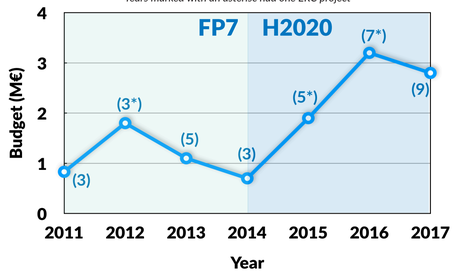
AN INTERNATIONAL RESEARCH CENTRE

The Aragon Institute of Engineering Research (I3A) has an international orientation by its own nature. Modern research is mainly based on international collaboration, and the different research groups from I3A work and interact with groups and institutions all over the world. Following our vision, researchers from I3A are very active in applying and participating in European projects, having participated in its history in around 50 of them. We are constantly willing to participate in new consortia within H2020 and forecoming programs and to collaborate in the advance of the European knowledge society.

Budget and number (X) of new european projects (FP + INTERREG) since 2011.
Years marked with an asterisc had one ERC project



H2020 projects leaded or participated by researchers from I3A

Excellent Science	Industrial Leadership	Societal Challenges
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ARAGON INSTITUTE OF ENGINEERING RESEARCH

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AN APPLIED RESEARCH INSTITUTE

The demands of the knowledge society, characterised by globalisation, information, communication and the growing economic value of structured knowledge, require qualitative changes from the scientific and technological community in order to improve quality and effectiveness. In an effort to meet this challenge, the **Aragón Institute of Engineering Research (I3A)** was stablished in 2002, being the first institute of its kind created at the University of Zaragoza.

I3A is an interdisciplinary University Research Institute specialised in **applied research and engineering**. It emerged from a strong conviction of the importance of the synergy that can be obtained in research planned in an interdisciplinary manner. This leads to an increase in working efficiency and a high capacity to deal with multidisciplinary projects. The aim is to generate, manage and transfer scientific knowledge to society, and contribute to the technological innovation of industry as an active agent for regional, national and international economic development.

The Institute aims at being recognised as a European and national reference point for certain specific strategic lines of research and in technological innovation in specialist fields. At the same time, its range and complexity presents a great opportunity to provide within the same institution very different technologies relating to research and development in all areas of engineering, which enable us to take on complex projects requiring many different skills. It is therefore of crucial importance to define key research areas enabling collaboration between different groups and the sharing of space, equipment and technical staff in the search for excellence in each area and the ability to transfer knowledge to society at large.

I3A has established four **strategic divisions** to reflect these key areas: the Biomedical Engineering Division, the Information and Communication Technologies Division, the Processes and Recycling Division, and the Industrial Technologies Division. In all these areas we try to generate knowledge at the highest level and transfer this knowledge to the social and business communities.

SERVICES & FACILITIES

The I3A has the use of a good number of laboratories for the various groups to carry out their work, in addition to the facilities of the institute itself . These include: the **I3A Impact Laboratory** at TechnoPark in Motorland, Alcañiz, a special facility created for the study of the mechanics and biomechanics of impact in the sports and automotive sectors; the **Biomechanics Laboratory,** which has equipment designed for the study of human body movement in all research and development areas in which this is a key to knowledge; the supercomputing **cluster HERMES**, the R+D base for the simulation of all types of studies related to engineering (mechanical, biomedical, communications, signal processing, software, etc.); and the **Biomass Pilot Plan**t managed by the GPT group, which enables R+D activity in this area to be carried out close to industrial scale. I3A also houses two units of the Singular Scientific Technological Structure (ICTS) of the **NANBIOSIS network, units U13 and U27**. These facilities offer services either to our researchers or to researchers of other centers, including the industry.

STRATEGIC DIVISIONS

4 DIVISIONS INTEGRATING MULTIDISCIPLINARY GROUPS

The size of the Aragon Institute of Engineering Research is large compared to most of the research organizations belonging to the University of Zaragoza. Almost 300 PhD members of the Institute belong to 35 research groups recognized by the Government of Aragon working in areas related to engineering or applied science. The structuring of the research activity within four large strategic divisions is therefore essential.

INDUSTRIAL TECHNOLOGIES

The Industrial Technologies division aims at integrating research and development in technologies with applications in the manufacturing of the future and industry 4.0. We understand that the productive model in European countries must meet the challenges of global competitiveness and it is therefore essential to promote competitiveness in the productive sector. To achieve this, we work in the following areas:

- Advanced manufacturing and metrology
- Electronics and photonics
- Automotive technologies
- Logistics
- Advanced materials and structural design

INFORMATION AND COMMUNICATION TECHNOLOGIES

Information and Communication Technologies are cross-cutting technologies meeting the challenges of the Information Society. They include various disciplines such as communications, network management, ubiquitous computing, multimodal user interfaces, artificial intelligence techniques, biometric systems, robotics and audiovisual technologies. Our main areas of work are:

- Audiovisual and multimedia technologies
- Advanced interfaces and robotics
- Advanced computing technologies and embedded systems
- Telecommunications infrastructures, technologies and services.

PROCESSES AND RECYCLING

The Processes and Recycling division studies the reuse and exploitation – mainly in energy terms – of materials that have lost their primary use or that appear as by-products in production processes. It also investigates the production, separation, distribution and storage of hydrogen deriving from the same sources. Finally, research related to food technology is also included in this division. Our main areas of work are:

- Energy and the environment
- Hydrogen technologies
- Waste reduction and recycling
- Agro-food technologies

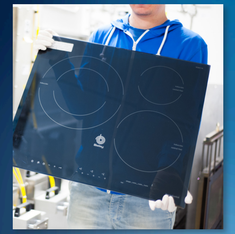
BIOMEDICAL ENGINEERING

Biomedical engineering is a highly multidisciplinary field in which specialists in biology, medicine, physics, mathematics, and engineering work together to improve health and the quality of life. The aim is to find solutions to engineering problems arising in the areas of biology and medicine, including tissue engineering, mechanobiology, genetics, biomaterials, biomedical signal processing and assistive technology. Our main areas of work are:

- Tissue engineering and biomaterials
- Biological modelling and biomechanics
- Imaging, signal and biomedical instruments
- Prevention and assistive technologies

TECHNOLOGY TRANSFER

As an engineering research institute, our research lines often have direct application in our industry or society. However, being a strong research player at an international level while at the same time working, listening to and collaborating with businesses is not always easy. I3A has a long track record in collaborating with the industrial environment and has the capacity to share both objectives and points of view. Proof of this is the fact that year after year about 50% of the revenue of the institute is generated by collaborating with the industry or with public institutions.



Firstly, this has been achieved through collaboration with businesses and institutions through R+D projects coordinated by members of I3A and managed through the Technology Transfer Office of the University of Zaragoza. This is complemented by the offer of advanced technology services aimed at improving products and processes.
Secondly, we are serious about Intellectual Property management and valorization of our research results. Therefore, we hold a number patents and utility models, and participate as inventors in a great number of them derived from our research activities and from projects associated with their development.
Finally, we work to promote an entrepreneurial culture through the creation of spin-off or start-up companies by I3A researchers, contributing positively to the expansion of the regional business fabric. LSLuz, GeoSlab, Bitbrain, BeonChip, EpicPower, J3D Vision or Ebers are some of the spin-off companies coming out from our labs.