

USACM Conference on Isogeometric Analysis and Meshfree Methods

October 10-12, 2016

La Jolla, California

Conference Chairs:

Yuri Bazilevs and J.S. Chen

University of California-San Diego

USACM

Conference Organization

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Technical Sessions Overview

	Ballroom A	Ballroom B	Ballroom C	Ballroom DE
Monday				
Session 1	TS 1-1	TS 4-1	TS 13-1	TS 15-1
9:10 - 11:00				
Session 2	TS 1-2	TS 4-2	TS 13-2	TS 15-2
11:20 - 1:10				
Session 3	TS 12-1	TS 4-3	TS 13-3	TS 15-3
2:10 - 4:00				
Session 4	TS 12-2	TS 7-1	TS 13-4	TS 15-4
4:20 - 6:10				
Tuesday				
Session 5	TS 2-1	TS 9-1	TS 13-5	TS 8-1
9:00 - 10:50				
Session 6	TS 2-2	TS 9-2	TS 11-1	TS 8-2
11:10 - 1:00				
Session 7	TS 5-1	TS 16-1	TS 11-2	TS 8-3
2:00 - 3:50				
Session 8	TS 5-2	TS 16-2		TS 8-4
4:10 - 6:00				
Wednesday				
Session 9	TS 17-1	TS 18-1	TS 14-1	TS 6-1
9:00 - 10:50				
Session 10	TS 17-2	TS 18-2	TS 14-2	TS 6-2
11:10 - 1:00				

Technical Sessions

- TS 1: Mathematical Aspects of IGA and Meshfree Methods
- TS 2: Basis Function Technology and Local Refinement for IGA and Meshfree Methods
- TS 4: Quadrature and Stability Issues in IGA and Meshfree Methods
- TS 5: Galerkin and Collocation Methods
- TS 6: Progress in Software Development for IGA and Meshfree Methods
- TS 7: High Performance Computing in IGA and Meshfree Methods
- TS 8: Industrial Applications of IGA and Meshfree Methods
- TS 9: Nonlocal Mechanics and Peridynamics
- TS 11: Modeling of Extreme Events
- TS 12: XFEM and GFEM
- TS 13: Application of IGA and Meshfree Methods to Coupled Problems and Contact
- TS 14: Phase-field Modeling
- TS 15: Geometric Modeling and Integration with Analysis
- TS 16: IGA and Meshfree Methods for Thin Structures
- TS 17: IGA and Meshfree Methods for Solids
- TS 18: IGA and Meshfree Methods for Fluids, Turbulence, and Transport Phenomena

Note: The Ballrooms are noted in the program as "BR"; BR A - Ballroom A, BR B - Ballroom B, BR C - Ballroom C, BR DE - Ballroom DE

Sunday, October 9 Registration: 4:00 pm – 8:00 pm – La Jolla Ballroom Lobby Opening Reception : 6:00 pm – 8:00 pm – La Estancia Courtyard					
Monday, October 10 Opening Remarks: 8:00 – 8:10 Ballroom C 8:10 – 8:50 Plenary - Ballroom C <i>Isogeometric Analysis: Past, Present, and Future</i> Thomas J.R. Hughes					
Session 1					
Room	9:10-9:40 (K)	9:40 – 10:00	10:00 – 10:20	10:20 – 10:40	10:40 – 11:00
Technical Session #1-1: Mathematical Aspects of IGA and Meshfree Methods					
Chair: Giancarlo Sangalli					
BR A	<i>Isogeometric Analysis on Multipatch Surfaces,</i> Trond Kvamsdal*, Mats G. Larson	<i>Partially Nested Hierarchical B-Splines,</i> Nora Engleitner*	<i>A Sparse-Grid Version of IGA Methods,</i> Lorenzo Tamellini*, Giancarlo Sangalli	<i>An Isogeometric Design Space Exploration Framework for Propagation, Analysis, and Control of Geometric Variation,</i> Joseph Benzaken*, Austin Herrema, Ming-Chen Hsu, John Evans	<i>Local Refinement for T-Splines in Any Dimension,</i> Philipp Morgenstern*
Room	9:10-9:40 (K)	9:40 – 10:00	10:00 – 10:20	10:20 – 10:40	10:40 – 11:00
Technical Session #4-1: Quadrature and Stability Issues in IGA and Meshfree Methods					
Chair: Sheng-Wei Chi					
BR B	<i>A Convected Particle Tetrahedral Domain Interpolation Technique for the Material Point Methods,</i> Brian Leavy*, Rebecca Brannon, James Guilkey	<i>Accelerated Meshfree Methods Under a Smoothed Implicit Gradient Framework,</i> Michael Hillman*, J.S. Chen	<i>Variationally Consistent Coupling of Non-Matching Finite-Element and Meshfree Discretizations,</i> Arun Prakash*, Xiaowo Wang, Ertugrul Taciroglu, J.S. Chen	<i>Consistent High Order Meshfree Methods and Their Application,</i> Qinglin Duan*, Bingbing Wang, Xin Gao, Xikui Li	<i>Connections Between Peridynamics and SPH,</i> Qiang Du*, Zuoqiang Shi, Xiaochuan Tian
Room	9:10-9:40 (K)	9:40 – 10:00	10:00 – 10:20	10:20 – 10:40	10:40 – 11:00
Technical Session #13-1: Application of IGA and Meshfree Methods to Coupled Problems and Contact					
Chair: Zhen Chen					
BR C	<i>The Finite Cell Method for Coupled and Multiscale Problems – Application to Additive Manufacturing,</i> Ernst Rank*, Stefan Kollmannsberger, Ali Özcan	<i>Preconditioning Immersed Methods for Fluid-Structure Interaction,</i> Harald van Brummelen*, Frits de Prenter, Clemens Verhoosel	<i>Immerso-geometric Fluid-Structure Interaction: Fundamentals and Applications,</i> Ming-Chen Hsu*, David Kemensky, Fei Xu, Michael Wu	<i>Error Analysis for an Immerso-geometric Cardiovascular Fluid-Structure Interaction Framework,</i> Yue Yu*, David Kamensky, Ming-Chen Hsu, John Evans, Thomas Hughes	<i>Behavior of Red Blood Cells and Circulating Tumor Cells in Shear and Parabolic Flows,</i> Hugo Casquero*, Carles Bona-Casas, Hector Gomez

