Manuel Garcìa Pèrez ***Résumé***

Associate Professor
Department of Biological Systems Engineering
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AREAS OF EXPERTISE

- Identification of key problems in chemical processes and their causes using cost and quality criteria
- Generation, screening, evaluation, design and implementation of alternatives to solve engineering problems
- Use of computer techniques, numerical methods, statistical techniques, optimization, modelling and chemical engineering principles to study and improve the performance of chemical plants
- Project conception and implementation (at laboratory, bench and pilot scale) to determine the best operational and design parameters for a desired application
- Use of analytical techniques (proximate and elemental analysis, TG/DTG, DSC, GPC, GC, UV-Fluorescence, Karl-Fischer titration, GC/MS, Py-GC/MS, XPS, FTIR, Raman, microscopy, steady and dynamic rheology, ASTM fuel characterization methods, ash characterization techniques etc) to study the behaviour of complex materials in industrial units.
- Special training in: *Thermochemical conversion of biomass, Applications of Pitch, Coke, Bio-oils and Char, Fuel characterization techniques, mineral processing technologies, hydrogen production, liquids and solid combustion, fuel spray characterization, droplets evaporation and combustion kinetics, application of products from thermo-chemical reactions of biomass. Bio-oil based refinery concepts*.

EDUCATIONAL QUALIFICATIONS

2006-07	Post-doc at the Chemical Engineering Department (Monash University, Melbourne, Australia)
2005-06	Post-doc at the Biological and Agricultural Engineering Dept (Univ. of Georgia, Athens, Georgia, USA)
2001-05	Ph.D. in Chemical Engineering (Université Laval, Québec, Canada)
1999-01	M.Sc. in Chemical Engineering (Université Laval, Québec, Canada)
1996-98	M.Eng. in Process Engineering (University of Orient, Santiago de Cuba)
1990-95	B.E. in Chemical Engineering (University of Orient, Santiago de Cuba)

LANGUAGE SKILLS: English, French and Spanish: Proficient

PROFESIONAL EXPERIENCE

2013- **WASHINGTON STATE UNIVERSITY (Pullman, Washington USA)** Associate Professor at the Biological Systems Engineering Department. Working in fundamental studies to understand cellulose and lignin pyrolysis mechanisms. The development of selective pyrolysis reactors and bio-refinery concepts to convert bio-oils into bio-fuels and bio-chemicals.

2007-2013 **WASHINGTON STATE UNIVERSITY** (Pullman, Washington USA). Assistant Professor at the Biological Systems Engineering Department. Developing a program in Biomass Thermochemical Conversion.

2006-07 **MONASH UNIVERSITY** (Melbourne, Australia). Post doctoral research fellow responsible for the improvement of a fast pyrolysis reactor to produce bio-oils from Mallee trees. Characterization, up-grading and combustion of bio-oils and chars. Study of generation of oligomers during pyrolysis.

2005-06 **UNIVERSITY OF GEORGIA** (Athens, Georgia, USA). In charge of improving and designing of thermochemical reactors and analytical laboratories. The main responsibility was to improve and design thermo-chemical reactors (Continuous Auger and Batch pyrolysis reactors) and to identify and install new analytical equipments (DSC/TG-MS, Karl-Fischer, Rota-evaporators, GC analyser, CHNS-O, Proximate analysers) for a thermo-chemical laboratory. Development of new applications for pyrolysis products in the agriculture. Study of fuel properties of bio-oil/bio-diesel blends.

2001-05 **LAVAL UNIVERSITY** (Quebec City, Canada), **CANMET** (Advanced Combustion Technologies, NRCan) (Ottawa, Canada) and **PYROVAC** (Quebec City, Canada). In charge of a project to study the fuel properties of vacuum pyrolysis oils obtained from wood industry residues. Scholarship of Doctorate from the Laval University Foundation. 1 month of i*nternship at the "CO_2 solution" pilot plant.*

1999-01 **LAVAL UNIVERSITY and PYROVAC** (Quebec City, Canada)
In charge of projects for the co-pyrolysis under Vacuum of Bagasse and Petroleum Residue for the Production of Bio-fuels.

1995-99 **UNIVERSITY OF ORIENT** (Santiago de Cuba, Cuba) **and MOA NICKEL S.A.** (Moa, Holguin, Cuba), Assistant professor at the Chemical Engineering department. M.Sc. student in the Process Engineering Program. In charge of a project to simulate the performance of a Hydrogen Unit at the Moa Nickel S.A. complex, Cuba. As part of the Master's studies, 14 post-graduate courses were accredited. Consultant in a project to increase the production capacity of a mineral cooler and liquor coolers in the nickel company "Ernesto Che Guevara" (Moa city, Cuba)

1990-95 UNIVERSITY OF ORIENT (Santiago de Cuba, Cuba)

Undergraduate studies. Graduated with honours. Several interships were made in Cuban industries: Fàbrica de gases industriales (Industrial gases company; oxygen and acetylene units), Santiago de Cuba city, 1990, 1991, 1992, Refinerìa Hermanos Diaz (Hermanos Diaz Refinery, Power Plant), Santiago de Cuba city, 1993, 1994, Moa Nickel S.A. (Hydrogen Unit) Moa city, Cuba 1995.

Papers:

(1) Zhou S, Garcia-Perez M, Pecha B, McDonald AG, Kersten SRA, Westerhof RJM: Effect of Particle Size on the Composition of Lignin Derived Oligomers Obtained by Fast Pyrolysis of Beech Wood (Accepted in *Fuels*, **2014**).

(2) Wu, L, Hu X, Mourant D, Wang Y, Kelly C, Garcia-Perez M, He M, Li C-Z: Quantification of strong and weak acidities in bio-oil via non-aqueous potentiometric titration Fuel, Volume 115, January **2014**, 652-657

(3) Zhou S, Wang Z, Liaw S-S, Li C-Z, Garcia-Perez M: Effect of Sulfuric Acid on the Pyrolysis of Douglas Fir and Hybrid Poplar Wood: Py-GC/MS and TG Studies. *Journal of Analytical and Applied Pyrolysis*, Volume 104, November **2013** pp 117-130

(4) Zhou S, Garcia-Perez M, Pecha B, McDonald A, Kersten SRA, Westerhof RJM: Effect of the Fast Pyrolysis Temperature on the Primary and Secondary Products of Lignin (*Energy and Fuels*, **2013,** 27 (10), pp 5867-5877)

(5) Bermudez-Aguirre D, Wemlinger E, Pedrow P, Barbosa-Canovas G, Garcia-Perez M: Effect of atmospheric pressure cold plasma (APCP) on the inactivation of Escherichia coli in fresh produce food control. (Volume 34, 1, *Food Control*, **2013,** pp. 149-157)

