SPHERIC'2014 programme

Red stars* spot the Libersky prize candidates.

Tuesday June 3

08:00 Registration

08:30 Opening of the 9th SPHERIC Workshop — **D. Violeau, A. Hérault, D. Le Touzé**

08:45 Keynote – Bliss and woe of simulating compressible flows with SPH — **W. Dehnen**

09:40 Session 1 – Multiphase Flow 1 — **Chair: N. Quinlan**

Paper 1.1 – A Multi-phase particle shifting algorithm for SPH simulations for violent hydrodynamics on a GPU — A. Mokos, B.D. Rogers, P.K. Stansby

Paper 1.2 – 3-D SPH modelling of sediment scouring induced by rapid flows* — G. Fourtakas, B.D. Rogers, D. Laurence

Paper 1.3 – SPH modelling of granular flows — A. Amicarelli, G. Agate

Paper 1.4 – Two-phase benchmarks for SPH multiphase fully compressible schemes — I. Zisis, R. Messahel, B. van der Linden, M. Souli

10:45 Coffee Break

11:10 Session 2 – Incompressibility — **Chair: P. Groenenboom**

Paper 2.1 – A non-Newtonian ISPH scheme for improved prediction of pressure fields* — A.M. Xenakis, S.J. Lind, P.K. Stansby, B.D. Rogers

Paper 2.2 – Buoyancy modelling with incompressible SPH and the unified semi-analytical wall boundary conditions* — A. Leroy, D. Violeau, M. Ferrand, A. Joly

Paper 2.3 – Modelling buoyancy and thermocapillary convection in molten metals using an incompressible SPH method — C. Demuth, A. Mahrle, A.F. Lasagni

Paper 2.4 – Space potential particles as free-surface boundary condition in projection-based particle methods — N. Tsuruta, A. Khayyer, H. Gotoh

12:15 Lunch

13:30 Session 3 – Surface Tension — **Chair: P. Stansby**

Paper 3.1 – A Novel Laplacian-based surface tension model for particle methods — A. Khayyer, H. Gotoh, N. Tsuruta

Paper 3.2 – On the issue of interface spurious fragmentations in multiphase SPH — K. Szewc, J. Pozorski, J.-P. Minier

Paper 3.3 – Numerical simulation of jet fragmentation in multi-fluid medium using Smoothed Particle Hydrodynamics — T. Yue, A. Kruisbrink, F. Pearce, H. Morvan

Paper 3.4 – Implementation of surface tension in flow polymer during Reactive Rotational Molding — A. Hamidi, S. Khelladi, L. Illoul, A. Tcharkhtchi

14:35 Session 4 – Boundary Conditions — **Chair: T. Dalrymple**

Paper 4.1 – Exact computation of SPH wall renormalising integrals in 3-D — D. Violeau, A. Mayrhofer, A. Leroy

Paper 4.2 – Local Uniform STencil (LUST) boundary conditions for 3-D irregular boundaries in DualSPHysics* — G. Fourtakas, R. Vacondio, J.M. Domínguez, A. Nasar, B.D. Rogers

Paper 4.3 – Explicit strategies for consistent kernel approximations* — M. Leonardi, T. Rung

Paper 4.4 – Open boundary conditions using the mirror ghost particle approach in OpenFOAM SPH* — B. Werdelmann, W. Krebs, R. Koch, H.-J. Bauer

15:40 Coffee Break

16:05 Session 5 – High Performance Computing — **Chair: J. Monaghan**

Paper 5.1 – MultiGPU, multi-node SPH implementation with arbitrary domain decomposition — E. Rustico, J. Jankowski, A. Hérault, G. Bilotta, C. Del Negro

Paper 5.2 – Towards a highly scalable Incompressible Smoothed Particle Hydrodynamics (ISPH) toolkit: Optimization for real applications — X. Guo, B.D. Rogers, S. Lind, P.K. Stansby, M. Ashworth

Paper 5.3 – Achieving the best accuracy in an SPH implementation — A. Hérault, G. Bilotta, R.A. Dalrymple

Paper 5.4 – Efficient implementation of double precision in GPU computing to simulate realistic cases with high resolution* — J.M. Domínguez, A.J.C. Crespo, A. Barreiro, B.D. Rogers, M. Gomez-Gesteira

