

# ICAM 2023, Day 1, 30 May 2023, Tuesday

HK Time		Venue
8:30 - 9:00	Registration opens	LT-10
9:00 - 9:50	<b>Opening Ceremony</b> <b>Welcome Remark by President – Prof. Freddy Boey</b> <b>Introduction of the William Benter Prize – Prof. Roderick Wong</b> <b>Introduction of the William Benter Prize Winner 2020</b> <i>Prof. Michael Waterman (by Prof. Jun S. Liu)</i> <b>Prize Presentation Ceremony – Prof. Michael Waterman</b> <b>Introduction of the William Benter Prize Winner 2022</b> <i>Prof. Thomas J.R. Hughes (by Prof. Yuri Bazilevs)</i> <b>Prize Presentation Ceremony – Prof. Thomas J.R. Hughes</b>	
9:50 - 10:10	Photo Session	
10:10 - 10:45	Coffee Break	
10:45 - 11:45	<b>PLENARY TALK I: Mathematics and biology: Search, a case study</b> <i>Prof. Michael Waterman, University of Virginia, USA</i> Session Chair: <a href="#">Prof. Ding-xuan Zhou</a>	
11:45 - 12:45	<b>PLENARY TALK II: The finite element method and isogeometric analysis: Mathematical and engineering perspectives</b> <i>Prof. Thomas J.R. Hughes, The University of Texas at Austin, USA</i> Session Chair: <a href="#">Prof. Ding-xuan Zhou</a>	
12:45 - 14:15	Lunch Break	/
	<b>PARALLEL SESSION</b>	
	<b>Special Session in honor of Prof. Hughes</b> (Session Chair: <a href="#">Prof. Yuri Bazilevs</a> )	P4701
14:15 – 14:45	<b>Dynamic fracture for geological applications</b> <i>Victor Calo, Curtin University, Australia</i>	
14:45 - 15:15	<b>Approximation of eigenproblems of incompressible materials using a stabilised finite element formulation: Application to modal analysis</b> <i>Ramon Codina, Universitat Politècnica de Catalunya, Spain</i>	
	<b>Special Session in honor of Prof. Waterman</b> (Session Chair: <a href="#">Prof. Jun S. Liu</a> )	P4703
14:15 – 14:45	<b>Motifs in multiple sequence alignments</b> <i>Christian Reidys, University of Virginia, USA</i>	
14:45 – 15:15	<b>TandemAligner: A new parameter-free framework for fast sequence alignment</b> <i>Pavel A. Pevzner, University of California at San Diego, USA</i>	
15:15 – 15:45	Coffee Break	

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**PARALLEL SESSION**

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**Special Session in honor of Prof. Hughes** (Session Chair: Prof. Yuri Bazilevs) P4701

15:45 – 16:15 **Graph Laplacians and operator networks - ML tools for computational mechanics**

*Assad A Oberai, University of Southern California, USA*

16:15 – 16:45 **A revisit of a viscoelasticity theory**

*Ju Liu, Southern University of Science and Technology, China*

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**Special Session in honor of Prof. Waterman** (Session Chair: Prof. Jun S. Liu) P4703

15:45 – 16:15 **Computational approaches for metagenomic contig binning using Hi-C data**

*Fengzhu Sun, University of Southern California, USA*

16:15 – 16:45 **Learning the underlying unified coordinate system in single-cell data**

*Xuegong Zhang, Tsinghua University, China*

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# ICAM 2023, Day 2, 31 May 2023, Wednesday