(6) Sahaf A, Laborie M-P G, Englund K, Garcia-Perez M, McDonald AG: Rheological Properties and Tunable Thermoplasticity of Phenolic Rich Fraction of Wood Pyrolysis Bio-Oil. *Biomacromolecules*, **2013,** 14 (4), pp. 1132-1139

(7) Kersten SRA, Garcia-Perez M: Recent Developments in Fast Pyrolysis of Lignocellulosic Materials. *Current Opinion in Biotechnology*, Volume 24, Issue 3, **2013**, pp. 414-420)

(8) Pecha B, Chambers E, Levengood C, Bair J, Liaw S-S, Leachman J, Garcia-Perez M, Ha S: Novel Concept for the Conversion of Wheat Straw into Hydrogen, Heat and Power: A preliminary Design for the Conditions of Washington State University. (*International Journal of Hydrogen Energy*, Volume 38, 12, **2013,** pp. 4967-4974)

(9) Zhou S, Pecha B, Westerhof R, Garcia-Perez M, McDonald A, Kersten S: Secondary Vapor Phase Reactions of Lignin Derived Oligomers Obtained by fast Pyrolysis of Pine Wood. *Energy and Fuels*, **2013,** 27 (3), pp 1428-1438

(10) Lian J, Garcia-Perez M, Chen S: Fermentation of Levoglucosan with Oleaginous Yests for Lipid Production. *Bio-resources Technology*, Volume 133, **2013**, 183-189

(11) Usman-Rahim M, Gao X, Garcia-Perez M, Li Y, Wu H: Release of Chlorine during Mallee Bark Pyrolysis *Energy and Fuels*, **2013,** 27 (1), 310-317

(12) Wang Z, McDonald A, Cuba-Torres C, Ha S, Westerhof R, Kersten S, Pecha B ,Garcia-Perez M: Effect of Cellulose Crystallinity on the Formation of a Liquid

Intermediate and on Product Distribution During Pyrolysis, *Journal of Analytical and Applied Pyrolysis*, Volume 100, March **2013**, 56-66
(13) Hu X, Mourant D, Wang L, Wu L, Chaiwat W, Gunawan R, Gholizadeh M, Lievens C, Garcia-Perez M, Li C-Z: Acid-catalysed treatment of the mallee leaf of bio-oil with methanol: Effects of molecular structure of carboxylic acids and esters on their conversion, *Fuel Processing Technology*, Volume 106, February **2013,** 569-576.
(14) Liaw S-S, Zhou S, Wu H, Garcia-Perez: Effect of Pretreatment Temperature on the Yield and Properties of Bio-Oils obtained from the Auger Pyrolysis of Douglas Fir Wood. *Fuel, Vol. 103, January* **2013**, 672-682
(15) Zhou S, Osman N, Li H, McDonald A, Mourant D, Li C-Z, Garcia-Perez M : Effect of Sulfuric Acid Addition on the Yield and Composition of Lignin Derived Oligomers Obtained by the Auger and Fluidized bed Pyrolysis of Douglas Fir Wood *Fuel, Volume 103, January* **2013**, *512-523*
(16) Zhou S, Mourant D, Leviens C, Wang Y, Li C-Z, Garcia-Perez M: Effect of Sulfuric Acid Concentration on the Yield and Properties of the Bio-oils Obtained from the Auger and Fast Pyrolysis of Douglas Fir. *Fuel, Volume 104, February* **2013,** 536-546.
(17) Westerhof RJM, Brilman DWF, Garcia-Perez M, Wang Z, van Swaaij WPM, Kersten SRA: Step-wide Pyrolysis of Pine Wood, *Energy Fuels*, **2012,** 26, 7263-7273
(18) Gao X, Garcia-Perez M, Wu H: Roles of Inherent Fine Included Mineral Particles in the Emission of PM10 during Pulverized Coal Combustion. *Energy and Fuels*, **2012**, 26 (11), 6783-6791
(19) Lian J, Garcia-Perez M, Coates R, Wu H, Chen S: Yeast Fermentation of Carboxylic Acids obtained from Pyrolytic Aqueous Phases for Lipid Production. *Bio-resources Technology, Volume 118, August 2012, 177-186,* **2012**
(20) Liaw S-S, Wang Z, Ndegwa P, Frear C, Ha S, Li C-Z, *Garcia-Perez M*: Effect of Pyrolysis Temperature on the Yield and Properties of Bio-Oils Obtained from the Auger Pyrolysis of Douglas Fir Wood. *Journal of Analytical and Applied Pyrolysis*, Volume 93, January **2012**, 52-62
(21) Streubel J, Collins H, *Garcia-Perez M*, Tarara J, Granatstein D, Kruger C : Influence of Contrasting bio-char Types on Five Soils at Increasing Rates of Application. *Soil Science Society of America Journal. Volume 75, Number 4, July-August* **2011,** pp. 1402-1413
(22) Nesbitt E.ER., Carrier J, Gao J, *Garcia-Perez M*, Morgan J, Peterson J, Shoemaker S, Thiers P, Wang G, Wensel P-C, Chen S : China's Vision for Renewable Energy : Status of Bioenergy and Bioproduct Research and Commercialization. Industrial Biotechnology, October **2011**, 7 (5) : 336-348. Also at the *Journal of Intenational Commerce & Economics*. Volume 4, No 1, March **2012.**
(23) Zhang T, Yapeng Chao, Liu N, Thompson J, Garcia-Perez M, He BB, Gerpen JA, Chen S : Case Study of Biodiesel –Diesel Blends as a Fuel in Marine Environment. *Advances in Chemical Engineering and Science* (ACES), Vol. 1, No. 2 April **2011**, 65-71
(24) Li X, Gunawan R, Lievens C, Wang Y, Mourant D, Wu H, *Garcia-Perez M*, Li C-Z : Simultaneous catalytic esterification of carboxylic acids and acetalisation of aldehydes in a Fast Pyrolysis Bio-oil from Mallee Biomass. *Fuel* 90 (**2011**) 2530-2537