17:10 Discussion Panel 1 – SPH Question Time — **Chair: B. Rogers**

18:10 Reception

Wednesday June 4

08:30 Keynote – Simulating Free-Surface Viscous Flows with SPH: Theoretical and Practical Aspects — **A. Colagrossi**

09:25 Session 6 – Multiphase 2 — **Chair: B. Rogers**

Paper 6.1 – Application of multiphase SPH to fluid structure interaction problems — R. Paredes, L. Imas

Paper 6.2 – Drying and morphology evolution of single droplets in spray processes* — W. Säckel, M. Huber, M. Hirschler, P. Kunz, U. Nieken

Paper 6.3 – Pairwise force Smoothed Particle Hydrodynamics multiphase flow model — A.M. Tartakovsky, U.B. Bandara, M. Oostrom, B. Palmer

Paper 6.4 – Application of SPH method using interparticle contact algorithms to mesomechanics of heterogeneous media — A. N. Parshikov, S. A. Medin, A. V. Ivanov

10:30 Coffee Break

10:55 Session 7 – Adaptivity — **Chair: A. Colagrossi**

Paper 7.1 – 3-D SPH scheme with variable resolution: assessment of the optimal splitting refinement pattern — R. Vacondio, B.D. Rogers, P. Mignosa, P.K. Stansby

Paper 7.2 – Particle filling and the importance of the SPH inertia tensor — P. Groenenboom

Paper 7.3 – Smoothed Particle Hydrodynamics with adaptive discretization* — F. Spreng, D. Schnabel, A. Mueller, P. Eberhard

Paper 7.4 – Toward a higher order SPH-ALE method based on Moving Least Squares method* — G.-A. Renaut, J.-C. Marongiu, S. Aubert

12:00 Lunch

13:15 Session 8 – Turbulence, Structures, Energy — **Chair: A. Souto-Iglesias**

Paper 8.1 – Flow structure detection with Smoothed Particle Hydrodynamics* — B. Toth, K.G. Szabo

Paper 8.2 – Large eddy simulation with SPH: Mission impossible? — A. Mayrhofer, D. Laurence, B.D. Rogers, D. Violeau

Paper 8.3 – 2D turbulence using the SPH method — A. Valizadeh, J.J. Monaghan

Paper 8.4 – Energy conservation in the δ-SPH scheme — M. Antuono, B. Bouscasse, A. Colagrossi, S. Marrone

14:20 Session 9 – Coupling — **Chair: R. Vignjevic**

Paper 9.1 – An interface-energy-conserving approach for the coupling of smoothed-particle-hydrodynamics and finite-element methods for transient fluid-structure interaction — J. Nunez, Z. Li, J.-C. Marongiu, A. Combescure

Paper 9.2 – Coupling of a SPH-ALE and a Finite Volume method. Extension to 2D and 3D* — M. Neuhauser, J.-C. Marongiu

Paper 9.3 – Coupling between SWASH and SPH for real coastal problems — C. Altomare, T. Suzuki, J.M. Domínguez, A.J.C. Crespo, M. Gómez-Gesteira

Paper 9.4 – Modeling and validation of guided ditching tests using a coupled SPH-FE approach — M.H. Siemann, P.H.L. Groenenboom

15:25 Coffee Break

15:50 Session 10 – Numerical Stability — **Chair: J.-C. Marongiu**

Paper 10.1 – Momentum conserving methods that reduce particle clustering in SPH* — S.P. Korzilius, A.C.H. Kruisbrink, T. Yue, W.H.A. Schilders, M.J.H. Anthonissen

Paper 10.2 – Pressure evaluation improvement for Euler isentropic SPH scheme — M. Clayer, J.L. Lacomea, J. Limidoa, J.P. Vila

Paper 10.3 – Towards both numerical consistency and conservation for SPH approximation — S. Litvinov, X.Y. Hu, N.A. Adams

Paper 10.4 – On SPH nonlocal regularisation method for instabilities due to strain-softening — R. Vignjevic, N. Djordjevic, T. De Vuyst

