**Christian Herrero**

**EPR Lab**

**Institute de Chimie Moleculaire et des Materiaux de Orsay (ICMMO), University Paris-Sud**

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**Employment History**

**2015-Present Research Assistant, EPR Lab, Université Paris XI, Orsay, France**

Responsible for the EPR lab, my current interest involves the coupling of different techniques such as electrochemistry or visible light illumination for the in situ generation and detection of reaction intermediates.

**2013-2015 Postdoctoral researcher, Université Paris XI, Orsay, France**

My project involved the synthesis and study of iron-based catalyst complexes to be used for electrochemical and light-driven oxidation reactions. Working with different ligand structures, we design catalysts to be active in solution, electrodes, protein scaffolds or semiconducting surfaces. The use of different techniques including electrochemistry, flash photolysis, and EPR allow us to understand the reaction mechanisms of the cataysts.

**2008- 2013** **Postdoctoral researcher, CEA-Saclay,** **Gif sur Yvette, France**

As a research associate I worked on the synthesis and study of homogeneous and heterogeneous light driven catalysts designed to perform the oxidation of water, organic substrates as well as the reduction of carbon dioxide in order to obtain clean renewable fuels. I have also been involved in the incorporation of molecular catalysts on semiconducting surfaces as a way to construct reaction half cells that can be used as fuel-producing solar panels.

During the last five years I have been responsible for the operation of an organic chemistry lab and involved in the preparation of grants from European and French funding agencies.

I have also been responsible for the guidance and supervision of several Master’s and PhD students, and teaching of an international master’s course at Université Paris XI.

During this time I was responsible for the maintenance and running of a chemistry laboratory.

**2005-2007 PhD student, Université Paris XI, Orsay, France**

As recipient of the Blaise Pascal Scholarship I completed my PhD studies at Université Paris XI where I conducted research in the synthesis and study of ruthenium based molecules covalently linked to

manganese catalysts designed for the oxidation of water. As a result of the work carried out in both Université Paris XI and Arizona State University I was awarded a PhD for the thesis entitled “Modelisation de processus photo induits de Photosystem II” (Modelling of photo-induced processes in Photosystem II) which was awarded mention *très honorable*.

**2001-2004 PhD student, Arizona State University, Tempe, Arizona, USA**

As a recipient of a IGERT fellowship from the National Science Foundation my graduate work involved the synthesis of artificial photosynthetic antennas, molecular wires, conducting polymers and sensitizing molecules for the study of electron and energy transfer processes and their use in solar powered devices. Most of these constructs were composed of carotenoids, phthalocyanins, and organic polymers.

As a teaching assistant I was in charge of two organic chemistry laboratory sections per semester which involved the design and supervision of lectures, practical sessions and tutorials. I was also responsible for the maintenance of a teaching NMR facility.

**1998–2001 Master’s student, Florida International University, Miami, Florida, USA**

Covered coursework on Mass Spectrometry, Structure Elucidation and Organic Synthesis. During my research I successfully designed a method for the, synthesis, isolation and identification of lutein metabolites present in human serum and retinas using HPLC, NMR, LC-MS and IR techniques. As a result of this work I was awarded the noteworthy scientific mention at the Gordon Conference in Carotenoids held in Ventura Beach, California.

As a teaching assistant I was responsible for the supervision of two organic/general chemistry laboratory sections per semester, including practical sessions and tutorials. I was presented with a 'Merit Recognition for Excellence in Teaching Award’ by Florida International University and a ‘Excellence as a Teaching Assistant in Organic Chemistry’ award by the South Florida Section of the American Chemical Society.

**EDUCATION**

**2005-2007 Université Paris XI, Orsay, France**

PhD Chemistry

**2002-2004 Arizona State University, Tempe, Arizona, USA**

PhD Chemistry

**1999-2001 Florida International University, Miami, Florida, USA**

MSc Chemistry

**1994-1998** **Florida International University**, **Miami, Florida, USA**

BS Chemistry

**PUBLICATIONS (46 publications, 1232 citations, h-factor=18)**

**41**. Lancry, M.; Ollier, N.; Babu, B. H.; Herrero, C.; Poumellec, B., **EPR reversible signature of self-trapped holes in fictive temperature-treated silica glass**. *Journal of Applied Physics* **2018,** *123* (11), 113101.