(25) Mourant D, Zhouhong Wang, He M, Wang X.S., *Garcia-Perez M*, Li C-Z: Mallee Wood Fast Pyrolysis: Effect of Alkali and Alkaline Earth Metallic Species on the Yield and Composition of Bio-oil. *Fuel* 90 (**2011**) 2915-2922.
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(27) Galinato S, Yoder J, Granatstein D, *Garcia-Perez M*: Economic trade off between bio-char and bio-oil production via pyrolysis. *Biomass and Bio-energy* 35 (**2011**) 1851-1862.
(28) Lian J, Zhou S, Chen S, Wang Z, Li C-Z, *Garcia-Perez M*: Separation, Hydrolysis and Fermentation of Pyrolytic Sugars, *Bio-resource Technology*, 101, **2010,** 9688-9699.
(29) *Garcia-Perez M*, Shen J, Wang X-S, Li C-Z: Production and Fuel Properties of Fast Pyrolysis Oil/Bio-diesel Blends. *Fuel Processing Technology, Volume 91, Issue 3*, March **2010**, Pages 296-305
(30) *Garcia-Perez M*, Adams TT, Goodrum JW, Das KC, Geller D: DSC Studies to Evaluate the Impact of Bio-oil on Some Cold Flow Properties and Oxidation Stability of Bio-diesel. *Bioresources Technology*, **2010,** 101 (15): Pages 6219-24
(31) Johnson R L, Liaw S-S, *Garcia–Perez M*, Ha S, Lin S-S, McDonald A, Chen S, Pyrolysis Gas Chromatography Studies to Evaluate High-Temperature Aqueous Pretreatment as a Way to Modify the Composition of Bio-oil from Fast Pyrolysis of Wheat Straw. *Energy & Fuels,* **2009**, 23, 6242-6252
(32) Shen J, Wang X-S, *Garcia-Perez M*, Mourant D, Rhodes M, Li C-Z: Effect of Particle Size on the Fast Pyrolysis of Oil Mallee Woody Biomass. *Fuel 88*, **2009,** *1810-1817.*
(33) Smith J, Das K.C., *Garcia-Perez M*: Producing Fuel and Speciality Chemicals from the Slow Pyrolysis of Poultry DAF Skimmings. *Journal of Analytical and Applied Pyrolysis, 86,* **2009**, p. 115-121.
(34) *Garcia-Perez* M, Wang S, Shen J, Rhodes MJ, Lee W-J, Li C-Z: Effects of Temperature on the Formation of Lignin Derived Oligomers during the Fast Pyrolysis of Mallee Woody Biomass. *Energy & Fuels* **2008,** 22, 2022-2032.
(35) *Garcia-Perez* M, Wang S X, Shen J, Rhodes M J, Tian F-J, Lee W-J, Wu H, Li C-Z: Fast Pyrolysis of Oil Mallee Biomass: Effect of Temperature on the Yield and Quality of Products. *Industrial and Engineering Chemistry Research,* **2008,** 47, 1846-1854
(36) Das KC, *Garcia-Perez M*, Bibens B, Melear N: Slow Pyrolysis of Poultry Litter and pine Woody Biomass: Impact of Char and Bio-oils on Microbial growth. *Journal of Environmental Science and Health. A Tox, Hazard Environ Eng,* **2008**, 43, 7, pp. 714-724
(37) Peláez-Samaniego M.R., *Garcia-Perez M.*, Cortez L.B., Rosillo-Calle F., Mesa J.: Improvements of Brazilian Carbonization Industry as Part of the Creation of a Global Biomass Economy. *Renew Sust Energ Rev.* v 12, n 4, May, **2008,** p 1063-1086
(38) Garcia-Nunez J.A., *Garcia-Perez M*, K.C. Das: Determination of kinetic parameters of thermal degradation of Palm Oil Mill by Products using Thermogravimetric Analysis and Differential Scanning Calorimetry. *Transactions of the ASABE. , v 51, n2,* **2008**, p. 547-557

(39) Pelaez-Samaniego M.R., *Garcia-Perez M*, Cortez L.A.B., Olmedo G., Oscuello J: Energy Situation of Ecuador: Current Status. In Press *Energy Policy*, v 35, n 8, August, **2007**, p 4177-4189
(40) *Garcia-Perez M*, Adams T.T., Goodrum J.W., Geller D.P., Das K.C.: Production and Fuel Properties of Pine Chip Bio-oil/Biodiesel Blends. *Energy and Fuels*, ***2007***, 21 (4) 2363.
(41) *Garcia-Perez M*, Chaala A, Pakdel H, Kretschmer D, Roy C: Vacuum Pyrolysis of Softwood and Hardwood Residues. Comparison between Product Yields and Bio-oil Properties. *Journal of Analytical and Applied Pyrolysis.* **2007.** *Volume 78, Issue 1, Pages 104-116***.**
(42) *Garcia-Perez M*, Chaala A, Pakdel H, Kretschmer D, Roy C: Characterization of Bio-oils in Chemical Families. *Biomass and Bioenergy*, **2007**. *Volume 31, Issue 4, Pages 222-242*
(43) *Garcia-Perez M*, Chaala A, Pakdel H, Kretschmer D, Rodrigue D, Roy C: Multiphase Structure of Bio-Oils. *Energy and Fuels*, **2006,** 20, 364-375.
(44) *Garcia-Perez M*, Chaala A, Pakdel H, Kretschmer D, Rodrigue D, Roy C: Evaluation of the influence of stainless steel and copper on the aging process of bio-oil. *Energy and Fuels*, **2006**, 20, 786-795.
(45) *Garcia–Perez M*, Lappas P, Hughes P, Dell L, Chaala A, Kretschmer D, Roy C: Evaporation and Combustion Characteristics of Bio-Oils Obtained by Vacuum Pyrolysis of Wood Industry Residues. *IFRF Electronic Journal*, May **2006** *http://www.journal.ifrf.net/*
(46) Darmstadt H, *Garcia-Perez M*, Adnot A, Chaala A, Kretschmer D, Roy C: Corrosion of Metals by Bio-oils Obtained by Vacuum Pyrolysis of Softwood Bark Residues. An X-ray photoelectron spectroscopy and Auger Electron Spectroscopy Study. *Energy & Fuel* (**2004**), *18, pp. 1291-1301.*
(47) Chaala A, Ba T, *Garcia-Perez M*, Roy C : Colloidal Properties of Bio-oils obtained by vacuum pyrolysis of softwood bark. Ageing and Thermal Stability. *Energy & Fuel* (**2004**) 18, n 5, *pp. 1535-1542.*
(48) Ba T, Chaala A, *Garcia-Perez M*, Roy C: Colloidal properties of bio-oils obtained by vacuum pyrolysis of Softwood bark. Storage Stability. *Energy & Fuel* (**2004**), 18, *pp.188-201*.
(49) Ba T, Chaala A, *Garcia-Perez M*, Rodrigue D, Roy C : Colloidal Properties of Bio-oils Obtained by Vacuum Pyrolysis of Softwood Bark. Characterization of Water-soluble and Water-insoluble Fractions. *Energy and Fuels* (**2004**) 18, *pp. 704-712*
(50) *Garcia-Perez M*, Chaala A, Pakdel H, Roy C: Sugarcane Bagasse Vacuum Pyrolysis. *Journal of Analytical and Applied Pyrolysis* 65 (**2002**) *pp. 111-136.*
(51) *Garcia-Perez M*, Chaala A, Roy C: Co-pyrolysis of Sugarcane Bagasse with Petroleum Residue. Part II. Product Yields and Properties. *Fuel* 81 (**2002**) *pp. 893-907*
(52) *Garcia-Perez M*, Chaala A, Yang J, Roy C: Co-pyrolysis of Sugarcane Bagasse with Petroleum Residue. Part I: Thermogravimetric Analysis. *Fuel* 80 (**2001**) *pp.1245-1258.*

