2024 SPHERIC Zhuhai International Workshop | 17-20th October 2024 | Zhuhai, China

Detailed Programme

Training Day Thursday, 17th October				Chair: Hong-Guan Lyu
	Time	Topic & Title	Location	Presenter
Registration	08:00 - 18:00	/	Entrance, No.4, Haiqin Building	/
Welcome	08:30 - 08:40	/	Room B125, No.3, Haiqin Building	Peng-Nan SUN (Sun Yat-sen University, China)
Session 1	08:40 - 09:40	Theory and numerical aspects of weakly-compressible SPH		Zhi-Lang ZHANG (ETH Zurich, Switzerland)
Q&A	09:40 - 09:45			
Session 2	09:45 - 10:45	Theory and numerical aspects of incompressible SPH	Room B125, No.3, Haiqin Building	Abbas KHAYYER (Kyoto University, Japan)
Q&A	10:45 - 10:50			
Coffee break	10:50 - 11:10			
Session 3	11:10 - 12:10	SPH applications for different engineering problems	Room B125, No.3, Haiqin Building	Yang YANG (Northwestern Polytechnical University, China)
Q&A	12:10 - 12:15			
Lunch Break	12:15 - 14:00			
Session 4	14:00 - 15:00	Introduction to SPHinXsys	Room B125, No.3, Haiqin Building	Dong WU (Technical University of Munich, Germany)
Session 5	15:00 - 17:00	Exercise with SPHinXsys		
Welcome Drink	17:00 - 18:00		Lobby, No.4, Haiqin Building	

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Day 1	Friday, 18th October (Room D209, No.4, Haiqin Building)		
	Time	Topic & Title	Person
Registration	08:00 - 18:00	/	/
Opening Ceremony	09:00 - 09:25	/	/
Group Photo	09:25 - 09:30	/	/
Keynote I	09:30 - 10:20	High-accurate SPH modeling and applications for fluid-structure interactions in ocean engineering	Chair: Prof. Xiong ZHANG (Tsinghua University, China) Presenter: Prof. A-Man ZHANG (Harbin Engineering University, China)
Keynote II	10:20 - 11:10	Conservation and dissipation of energy in free-surface flows simulated with SPH models	Chair: Prof. Moubin LIU (Peking University, China) Presenter: Prof. Andrea COLAGROSSI (CNR-INM, Italy)
Coffee Break	11:10 - 11:30		
Session 1	11:30 - 12:30	Coupling I	Chair: Guillaume OGER
Student prize	11:30 - 11:42	A SPH-FEM coupling method for simulating 2D tank sloshing problems	Presenter: Wenkui SHI (Peking University)
	11:42 - 11:54	A Two-Point, Three-Phases HBP-SPH-DCDEM Coupling Model for Debris-Flow Dynamic Simulation	Presenter: Yangfan MA (Kyushu University)
	11:54 - 12:06	An enhanced FV-SPH approach to solve the flow around a free-surface piercing cylinder	Presenter: Salvatore MARRONE (CNR-INM)
Student prize	12:06 - 12:18	Coupling model of multiphase Riemann-SPH and RKPM accelerated by GPU and applications in impact problems	Presenter: Hao CHEN (Harbin Engineering University)
	12:18 - 12:30	Q&A	
Lunch Break	12:30 - 14:00	Location: Ruohai Canteen in SYSU (Zhuhai Campus)	
Session 2	14:00 - 15:00	Variable Resolution	Chair: Salvatore MARRONE
	14:00 - 14:12	A simple multi-resolution SPH scheme within the RHOD-SPH framework	Presenter: Julien MICHEL (Ecole Centrale Nantes)
Student prize	14:12 - 14:24	Automatic 3D Adaptive Resolution for Weakly Compressible SPH	Presenter: Arpan GUPTA (Indian Institute of Technology Bombay)
	14:24 - 14:36	Enhanced Multi-Resolution MPS Method Based on Least-Squares Discretization	Presenter: Yubao ZHONG (Xi’ an Jiaotong University)
Student prize	14:36 - 14:48	An Adaptive Particle Generation Method for Smoothed Particle Hydrodynamics	Presenter: Kan LIU (Beijing Institute of Technology)
	14:48 - 15:00	Q&A	
Session 3	15:05 - 16:20	Accuracy, Consistency, Convergence	Chair: Fang HE
Student prize	15:05 - 15:17	Development of a SPH model for porous media flows with enhanced volume conservation	Presenter: Xiujia SU (Zhejiang University)
Student prize	15:17 - 15:29	Comparative Analysis of Pressure Stabilization Methods in a Fluid-Particle Two-Phase WCSPH Model	Presenter: Xiafei GUAN (University of Macau)
