

# DEPARTMENT

## CIVIL AND INDUSTRIAL ENGINEERING

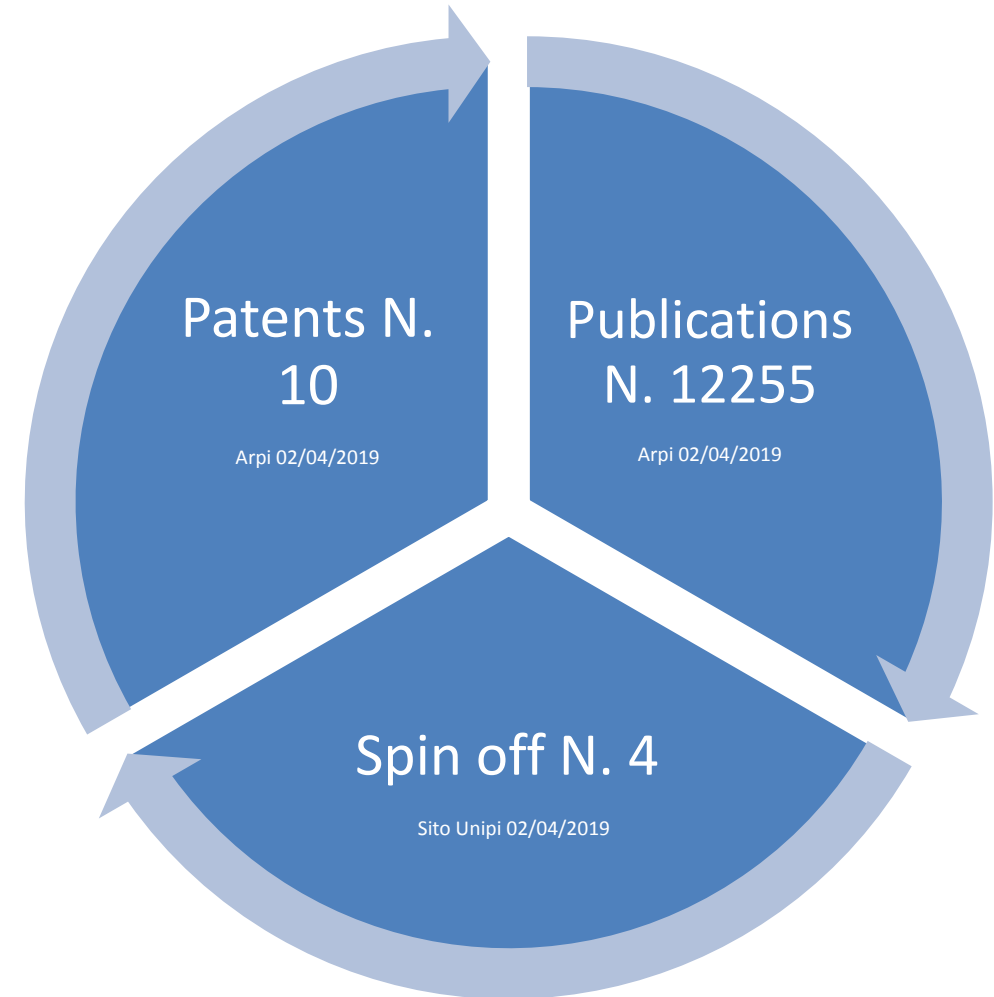
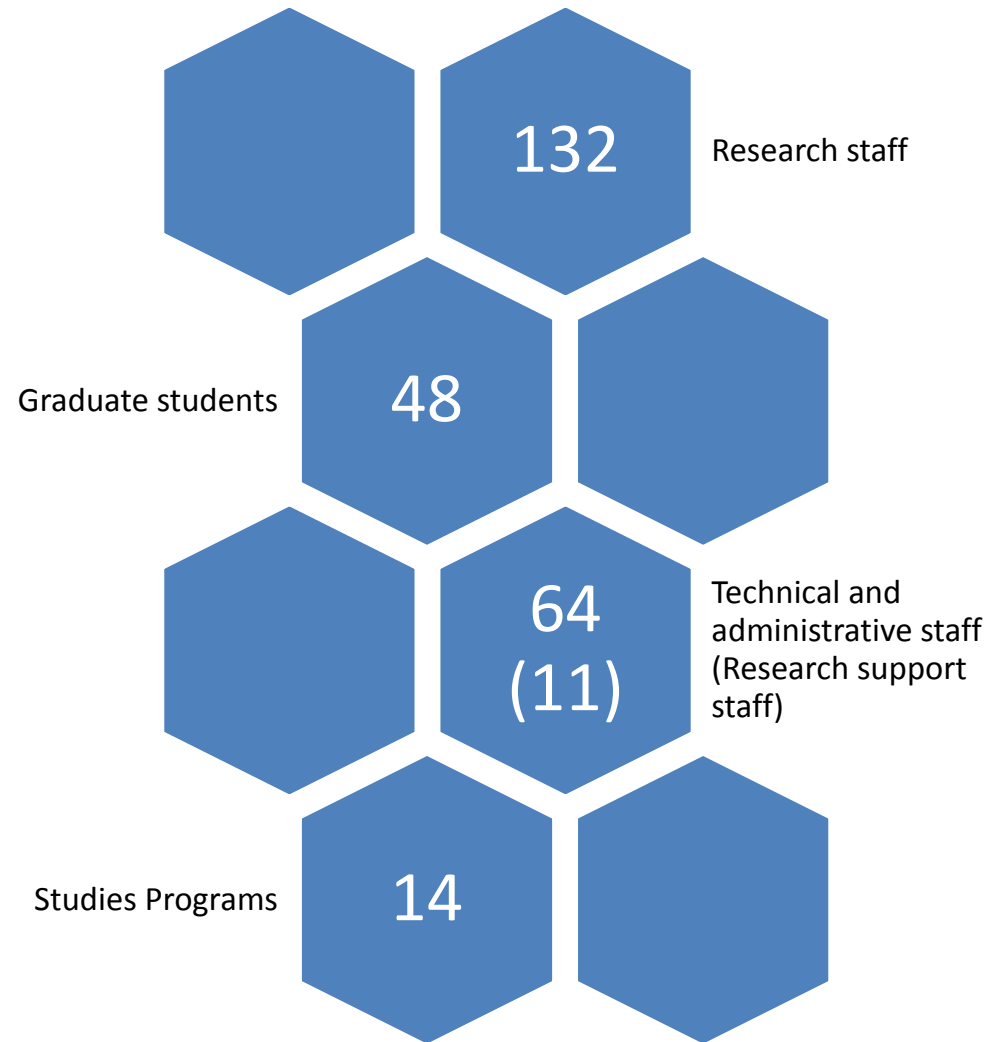


