

# DITET

Struttura	Voto Panel	Giudizio
Gas Ionizzati	87	excellent
Materiali per l'Elettronica e il Magnetismo	86	excellent
Rilevamento Elettromagnetico dell'Ambiente	85	excellent
Scienza e Tecnologia dell'Informazione	85	excellent
Fisica Applicata "Nello Carrara"	83	excellent
Informatica e Telematica	82	excellent
Elettronica ed Ingegneria dell'Informazione e delle Telecomunicazioni	81	excellent
Ricerche sulla Combustione	81	excellent
Tecnologie Avanzate per l'Energia	81	excellent
Analisi dei Sistemi e Informatica	79	very good
Fisica del Plasma	79	very good
Macchine Agricole e Movimento Terra	79	very good
Studi sui Sistemi Intelligenti per l'Automazione	79	very good
Matematica Applicata a Tecnologie Informatiche	78	very good
Studi ed Esperienze di Architettura Navale	78	very good
Tecnologie Industriali e Automazione	77	very good
Motori	76	very good
Applicazioni del Calcolo	74	very good
Acustica e Sensoristica "Orso Mario Corbino"	67	GOOD BUT
Tecnologie della Costruzione	65	GOOD BUT
Calcolo e Reti ad Alte Prestazioni	64	GOOD BUT
<b>MEDIA PANEL</b>		<b>78,38</b>

Istituto: Gas Ionizzati - (IGI)

Voto Panel	87
Giudizio	excellent

## Panel Recommendations

The Institute should be supported with an adequate recruitment policy in view of the long term commitment in the ITER programme and the large population of researchers and technologists with age above 56 years.

**Istituto:** Materiali per l'Elettronica e il Magnetismo - (MEM)

Voto Panel	86
Giudizio	excellent

**Panel Recommendations**

MEM must continue the policy of integration in the interdepartmental projects and should focus activities on a few areas (e.g. materials for energy and for sensing) abandoning areas where technological competition is too strong (such as electronics materials for chip). The policy of joint labs with other Institution is to pursue. MEM has, however, need to find industrial partnerships either in the National or in the European context should be further enhanced.

**Istituto:** Rilevamento Elettromagnetico dell'Ambiente - (IREA)

Voto Panel	85
Giudizio	excellent

**Panel Recommendations**

IREA is an important and effective resource for the Department. It presents high-qualified personnel that can be better valorized by stimulating spin-off and patents policy. Moreover IREA presents competencies in one of the relevant discipline of the telecommunications, the digital signal processing. Hence, in the hypothesis of re-organization of the telecom sector of the department, IREA can play an important role.

**Istituto:** Scienza e Tecnologia dell'Informazione - (ISTI)

Voto Panel	85
Giudizio	excellent

#### **Panel Recommendations**

ISTI combines a very high scientific quality and excellent personnel, with visionary research directions (as also evident from the participation to frontier research initiatives and specifically to as much as 9 FET EU projects – Future Emerging Technologies), well organized laboratory structure and combination of skills, and an impressive fund raising ability bringing almost 5M€/year from competitive projects at all levels (EU, regional, national, public/private), and almost 6.5M€/year further including revenues from services. Even exploitation of results (despite listed in the weaknesses by the SWOT analysis) appears already significant. Overall, ISTI appears very well organized and managed, with a very clear internal view not only of the Institute's assets and strengths, but also of the possible weaknesses and/or threats, and no special of further recommendations appear needed at this stage (besides the encouragement of continuing with the current pace).

**Istituto:** Fisica Applicata "Nello Carrara" - (IFAC)

Voto Panel	83
Giudizio	excellent

#### **Panel Recommendations**

IFAC is an important and effective resource for the Department. It presents high-qualified personnel in applied physics that can be better valorized: by re-focusing the Institute mission in a lower number of research lines; by extending the spatial network of the Institute; by a better integration with other competencies present in the Department.

