



MODEC03-2018, International Workshop on the Natural Products and Agro-Industrial Processes in Ecuadorian Amazon region

Chairperson: [Amaury Pérez Martínez, amperez@uea.edu.ec](mailto:amperez@uea.edu.ec) , *Universidad Estatal Amazónica, Ecuador*
Oscar Miguel Rivera-Borroto, orivera@uea.edu.ec, Gerardo M. Casañola-Martín, gcasanola@uea.edu.ec,
Karel Dieguez Santana, kdieguez@uea.edu.ec, Universidad Estatal Amazónica, Ecuador Workshop
 introductory paper signed by the chairperson and some comm. founders on behalf of all the committee.

Abstract: Welcome to the MODEC2018 workshop. This is [Amazon State University's \(UEA\)](#) third workshop, devoted to the promotion and application of the Multidisciplinary Sciences to the development of natural products and agro-industrial processes in Ecuadorian Amazon regions. This includes the application of Information and Communications Technologies (ICTs) for data analysis and computational model including the fields of Agro-industrial Engineering, Chemistry, Chemical Engineering, Biotechnology, Veterinary Medicine, and/or Environmental Sciences, etc. We invite you to visit the official web of the workshop: <https://sciforum.net/conference/mol2net-04/modec-03>

This workshop runs online. The online workshop is powered by the SciForum platform of MDPI, hosted by the [MOL2NET](#) conference, [International Conference on Interdisciplinary Sciences](#). Please, contact the workshop chairmen for further details. Paper submission is already open and the publication of papers for conference purposes in SciForum platform is free of cost.

Publications are expected to be short papers consisting of 1-3 pages. Be aware that the submission is a two step process. First you must register and submit a tentative title, authors list and abstract. Next, you need to submit your full publication upon acceptance of the abstract by the committee. Full publications will be published online, free of charge, with doi number as soon as possible after acceptance. If you are planning to submit a publication, please use the following template, [MODEC Template.doc](#). Click on the following link to register and/or submit your communication [Sumit to MODEC here](#).

All submitted papers should fall under one of the following categories:

- Computational chemistry, Cheminformatics, and Bioinformatics
- Mathematical modeling
- Organic and Functional Foods
- BioTrade: Natural Products of the Amazon
- Production systems with agro-business and forestry purposes or biomass for energy purposes
- Environmental impacts
- Agro-industrial development processes

All summaries should be sent no later than October 25, 2018. The acceptance of a publication will be given November 15, 2018 and completed papers need to be submitted by December 1, 2018. Final acceptance of the finished paper will be given on December 1, 2018 and papers will be published on December 15, 2018.

Chairperson



Amaury Pérez Martínez received his Bs. in Chemical Engineering in 2002, his MSc degree in Chemical Engineering Processes and Analysis in 2007, and his PhD degree in Chemical Engineering in 2013. He has worked in the development of new technology in the Chemical Industry. Currently, he is an Assistant Professor of Agro industrial Engineering at Amazon State University in Puyo, Ecuador. His research interests include philosophy of process design, simulation, and sustainable development

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Local Chairs



Oscar Miguel Rivera-Borroto received his BS degree in chemistry (summa cum laude) from the Universidad Central “Marta Abreu” de Las Villas (UCLV), Santa Clara, Cuba in 2003, his MS in applied mathematics from UCLV in 2008. From 2006 to 2015, he was the head of the cheminformatics research line at the Laboratory of Bioinformatics, UCLV. Currently, he is an Assistant Professor of Physics at the Amazon State University in Puyo, Ecuador. His research interests include philosophy of science, statistics, chemometrics and chem-bio-informatics.

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Gerardo M. Casañola-Martín was born in Ciego de Avila, Cuba, in 1979. He received his degree in Chemistry in 2003; and a PhD in Chemical Sciences in 2009 at the Universidad Central de Las Villas, Cuba. He is currently pursuing a PhD in Biomedicine and Pharmacy at Valencia University, Spain. His main research interests are related to the discovery guide of enzyme inhibitors using chem-bio-informatics approaches, drug design and others computer-aided molecular design procedures using different chemometrics, artificial intelligence and machine learning techniques to the application of chemoinformatics among other life sciences to analyze the social impact and related environmental problems.

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Karel Dieguez Santana obtained his BEng. degree in Chemical Engineering at Central University of “Las Villas”, Santa Clara City, Cuba in 2003; MSc. In Environmental Engineering at the Central University of “Las Villas”, Santa Clara City, Cuba. He works in the Faculty of Environmental Engineering at the Amazonian State University, Puyo, Ecuador, and his research interests are focused in cleaner technologies in food industries, waste minimization and environmental impact.

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Advisory Board



Maria João Matos graduated with a degree in Pharmaceutical Sciences at the University of Porto in 2006. In the last year of her studies, she moved to Santiago de Compostela (Spain) as an Erasmus and Leonardo da Vinci fellow. She obtained her MSc in Organic Chemistry in 2008, from the University of Santiago de Compostela. She completed her first PhD in 2010, at the Department of Pharmaceutical and Chemical Science and Technology, University of Cagliari (Italy). Maria completed her second PhD in 2013, at the Department of Organic Chemistry, Faculty of Pharmacy, University of Santiago de Compostela.

After a stay as a invited researcher at the University of Chile, in January of 2014, she moved to the University of Porto, as a Postdoctoral Fellow. She earned a temporary appointment as a Visiting Professor in the Department of Environmental and Life Science at the University of Cagliari in September 2015. She moved to Cambridge in October 2015.

Institution: University of Cambridge, UK,

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Prof. Roldan Torres Gutierrez has a doctorate in Bioscience Engineering from the Catholic University of Leuven (KUL), Belgium in 2008, under the supervision of Prof. Jos Vanderleyden. He has lead several research projects at the Universidad Central “Marta Abreu” de Las Villas (UCLV) in Cuba, in collaboration with several research groups from Belgium, Germany, Ecuador and Cuba in the field of nitrogen fixation by diazotrophic bacteria. He was a full time Professor in Microbiology at UCLV for more than 10 years and has a post doctorate under the Secretary of Higher Education, Science, Technology and Innovation (SENESCYT)-Ecuador from 2013 to 2015. The scope of his research interest is related to microbial ecology, molecular biology for microbe species identification and microbe-plant-animal- interaction.