DICI WAS ESTABLISHED IN 2012, FOLLOWING A MAJOR REFORM OF THE ITALIAN HIGHER EDUCATION SYSTEM, AS A MERGER OF THE FORMER DEPARTMENTS OF:

- AEROSPACE ENGINEERING,
- CHEMICAL ENGINEERING, INDUSTRIAL CHEMISTRY AND MATERIALS SCIENCE,
- MECHANICAL, NUCLEAR AND PRODUCTION ENGINEERING,  
– and a part of the department of
- CIVIL ENGINEERING.



# DEPARTMENT AT A GLANCE



# RESEARCH AREAS

## Aerospace

Fatigue and damage tolerance of aerospace structures (advanced metals and composites)  
Flow stability and control, Aerodynamics of road vehicles  
Advanced chemical propulsion, Low thrust space propulsion  
Development of fly-by-wire control systems,  
Space mission analysis and space vehicle design

## Chemical

Multiphase flow, fluid mechanics and interfacial engineering  
Materials engineering: polymers, functional materials, nanocomposites, metals, biomedical  
Product design: membranes, electrodes, fuel cells; Fuel technology and carbon capture  
Chemical process design, control, intensification, modelling  
Manufacturing planning, systems and optimization  
Industrial safety & Environmental protection (wastewater- waste management)

