Raphaël CHATTOT

Postdoctoral Fellow

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Research Interests

My research focuses on the structure-catalytic activity-stability relationships of low platinum-group metals based nanomaterials for the oxygen electrocatalysis in energy conversion and storage systems. Especially, I investigate on the emergence of desirable and stable electrocatalytic properties from structural disorder at the nanoscale.

Education

2014–2017 **Ph.D. Thesis in Electrocatalysis**, *University of Grenoble-Alpes*, Grenoble (38), France.
'Surface Distortion and Electrocatalysis : Structure-Activity Relationships for the Oxygen Reduction Reaction on PtNi/C Nanocatalysts'

2011–2014 **Master's Degree**, *Grenoble Institute of Technology, School of Physics, Electronics and Materials (PHELMA)*, Grenoble (38).
Electrochemistry and Process for Energy and Environment speciality. Magna Cum Laude

Research Experience

2018 – Ongoing **Post-Doctoral Position**, *European Synchrotron Radiation Facility (ESRF) and the Laboratory of Electrochemistry and Physico-chemistry of Materials and Interfaces (LEPMI)*, Grenoble, France.
'X-Rays Operando Studies of Oxygen Electrocatalysis on Structurally-Defective Nanocatalysts using Reduced Platinum-Group Metals Mass'

2016 **3 Months Student Exchange**, *TUB*, Berlin, Germany.
'Synthesis and Characterization of Preferetially-Shaped Bimetallic Nanoparticles for the Oxygen Reduction Reaction'

2014 **6 Months Degree Project**, *French Alternative Energies and Atomic Energy Commission (CEA)*, Grenoble (38), France.
'Investigations on Degradation Heterogeneities Within Proton-Exchange Membrane Fuel Cell Stacks.'

2013 **19 Weeks Internship**, *Paul Scherrer Institut (PSI)*, Villigen, Switzerland.
'Investigations on Gas Diffusivity in Fuel Cell membranes.'

Teaching/Administrative Experience

2014–2017 **Undergraduate Instructor**, *Grenoble Institute of Technology*, Grenoble (38), France.
Supervision of practical work and in charge of tutorial classes at the master's level.

Research Skills

Microscopy : Operator for TEM (JEOL 2010), STEM (JEOL JEM 2100F).

Analysis : Operator for (S)TEM/X-EDS, AAS (PinAAcle 900F PerkinElmer).

X-Ray Diffraction : Operator for ESRF ID31 high energy beamline (local contact since 2018) ; Beamline alignment, setup and measurement with various *ex situ* or *operando* techniques (WAXS, (GI)SAXS, XRR, CTRs etc.)

Electro-chemical Systems : Catalytic ink formulation, MEA manufacturing and characterization, PEMFC single-cell and stack test bench operation, (LabVIEW), proposition of mitigation strategies, Rotating Disk Electrode (RDE) experiments (AUTOLAB, Nova),(BioLogic, EC-Lab).

Synthesis : Various nanomaterials with controlled nanoparticle shape and chemical composition

Metrics : 21 papers published in international peer-reviewed journals, 2 under review, 5 in preparation ; 438+ citations ; h-index = 13 (Scopus 05/02/2020).

Other Skills

IT : Microsoft Office suite, Origin, COMSOL, SolidWorks.

Programming : C++, Matlab, Python

Languages : French : mother tongue, English : proficient (B2 level based on Toefl IBT), Spanish : school notions

Driving : Driving licence (car and motorbike), motorboat.

Selected Publications

— **R. Chattot**, O. Le Bacq, V. Beermann, S. Kühl, J. Herranz, S. Henning, L. Kühn, T. Asset, L. Guétaz, G. Renou, J. Drnec, P. Bordet, A. Pasturel, A. Eychmüller, T. J. Schmidt, P. Strasser, L. Dubau, and F. Maillard, 'Surface distortion as a unifying concept and descriptor in oxygen reduction reaction electrocatalysis', *Nature Materials*, vol. 17, pp. 827-833, **2018**

— **R. Chattot**, T. Asset, P. Bordet, J. Drnec, L. Dubau and F. Maillard, 'Beyond Strain and Ligand Effects : Microstrain-Induced Enhancement of the Oxygen Reduction Reaction Kinetics on Various PtNi/C Nanostructures', *ACS Catal*, vol. 7, no. 1, pp. 398–408, **2017**

— **R. Chattot**, T. Asset, J. Drnec, P. Bordet, J. Nelayah, L. Dubau, and F. Maillard, 'Atomic-Scale Snapshots of the Formation and Growth of Hollow PtNi/C Nanocatalysts', *Nano Letters*, vol. 17, no. 4, pp. 2447–2453, **2017**.