(53) Darmstadt H, *Garcia-Perez M*, Chaala A, Cao N, Roy C: Co-pyrolysis under Vacuum of Sugarcane Bagasse and Petroleum Residue. Properties of Charcoal and Activated Char Products. *Carbon* 39 (**2001**) *pp. 815-825.*
(54) *Garcia-Perez M*, Viera-Bertran R, Lòpez-Cobiella G : Validacion de un Modelo Matematico para Reactores de Reformaciòn Catalìtica de LPG. *Tecnología Quìmica* (**2000**) Vol. XX, N^{o} 1, *pp. 11-24.*
(55) Valle-Matos, *Garcia-Perez M*, Rabell D, Morales Y: Evaluacion de los Enfriadores de Mineral de la Empresa Cmdte. Ernesto Che Guevara de Moa (I). *Tecnología Quìmica* (**2000**) Vol. XX, N^{o} 1 pp. 70-77.
(56) Valle-Matos, *Garcia-Perez M*, Rabell D, Morales Y: Evaluación de los Enfriadores de Mineral de la Empresa Cmdte. Ernesto Che Guevara de Moa (II). *Tecnología Quìmica* (**2000**) Vol. XX, N^{o} 2 pp. 10-15.
(57) *Garcia-Perez M*, Penedo M, Garcìa-Carrera HL, Casin-Villalon: Obtención de Fracciones Liquidas a Partir de la Pirolisis de Bagazo de Cana. *Tecnología Quìmica* (**1999**) Vol. XIX N^{o} 3, pp. 70-76
(58) *Garcia-Perez M*, Viera-Bertràn R: Modelación Matemática de un Reactor para la Reformaciòn Catalítica de LPG. *Tecnología Química* (**1999**) Vol. XIX N^{o} 3, pp. 4-13.

Professional article, non-referred

(73) Yoder J, Galinato S, Granatstein D, *Garcia-Perez M*: Economic tradeoff between bio-char and bio-oil production via pyrolysis. Working Paper Series, WP 2009-25, http://www.ses.wsu.edu/PDFFiles/WorkingPapers/Yoder/WP2009-25.pdf

(74) Granatstein D, Kruger C, *Garcia-Perez M*, Collins H, Yoder J, Galinato S: Biochar and Pyrolysis: Renewable Soil and Energy. Sustaining the Pacific Northwest. Food, Farm & Natural Resources Systems, December 2009, Vol. 7, N^{o} 4, http://csanr.wsu.edu/publications/SPNW/SPNW-v7-n4.pdf

Major Technical Reports:

(1) Garcia-Perez M, Lewis T., Kruger CE: Methods for Producing Bio-char and Advanced Biofuels in Washington State. Part 1: Literature Review of Pyrolysis Reactors. Ecology Publication Number 11-07-017. **July 2011,** http://www.ecy.wa.gov/pubs/1107017.pdf

(2) Garcia-Perez M., Kruger C, Sokhansanj S, Badger PC, J.A. Garcia-Nunez, T. Lewis, C. Kantor S, 2011. Methods for Producing Biochar and Advanced Biofuels in Washington State. Part 2: Literature Review of Biomass Supply Chain and Processing Technologies (From Field to Pyrolysis Reactor). Second Project Report. Department of Biological Systems Engineering and the Center for Sustaining Agriculture and Natural Resources, Washington State University, Pullman, WA, 79 pp. It can be found at: http://www.ecy.wa.gov/biblio/1207034.html.

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(6) Garcia-Perez M, Metcalf J: The Formation of Polyaromatic Hydrocarbons and Dioxins During Pyrolysis: A Review of the Literature with Descriptions of Biomass Composition, Fast pyrolysis Technologies and Thermochemical Reactions. **July 2008** http://www.pacificbiomass.org/documents/TheFormationOfPolyaromaticHydrocarbonsAndDioxinsDuringPyrolysis.pdf

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(2) Garcia-Nunez JA, Ramirez-Contreras NE, Rodriguez-Penuela DT, Garcia-Perez M: Palm Oil Mill Bio-refinery concepts: Challenges and Opportunities. Conferencia Internacional de Bio-energia de las Americas. BECA 2013. Medellin-Colombia, Oct 10-11, 2013.

(3) Suliman W, Smith M, Garcia-Perez M: Effect of Pyrolysis Temperature on Oxidability and Surface Chemistry of Bio-char. Bioenergy IV: Innovations in Biomass Conversion for Heat, Power, Fuels and Chemicals. June 9-14, 2013, Otranto, Italy

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(13) Garcia-Perez M: Challenges and Opportunities of Biomass Pyrolysis to Produce Second Generation Bio-fuels and Chemicals. Workshop on Lignocellulosic Bio-fuels Using Thermo-chemical Conversion. June 13, 2012, Auburn University

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(15) Bermudez-Aguirre D, Wemlinger E., Pedrow, P., Garcia-Perez, M. and Barbosa-Canovas, G.V. 2012. Effect of atmospheric pressure cold plasma in the inactivation of *Escherichia coli* in fresh produce. Conference of Food Engineering, CoFE 2012. April 2-4, **2012**. Leesburg, Virginia.

(16) Sahaf A, Englund K, Zhou S, Garcia-Perez M, McDonald A, Laborie M-P: Pyrolytic Lignin with Tunable Thermoplasticity**.** International Conference on Biobased Materials and Composites – ICBMC' 12. February 22-24, 2012 Marrakesh – Morocco.

(17) Matthew Smith, Garcia-Perez M : Effects of Ozonation on the Surface Structure and Nutrient Adsorption Capacity of Bio-char. The International Conference on Thermochemical Conversion Science. tcbiomass 2011, Chicago 27-30 September **2011**

(18) Zhou S, Garcia-Perez M : Sulfuric Acid as an Additive to Enhance the Production of Fermentable Sugars during the Auger Pyrolysis of Douglas Fir. The International Conference on Thermochemical Conversion Science. tcbiomass 2011, Chicago 27-30 September **2011**

(19) Wang Z, Garcia-Perez M : Understanding the Cellulose Thermal Degradation Mechanism to Enhance the Production of Precursors of Transportation Fuels. The International Conference on Thermochemical Conversion Science. tcbiomass 2011, Chicago 27-30 September **2011**

(20) Liaw S-S, Garcia-Perez M : Effect of Reactor Temperature on the Yield and Properties of Bio-oils obtained from the Auger Pyrolysis of Douglas Fir Wood. The International Conference on Thermochemical Conversion Science. tcbiomass 2011, Chicago 27-30 September **2011**

(21) Shi-shen Liaw, Garcia-Perez M: Effect of Thermal Pretreatment and Pyrolysis Temperature on the Yield and Composition of Bio-oil. NSF CMMI Research and Innovation Conference 2011, Atlanta, USA, January 4-7, **2011**

(22) Garcia-Perez M. New Concepts to Obtain High Yields of Pyrolytic Sugars for Ethanol Production. Biomass Fuels Summit. October 12-13, **2010**, Vancouver, WA

(23) Garcia-Perez M: Challenges and Opportunities for Biomass Pyrolysis in Washington State. Thermochemical Conversion – Pyrolysis and Gasification Session. Bio-energy Symposium, Nov. 9-10, **2010**, Seattle, WA.