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Ivan Idrovo González was born in 1984 in Ecuador. He studied in Germany at the University of Bielefeld and lived there for 11 years. He obtained his Bachelor’s degree in English Philology and Social Sciences in 2010. He has dedicated a major part of his time to learn and master languages. He speaks Spanish (native language), German (C2), English (C2) Portuguese (C1) and Russian (A1). He worked as translator and interpreter for LKA-61 in Hamburg from 2011 to 2012. Currently, he teaches English at Universidad Estatal Amazonica in Puyo- Ecuador.

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Prof Lopez Trabanco Pedro Jesús has a doctorate in Philological Sciences from the University of Havana, Cuba. He has participated in many scientific international congress and published several books and articles related to teaching and linguistics eg. English at the service of Forestry, and Geology, Dictionary of Forestry, Orchid genera of Cuba, Iconography of Cuban Orchids, Phytonimy of common an botanical names of Ecuadorian and Cuban Orchids, etc. He has collaborated with other international universities in Jamaica, Venezuela, Colombia, Ecuador and Brazil. He has worked in the University of Pinar del Rio. Currently, He has been working in the Universidad Estatal Amazónica Ecuador.

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Honor Committee



Georg Schreckenbach was born in 1965 in Potsdam, Germany. He studied physics in Dresden, before going to the University of Calgary, Canada, where he obtained his Ph.D. under the supervision of the late Tom Ziegler. From 1997 to 2000, he was Seaborg Institute Postdoctoral Fellow at Los Alamos National Laboratory (USA). After periods at Daresbury Laboratory, U.K., and Concordia University, Canada, he came in 2003 to the University of Manitoba where he is currently Professor of Chemistry. Dr. Schreckenbach's research involves developing and applying density functional methods to diverse problems such as actinide chemistry, materials, solar energy, or environmental chemistry.

Institution: University of Manitoba, Canada

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Ramon Carbo Orca Professor at the IQS since 1968 and UAB in 1970. In 1984, I became Professor at the Col·legi Universitari de Girona, later the Universitat de Girona (UdG), Professor at Ghent University (2004-2010), and nominated UdG Emeritus Professor in 2011. Also, I founded the Institut de Química Computacional (IQC). The initial international UdG activity was the 1st Girona Workshop on Quantum Chemistry and later the Girona Seminars, biannual meetings on Theoretical Chemistry still running. I have published 398 papers (h=46, Google Academia) and 17 books, including research monographs, classroom volumes and popular science studies. Additionally, I have directed 17 PhD theses, and delivered lectures and courses in Europe, North and South America and Asia as well. I am a member of the editorial board of the Journal of Mathematical Chemistry, International Academy of Mathematical Chemistry, American Physical Society as a life member, American Chemical Society. For my achievements I obtained the Catalan Government Narcís Monturiol Medal.

Institution: Universitat de Girona, España

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Erenio González Suárez received his Dr.C (PhD) degree in Chemical Engineering from Central the University "Marta Abreu" de Villa Clara in 1982 working in the field of modeling and optimization of technological process and in 1991 has received his Dr.Cs (Second and high level in Cuba) in the thematic the problems of Strategy of process in Chemical Industry. Between 1970 and 1982 has Managing of Projects International Educations, of Investments in the industry and of industrials companies. Since 1982 were Professor and Investigator and Advisory of Vice rector of investigations, managing of groups and Centers of Investigations and of Transfer of Technology center, ace well ace vice rector of Investigations at the same university. There was international coordinator of Projects and Nets of scientific collaboration with countries of Europe and Latin America. There is scientifically leader and investigation about Chemical Industry. He has directed 38 PhD theses. From the year 2006, there is one Member of Merit of the Academy of Science of Cuba and has received the National Reward of Chemical Engineering for the work of their life in the year 2013.

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Pedro Fernández de Córdoba was born in Valencia in October 1965. He received the Licenciado degree, and the M.S. and the Ph.D. degrees in Theoretical Physics from the Universitat de València (UV), Valencia, Spain in 1988, 1990, and 1992, respectively. He also received the Ph.D. degree in Mathematics from the Universidad Politécnica de Valencia (UPV), Valencia, Spain, in 1997. His research work was performed at UV, UPV, the Joint Institute for Nuclear Research (Russia), the University of Tübingen (Germany) and the Istituto Nazionale di Fisica Nucleare (INFN) in Torino (Italy). He is currently Professor in the Departamento de Matemática Aplicada at UPV.

Likewise, the October 25, 2012 he received the title of Doctor Honoris Causa from University of Pinar del Rio (Cuba) and the October 17, 2015 he was named an elected fellow of the "Académie Nationale des Sciences, Arts et Lettres du Bénin".

Institution: Universidad Politécnica de Valencia, Spain

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Eugenio Uriarte is Professor of Organic and Medicinal Chemistry since 1989 at the Organic Chemistry Department, Faculty of Pharmacy, University of Santiago de Compostela, Spain. He heads an active research group in the organic and medicinal chemistry field. He spent research periods and was visiting professor at

several well-known research centers and universities and has many national and international regular collaborations. He authored more than 300 publications in international journals, presenting over 250 communications to congresses and was director of more than 20 doctoral students.

Institution: Universidad de Santiago de Compostela

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Rector, Dean, & Directors of Science (Advisory Honor Committee)

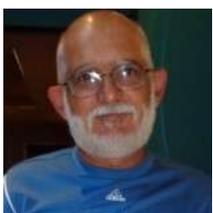


Dr. C. Julio Cesar Vargas Burgos is the current rector of the Amazon State University. He has been a titled professor since 2012. He received his PhD in Veterinary Science at the University of Granma (Cuba 2011) and has done his post doctorate work on the Improvement and Conservation of Genetic Resources of Domestic Animals. He has a Masters in Business Administration from the University of Cordoba (Spain 2015) and another in Educational Research. He has participated some 30 scientific publications and the writing of 4 books contributing to the conservation of agro-forestry and meadow ecosystems by encouraging a more rational use of these areas, thus reducing the deterioration of these ecosystems.

His activities as an investigator have covered diverse fields of study concerning cattle farming systems. He has participated in a number of research projects funded both internally and externally including "Sustainable livestock practices and productive reconversion of the Ecuadorian Amazon, using good practices model and the reduction of emission" funded by Rain Forest Alliance and "Productive performance of the four dairy genotypes in free grazing conditions in Arosemena Tola canton, in the Napo province". This project aims to contribute to the search for biotypes of dairy cattle that are better suited to the environmental conditions of the Amazon (Ecuador).

