



METAPROJECTS
ELECTRONIC ENGINEERING RESEARCH

www.metaprojects.it



M E T A P R O J E C T S

P R O F I L E



Identity

Metaprojects is an applied research laboratory specialized in the development of advanced electronic technologies.

It operates within ENEA's Brasimone Research Centre, where it has a dedicated laboratory and operational infrastructure for the design, prototyping and validation of innovative systems.

The organization develops tailored solutions for applications with a high level of innovation and technical criticality, integrating expertise in embedded electronics, radio frequency, automation, numerical simulation and metamaterials.

Metaprojects was founded on a strong technical vocation and maintains a practical, implementation-driven approach: transforming a project concept into a functional, verifiable and industrially transferable system (TRL 9).



Mission & Role

Metaprojects designs, develops and validates devices and systems with a high degree of technical complexity, operating throughout the entire cycle of industrial research and experimental development.

It combines multiphysics simulation, advanced prototyping and laboratory testing to support public entities, research centres and industry in the development of strategic technologies, with applications in the energy, automation, aerospace and UAV sectors.

The organization acts as a link between applied research and industrial implementation, contributing to the development of highly reliable solutions for infrastructure and innovative operational environments.

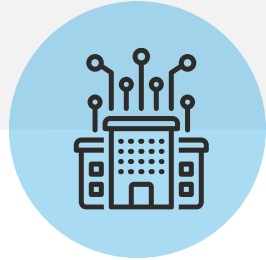
Expertise and Infrastructure for High-Criticality Systems

Metaprojects operates within a structured technical ecosystem that integrates research, development and validation in a single operational environment.

It stands out for its ability to develop technologies in operating contexts with high technical, environmental and regulatory complexity.

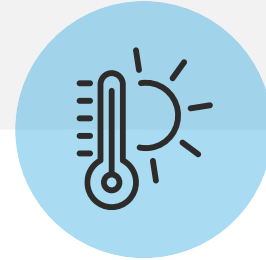
Its infrastructure, located at ENEA's Brasimone Research Centre, enables direct control over the design cycle and reduces development times.

It integrates research, development and validation in a single operational ecosystem.



Operational Infrastructure

Laboratories, workshop and
test field



Critical Environments

High temperatures,
ionizing radiation and
electromagnetic
interference



Safety and Reliability

Design of Safety SIL-
certifiable systems for critical
functions and software
compliant with EU
Cybersecurity Regulation
2024/2847 (CRA)



In-house Prototyping

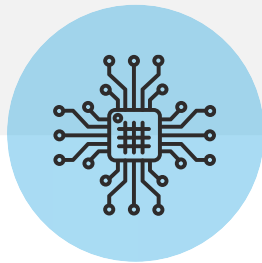
Laboratory equipped with
extensive electronic
instrumentation, mechanical
workshop and EMI/EMC
pre-compliance testing for
prototypes up to TRL 9



Industrial Research

Integration of research
and application for
scalable solutions

Technological Expertise



Embedded Electronics and Automation

Firmware development for microcontrollers, DSPs and FPGAs.
Design of control, regulation and data acquisition systems



Radio Frequency and Resonant Filters

Design of antennas, RF filters and front-ends For wireless systems.
Development of tuning and coupling circuits for critical resonators



Multiphysics Simulation

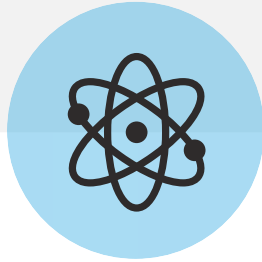
Computational multiphysics modelling
Of radio-frequency, thermal and mechanical components.
Performance assessment through advanced numerical simulations



Sensors & Systems for Harsh Environments

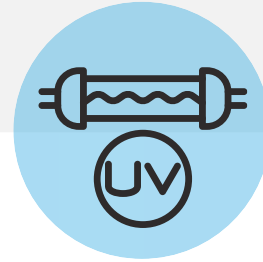
Development of sensors for high temperatures and ionizing radiation.
Design of reliable systems for severe conditions, SIL 2 and SIL 3

Application Sectors



Nuclear Energy

Development of technologies for Generation IV reactors and radiation-resistant diagnostic systems



UV Sanitization

UV sanitization systems for environments, agriculture and agri-food applications, biologically certified



Oil & Gas Offshore

Electronics and instrumentation for underwater sensors and monitoring systems on offshore platforms



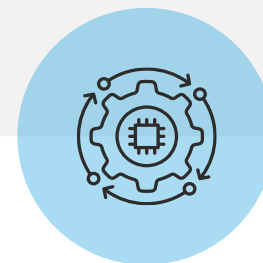
Agritech

Advanced technologies for agricultural robotics, autonomous drones and crop monitoring systems



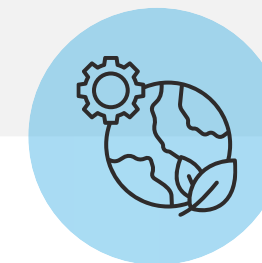
Medical

Electronic devices for early diagnosis, biomedical monitoring and patient safety



Industrial Automation and Control

Microprocessor-based machine controls, real-time systems and servo controls, developed to customer specifications



Environmental Monitoring

Systems for detecting environmental parameters in remote areas, including IoT networks



Drones

Development of customized UAV platforms and integration of tailored sensor payloads

Operating Model



Industrial Research

Experimental technologies,
proof of concept,
feasibility studies

Fundamental in determining
low TRL levels (1–4)

LOW TRL 1 - 4

Project Engineering

Engineering development of
functional prototypes
at laboratory level

Execution of technical-functional
testing and validation
activities

INTERMEDIATE TRL 5 - 7

Prototype

Manufacturing in workshop
and laboratory with
finalized components
and systems

Focus on advanced
TRL levels (6–7)

ADVANCED TRL 6 - 7

Testing

Functional and environmental
verification of prototypes
in real contexts

EMI/EMC, radio frequency,
thermal and mechanical
pre-compliance testing

VALIDATION TRL 8 - 9

Certification support

Support provided alongside
certification bodies
and preparation of technical
documentation

Validation and attestation of
regulatory requirements

FINALIZED TRL 9

LIF LIDAR Drone for environmental monitoring

UAV system with laser-induced fluorescence optical sensor for contaminant detection.