— I. Martens, **R. Chattot**, M. Rasola, M.V. Blanco, V. Honkimäki, D. Bizzotto, D.P. Wilkinson, and J. Drnec, 'Probing the dynamics of platinum surface oxides in fuel cell catalyst layers using in situ x-ray diffraction', *ACS Applied Energy Materials*, Article in press, **2019**.

— T. Asset, C. Gommes, J. Drnec, P. Bordet, **R. Chattot**, I. Martens, J. Nelayah, N. Job, F. Maillard and L. Dubau, 'Disentangling the Degradation Pathways of Highly Defective PtNi/C Nanostructures – An Operando Wide and Small Angle X-Ray Scattering Study', *ACS Catalysis*, vol. 9, no. 1, pp. 160-167, **2019**.

Publications

— **R. Chattot** I. Martens, Marion Scohy, Juan Herranz, J. Drnec, Frédéric Maillard and Laetitia Dubau 'Disclosing Pt-Bimetallic Alloy Nanoparticle Surface Lattice Distortion with Electrochemical Probes', *ACS Energy Letters*, vol. 5, no. 1, pp. 162-169 , **2020**.

— I. Martens, **R. Chattot**, M. Rasola, M.V. Blanco, V. Honkimäki, D. Bizzotto, D.P. Wilkinson, and J. Drnec, 'Probing the dynamics of platinum surface oxides in fuel cell catalyst layers using in situ x-ray diffraction', *ACS Applied Energy Materials*, Article in press, **2019**.

— I. Martens, A. Vamvakeros, **R. Chattot**, M.V. Blanco, M. Rasola, J. Pusa, S.D.M Jacques, D. Bizzotto, D.P. Wilkinson, B. Ruffmann, S. Heidemann, V. Honkimäki and J. Drnec, 'X-ray transparent proton-exchange membrane fuel cell design for in situ wide and small angle scattering tomography', *Journal of Power Sources*, vol. 437, no. 15, Article number 226906, **2019**.

— T. Asset, C. Gommes, J. Drnec, P. Bordet, **R. Chattot**, I. Martens, J. Nelayah, N. Job, F. Maillard and L. Dubau, 'Disentangling the Degradation Pathways of Highly Defective PtNi/C Nanostructures – An Operando Wide and Small Angle X-Ray Scattering Study', *ACS Catalysis*, vol. 9, no. 1, pp. 160-167, **2019**.

— **R. Chattot**, O. Le Bacq, V. Beermann, S. Kühl, J. Herranz, S. Henning, L. Kühn, T. Asset, L. Guétaz, G. Renou, J. Drnec, P. Bordet, A. Pasturel, A. Eychmüller, T. J. Schmidt, P. Strasser, L. Dubau, and F. Maillard, 'Surface distortion as a unifying concept and descriptor in oxygen reduction reaction electrocatalysis', *Nature Materials*, vol. 17, pp. 827-833, **2018**.

— T. Asset, **R. Chattot**, M. Fontana, B. Mercier-Guyon, N. Job, L. Dubau and F. Maillard, 'A Review on Recent Developments and Prospects for the Oxygen Reduction Reaction on Hollow Pt-alloy Nanoparticles', *ChemPhysChem*, vol. 19, no. 13 pp. 1552-1567, **2018**.

— T. Asset, N. Job, Y. Busby, A. Crisci, V. Martin, V. Stergiopoulos, C. Bonnaud, A. Seyrov, P. Atanassov, **R. Chattot**, L. Dubau and F. Maillard, 'Porous Hollow PtNi/C Electrocatalysts : Carbon Support Considerations To Meet Performance and Stability Requirements', *ACS Catalysis*, vol. 8, pp. 893-903, **2018**.

— T. Asset, **R. Chattot**, F. Maillard, L. Dubau, Y. Ahmad, N. Batisse, M. Dubois, K. Guérin, F. Labbe, R. Metkemeijer, S. Berthon-Fabry and M. Chatenet 'Activity and durability of platinum-based electrocatalysts supported on bare or fluorinated nanostructured carbon substrates', *Journal of the electrochemical Society*, vol. 165, no. 6 pp. F3346-F3358, **2018**.