## Civil

Traditional and innovative materials for structural engineering (masonry, wood, reinforced concrete, steel, glass, fibre-reinforced composites, etc.); Classical linear and non-linear elasticity; Damage mechanics, Fracture mechanics and Fatigue; Road and runway materials, pavement and subgrade design, monitoring and evaluation, Geomatic and soil /foundation engineering; Earthquake engineering and Structural dynamics; Fire and explosion resistance of structures; Structural design of bridges, buildings, industrial plants, and innovative elements; Traffic management: advanced methods for roundabout design and flow simulation, Road safety and mitigation of road traffic noise, Mathematical models for transport demand and network analysis; Freight logistics and port planning

## Mechanical

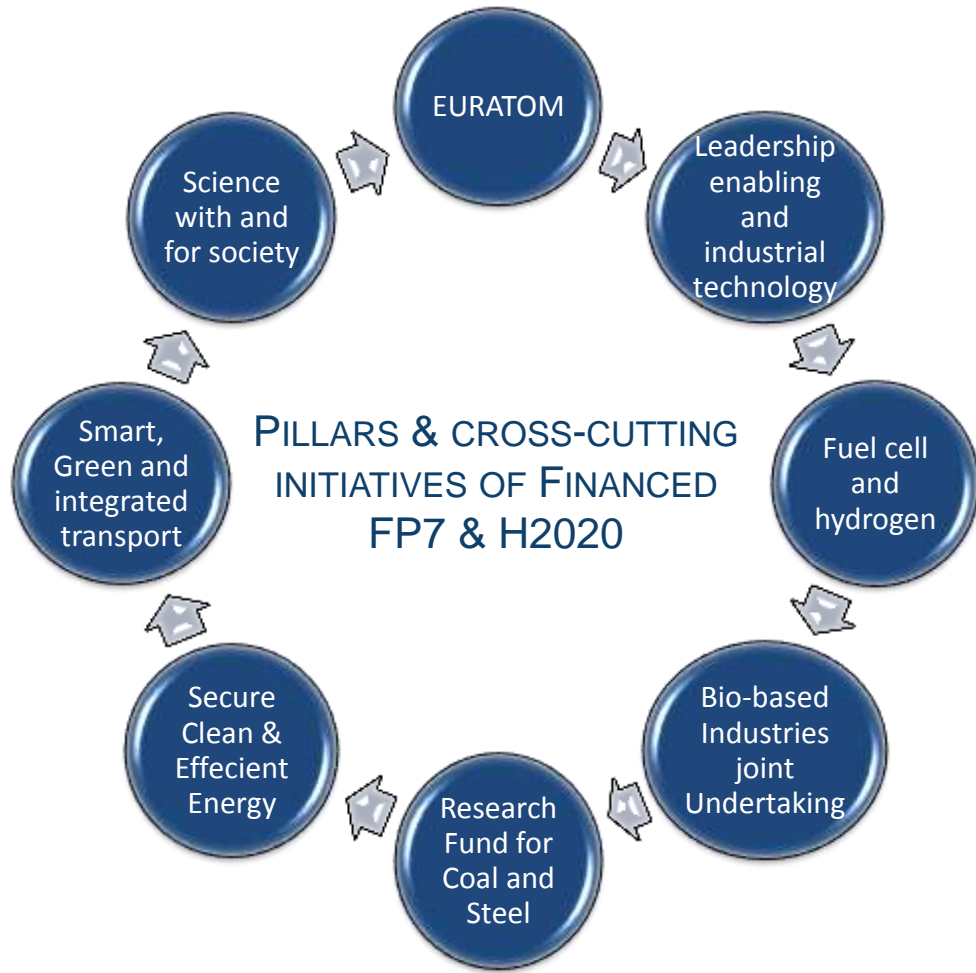
Mechanics of Materials and components: modelling, testing and computational analyses (fatigue, fracture, creep, wear, residual stress)  
Hydrogen Embrittlement; Surface mechanics and Tribology  
Acoustic and Bioacoustic: noise analysis and modelling; Mechatronics and Robotics  
Computational and Experimental Biomechanics and Biotribology  
Dynamics and design of Vehicles, transmissions, structural and rotor dynamics  
Laser Applications for Manufacturing