**40**. Tebo, A. G.; Quaranta, A.; Herrero, C.; Pecoraro, V. L.; Aukauloo, A., **Intramolecular Photogeneration of a Tyrosine Radical in a Designed Protein**. *ChemPhotoChem* **2017**, 3, 89-92.

**39**. Mustieles-Marín, I.; Cheisson, T.; Singh Chauhan, R.; Herrero, C.; Cordier, M.; Clavaguéra, C.; Nocton, G.; Auffrant, A., **Electronic Structures of Mono-Oxidized Copper and Nickel Phosphasalen Complexes**. *Chemistry – A European Journal* **2017**, 23 (71), 17940-17953.

**38**. Galardon, E.; Huguet, F.; Herrero, C.; Ricoux, R.; artaud, i.; Padovani, D., **Reactions of persulfides with the heme cofactor of oxidized myoglobin and microperoxidase 11: reduction or coordination**. *Dalton Transactions* **2017,** 46 (24), 7939-7946.

**37**. Di Meo, T.; Ghattas, W.; Herrero, C.; Velours, C.; Minard, P.; Mahy, J.-P.; Ricoux, R.; Urvoas, A., **αRep A3: A versatile artificial scaffold for metalloenzyme design**. *Chemistry – A European Journal* **2017**, 23 (42).

**36**. Cheaib, K.; Herrero, C.; Guillot, R.; Banse, F.; Mahy, J.-P.; Avenier, f**., Imidazolidine Ring Cleavage upon Complexation with First Row Transition Metals**. *European Journal of Inorganic Chemistry* **2017**.

**35**. Berardan, D.; Meena, A. K.; Franger, S.; Herrero, C.; Dragoe, N**., Controlled Jahn-Teller distortion in (MgCoNiCuZn)O-based high entropy oxides**. *Journal of Alloys and Compounds* **2017,** *704*, 693-700.

**34**. Tebo, A. G.; Das, S.; Farran, R.; Herrero, C.; Quaranta, A.; Fallahpour, R.; Protti, S.; Charlot, M.-F.; Aukauloo, A.; Leibl, W., **Light-driven electron transfer in a modular assembly of a ruthenium(II) polypyridine sensitiser and a manganese(II) terpyridine unit separated by a redox active linkage. DFT analysis**. *Comptes Rendus Chimie* **2017,** 20(3), 323-332.

**33**. Plegaria, J. S.; Herrero, C.; Quaranta, A.; Pecoraro, V. L., **Electron transfer activity of a de novo designed copper center in a three-helix bundle fold**. *Biochimica Et Biophysica Acta-Bioenergetics* **2016,** *1857* (5), 522-530.

**32**. Oliveira, R.; Zouari, W.; Herrero, C.; Banse, F.; Schöllhorn, B.; Fave, C.; Anxolabéhère-Mallart, E., **Characterization and Subsequent Reactivity of an Fe-Peroxo Porphyrin Generated by Electrochemical Reductive Activation of O2**. *Inorganic Chemistry* **2016,** 55 (23),12204-12210.

**31**. Herrero, C.; Quaranta, A.; Ricoux, R.; Trehoux, A.; Mahammed, A.; Gross, Z.; Banse, F.; Mahy, J. P., **Oxidation catalysis via visible-light water activation of a Ru(bpy)(3) (2+) chromophore BSA-metallocorrole couple**. *Dalton Transactions* **2016,** *45* (2), 706-710.

**30**. Herrero, C.; Nguyen-Thi, N.; Hammerer, F.; Banse, F.; Gagné, D.; Doucet, N.; Mahy, J.-P.; Ricoux, R., **Photoassisted Oxidation of Sulfides Catalyzed by Artificial Metalloenzymes Using Water as an Oxygen Source**. *Catalysts* **2016,** *6* (12), 202.

**29**. Cheaib, K.; Roux, Y.; Herrero, C.; Trehoux, A.; Avenier, F.; Mahy, J.-P., **Reduction of a Tris(picolyl)amine Copper(II) Complex by an Polymeric Flavo-Reductase model in Water**. *Dalton Transactions* **2016,** 45 (45), 18098-18101.

**28. Synergistic “ping-pong energy transfer for efficient light activation in a chromophore-caralyst dyad”.** Annamaria Quaranta, Georgios Charalambidis, Christian Herrero, Sofia Margiola, Winfried Leibl, Ally Aukauloo, Athanassios Coutsolelos. *Physical Chemistry Chemical Physics* **2015**, 17 (37), 24166-24172.