Student prize	15:29 - 15:41	An enhanced DualSPHysics with improvements in accuracy, energy conservation and resolution of the continuity equation	Presenter: Yi ZHAN (Zhejiang University)
	15:41 - 15:53	A Novel High-Order Smoothed Particle Hydrodynamics Method using Gaussian Quadrature	Presenter: Ting YE (Jilin University)
Student prize	15:53 - 16:05	Implicit-splitting physics-driven particle relaxation for enhancement of Eulerian SPH	Presenter: Bo ZHANG (Technical University of Munich)
	16:05 - 16:20	Q&A	
Coffee Break	16:20 - 16:40		
Session 4	16:40 - 17:55	Free-Surface Flows I	Chair: Abbas Khayyer
	16:40 - 16:52	A high-performance particle simulator based on SPH(2) accelerating with a geometric multi-grid solver	Presenter: Mitsuteru ASAI (Kyushu University)
	16:52 - 17:04	Numerical wave tank containing submerged breakwaters based on the localized nonsingular method of fundamental solutions	Presenter: Lanlan LI (Hohai University)
Student prize	17:04 - 17:16	Numerical modeling of green water overtopping with smoothed particle hydrodynamics method	Presenter: Tihan FU (Tongji University)
Student prize	17:16 - 17:28	GPU-Accelerated Simulation of Submarine Wake Characteristics using SPH Method	Presenter: Yue YU (Peking University)
	17:28 - 17:40	Numerical simulation of isolated wave propagation evolution under reef topography based on DualSPHysics model	Presenter: Achao YU (Ningbo university)
	17:40 - 17:55	Q&A	
Gala Diner	18:30 - 20:30	Location: Tangyan Seafood Restaurant	

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Day 2	Saturday, 19th October (Room D209, No.4, Haiqin Building)		
	Time	**Topic & Title**	**Person**
Keynote III	09:00 - 09:50	Spiral Development of the Moving Particle Semi-implicit Method through User-University-Vendor Collaboration	Chair: Prof. Fei XU (Northwestern Polytechnical University, China) Presenter: Prof. Seiichi KOSHIZUKA (The University of Tokyo, Japan)
Keynote IV	09:50 - 10:40	An SPH Formulation based on the Fulfillment of Requirements on Spatial Discretization Schemes	Chair: Prof. Pengnan SUN (Sun Yat-sen University, China) Presenter: Prof. Christian Weißenfels (University of Augsburg, Germany)
Coffee Break	10:40 - 11:00		
Session 5	11:00 - 12:15	Industrial Applications	Chair: Min LUO
	11:00 - 11:12	Study on Hydrodynamic Performance and Flow Field Effects of Square Artificial Reefs Based on Smoothed Particle Hydrodynamics Method	Presenter: Zijing ZHAO (Shanghai Ocean University)
Student prize	11:12 - 11:24	3D concrete printing modeling via smoothed particle hydrodynamics	Presenter: Hao YU (City University of Hong Kong)
	11:24 - 11:36	Simulation of sediment incipient motion with SPH-DEM method	Presenter: Yi PAN (Hohai University)
	11:36 - 11:48	SimArk Particles: A meshless and parallelizable CFD simulation software based on the Delta-Plus Smoothed Particle Hydrodynamics method	Presenter: Shequan ZENG (Zhuhai SimArk Technology Co.,LTD)
	11:48 - 12:00	Simulating anisotropic diffusion processes with smoothed particle hydrodynamics	Presenter: Xiaojing TANG (Technical University of Munich)
	12:00 - 12:15	Q&A	
Lunch Break	12:15 - 14:00	Location: Ruohai Canteen in SYSU (Zhuhai Campus)	
Session 6	14:00 - 15:15	Solid Dynamics	Chair: Zhen CHEN
	14:00 - 14:12	A novel variationally consistent Total Lagrangian SPH for non-linear and finite strain elastic structural dynamics	Presenter: Abbas Khayyer (Kyoto University)
	14:12 - 14:24	A unified SPH framework for shell-related interactions	Presenter: Dong WU (Technical University of Munich)
Student prize	14:24 - 14:36	Stress Intensity Factors and Fatigue Life Prediction Using the Smoothed Particle Hydrodynamics Method	Presenter: Shen PAN (University of Notthingham Malaysia)
	14:36 - 14:48	An efficient solid shell material point method for large deformation of thin structures	Presenter: Jiasheng LI (Tsinghua University)