## Nuclear

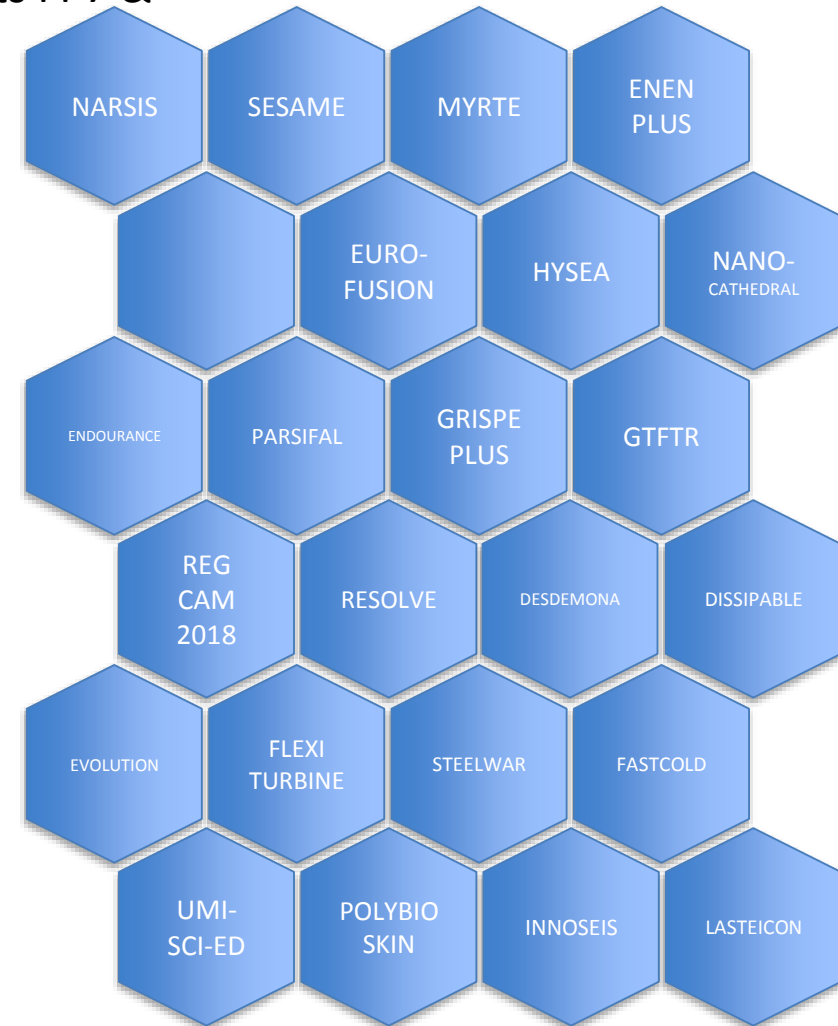
Thermal hydraulics of innovative nuclear systems;  
Thermal mechanical behaviour of breeder materials for nuclear fusion reactors  
Dosimetry and image quality in radiodiagnostic; Environmental and personnel neutron and gamma dosimetry  
Design and licensing of casks for storage and transport of radioactive materials; Qualification tests of noble radioactive gases delay beds with activated carbon  
Nuclear Reactor Safety;



# RESEARCH PROJECTS



## Research Projects FP7 & H2020 Financed



# RESEARCH IMPACT



## Local

- Patents are used by local companies
- Enabling and strengthening industrial technologies (in the field of materials, energy system, fuels and transport)



## Regional

- Strengthen Europe's industrial capacities and business perspectives, including SMEs
- promoting innovation-driven growth and employment
- beneficial applications of new process and application in the industrial sectors