**27. An artificial enzyme made by covalent grafting of an FeII complex in β-lactoglobulin : molecular chemistry, oxidation catalysis and reaction intermediate's monitoring in a protein.** Charlotte Buron, Katell Sénéchal-David,Rémy Ricoux,Jean-Pierre Le Caër,Vincent Guérineau, Philippe Méjanelle,Régis Guillot,Christian Herrero,Jean-Pierre Mahy, Frédéric Banse. Chemistry- a European Journal, **2015**, 21 (34), 12188-12193.

**26.** **Successive Light Induced Two Electron Transfers in a Ru-Fe Supramolecular Assembly : from Ru-Fe(II)-OH2 to Ru-Fe(IV)-Oxo.** Christian Herrero, Annamaria Quaranta, Marie Sircoglou, Katell Sénéchal-David, Aurélie Baron, Irene Mustieles Marín, Charlotte Buron, Jean-Pierre Baltaze, Winfried Leibl, Ally Aukauloo and Frédéric Banse. *Chemical Science*, **2015, 6, 2323-2327.**

**25.** **Carbon dioxide reduction via light activation of a ruthenium-Ni(cyclam) complex**. Christian Herrero, Annamaria Quaranta, Sanae El Ghachtouli,BorisVauzeilles,Winfried Leibl, Ally Aukauloo, 2014, *Physical Chemistry Chemical Physics*, **2014**, 16, 12067-12072.

**24.** [**Ruthenium-based molecular compounds for oxygen evolution in acidic media**](http://apps.webofknowledge.com.gate1.inist.fr/full_record.do?product=WOS&search_mode=GeneralSearch&qid=1&SID=Y18HJM8awlsUYQX7Lpk&page=1&doc=1). N. Mbemba Kiele, C. Herrero, A. Ranjbari, A. Aukauloo, S.A. Grigoriev, A. Villagra, P. Millet. *International Journal of Hydrogen Energy*, **2013**, 38, 8590-8596.

**23. Experiments with a titanium dioxide – ruthenium *tris*-bipyridine - nickel cyclam system for the photocatalytic reduction of CO2.** Sara Montanaro, Christian Herrero, Stefano Protti, Winfried Leibl, Angelo Albini, *Green Processing and Synthesis*, **2013**, 2(4), 335-343.

**22. Separating Annihilation and Excitation Energy Transfer Dynamics in Light Harvesting Systems**. Mikas Vengris, Delmar Larsen, Leonas Valkunas, Gerdenis Kodis, Christian Herrero, Devens Gust, Thomas A. Moore, Ana Moore, Rienk van Grondelle, **2013**, *Journal of Physical Chemistry B*, 117 (38), 11372–11382*.*

**21. Identification of the Different Mechanisms of Activation of a [RuII(tpy)(bpy)(OH2)]2+ Catalyst by Modified Ruthenium Sensitizers in Supramolecular Complexes.** Christian Herrero, Annamaria Quaranta, Reza-Ali Fallahpour, Winfried Leibl, Ally Aukauloo, **2013**, *Journal of Physical Chemistry C*, 117 (19), 9605–9612.

**20. Light-induced Tryptophan radical generation in a click modular assembly of sensitizer-Tryptophan residue**. Sujitraj Sheth, Aurélie Baron, Christian Herrero, Boris Vauzeilles, Ally Aukauloo, Winfried Leibl. *Photochemical & Photobiological Sciences*, **2013** **(12),** 1074-1078.

**19.** **Photoassisted Generation of a Dinuclear Iron(III) Peroxo Species Leading to Oxygen Atom Transfer Reaction.** Frédéric Avenier, Christian Herrero,Winfried Leibl, Alain Desbois, Régis Guillot, Jean-Pierre Mahy, Ally Aukauloo, *Angewandte Chimie Int Ed*. **2013**, 125(13), 3722-3725.

**18. Click Chemistry as a Convenient Tool for the Incorporation of a Ruthenium Chromophore and a Nickel–Salen Monomer into a Visible-Light-Active Assembly.** Christian Herrero, Luke Batchelor, Aurélie Baron, Sanae El Ghachtouli, Sujitraj Sheth, Régis Guillot, Boris Vauzeilles, Marie Sircoglou, Talal Mallah, Winfried Leibl, Ally Aukauloo, European *Journal of Inorganic Chemistry*, **2013**, 4, 494-499.