— T. Asset, **R. Chattot**, O. Le Bacq, A. Pasturel, J. Drnec, P. Bordet, J. Nelayah, L. Dubau and F. Maillard, 'Porous Hollow PtNi/C Nanoparticles and Their Many Facets', *ECS Trans.*, vol. 80, no. 8, pp. 731-741, **2017**.

— T. Asset, **R. Chattot**, J. Drnec, P. Bordet, N. Job, F. Maillard and L. Dubau, 'Elucidating the Mechanisms Driving the Ageing of Porous Hollow PtNi/C Nanoparticles by the Means of COads Striping', *ACS Applied Materials and Interfaces*, vol. 9, pp. 25298-25307, **2017**.

— M. Lions, J.-B. Tommasino, **R. Chattot**, B. Abeykoon, N. Guillou, T. Devic, A. Demessence, L. Cardenas, F. Maillard and A. Fateeva, 'Insights Into the Mechanism of Electrocatalysis of the Oxygen Reduction Reaction by a Porphyrinic Metal Organic Framework', *Chemical Communications*, vol. 53, no. 48, pp. 6496-6499, **2017**.

— **R. Chattot**, T. Asset, J. Drnec, P. Bordet, J. Nelayah, L. Dubau, and F. Maillard, 'Atomic-Scale Snapshots of the Formation and Growth of Hollow PtNi/C Nanocatalysts', *Nano Letters*, vol. 17, no. 4, pp. 2447–2453, **2017**.

— L. Dubau, J. Nelayah, T. Asset, **R. Chattot** and F. Maillard, 'Implemeting Structural Disorder as a Promising Direction for Improving the Stability of PtNi/C Nanoparticles', *ACS Catalysis*, vol. 7, pp. 3072-3081, **2017**.

— O. Le Bacq, A. Pasturel, **R. Chattot**, B. Previdello, J. Nelayah, T. Asset, L. Dubau, and F. Maillard, 'Effect of Atomic Vacancies on the Structure and the Electrocatalytic Activity of Pt-rich/C Nanoparticles : A Combined

Experimental and Density Functional Theory Study' *ChemCatChem*, vol. 9, no. 12, pp. 2324–2338, **2017**.
— **R. Chattot**, T. Asset, P. Bordet, J. Drnec, L. Dubau and F. Maillard, 'Beyond Strain and Ligand Effects : Microstrain-Induced Enhancement of the Oxygen Reduction Reaction Kinetics on Various PtNi/C Nanostructures', *ACS Catal*, vol. 7, no. 1, pp. 398–408, **2017**.
— G. Cognard, G. Ozouf, C. Beauger, G. Berthomé, D. Riassetto, L. Dubau, **R. Chattot**, M. Chatenet and F. Maillard, 'Benefits and Limitations of Pt Nanoparticles Supported on Highly Porous Antimony-Doped Tin Dioxide Aerogel as Alternative Cathode Material for Proton-Exchange Membrane Fuel Cells', *Applied Catalysis B : Environmental*, vol. 201, pp. 381-390, **2016**.
— T. Asset,**R. Chattot**, J. Nelayah, N. Job, L. Dubau and F. Maillard, 'Structure-Activity Relationships for the Oxygen Reduction Reaction in Porous Hollow PtNi/C Nanoparticles', *ChemElectroChem*, vol. 3, pp. 1591–1600, **2016**.
— L.Dubau, S. Moldovan, O.Ersen, J. Nelayah, P. Bordet, J. Drnec, T. Asset, **R. Chattot** and F. Maillard, 'Defects do Catalysis : CO Monolayer Oxidation and Oxygen Reduction Reaction on Hollow PtNi/C Nanoparticles', *ACS Catalysis*, vol.6, pp 4673-4684, **2016**
— L. Dubau, T. Asset, **R. Chattot**, C. Bonnaud, V. Vanpene, J. Nelayah and F. Maillard, 'Tuning the Performance and the Stability of Porous Hollow PtNi/C Nanostructures for the Oxygen Reduction Reaction', *ACS Catalysis*, vol. 5, pp. 5333–5341, **2016**.
— **R. Chattot** and S. Escribano, 'Ageing studies of a PEM Fuel Cell stack developed for reformate fuel operation in μCHP units : Development of an accelerated degradation procedure.' *International Journal of Hydrogen Energy*, vol. 40, pp. 5367–5374, **2015**.
— Z. Zhang, **R. Chattot**, L. Bonorand, K. Jetsrisuparb, Y. Buchmüller, A. Wokaun, and L. Gubler, 'Mass spectrometry to quantify and compare the gas barrier properties of radiation grafted membranes and Nafion®.' *Journal of Membrane Science*, vol. 472, pp. 55–66, Dec. **2014**.

