



**Curriculum Vitae**

**Pascal Brault  
Senior Research Fellow at CNRS  
(Directeur de Recherche)**

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## CURRICULUM VITAE



**Name :** M. BRAULT Pascal

**Place and birth date :** Born 15 février 1961 in LE BLANC (France)

**Nationality :** French

**Appointment:** Directeur de Recherche 2° Classe CNRS

Director of Laboratory FR776 EPEE 'Energie, Propulsion, Espace, Environnement since January, 1st 2006

**Work Address :**

Groupe de Recherches sur l'Energétique des Milieux Ionisés, UMR 6606 et FR W0776

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**Foreign languages :** English and German , fluent (written and spoken)

**Diploma :**

**Habilitation à diriger des Recherches** (Orléans 20 mars 1992)

*Plasma Surface Interactions : Fluorinated plasma etching of Silicon:Chemical Physics and surface structure modifications.*

*(Interactions Plasma -Surface : Gravure du silicium par plasmas fluorés. Physico-chimie et modifications structurales en surface.)*

**Committee :** B. Dubreuil (Président), J. P. Gauyacq (Rapporteur), M. Stutzmann (Rapporteur), P. Ranson (Rapporteur), J. P. Toennies, H. Estrade-Szwarczopf, R. Vetter, C. Leborgne, O. Vallée

**Ph D University of Orléans** (Orléans, 12 juin 1987, Thesis Supervisor: Prof. O. Vallée)

(Prépared at Meudon Observatory)

Semiclassical models for collision theories : Applications to radial coupling studies, reactive scattering induced by a radiation field and to solar Rydberg spectral line broadening

*Modèles semiclassiques en théorie des collisions : applications l'étude du couplage radial, aux collisions réactives induites par un champ de rayonnement et à l'élargissement des raies de Rydberg solaires.*

**PhD committee :** J. Chapelle (Président), B. Dubreuil (Rapporteur), N. Tran Minh (Rapporteur), G. Chambaud, N. Feautrier, G. Grynberg, O. Vallée, R. Vetter

**Member of the Thesis Committees for 20 PhD or Habilitation**

**Honor: Alexander von Humboldt Fellow 1992-1993**

Max Planck Institute for Fluid Mechanics, Prof. J. P. Toennies, Göttingen  
Molecular beam interactions with metallic surfaces

Laureate of "Tremplin Recherche" Prize from French Senate (Paris 12 February 2008)

[http://www.senat.fr/colloques/tremplin\\_recherche\\_3/tremplin\\_recherche\\_35.html](http://www.senat.fr/colloques/tremplin_recherche_3/tremplin_recherche_35.html)

Laureate of "Trophy of Public Research: Energy, Environment and Climate change 2015"  
(Paris, World Efficiency Conference, 13 October 2015)

<http://www.world-efficiency.com/Side-events/Prix-et-Trophees/Trophee-de-la-Recherche-Publique-Energie-Environnement-Climat.htm>

- **Research topics:**

- Plasma treatment and deposition of thin films. The applications concern materials for energy (fuel cells, battery, ...). Especially, I am involved in activities related to reducing the amount of platinum catalysts in fuel cell electrodes and their substitution by more common metals.
- Transfer of technology: SAPAC project in collaboration with CRT CRESITT Industries dedicated to the design and manufacture of demonstrators coupling Renewable energies and hydrogen chain (Production / Storage and conversion of hydrogen with a fuel cell). Independent power supply for off-grid systems.
- Modelling growth of deposits and plasma chemistry by simulation in molecular dynamics: in particular plasma spraying and deposition of nanocatalysts on a porous support or their growth in the gaseous phase; Study of Carbon Soot Growth in Plasmas (in collaboration with LSPM)
- I have co-authored 132 articles in peer-reviewed international journals, over 200 articles in national and international conferences, 42 of which invitation. I am co-inventor of 7 patents, 3 being subject to international extensions.