HK Time		Venue
9:00 - 9:30	<b>Registration opens</b>	LT-10
9:30 - 10:30	<b>PLENARY TALK III: Computational fluid-structure interaction: methods, breakthroughs and applications</b> <i>Prof. Yuri Bazilevs, Brown University, USA</i> <a href="#">Session Chair: Prof. Daniel Ho</a>	LT-10
10:30 - 11:00	<b>Coffee Break</b>	
<b>PARALLEL SESSION</b>		
	<b><u>Special Session in honor of Prof. Hughes</u></b> ( <a href="#">Session Chair: Prof. Yuri Bazilevs</a> )	P4701
11:00 - 11:30	<b>Weak and strong stabilization of cut elements</b> <i>Mats G. Larson, Umea University, Sweden</i>	
11:30 - 12:00	<b>Variational multiscale moment methods for the Boltzmann equation</b> <i>Michael Abdelmalik, Eindhoven University of Technology, Netherlands</i>	
12:00 - 12:30	<b>Structured mesh generation for IGA</b> <i>Xianfeng Gu, Stony Brook University, USA</i>	
	<b><u>Special Session in honor of Prof. Waterman</u></b> ( <a href="#">Session Chair: Prof. Fengzhu Sun</a> )	P4703
11:00 - 11:30	<b>Statistical inference of cell-type-specific gene co-expression from single cell and bulk RNA-seq data</b> <i>Hongyu Zhao, Yale University, USA</i>	
11:30 - 12:00	<b>DeepRHP: A hybrid variational autoencoder for designing random heteropolymers as protein mimics</b> <i>Haiyan Huang, University of California at Berkeley, USA</i>	
12:00 - 12:30	<b>Cross-linked peptide identification using a protein-feedback method</b> <i>Weichuan Yu, The Hong Kong University of Science and Technology</i>	
	<b><u>Machine Learning and Statistics</u></b> ( <a href="#">Session Chair: Dr. Dong Xia</a> )	P4704
11:00 - 11:30	<b>Covariance estimators for the ROOT-SGD algorithm in online learning</b> <i>Xiaoming Huo, The Georgia Institute of Technology, USA</i>	
11:30 - 12:00	<b>Minimax bounds for estimating multivariate Gaussian location mixtures</b> <i>Kyoung Hee Arlene Kim, Korea University, Korea</i>	
12:00 - 12:30	<b>RankSEG: A consistent ranking-based framework for segmentation</b> <i>Ben Dai, The Chinese University of Hong Kong, Hong Kong</i>	
12:30 - 14:00	<b>Lunch Break</b>	/
14:00 - 15:00	<b>PLENARY TALK IV: Digital twins through reduced order models and machine learning</b> <i>Prof. Jan S Hesthaven, École Polytechnique Fédérale de Lausanne, Switzerland</i> <a href="#">Session Chair: Prof. Hongyu Liu</a>	LT-10
<b>PARALLEL SESSION</b>		
	<b><u>Special Session in honor of Prof. Waterman</u></b> ( <a href="#">Session Chair: Prof. Fengzhu Sun</a> )	P4703
15:00 - 15:30	<b>From data to modeling: Exploration at the whole brain scale</b>	

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*Jianfeng Feng, Fudan University, China*

15:30 – 16:00 **From apes to human the cis-regulatory modules underwent a phase transition with ALU as one key driving force**

*Lei M Li, Chinese Academy of Sciences, China*

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**Numerical PDEs** (Session Chair: Dr. Shun Zhang)

P4701

15:00 – 15:30 **A mass conservative scheme for the coupled Brinkman-Darcy flow and transport**

*Lina Zhao, City University of Hong Kong, Hong Kong*

15:30 – 16:00 **An EMA-conserving, pressure-robust and Re-semi-robust reconstruction method for simulation of incompressible Navier-Stokes equations**

*Hongxing Rui, Shandong University, China*

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**Contributed Talks** (Session Chair: Dr. Wing Cheong Lo)

P4704

15:00-15:20 **Velocity and energy of periodic travelling internal waves**

*Filipe Cal, Lisbon School of Engineering, Portugal*

15:20-15:40 **Mathematical modelling of blood flow through multiple stenoses in a narrow artery**

*Sanjeev Kumar, Dr. Bhimrao Ambedkar University, Agra, India*

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16:00 - 16:30 **Coffee Break**

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**Special Session in honor of Prof. Waterman** (Session Chair: Prof. Fengzhu Sun)