(24) Garcia-Perez M: Overview of Biomass Pyrolysis Technologies. Historical developments and potential for the production of bio-char, advanced fuels and high value products. Future Energy Conference, Nov. 9-10, **2010**, Seattle, WA.

(25) Lian Jieni: Separation, Hydrolysis and Fermentation of Pyrolytic Sugars (Oral Presentation at the 32nd Symposium on Biotechnology for Fuels and Chemicals, April 19-22, **2010** Clearwater, FL.

(26) Granastein D, Kruger C, Collins H, Garcia-Perez M, Yoder J, Galinato S: Use of Bio-char from the Pyrolysis of Waste Organic Material to increase Soil Carbon Sequestration. Conference on Pacific Northwest Climate Science, June 15-16, **2010** Portland, OR.
(27) Smith M, Garcia-Perez M: Evolution of Acidic functional Groups on Bio-chars by Ozone Oxidation. Conference on Pacific Northwest Climate Science, June 15-16, **2010** Portland, OR.
(28) Garcia-Perez M, Lian J, Liaw S-S, Chen S, Li C-Z, Mourant D: Production, Separation, Hydrolysis and Fermentation of Pyrolytic Sugars to Produce Ethanol and Lipids. TCS 2010 Symposium on Thermal and Catalytic Sciences for Biofuels and Biobased Products. September 21-23, **2010**, Iowa State University
(29) Garcia-Perez M: Challenges and alternatives for the production of bio-ethanol, green gasoline and green diesel from lignocellulosic materials via fast pyrolysis. International Conference on Biomass Energy Technologies (ICBT2010) August 21-23, **2010**, Beijing, China.
(30) Garcia-Perez M: Overview of Biomass Pyrolysis Technologies. Historical developments and potential for the production of bio-char, advanced fuels and high value products. Future Energy Conference, Nov. 9-10, **2010**, Seattle, WA.
(31) Garcia-Perez M: Challenges and opportunities for Biomass Pyrolysis in Washington State. Thermochemical Conversion – Pyrolysis and Gasification Session. Bio-energy Symposium, Nov. 9-10, **2010**, Seattle, WA.
(32) Garcia-Perez M. New Concepts to Obtain High Yield of Pyrolytic Sugars for Ethanol Production. Biomass Fuels Summit. October 12-13, **2010**, Vancouver, WA
(33) Garcia-Perez M, Lian J, Liaw S-S, Chen S, Li C-Z, Mourant D: Production, Separation, Hydrolysis and Fermentation of Pyrolytic Sugars to Produce Ethanol and Lipids. TCS 2010 Symposium on Thermal and Catalytic Sciences for Biofuels and Biobased Products. Iowa State University Bio-economy Institute September 21-23, **2010**
(34) Garcia-Perez M: Challenges and alternatives for the production of bio-ethanol, green gasoline and green diesel from lignocellulosic materials via fast pyrolysis. International Conference on Biomass Energy Technologies (ICBT2010) August 21-23, **2010**, Beijing, China
(35) Johnson RL, Garcia-Perez, Liaw S-S, Ha S, Lin S-S, Chen S: Py-GC/MS studies to evaluate the effect of thermal pretreatment on the yield of sugars resulting from fast Pyrolysis. 8th World Congress of Chemical Engineering. Montreal, Canada, August 23-27, **2009**
(36) Geller D.P., Garcia-Perez M, Goodrum JW, Bibens BP, Das K.C., Multicomponent bio-oil/biodiesel based fuels. American Society of Agricultural and Biological Engineers Annual International Meeting 2009, v 8, p 5359-5369, 2009, American Society of Agricultural and Biological Engineers Annual International Meeting **2009.**
(37) Mourant D, Garcia-Perez M, Shen J, Wang S, Li C-Z: Pyrolysis of Mallee wood: effects of temperature, particle size and pretreatment on yields and oil quality. Bioenergy Australia, Melbourne, 8-9 December, **2008.**
(**38)** Garcia-Perez M, Wang S, Rhodes M, Tian F, Lee W J, Li C-Z: Fast Pyrolysis of

Oil Mallees Woody Biomass. Paper accepted at Chemeca 2007, Melbourne, September 23 – 26, **2007**.
(39) Das KC, Garcia-Nunez JA, *Garcia-Perez M*, Overview of a Biorefinery and Opportunities in the Palm Oil Sector. XV Conferencia Internacional sobre Palma de Aceite. Cartagena, Colombia, 19-22 September, **2006**.
(40) Garcia-Nunez JA, *Garcia-Perez M*, Das K.C., Determination of Kinetic Parameters of Thermal Degradation of Palm Oil Mill by Products Using Thermogravimetric Analyses and Diferential Scanning Calorimetry. 2006 ASABE Annual International Meeting. Portland Oregon 9-12 July, **2006**.
(41) *Garcia-Perez M*, P. Lappas, C. Roy: An Overview of the Potential use of Bio-oils as Fuels in Advanced Combustion Systems. In the proceedings of: *Science in Thermal and Chemical Biomass Conversion.* Victoria, Vancouver Island, BC, Canada, 30 August – 2 September, **2004**.
(42) *Garcia-Perez M*, A. Chaala, D. Kretschmer, A. De Champlain, P. Hughes, C. Roy : Spray Characterization of a Softwood Bark Vacuum Pyrolysis oil. Proc. of: *Science in Thermal and Chemical Biomass Conversion Bridgwater and Boocock (Eds).* Victoria, Vancouver Island, BC, Canada, 30 August – 2 September, **2004,** pp. 1468.
(43) *Garcia-Perez M*, Chaala A., Pakdel H., Kretschmer D., Hughes P. and Roy C.: The Complex Multiphase Structure of Bio-oils. 2nd W*orld Conference on Biomass for Energy, Industry and Climate Protection,* Proceedings of the Conference held in Rome, Italy, May 10-14, **2004,** pp. 725-728.
(44) Garcia-Perez, M., A. Chaala, H. Pakdel, D. Kretschmer, P. Hughes and C. Roy. The Complex Structure of Bio-Oils. 2nd World Conference on Biomass for Energy, Industry and Climate Protection. Proceedings of the Conference held in Rome, Italy. May 10-14, **2004**.
(45) Garcia-Perez, M., A. Chaala, D. Kretschmer, P. Hughes and C. Roy. Combustion properties of Bio-Oils Obtained by Vacuum Pyrolysis of Softwood Bard Residues. *53rd Canadian Chemical Engineering Conference*. Hamilton, Ontario, October 26-29, **2003**.
(46) Chaala, A., M. Garcia, T. Ba and C. Roy. Collodial Properties of Bio-Oils Obtained by Vacuum Pyeolysis of Softwood Bark Residues. 51st Canadian Chemical Engineering Conference. Halifax, N.S. October 14-17, **2001**.
(47) *Garcia-Perez M*, Chaala A, Pakdel H, Roy C, Falcon J: Sugarcane Bagasse Vacuum Pyrolysis. *III Taller Internacional de reciclaje 2000. Feria Internacional METANICA 2000 (METSOC).* Havana, Cuba, 29-30 July, **2000**.
(48) *Garcia-Perez M*, Darmstadt H, Chaala A, Cao N, Roy C: The co-pyrolysis under Vacuum of Sugarcane Bagasse and Petroleum Residue, Properties and Potencial uses of the Char Product. *First World Conference on Carbon. Eurocarbon 2000.* Berlin, Germany 9-13 July, **2000**.
(49) Chaala A, *Garcia-Perez M*, Roy C: Co-pyrolysis under Vacuum of Bagasse with Petroleum Residue. *Progress in Thermochemical Biomass Conversion.* Tyrol, Austria 17-22 September, **2000**.
(50) Garcia-Perez, M., A. Chaala, J. Falcon and C. Roy. Vacuum Pyrolysis of Sugarcane Bagasse. III Taller Internacional de Reciclaje. Feria Internacional METANICA 2000. Havana, Cuba. July 19-20, 2000.