**Istituto:** Informatica e Telematica - (IIT)

Voto Panel	82
Giudizio	excellent

#### **Panel Recommendations**

IIT is an excellent reality in CNR. It blends advanced research activities revolving around the multiple facets of the future Internet (Pervasiveness, Cyber-physical, security, applications, algorithms and analytics, etc.), with professional internet services mainly comprising the .it registry maintenance and management. With an average age of 42 years old, the Institute has very good perspective for the near future. The recent (May 2014) establishment of a secondary site in southern Italy could ultimately become an asset especially in terms of accessibility to dedicated regional funds, although at this stage we are not yet able to judge, as virtually all the activities carried out in the considered period and the relevant achievements are still strongly centred in the Pisa site.

**Istituto:** Elettronica ed Ingegneria dell'Informazione e delle Telecomunicazioni - (IEIIT)

Voto Panel	81
Giudizio	excellent

#### **Panel Recommendations**

The Institute holds the unique competencies in telecommunications in the Department (and probably in the whole CNR). It can therefore be an important reference point for the telecom sector throughout the department. IEIIT presents thematic groups in Network, Wireless communications and systems and Security. Unfortunately it does not present competencies on "optical communications" neither in "transport" nor in "access". In front of future developments in the telecommunications networks in access (European and national programmes on Ultra-Large-Band, NGN, 5G) and data-com (intra-data-com net for the HPC and in general for the data-centers) where the wire-line/wire-less integration plays a strategic role, an improvement along this thematic line is suggested.

Istituto: **Ricerche sulla Combustione - (IRC)**

Voto Panel	81
Giudizio	eccellente

#### **Panel Recommendations**

IRC seems to be in good agreement with the general mission of CNR, but some improvements are possible. The good level of basic research, both theoretical and experimental, on the one side, and the reduced time dedicated to innovative applications in contact with external partners, on the other side, would deserve some action from the central administration to promote a better performance of the Institute. As a preliminary suggestion we recommend a much closer connection with the institute IM of the same Department which has a common interest on most research topics, but a more pronounced and, in a way, complementary vocation for application issues and technology transfer. A strict relationship could also improve the human resources distribution either for a consistent dimension of the research groups and for a larger technical support to the experiments. A further connection with other CNR institutes of the same and of different departments is strongly encouraged to enlarge the domain of potential interest and funds acquisition. As a second point, we encourage the personnel to keep, also after the new location is established, the present involvement of young people, in particular PhD students, who are essential for maintaining a basic approach to scientific problems.

Istituto: **Tecnologie Avanzate per l'Energia - (ITAE)**

Voto Panel	81
Giudizio	eccellente

#### **Panel Recommendations**

The ITAE is historically totally committed on cutting-edge research and highly topical aimed at improving the knowledge and the satisfaction of needs of material with special properties, new components and devices, efficient energy systems. In recent years the Institute has increased the number of permanent researchers, created the "Centre for promotion, innovation and transfer of energy technology" to optimize the mission of the Institute. The level of the Institute will be maintained if: a) the researcher's number having fixed-term contracts will be included in the permanent staff; b) the staff will be properly updated also according to the marked demands; c) simplifications of administrative tasks are realized; d) the overcoming of the crisis that discourages investment in research in the public and private sectors will be overcome. The role of ITAE could be emphasized by a greater involvement with Institutes of other Departments interesting in participate in energy sector research with their chemical, physical, engineering, environmental, economic and regulatory skills: it would be important that relevant projects can involve all the CNR experiences and a systematic network with Italian Universities.

**Istituto:** Analisi dei Sistemi e Informatica - (IASI)

<b>Voto Panel</b>	79
<b>Giudizio</b>	very good

#### **Panel Recommendations**

The main shortcoming of the Institute is arguably the relative modest level of external funding. Such a funding level could be improved by a better internal coordination, an employment of a critical mass of resources over targeted initiatives, and a more tailored selection strategy of the EU funding opportunities.

The Institute's own plan, foreshadowed in the evaluation report, of increasing the number of application areas of interest by adding new areas (such as smart-grid, smart city, energy management, etc.) does not seem fully satisfactory, because it involves a very high risk of an excessive fragmentation. Rather, a more promising direction appears to be the establishment of structured integration – which the CNR should somehow formalize – between IASI and the other two institutes for applied mathematics of the Department, IAC and IMATI, with which IASI shares themes of fundamental research and application sectors.