He has given several presentations at international conferences and seminars by invitation of research centers, and has participated in several current practice or professional development courses.

Institution: Universidad Estatal Amazónica, Ecuador.



Reynaldo Alemán Pérez has a PhD in Agricultural Sciences and Professor for more than 30 years in higher education. Teacher - Researcher in the Amazon State University of Ecuador, where he holds the position of Director of Research. Undergraduate and postgraduate teaching, including Masters and Doctorates in areas such as curriculum Ecology, Agroecology, Production Systems, the Fitotecnia crop. Lecturer at 18 international congresses. Director of Research Projects 14 national and international character and member of the research team of 24 other projects. 6- member international research networks. Scientific Director of the magazine "Agricultural Center". Member of the National Court awarded Scientific Degrees PhD in Agricultural Sciences and the National Commission of agronomy. Author of more than 60 scientific publications, 42 of them in indexed journals and scientific books and 6 teachers. Breeder as principal author of two patents with intellectual property registration. Tutor 70 Thesis to achieve the title of agronomist and / or agricultural, 27 Magister thesis and 6 projects Doctorate (PhD). Member of Scientific Councils and Technical Advisory Committees in Cuba and abroad. It has provided technical services in several countries including Nicaragua, Colombia, Ecuador, Venezuela, Argentina, Angola.

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Scientific Committee

President Scientific Committee (Computational chemistry, Cheminformatics, and Bioinformatics)



Oscar Miguel Rivera-Borroto received his BS degree in chemistry (summa cum laude) from the Universidad Central “Marta Abreu” de Las Villas (UCLV), Santa Clara, Cuba in 2003, his MS in applied mathematics from UCLV in 2008. From 2006 to 2015, he was the head of the cheminformatics research line at the Laboratory of Bioinformatics, UCLV. Currently, he is an Assistant Professor of Physics at the Amazon State University in Puyo, Ecuador. His research interests include philosophy of science, statistics, chemo-metrics and chem-bio-informatics.

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Gerardo M. Casañola-Martín was born in Ciego de Avila, Cuba, in 1979. He received his degree in Chemistry in 2003; and a PhD in Chemical Sciences in 2009 at the Universidad Central de Las Villas, Cuba. He is currently pursuing a PhD in Biomedicine and Pharmacy at Valencia University, Spain. His main research interests are related to the discovery guide of enzyme inhibitors using chemo-bio-informatics approaches, drug design and others computer-aided molecular design procedures using different chemo-metrics, artificial intelligence and machine learning techniques to the application of chemo-informatics among other life sciences to analyze the social impact and related environmental problems.

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President Scientific Committee (Mathematical modeling)



Dagoberto Acosta Iglesias was born in Pinar del Río, Cuba. He studied Mathematics at the University of Havana and graduated in 1985. In 2002, he obtained a Master’s Degree in Mathematics for engineering on Mathematical Models of Biomass directed by Dr. Oscar Gonzalez Chong. He has been teaching at different universities such as The University of Pinar del Río, The University of Information Sciences in Havana and The Central American Technological University in Tegucigalpa. He completed his Ph.D. degree with the research group InterTech Valencia led by Dr. Pedro Fernandez de Cordova in 2002.

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President Scientific Committee (Organic and Functional Foods)

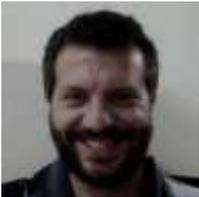


Manuel Lazaro Pérez Quintana, received his PhD in Veterinary Science at the Havana Agricultural University, in Cuba in 2000 by working with hydrolyzed alcohol yeast, as a poultry probiotic. He was Dean of Research at the University of Matanzas, and he has also researched on probiotics, prebiotics, ruminal protozoa metabolism and biodiversity in Ecuadorian Amazon. He was part of an advisory committee of experts for the accreditation of the Masters in Veterinary Microbiology at the National Center for Agricultural Health in Cuba as well as an advisor to the expert committee for the accreditation of Agronomy at the University of Ciego de Avila in Cuba. He teaches Agricultural Biochemistry, Agro-industrial Microbiology, Animal Nutrition, Agro-industrial Biotechnology, Microbial Transformations and Industrial Fermentation. He has published 30 scientific articles and participated in more than 30 international scientific events. He has three approved patents and has been director of four scientific research projects.

Institution: Universidad Estatal Amazónica, Ecuador.

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President Scientific Committee (BioTrade. Natural Products of the Amazon)

	<p>Matteo Radice was born in 1972 in Novara, Italy. He studied chemistry in Pavia, before going to the University of Ferrara, where he obtained his Ph.D. From 1998 to 2002 he was R&D Specialist into the cosmetic department of Rottapharm (ex Laboratori Guieu). Specialized on creation of baby care and body care product, long-term stability analysis and industrial process monitoring. Between 2002 and 2014 he was researcher and International Voluntary Worker for several international development projects, including the Prometeo Project of the Government of Ecuador. From 2015 became Professor of organic chemistry and pharmacognosy at the Amazonian State University of the Republic of Ecuador. His field of research includes herbal medicine bioactivity, natural product isolation and characterization, in particular on cosmetic raw materials based on plant extracts. He has a special interest in organic and fair trade natural products and their applications in pharmaceutical and cosmetic formulations. Bio Trade, international development and scientific cooperation in Latin America are his fields of expertise, as well as technology transfer at companies, NGOs and local farmer level. He was consultant for Ecuadorian ministries involved in development projects in the Amazonian region of Ecuador.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador</p> <p>Email: mradice@uea.edu.ec</p>
President Scientific Committee (Environmental impacts)	
	<p>Yannay Casas Ledón is Chemical Engineer and received her PhD degree in Applied Biological Science from Ghent University in 2012 under the supervision of Prof Jo Dewulf. Between 2004 and 2014 she worked as full Professor of thermodynamic and unit operations at Chemical Engineering Department of Central university of Marta Abreu de las Villa. From 2014 until currently, she is assistant professor in Environmental Engineering Department of Concepción University, Chile. Her research is mainly oriented to environmental sustainability assessment of cleaner technologies, focusing on the reduction of impact of emissions, making emphasis on the resource intake pattern and on the overall efficiency of the production and consumption chain through life cycle assessment (LCA), exergy analysis, Exergetic Life Cycle Analysis (ELCA), Exergo-environmental and exergo- economic analysis.</p> <p>Institution: Concepción University, Chile</p> <p>Email: ycasas@udec.cl</p>
President Scientific Committee (Agroindustrial development processes)	
	<p>Chemical Engineer graduated in 2004 at Universidad Central de Las Villas (UCLV-Cuba). Holds a MSc in Process Analysis Tools and a PhD in Chemical Engineering (UCLV). Worked as post-doc in the Laboratory of Thermochemical Conversion in the University of Ghent (Belgium) during a short-term stay in 2012, under the supervision of Prof. Jo Dewulf and Prof. Wolter Prins. Since 2014 is a full-time researcher in the Technological Development Unit at the University of Concepcion (UdeC-Chile). His main research interests concerns the heterogeneous catalysis for upgrading biomass-derived fuels, development of carbon aerogels-like structures, process synthesis and analysis.</p> <p>Institution: Concepción University, Chile</p> <p>Email: luiseap@gmail.com</p>