(51) *Garcia-Perez M*, Viera-Bertràn R: Modelo de Simulaciòn de una planta de Hydrogeno. *Segundo Simposio Internacional de Ingenierìa Quìmica*, Santiago de Cuba, **1997**.

Book Chapter:

(1) Pecha B, Garcia-Perez M: Pyrolysis of Lignocellulosic Biomass: Oil, Char and Gas. In: Biomass to Biofuels, Elsevier Editor: Anju Dihiya (University of Vermont) *(Under review)* 2014.
(2) Brown R, del Campo B, Boateng AA, *Garcia-Perez M*, Masek O: Chapter 3 : Fundamentals of Biochar production. In : Biochar for Enviornmental Management. Editted by Lehman 2013 (*Under review*).
(3) Boateng AA, Garcia-Perez M, Ondrej M, Brown R, del Campo B: Chapter 4 : Biochar Production Technology. In : Biochar for Enviornmental Management. Editted by Lehman 2013 (*under review*).
(4) *Garcia-Perez M*. Chapter 23 Pyrolysis. In: Bioenergy: Principles and Applications. Editors: Yebo Li, Samir Kumar Khanal 2013 (*under review*)
(5) Laird D.A., Rogovska N.P., *Garcia-Perez M*, Collins H.P., Streubel J.D., Smith M : Chapter 16 : Pyrolysis and Biochar – Opportunities for Distributed Production and Soil Quality Enhancement. In : Sustainable Alternative Fuel Feedstock Opportunities, Challenges and Roadmaps for Six U.S. Regions. Proceedings of the Sustainable Feedstocks for Advanced Biofuels Workshop. Edited by Ross Braun, 2011, Doug Karlen and Dewayne Johnson. Web site : http://www.swcs.org/documents/resources/Chapter_16__Laird__Pyrolysis_and_Bi_96E09F2679C2B.pdf
(6) *Garcia-Perez M*: Chapter 7: Biomass Pyrolysis and Bio-oil Refineries. In: Introductory book to Bio-Systems Engineering (McGraw Hill Publisher, USA, 2010). Editor, A. Nag.
(7) *Garcia-Perez M*, Das K.C., Adams T.T: Chapter 26: Thermo-chemical Conversion of Biomass in Bio-refineries. In: Conversao Termoquimica de Biomassa em Biorefinarias: Sua Caracterizacao e Use deste Conhecimento na criancao de Novas Areas. Embrapa Amazonia Ocidental, 2009 (In Portuguesse).

Patents:

(1) Adams TT, *Garcia-Perez* M, Geller D, Goodrum J, Pendergrass: Miscible multi-component, diesel fuels and methods of bio-oil transformation. US Patent Publication No. US-2007-0261296-A1

Patent Disclosure:

(1) Lian J, Garcia-Perez M, Chen S: Biological Conversion of Cellulose and Hemicellulose Pyrolytic Products (Anhydrosugars and Carboxylic Acids) to Produce Lipids by Oleaginous Yeats. Patent Disclosure Submitted 2/5/2012

(2) Garcia-Perez M, Frear C : Co-digestion of C1-C4 Oxygenated Compounds Produced from Thermochemical Conversion of Lignocellulosic Materials in Advanced Anaerobic Digesters for the Production of Methane. Patent Disclosure Submitted 12/17/2010

Grants Awarded:

1.- Bio-refinery concept to convert softwood bark to transportation fuels. PIs: Manuel Garcia-Perez, Shulin Chen
Total Award: $ 119,905
Funding agency: Washington State (Department of Ecology)
Period: January 2008 – June 2009

2.- Use of bio-char from the pyrolysis of waste organic material as a soil amendment. PIs: David Granatstein, Harold Collins, Manuel Garcia-Perez, Jonathan Yoder.
Total Award: $ 116, 078
Funding Agency: Washington State (Department of Ecology)
Period: January 2008- June 2009

3.- High quality transportation bio-fuels from Australian and American biomasses via pyrolisis and bio-oil refinery. PIs: Chun-Zhu Li, Manuel Garcia-Perez
Total Award: $ 237,772
Funding Agency: International Science Linkages. Australian Government
Period: January 2009-January 2011

4.- A Pyrolysis Bio-refinery for Transportation Fuels and Adhesives Markets. PIs: Karl R Englund, Marie-Pierre Laborie, Manuel Garcia-Perez
Total Award: $ 180,000
Funding Agency: Sun Grant-DOT
Period: May 2009- May 2012

5.- New Concepts to Obtain high Yields of Pyrolytic Sugars for Ethanol Production. PIs: Manuel Garcia-Perez, Shulin Chen
Total Award: $ 120,000
Funding Agency: Sun Grant-DOT
Period: May 2009-May 2012

6.- Use of Biochar Produced from Agricultural and Forest Wastes from the State of Washington to Recover Ammonia and Phosphorous from Effluents of Anaerobic Digesters
PI: Manuel Garcia-Perez
Total Award: $ 60,000
Funding Agency: Washington State Department of Agriculture

