



DENORMS Action CA15125

Training School

***Use and characterisation of new
acoustic treatments and tools***

Budapest (Hungary), 16-18 December 2019



DENORMS Action's 5th Training School "***Use and characterisation of new acoustic treatments and tools***" will be held from **16th to 18th December 2019 in Budapest (Hungary)**, organised by Óbuda University.

This Training school is aimed at the industrial partners and Early Career Investigators. The training will be offered in both theoretical and experimental aspects of developing new sound absorbing and sound controlling structures.

During the first day, the refresher training courses will be organised covering the basic theory of sound interaction with porous materials and metamaterials. During the following two days lectures and practical sessions will familiarise the audience with the new methods used in design of conventional and metamaterial based noise reducing treatments.

Scientific & social program

The lectures and practicals will be held **room 252, 2nd Floor, Bánki Donát, Faculty of Mechanical and Safety Engineering, Óbuda University, Nepszínház utca 8.**

Practical for which a laptop is mandatory are indicated **in red**. We kindly ask you to install COMSOL Multiphysics by following the instructions provided in the item practical information.

✓ **Day 1, December 16 2019 Refresher courses**

- 8h30: Registration
- 9h10-9h30: Welcoming words and opening ceremony
- 9h30-10h30: *Acoustic wave propagation in viscothermal fluids and acoustic materials, Part I* by N. Dauchez (University of Technology of Compiègne - UTC)
 - Coffe break: 10h30-11h
- 11h-12h: *Acoustic wave propagation in viscothermal fluids and acoustic materials, Part II* by N. Dauchez (University of Technology of Compiègne - UTC)
 - Lunch break: 12h-13h30
- 13h30-15h: *Transfer matrix method for conventional acoustic materials and structures, Part I* by N. Atalla (Université de Sherbrooke)
 - Coffee break: 15h-15h30
- 15h30-17h: *Transfer matrix method for conventional acoustic materials and structures, Part II* by N. Atalla (Université de Sherbrooke)
- 18h: Departure for Sightseeing, which will end at the Christmas market
<https://city-sightseeing.com/en/48/budapest/57/hop-on-hop-off-budapest>
- 21h: YAN social event

✓ **Day 2, December 17 2019 Porous materials**

- 9h30-10h30: *Introduction to homogenisation theory and its application to porous materials design, Part I* by C. Perrot (Université Paris-Est Marne-la-Vallée - UPEM)
 - Coffe break: 10h30-11h
- 11h-12h00: *Introduction to homogenisation theory and its application to porous materials design, Part II* by C. Perrot (Université Paris-Est Marne-la-Vallée - UPEM)
 - Lunch break: 12h-13h30
- **13h30-15h**: *Practical session on design/manufacturing (including rapid manufacturing) and characterisation of porous materials* by T. Cavalieri (LAUM, UMR CNRS 6613, Safran Aircraft Engines)
 - Coffee break: 15h-15h30
- **15h30-17h**: *Practical session on design/manufacturing (including rapid manufacturing) and characterisation of porous materials* by T. Cavalieri and J. Boulvert (LAUM, UMR CNRS 6613, Safran Aircraft Engines)
- 18h00: Diner at Thököly Restaurant - <http://www.thokolyrestaurant.hu/en/index1.php>

✓ **Day 3, December 18 2019 Acoustic metamaterials**

- 9h30-10h30: *Application of the transfer matrix method to acoustic metamaterial design, Part I* by N. Jiménez (Spanish Research Council - CSIC)
 - Coffee break: 10h30-11h
- 11h-12h00: *Application of the transfer matrix method to acoustic metamaterial design, Part II* by N. Jiménez (Spanish Research Council - CSIC)
 - Lunch break: 12h-13h30
- **13h30-15h**: *Practical session on design/manufacturing (including rapid manufacturing) and characterisation of acoustic metamaterials* by V. Romero-García and J.-P. Groby (LAUM, UMR CNRS 6613)
 - Coffee break: 15h-15h30
- **15h30-17h**: *Practical session on design/manufacturing (including rapid manufacturing) and characterisation of acoustic metamaterials* by V. Romero-García and J.-P. Groby (LAUM, UMR CNRS 6613)
- 17h-17h10: Closing ceremony

Practical information for the lectures

A **laptop with Comsol Multiphysics is mandatory** to attend the practical scheduled on Day 2 and Day 3 in the afternoon.

✓ **How to install Comsol Multiphysics:**

Please read the instructions below, then download your trial version of COMSOL Multiphysics at <http://www.comsol.fr/product-download>

License number: 8078028

Passcode: 9FFF3FFFF7F533-PYFR-191223-8078028-43B81D0EC010

To access the downloading page, it is necessary to activate your "COMSOL Access" account with the license information above. If you do not have an account, you will need to create one from the "Create Account" tab available on this same page.

Once the downloading page is available, we recommend that you download the installer before starting the installation.

Important information:

- If you do not already have a COMSOL Access account, you will be asked to create one (password of the account you have defined)
- Download help: www.comsol.fr/support/knowledgebase/1149/
- Installation assistance: www.comsol.fr/support/knowledgebase/1077/
- Online installation manual: www.comsol.fr/iog
- Run the downloaded file as an administrator
- If COMSOL Multiphysics is already installed on your computer, choose a different installation directory for the trial version than for the existing installation

Catering

Refreshments will be provided free of charge. The Conference will cover refreshments throughout the event on 16-18 December 2019.

Lunches (not free of charge!) will be proposed at the Training School location for 3600 Ft per person and per day. It includes a soup, a main dish, and a dessert. **Payment is mandatory at the registration desk the first day.**

A Dinner (also not free of charge!) is proposed on Day 2, December 17 2019. **Registration is mandatory at the registration desk.**

Social events

- ✓ **Day 1:** Sightseeing, visit of Budapest and Christmas market <https://city-sightseeing.com/en/48/budapest/57/hop-on-hop-off-budapest>. **Payment is mandatory at the registration desk the first day** (approximate price 4500 Ft).
- ✓ **Day 1:** YAN social event, **beers for free!**
- ✓ **Day 2:** Diner at Thököl Restaurant - <http://www.thokolyrestaurant.hu/en/index1.php>

Venue



The Training School will be held at Bánki Donát, Faculty of Mechanical and Safety Engineering, Óbuda University, Nepszínház utca 8, located in the city center of Budapest. More information on <https://www.budapestinfo.hu/en/>.



Transport Connections

Airport connections

Budapest city center can be reached from the Airport by public transportation. Bus line 200E operates day and night between Terminal 2 and Nagyvárad tér metro station (the temporary terminus of metro line M3 during reconstruction*). BKK tickets, multi-day travelcards or passes are required for travel. More information on <https://www.bud.hu/en/passengers/transport>.

Another possibility is Ferihegy transfer <http://www.ferihegyexpress.com/en/>

Local Transportation

Local organiser suggests the 72 hours transfer ticket, which is 4150 Ft.

Contacts

- Local hosts:
 - Cvetityánin Livia, <mailto:cpinter.livia@bgk.uni-obuda.hu>
 - Hronyecz Erika, <mailto:hronyecz.erika@bgk.uni-obuda.hu>
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Acknowledgement

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