**17. Click Chemistry on a Ruthenium Polypyridine Complex. An Efficient and Versatile Synthetic Route for the Synthesis of Photoactive Modular Assemblies.** Aurelie Baron, Christian Herrero, Annamaria Quaranta, Marie-France Charlot, Winfried Leibl, Boris Vauzeilles, Ally Aukauloo, *Inorganic Chemistry*, **2012**, 51, 5985-5987.

**16. Triazole link as efficient intra molecular electron transfer channel in ruthenium polypyridine type complexes**. Aurélie Baron, Christian Herrero, Annamaria Quaranta, Marie-France Charlot, Winfried Leibl,Boris Vauzeilles, Ally Aukauloo, *Chemical Communications*, 2011, 47, 11011-11013.

**15.** **Photoinduced Multi-Electron Transfer to a Multicopper Oxidase Resulting in Dioxygen Reduction into Water.** A. Jalila Simaan, Yasmina Mekmouche, Christian Herrero, Pierre Moreno, Ally Aukauloo, JacquesA. Delaire, Marius Réglier, Thierry Tron, *Chemistry-A European Journal*, 2011, 17(42), 11743-11746.

**14.** **Light driven activation of the [H2O(terpy)MnIII-µ-(O2)-MnIV(terpy)OH2] unit in a chromophore-catalyst complex.** Christian Herrero, Annamaria Quaranta,Stefano Protti, Winfried Leibl, A. William Rutherford, Reza Fallahpour, Marie-France Charlot, Ally Aukauloo, *Chemistry-an Asian Journal*, 2011, 6 (6), 1335-1339.

**13**. [**Artificial photosynthetic systems. Using light and water to provide electrons and protons for the synthesis of a fuel**](http://pubs.rsc.org/en/content/articlelanding/2011/ee/c0ee00645a)**.** Christian Herrero, Annamaria Quaranta, Winfried Leibl, A. William Rutherford, Ally Aukauloo, *Energy and Environmental Chemistry*, 2011, 4 (7), 2353-2365.

**12**. **Intramolecular Light Induced Activation of a Salen-Mn(III) Complex by a Ruthenium Photosensitizer.** Christian Herrero, Joseph L. Hughes, Annamaria Quaranta, Nicholas Cox, A. William Rutherford, Winfried Leibl, Ally Aukauloo, *Chemical Communications*, 2010, (46), 7605-7607.

**11. Artificial systems related to light driven electron transfer processes in PSII.** Christian Herrero, Benedikt Lassalle-Kaiser, Winfried Leibl, A. William Rutherford, Ally Aukauloo, *Coordination Chemistry Reviews* (2008), 252(3+4), 456-468.

**10.** **Influence of the Protonic State of an Imidazole-** **Containing Ligand and on the Electrochemical and Photophysical Properties of a Ruthenium(II)–Polypyridine-Type Complex.** Annamaria Quaranta, Fabien Lachaud, Christian Herrero, Regis Guillot, Marie- France Charlot, Winfried Leibl, Ally Aukauloo, *Chemistry-A European Journal* (2007), 13, 8201-8211.

**9.** **Energy transfer, excited-state deactivation and exciplex formation in artificial carotene-phthalocyanine light-harvesting antennas.** Rudi Berera, Ivo H. M. van Stokkum, Gerdenis Kodis, Amy E. Keirstead, Smitha Pillai, Christian Herrero, Rodrigo E. Palacios, Mikas Vengris, Rienk van Grondelle, Devens Gust, Thomas A. Moore, Ana L. Moore, John T. M. Kennis, *Journal of Physical Chemistry B* (2007), 111(24), 6868-6877.

**8.** **Tetrapyrrole Singlet Excited State Quenching by Carotenoids in an Artificial Photosynthetic Antenna.** Rodrigo E. Palacios, Gerdenis Kodis, Christian Herrero, Ernesto Marino Ochoa, Miguel Gervaldo, Stephanie L. Gould, John T. M. Kennis, Devens Gust, Thomas A. Moore, Ana L.Moore, *Journal of Physical Chemistry B* (2006), 110(50), 25411-25420.

**7.** **A simple artificial light-harvesting dyad as a model for excess energy dissipation in oxygenic photosynthesis.** Rudi Berera, Christian Herrero, Ivo H. M. van Stokkum, Mikas Vengris, Gerdenis Kodis, Rodrigo E. Palacios, Herbert van Amerongen, Rienk van Grondelle, Devens Gust, Thomas A. Moore, Ana L. Moore, John T. M. Kennis, *Proceedings of the National Academy of Sciences of the United States of America* (2006), 103(14), 5343-5348.