Communications

Invited Conferences in International Meetings (presenting author) :

- **R. Chattot**, P. Bordet J. Drnec, T. Asset, L. Dubau, F. Maillard, "Structural Disorder and Electrocatalysis : friends or foes", Electrocatalysis, August 29th – September 1st, **2018**, Szczyrk, Poland. **Invited Keynote Lecture 30 min**.
- **R. Chattot**, P. Bordet J. Drnec, T. Asset, L. Dubau, F. Maillard, "Evidences of Structural Disorder and Oxygen Reduction Reaction Kinetics", International Conference on Electrochemical Energy Science and Technology 2018 (EEST2018), Niagara Falls, Canada, August 13-17, **2018**. **Invited Keynote Lecture 30 min**.
- T. Asset, N. Job, Y. Busby, A. Crisci, V. Martin, V. Stergiopoulos, C. Bonnaud, A. Serov, P. Atanassov, **R. Chattot**, L. Dubau, F. Maillard, "Porous Hollow PtNi/C Electrocatalysts : Carbon Support Considerations to Meet Stability Requirements", 232nd ECS Meeting, May 13th - 17th, **2018**, Seattle, United States. Abstract 107885. **Lecture 20 min.**
- T. Asset, R. Chattot, O. Le Bacq, A. Pasturel, J. Drnec, P. Bordet, J. Nelayah, L. Dubau, F. Maillard, "Porous Hollow Pt-based/C Nanoparticles and Their Many Facets", 232nd ECS Meeting, October 1st - 6th, **2017**, Washington, United States. Abstract 103790. Keynote Lecture 40 min.
- T. Asset, **R. Chattot**, O. Le Bacq, A. Pasturel, J. Drnec, P. Bordet, J. Nelayah, L. Dubau, F. Maillard, "Why We should Implement Structural Disorder in Oxygen Reduction Reaction Electrocatalysts", Nanostructured devices and materials for energy conversion, harvesting and storage, July 26th - 28th, 2017, Literaturhaus München, München, Germany. **Lecture 40 min.**
- F. Maillard, O. Le Bacq, A. Pasturel, J. Nelayah, J. Drnec, P. Bordet, T. Asset, **R. Chattot**, L. Dubau, "Nanoparticules de Pt creuses : synthèse, caractérisation et application en électrocatalyse", Journées Electrochimie 2017, June 26th-29th, **2017**, Bordeaux, France. **Lecture 20 min**
- F. Maillard, **R. Chattot**, T. Asset, J. Nelayah, P. Bordet, J. Drnec, L. Dubau, "Tuning the catalytic activity of Pt via hollow nanostructures", French Conference on Catalysis, May 23rd-27th, **2016**. Fréjus, France. Invited **Lecture 20 min**
- F. Maillard, T. Asset, **R. Chattot**, L. Dubau, 'Design and Optimization of Hollow Pt-Ni Nanostructures for the Oxygen Reduction Reaction', 2nd International Symposium on Nanoparticles/Nanomaterials and Applications, 18th-21st, January **2016**, Lisbon, Portugal. **Lecture 20 min**.
- L.Dubau, T. Asset, **R. Chattot**, F. Maillard, 'Improving activity and stability of ORR electrocatalysts with Pt-rich hollow nanostructures', 227th ECS Meeting, May 24th – 28th, **2015**, Chicago, United States. Abstract n. 50036. **Lecture 20 min**.