P4703

16:30 - 17:00 **Joint inference of clonal structure using single-cell genome and transcriptome sequencing data**

*Li Xia, South China University of Technology, China*

17:00 - 17:30 **Bayesian cancer subtyping based on paired methylation data**

*Xiaodan Fan, The Chinese University of Hong Kong, Hong Kong*

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**Numerical PDEs** (Session Chair: Dr. Shun Zhang)

P4701

16:30 - 17:00 **High order numerical scheme for the nonlinear quantum Zakharov system**

*Yan Xu, University of Science and Technology of China, China*

17:00 - 17:30 **Energy dissipation preserving Runge-Kutta methods for phase-field models**

*Jiang Yang, Southern University of Science and Technology, China*

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**Contributed Talks** (Session Chair: Dr. Wing Cheong Lo)

P4704

16:30-16:50 **Imaging with localized solutions**

*Maria V Perel, St Petersburg State University, St Petersburg, Russia*

16:50-17:10 **Deep learning-based 3D localization on rotating point spread function with applications on telescope imaging**

*Lingjia Dai, City University of Hong Kong, Hong Kong*

17:10-17:30 **Spherical framelets from spherical designs**

*Yuchen Xiao, City University of Hong Kong, Hong Kong*

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# ICAM 2023, Day 3, 1 June 2023, Thursday

HK Time		Venue
9:00 - 9:30	Registration opens	LT-10
9:30 - 10:30	<b>PLENARY TALK V: Modeling, estimation, and applications of generalized heteroscedastic Gaussian processes</b> <i>Prof. Jun S Liu, Harvard University, USA</i> Session Chair: Prof. Junhui Wang	LT-10
10:30 - 11:00	Coffee Break	
<b>PARALLEL SESSION</b>		
	<b>Machine Learning and Statistics</b> (Session Chair: Dr. Jun Fan)	P4701
11:00 - 11:30	<b>Total stability of localized learning</b> <i>Andreas Christmann, University of Bayreuth, Germany</i>	
11:30 - 12:00	<b>Controlling the false discovery rate in structural sparsity: Split knockoffs</b> <i>Yuan Yao, The Hong Kong University of Science and Technology, Hong Kong</i>	
12:00 - 12:30	<b>Stability and generalization of stochastic gradient descent</b> <i>Yunwen Lei, Hong Kong Baptist University, Hong Kong</i>	
	<b>Special Session in honor of Prof. Waterman</b> (Session Chair: Prof. Xuegong Zhang)	P4703
11:00 - 11:30	<b>Optimal transport for single-cell data analysis</b> <i>Lin Wan, Chinese Academy of Sciences, China</i>	
11:30 - 12:00	<b>Statistical approaches to genome wide association analysis of complex diseases</b> <i>Lin Hou, Tsinghua University, China</i>	
12:00 - 12:30	<b>Estimation of leading multi-block canonical correlation directions via norm constrained proximal gradient descent</b> <i>Leying Guan, Yale University, USA</i>	
12:30 - 14:00	Lunch Break	/
14:00 - 15:00	<b>PLENARY TALK VI: The symbiosis of applied mathematics and statistics</b> <i>Prof. Richard J. Samworth, University of Cambridge, United Kingdom</i> Session Chair: Prof. Jonathan James Wylie	LT-10
<b>PARALLEL SESSION</b>		
	<b>Special Session in honor of Prof. Waterman</b> (Session Chair: Prof. Xuegong Zhang)	P4703
15:00 - 15:30	<b>Intelligent spatial transcriptomics: Paving the way for deciphering tissue architecture</b> <i>Shihua Zhang, Chinese Academy of Sciences, China</i>	
15:30 - 16:00	<b>Concordant changes among multiple large-scale data sets</b> <i>Yinglei Lai, University of Science and Technology of China, China</i>	

