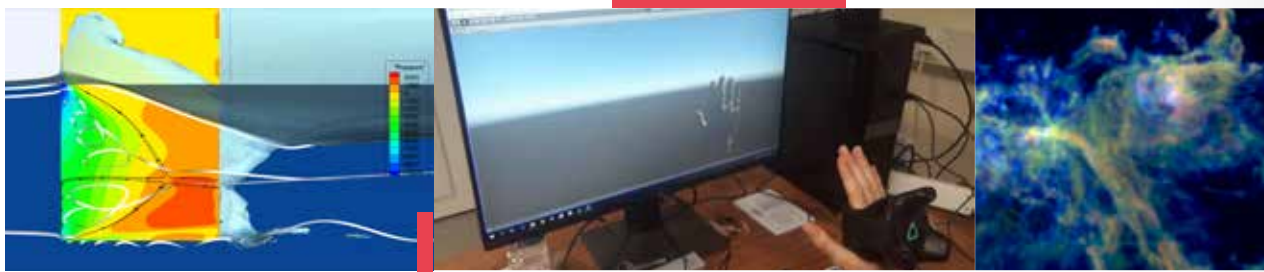


### 3<sup>RD</sup> YEAR PROFESSIONAL OPTION

# RESEARCH AND DEVELOPMENT

The Research and Development professional option is designed for final-year engineering students who are keen to discover how academic and private research and its various professions work, from upstream research to advanced R&D work.

The option is structured into two teaching modules: 'Industrial property and innovation' and 'Research methodology, overview of public and private R&D careers', and a supervised Research and Development project.



## COURSE CONTENT

### INDUSTRIAL PROPERTY AND INNOVATION

- > Aims to raise student awareness of industrial property issues, the innovation process and project management: how does the idea of a technological innovation emerge and how can its development be financed, how to protect it, transform it into a product and get it into the market?

### RESEARCH METHODOLOGY, OVERVIEW OF PUBLIC AND PRIVATE R&D CAREERS

- > Offers an introduction to research methodology (bibliographical research, scientific ethics, dissemination). An overview of the different professions - in both industry and academia - related to R&D activities is provided.

### RESEARCH AND DEVELOPMENT PROJECT

- > The project is supervised by a member of a Centrale Nantes laboratory and generally involves other academic or industrial partners. Project topics are generally proposed by the members of the laboratories, in support of their research activity, but can also be defined on the students' initiative.



4 QUALITY EDUCATION



9 RESEARCH, INNOVATION AND PROFESSIONALISM



## CAREER PROSPECTS

- > PhD thesis
- > Researcher in academia
- > Research Engineer
- > R&D Project Manager
- > R&D Consultant
- > Business creator (start-up)

## TEACHING STAFF

### HEAD OF OPTION

Mickaël Hilairet

### LECTURERS

Mickaël Hilairet, Ina Taralova

### EXTERNAL SPEAKERS

INPI (Institut National de la Propriété Industrielle), Distingo conseil, EDF, IRT Jules Verne, CNES, Keosys, Dilepix

### CONTACT :

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## EXAMPLES OF PAST PROJECTS

- > Determination and identification of a behaviour law for a polymer material
- > Additive manufacturing for climbing
- > Validation of a behaviour model for thermoplastic materials
- > Simulation in an atmospheric wind tunnel of dispersion in an urban canopy: concentration measurement by optical technique
- > Design of a Flettner rotor to demonstrate offshore wind energy recovery by a hydro-wind vessel
- > Optimization of the anchoring system for a floating wind turbine
- > Analysis of radio emission spectra for the study of the interstellar medium
- > Design of a robotic system for otologic surgery
- > Search for attractors in the study of discrete dynamic systems
- > Recognition of objects in an urban video using neural networks

## EXAMPLES OF PAST INTERNSHIPS

- > Similarity algorithm for 3D scans of megalithic rock art (University College Dublin)
- > Multiscan registration for surface defect detection on aerospace components (McGill University, Montreal)
- > Existence and uniqueness of linear and non-linear evolution equations (Universidad Cardenal Herrera, Valencia)
- > Numerical simulation of the ventilation inception on surface-piercing hydrofoils (LHEEA, Centrale Nantes)
- > Development of a wave-powered marine desalination system (Oneka, Port St Lucie, Florida)
- > Microstructure modeling of cast iron (SINTEF Industry, Oslo)
- > Metocean study and extreme value analysis of PTO extension in a wave energy converter (Carnegie Clean Energy, Perth)
- > Software development for an augmented reality system (Thales, St-Héand)
- > Modeling of pipelines in composite materials (Bureau Veritas, Paris)
- > Fluid and thermal study of an innovative cooling system for an electrical module (Faurecia, Montbéliard)
- > Development of a modelling and simulation tool for heating networks (CFERM Engineering, Paris)



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