Period: June 2009 – June 2011

7.- Understanding Cellulose Thermochemical Reactions to Enhance the Yields of anhydro-saccharides from Fast Pyrolysis PIs: Manuel Garcia-Perez, Armando McDonald
Total Award: $ 299,930
Funding Agency: US National Science Foundation
Period: January 2010 – December 2012

8.- Feasible Pyrolytic Methods for Producing Bio-char and Advanced Bio-fuels in the State of Washington. PI: Manuel Garcia-Perez
Total Award: $ 110,000
Funding Agency: Washington State Department of Ecology
Period: January 2010- June 2011

9.- Optimization and Low Energy production of Woody Biomass. PIs: Manuel Garcia-Perez, Shulin Chen
Total Award: $ 30,000
Funding Agency: US Department of Energy
Period: January 2011-June 2011

10.- Production of methane and lipids from C1-C4 oxygenated compounds from pyrolysis and torrefaction of lignocellulosic materials. PIs: Manuel Garcia-Perez, Shulin Chen, Craig Frear
Total Award: $ 199,915
Funding Agency: Western SunGrant – DOT
Period: November 2011 – November 2013

11.- Bio-oil/bio-char slurry from biomass for co-combustion in coal power plants: achieving power generation with a significant reduction of CO2 emission.
PIs: Hongwei Wu, Manuel Garcia-Perez,
Total Award: 210,000 AUD (To be used in Australia)
Funding Agency: International Science Linkages. Australian Government
Period: January 2011- January 2013

12. Waste 2 Fuels 2011-2013
PIs: Chad Kruger, Shulin Chen, Craig Frear, Manuel Garcia-Perez*,
Total Award: $225,000
Funding Agency: *Washington State Department of Ecology*
Period: September 2011 – September 2013

13.- CAREER: An Integrated Research and Educational Plan to Develop Selective Pyrolysis Reactors and improve the Capacity of Students to Work in Multidisciplinary Teams.
PI: Manuel Garcia-Perez
Total Award: $ 400,000

Funding Agency: US National Science Foundation
Period: May, 2012 – May 2017

14.- US Dairy Adoption of Anaerobic Digestion Systems Integrating Multiple Emerging Clean Technologies: Climate, Environmental & Economic Impacts. PIs: Craig Frear, Harold Collins, Manuel Garcia-Perez, Chad Kruger, C Shumway, Claudio Stockle
Total Award: ***$749,920*** Funding Agency: USDA-NIFA-AFRI Climate Variability. July 2012 – July 2015

Donations:

1.- Berry Family (2009): To support New Faculty to Grow a Cluster in Sustainable Energy Technology. Funds received: $ 21,000

2.- Portland General Electric (2011): To support studies on the Torrefaction of Arundo Donax. Funds received: $ 15,000

3.- Portland General Electric (2012): To Support the growth of Biomass Torrefaction Capabilities: Funds received: $ 11,000

4.- Portland General Electric (2013): To Support the growth of Biomass Torrefaction Capabilities. Funds received: $ 19,000

Main Thesis Advisor:

Current Students

1.- Shi-Shen Liaw, Ph student, WSU Biological Systems Engineering
2.- Daniel Howe, PhD student, Chemical Engineering
3.- Jesus Alberto Garcia, PhD student, WSU Biological Systems Engineering
4.- Waled Suliman, PhD student, WSU Soil Sciences
5.- Matthew Smith, PhD student, WSU Chemical Engineering
6.- Filip Stankovic, PhD student, WSU Biological Systems Engineering
7.- Michael Brennan Pecha, PhD student, WSU Chemical Engineering
8.- Iva Tews, PhD student, WSU Biological Systems Engineering
9.- Sergio Baravalle, MSc student, WSU Biological Systems Engineering (Co-Advised with Dr. Bin Yang)

Graduated

1.- Shuai Zhou, PhD, WSU Biological Systems Engineering, Graduated 2013
2.- Zhouhong Wang, PhD, WSU Biological Systems Engineering, 2013

3.- Jieni Lian, PhD, WSU Biological Systems Engineering, 2013 (Co-advised with Dr. Shulin Chen)
4.- Matthew Smith, MS, WSU Biological Systems Eng., Graduated 2011
5.- Oisik Das, MS WSU Biological Systems Engineering, Graduated 2010
6.- Robert Johnson Lee, MS, WSU Biological Systems Engineering, Graduated 2009
7.- Daniel Negru, MS, University of Bologna (Exchange student), Italy, Graduated 2009

Current Committee Member of the following Graduate Students

1.- Charles Degan (MSc Biological Systems Engineering, WSU)
3.- Xiao Miao (PhD Biological Systems Engineering, WSU)
4.- Lishi-Yan (PhD Biological Systems Engineering, WSU-Tri-cities)
6.- Tingting Li (MSc Biological Systems Engineering, WSU)
7.- Zheting Bi (PhD Biological Systems Engineering, University of Idaho)
8.- Baran Arslan (PhD Chemical Engineering, WSU)
9.- Mohammadali Azadfar (PhD Biological Systems Engineering, WSU)

Committee Members Graduated :

1.- Diwakar Rana (PhD Chemical Engineering, WSU-Tri-cities, 2013)
2.- Dong Tao (PhD Biological Systems Engineering, WSU, 2013)
3.- Amir Sahaf (PhD Materials Science and Engineering, WSU, 2013)
4.- Liang Yu (PhD, Biological Systems Engineering, WSU) (2012)
5.- Nicholas Kennedy (MSc Biological Systems Enginering, WSU) (2012)
6.- Difeng Gao (MSc Biological Systems Engineering, WSU) (2012)
7.- Erik Wemlinger (PhD , Electrical Engineering, WSU) (2012)
8.- Allan Gao (MSc Biological Systems Engineering, WSU) (2012)
9.- Jijiao Zeng (PhD, Biological Systems Engineering, WSU) (2012)
10.- Chao Miao (MSc Biological SystemsEngineering, WSU) (2011)
11.- Mythreyi Chandoor (MSc, Biological Systems Engineering, WSU) (2010)
12.- Yubin Zheng (MSc, Biological Systems Engineering, WSU) (2010)
13.- Xiochen Yu (MSc, Biological Systems Engineering, WSU) (2010)
14.- Isabela Reinati (MSc Chemical Engineering, WSU) (2009)

Supervised one post-doctoral fellow:

1.- Prof. Shangyu Liu (Visiting Professor from Taiyuan University of Technology, Six months supported by China's funds)
2.- Victor Haber Perez (Visiting Professor from UENF/ CCTA/ LTA, Supported by CAPES, Brazil)
3.- Oselys Rodriguez Justiz (Visiting Professor from Brazil, Sponsored by CAPES, Brazil)

Summer Internship Students advised:

1.- Seth Jordan (Heritage High School Student 2010) (Imagine Tomorrow Student)
2.- Gregory Makar (Heritage High School Stud. 2010) (Imagine Tomorrow Student)
3.- Alex Pien (Camas High School Student 2010) (Imagine Tomorrow Student)
4.- Trevor Lewis (Civil Engineeing, WSU, 2010-2011)
5.- Joran Boegborn (Chemical Eng. Student Twente University, Netherlands, 2011)
6.- Jeroen Degraaf (Chemical Eng. Twente University, Netherlands, 2011)
7.- Connor Heinz (Heritage High School Student 2011) (Imagine Tomorrow Student)
8.- Aloren Martin (Heritage High School Student 2011) (Imagine Tomorrow Student)
9.- Michiel van Kuppevelt (Chem. Eng. Student Twente University, Netherlands, 2012)
10.- Tim Hilbers (Chem. Eng. Student Twente University, Netherlands, 2012)
11.- Dylan Quinn (Moscow High School, 2012) (Imagine Tomorrow Student)
12.- Ashley Rodrigues (Biotech. Engineering, Universidad Politecnica de Costa Rica, 2012)
13.- Pablo Arauzo (Chemical Engineering, University of Zaragoza, 2013)

Mentoring Undergraduate Students in Competitions:

Pecha B, Chambers EJ, Levengood C, Bair J, Liaw S-S : CougsCARE Clean and Renewable Energy at WSU. Washington State University's CHHP System Design and Report. April 2, 2012 (Advisors : Jacob Leachman, Su Ha, Manuel Garcia-Perez)

Invited presentations and courses:

1.- Voiland School of Chemical Engineering and Bioengineering WSU, USA (2008)

2.- Wood Materials and Engineering Laboratory, WSU, USA (2008)

2.- Chemical Engineering Department at Autonomous University of Nuevo Leon, Mexico, (2009)

3.- Curtin University of Technology, Perth, Australia, (2009)

4.- Pacific Northwest Bio-char Conference, Richland, Washington (2009)

5.- Forestry Department, University of Idaho, USA (2010)

6.- Invited to teach two courses at the Master Program in Energy Planning and Management at the University of Cuenca, Ecuador (2010)

7.- Invited speaker to the 11^{th} Annual Northwest Conference: Harvesting Clean Energy Boise, Idaho, USA (2011)

8.- Organized and moderated a session called: Thermochemical Conversion for Renewable Energy, Fuels and Stable Carbon: at the Future Energy Conference. Seattle, USA (2011)

9.- Invited Speaker at the Hybrid Processing for Biorenewable Fuels & Chemicals Production Symposium, Iowa State University, USA (May: 2012),

10.- Invited Speaker at the Workshop on Lignocellulosic Biofuels using Thermochemical Conversion. Auburn University, USA (June: 2012), Invited Speaker at the XVII International Oil Palm Conference, Cartagena, Colombia (September: 2012),

11.- Biomass thermochemical Conversion Course at the University of Zaragoza Spain (November: 2012)

Professional service activities:

1.- Associate Editor: Biomass and Bioenergy (January 2013-Present)

2.- Member of Editorial Boards: (1) Applied Bioenergy and (2) Asian Journal of Energy

2.- Member of the American Chemical Society and *Professional Associations:* American Chemistry Society and Chemical Institute of Canada

3.- Jury of the Imagine Tomorrow Competition: (Washington State University, 2008 and 2009, 2010, 2011 and 2012, 2013).

4.- Five K-12 students (Seth Jordan, Gregory Makar, Alex Pien (**2010**), Aloren Martin, Connor Heinz (**2011**)) attending the Imagine Tomorrow Competition received scholarships from an NSF funded project for summer internships at the WSU Thermochemical Conversion Laboratory.

5.- Dr. Garcia-Perez co-supervised two senior design projects (ten students from the Electrical Engineering Department participated in these projects) (Matt Horvath, Peter Olson, Andrew Pillaud, Amin Rasa and Brian Smith (**2011**) and Shamina S Hossain, Leslie Corson, Abeye Woldeselassie, Dongjin Lee in (**2012**)). These students designed a wire mesh reactor coupled with a fast speed camera to visualize thermochemical reactions under very fast heating rate conditions.

6.- Reviewer to peer reviewed Journals: *Journal of Analytical and Applied Pyrolysis*, *Energy and Fuels*, *Fuel*, *Industrial and Engineering Chemistry Research*, *Applied Energy*, *Fuel Processing Technology*, *Environmental Science and Technology*, *Green Chemistry*, *Bio-molecules*, *Bio-resource Technology*, *Fuel Safety and Environmental Protection*, *Transactions of ASABE*, *Applied Bio-chemistry and Biotechnology*, *International journal of Greenhouse Gas Control*, *Energy Conservation and Management*, *Catalysis Science & Technology*, *Catalysis Science & Technology*, *Chemical Engineering Journal*, *Renewable Energy*.

7.- Reviewer of Proposals: *US Department of Energy*, *Fund Nature et Technologie* (Quebec Canada), *California Energy Commission*, *Washington State Department of Natural Resources*, *US National Science Foundation*, US Department of Agriculture, *Sun Grant Initiative*, *U.S. Civilian Research & Development Foundation*:, DoE/SERDP Waste to Energy Converters for Overseas Contingency Operations,

Natural Sciences and Engineering Council of Canada (NSERC), NSERC Canada Research Chair, Australian Research Council (ARC) Linkage Projects 2012.

8.- Main coordinator and manager of the Departmental Central Analytical Laboratory (For Five years). Our analytical lab has grown dramatically in the period I have been coordinating its activities: http://www.bsyse.wsu.edu/core/Research/servicecntrs/CACL-service-cntr/caclhome.html.

9.- Completed a 26 week Proposal Writing workshop taught by Dr. Stephan Russell and participated in the NSF career Grant Workshop Organized by Dr. Grant Norton.

10.- Currently participating in the Provost's Leadership Academy 2011-2012

11.- Examiner of International MSc and PhD theses (Twente University, Curtin University, Melbourne University, University of Zaragoza)

12.- Member of the International Advisory Committee of Cenipalma (Research Center of the Palm Oil industry of Colombia) (2009-present)

13.- Member of the WSU Latin America Interest Group (Work actively with the International Program in the development strategies to increase the recruitment of Latin American Students to our graduate Program)

14.- Coordinator of the Departmental Biomass Processing and Bio-products graduate program.

15.- Mentored four BS students from Twente University (Netherlands) (Joram Boegborn, Jeroen Degraaf (2011) and Michiel van Kuppevelt, Tim Hilbers (2012)) as part of summer internships at the WSU biomass thermochemical conversion lab. Joram and Jeroen defended their theses successfully at their return. Michiel and Tim completed their projects. Tim Hilbert received the Shell prize to the best BSc thesis 2013.

16.- Co-Chair Bioenergy IV: Innovation in Biomass Conversion for Heat, Power, Fuels and Chemicals. An ECI Conference. June 9-14, 2013. Basiliani Resort, Otranto, Italy.