<b>Numerical PDEs</b> (Session Chair: Dr. Wing Tat Leung)		P4701
15:00 – 15:30	<b>Multicontinuum homogenization and applications</b> <i>Yalchin Efendiev, Texas A&amp;M University, USA</i>	
15:30 – 16:00	<b>Geometric quasilinearization (GQL) for bound-preserving schemes</b> <i>Kailiang Wu, Southern University of Science and Technology, China</i>	
<b>Contributed Talks</b> (Session Chair: Dr. Laurent Mertz)		P4704
15:00-15:20	<b>A portfolio optimization problem with consumption constraints</b> <i>Tao Pang, North Carolina State University, USA</i>	
15:20-15:40	<b>Localized necking and bulging of finitely deformed residually stressed solid cylinder</b> <i>Yang Liu, Tianjin University, China</i>	
16:00 - 16:30	<b>Coffee Break</b>	
<b>PARALLEL SESSION</b>		
<b>Numerical PDEs</b> (Session Chair: Dr. Wing Tat Leung)		P4701
16:30 - 17:00	<b>Determining a random Schrödinger equation with unknown source and potential</b> <i>Jingzhi Li, Southern University of Science and Technology, China</i>	
17:00 - 17:30	<b>Discontinuous Galerkin methods for magnetic advection diffusion problems</b> <i>Shuonan Wu, Peking University, China</i>	
<b>Machine Learning and Statistics</b> (Session Chair: Dr. Ben Dai)		P4703
16:30 - 17:00	<b>Towards an understanding of soft sparsity in regression learning</b> <i>Yuhong Yang, University of Minnesota, USA</i>	
17:00 - 17:30	<b>Optimal clustering by Lloyd algorithm for low-rank mixture model</b> <i>Dong Xia, The Hong Kong University of Science and Technology, Hong Kong</i>	
<b>Contributed Talks</b> (Session Chair: Dr. Laurent Mertz)		P4704
16:30-16:50	<b>A 3-stage spectral-spatial method for hyperspectral image classification</b> <i>Ruoning Li, City University of Hong Kong, Hong Kong</i>	
16:50-17:10	<b>Spherical signal processing via framelets and convolutional neural networks</b> <i>Jianfei Li, City University of Hong Kong, Hong Kong</i>	
17:10-17:30	<b>Hyperspectral image analysis with spatial-spectral reconstruction and diffusion geometry-based clustering</b> <i>Kangning Cui, City University of Hong Kong, Hong Kong</i>	
18:00 – 21:30	<b>Banquet</b>	Faculty Lounge

# ICAM 2023, Day 4, 2 June 2023, Friday

HK Time		Venue
9:30 - 10:30	<b>PLENARY TALK VII: Mathematical approximation, risk, and confidence for statistical learning</b> <i>Prof. Andrew R Barron, Yale University, USA</i> Session Chair: Prof. Felipe Cucker	LT-10
10:30 - 11:00	<b>Coffee Break</b>	
<b>PARALLEL SESSION</b>		
<b>Numerical PDEs (Session Chair: Dr. Weifeng Qiu)</b>		P4701
11:00 - 11:30	<b>Quasi-Monte Carlo finite element approximation of the Navier-Stokes equations with initial data modeled by log-normal random fields</b> <i>Guanglian Li, The University of Hong Kong, Hong Kong</i>	
11:30 - 12:00	<b>PIFE-PIC: Parallel immersed-finite-element particle-in-cell for 3-D kinetic simulations of plasma-material interactions</b> <i>Xiaoming He, Missouri University of Science &amp; Technology, USA</i>	
12:00 - 12:30	<b>Optimal analysis of non-uniform Galerkin-mixed FE approximations to the Ginzburg-Landau equations in superconductivity</b> <i>Huadong Gao, Huazhong University of Science and Technology, China</i>	
<b>Imaging Science (Session Chair: Prof. Bin Han)</b>		P4703
11:00 - 11:30	<b>Image segmentation problems: Models, algorithms and challenges</b> <i>Ke Chen, University of Liverpool, UK</i>	
11:30 - 12:00	<b>Medical imaging analysis in clinical scene</b> <i>Yao Lu, Sun Yat-sen University, China</i>	
12:00 - 12:30	<b>Bayesian image restoration: From deep prior to uncertainty estimation</b> <i>Weisheng Dong, Xidian University, China</i>	
12:30 - 14:00	<b>Lunch Break</b>	/
14:00 - 15:00	<b>PLENARY TALK VIII: An arbitrarily high order finite element method for arbitrarily shaped domains with automatic mesh generation</b> <i>Prof. Zhiming Chen, Chinese Academy of Sciences, China</i> Session Chair: Prof. Ya Yan Lu	LT-10
<b>PARALLEL SESSION</b>		
<b>Numerical PDEs (Session Chair: Dr. Lina Zhao)</b>		P4701
15:00 - 15:30	<b>Recent progress on multiscale computational methods</b> <i>Lei Zhang, Shanghai Jiaotong University, China</i>	
15:30 - 16:00	<b>Numerical analysis of a fully discrete finite element method for incompressible vector potential MHD system</b> <i>Shipeng Mao, University of Chinese Academy of Sciences, China</i>	