**Istituto:** Fisica del Plasma - (IFP)

<b>Voto Panel</b>	79
<b>Giudizio</b>	very good

#### **Panel Recommendations**

The Institute should be supported with an adequate recruitment policy and an adequate career progression in view of the long term commitment in the ITER programme and the large population of researchers and technologists with age above 56 years.

**Istituto:** Macchine Agricole e Movimento Terra -  
(IMAMOTER)

Voto Panel	79
Giudizio	very good

#### **Panel Recommendations**

The field of activities of the Institute needs quality and technical competencies that only experienced people may have. In young people competencies may grow only working together with more experienced colleagues. That means that the age of personnel must be a continuous function. In IMAMOTER the distribution of age has critical jumps. Approximately one third of researchers, technologist and technicians is more than 56 years old, only the 24% is less than 40.

If CNR wish to preserve the present level of quality of the Institute it is quite urgent to solve the problem of turn-over allowing the entrance of young people.

**Istituto:** Studi sui Sistemi Intelligenti per l'Automazione -  
(ISSIA)

Voto Panel	79
Giudizio	very good

#### **Panel Recommendations**

ISSIA has good perspective for the near future, also considering that the 50% of researchers and technologist are less than 46 years old. There are no doubts that ISSIA fields of activities are taking advantages from multidisciplinary and interdisciplinary between the different branches of its competences.

In the next future ISSIA must drive its efforts stressing the cooperation with Universities in order to increase its attractiveness to young people and must increase the amount of revenues coming from private contracts or given by selling of services in order to improve the self financing of its research activities.

**Istituto:** Matematica Applicata e Tecnologie Informatiche - (IMATI)

<b>Voto Panel</b>	78
<b>Giudizio</b>	very good

#### **Panel Recommendations**

As said, the Institute results from the merge of three groups working in Pavia - primary location -, Milano and Genova. The groups, composed more or less by the same number of researchers, mostly work on different topics; moreover, there is a weak interaction scientific and cultural between them (especially between the group of Genova and the other two), so that they appear as three distinct small institutes.

This being so, it seems very reasonable to confirm the recommendation made in the previous evaluation, according to which the group of Genova should be separated from IMATI and coupled to the group LEIT of Genova working on the same issues. But even more important would be the establishment of a structured strong integration - which the CNR should somehow formalize - between IMATI and the other two institutes of applied mathematics of the Department, IAC and IASI, with which IMATI shares themes of fundamental research and application sectors.

**Istituto:** Studi ed Esperienze di Architettura Navale - (INSEAN)

<b>Voto Panel</b>	78
<b>Giudizio</b>	very good

#### **Panel Recommendations**

INSEAN is in good agreement to the general mission of CNR, however the presence of large-scale facilities and the reduced resources exclusively dedicated to scientific production would deserve some action from the central organization to improve its overall performance. As a preliminary suggestion, we recommend a larger cooperation among the different groups inside the Institute and a closer connection with other Institutes of the Department with some common research topics (e.g. ISSIA, IASI, IAC). Also a further connection with other Institutes of different Departments is strongly encouraged to enlarge the domain of potential interest and funds acquisition. As a second, but equally important suggestion, we recommend an adequate policy to enlarge the involvement of young people, essentially PhD students and post-doc, who are the added value to increase basic research and scientific production.



Istituto: Tecnologie Industriali e Automazione - (TTIA)

Voto Panel	77
Giudizio	very good

#### Panel Recommendations

The Institute holds the unique competencies in manufacturing analysis, design and management. In consideration of the strategic role of the manufacturing industries for the Country, it important to enhance the role of ITIA within the Department research organization/net. This can be pursued by means of a vertical integration of competencies (e.g. with mathematical-oriented Institutes or technology-oriented Institutes ) and skill already present in the Department.

