



Innovating for tomorrow's  
energy together

# IFP,

a world-class research player  
in the fields of energy, transport and  
the environment



## A public-interest mission

**I**FP is a world-class public-sector research and training center, aimed at developing the technologies and materials of the future in the fields of energy, transport and the environment. It provides public players and industry with innovative solutions for a smooth transition to the energies and materials of tomorrow – more efficient, more economical, cleaner and sustainable.

To fulfill its mission, IFP has 5 complementary strategic priorities:

- capturing and storing CO<sub>2</sub> to combat the greenhouse effect,
- diversifying fuel sources,
- developing clean, fuel-efficient vehicles,
- converting as much raw material as possible into energy for transport,
- pushing back the boundaries in oil and gas exploration and production.

## Mixed funding

Within its focal areas, IFP fosters knowledge transfers between long-term fundamental research, applied research and industrial development. It is funded both by a state budget and by resources provided by private French and foreign international partners.



## Research with an industrial focus

In a constant drive for progress, IFP aids the conversion from invention to innovation, from patent to product and from research to industry. It is committed to seeing the outcome of its research exploited by industry. This has prompted it to support the creation of some thirty companies, which have themselves become significant employers and exporters. These businesses span all the research fields covered by its strategic priorities, in particular new energy technologies.

IFP's exceptional ability to combine fundamental and applied research is illustrated by the Nobel prize for chemistry awarded in 2005 to Yves Chauvin, former Research Director at IFP, for his work on metathesis. Today, his findings are applied in various industrial fields (cosmetics, pharmaceuticals, etc.).

### At a glance

- A world-class group
- 2 main research sites in Paris and Lyon
- 1,710 employees including 65% researchers and, among them, 42% hold doctoral degrees
- 40,000 patents filed including 13,500 active patents
- 226 scientific papers published each year
- 27 IFP projects funded by the European Commission in 4 years
- 100 recruitments with open-ended contracts per year
- 200 doctoral and post-doctoral researchers per year
- 350 placement students per year
- 30 work-study contracts per year

## Earth sciences



### Scientific skills:

structural geology, sedimentology, mineral and organic geochemistry, petroleum system and reservoir modeling, seismic characterization of reservoir, seismic and geochemical monitoring.



**Applications:** characterize and model the properties of geological reservoirs for CO<sub>2</sub> storage, renew oil & gas reserves by contributing to the discovery of new resources, optimize the production of oil & gas fields.



*After six years as a sedimentological technician, I wanted to develop my career path and become an engineer. Encouraged by my superiors and supported by the Human Resources Division, I took two degree programs, funded by IFP."*

**Rémy Deschamps, Engineer,  
Geology-Geochemistry-Geophysics  
Division**



## Reservoir engineering



### Scientific skills:

physics and physical chemistry of flows in a porous medium, petrophysics, reservoir characterization, modeling and simulation of dynamic reservoir behavior, uncertainties.



**Applications:** develop geological CO<sub>2</sub> storage technologies and performance evaluation methodologies, improve the evaluation, development and exploitation of oil & gas fields.



*My job involves highly varied tasks; each experiment is different and each setting-up is unique. What makes scientific research interesting is that one can rarely exactly predict the results. An error can lead to discovery."*

**Mathieu Olivaud, Technician,  
Reservoir Engineering Division**



### IFP and extended reserves

> Recognized for its computing skills in reservoir characterization aimed at enhancing recovery

### IFP and controlled CO<sub>2</sub>

> Expert in the development of software used to model CO<sub>2</sub> behavior underground to make its storage secure



### Scientific skills:

chemistry and physical chemistry of complex fluids and materials, biotechnology, thermodynamics, and molecular modeling.



**Applications:** improve CO<sub>2</sub> capture/storage technologies, investigate the behavior of new products (fuels ex biomass, complex fluids, materials) and microorganisms for use in second-generation biofuel production, develop batteries for hybrid vehicles, improve oil production (surfactants, polymers and materials).



*While working on my thesis at IFP, I could value not only the richness of applied research subjects but also the extent of the human and material resources made available to the doctoral students. In addition, IFP's areas of expertise are so varied that you can always find answers to your questions."*

**Aurélien Wender, Engineer,  
Applied Chemistry and Physical  
Chemistry Division**



## Applied mechanics



### Scientific skills:

mechanical engineering (design of technological equipment), solid mechanics (materials and structures), fluid mechanics (flowing fluids, interactions with structures or solids).



**Applications:** develop CO<sub>2</sub> capture, transport and storage solutions, develop new energies (hydrogen transport/storage), develop new transmissions for hybrid vehicles, and oil & gas production and refining technologies.



*As a young researcher, I appreciate the freedom I have to steer my work, while being supported by an organization that sets the objectives to be reached."*

**Eléonore Roguet, Engineer,  
Applied Mechanics Division**



## Catalysis and separation



### Scientific skills:

chemistry, theoretical chemistry, organic synthesis, mineral synthesis, homogeneous catalysis, heterogeneous catalysis, and separation techniques.



**Applications:** develop catalysts and separation agents for refining and petrochemical processes, for CO<sub>2</sub> capture, and for the conversion of biomass into fuel.



*At IFP, all employees have the same resources to develop their career paths, including disabled people like myself. IFP's integration policy is reflected on a daily basis through genuine support, small adjustments to the jobs or redeployment initiatives if necessary. This is reassuring and encourages you to do your best."*

**Sonia Louchène,  
Technician, Catalysis  
and Separation Division**



# our areas of expertise

## IFP and clean refining

> A creator of new catalysts for processes to produce fuels meeting the most stringent specifications

## Analysis and instrumentation



### Scientific skills:

separative and analytical sciences, molecular identification, physical-chemical characterization of solids.