<b>Imaging Science</b> (Session Chair: Dr Xiaosheng Zhuang)		P4703
15:00 – 15:30	<b>Color image inpainting via robust pure quaternion matrix completion</b> <i>Michael Ng, The University of Hong Kong, Hong Kong</i>	
15:30 – 16:00	<b>Rank-One Prior: Real-Time Scene Recovery</b> <i>Tieyong Zeng, The Chinese University of Hong Kong, Hong Kong</i>	
<b>Contributed Talks</b> (Session Chair: Dr. Moritz Reintjes)		P4704
15:00-15:20	<b>Generalization guarantees of gradient descent for multilayer neural networks</b> <i>Puyu Wang, City University of Hong Kong, Hong Kong</i>	
15:20-15:40	<b>Autonomous vehicle active safety control system based on roadside LiDAR and V2X communication</b> <i>Shiqi Tang, City University of Hong Kong, Hong Kong</i>	
15:40-16:00	<b>Approximation of smooth functionals using deep ReLU networks</b> <i>Ying Liu, City University of Hong Kong, Hong Kong</i>	
16:00 - 16:30	<b>Coffee Break</b>	
<b>PARALLEL SESSION</b>		
<b>Numerical PDEs</b> (Session Chair: Dr. Lina Zhao)		P4701
16:30 - 17:00	<b>A robust fifth order finite difference Hermite WENO scheme for compressible Euler equations</b> <i>Jianxian Qiu, Xiamen University, China</i>	
17:00 - 17:30	<b>Numerical methods for nonlinear Schrödinger equations with random potentials</b> <i>Zhiwen Zhang, University of Hong Kong, Hong Kong</i>	
<b>Imaging Science</b> (Session Chair: Dr Xiaosheng Zhuang)		P4703
16:30 - 17:00	<b>Nonsmooth nonconvex-nonconcave min-max problems and generative adversarial networks</b> <i>Xiaojun Chen, The Hong Kong Polytechnic University, Hong Kong</i>	
17:00 - 17:30	<b>Applied harmonic analysis and particle dynamics for designing neural message passing on graphs</b> <i>Yuguang Wang, Shanghai Jiao Tong University, China</i>	
<b>Contributed Talks</b> (Session Chair: Dr. Moritz Reintjes)		P4704
16:30-16:50	<b>On behaviour of entropy and Fisher information of some solitons of nonlinear Schrodinger equation</b> <i>Takuya Yamano, Kanagawa University, Japan</i>	
16:50-17:10	<b>Well-conditioned mode matching method for applications in photonics</b> <i>Nan Zhang, City University of Hong Kong, Hong Kong</i>	
17:10-17:30	<b>Computing diffraction anomalies as nonlinear eigenvalue problems</b> <i>Zitao Mai, City University of Hong Kong, Hong Kong</i>	