Scientific Committee Members

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Yunierkis Pérez- Castillo. Universidad Técnica Particular de Loja, Ecuador

Liliana Cerda-Mejía. Universidad Técnica de Ambato, Ecuador

Viviana Quevedo-Tumaili. Universidad Estatal Amazónica, Ecuador

Bernabé Ortega-Tenezaca. Universidad Estatal Amazónica, Ecuador

Mathematical modeling

Eberto Pablo Gutiérrez Morales. Universidad Estatal Amazónica, Ecuador

Verena Torres Cárdenas. Instituto de Ciencia Animal, Cuba

Jorge Manuel Ríos Obregón. Universidad Estatal Amazónica, Ecuador

Organic and Functional Foods

Aldo Hernández Monzón. Havana University, Cuba

Javier Domínguez Brito. Universidad Estatal Amazónica, Ecuador

María Isabel Viamonte Garcés. Universidad Estatal Amazónica, Ecuador

Estela Guardado Yordi Universidad de Camagüey Ignacio Agramonte Loynaz, Cuba.

BioTrade. Natural Products of the Amazon

Eberto Tuniesky Gutierrez. Universidad Estatal Amazónica, Ecuador

Laura Scalvenzi. Universidad Estatal Amazónica, Ecuador

María del Rosario Herrera Velázquez. Universidad Estatal del Sur de Manabí, Ecuador

Neyfe Sablón Cossío. Universidad Técnica de Manabí, Ecuador

Luis Bravo Sánchez. Universidad Estatal Amazónica, Ecuador

Production systems with agribusiness and forestry purposes. Biomass for energy purposes

Yasiel Arteaga Crespo. Universidad Estatal Amazónica, Ecuador

Yudel García Quintana. Universidad Estatal Amazónica, Ecuador

Juan Elías González. Rivera Universidad Estatal Amazónica, Ecuador

Environmental impacts

Eugenio Martínez Castellanos. Instituto Tecnológico Superior de Comalcalco, México

Pablo Ángel Galindo Llanes. Universidad de Camagüey “Ignacio Agramonte Loynaz”, Cuba.

Carlos Alfredo Bravo Medina. Universidad Estatal Amazónica, Ecuador

Agroindustrial development processes

Víctor Rodrigo Cerda. Universidad Estatal Amazónica, Ecuador

Juan Esteban Miño Valdés. Universidad Nacional de Misiones, Argentina

Eligio Jesús Castellanos Estupiñán. Universidad Estatal Amazónica, Ecuador

Isnel Benítez Cortés. Universidad de Camagüey Ignacio Agramonte Loynaz, Cuba

Hilda Oquendo Ferrer. Universidad de Camagüey Ignacio Agramonte Loynaz, Cuba.

Computational chemistry, Cheminformatics, and Bioinformatics

The application of computational chemistry, cheminformatics, and bioinformatics to the discovery of new bioactive compounds within the Ecuadorian Amazon ecosystem which can contribute to the identification of natural agents with drug-like bioactivity that will serve to relieve the symptoms of socially relevant diseases. These findings have the potential to enhance the health, well-being, and quality of life for the native population. This section is devoted to, but not limited to the following fields/subjects of study: description of new bio compounds and data sets, (quantum) similarity measures, similarity/diversity searching, clustering algorithms, QSAR techniques, validation metrics, the discovery of enzyme inhibitors, proteasome, tyrosine, computer-aided molecular design, lead optimization, artificial intelligence and machine learning, multi-target approaches, QSPR, QSAR, QSTR, applied computer sciences, and applied statistics.

President



Oscar Miguel Rivera-Borroto received his BS degree in chemistry (summa cum laude) from the Universidad Central “Marta Abreu” de Las Villas (UCLV), Santa Clara, Cuba in 2003, his MS in applied mathematics from UCLV in 2008. From 2006 to 2015, he was the head of the cheminformatics research line at the Laboratory of Bioinformatics, UCLV. Currently, he is an Assistant Professor of Physics at the Amazon State University in Puyo, Ecuador. His research interests include philosophy of science, statistics, chemo-metrics and chem-bio-informatics.

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Gerardo M. Casanola-Martín was born in Ciego de Avila, Cuba, in 1979. He received his degree in Chemistry in 2003; and a PhD in Chemical Sciences in 2009 at the Universidad Central de Las Villas, Cuba. He is currently pursuing a PhD in Biomedicine and Pharmacy at Valencia University, Spain. His main research interests are related to the discovery guide of enzyme inhibitors using chemo-bio-informatics approaches, drug design and others computer-aided molecular design procedures using different chemo-metrics, artificial intelligence and machine learning techniques to the application of chemo-informatics among other life sciences to analyze the social impact and related environmental problems.

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Members



Yunierkis Pérez-Castillo obtained his PhD in Science in 2013 at the “Vrije Universiteit Brussel”, Belgium and currently is a professor at the “Universidad Técnica Particular de Loja”, Ecuador. He has a large experience in researches related to the design, implementation and application of computational tools to biological, chemical and pharmaceutical problems. He has published more than 15 papers in peer- review journals and participated in several international conferences. His research skills include the application of structure-based drug design tools such as homology modeling, molecular dynamics, molecular docking and virtual screening. In addition, he has programming skills and in the application of machine learning algorithms to ligand-based drug discovery.