Istituto: Motori - (IM)

Voto Panel	76
Giudizio	very good

#### Panel Recommendations

IM seems to be in good agreement with the general mission of CNR, however the good level of experimental expertise and the reduced time exclusively dedicated to basic research would deserve some action from the central administration to improve the performance of the Institute. As a preliminary suggestion we recommend a closer connection with the institute IRC of the same Department, which has a common interest on most research topics, but a more pronounced and complementary vocation for basic research issues. A closer relationship could also improve the human resources distribution either for the consistency of research groups and for the technical support to the experiments. A further connection with other CNR institutes of the same and of different departments is strongly encouraged to enlarge the domain of potential interest and funds acquisition. As a second suggestion, we recommend to maintain, and possibly increase, the involvement of young people, essentially PhD students and post-doc, to facilitate more basic approaches and a general improvement of the scientific production.

**Istituto:** Applicazioni del Calcolo - (IAC)

<b>Voto Panel</b>	74
<b>Giudizio</b>	very good

**Panel Recommendations**

The main shortcoming of IAC is arguably the relative modest level of external funding gathered from competitive projects. The level could be improved by a better internal coordination, an employment of a critical mass of resources over targeted initiatives, and a more tailored selection strategy of the EU funding opportunities.

Also from this point of view, it would be important to tighten a structured integration - which the CNR should somehow formalize - between IAC and the other two institutes of applied mathematics of the Department, IASI and IMATI, with which IAC shares themes of fundamental research and application sectors.

**Istituto:** Acustica e Sensoristica "Orso Mario Corbino" - (IDASC)

<b>Voto Panel</b>	67
<b>Giudizio</b>	GOOD BUT

**Panel Recommendations**

IDASC has important laboratory facilities substantially underutilized. The limited results could be improved by a systematic, closer and more effective interaction with other institutes of the Department. IDASC can be a resource for the Department in the subject field of acoustics where important synergies with other Institutes can be easily developed.

IMEM Institute has excellent activity in sensors, good interaction with the production world, but lack in acoustic knowledge. The merging between IMEM and IDASC could originate a new Institute having higher potential in basic and applied sensor field, eligible for competing with international institutions.

**Istituto:** Tecnologie della Costruzione - (ITC)

Voto Panel	65
Giudizio	GOOD BUT

#### **Panel Recommendations**

Considering the present economic and technological changes in the world of European Civil Constructions, CNR must decide if certification of products is inside its scopes or it is only an help to the Italian industrial system of civil construction.

In any case, but in consequence of this decision, ITC needs a redesign of its role, its objectives, its strategy considering also a more strict relation with university departments and CNR Institutes.

In addition, if CNR wishes to keep the technical and experimental know how of the Institute, there is an urgent need of turn-over due to the high level of age of personnel: approximately the 30% of researchers, technologist and technicians is more than 56 years old and, extremely critical, the 65% more than 46.

**Istituto:** Calcolo e Reti ad Alte Prestazioni - (ICAR)

Voto Panel	64
Giudizio	GOOD BUT

#### **Panel Recommendations**

The above analysis shows contrasting results. In terms of quality of the research and of the technology transfer, ICAR appears satisfactory, and even with spikes of high quality. However, several concerns and shortcomings do emerge in terms of quantity of the research productivity and of the exploitation initiatives and services, especially owing to the quite large size of the institute in terms of personnel in relation with the current quantitative figures.

Fund raising initiatives could benefit of an attempt to differentiate the external sources, so as to reduce the reliance on MIUR as primary external funding agency. Accession to competitive EU funding is highly advised (although we understand it is not nearly easy).

ICAR could also benefit of a reorganization in terms of research topics and relevant groups: the current research activity appears on one side broadly organized in very large research areas: on the other side, the specific research activities appear overly fragmented and detached from the original mission of the institute. Also, at least in part, such research activities do not seem to clearly differentiate from similar activities carried out in peer institutes.

Finally, attractiveness towards young people and especially towards students may be improved, as well as increase in the amount of revenues coming from private contracts or given by selling of services in order to improve the self financing of its research activities.