individual research activity is internally evaluated yearly according to transparent quantitative criteria. The collaborations are fairly established on the basis of common scientific interests. The young researchers feel well supported in the development of their personal career, by their respective group leaders, by the Scientific Council, and by the Director. The R&D environment is pleasant, productive, stimulating, and competitive.

Individual proposed marks

4.7

C4.8 Availability of administrative and auxiliary staff

During interviews, several randomly selected staff members pointed out that the workshops of the Institute are “good”, and that the technical staff is highly qualified and skilled for producing “in-house” equipments and original products. The administrative staff was also

recognized to be very efficient and helpful, ensuring a prompt support for the financial aspects of the grants management, equipment acquisition and maintenance, administrative and financial reporting. Services are available when needed, and their management is satisfactory.

Individual proposed marks

4.7

C4.9 European and International best practices

The Institute has established many certified procedures and obtained ISO certification for a few laboratories. In addition, participations in a rather large number of European projects ensure that European best practices are known throughout the Institute and adhered by. Ad-hoc interviews with staff members revealed that good practices concerning possible discrimination, gender and maternity issues, as well as concerning the authorship policy and career development and promotion, are respected.

Individual proposed marks

4.5

Average C4

4.7

Summary comments:

Overall, the evaluators were impressed by a highly dynamic, engaged and enthusiastic administrative team, which communicated well about the opportunities and past difficulties of the Romanian research landscape and its anticipation of the future. In a precarious general context, the management team has led the Institute on a steady path from early established research-directions, such as isotope separation, towards novel research fields in bio- and nanotechnology, where the opportunities of the future may be. In doing so, it has established a strong solidarity among formerly disparate research teams, which results in a high motivation. The R&D staff succeeded to participate in a large number of national, nucleus and European projects, which in turn allowed generating an impressive and competitive infrastructure in key areas. The management has reasonably assured that the number of novel areas remains limited, such that each of them can reach a critical mass.

C5 Quality and Credibility of the Institutional Development Plan

C 5.1 Development direction

The strategic directions of the R&D activity are characterized by a pragmatic approach, by which the Scientific Council adapts the direction to a new research landscape. The research fields are established at the group and PI levels, not by the management.

Individual proposed marks

4.7

C 5.2 Stimulating new ideas and direction in R&D

Any direction of fundamental, applied, or technological transfer research is supported by the Scientific Council, as soon as it has a high potential in attracting funds and in producing results at the international level. There is a short term focus on new research lines and some lack of bottom-up brain storming for selecting major research fields. In the strategic plan, all the 12 main R&D directions are considered relevant.

Individual proposed marks

4.3

C 5.3 Recruitment policy

Discussions with the Director and members of the Scientific Council revealed an open personnel policy towards attracting highly qualified researchers: “If I see a good scientist in the street, I hire him immediately” – Mr. Director said. The Institute adopted clear and transparent evaluation and promotion rules with excellence-oriented criteria. The qualification and experience abroad is positively evaluated, collaborative mobilities are encouraged and supported by the institution. The Institute addresses a rational and fair policy towards possible age and gender problems, and a constant preoccupation for refreshing and reinforcing the groups with young members in order to reach a critical mass.

Individual proposed marks

4.8

C 5.4 Collaborations and partnerships

All the groups presented a large number of internal and external cooperations: multiple publications and patents were realized in collaboration. The approach to partnering is ad hoc, with clear interests in establishing new collaborations besides maintaining traditional ones. The Institute policy in protecting and valorizing the intellectual property on products realized in collaboration seems somehow unclear.

Individual proposed marks

4.8

C 5.5 Scientific communication and major projects

The Institute provides a large number of well defined high level projects coordinated at the level of the Departments, and new projects with significant potential (basic, applied, or even technological-oriented science). Apparently, there may be a lack of systematic brain storming about major projects or strategic directions at the inter-group level.

Individual proposed marks

4.3

C 5.6 Critical mass in key area

Several key competences prove to have a critical mass. Each Department reaches the critical mass for productive research. In spite of its high technological transfer potential, Team 12 however encounters difficulties in attracting young researchers (PhDs and post-docs) because the topic is a priori less attractive and productive in terms of publications.

Individual proposed marks

4.2

Average C5

4.5

Summary comments:

The visit in the labs and discussions with various staff members revealed a highly enthusiastic and motivated atmosphere, focused on a clear set of priority ideas for future R&D directions and to find niches in highly competitive areas. The R&D staff demonstrated its capacity to adapt to funding fluctuations and to the advancement of the research landscape. The Direction has a pragmatic attitude and an excellence-oriented recruitment policy, but it should be kept aware that the solidarity between groups and its members is the strength of the Institute.

Overall technical considerations, observations, conclusions:

The National Institute for Research - Development of Isotopic and Molecular Technology – ITIM Cluj-Napoca provides an excellent record of research activity, with multiple articles published in good ranking journals that attracted multiple citations.

The Institute also exhibits a high level record of implemented EU and national grants, as well as patents for new technologies. Nevertheless, the extent to which most of the presented patents were applied in economy or transferred to partners, with possible economical income, is not clear. Their valorization must be improved.

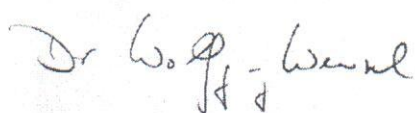

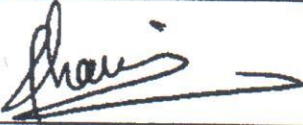
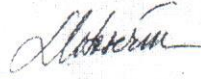


The average age of the personnel involved is about 42 yrs., and the management shows a marked will for the brain-gain process, to the very benefit of the Institute.

The Institute possesses an excellent, top-notch research infrastructure, which is already employed in many current projects and research activities. Nevertheless, in certain instances, it was apparent that a well-defined, clear-cut research idea around few research equipments was absent. In the future, it is recommended that a strategic idea must precede the research infrastructure acquired, and not the opposite.

The staff is regularly involved in the decision making process. People are treated according to their efforts and results, based upon a system that assesses periodically all the personnel performance. Nevertheless, more young scientists should be part of the Scientific Council of the Institute.

A good match applies between the existing research infrastructure, existing research venues, and available research experiences. The groups are incited to undertake collaborations with other institutions in the Cluj area and beyond. Finally, the focus on the set of priority ideas for future R&D activity and major strategic projects is commendable, but could be improved still.

Proposed Certification level: 4.6 = A+

| Nr. crt. | Name, Surname | Signature |
|------------------------|---|---|
| Evaluation TEAM | | |
| 1 | Evaluator 1 - Wolfgang WENZEL |  |
| 2 | Evaluator 2 - Tudor LUCHIAN |  |
| 3 | Evaluator 3 - Remi CHAUVIN |  |
| 4 | Evaluator 4 - Liliana MITOSERIU |  |
| 5 | Evaluator 5 - Caterina VOZZI | <i>Caterina Vozzi</i> |
| Observers: | | |
| 1 | Coordinating Authority | |
| 2 | CCCDI Representative | <i>Carmen Socaciu</i>  |
| 3 | ANCS Representative - Letitia Clara STANILA |  |

Proposed Certification level: A+

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| Date: May 16, 2012 | | |
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