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	<p>Liliana Cerda-Mejía was born in 1986 in Ambato, Ecuador. She studied Food Engineering in Ambato, before going to the Universitat de Barcelona, Spain, where she obtained her Ph.D. under the supervision of Javier Pastor and Pilar Diaz. Her main research interests are focused on the use of bioinformatics tools in massive sequencing methods, NGS. The search, cloning and purification of microbial enzymes and their application in different stages in the production of biofuels, production of paper. In this research included the design of new materials for the manufacture of kit's disease detection.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador Email: lcerda@uea.edu.ec</p>
	<p>Viviana Quevedo-Tumaili, Computer Systems Engineer, Master in Technologies for Teaching Management and Practice, Professor of Computer Science in the Department of Earth Sciences and Professor of Computer Science applied to Research in the Postgraduate Department at the Universidad Estatal Amazónica (UEA) - Ecuador. I currently do my doctoral studies in the official doctorate program in information and communication technologies of the University of Coruña (UDC) - España.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador. Email: vquevedo@uea.edu.ec</p>
	<p>Bernabé Ortega-Tenezaca, Computer Systems Engineer, master in database management, professor of systems engineering and software engineering at the Universidad Regional Autónoma de los Andes (UNIANDES) - Puyo, Technology Analyst at the Universidad Estatal Amazónica (UEA) - Puyo, I currently do my doctoral studies in the official doctorate program in information and communication technologies of the University of Coruña. (UDC) – España. Institution: Universidad Estatal Amazónica, Ecuador.</p> <p>Email: bortega@uea.edu.ec</p>

Mathematical modeling

For the mathematical modeling commission, papers relating to the use of mathematical tools used to obtain or support the presented results will be shared. These purpose of this research is aimed finding natural products in the Amazonian region of Ecuador linked to agro-industrial processes and the related disciplines such as Chemical Engineering, Biotechnology and environmental processes. The modeling process should strengthen the analysis of the experimental processes in order to describe with adequate precision the processes, phenomena, data, etc. The techniques applied may be statistical or non-statistical consistent with data analysis and computer and communications technologies. The obtained results may be presented in any stage of the model: development, analysis or interpretation.

President



Dagoberto Acosta Iglesias was born in Pinar del Río, Cuba. He studied Mathematics at the University of Havana and graduated in 1985. In 2002, he obtained a Master's Degree in Mathematics for engineering on Mathematical Models of Biomass directed by Dr. Oscar Gonzalez Chong. He has been teaching at different universities such as The University of Pinar del Río, The University of Information Sciences in Havana and The Central American Technological University in Tegucigalpa. He completed his Ph.D. degree with the research group InterTech Valencia led by Dr. Pedro Fernandez de Cordova in 2002.

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Members



Eberto Pablo Gutiérrez Morales received a BS degree in mathematics (summa cum laude) at the Pedagogical University "Felix Varela" Santa Clara, Cuba, in 1981. Later, his received a PhD. degree in Pedagogical Sciences at the Universidad de Oriente, Cuba, in 1999. Between 1990 and 2000 he played a fundamental as Pro-Rector at the University of Sancti Spiritus. Also, between 2000 and 2014 he worked as the Head of Center for the Study of Advanced Management Techniques (CETAD). Currently, he is an assistant Professor of Mathematics at the University of the State of Amazonas in Puyo, Ecuador. His research interests include administration and Mathematics teaching.

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Verena Torres Cárdenas received his grade of PhD in the Agricultural Sciences in 1982 working in the field of Applied Mathematical Statistic in Cuba. She carried out studies postdoctorales in the Federal university of Mines of Geráis in Brazil and have Regular Investigator's categories and Enclosed Auxiliary Professor of the dpto. of Applied Mathematics in the Institute of Animal Science where I work from 1971. I am active member and of honor of National Tribunal of Zootecnia from their foundation. It possesses more than 10 prizes and distinctions at different levels in the country and recently (2015), she received the prize of the Academy of Sciences of Cuba, with the Statistical Pattern of Mensuration of Impact. She has been tutor of more than 10 doctorate thesis and more than 25 thesis of Master. Leader of 8 projects of national investigation and international 3 project. It possesses more than 60 publications in impact magazines and 5 in the period 2015-2016. She is author of two chapters of published books one in Cuba and the other one in the Ecuador.

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Jorge Manuel Ríos Obregón was born in 1971 in Sancti Spiritus, Cuba. He concluded in 1994 his undergraduate education in Mathematic in Oriente University, Cuba and further in 2014 at the same university concluded a Ph.D in Pedagogical Sciencies in the area of Calculus Infinitesimal for engineers. He completed in 2000 his master's degree in Matemática Aplicada with expertise in Matematica Aplicada in Central University Marta Abreu de Las Villas. In 2015 came to the Amazon State University working currently like a Professor and researcher. He has researched in various fields related to Group Theory and Mathematics Education.

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Organic and Functional Foods

Functional foods have been conceptualized by different researchers and institutions from all over the academic and business worlds. The European Council on Food Information defined functional foods as those that are consumed as part of a normal diet, to provide essential nutrients for life such as proteins with essential amino acids, carbohydrates, fats, vitamins and minerals. They also contain biologically active components that offer health benefits as they reduce the risk of chronic degenerative diseases such as diabetes, hypertension, and cancer among others.

The main components of a successful functional food can be summarized in the following categories:

1. Organic food production.
2. Intestinal Micro Flora Balancing including probiotics, prebiotics and synbiotics.
3. Antioxidants and their impact on health.
4. Dietary fiber as part of a healthy diet.
5. The marketing of healthy, organic food.
6. The health benefits of using the Ecuadorian Amazon as a food source. Submissions should pertain to the above mentioned categories.

President



Manuel Lazaro Pérez Quintana, received his PhD in Veterinary Science at the Havana Agricultural University, in Cuba in 2000 by working with hydrolyzed alcohol yeast, as a poultry probiotic. He was Dean of Research at the University of Matanzas, and he has also researched on probiotics, prebiotics, ruminal protozoa metabolism and biodiversity in Ecuadorian Amazon. He was part of an advisory committee of experts for the accreditation of the Masters in Veterinary Microbiology at the National Center for Agricultural Health in Cuba as well as an advisor to the expert committee for the accreditation of Agronomy at the University of Ciego de Avila in Cuba. He teaches Agricultural Biochemistry, Agro-industrial Microbiology, Animal Nutrition, Agro-industrial Biotechnology, Microbial Transformations and Industrial Fermentation. He has published 30 scientific articles and participated in more than 30 international scientific events. He has three approved patents and has been director of four scientific research projects.

