

# Curriculum Vitae

## Pascaline Pré

### Professor in Process Engineering

#### IMT Atlantique

Department of Energy Systems and Environment  
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### Researcher in CNRS Joint Research Unit GEPEA :

GEne des Procédés, Environnement et Agro-alimentaire / Chemical Process Engineering,  
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## 1. Research expertise

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**Multi-scale analysis of reaction and transfers in gas-solid systems and porous media - Development of processes of gas conversion, separation and storage for conditioning of energy carriers and reduction of pollutant and greenhouse gases.**

- **Characterization and applications of carbon materials:** disordered and microporous carbon structures produced from new syntheses and residues.
- **Experimental and modeling studies of gas adsorption properties:** Metal Organic Framework, carbon and composite adsorbents, adsorption thermodynamic data (isotherms, enthalpies), selectivity, grain scale diffusion, mass and heat transfer kinetics.
- **Gas separation process operability studies:** Pressure and Temperature Swing Adsorption (PSA, TSA), separation and storage performance studies, modeling, simulation, optimization, intensification.

## 2. Academic carrier

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- 2015** Professor at IMT Atlantique, Department of Energy Systems & Environment, Nantes.
- 2010** Habilitation to supervise research, *“Accounting for the stochastic nature of gas-solid interactions in the development of advanced process models.”* Nantes University.
- 1997** Assistant Professor, IMT Atlantique (Mines de Nantes), Department of Energy Systems & Environment, Nantes.
- 1997** PhD, *“Experimental study and modelling of natural gas combustion in fluidized bed reactors.”* National Polytechnical Institute, Laboratoire de Génie Chimique LGC, Toulouse, France.
- 1992** Engineer, Ecole Nationale Supérieure des Ingénieurs de Génie Chimique ENSIACET, Toulouse, France.

### 3. Responsibilities & management

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**2016**      **Research group leader VERTE in the GEPEA-CNRS unit, “Energy Valorization of Residues and Gas treatment”,** 12 permanent researchers.

**2016**      **Coordinator of the ENERGICS programme (ANR- Programme Investissements d’Avenir, 2015-2021):** development of R&D industrial partnerships of 5 Carnot Institutes : Energies du Futur, M.I.N.E.S, ICEEL, BRGM, and CSTB.

#### **Main contractual research projects:**

**2016 - 2014**    **AHEAD : Adsorber-Heat Exchanger – Advanced Design, leader.** Institut Mines Telecom, Mines Douai.

**2015 –2012**    **« Filière H<sub>2</sub> », co-leader.** Institut Carnot Mines, industry (PROSIM), ENSTA ParisTech, Mines ParisTech.

**2010 –2009**    **«HRTEM image processing and structural analysis of disordered carbons », leader.** Institut Carnot Mines, Mines ParisTech.

**2012 - 2009**    **« CAP : Cyclic Adsorption processes », leader.** Agence de l’Environnement et de la Maîtrise de l’énergie ADEME, ARKEMA and PROSIM companies, Ecole Nationale Supérieure de Chimie de Rennes

**2011 – 2009**    **« VEGAZ : Energy valorization of biomass for natural gas production », partner.** ANR, GDF-SUEZ company, Laboratoire de Sciences Analytiques (Lyon) - Unité de Catalyse et de Chimie du Solide (Lille) - Laboratoire d’Innovation pour les Technologies des Energies Nouvelles et les Nanomatériaux, CEA (Grenoble).

**2010- 2007**    Implementation and coordination of the **International Erasmus Mundus Master of Sciences ME3** « European joint masters in Management & Engineering of Environment & Energy »

### 4. Scientific production

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Articles (peer reviewed)	43
Book chapters and collections	8
Oral communications in international conferences	54
Invited conferences	5

### 5. Membership in professional body

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**Since 2016:**    Expert member in the **HCERES High Council for Evaluation of Research and Higher Education** evaluation board. <http://www.hceres.fr/MODALITES-D-EVALUATIONS/Liste-des-experts-ayant-participe-a-une-evaluation>

**Since 2015:**    Elected member in the administration board of the **French Association of Adsorption (AFA)** <https://www.adsorption.fr/spip.php?rubrique9>

- **Société Francophone d’Etudes du Carbone SFEC,**
- **Société Française du Génie des Procédés SFGP** : member of the organization committee of national conference SFGP2019,
- **Fédération Française des Matériaux** : member of the organization committee of the conference Matériaux 2018,
- Soot French CNRS Research Group n°3622 : **GDR-SUIE**, <https://suie.sciencesconf.org/>

## 6. Publication list

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1. **Pré P., Hémati M., Marchand B.** Study on natural gas combustion in fluidized beds : modelling and experimental validation. *Chem. Eng. Sc.* 1998, Vol. 53, 16, pp. 2871-2883.
2. **Giraudet S., Pré P., Le Cloirec P.** Modeling the Heat and Mass Transfers in Temperature-Swing Adsorption of Volatile Organic Compounds onto Activated Carbons. *Environ. Sc. & Technol.* 2009, Vol. 43, 4, pp. 1173-1179.
3. **Jayabalan T., Pré P., Héquet V., Le Cloirec P., Rouzaud J.N.** Material properties influencing the oxidation and ignition reactivity of activated carbons : thermal analysis, HRTEM study and statistical modelling. *Energy & Fuels.* 2009, Vol. 23, 8, pp. 4051-4058.
4. **Ramalingam S.G., Pré P., Giraudet S., Le Coq L., Le Cloirec P., Baudouin O., Déchelotte S.** Different families of Volatile Organic Compounds pollution control by microporous activated carbon in Temperature Swing Adsorption. *J. of Hazardous Mater.* 2012, Vol. 221-222, pp. 242 -247.
5. **Pré P., Huchet G., Jeulin D., Rouzaud J.N., Sennour M., Thorel A.** A new approach to characterize the nanostructure of activated carbons from mathematical morphology applied to high resolution transmission electron microscopy. *Carbon.* 2013, Vol. 52, pp. 239-258.
6. **Kursheed Shah I., Alappat B., Pré P.** Effect of thermal regeneration of spent activated carbon on volatile organic compound adsorption performances. *J. of the Taiwan Inst. of Chem. Eng.,* 2014, Vol. 45, 4, pp. 1733-1738.
7. **Apicella B., Pré P., Alfè M., Ciajolo A., Gargiulo V., Russo C., Tregrossi A., Deldique D., Rouzaud J.N.** Soot nanostructure evolution in premixed flames by high resolution electron transmission microscopy (HR-TEM). *Proceed. Comb. Inst.* 2015, Vol. 35, 2, pp. 1895-1902.
8. **Oschatz M., Pré P., Dörfler S., Nickel W., Beaunier P., Rouzaud J.N., Fischer C., Brunner E., Kaskel S.** Nanostructure characterization of carbide-derived carbons by morphological analysis of transmission electron microscopy images combined with physisorption and Raman spectroscopy. *Carbon.* 2016, 105, pp. 314-322.
9. **Yu Z., Deschamps J., Hamon L., Karikkethu Prabhakaran P., Pré P.** Modeling hydrogen diffusion in hybrid activated carbon-MIL101(Cr) considering temperature variations and surface loading changes. *Microporous & Mesoporous Mat.* 2017, Vol. 248, pp. 72-83.
10. **Gautier R., Dbouk T., Campesi M.A., Hamon L., Harion J.L., Pré P.** Pressure swing adsorption in isotropic porous medium: transient 3D modeling and validation. *Chem. Eng. J.* 2017. in Press. <https://doi.org/10.1016/j.cej.2017.05.145>