**6**. **Conductance of a biomolecular wire.** Iris Visoly-Fisher, Kayvon Daie, Yuichi Terazono, Christian Herrero, Fernando Fungo, Luis Otero, Edgardo Durantini, Juana J.Silber, Leonides Sereno, Devens Gust, Thomas A. Moore, Ana L. Moore, Stuart M. Lindsay, *Proceedings of the National Academy of Sciences of the United States of America* (2006), 103(23), 8686-8690.

**5**. **Preparation and spectroscopic characterization of 3'-oxolutein.** Peter Molnar, Jozsef Deli, Erzsebet Osz, Gyula Toth, Ferenc Zsila, Christian Herrero, John T. Landrum, *Letters in Organic Chemistry* (2006), 3(10), 723-734.

**4**. **Electronic Decay Constant of Carotenoid Polyenes from Single-Molecule Measurements.** Jin He, Fan Chen, Jun Li, Otto F. Sankey, Yuichi Terazono, Christian Herrero, Devens Gust, Thomas A. Moore, Ana L. Moore, Stuart M. Lindsay, *Journal of the American Chemical Society* (2005), 127(5), 1384-1385.

**3. Bioinspired energy conversion.** Rodrigo E. Palacios, Stephanie L. Gould, Christian Herrero, Michael Hambourger, Alicia Brune, Gerdenis Kodis, Paul A.Liddell, John Kennis, Alisdair N. Macpherson, Devens Gust, Thomas A. Moore, Ana L. Moore, *Pure and Applied Chemistry* (2005), 77(6), 1001-1008.

**2.** **Light Harvesting and Photoprotective Functions of Carotenoids in Compact Artificial Photosynthetic Antenna Designs.** Gerdenis Kodis, Christian Herrero, Rodrigo Palacios, Ernesto Marino-Ochoa, Stephanie Gould, Linda De la Garza, Rienk Van Grondelle, Devens Gust, Thomas A. Moore, Ana L Moore, John T. M Kennis. *Journal of Physical Chemistry B* (2004), 108(1), 414-425.

**1**. **Carotenoids in the human retina.** John T. Landrum, Richard A. Bone, Yin Chen, Christian Herrero, Cristina M. Llerena, Ewa Twarowska**.** *Pure and Applied Chemistry* (1999), 71(12), 2237-2244.

**Book Chapters**

**4. Porphyrins and Metalloporphyrins as Components in Artificial Photosynthetic Research.** Alison Tebo, Christian Herrero, Ally Aukauloo. Handbook of Porphyrin Science. 34, 2014, 195-237.

**3. Converting Photons to Electron and Proton Shifts from Water for Fuel Production**. Christian Herrero, Cyrille Costentin, Ally Aukauloo. *Molecular Solar Fuels.* RSC Press, 2012, 39-84.

**2. A simple artificial light harvesting dyad as a mimic of nonphotochemical quenching in green plants.** Rudi Berera, Ivo H.M. van Stokkum, Christian Herrero, Mikas Vengris, Gerdenis Kodis, Rodrigo E. Palacios, Herbert van Amerongen, Rienk van Grondelle, Devens Gust, Thomas A. Moore, Ana L. Moore, John T.M. Kennis. *Femtochemistry VII*, Elsevier, 2006, 387-390.

**1. Astaxanthin, β-cryptoxanthin, lutein, and zeaxanthin.** John T. Landrum, Richard A. Bone, Christian Herrero. *Phytochemicals in Nutrition and Health,* CRC Press, 2002, 173-191.

**Patent**

**I. Compounds Based on a Triazole Group That are Capable of Complexing at Least One Metallic Element and Coordination Complex Based on These Compounds.** Winfried Leibl, Boris Vauzeilles, Aurelie Baron, Ally Aukauloo, Christian Herrero, Marie France Charlot. Pat. No[FR2953519 A1](http://patent.ipexl.com/FR/FR2953519ZZUCZZA1.html)

**Oral and Poster Presentations**

Christian Herrero. COST Meeting, **Successive Light Induced Two Electron Transfers in a Ru-Fe Supramolecular Assembly : from Ru-Fe(II)-OH2 to Ru-Fe(IV)-Oxo**. Lund, Sweden, May 21-23, 2014.