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Members



Aldo Hernández Monzón received his PhD degree in Technical Sciences from the Politecnical Institute José Antonio Echevarria, in Havana Cuba in 1990; the research was in the development of rheological technics for optimization and control of technological processes applied in semi hard cheeses, under the supervision of PhD Antonio Díaz –Abreu. From 1972 up to 1993 he was Professor of Food Engineering in the Chemical Engineering Faculty of the same Institute and since 1994 work as professor of Food Science and Technology in the Institute of Pharmacy and Food of Havana University. He is a member of the Doctoral committee in Food Science and of the Food Science and Technology Master. The Research work involves the evaluation and development of functional dairy products and he has directed 6 PhD theses, and delivered lectures and courses in universities of Mexico, Colombia and Ecuador

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Javier Dominguez Brito received his PhD degree in Mechanization and Agricultural Technology from the Universidad Politécnica de Valencia in 2003 working in the field of theoretical chemistry under the supervision of Prof Daniel Jorajuria. Between 1996 and 2013 he was Auxiliary Professor at the Ciego de Ávila university and since 2013, he is a Professor in Machinery and equipment, Irrigation and Drainage and Physics I at the Department of Earth

	<p>Sciences. His main research interests concern the food production, including those related to the study of the production of corn and sugar cane under conditions of the Ecuadorian Amazon.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador</p> <p>Email: jdominguez@uea.edu.ec</p>
	<p>Maria Isabel Viamonte Garcés obtained her PhD in Veterinary Sciences at the Agrarian University of Havana, Cuba in 2010. Between 1986 and 2013, she worked as researcher at the Institute of Agricultural Research "Jorge Dimitrov" in the province of Granma, Cuba. Her research mainly referred to the productive and reproductive improvement of cattle, and animal clinic. She was professor at the University of Granma from 2007-2013. Since 2014, she is professor and researcher at the Amazon State University in Puyo – Ecuador. She is responsible for the Food Production Program in Biodiverse Systems. She has been working on matters related to agricultural production, animal physiology and research methodology. She has trained workers, livestock producers and specialists in the design and management of cattle farms. She has 45 publications, including scientific articles and book chapters as lead author and co-author; she has also supervised 10 Bachelors theses and 8 Masters Theses. She has led conferences and lectures in livestock technologies and has collaborated with the Technical and Veterinary Service Team of the Cooperative Society of Alta Moraña, Spain. She has participated in several national and international events.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador</p> <p>Email: mviamontes@uea.edu.ec</p>
	<p>Estela Guardado received his Bs. in Pharmaceutical Sciencesg in 1998, her MSc degree in Food Science and Technology is in 2010. She has worked in the Functional Food and QSAR studies. Currently, she is an Professor of Food Science at Universidad de Camagüey, in Camagüey, Cuba. Her research interests include Polyphenols, antioxidants, prooxidant, and Functional Foods.</p> <p>Institution: Universidad de Camagüey “Ignacio Agramonte Loynaz”, Cuba.</p> <p>Email: estela.guardado@reduc.edu.cu</p>

BIOTRADE. Natural Products of the Amazon

BioTrade alludes to collection, production, transformation and commercialization activities of goods and services obtained from native biodiversity in terms of environmental, social and economic sustainability. In 1996, the United Nation Conference on Trade and Development (UNCTAD) launched the “BioTrade Initiative” that has been promoting Biotrade at local level with local farmers and producers. The Amazon basin is strongly involved in Biotrade because of its high biodiversity of natural resources and because of the wide number of transformations in the value chain. Ecuador as well as the other Amazonian countries are a promissory expectation for the “Biotrade Initiative”, in light of its high biological resources and related cultural heritage. Some experiences on Biotrade are available and they suggest big opportunities for new incomes for local farmers and producers, as well as for scientific research.

President



Matteo Radice was born in 1972 in Novara, Italy. He studied chemistry in Pavia, before going to the University of Ferrara, where he obtained his Ph.D. From 1998 to 2002 he was R&D Specialist into the cosmetic department of Rottapharm (ex Laboratori Guieu). Specialized on creation of baby care and body care product, long-term stability analysis and industrial process monitoring. Between 2002 and 2014 he was researcher and International Voluntary Worker for several international development projects, including the Prometeo Project of the Government of Ecuador. From 2015 became Professor of organic chemistry and pharmacognosy at the Amazonian State University of the Republic of Ecuador. His field of research includes herbal medicine bioactivity, natural product isolation and characterization, in particular on cosmetic raw materials based on plant extracts. He has a special interest in organic and fair trade natural products and their applications in pharmaceutical and cosmetic formulations. Bio Trade, international development and scientific cooperation in Latin America are his fields of expertise, as well as technology transfer at companies, NGOs and local farmer level. He was consultant for Ecuadorian ministries involved in development projects in the Amazonian region of Ecuador.

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Eberto Tuniesky Gutierrez De Leon received his BS in Industrial Engineering at the Central University "Marta Abreu" of Las Villas (UCLV), Santa Clara, Cuba in 1997. Later, in 2005 he received his MS degree at the University of Sancti Spiritus, Cuba. Between 2005 and 2014, he worked as associate professor at the same university. Currently, he is an assistant professor of physics and operations research at the Amazon State University in Puyo, Ecuador. His research interests include the statistics, optimization, and administration.

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Laura Scalvenzi was born in Milan, Italy. She studied Agronomy Sciences at the University of Milan and obtained her Ph.D. in Biotechnology at the University of Ferrara (Italy). She did her research work on the bioactivity and biotransformation of essential oils in medical compounds containing endophytic fungi from Amazonian plants. She spent 10 years working on development aid in the Amazonian region of Ecuador. Her main activities focused on the self-development of native people by sustainable use of biodiversity, in order to create new income opportunities based on Bio-Trade. After her development work, she taught at the University of Cuenca in 2011 and has been teaching at the Amazon State University (Ecuador) since 2012. Currently, she teaches Industrial Biotechnology and is also serving as Director of the International Relations Department.