- **Experiences:**

- Executive Officer in charge of the Energy Research policy at CNRS
- Director of the Research Institute "Energetics, Propulsion, Space and Environment" (CNRS - FR776 EPEE)
- Coordinator of the SMARTCat JTI FCH-JU project (Call 2012)
- Coordinator of french funding agency ANR project AMADEUS: technology transfer of fuel cells
- Chairman of Selection committee "Energy" of the French funding Agency ANR
- Associate Editor of "Frontiers in Physics : Plasma Physics"  
<http://journal.frontiersin.org/journal/physics/section/plasma-physics#>
- Project manager in CNRS Energy Program (PLASMAPAC)
- Scientific manager of a large regional program on fuel cells involving European Social Fund (2 M€)
- Regional partner of the INTERREG IIIC "International Cooperation Platform for Sustainability". ICOPS project ([www.icops.eu](http://www.icops.eu))
- Manager of the project "Future Energies" French government - Region Centre Project Contract (5 M€)
- Manager of Regional project on solid oxide fuel cell (300 k€)
- Referee for EU-ISTU projects (FP6), CONCERT - Japan,
- Referee for PHC program (France)
- Referee for numerous peer reviewed international scientific journal
- Member of the scientific committee of the international conferences « Innovations on Thin Films Processing and Characterisation » and « International Symposium on Plasmas for Catalysis and Energy Materials ».

## 10 preferred Publications

1. P. Brault, A. Caillard, A. L. Thomann, J. Mathias, C. Charles, R. W. Boswell, S. Escribano, J. Durand, T. Sauvage, *Plasma sputtering deposition of platinum into porous fuel cell electrodes*, J. Phys. D **37** (2004) 3419-3423
2. P. Brault, Ch. Josserand, J.-M. Bauchire, A. Caillard, Ch. Charles, R. W. Boswell, *Anomalous diffusion mediated by atom deposition into a porous substrate*, Phys. Rev. Lett. **102** (2009) 045901
3. M. Cavarroc, A. Ennadjaoui, M. Mougnot, P. Brault, R. Escalier, Y. Tessier, J. Durand, S. Roualdès, T. Sauvage, C. Coutanceau, *Performance of plasma sputtered Fuel Cell electrodes with ultra-low Pt loadings*, Electrochemistry Communications **11**, 859 - 861 (2009)
4. D. B. Graves, P. Brault, *Molecular dynamics for low temperature plasma-surface interaction studies*, J. Phys. D **42** (2009) 194011, (Topical Review, 27 pages)
5. P. Brault (Review Article), *Plasma deposition of catalytic thin films: Experiments, Applications, Molecular modeling*, Surf. Coat. Technol. **205** (2011) S15-S23
6. X. N. Guo, P. Brault, G. Zhi, A. Caillard, G. Jin, XY. Guo, *Structural Evolution of Plasma Sputtered Core-shell Nanoparticles for Catalytic Combustion of Methane*, J. Phys. Chem. C **115** (2011) 24164-24171
7. M. Mougnot, A. Caillard, P. Brault, S. Baranton, C. Coutanceau, *High Performance Plasma Sputtered PdPt Fuel Cell Electrodes with Ultra Low Loading*, International Journal of Hydrogen Energy **36** (2011) 8429-8434
8. L. Xie, P. Brault, J.-M. Bauchire, A.-L. Thomann, L. Bedra (article invité), *Molecular Dynamics simulations of clusters and thin film growth in the context of plasma sputtering deposition*, J. Phys D **47** (2014) 224004
9. L. Xie, P. Brault, C. Coutanceau, A. Caillard, J. Berndt, E. Neyts, *Efficient amorphous platinum catalyst cluster growth on porous carbon: A combined Molecular Dynamics and experimental study*, Appl. Cat. B, **62** (2014) 21 - 26
10. P. Brault, E. Neyts, *Molecular dynamics simulations of supported metal nanocatalyst formation by plasma sputtering*, Catalysis Today **256** (2015) 3-12

See for details:

<http://www.univ-orleans.fr/gremi/pascal-brault>

<http://Pascal.Brault.pagesperso-orange.fr>

[http://www.researchgate.net/profile/Pascal\\_Brault](http://www.researchgate.net/profile/Pascal_Brault)

<http://www.researcherid.com/rid/A-7027-2009>

<http://scholar.google.fr/citations?user=Jzng5nEAAA&hl=fr>

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