Christian Herrero. CHARMAT Meeting, **Study of the Successive One-Electron Photochemical Events in a Chromophore-Catalyst Molecular Assembly**. Gif sur Yvette, France, April 28, 2014.

Christian Herrero. Solar-H2 Workshop, **Chromophore-Catalyst Assemblies in Artificial Photosynthesis**. Berlin, Germany, 2010

Christian Herrero, Annamaria Quaranta. **Manganese complexes for artificial photosynthesis**. Solar-H2 Workshop. Tarragona, Spain, March 30, April 3, 2009

Christian Herero. **Bioinspired catalysts for water photolysis**. Ecole thématique CNRS. Mécanismes Moléculaires fondamentaux en biologie. Biarritz, France, December 8-12, 2008.

Christian Herrero. **Ru-Mn complexes as photo-oxidarion catalysts**. Solar-H2 Workshop. Bochum, Germany, May 18-21, 2008.

Christian Herrero. **Synthesis of Ruthenium Based Artificial Photosynthesis Mimics**. 4th ERA-Chemistry Flash Conference: "Modern chemical techniques for light harvesting", Madrid, Spain, November 9-12, 2008.

Christian Herrero. **Synthesis and characterisation of Ruthenium Based Artificial Photosynthesis Mimics**. 14th International Congress of Photosynthesis. Glasgow, Scotland, July 22-27, 2007.

Annamaria Quaranta, Christian Herrero. **Towards the Photo-Oxidation of Manganese**. Solar- H Workshop. Uppsala, Sweden, May 12-15, 2007.

Gerdenis Kodis, Yuichi Terazono, Paul A. Liddell, Vikas Garg, Christian Herrero, Rodrigo E. Palacios, Michael Hambourger, Rudi Berera, John T. M. Kennis, Thomas A. Moore, Ana L. Moore, Devens Gust.  **Exploring paradigms of natural photosynthesis: energy and electron transfer in artificial antenna-reaction center complexes.** Abstracts, 40th Western Regional Meeting of the American Chemical Society, Anaheim, CA, January 22-25, 2006.

Christian Herrero, Yin Chen, John Landrum. **Photochemistry Studies of Oxo-lutein**.13th International Carotenoid Society Symposium, Hawaii, January 6-11, 2002.

Yin Chen, Christian Herrero, Richard Bone, John Landrum. **Distribution of a Minor Carotenoid Component in the Human Retina**.Association for Research in Vision and Ophthalmology (ARVO), April 29-May 4, Fort Lauderdale, Fl, 2001.

Christian Herrero, Richard Bone, John Landrum. **Lutein Metabolism** **in Human Serum. Antioxidant Assay of Carotenoids**. Federation of American Societies for Experimental Biology (FASEB), Orlando, Fl, March 31-April 4, 2001.

Christian Herrero, Richard Bone, John Landrum. **Lutein Metabolism in Human Serum. Antioxidant Assay of Carotenoids**. Gordon Conference on Carotenoids, Ventura Beach, Ca, January 14-19, 2001.

Christian Herrero, Richard Bone, John Landrum. **Lutein Metabolism in Human Serum and Retina**. Federation of American Societies for Experimental Biology (FASEB), San Diego, Ca, April 15-17, 2000.

**Awards**

* 2001 IGERT Scholarship ‘Integrative Graduate Education and Research Traineeship’ funded by the National Science Foundation, 2001
* 2001 Excellence in Teaching. Merit Recognition Award by Florida International University, 2001
* 2001 Excellence as a Teaching Assistant in Organic Chemistry by the South Florida Section of the

American Chemical Society, 2001

* 2001 Noteworthy Scientific Mention at the Gordon Conference in Carotenoids, 2001

**Teaching Experience**

* **Université Paris Sud, Orsay, France (2010-2012)**

Master International Erasmus Mundus SERP Chem.

* **Ecole thématique CNRS. Mécanismes Moléculaires fondamentaux en biologie (2008)**

Course on artificial photosynthesis, covering the basic aspects of natural photosynthesis, energy and electron transfer and catalysis.

* **Arizona State University, Tempe, Arizona, USA (2002-2004)**

Organic Chemistry I and II, Nuclear Magnetic Resonance.

* **Florida International University**, **Miami, Florida, USA (1998-2001)**

General Chemistry I and II, Organic Chemistry I and II.