EDITORIAL

Mechanical Engineering in Chile: present and future

The XVI Chilean Mechanical Engineering Congress (COCIM) was held in Valparaiso, during November of 2015, aiming to gather both scientific and industrial communities in order to analyze current national technological challenges and proposed solutions regarding the more important topics of the field. The Mechanical Engineering Department of the Federico Santa Maria Technical University (UTFSM) was in charge of this year organization, receiving the help and support of academics, researchers, engineers, and undergraduate and postgraduate student from national and foreign universities and companies.

With the passage of time the COCIM has come to be an instance where researchers and institutions may exchange experiences and debate about the current status and future of the field. During the 3 days of the XVI COCIM several activities were held, such as: 4 international plenary sessions, 2 symposiums, one industry trade fair, and round table on the future of Mechanical Engineering in Chile. The latter was attended by: Ing. Sally Bederesky from the “Instituto de Ingenieros”, Ing. Felipe Solorza from the “Colegio de Ingenieros”, Dr. Mario Letelier from the “Sociedad Chilena de Educación en Ingeniería”, and important regional companies. Over 80 research works were presented featuring a wide variety of topics such as: thermal processes, fluid mechanics, renewable energies, numerical methods and computational mechanics, production methods and management engineering, maintenance engineering, mechatronics, energy economics, machine design, mechanical behavior of materials, and education in engineering.

The plenary sessions were held by the following researchers, all from international universities:

- Professor from the John Hopkins University, USA, Ph.D Charles Meneveay, over *Turbulence in the Big Data era: allowing public access to massive simulations on fluid mechanics*.
- Professor from the Offenburg University of Applied Sciences, Germany, Dipl.-Ing. Elmar Bollin, over *New Developments in Renewable Energy made in Germany*.
- Professor from the University of Navarra, Spain, Dr. Rufino Goñi, over *The Art of Structural Simulations: Experiments and Models*.
- Professor from the University of Zaragoza, Spain, Dr. César Dopazo, over: *Direct Numerical Simulation (DNS) of premixed combustion systems*.

During a parallel session of the XVI COCIM the *Symposium on Combustion* took place with the participation of 10 research papers as well as the keynote speaker, Dr. César Dopazo, lecture on *Micro-combustion in hydrodynamic cavitation processes and its applications*. Likewise, the “Symposium on Solar Energy” was held in a second parallel session with the presentation of 11 research papers. Additionally, two keynote speakers lectures were presented: Prof. Dipl.-Ing. Elmar Bollin on the topic of *Challenges for Renewable Energy Technologies Today* and Ph.D Inmaculada Arauzo from the University of Zaragoza, Spain, on the topic of *Solar thermal plant hybridized with Biomass*.

In order to ensure the transfer and availability of the knowledge gathered and created during the XVI COCIM, the Organization Committee has decided to open to the scientific and professional communities the congress proceedings, as well as some of the audiovisual material from the plenary sessions and the round table. The above discussed material is available at the website: http://www.mecanica.usm.cl
Additionally, as a way to value and witness the effort put in the preparation of the research papers presented at the XVI COCIM, the Organization Committee has selected the best papers in order to publish them in this special edition of the Ingeniare. Revista Chilena de Ingeniería journal. The selection of these papers was made under a peer-review process according to the standards and criteria of this journal. At this point it is imperative to distinguish and appreciate the crucial collaboration of all reviewers that took part of the process, their work was rigorous and on time, and the Editor of the Ingeniare journal, Dr. Kristopher Chandía, for his dedication in readying the publication of this special issue.

The Mechanical Engineering, as a branch of Engineering, grew stronger with the increase of machine usage for different applications (thermal, hydraulics, transportation and manufacturing) during the Industrial Revolution on the second half of the XVIII century. Having elapsed 75 years since the first Chilean mechanical engineer, Mr. Francisco González Villalobos, received his degree from the Federico Santa María Technical University in 1940, the articles in this special issue are, in our opinion, a representative sample of the current status of national research being conducted on the field, and also bring to light the links and active cooperation between researchers, industries and international entities.

The future of the Mechanical Engineering in Chile, as well as the status of its scientific and applied research, can be understood by analyzing the articles and results from the XVI COCIM 2015. It is difficult to think in national progress, for instance in mining, agriculture, infrastructure, energy, education, and health, without the existence of a highly qualified critical mass of professionals capable of: developing new technologies, or assimilate and improve existing ones by yielding them more efficient, environmentally friendly and socially responsible. In this regard, the contribution of the Mechanical Engineering specialty can be seen in the development of joint research with national industries in areas such as fluid mechanics, solid mechanics, mechanical design, manufacturing processes, renewable energies and combustion, from an experimental and/or a computational approach. We highlight the strong development of computational mechanics crosswise the different fields of the specialty.

As discussed during the XVI COCIM, we are convinced that in order to accomplish true technological progress, it is not enough merely achieving a collaboration between the academic and industrial sectors, but it is mandatory to involve public policies in a permanent fashion to ensure its success.

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