

Welcome to the 13th SPHERIC International Workshop

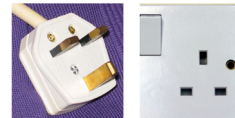
Information for speakers

Regular presentations are 13 minutes long. Instead of taking questions after each talk, there is a discussion period at the end of every session, involving all speakers.

The projector aspect ratio is 16:10. Slides designed in 4:3 ratio will be displayed without loss of size or quality.

A built-in PC is provided with Windows 10 and MS Office 2016. VGA and HDMI connections are available for laptops. In advance of your session, please either copy your presentation onto the built-in PC, or test your laptop. Workshop staff will be available to assist.

Ireland uses type G electrical connections (as in Britain).



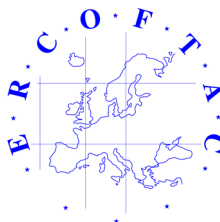
Venues

All activities are in the Alice Perry Engineering Building in NUI Galway, unless otherwise stated.

Training Day lectures are in G047 (ground floor, off the atrium) and the practical session is in room 2017 on the second floor. The Edit-a-thon is in room 2001 (second floor). Lunch is in the Zinc Café on the first floor

All workshop sessions are in room G018. Entrances are on the ground floor off the atrium, and on the first floor through the Zinc Café. Please use the upper entrance when a session is in progress. Lunch is in Friars Café and Restaurant, in the Cairnes Building.

Committee meetings are in room 2052 on the second floor.



Monday 25 June

Training Day

09:30 - 11:00	Lecture	Room G047
Fundamentals of SPH		Matteo Antuono
11:00 - 11:30	Coffee	
11:30 - 13:00	Lecture	Room G047
Delta-SPH: Theory and Applications		Salvatore Marrone
13:00 - 14:00	Lunch	Zinc Café (Alice Perry Building)
14:00 - 16:00	Practical	Room 2017
Simulation and Postprocessing		DualSPPhysics team

Wikipedia Edit-a-thon

09:30 - 11:00	Edit-a-thon	Room 2001
Convened by Daniel Duque		
11:30 - 13:00	Edit-a-thon	Room 2001
14:00 - 16:00	Edit-a-thon	Room 2001

SPHERIC Steering Committee Meeting

17:00 - 19:00	Room 2052
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08:15 – 08:50	Registration and coffee	
08:50 – 09:10	Welcome	
09:10 – 10:05	Keynote Lecture	Chair: Joe Monaghan
Some insights on SPH theories, and key aspects of application to complex free-surface flows		David Le Touzé
10:05 – 11:10	Convergence, Consistency and Stability 1	Chair: Guillaume Oger
An SPH numerical scheme with a diffusive term for the continuity equation based on Total Variation Diminishing reconstruction		Green, M. D.*, Vacondio, R., Peiró, J.
Enhancement of accuracy of stabilizer for projection-based particle method		Tsuruta, N.*, Khayyer, A., Gotoh, H.
Numerical error evaluations of the incompressible Navier-Stokes equations by a time-explicit generalized particle method		Tagami, D.*, Imoto, Y
Notes on the SPH model within the Arbitrary-Lagrangian-Eulerian framework		Colagrossi, A., Antuono, M., Marrone, S., Sun, P.M.*, Zhang, A.M.
11:10 – 11:40	Coffee	
11:40 – 12:45	Astrophysics and High-Performance Computing	Chair: Jose Luis Cercós-Pita
Smoothed Particle Hydrodynamics near black holes 		Liptai, D.*, Price, D.J.
Semi-implicit integration of strongly coupled dust and gas mixtures in astrophysical environments		Loren-Aguilar, P.*, Bate, M.R.
SWIFT: Maintaining weak-scalability with a dynamic range of 10^4 in time-step size to harness extreme adaptivity		Borrow, J., Bower, R.G., Draper, P.W., Gonnet, P., Schaller, M.*
MULTIGRAIN: Simulating mixtures of multiple dust grains and gas with SPH		Price, D.J.*, Hutchison, M.A., Laibe, G.
12:45 – 14:00	Lunch	
14:00 – 15:05	Industrial Applications: Energy and Aerospace	Chair: Emily Ryan
Applicability of hybrid SPH-FE analysis on reactor safety assessment		Groenenboom, P.H.L.*, Kamoulakos, A., Omata, I.
Multiscale simulation with projective integration of the erosion process of a Pelton bucket using the Finite Volume Particle Method 		Leguizamón, S.*, Jahanbakhsh, E., Maertens, A., Alimirzazadeh, S., Avellan, F.
Multiphase SPH modeling of supercooled large droplet dynamics 		Cui, X.D.*, Bakkar, A., Habashi, W.G.
Ineffectiveness of suppressing water spray by aircraft chine tire on a contaminated runway 		Ren, X.*, Xu, F., Zhang, X., Gao, X., Lv, J.
15:05 – 15:55	Free surfaces and surface tension	Chair: Audrey Maertens
A model for surface tension in the finite volume particle method without parasitic current 		Moghim, M.H.*, Quinlan, N.J.
A surface tension and wetting model for the δ^+ -SPH scheme		Bierwisch, C.*
SPH modelling of an experimental urban dam-break flood and a rectangular lateral side weir for flood-control works		Amicarelli, A.*
15:55 – 16:30	Coffee	
16:30 – 17:35	Adaptivity and Variable Resolution	Chair: Renato Vacondio
Development of consistent, conservative and accurate multi-resolution projection-based particle methods for hydroelastic fluid-structure interactions		Khayyer, A.*, Gotoh, H., Shimizu, Y., Tsuruta, N., Sasagawa, H.
Towards the simulation of laser material processing using SPH with adaptive particle refinement 		Hu, H.*, Eberhard, P., Fetzner, F., Berger, P.
Hydrodynamic SPH applications using adaptive kernel gradients and variable resolution		Leonardi, M.*, Dominguez, J.M., Rung, T.
Numerical SPH simulation of porous media flow considering permeability, capillarity and saturation relations 		Wybraniec, T.B.*, Sabrowski, P., Przybilla, S., Villwock, J.
17:40 – 18:20	Discussion	Chair: Alexandre Tartakovsky
Time-integration methods in SPH		
18:30 – 20:30	Welcome reception	(Sult / College Bar, NUI Galway)

