

## **PUBLISHABLE SUMMARY**

ITN – BATWOMAN (**B**asic **A**coustics **T**raining - & **W**orkprogram **O**n **M**ethodologies for **A**coustics – **N**etwork, GA-2013- 605867): The BATWOMAN ITN aims at providing top level PhD research training in basic and advanced acoustics for a group of 13 young scientists studying in 8 European countries. Two experienced researchers (postdoc positions) and supervisors from 8 Universities and 5 private enterprises are taking care that research projects are being related and coordinated and that achievements and challenges are being adequately communicated within the consortium and disseminated to an interested public.

The interdisciplinary and intersectoral scientific training together with a broad range of transferable skills training courses will ensure good career opportunities for the early-stage researchers in a highly diverse research field which is currently getting more and more attention and attraction. The scientific research done within the project is expected to significantly push the state of the art in all the branches of acoustics which have been united by BATWOMAN.

The consortium consists of renowned public and private partners from musical acoustics, room acoustics and automotive acoustics who are ready to merge their existing knowledge, extend it jointly and complement it with insights of current sound perception research. This exploits existing synergies and overcomes obvious fragmentation in research, methodology and basic as well as advanced acoustics training.

Providing interdisciplinary training and joining or exchanging methodology in research is expected to have a strong impact on the skills of trained researchers as far as sound design capabilities, modelling accuracy, efficiency and applicable frequency range is concerned. Adding the understanding of human auditory perception helps to tackle the hard problem of sound quality parameters and to better understand stimulating effects on well-being and cognition of people exposed to sound, but also harmful effects, like annoyance or even deteriorating cognitive performance.

The ITN therefore provides interdisciplinary and intersectoral research training for excellence. It structures existing PhD-level training in acoustics setting up European curricula with compatible and recognised courses offered by Universities and private enterprises. Simultaneously it pushes the state of the art in vibro-acoustic modelling and in interdisciplinary design optimisation by initiating a joint research effort increasing critical mass. The complementary structure of the network will make it not to break apart after the ITN project period. It is rather expected that the methodologies used to analyse, design and optimise transport vehicles, rooms and musical instruments will grow together and will be further developed in an interdisciplinary joint effort.

### **General objectives of the BATWOMAN project**

- To bring together early career researchers and experienced colleagues from across Europe, from across musical acoustics, room acoustics, vehicle acoustics and perception research, and from a broad range of professional backgrounds.
- To motivate and encourage early stage researchers to do advanced scientific research in one of the fields of acoustics but being aware of and successfully using and combining the methodologies of other adjacent fields of acoustics which have almost completely been ignored in the past.
- To provide high level education, training facilities and technical supervision for PhD fellows in the whole multidisciplinary field of acoustics, thus eliminating the overspecialisation potentially limiting career perspectives.
- To put a new focus of engineering acoustics on perception science by studying sound quality of full audio bandwidth sounds and how such sounds can affect cognitive performance. Similarities between the perceived sound of musical instruments, vehicles or consumer items are to be studied.

### **Description of the main results achieved so far in the BATWOMAN project:**

- An excellent consortium with high and very active industrial participation
- including top universities and research centres from seven countries.
- Individual personal carrier development plans for each fellow.
- Training events (technical workshops, public tutorials and complementary skills courses).

The project website is active and can be found here: <http://www.batwoman.eu/>

## **PROJECT OBJECTIVES FOR THE PERIOD**

The general objectives of the project are listed below, indicating how the network is in full progress of achieving the objectives:

**OBJECTIVE1:** To bring together early career researchers and experienced colleagues from across Europe, from across musical acoustics, room acoustics, vehicle acoustics and perception research, and from a broad range of professional backgrounds.

**PROGRESS1:** Achieved by the definition of an excellent consortium with high and very active industrial participation.

**OBJECTIVE2:** To motivate and encourage early stage researchers to do advanced scientific research in one of the fields of acoustics but being aware of and successfully using and combining the methodologies of other adjacent fields of acoustics which have almost completely been ignored in the past.

**PROGRESS2:** Achieved by the selection of participating universities and research centres, by carefully worked out secondment plans and by forcing an active exchange of ideas and experiences during the biannual technical workshops and in between by state of the art means of electronic communication and video conferencing.

**OBJECTIVE3:** To provide high level education, training facilities and technical supervision for PhD fellows in the whole multidisciplinary field of acoustics, thus eliminating the overspecialisation potentially limiting career perspectives.

**PROGRESS3:** Achieved through high-level internal and external training events such as the mandatory biannual technical workshops in Paris, Detmold and Graz or the first public tutorial course in Vienna, which was part of ViennaTalk 2015, an international conference on Music Acoustics organized by the BATWOMAN partner MDW.

**OBJECTIVE4:** To put a new focus of engineering acoustics on perception science by studying sound quality of full audio bandwidth sounds and how such sounds can affect cognitive performance. Similarities between the perceived sound of musical instruments, vehicles or consumer items are to be studied.

**PROGRESS4:** Achieved by the participation of Prof. Kohlrausch who is an expert in psychoacoustics and sound perception and who represents the BATWOMAN partners University of Eindhoven and Philips Research and by the research projects of the two fellows supervised by him. Collaborations between young researchers of different disciplines - e.g., automotive design and musical acoustics, room acoustics and sound perception, etc. - are being encouraged and are supposed to lead to new theoretical and practical concepts emerging from the forefront of technological development in their respective fields and eventually to joint publications.