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	<p>María del Rosario Herrera Velázquez is graduate in Pharmaceutical Sciences (1995) at the Faculty of Chemistry at the University of Camagüey, Cuba. She received her PhD in Pharmaceutical Sciences (Natural products) in the Faculty of Pharmacy, University of Barcelona, Spain (2001). Foreign visiting professor at the Universidade do Estado do Amazonas (UEA) (2011-2013). She was a Professor at the Faculty of Chemistry of the University of Camagüey, Cuba. Specialty Program Coordinator of Post-Graduation in Food and Beverage in the biennium 2007- 2009. Member of the Commission of Science Degree from the University of Camaguey, Cuba. Member of the Scientific Council of the Faculty of Applied Sciences Industry. University of Camaguey, Cuba. She is currently teaching nursing career at the Universidad Estatal del Sur de Manabí, Jipijapa, Ecuador, where she teaches courses in Biochemistry and Pharmacology. She has Research experience in the area of Pharmacy, specifically in Chemistry of Natural Products (Phytochemistry) in the extraction, purification and identification of plant secondary metabolites and their biological and pharmacological activities.</p> <p>Institution: Universidad Estatal del Sur de Manabí, Ecuador Email: vehemari@gmail.com</p>
	<p>Neyfe Sablón Cossío was born in 1985 in Holguin, Cuba. She studied industrial engineering in Matanzas, before going to the University of Matanzas, where she obtained her magister and Ph.D in 2014. Professor- at the University of Matanzas since 2008 and in 2014. She was consultant for development projects in supply chain and business in Cuban, México and Ecuador. Her field of research includes logistic, process, human resources, service, business and supply chain, in particular on collaboration on business. From 2015 became Professor of commercial, empowerment and quality at the Amazonian State University of the Republic of Ecuador.</p> <p>Institution: Universidad Técnica de Manabí, Ecuador Email: nsabloncossio@gmail.com</p>
	<p>Luis Bravo Sanchez is PhD in Chemical Sciences. Master in Pharmaceutical Technology and Quality Control (University of Havana). Bachelor in Chemistry (Central University Las Villas). Professor of Analytical Chemistry (27 years, since 1991). Currently, Professor in Amazon State University, Ecuador. Coordinator of Master Program in Agroindustry. Director of 3 PhD thesis, 22 M.Sc. thesis and 36 B.Sc. thesis in Pharmacy and Chemistry. Director or member of 3 international (Belgium, Spain, Brazil) and 7 national (Cuba, Ecuador) research projects. 41 scientific publications (original journal papers) and 47 conferences and congresses scientific contributions. Native language: Spanish. Foreign languages: English, Russian and Portuguese.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador Email: lbravo@uea.edu.ec</p>

Production systems with agribusiness and forestry purposes. Biomass for energy purposes.

This workshop pretends to be a meeting point to exchange information about research processes in the use of biomass for renewable energy production in order to foment the development and application of the research activities in the Amazon region in Ecuador. In this context, the workshop tries to cover all aspects related to the use of biomass as a renewable resource, using agro-forest residues to produce clean biofuels.

- Biomass (including waste) recovery and recycling
- Biomass for biofuels (liquid and gaseous)
- Biomass for bio-based chemicals & products
- Thermochemical conversion and pretreatment of biomass
- Bio-refineries and white biotechnology
- Systems approach: biomass systems analysis, life cycle assessment (LCA), carbon accounting
- Industrial applications and up-scaling
- Biomass policy & economics

President



Reinier Abreu Naranjo was born in 1980 in Sancti Spiritus, Cuba. He studied chemical engineering at Universidad Central de Las Villas, Cuba, (2004), before attending the Università Politecnica delle Marche, Italy, where he obtained his Ph.D (2012), under the supervision of Prof. Ester Foppa Pedretti and Juan A. Conesa (University of Alicante, Spain). Professor at University of Sancti Spiritus (2004-2014) and Director of Center for Energetic and Industrial Process Studies (CEEPI), (from 2008 to 2009) and (from 2012 to 2014). He came in 2014 to the Amazon State University where he is currently Professor and researcher. Research projects developed: Chemical-physical and thermogravimetric analysis of lignocellulosic material and solid waste for its possible usage as a raw material in thermo-chemical conversion processes. Process of torrefaction as a thermal pre-treatment. Kinetic analysis and modelling of thermo-chemical conversion processes.

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Members



Yasiel Arteaga Crespo was born in 1978 in Pinar del Rio, Cuba. He concluded his undergraduate education in chemistry at Havana University. He further obtained a master's degree in Chemistry focused on Organic Chemistry. He completed his doctorate in Forestry Sciences, led by the University of Pinar del Rio, Cuba in

the area of forest plants production. 2015, he came to the Amazon State University and is currently working like professor and researcher. He has researched in various fields related to chemistry and forest management, achieving publications in relevant journals. He is program coordinator of Forestry Engineering.

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Yudel García Quintana was born in 1975 in Ciego de Ávila, Cuba. He concluded his undergraduate education in Forest Engineering in Pinar del Rio University and obtained a master's degree in Forestry focused on Forest Management. He completed his doctorate in Ecological Sciences led by the University of Alicante, Spain. 2015 he came to the Amazon State University and is currently working as professor and researcher. He has researched in various fields related to the management and conservation of forest resources, achieving

	<p>publications in relevant journals. He is master's degree coordinator of Forestry Engineering.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador</p> <p>Email: ygarcia@uea.edu.ec</p>
	<p>Juan Elias Gonzalez Rivera obtained a Master's degree in Management of Agroindustrial Production at the Technical University in Ambato – Ecuador. He is currently pursuing a PhD in Renewable Energy at the Polytechnic University José Antonio Echeverría in Havana. He has been working on a research project about forest biomass for industry under the supervision of Dr. Denny Oliva and Dr. Cujae, PhD in Renewable Energy. He is a senior lecturer at the University who has been supporting foreign students in their professional training.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador</p> <p>Email: jgonzalez@uea.edu.ec</p>

Environmental impacts

This workshop brings together engineers, scientists, researchers, students, managers and other professionals in order to address and discuss emerging environmental issues related to agroindustry and petrochemicals processes, waste management, wastewater treatment and cleaner technologies.

Authors are invited to submit papers from the following areas:

- Evaluation of carbon footprint and water footprint management for existent and new technologies.
- Advances in life cycle assessment and life cycle management of agroindustry and petrochemical processes.
- Improved processes through development and usage of "environmentally friendlier" technologies using agriculture waste.
- Sustainability of agroindustry and petrochemicals processes.
- Agriculture and petrochemical waste management.
- Environmental assessment of wastewater treatment.