Wednesday 27 June


(All sessions in room G018)

09:10 – 10:05	Keynote lecture	Chair: Steven Lind
Radial Basis Function-Generated Finite Differences (RBF-FD): New Opportunities for Applications in Scientific Computing		Natasha Flyer
10:05 – 11:10	Alternative Formulations	Chair: Abbas Khayyer
Free surface application of the PFEM (particles + finite elements) methodology to submerged cylinders		González, L.M.*, Ferrer, E., Gimenez, J.M.
Spectral particle simulations		Duque, D.*, Calderon-Sanchez, J.
Particle transport velocity correction for complex boundaries in the Finite Volume Particle Method 		McLoone, M.*, Moghimi, M.H., Quinlan, N.J.
An accurate SPH-ALE scheme for barotropic flows 		Collé, A.*, Limido, J., Vila, J.P.
11:10 – 11:40	Coffee	
11:40 – 12:30	Solid Mechanics, Geophysics and High-Performance Computing	Chair: Alex Crespo
Application of a penalty contact algorithm for ballistic impact simulations in an axisymmetrical SPH formulation 		Frissane, H.*, Taddei, L., Lebaal, N., Roth, S.
Modelling failure in solids using inter-particle interactions in SPH		De Vuyst, T.*, Vignjevic, R., Djordjevic, N., Campbell, J.C., Hughes, K.
Benchmarking of the GPUSPH particle engine on lava flows 		Zago, V.*, Bilotta, G., Cappello, A., Ganci, G., Del Negro, C., Hérault, A., Fortuna, L., Dalrymple, R.A.
12:30 – 13:45	Lunch	
13:45 – 14:50	Industrial Applications: Hydraulics and Marine	Chair: Matthieu De Leffe
SPH-based flooding simulations in probabilistic risk assessment		Montanari, N.*, Sampath, R., Akinci, N., Prescott, S., Smith, C., Weglian, J.
Simulating spillway flows with the SPH method		Moreira, A., Leroy, A.*, Violeau, D., Taveira- Pinto, F.
Validation of DualSPHysics for modelling WECs with mechanical systems: Application to the OWSC 		Brito, M.*, Canelas, R.B., Ferreira, R.M.L., Neves, M.G., Teixeira, L.
Survivability of floating moored offshore structures studied with DualSPHysics		Crespo, A.J.C.*, Domínguez, J.M., Gómez-Gesteira, M., Hall, M., Altomare, C., Wu, M. <i>et al.</i>
14:50 – 15:40	Incompressibility	Chair: Salvatore Marrone
Towards high-order 3-D Eulerian incompressible SPH for arbitrary geometries with generalised particle distributions		Fourtakas, G.*, Nasar, A., Vacondio, R., Stansby, P.K., Lind, S.J., Guo, X., Rogers, B.D.
Investigating breaking-wave forces on a vertical cylinder with a 3-D incompressible SPH (ISPH) numerical wave basin accelerated on a GPU 		Chow, A.D.*, Rogers, B.D., Lind, S.J., Stansby, P.K.
Predictive-corrective incompressible SPH for fluid modeling with multi-GPU acceleration		Peng, C.*, Bauinger, C., Szewc, K., Verma, K., Wu, W.
15:40 – 16:10	Coffee	
16:10 – 17:15	Convergence, Consistency and Stability 2	Chair: Jean-Christophe Marongiu
On second derivatives in SPH 		Biriukov, S.*, Price, D.
An alternative SPH formulation: ADER-WENO-SPH		Avesani, D.*, Vacondio, R., Dumbser, M., Righetti, M.
Fast, accurate techniques for integrating SPH dissipative equations		Monaghan, J.J.*
Effects of particle disordering on local and global fluid volume in the SPH method and proposition of an improved SPH-ALE scheme 		Michel, J.*, Oger, G., Le Touzé, D.
Use of WENO reconstructions in a high-order Riemann-SPH scheme 		Vergnaud, A.*, Oger, G., Le Touzé, D.
17:20 – 18:30	SPHERIC Steering Committee meeting	Room 2052
18:45 –	Banquet and Presentation of Joe Monaghan Prize	