16:55 Discussion Panel 2 – The needs of Industry — **Chair: D. Le Touzé**

17:55 Steering Committee Meeting

19:15 Museum & Workshop Banquet

Thursday June 5

09:00 Session 11 – Water Waves — **Chair: T. Rung**

Paper 11.1 –	On the model inconsistencies in simulating breaking wave with mesh-based and particle methods	S. Marrone, D. Le Touzé, A. Colagrossi, A. Di Mascio
Paper 11.2 –	Modeling the coherent vortices in breaking waves	R. Jalali Farahani, R. A. Dalrymple, A. Hérault, G. Bilotta, E. Rustico
Paper 11.3 –	SPH numerical computations of wave impact onto a vertical wall	X.Z. Lu, J.M. Cherfils, G. Pinon, E. Rivoalen, J. Brossard
Paper 11.4 –	Modelling of wave impacts on harbour structures and objects with SPH and DEM*	R.B. Canelas, D. Conde, J.M. Domínguez, A.J.C. Crespo, R.M.L. Ferreira

10:05 Coffee Break

10:30 Session 12 – Real-Life Applications — **Chair: D. Le Touzé**

Paper 12.1 –	Hydrodynamic performance simulations using SPH for automotive applications	D. Barcarolo, J. Candelier, D. Guibert, M. de Leffe
Paper 12.2 –	Simulation of earthquake sloshing loads in a nuclear reactor*	J.L. Cercos-Pita, A. Moreno, F. Beltran, L.M. Gonzalez
Paper 12.3 –	Modelling real-life flows in hydraulic waterworks with GPUSPH	G. Bilotta, A. Vorobyev, A. Hérault, A. Mayrhofer, D. Violeau
Paper 12.4 –	Application of GPUSPH to design of wave energy converters	B. Edge, R.A. Dalrymple, A. Hérault, K. Gamiel, G. Bilotta

11:35 Session 13 – Alternative Approaches — **Chair: X. Hu**

Paper 13.1 –	Multiphase and free-surface flows in the finite volume particle method	N.J. Quinlan
Paper 13.2 –	Finite Volume Particle Method for 3-D elasto-plastic solid simulation*	E. Jahanbakhsh, C. Vessaz, F. Avellan
Paper 13.3 –	Applications and improvements of the particle finite element method to free surface flows	J.M. Gimenez, L.M. Gonzalez, P. Galan del Sastre
Paper 13.4 –	Voronoi-SPH: on the analysis of a hybrid Finite Volumes – Smoothed Particle Hydrodynamics method*	D. Barcarolo, D. Le Touzé, G. Oger, F. De Vuyst

12:40 Lunch

13:55 Session 14 – Free-Surface Flow — **Chair: S. Sibilla**

Paper 14.1 –	SPH modelling of wave pressures at vertical and perforated breakwaters	D.D. Meringolo, F. Aristodemo, P. Groenenboom, A. Lo Schiavo, P. Veltri, M. Veltri
Paper 14.2 –	Evaluation of SPH in capturing flow separation points on hydrophobic and hydrophilic bodies during bluff water entry	A. Kiara, R. Paredes, D.K.P. Yue
Paper 14.3 –	Investigation of ship flooding situations by MPS and SPH methods compared to dedicated experiments	H. Hashimoto, D. Le Touzé, N. Grenier, M. Sueyoshi
Paper 14.4 –	Energy decomposition analysis in free-surface flows: road-map for the direct computation of wave breaking dissipation	A. Colagrossi, B. Bouscasse, A. Souto-Iglesias

15:00 Session 15 – Miscellaneous — **Chair: M. Gomez-Gesteira**

Paper 15.1 –	Smoothed Particle Hydrodynamics (SPH) simulation of a high-pressure homogenizer	L. Wieth, S. Braun, R. Koch, H.-J. Bauer, K. Kelemen, H. P. Schuchmann
Paper 15.2 –	A semi-implicit SPH scheme for the shallow water equations	A. Bankole, A. Iske, T. Rung, M. Dumbser
Paper 15.3 –	Multiphase SPH for liquid-dust flow and its application to sedimentation in a turbulently convecting flow	J. Kwon, J.J. Monaghan
Paper 15.4 –	Whale to turbine impact using the GPU based SPH-LSM method	S.M. Longshaw, B.D. Rogers, P.K. Stansby

16:05 Closing and Awards — **D. Violeau, A. Hérault, D. Le Touzé**

16:20 Coffee and Goodbye