	14:48 - 15:00	Analysis of SPH algorithm for elastic-plastic large deformation	Presenter: Jiayi WANG (Northwestern Polytechnical University)
	15:00 - 15:15	Q&A	
Session 7	15:20 - 16:35	Fluid-Structure Interaction	Chair: Songdong SHAO
Student prize	15:20 - 15:32	A coupled δ^+-SPH-NOSB-PD method: Towards fluid-structure interaction problems involving violent free-surface flows and structural deformations and failure	Presenter: Guangqi LIANG (Sun Yat-sen University)
Student prize	15:32 - 15:44	3D meshless fluid–shell interaction framework	Presenter: Tianrun GAO (The Hong Kong University of Science and Technology)
Student prize	15:44 - 15:56	A SPH-lattice spring method for fluid structure interaction with failure of reinforced concrete structure	Presenter: Weichian LOW (University of Nottingham Malaysia)
Student prize	15:56 - 16:08	A multi-resolution FSI solver based on SPH and SPIM	Presenter: Xi YANG (Dalian University of Technology)
	16:08 - 16:20	A coupled multi-material arbitrary Lagrangian Eulerian particle method for modeling fluid-structure interaction	Presenter: Zixian SUN (Tsinghua University)
	16:20 - 16:35	Q&A	
Coffee Break	16:35 - 16:55		
Session 8	16:55 - 18:10	High-performance computing and post-processing	Chair: Dianlei FENG
Student prize	16:55 - 17:07	A GPU-Based Data Mapping Algorithm for Interpolation from Particles to Arbitrary Surface Meshes	Presenter: Yuxin DAI (Northwestern Polytechnical University)
	17:07 - 17:19	Evolution of Rendering Technique for Visualizing SPH Simulation of Natural Hazards	Presenter: Jiaqi SHAO (University of Cambridge)
	17:19 - 17:31	The Application of GPU-Accelerated Smoothed Particle Hydrodynamics(SPH) Method with Dynamic Parallelism 2	Presenter: Liwen XUE (Qinghai University)
	17:31 - 17:43	Numerical simulation on a high-fidelity of wave propagation based on a multi-GPU SPH method	Presenter: Bright MASVAYA (Jiangsu University of Science and Technology)
Student prize	17:43 - 17:55	Numerical Investigation of High–velocity Impact on Concrete using a GPU–accelerated SPH Framework	Presenter: Yao LU (Peking University)
	17:55 - 18:10	Q&A	
Diner	18:30 - 19:30	Location: Ruohai Canteen in SYSU (Zhuhai Campus)	

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Day 3	Sunday, 20th October (Room D209, No.4, Haiqin Building)		
	Time	Topic & Title	Person
Session 9	08:30 - 09:45	Multiphase Flows	Chair: Mitsuteru ASAI
Student prize	08:30 - 08:42	A stable Smoothed Particle Hydrodynamics model for soil-water coupling interface treatment	Presenter: Can YI (Tongji University)
Student prize	08:42 - 08:54	An Improved Single-layer SPH Model for Water-soil Two-phase Flow	Presenter: Ziyang ZHAN (Shanghai Jiao Tong University)
	08:54 - 09:06	A diffuse-interface smoothed particle hydrodynamics method for compressible multiphase flows	Presenter: Mingduo YUAN (The Hong Kong University of Science and Technology)
	09:06 - 09:18	Application of a Non-Newtonian multiphase SPH model to local scouring in offshore pipelines and cables	Presenter: Javier CALDERON-SANCHEZ (Universidad Politecnica de Madrid)
Student prize	09:18 - 09:30	Multi-phase SPH-FDM and experimental investigations on the hydrodynamics of an oscillating water column wave energy device	Presenter: Haonan JIANG (Zhejiang University)
	09:30 - 09:45	Q&A	
Session 10	09:50 - 11:05	Free-Surface Flows II	Chair: Shaowu LI
Student prize	09:50 - 10:02	SPH simulation of landslide dam hazard chain	Presenter: Shuang LI (Tongji University)
	10:02 - 10:14	PID-Controlled Elastic Baffle for Sloshing Mitigation Using the Smoothed Particle Hydrodynamics Method	Presenter: Yaru REN (Sichuan University)