Thursday 28 June

(All sessions in room G018)

09:00 – 10:05 Boundary Conditions

Introduction of partial slip boundary conditions to Smoothed Particle Hydrodynamics 

Generalized Boundary Local Coordinates: Application to the computation of forces in a Boundary Integral SPH formulation

A new Shepard renormalization factor formulation for boundary integrals 

Towards higher-order boundary conditions for Eulerian SPH

Chair: Agnès Leroy


English, A.*^{*}, Stansby, P.K., Lind, S.J.


Cercos-Pita, J.L.*^{*}, Macià, F., Calderon-Sanchez, J.


Calderon-Sanchez, J.*^{*}, Cercos-Pita, J.L., Duque, D.


Nasar, A.M.A.*^{*}, Fourtakas, G., Lind, S.J., Rogers, B.D., Stansby, P.K.

10:05 – 11:10 Multiple Continua and Multiphase Flow 1

An upwind scheme for conservative, realizable two-phase mixture SPH model with high density ratios 

Meshfree modeling of particulate flows with thermal convection using a finite particle method with particle shifting technique 

How to derive the multi-fluid delta-SPH model 

Sediment transport in free-surface flow using δ -like two-fluid SPH 

Chair: Georgios Fourtakas

Fonty, T.*^{*}, Ferrand, M., Leroy, A., Joly, A., Violeau, D.

Zhang, Z.L.*^{*}, Huang, C., Walayat, K., Liu, M.B.

Hammani, I.*^{*}, Oger, G., Le Touzé, D., Colagrossi, A., Marrone, S.


Olejník, M.*^{*}, Pozorski, J., Szewc, K.


11:10 – 11:40 Coffee

11:40 – 12:45 Industrial Applications: Materials and Biotechnology

Adaptive resolution in co-rotating twin-screw extruders 

Recycling composite materials using a water-jet tape deposition method

Heat conduction due to laser beam heating: effect of surface geometry 

A fully coupled SPH-based computational model for the integration of mixing, heat transfer and biochemical reactions in anaerobic digestion 

Chair: Fei Xu

Kondor, I.*^{*}, Scharler, R., Khinast, J.G.

Huntley, S.*^{*}, Rendall, T., Longana, M., Pozegic, T., Potter, K., Hamerton, I.

Blank, M.*^{*}, Nair, P., Pöschel, T.

Rezavand, M.*^{*}, Winkler, D., Rauch, W.

12:45 – 14:00 Lunch

14:00 – 14:55 Keynote lecture


Whither European Research Community On Flow, Turbulence And Combustion?

Chair: Ben Rogers

Stefan Hickel

14:55 – 16:00 Viscosity and Turbulence

Theoretical considerations on the constitutive properties of the SPH bulk viscosity

RANS simulation of a Pelton turbine Using the Finite Volume Particle Method accelerated on GPU 

LES-SPH model for weakly-compressible Navier-Stokes equations

Simulating low Reynolds number Newtonian and viscoelastic free surface flows using ISPH

Chair: Damien Violeau

Colagrossi, A., Durante, D., Souto-Iglesias, A., Bonet-Avalos, J.*^{*}

Alimirzazadeh, S.*^{*}, Leguizamón, S., Kumashiro, T., Maertens, A., Jahanbakhsh, E., Tani, K., Avellan, F.

Antuono, M., Marrone, S., Di Mascio, A.*^{*}, Colagrossi, A.

King, J.R.C.*^{*}, Lind, S.J.

16:00 – 16:30 Coffee

16:30 – 17:35 Multiple Continua and Multiphase Flow 2

Influence of the spurious interface fragmentation correction on the simulation of flow regimes

Smoothed Particle Hydrodynamics model for mesoscopic multiphase flows

Consistent Particle Method simulation of wave impact with entrapped air pocket

Three-dimensional SPH modeling of gas bubble bursting on free surface

Chair: Pablo Loren-Aguilar

Douillet-Grellier, T.*^{*}, De Vuyst, F., Calandra, H., Ricoux, P.

Tartakovsky, A.M.*^{*}

Luo, M.*^{*}, Reeve, D.E., Karunarathna, H.

Sun, P.N.*^{*}, Zhang, A.M., Ming, F.R., Cheng, H., Li, S.

17:35 – 17:50 Presentation of Libersky Prize

17:50 Close

18:00 – Optional Tours