Conferences in International Meetings

- L. Dubau, T. Asset, J. Nelayah, **R. Chattot**, P. Bordet, J. Drnec, F. Maillard, "Unveiling the Degradation Pathway of Highly Defective Hollow PtNi/C in Operando Conditions, 232nd ECS Meeting, May 13th - 17th, **2018**, Seattle, United States. Abstract 110634. **Oral Communication**.
- T. Asset, **R. Chattot**, L. Dubau, N. Job, F. Maillard, "Controlling the morphology, activity and durability of PtNi porous hollow nanoparticles through the nature of their carbon support", 68th Annual Meeting of the International Society of Electrochemistry, August 27 – September 1st, **2017**, Providence, United States. **Oral Communication**.
- **R. Chattot**, O. Le Bacq, T. Asset, P. Bordet, J. Drnec, A. Pasturel, L. Dubau, F. Maillard, "Beyond Alloying Effects : Microstrain-Induced Modification Of Catalytic Sites Reactivity On Various PtNi/C Nanostructures : Application to the Oxygen Reduction and Alcohool Oxidation Reactions", 68th Annual Meeting of the International Society of Electrochemistry, August 27 – September 1st, **2017**, Providence, United States. **Oral Communication**.
- F. Maillard, **R. Chattot**, T. Asset, J. Drnec, P. Bordet, J. Nelayah, L. Dubau, "Seeing Inside a Growing Catalyst", 68th Annual Meeting of the International Society of Electrochemistry, August 27 – September 1st, **2017**, Providence, United States. **Oral Communication**.
- **R. Chattot**, T. Asset, P. Bordet, J. Drnec, L. Dubau and F. Maillard, 'Microstrained PtNi/C Nanostructures as Highly Active Electrocatalysts for Electrooxidation and Electroreduction Reactions' 231st ECS Meeting, May 28-June 2, **2017**, New Orleans, USA. Abstract 1437. **Oral Communication**.
- . L. Dubau, J. Nelayah, **R. Chattot**, T. Asset, P. Bordet, J. Drnec, F. Maillard, "Implementing Structural Defects As a New Direction to Improve the Durability of Pt-Based/C Nanoparticles", 231st ECS Meeting, May 28-June 2, **2017**, New Orleans, USA. Abstract 1437. **Oral Communication**.
- T. Asset, **R. Chattot**, J. Drnec, P. Bordet, N. Job, L. Dubau, F. Maillard, "Formation and Growth of Hollow PtNi/C Nanocatalysts for the Oxygen Reduction Reaction", 231st ECS Meeting, May 28-June 2, **2017**, New Orleans, USA. Abstract 1436. **Oral Communication.**
- F. Micoud, M. Heitzmann, C. Nayoze-Coynel, **R. Chattot**, T. Asset, T. Gutel, L. Dubau, L. Guétaz, F. Maillard, "Up-scaling the Pt hollow nanoparticle materials : from the laboratory synthesis up to large PEMFC cell integration and electrochemical evaluation", PRiME 2016/230th ECS Meeting, October 2-7, **2016**, Honolulu,

Hawaï. **Oral Communication**.

— **R. Chattot**, T. Asset, L. Dubau, F. Maillard, "Unveiling structure-electrocatalytic activity relationships for PtNi/C nanoparticles", Second International Symposium on Nanoporous Materials by Alloy Corrosion, Lake Bostal, Germany, September 23-27, 2016. Poster presentation

— T. Asset, **R. Chattot**, J. Drnec, P. Bordet, N. Job, L. Dubau, F. Maillard. "Synthesis of hollow PtNi/C nanoparticles for oxygen reduction : direct evidences of the nanoscale Kirkendall effect and the galvanic replacement", Second International Symposium on Nanoporous Materials by Alloy Corrosion, Lake Bostal, Germany, September 23-27, **2016**. **Poster presentation**.

— T. Asset, **R. Chattot**, J. Nelayah, J. Dnerc, P. Bordet, N. Job, L. Dubau, F. Maillard, "Influence of grain boundaries on the COads monolayer oxidation and oxygen reduction reaction kinetics", International Symposium on Electrocatalysis. A key of sustainable society, September 11-14, **2016**, Shonan Village Center, Kanagawa, Japan. **Oral presentation**.

— **R. Chattot**, T. Asset, P. Bordet, J. Drnec, L. Dubau and F. Maillard, 'Beyond Alloying Effects, Microstrain-Induced Enhancement of the Oxygen Reduction Reaction Kinetics on Various PtNi/C Nanostructures' Electrocatalysis **2016**, Shonan Village, Kanagawa, Japan, September 2016. **Oral communication**.