**Applications:** develop new characterization techniques and methods to improve catalyst poison detection limits and speciation, relate the compositions with functional properties of fuels, describe the compounds derived from biomass conversion, understand how catalysts work, meet the kinetic modeling needs for processes.



*It was in a chemistry forum that I discovered IFP. I left my CV, and was contacted a few months later for a temporary job that soon became permanent. I appreciate this good fortune and am very pleased with my job in this laboratory... a fulfilling, varied and exciting job!"*

**Isabelle Cléménçon,  
Technician,  
Physics and Analysis Division**



## Computer science and applied mathematics



### Scientific skills:

high performance computing, mesh generation and geometric modeling, optimization, statistics, automatic control, signal processing, software architectures, real-time systems, electronic measurements, power electronics.



**Applications:** high performance scientific codes (CO<sub>2</sub> storage simulation), and real-time software in on-board computers (for conventional and hybrid vehicles).



*Projects involve many interrelated areas of expertise, so we are very often in contact with engineers from other divisions, and elsewhere, with other research centers and our industrial partners."*

**Jean-Marc Gratien, Computer Science  
Engineer, Technology, Computer  
Science and Applied Mathematics  
Division**



## Process engineering



### Scientific skills:

studies, optimization and simulation of industrial processes, pilot units, chemical and hydrodynamic engineering of catalytic reactors, thermal engineering, catalytic engineering.



**Applications:** develop and improve refining, gas treatment, biomass conversion and energy production technologies, optimize design, development, tuning and operation of pilot units.



*I appreciate working at IFP, which combines fundamental research and applied research... a combination I did not find elsewhere, whether in the laboratory or in industry."*

**Dominique Casanave,**  
Research engineer, Process  
Design and Modeling Division



## Engines/Powertrains



### Scientific skills:

modeling and simulation of engines and vehicles, combustion, development of new powertrains (hybrids in particular), exhaust gases after-treatment, matching engines with current and alternative fuels.



**Applications:** reduce the CO<sub>2</sub> emissions of vehicles, continue reducing regulated pollutants, develop innovative powertrains.



*I wanted to work in applied engine research, and IFP boasted, and still boasts, the best expertise in France in this field."*

**Benoist Thirouard,**  
Head of the Engine System  
Analysis Department,  
Energy Applications  
Techniques Division



## IFP and diversified fuels

> Expert in the development of processes to produce second-generation biofuels from lignocellulosic biomass

# Work for a company that gives you

## IFP's assets for top-level R&D

### Innovation culture

Developing teams' innovation abilities and fostering technological breakthroughs by:

- >> incorporating recent fundamental research progress,
- >> developing techniques that can be applied on an industrial scale.

### Top-level expertise

Ensuring the relevance of scientific approaches and results' industrial impact through R&D division assessments.

Providing an expert opinion on complex subjects for public authorities and industry.

### Effective project-based operations

Fostering skills acquisition in cross-cutting teams. Encouraging employees to take initiative and work independently through real-life case studies and experiences.

### International recognition

Publishing: peer-reviewed international scientific journals, books and conference papers.

Taking part in scientific conferences bringing together international academic and industrial experts to discuss a given issue.

### Cutting-edge technical environment

Boasting high-level resources for effective R&D: laboratories, equipment, pilot units, testing and calculation facilities.

### Collaborative research

Involvement in the French Research and Innovation System (SFRI): French National Research Agency (ANR) projects, competitiveness clusters, Carnot Institutes. Steering European projects and taking part in international programs in partnership with key scientific, academic and industrial players.

## Economics



### Scientific skills:

macroeconomics, microeconomics and econometrics, technical-economic evaluation (upstream and downstream in the oil sector, new energy technologies), evaluation of energy systems and transport technologies, environmental evaluation.



**Applications:** carry out studies and analysis on short-, medium- and long-term economic and energy prospects (prices, markets for petroleum products, new energy technologies, equipment, etc.).



*When I completed my engineering studies, the European energy markets were being deregulated. Strongly motivated by this issue, I did my thesis work in economics at IFP, where I was then hired and have specialized in market analysis and environmental analysis of the various energy approaches."*

**Stéphane Tchong-Ming,  
Economic Engineer, Economics  
and Information Watch  
and Management Division**



## Support departments

**Cross-cutting skills** supporting the various areas of expertise in Research and Development: legal, finance, communications, human resources, quality, safety and internal management, management IS, international relations, information watch.



### IFP and fuel-efficient vehicles

> Expert in the development of clean, high-efficiency engine technologies (new combustion processes, after-treatment technologies, etc.)

# the means to succeed!

## Four questions to the Human Resources team

### What is the induction process like at IFP?

You will gradually find out about IFP and its network with the support of your line managers and will attend an induction seminar a few months after starting your job. You will attend a meeting two years later to discuss how you have settled in.

### Is training important at IFP?

We have a strong team training drive. It aims to maintain and develop your technical, scientific, inter-personal and managerial skills to ensure team efficiency and individual performance.

### What is IFP's mobility policy?

Mobility is one of the cornerstones for enhancing and developing skills. You can create your career path at IFP, in the group or with its industrial partners, in France and abroad.

### What about diversity at IFP?

You will get a lot out of the cultural and social diversity of your teams.

A company-wide agreement reinforces our commitment to recruit, train and integrate disabled people and to support or redeploy employees should they become disabled.





*Innovating for energy*

## Join us!

>> At <http://recruitment.ifp.com>

View our job vacancies and apply on line.

View the list of forums we are attending:

at these forums, you will meet our HR teams and professionals from our various areas of expertise to discuss your career aspirations.

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