

## Training Course

### Date

Friday, 8 June 2018

### Location

UPC BarcelonaTech, Campus Nord  
c/ Jordi Girona, 1-3  
08034 Barcelona (Spain)

### Lecturers

Dr Núria Pinyol  
Dr Alexander Rohe

### Registration Fee

€ 120,--

Includes: coffee breaks, lunch, tutorials  
and a GiD v14 licence for 1 year.  
The fee gives access to all GiD convention  
courses on 7 and 8 June.

### Registration form

[www.Anura3D.com/barcelona2018](http://www.Anura3D.com/barcelona2018)

### Registration deadline

13 April 2018

### Number of participants

Limited to 20

### Additional information

[alex.rohe@deltares.nl](mailto:alex.rohe@deltares.nl)

*The Anura3D Training Course is intended for PhD students, researchers and engineers interested in modelling large deformation and soil–water–structure interaction problems using the material point method.*

*The course includes lectures and hands-on computer sessions in which attendees will have the opportunity to have their first experience with the **Anura3D v2017.2** MPM software.*



This course is held in collaboration with:  
**9<sup>th</sup> Convention on  
Advances and Applications of GiD 2018  
(Workshop and Courses)**

[www.gidhome.com](http://www.gidhome.com)

## Training Course

Modelling large deformation and  
soil–water–structure interaction using  
the material point method

**8 June 2018 – Barcelona, Spain**



# Modelling large deformation and soil–water–structure interaction

Large deformation and soil–water–structure interaction problems exist in many environmental and civil engineering problems, such as landslides and slope instabilities, installation of piles in saturated soils, settlement due to consolidation processes, fluidisation and sedimentation processes in submerged slopes, internal erosion in dykes, and scouring around offshore structures.

The material point method (MPM) is a numerical approach capable of modelling large deformations and, within the framework of the Anura3D MPM Research Community, it has been further developed to cope with soil–water–structure interaction.

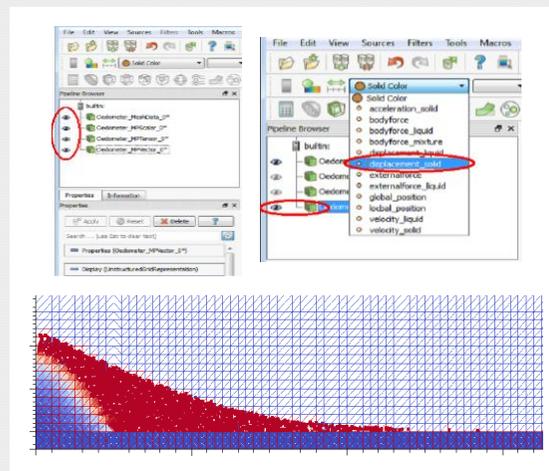
The **Anura3D v2017.2** MPM software uses a dynamic explicit MPM formulation. It is capable of simulating 1- and 2-phase materials and free surface water. A fully coupled hydro-mechanical approach is implemented to model the interaction between soil and water phases in saturated porous media. Contact problems can be solved using a contact algorithm. A library of constitutive laws is included as well as an interface for external user defined soil models.



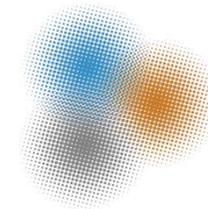
## Tutorials

Course participants will gain experience as users of the **Anura3D v2017.2** MPM software. During training lectures, the attendees will learn first-hand capabilities of MPM by means of a set of practical exercises that will be undertaken following a tutorial specially designed for the course. The tutorial will include the following exercises:

- Exercise 1: Oedometer problem
- Exercise 2: Column collapse
- Exercise 3: Shallow foundation
- Exercise 4: Excavation



[www.Anura3D.com](http://www.Anura3D.com)



## Programme

**Friday, 8 June 2018**

Location:

UPC BarcelonaTech, Campus Nord  
C1 Building, Room TBA (see website)

**08:30** Opening and introduction

**08:45** Theory and formulation Anura3D

**09:30** Hands-on using Anura3D

**10:00** Tutorial (Exercises 1 – 4)

**10:30** *Coffee break*

**11:00** Tutorial (Exercises 1 – 4)

**13:00** *Lunch*

**14:30** Tutorial (Exercises 1 – 4)

**16:30** *Coffee break*

**17:00** Tutorial (Exercises 1 – 4)

**17:30** Discussion and outlook

**18:00** Closure