— **R. Chattot**, **T. Asset**, P. Bordet, J. Drnec, L. Dubau and F. Maillard, 'Atomic Scale Snapshots of the Growth Mechanism of Hollow PtNi/C Nanocatalysts for the Oxygen Reduction Reaction' Electrocatalysis 2016, Shonan Village, Kanagawa, Japan, September 2016. **Poster communication**. **Student Poster Award**

— F. Maillard, **R. Chattot**, T. Asset, P. Bordet, J. Drnec, L. Dubau, "Atomic Scale Imaging of the Growth Mechanism of Hollow PtNi/C Nanocatalysts for Oxygen Reduction Reaction", 67th Annual Meeting of the International Society of Electrochemistry, August 21-26th, **2016**, The Hague, The Netherlands. Abstract ise162003. **Oral Communication.**

— L. Dubau, J. Nelayah, S. Moldovan, O. Ersen, P. Bordet, J. Drnec, T. Asset, **R. Chattot**, F. Maillard, "Defects do Catalysis : CO Monolayer Oxidation and Oxygen Reduction Reaction on Hollow PtNi/C Nanoparticles", 67th Annual Meeting of the International Society of Electrochemistry, August 21-26th, **2016**, The Hague, The Netherlands. **Oral Communication**.

— S. Berthon-Fabry, B. Molina Concha, F. Maillard, L. Dubau, **R. Chattot**, Y. Ahmad, N. Batisse, M. Dubois, K. Guérin, F. Labbé, R. Metkemeijer, M. Chatenet, "Durability of carbon based electrocatalysts supports for PEMFC application. Influence of the degree of graphitization level and effect of fluorination treatment", 67th Annual Meeting of the International Society of Electrochemistry, August 21-26, **2016**, The Hague, The Netherlands. **Oral Communication**.

— L. Dubau, J. Nelayah, **R. Chattot**, T. Asset, F. Maillard, 18th Topical Meeting of the International Society of Electrochemistry, March 8th-11th, **2016**, Gwangju, South Korea. **Oral communication**.

— T. Asset, **R. Chattot**, A. Zubiaur, L. Dubau, N. Job, F. Maillard, "Pt-Ni Porous Hollow Nanoparticles for Oxygen Reduction Reaction : Controlling the Nanoparticles Size and Dispersion", Electrolysis and Fuel Cells Discussions, September 13th-16th, **2015**. La Grande Motte, France. **Poster Communication**.

— L. Dubau, T. Asset, **R. Chattot**, F. Maillard, 'Design of Hollow Pt-Ni Nanostructures and their Application for the Oxygen Reduction Reaction', Electrolysis and Fuel Cells Discussions, September 13th-16th, **2015**. La Grande Motte, France. **Oral communication**.

— L. Dubau, T. Asset, C. Bonnaud, **R. Chattot**, V. van Peene, F. Maillard, "Optimizing Pt "Hollow" Nanostructures for the Oxygen Reduction Reaction", 65th Annual Meeting of the International Society of Electrochemistry, August 31-September 5, **2014**, Lausanne, Switzerland. **Poster communication**.

National Meetings :

— Y. Ahmad, N. Batisse, M. Dubois, K. Guérin, F. Labbé , R. Metkemeijer, S. Berthon-Fabry, B. Molina Concha, F. Maillard, L. Dubau, **R. Chattot**, M. Chatenet, "Fluorination of carbon based electrocatalysts for enhanced durability of PEMFC", SFEC , May 17th-20th, **2016**. Carqueiranne, France. **Oral presentation**.

Workshop and Symposiums :

— F. Micoud, **R. Chattot**, T. Asset, L. Dubau, F. Maillard, M. Chatenet, "Durability of platinum-based PEMFC electrodes – can electrodes with low Pt loading be durable ?" 232nd ECS Meeting, May 13th - 17th, **2018**, Seattle, United States. Abstract 108391. **Invited Tutorial Lecture 45 min**.

— **R. Chattot**, P. Bordet J. Drnec, T. Asset, L. Dubau, F. Maillard, "Désordre structurel et électrocatalyse : amis ou ennemis", Journées Surfaces et Interfaces, 23-24 janvier **2018**, Strasbourg, France. **Invited Keynote Lecture 45 min**.