Student prize	10:14 - 10:26	Simulation of wind affected wave overtopping using multi-phase SPH model with numerical wind tunnel	Presenter: Mingzhi WANG (Hohai University)
	10:26 - 10:38	SPH study of hydrodynamic responses of submerged floating tunnels to solitary wave impact	Presenter: Songdong SHAO (Dongguan University of Technology)
	10:38 - 10:50	Numerical simulation of droplet impacting on inclined wall with evaporation based on smoothed particle hydrodynamics method	Presenter: Xiaojing MA (Xinjiang University)
	10:50 - 11:05	Q&A	
Coffee Break	11:05 - 11:25		
Session 11	11:25 - 12:40	Coupling II	Chair: Yang YANG
Student prize	11:25 - 11:37	Interactions of bubble pairs with different inner pressure using an adaptive SPH-FVM coupling model	Presenter: Yidi ZHANG (Harbin Engineering University)
	11:37 - 11:49	A WCSPH-MSDEM coupled model for interactions between a discrete block and solid-wall boundary	Presenter: Sen GAO (Dalian University of Technology)
	11:49 - 12:01	A coupled FD-SPH method for shock-structure interaction and dynamic fracture propagation modeling	Presenter: Jianyu CHEN (Nanjing University of Science and Technology)
Student prize	12:01 - 12:13	A GPU-based SPH-DEM coupling method for multi-scale particle-fluid flow simulation	Presenter: Sijie WANG (Peking University)
	12:13 - 12:25	Three-Dimensional Simulations of Liquid-Solid Dam-Break Flows Impacting on Rigid Structures Based on Unresolved MPS-DEM Coupling Method	Presenter: Fengze XIE (Shanghai Jiao Tong University)
	12:25 - 12:40	Q&A	
Lunch Break	12:40 - 14:00	Location: Ruohai Canteen in SYSU (Zhuhai Campus)	
Session 12	14:00 - 15:15	Other Meshless Methods & Alternative Methods	Chair: Mamtimin Geni
Student prize	14:00 - 14:12	An improved algorithm for Finite Particle Method considering Lagrange-type remainder and its discontinuous format	Presenter: Yaoyu LI (Northwestern Polytechnical University)
Student prize	14:12 - 14:24	A Lagrangian Particle Method Based on a Generalized Finite Difference Scheme for the Bubble Rising	Presenter: Zhongjian LING (Wuhan University of Technology)
	14:24 - 14:36	Numerical study on wave-structure interaction by a GNN supported ISPH method	Presenter: Ningbo ZHANG (City, University of London)
Student prize	14:36 - 14:48	A projected Lagrangian Physics-Informed Neural Networks particle method for free surface flows	Presenter: Yuquan WANG (University of Macau)
	14:48 - 15:00	A 2D hybrid method for interfacial transport of passive scalars	Presenter: Yu FAN (Technical University of Munich)
	15:00 - 15:15	Q&A	
Session 13	15:20 - 16:35	Boundary Conditions & Industrial Applications I	Chair: Yuxiang PENG
Student prize	15:20 - 15:32	Investigation on adhesion strength of cold spray particles based on SPH method	Presenter: Zhen DAI (Northwestern Polytechnical University)
Student prize	15:32 - 15:44	Comparative Study of Open Boundary Conditions by SWE-SPH Method	Presenter: Xinhua LIU (Qinghai University)
Student prize	15:44 - 15:56	A multi-layer SPH method to simulate water-soil coupling interaction	Presenter: Yuxin CHEN (Zhejiang University)
	15:56 - 16:08	Three-dimensional Numerical Simulation of Selective Laser Melting Process Based on Smoothed Particle Hydrodynamics Method	Presenter: Jianqiao LI (Guangxi University)
	16:08 - 16:20	Research on the Generation Method of Superquadric Particles Based on SPH	Presenter: Fengrong LI (Xinjiang University)
	16:20 - 16:35	Q&A	
Coffee Break	16:35 - 16:55		
Session 14	16:55 - 17:55	Boundary Conditions & Industrial Applications II	Chair: Javier CALDERON-SANCHEZ
	16:55 - 17:07	Research on Improved Boundary Conditions for Meshfree Methods Based on Local Regular-Distributed Particles	Presenter: Zhe SUN (Dalian University of Technology)
	15:44 - 15:56	A Coulomb-Viscoplastic sliding boundary in 3D-SPH form for simulating debris-flow dynamics in inclined channels	Presenter: Bin SU (Central South University)
