



EDITORIAL

Universidad ECCI hosted several meetings and events during 2015. Our aim was to create and foster spaces for scientific debate, knowledge sharing and outreach for the general scientific community.

In October, ECCI hosted the "3er Congreso Latinoamericano de Investigación Educativa" (3rd Latin American Conference on Education Research). Human Quality was the central theme considering the current relevance of the peace process in Colombia. Universities need to generate strategies aligned with this process through education, development, and the socialization of science.

Universidad ECCI along with the Universidad Nacional de Colombia also hosted the "Seminario Internacional de Sistemas Energéticos y Energización Rural" (International Seminar on Energy Systems and Rural Energy Accessibility), where researchers presented their recent results on renewable energies, given Colombia's privileged geographical location and natural resources.

Universidad de los Andes and Universidad ECCI co-hosted the 2nd Astronomy in the Andean Region Workshop where 100 researchers and students from the Andean

countries (Bolivia, Chile, Colombia, Ecuador, Perú, and Venezuela) gathered to share their recent developments and to co-create transnational collaborations in the field of Astronomy. The context for this meeting was the creation of the Andean Regional Office of Astronomy for Development of the International Astronomical Union. The main focus of this office is to foster and support Astronomy projects in the Andean region that generate multi-dimensional development in education, outreach and research.

With the Universidad Antonio Nariño, ECCI also co-hosted the "3er Seminario Internacional Sobre Sistemas Electromecánicos" (3rd International Seminar on Electromechanical Systems) where international experts discussed recent developments in robotics in industrial contexts; computer assisted design, microgrids, and co-generation.

The paper titled "Influence of a plasma swirl motion on fine magnetic concentrations in the solar photosphere" opens our issue. In this article, a team of researchers from the Universidad Nacional De Colombia, the Universidad de Alcalá (Spain), ICATE-CONICET (Argentina) and the Universidad de Valencia (Spain) studied plasma vortices in the Sun using high-resolution observations from ground-



based and space-based telescopes. As plasma vortices are related to the magnetic activity of the Sun, this research has a significant impact on how to monitor the Solar outbursts that have the potential to affect satellite telecommunications.

A research group from the Universidad Militar Nueva Granada presents the paper "Design and construction of a machine for micro-abrasion-corrosion testing in simulated biological environments", which describes a method to design and manufacture equipment that performs simultaneous micro-abrasion and electrochemical tests on various materials in simulated biological fluids for the purpose of observing their behavior and viability as a biomaterial.

Researchers from the Universidad Autónoma de Colombia developed the paper titled "Triad model articulation of Integrated Management Systems [HSEQT]", which shows a model that integrates the ISO 9001:2008, ISO 14001:2004 y OHSAS 18001:2007 standards, showing success case studies of private businesses that implemented management systems.

The paper titled "Incidence of Corrosion on Electric Power Losses in ACSR Cables" by researchers from the Universidad Antonio Nariño sede Bucaramanga shows the study of the effect the accelerated corrosion in the mass and electric energy loss in ACSR cables, with a simulation of a marine environment and using a saline fog chamber. Their results showed that the hours of exposure of the

samples in the saline fog chamber generated greater effects in galvanized steel, causing damage to its zinc layer, in contrast to aluminum that turned out to be more resistant to this type of contaminant.

Researchers from the Escuela Politécnica Nacional (Ecuador) studied the most energetic phenomena in the Universe, Gamma Ray Bursts in the paper titled "Study of the internal structure of long GRBs with similar redshift". In this work, they attempt to hint at a new classification for GRBs based on a correlation between spectral lag (the time delay between the arrival of high energy and low energy photons) and luminosity of the burst.

The astroengineering research group Alfa-Orion of the Universidad Tecnológica de Pereira, present a paper titled "Development of a Magnetic Loop Antenna for the Detection of Jovian Radio Waves at 20.1 MHz". This study enabled the observation of radio sources A, B, C, IoA, IoB and IoC from Jupiter, allowing the construction of a database for the study of Jovian activity in radio waves. This is a pioneering result in a very fertile area of research (astronomical instrumentation) which is just starting in Colombia.

The paper titled "Comparative analysis of SOM Networks and Bayesian Networks applied to structural failure detection" by researchers from the Universidad Industrial de Santander and Universidad Antonio Nariño sede Bucaramanga contains a comparative study of Self-Organizing Maps (SOM) and Bayesian Networks. The general aim is to evaluate



their performance in the field of structural health as damage detector of type III structural failures. Simulations were carried with OpenSees and MATLAB®. Based on these results, they propose a hybrid methodology (BAYSOM) that seeks to reduce computational cost and improve performance in the diagnosis and detection of fault conditions in structures.

A team of researchers from the Universidad Antonio Nariño and Universidad del Norte developed the study "Thermodynamic Analysis of Self-Ignition in Spark-Ignited Engines Operated with Alternative Gaseous Fuels". This study develops a thermodynamic analysis to explore the self-ignition phenomenon in gaseous alternative fuels during the compression stroke in spark-ignited internal combustion engines.

The paper titled "Distribution of mass of the protoplanetary disk HL Tau" features one of the most interesting astrophysical objects to come to the attention of researchers last year, when HL Tau was imaged using the Atacama Large Millimeter/Sub-millimeter Array. This picture, which hit news outlets around the world, showed gaps in its debris disk that are believed to be related to active planet formation. Researchers from the Universidad Pedagógica y Tecnológica de Tunja propose a distribution of mass for the hypothetical planets orbiting HL Tau, and find that such a planetary system would indeed be stable.

The paper titled "Non-Traditional Flow Shop Scheduling Using CSP" from researchers in the Universidad del Valle addresses the problem of scheduling in a flow shop manufacturing environment with non-traditional requirements, where some jobs must be scheduled earlier and others later depending on the priority established by demand characteristics.

As presented above, the current articles contribute to addressing some modern life and modern science challenges. Universidad ECCI thanks the contributions of:

- ✎ Universidad Nacional de Colombia
- ✎ Universidad Tecnológica de Pereira
- ✎ Universidad Militar Nueva Granada
- ✎ Universidad Autónoma de Colombia
- ✎ Universidad Antonio Nariño sede Bucaramanga
- ✎ Escuela Politécnica Nacional de Ecuador
- ✎ Universidad Pedagógica y Tecnológica de Colombia
- ✎ Universidad del Norte
- ✎ Universidad del Valle

Sincerely,

MSc. Fernando Arturo Soler López

Rector

Universidad ECCI