— L. Dubau, J. Nelayah, S. Moldovan, O. Ersen, P. Bordet, J. Drnec, T. Asset, **R. Chattot**, F. Maillard, "Advanced microscopy techniques as an essential tool to unveil structure-activity relationships in electrocatalysis", Journée des utilisateurs METSA, Paris, December 12, **2016**. **Invited Lecture 20 min**.

— **R. Chattot**, T. Asset, L. Dubau, F. Maillard, "Unveiling structure-electrocatalytic activity relationships for PtNi/C nanoparticles", Second International Symposium on Nanoporous Materials by Alloy Corrosion, Lake Bostal, Germany, September 23-27, **2016**. **Poster presentation**.

— T. Asset, **R. Chattot**, J. Drnec, P. Bordet, N. Job, L. Dubau, F. Maillard, "Synthesis of hollow PtNi/C

nanoparticles for oxygen reduction : direct evidences of the nanoscale Kirkendall effect and the galvanic replacement", Second International Symposium on Nanoporous Materials by Alloy Corrosion, Lake Bostal, Germany, September 23-27, **2016**. **Poster presentation**.

— L. Dubau, J. Nelayah, S. Moldovan, O. Ersen, P. Bordet, J. Drnec, T. Asset, **R. Chattot**, F. Maillard, "Hollow Pt-Based nanostructures for the electrocatalysis of the oxygen reduction reaction", Workshop VITRIMETTECH "Vitrified Metals Technologies and Applications in Devices and Chemistry", September 12th-14th, **2016**, Saint Martin d'Hères, France. **Invited Lecture 60 min**.

— L. Dubau, T. Asset, **R. Chattot**, F. Maillard, "Tuning the ORR electrocatalytic properties via Pt hollow nanostructures", workshop CHIPCAT "thin-film nanocatalysts for on-chip fuel cell technology", June 8-11, **2015**, Dijon, France. Keynote Lecture. **45 min**.

— F. Maillard, **R. Chattot**, T. Asset, L. Dubau, 'Tuning the Performance and the Stability of Porous Hollow PtNi/C Nanostructures for the Oxygen Reduction Reaction', Nanoalliages 2015, Ile de Porquerolles, France, May 17-22, **2015**. **Invited conference - 45 min**.

Invited Research Seminars :

— L. Dubau, T. Asset, **R. Chattot**, F. Maillard, "Porous Hollow PtNi Nanostructures : Synthesis, Oxygen Reduction Reaction Electrocatalysis and Application at a Low-Temperature Fuel Cell Cathode", Université Paris Diderot, Paris (France), March 24th, 2017. **40 minutes**.

— L. Dubau, T. Asset, **R. Chattot**, J. Drnec, J. Nelayah, P. Bordet, F. Maillard, "Design and optimization of hollow PtNi nanostructures for the oxygen reduction reaction", Technische Universität Berlin, Berlin (Germany), December 7th, **2016**. **45 minutes**.

— **R. Chattot**, T. Asset, P. Bordet, J. Drnec, L. Dubau and F. Maillard, "Beyond Alloying Effects : Microstrain-Induced Enhancement of the ORR Kinetics on Various PtNi/C Nanostructures", Technische Universität Berlin, Berlin (Germany), October 26th, **2016**. **45 minutes**.

— L. Dubau, T. Asset, **R. Chattot**, J. Drnec, J. Nelayah, P. Bordet, F. Maillard, "Electrocatalysis on porous hollow Pt-rich/C nanoparticles", Laboratoire de Physique de la Matière Condensée, Palaiseau (France), December 1st, 2016. 45 minutes

National Research Seminars

— L. Dubau, T. Asset, **R. Chattot**, C. Bonnaud, V. Vanpeene, J. Nelayah, F. Maillard, 'Tuning the Performance and the Stability of Porous Hollow PtNi/C Nanostructures for the Oxygen Reduction Reaction', Réunion plénière du GDR 3652 GdR n. 3652 HySPàC 'Hydrogène, Systèmes et Piles à Combustible', Porticcio, October 14-16, **2015**. **Poster Presentation**.

— T. Asset, **R. Chattot**, A. Zubiaur, L. Dubau, N. Job, F. Maillard, " Hollow PtNi/C Nanoparticles for Oxygen Reduction Reaction : Controlling the Nanoparticle Morphology', Réunion plénière du GDR 3652 GdR n. 3652 HySPàC "Hydrogène, Systèmes et Piles à Combustible', Porticcio, October 14-16, **2015**. **Poster Presentation**.