# ICAM 2023, Day 5, 3 June 2023, Saturday

HK Time		Venue
9:30 - 10:30	<b>PLENARY TALK IX: Extreme superposition: Models for large-amplitude rogue waves</b> <i>Prof. Peter D. Miller, University of Michigan, USA</i> Session Chair: Dr. Dan Dai	LT-10
10:30 - 11:00	<b>Coffee Break</b>	
<b>PARALLEL SESSION</b>		
<b>Imaging Science</b> (Session Chair: Prof. Andrés Almansa)		P4701
11:00 - 11:30	<b>Variational approach to image vectorization</b> <i>Sung Ha Kang, Georgia Institute of Technology, USA</i>	
11:30 - 12:00	<b>Balanced augmented Lagrangian method with applications to compressive sensing and imaging</b> <i>Xiaoming Yuan, The University of Hong Kong, Hong Kong</i>	
12:00 - 12:30	<b>Surface reconstruction based modified Gauss formula</b> <i>Zuoqiang Shi, Tsinghua University, China</i>	
<b>Numerical PDEs</b> (Session Chair: Dr. Weifeng Qiu)		P4703
11:00 - 11:30	<b>Some recent advances of quadratures for isogeometric analysis</b> <i>Quanling Deng, Australian National University, Australia</i>	
11:30 - 12:00	<b>Bound-preserving and phase-wise conservative schemes for multi-phase ow in porous media</b> <i>Shuyu Sun, King Abdullah University, Saudi Arabia</i>	
12:00 - 12:30	<b>Approximation of curved domains with polygonal meshes</b> <i>Yanqiu Wang, Nanjing Normal University, China</i>	
12:30 - 14:00	<b>Lunch Break</b>	/
14:00 - 15:00	<b>PLENARY TALK X: Modeling COVID-19 incidence and reproduction number by the renewal equation</b> <i>Prof. Jean-Michel Morel, Ecole Normale Supérieure de Cachan, France</i> Session Chair: Prof. Raymond Chan	LT-10
<b>PARALLEL SESSION</b>		
<b>Imaging Science</b> (Session Chair: Prof. Sung Ha Kang)		P4701
15:00 - 15:30	<b>Wavelets on bounded intervals and wavelet methods for Helmholtz equations</b> <i>Bin Han, University of Alberta, Canada</i>	
15:30 - 16:00	<b>Provably convergent plug &amp; play linearized ADMM, applied to deblurring spatially varying kernels</b> <i>Andrés Almansa, CNRS &amp; Université Paris Descartes, France</i>	

<b>Machine Learning and Statistics</b> (Session Chair: Dr. Yunwen Lei)		P4703
15:00 – 15:30	<b>Generalization ability of wide neural networks on <math>\mathbf{R}</math></b> <i>Qian Lin, Tsinghua University, China</i>	
15:30 – 16:00	<b>Learning nonlinear functionals using deep ReLU networks</b> <i>Jun Fan, Hong Kong Baptist University, Hong Kong</i>	
16:00 - 16:30	<b>Coffee Break</b>	
<b>PARALLEL SESSION</b>		
<b>Imaging Science</b> (Session Chair: Prof. Sung Ha Kang)		P4701
16:30 - 17:00	<b>Provable sample-efficient sparse phase retrieval initialized by truncated power method</b> <i>Jian-Feng Cai, The Hong Kong University of Science and Technology, Hong Kong</i>	
17:00 - 17:30	<b>Image vectorization by affine shortening flow</b> <i>Yuchen He, Shanghai Jiao Tong University, China</i>	
<b>Contributed Talks</b> (Session Chair: Dr. Xiang Zhou)		P4704
16:30-16:50	<b>Multi-classification using one-versus-one deep learning strategy with joint probability estimates</b> <i>Anthony Hei Long Chan, City University of Hong Kong, Hong Kong</i>	
16:50-17:10	<b>Generalization analysis of pairwise learning for ranking with deep neural networks</b> <i>Shuo Huang, City University of Hong Kong, Hong Kong</i>	
17:10-17:30	<b>A generic algorithm framework for distributed optimization over the time-varying network with communication delays</b> <i>Jie Liu, City University of Hong Kong, Hong Kong</i>	