President



Yannay Casas Ledón is Chemical Engineer and received her PhD degree in Applied Biological Science from Ghent University in 2012 under the supervision of Prof Jo Dewulf. Between 2004 and 2014 she worked as full Professor of thermodynamic and unit operations at Chemical Engineering Department of Central university of Marta Abreu de las Villa. From 2014 until currently, she is assistant professor in Environmental Engineering Department of Concepción University, Chile. Her research is mainly oriented to environmental sustainability assessment of cleaner technologies, focusing on the reduction of impact of emissions, making emphasis on the resource intake pattern and on the overall efficiency of the production and consumption chain through life cycle assessment (LCA), exergy analysis, Exergetic Life Cycle Analysis (ELCA), Exergo-environmental and exergo-economic analysis.

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Eugenio Martinez Castellanos. PhD degree in Chemical Engineering from the Universidad Central de la Villas, Cuba. Since 1984, he has been working in the field of wastewater treatment, particular heavy metal contamination.

Between 2000 and 2006, he worked in the industrial sector of petroleum and industrial security.

He was full-time Professor at the University of Camaguey from 1984 to 2000. Since 2006, he has worked in several universities such as "Universidad Olmeca" and "Universidad Politecnica del Golfo de Mexico"

He is a Professor of Discrete Event Simulation and Sustainable Development at the Industrial Engineering Department in the Technological Institute of Comalcalco. His main research interests concern the development of natural and artificial sorbent for the treatment of contaminated wastewater.

He works with simulator ARENA to develop relative models to queuing systems and inventory.

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Pablo Angel Galindo Llanes received his PhD degree in chemical engineering from the University of Camaguey "Ignacio Agramonte Loynaz", Cuba in 2008. The topic of his work

	<p>was process analysis and environmental management. Since 2009, he is a full-time Professor in chemical engineering. His main research interests concern the development of new methodological approaches and their application in the field of process analysis and environmental management. Since 2014, he is vice rector of science, research and postgraduate education in the same university. He is a member of the PhD examining board on Chemical engineering.</p> <p>Institution: Universidad de Camagüey “Ignacio Agramonte Loynaz”, Cuba.</p> <p>Email: pablo.galindo@reduc.edu.cu</p>
	<p>Carlos Alfredo Bravo Medina was Senescyt Postdoctoral Program and Amazon State University, Ecuador for two years. Doctor in Environmental Engineering at the University of Cordoba, Spain. Magister Scientiarum in soil Science, Central University of Venezuela. Agronomy engineer, Romulo Gallegos University, Venezuela. Between 1993 and 2014 he was Titular Professor at the Simon Rodriguez University, Venezuela. Director of Research Center of Agroecology for 8 years. I currently work as a research professor in the Amazon, Ecuador State University and coordinated program management and environmental conservation. Teaching graduate and undergraduate, Masters and Doctorates.</p> <p>Institution: Universidad Estatal Amazónica, Ecuador</p> <p>Email: cbravo@uea.edu.ec</p>

Development of agroindustrial processes

To ensure the alimentary security of the global population demands a development of optimized and wisely-designed agroindustrial processes. This upgrading of existing technologies requires a common effort from the scientific community. The alimentary and technical issues associated to agroindustrial processes in Ecuador's Amazon Region are the main drivers for selecting this place as an ideal forum for the discussion and dissemination of knowledge. Therefore, this section encourages scientists to work on improving productivity, efficiency and sustainability of existing and novel agroindustrial processes to submit their works for an open discussion. Papers concerning the reuse and/or valorization of agroindustrial residues, such as: biochar for soil, water and gas treatment and construction materials are very welcomed. This section will pay special attention to those studies concerning to promote strategies for the development and preservation of indigenous communities from the agroindustrial perspective.

President



Chemical Engineer graduated in 2004 at Universidad Central de Las Villas (UCLV-Cuba). He holds a MSc Degree in Process Analysis Tools and a PhD in Chemical Engineering (UCLV). He worked as post-doc in the Laboratory of Thermochemical Conversion at the University of Ghent (Belgium) during a short-term stay in 2012, under the supervision of Prof. Jo Dewulf and Prof. Wolter Prins. Since 2014, he is a full-time researcher in the Technological Development Unit at the University of Concepcion (UdeC-Chile). His main research interests concerns the heterogeneous catalysis for upgrading biomass-derived fuels, development of carbon aerogels-like structures, process synthesis and analysis.

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Víctor Rodrigo Cerda Mejía received his M.Sc. degree in mathematics educative from the Universidad Técnica de Ambato in 2011 working in the mathematics applied process engineering. Since 2012 is Auxiliary Professor at the Universidad Estatal Amazónica, he is a Professor in mathematics at the Department of Science of Earth. His main research interests concern the applied mathematics at process design, including those related to simulation and optimization.

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Juan Esteban Miño Valdés was born in Argentina. He is a Chemical Engineer, with emphasis in Environmental, Quality and Production. He also holds a MSc. Degree in Food Technology, a Ph.D. in Technical Sciences and a Post Doctorate in Science and Innovation in the Chemical Industry. Assistant Professor and Researcher in the Faculty of Engineering at the National University of Misiones, Argentina. Books published: 14. Book chapters written: 51. Technical reviews: 14. Journal publications:

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Eligio Jesus Castellanos Estupiñán is a chemical engineer graduated in 1972. He obtained his PhD in Technical Sciences in 1990. He is professor at the Department of Chemical Engineering in the Central University "Marta Abreu de Las Villas". He makes research on operational controlling for chemical industries, mainly related to energy and environmental management and unconventional methods (use of membranes, electric and magnetic field). He collaborates in research related to non-conventional methods with the University of Oviedo in Spain and San Luis in Argentina.

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	<p>Isnel Benítez Cortés. Dean of the Faculty of Applied Sciences. He received his PhD degree in Technical Sciences from the University of “Camaguey Ignacio Agramonte Loynaz” in 2008. He worked in the field of technologies to reduce sulfur dioxide in combustion gases, under the supervision of Prof Dr. Luis Beltrán Ramos Sánchez and Dr. Agustín García Rodríguez. He is professor of Automatic Control in Chemical Industry and Process Analysis and Engineering at the University of Camaguey since 1995. Currently, he is a full-time Professor at above mentioned university. He was director of the Chemical Department for five years and is now dean of the Exact Science Faculty. His main research interests concern the development of new process and technologies to obtain essential oils and more clean production. He has been part of different events and has written several scientific articles.</p> <p>Institution: Universidad de Camagüey Ignacio Agramonte Loynaz, Cuba.</p> <p>Email: isnel.benites@reduc.edu.cu</p>
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