Problem

Monitoring chemical spills and surface contamination over large areas requires rapid, non-invasive and highly accurate solutions.

Solution

Development of a UAV platform integrated with a LIF LiDAR sensor for in-flight detection of pollutants through spectroscopic analysis.

Technical complexity

- Integration of a high-sensitivity optical payload
- Stabilization and vibration compensation
- Real-time data transmission
- Operational validation in real environments

Result

Demonstration system for advanced environmental monitoring, applicable in marine, industrial and civil protection contexts.



UV sanitization for environments, Agriculture and agrifood

UV-A, UV-B and UV-C irradiation sanitization system.

Problem

Sanitizing environments from viruses without the use of chemicals or liquids.

UV-C phytosanitary treatment for vineyards, vegetables and forestry without pesticides.

UV-C treatment for fruit to extend shelf life.

Solution

Development of automatic systems with UV-C LED panels and integrated safety features.

Technical complexity

- Study of irradiation algorithms and light modulation configured according to the application target
- Study and validation of the integrated system
- Biological certification of the virucidal effect

Result

KLARIS UV for environmental sanitization. Three-axis sanitization system for agriculture, applicable to tractors or autonomous guided robots.



Sensors for generation IV LFR Reactors

Development of sensors for high-temperature and neutron-radiation environments.

Problem

LFR reactors (Lead-cooled Fast Reactors) operate under extreme temperature and fast neutron flux conditions, which compromise the reliability of traditional sensors.

Solution

Design and development of radiation-resistant and thermally robust electronic sensors, integrable into diagnostic systems for next-generation reactors.

Technical complexity

- Exposure to fast neutrons
- High temperatures and critical thermal cycles
- Selection of compatible materials
- Functional safety and operational continuity

Result

Development of experimental devices suitable for validation in controlled environments, with applicability in advanced nuclear development programs.



Underwater Robotic Arm for 4000 m ROV

Electromechanical system for offshore maintenance and monitoring.

Problem

Operations on subsea pipelines and infrastructure at depths of up to 4,000 metres require robotic systems with high mechanical resistance and reliability.

Solution

Design of a seven-electric-axis robotic arm integrable on ROVs for maintenance and inspection operations.

Technical complexity

- Pressure up to 400 bar
- Watertight sealing and protection of electronic components
- Precision control in dynamic environments
- Reliability in critical offshore contexts

Result

System developed for deep-ocean operations, with applications in Oil & Gas and subsea infrastructure.



ExaDrone Academy

ENAC.UAS-RE.085

ExaDrone Academy is a training centre specialized in preparing drone pilots and operators for professional and industrial applications.

We operate at ENEA's Brasimone Research Centre and, through the ENAC.UAS-RE.085 Recognized Entity (ENEA), we provide training programmes compliant with European EASA and Italian ENAC regulations.

Our activities include:

- Structured theoretical training
- Practical training in real operational scenarios
- Assessment and accreditation according to European standards

The goal is to train competent, aware professionals ready to operate in complex environments, in full compliance with the highest safety and regulatory standards. Official providers for the Emilia-Romagna Region Drone Competence Centre.



ExaDrone Academy

ENAC.UAS-RE.085

Qualification and specialist training programmes.

ENAC courses and qualifications

- Open A1/A3 – A2
- Specific STS – STS-01 (VLOS) – STS-02 (BVLOS)

Advanced training

- SORA
- UAS CRM
- Aeronautical Communications Management

Professional courses

- Photogrammetry and Land Surveying
- Thermography
- Precision Agriculture
- Dangerous & Good
- Radio Communication for Emergencies and Rescue Operations



Partnership



AGENZIA NAZIONALE PER LE NUOVE TECNOLOGIE,
L'ENERGIA E LO SVILUPPO ECONOMICO SOSTENIBILE

ENEA - Brasimone Research Centre

Operational and infrastructural partnership
for research, development and validation
activities in the nuclear and advanced
technology sectors



Clust-ER

Active participation in the technology Clust-
ERs: Agrifood, Build, Health, Innovate, Mech
and Tourism



IdentityKey

IdentityKey srl

Partnership for research, development and
advanced technology validation activities



IDENTITYBASE

IdentityBase srl

Partnership for medical research,
development and validation activities

Metaprojects operates within a recognized and accredited system, ensuring regulatory compliance, institutional solidity and integration within the national and European applied research landscape.

Accreditations



High Technology Network - ER

ORDC accreditation as a Type A laboratory, ID1696, Resolution No. 5807, for industrial research and technology transfer



Cyber 4.0

Accreditation to a national centre promoting innovation, technology transfer in cybersecurity

ENAC - Italian Civil Aviation Authority

Accreditation as an authorized entity for issuing drone flight qualifications in Open and Specific scenarios

MUR - Ministry of University and Research

Accreditation in the National Research Registry: 001904_ETER

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Part of our team



Paolo Tassin

President & Founder
CTO - Chief
Technical Officer



Maria Ruberto

CFO - Chief
Financial Officer



Erik Tassin

Communication
& Event Specialist
Training Coordinator EA



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Accountable Manager
ExaDrone Academy



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