

## EAA SUMMER SCHOOL ON ACOUSTICS 2016 –REPORT

Previously to the EuroRegio 2016 Congress, on June 11<sup>th</sup> and 12<sup>th</sup>, the EAA Summer School on Acoustics was held at the Faculty of Engineering of the University of Porto (FEUP), in the city of Porto, in Portugal. This Summer School was sponsored by the European Acoustics Association (EAA) and was organized by the Portuguese and the Spanish Acoustical Societies (SPA and SEA), in collaboration with the Faculty of Engineering of the University of Porto.

The EAA Summer School comprised five topic-focused courses and one motivational and more general course, dealing with some of the most actual topics in acoustics, such as:

- ENA - Environmental acoustics and smart cities
- SAVB - Sustainable acoustics and vibrations in buildings
- RMA – Room and Musical acoustics
- 3DVA - 3D virtual acoustics
- NMA - Numerical methods in acoustics
- APA – Approaching Acoustics

Almost 130 participants attended all the EAA Summer School courses, which extended along two days, in two morning sessions and two afternoon sessions. For many participants, this was the opportunity for learning about important topics related to acoustics, lectured by recognized specialists from different European institutions.

A great dissemination and promotion work of the EAA Summer School was jointly developed by EAA, SPA and SEA, with the collaboration of the Young Acousticians Network (YAN) and the FEUP delegation of the International Association of Civil Engineering Students (IACES), who also cooperated with staff supporting teachers in the classrooms. In fact, the total number of almost 130 participants can be considered as very interesting. Some of these students also attended the EuroRegio2016 Congress in the subsequent days for free. There were participants coming from 19 countries worldwide, but an important number of students came from Portugal, Spain, Germany, Turkey, United Kingdom and Italy.

Additionally, a total number of 19 travel Grants was sponsored by SPA, SEA and International Commission for Acoustics (ICA), being offered to a selected group of participants (from 9 different countries) who applied for these grants through the Congress website. Almost half of the grants were given to Spanish students, and more than one student from Turkey and Slovakia also earned this kind of travel support.

According to the program, there were two full and half-day courses, which took place on Saturday June 11<sup>th</sup> and in the morning of Sunday, June 12<sup>th</sup>:

- The course entitled *ENA - Environmental acoustics and smart cities*, was lectured by José Luis Cueto from Universidad de Cádiz, Juan Miguel Navarro from Universidad Católica San Antonio de Murcia, and Enrique Nava from Universidad de Malaga. 15 participants were attending all sessions. This course represented an open look at the world of smart cities and environmental noise, its conceptual framework, and its technologies and applications;
- The course entitled *SAVB - Sustainable acoustics and vibrations in buildings*, was lectured by María Machimbarrena from Universidad de Valladolid, Rui Calejo from Faculdade de Engenharia da Universidade do Porto, Miguel Matos Neves from Instituto Superior Técnico, Elena Prokofieva from Edinburgh Napier University, and Ana Quintans from the BRE. It was attended by 11 participants. This course introduced the students in some new concepts concerning sound insulation requirements and set the basis for understanding sound and vibration propagation in buildings. It also dealt with sustainable sound insulation solutions used in different environments and focused in the concept of "sustainable construction" and in the compatibility between acoustic performance and structural and energetic performance of buildings.



“SAVB lecture”

Also during Saturday, June 11<sup>th</sup>, two half-day courses were held in the Summer School:

- The course entitled *NMA - Numerical methods in acoustics*, was lectured by Steffen Marburg from Technische Universität München, and Maarten Hornikx from Technische Universiteit Eindhoven, and it had 16 participants attending the session. The first lecture on numerical methods dealt with finite and boundary element methods for solution of the Helmholtz equation; and the second lecture dealt with an overview of volume-discretization time-domain methods for propagation of sound propagation in air;
- The course entitled *3DVA - 3D virtual acoustics*, was lectured by Michael Vorlander from RWTH Aachen University, and Diogo Alarcão from Instituto Superior Técnico, in Lisbon, and it was attended by 31 participants. This course handled the fundamental concepts and strategies concerning 3D Virtual Acoustics.



“General view of 3DV attendance”

During all Sunday long, June 12<sup>th</sup>, two full-day courses also took place in the scope of the EAA Summer School, at FEUP:

- The course entitled *RMA – Room and Musical acoustics*, was lectured by José Antunes from Instituto Superior Técnico, in Lisbon, Vincent Debut from Universidade Nova de Lisboa, and Ocátivo Inácio from Instituto Politécnico do Porto. 29 participants attended the sessions during the day. This full-day course addressed both the acoustical features of the information transmission path studied in room acoustics and the acoustical features of the sound production studied in instrumental acoustics;



“RMA attendance”

- The course entitled *APA – Approaching Acoustics*, was lectured by Cecília Rocha from Faculdade de Engenharia da Universidade do Porto, María Machimbarrena from Universidad de Valladolid, José Luis Cueto from Universidad de Cádiz, and by Jorge Fradique, from Instituto Português da Qualidade, and it was attended by 26 participants. This was an introductory course with the objective of motivating students and young researchers for acoustics. A glimpse of the interesting scientific topics of acoustic fields was proposed to the audience. The participants were mainly undergraduate or master students in engineering or physics, or enthusiasts trying to have the first motivational contact with acoustics. For students (except PhD) participating in this APA course, the registration was waived.



“Lecturing at the APA course”

On the afternoon of the Monday June 13<sup>th</sup>, optative Exams in the Summer School courses, except the motivational APA course, were provided to almost one quarter of the total participants. These students had previously registered for this evaluation component and, in case of success, certificates for recommended ECTS credits were issued by the Organizing Committee.

For the EAA Summer School participants different social activities were prepared in a get-together style, namely a dinner on Saturday June 11<sup>th</sup>, organized by the YAN, and a boat trip along Douro River, at the sunset of Sunday June 12<sup>th</sup>, which was promoted by IACES. Both social events were greatly participated and were used to break the ice between Summer School participants.

In order to help with the improvement of future EAA Schools, an anonymous Survey was prepared and distributed to all Summer School 2016 participants. Important, interesting and valuable comments can now be analyzed, regarding the organization of the Summer School itself and more specific information related to the evaluation of each course and further suggestions from the participants.

The organizers have the opinion, shared by others (professors and participants), that the School was really important and that this kind of initiative is an excellent way for the promotion of acoustics and future development of research and studies in this scientific area.

On behalf of the Summer School organizing Committee

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