

**THE INTERNATIONAL CONFERENCE “WOOD SCIENCE AND ENGINEERING IN
THE THIRD MILLENNIUM” – ICWSE 2011**
8th edition
03-05 November, Brasov, Romania

The Aula of the *Transilvania* University in Brasov, Romania, hosted between 03 and 05 November 2011 the 8th edition of the International Conference “Wood Science and Engineering in the Third Millennium”-ICWSE 2011, organized every 2 years by the Faculty of Wood Engineering, in collaboration with IUFRO.

Eighty researchers from 11 countries (Turkey, Japan, Greece, Sweden, Slovakia, Hungary, Germany, Norway, France, Switzerland and Romania) attended this edition. The 80 papers included in the conference program covered the whole thematic range of this conference on wood engineering, by approaching various topics of maximum interest and actuality regarding:

- Wood structure and properties
- Wood drying and heat treatments
- Mechanical wood processing
- Wood-based composites
- Gluing, coating and chemical modification of wood
- Conservation-restoration of wooden objects
- Wood constructions
- Computer-aided engineering in wood industry
- Economics in wood industry

The Opening Ceremony was moderated by the conference coordinator, Prof.dr.eng. Mihaela Campean. Welcome speeches were addressed by the Dean of the Wood Engineering Faculty, Prof.dr.eng. Gavril Budau and by the Vice-Rector for Visual Identity and International Relations of the *Transilvania* University, Prof.dr.eng. Marina Cionca. The Opening Ceremony reunited representatives from industry, media, teachers and students. All speakers expressed their joy to support the faculty with the organization of such events, which promote research in the field of wood engineering. Once again, it was proven that the Faculty of Wood Engineering in Brasov remains the main link between the triad elements Education – Research – Industry in the Romanian wood sector, fulfilling successfully its role as central information access pole in this domain.

Within the first part of the conference, three Keynote Addresses were presented in plenum.

The first presentation, “Wood science education in Europe” was given by Dr.eng.dr. Marius Catalin Barbu, professor at the Faculty of Wood Engineering in Brasov. After the political reforms in 1989, the large research centers and high education institutions of Eastern Europe were reintegrated and reformed in order to be able to survive the economic and political changes. At the same time pressure from Western countries was high and resulted in a decline of the paper and wood processing industries. The harsh competition, massive immigration of high qualified personnel from East to West and the transfer of the production capacities from Western to Eastern part of Europe in order to avoid higher salaries but also high environmental requirements had a major impact on the quality and number of students in both regions. The decreasing number of high school graduates along with the decreasing motivation for practicing wood engineering, considering the financial difficulties of the wood-processing enterprises, lead to a dramatic decrease of the number of students and even the disappearance of some traditional faculties. At present, there are in European space ca. 100 faculties/departments within higher education institutions which teach wood science and/or wood engineering.

The second Keynote Address, “Present needs and trends of applicative research in the wood sector” was offered by Dr. Steffen Tobisch, Director of the Institute of Wood Technology Dresden. Dr. Tobisch emphasized that forestry and the woodworking industry, the wood-processing trade and the supply industry are facing a variety of challenges today, which are partly inherent in their nature, partly caused by politics and can meanwhile be attributed also to globalize markets. These challenges aggravate competition among suppliers and result in changes in the markets. They have a direct impact on employment and the situation in the job market; they affect prices for energy and resources and cause changes in the supply of raw materials and auxiliaries as well as in the products that are marketable in a social context. And if the woodworking industry wants to maintain its markets, and possibly expand them, it will be of extraordinary importance to make manufacturing and supply structures more flexible and to further expand the capacity for innovation. At this point, application-minded wood research plays an important role in the further development. Dr. Tobisch formulated in his presentation some recommendations for several woodworking sectors as well:

- Sawmilling: the conversion of forest will effect a change in deliverable wood species and qualities towards the less straight deciduous tree or strong timber species (coniferous wood, chest height diameter > 70 cm). The plant systems currently in use are not capable anymore of supplying the usual assortments in sufficient quantities and quality pleasing the customer. In this view, machine-building concepts are to be designed and implemented that respond to these changes by higher flexibility with regard to maximum diameters and a higher degree of inhomogeneity in dimensions.
- Constructions: previously used, long and straight-grown coniferous species of well-known grading and resistance classes are increasingly being substituted by dimensionally inhomogeneous deciduous species of lower biological resistance and with characteristic properties missing (strength, stiffness). The glues, modes of application and curing used so far in the lamination of coniferous wood need to be adapted to the use of deciduous species; research and investigations into “green gluing” and into the application of new and moisture-resistant systems appear to be sensible. Another task of research will be to design, investigate and establish design variants of multi-storey timber structures by using newly developed jointing systems and material combinations and thereby remove the previously existing weakness in their reaction to fire.
- Wood-based panels: here, the processes must be re-evaluated and redesigned, regarding their energy and resource efficiency. Industry, research and machine builders need to look into, first of all, the use of potential for energy-saving by applying more energy-efficient extraction techniques, into a reduction of heating and drying capacities and into an increase in manufacturing effectiveness. The implementation of the principles of a material-efficient production of wood-based materials will result in an increased manufacture of light-weight panels of the previously known issues of meeting the requirements of elasto-mechanical properties at reduced raw density, of meeting the requirements of properties desired for coating and jointing (narrow edges, extraction strength of means of jointing) and of its processability. Another possibility would be the development of panels of raw-density profiles that have been adjusted as to intended application or possibly asymmetrically, or the manufacture of very thin wood-based materials as semi-tools for the subsequent production of composites.
- Furniture: the use of light-weight wood-based materials (transport weight) that has frequently been called for by the industry and customers alike leads to some problems with view of the machinability and processability of such materials, of potential jointing agents for edge and front joints and with view of functional safety at increased mobility (fit to be set up several times) at the same time. Moreover, the rheological properties of light-weight materials are not sufficiently known. Hence it is necessary in these fields to initiate meaningful research projects in close cooperation with the furniture industry, manufacturers of wood-based materials and of jointing agents and applied research.

“As for the future” – cited the speaker in the end of his speech - “our mission is not to foresee it, but to make it possible” (Antoine de Saint-Exupery).

The third Keynote Address, entitled “COST – a flexible research networking tool to foster innovation. Forests, their products and services (FPS) domain”, was presented by Prof.dr. Elena Bobu from the Technical University “Gheorghe Asachi in Iași. This presentation focused on the present joint European research opportunities within the COST program, with concrete examples of recently opened actions:

- Action FP090: *Development and harmonization of new operational research and assessment procedures for sustainable forest biomass supply;*
- Action FP080: *Experimental and computational micro-characterization techniques in wood mechanics;*
- Action FP 1003: *Impact of renewable materials in packaging for sustainability - development of renewable fiber and bio-based materials for new packaging applications.*

Many interesting and actual papers were also presented within up-following conference program divided per sections, including:

- atomic-level strain sensing using FT-IR to determine the deformations of the chemical compounds of wood under tensile stress;
 - influence of moisture upon elastic properties of beech wood;
 - SEM images of dry spruce wood previously frozen under different conditions and evaluation of property changes occurred through freezing;
 - CT-images of spruce wood during heat treatment;
 - evaluation of dimensional stability of heat-treated wood of different wood species;
 - evaluation of wood roughness after milling, sanding and evaluation of a method to establish the measuring resolution;
 - effect of incising upon the stability of circular saw blades;
 - improvement of dimensional stability of MDF panels by addition of melamine-impregnated paper wastes;
 - use of coconut oil within wood-based composites;
 - comparative analysis of water absorption and swelling of acetylated wood compared to untreated wood from different exotic and home-grown species;
 - efficiency evaluation of new consolidation materials for old wood objects based on Paraloid B72 with insertion of nano-ZnO;
 - experimental testing of mechanical properties of lamellar beams made of poplar and spruce wood;
 - optimization software for wood milling processes
- and many other.

A selection of the best papers presented can be accessed online on the website of Pro Ligno Journal (www.proligno.ro), which dedicated a Special Edition – Vol. 7 N° 4 – December 2011 to this major international event.

A most attractive social program on both conference evenings completed the scientific part and enchanted the participants, making them express their wish to attend the next edition, in 2013, as well.

The Organizing Committee of the 8th Edition of ICWSE in December 2011