	17:19 - 17:31	Generalized and high-efficiency arbitrary-positioned buffer for smoothed particle hydrodynamics	Presenter: Shuoguo ZHANG (Technical University of Munich)
	17:31 - 17:43	SPH Study on Channel-Channel Water-Ice Sheet Interaction under Thermal Coupling Conditions	Presenter: Haitao WU (Qinghai University)
	17:43 - 17:55	Q&A	
Closing Ceremony	17:55 - 18:25		

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Poster Exhibition: Lobby, No.4, Haiqin Building, 18-20th, October

No.	Title	Authors
1	Numerical simulation of manta-ray swimming using a smoothed-particle hydrodynamics method	Tian-Yu Gao, Peng-Nan Sun, Xiao-Ting Huang, Yang Xu, Shi-Yun Zhong
2	An adaptive multi-resolution moving particle method with volume compensation for free-surface flow simulation	Xiaoxing Liu
3	Numerical Investigation of Fluid-flexible-structure Interaction Based on Entirely SPH Method	Tingting BAO, Jun HU, Can HUANG, Yong YU, Ahmad SHAKIBAEINIA
4	Numerical Simulation of Shallow Water Turbulence by SPH Method	Lirong TIAN, Xinhua LIU, Shenglong GU
5	Numerical simulations of water entry problems using an improved SPH interface contact algorithm	Xiangdong LIU, Yang YANG
6	Investigation on the hydrodynamic performance of the floating breakwater with an elastic plate below based on the SPH method	Yifan Zhang, Fang He, Can Huang
7	A Peridynamic SPH simulation of ice fragmentation by underwater explosion	Ying Song
8	Simulation of impact of lander foot pad on lunar soil based on SPH Method	Wanqing Yuan, Can Hang, Xiaoliang Wang, Qingquan Liu
9	Numerical Simulation of Dam Breach with a Multiphase Erosion SPH Model	Huiying Xie, Can Hang, Xiaoliang Wang, Qingquan Liu
10	Applications of SPH for Astrophysical Problems	Liu Kun , Liu Shangfei, Sun Pengnan, Meng Zifei
11	Numerical simulation of the interaction between the fixed net structures and currents/waves based on an improved smoothed particle hydrodynamics model	Yang Xu, Peng-Nan Sun, Xiao-Ting Huang, Pu-Zhen Liu
12	FDEM-SPH Solid-Fluid Coupling Landslide Tsunamis	Yanji Chen, Di Wang, Gang Ma, Wei Zhou
13	Numerical simulation of wave loading on the pier based on SPH method and GPU parallel computing	Xunuo Huang, Kai Wei, Di Wang, Gang Ma, Wei Zhou
14	A generalized three-dimensional hybrid contact method for smoothed particle hydrodynamics	Wenbin Liu, Zhuoping Duan, Yan Liu, Fenglei Huang
15	A density smoothing B-spline material point method for efficiently modeling FSI problems	Zheng SUN, Xiaomin ZHOU
16	An Updated Lagrangian Particle Hydrodynamics (ULPH)-Non-Ordinary State-Based Peridynamics Coupling Approach for Modeling Fluid-Structure Interaction Problems	Zhen Wang, Wenjie Zhou, Xin Lai, Shaofan Li, Lisheng Liu
17	Riemann-SPH Applications in Fluid-Soil-Solid Coupling problems	Jiawen Wang, Dianlei Feng
18	Numerical Simulation of Two-dimensional Water Entry of Wedge In Freak Wave Based on HOS-SPH Coupling Method	Yang Juncheng, Xie Chunmei, Sun Pengnan, Ni Xinyun, Cheng Xiaoming
19	A new coupling method of high resolution FVM with SPH for compressible dense gas-particle flow	Wang Dudou, Qiang Hongfu, Liu Yuxiang, Sun Zhensheng
20	Study on the MPS-BPM coupling model for interaction between fluid and elastic structures with large deformation	Hao Jie, Wang Lizhu, Jiang Qin, Zhu Liujie
21	Simulation of granular flows by MPS-DEM model and Rheological model	Liujie Zhu, Qin Jiang, Jie Hao
22	Study on hydrodynamics of multiple fish based on smoothed particle hydrodynamics	Xuejian Wang, Can Huang, Wenhui Yan, A. M. Aly, Quanliang Zhao, Guangping He
23	3D particle-based simulation of jet impingement behaviors	Yao Yao. Takatsuka Daichi. Koji Morita. Wei Liu,

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