Room	9:10-9:40 (K)	9:40 - 10:00	10:00 - 10:20	10:20 - 10:40	10:40 - 11:00
Technical Session #15-1: Geometric Modeling and Integration with Analysis					
Chair: TBA					
BR DE	<i>On the Extraordinary Points for T-Splines</i> , Xin Li*, T.W. Sederberg	<i>Recent Developments in Volumetric T-Spline Parameterization</i> , Jessica Zhang*	<i>Reconstructing Objects from Planar Cross-Sections using T-Splines</i> , Konstantinos Kostas*, Alexandros Ginnis, Panagiotis Kaklis	<i>Unstructured T-Splines with Mapped B-Spline Basis Functions over Extraordinary Regions for Isogeometric Analysis</i> , Weiyin Ma*, Xiaoyun Yuan, Kai Tang, Michael Scott	<i>Quadrilateral and Hexahedral Mesh Generation Based on Surface Foliation Theory</i> , David Gu*, Na Lei
Session 2					
Room	11:20 - 11:50 (K)	11:50 - 12:10	12:10 - 12:30	12:30 - 12:50	12:50 - 1:10
Technical Session #1-2: Mathematical Aspects of IGA and Meshfree Methods					
Chair: John Evans					
BR A	<i>Feasible Constraints for Smooth Convex Approximations via Semidefinite Programming</i> , N. Sukumar*, Jean B. Lasserre	<i>Isogeometric Analysis of Geometric Partial Differential Equations: Modeling of Red Blood Cells</i> , Andrea Bartezzaghi*, Luca Dedè, Alfio Quarteroni	<i>Uncertain Loading and Quantifying Maximum Energy Penetration Inside Composite Structures</i> , Paul Sinz*, Robert Lipton, Michael Stuebner	<i>Regularity of Solutions for Nonlocal Systems</i> , Petronela Radu*, Mikil Foss	<i>Adaptive Isogeometric Analysis: Local h-refinements and A Posteriori Error Estimators</i> , Mukesh Kumar*
Room	11:20 - 11:50 (K)	11:50 - 12:10	12:10 - 12:30	12:30 - 12:50	12:50 - 1:10
Technical Session #4-2: Quadrature Stability Issues in IGA and Meshfree Methods					
Chair: Alessandro Reali					
BR B	<i>Fast Formation of Isogeometric Galerkin Matrices by Weighted Quadrature</i> , Mattia Tani*, Giancarlo Sangalli, Francesco Calabrò	<i>The Variational Collocation Method</i> , Laura De Lorenzis*, Hector Gomez	<i>Optimal Quadrature Rules for Splines and Their Applications to Isogeometric Analysis</i> , Michael Barton*, Victor Calo	<i>Improval Quadrature Rules for Reducing Dispersion Error in Isogeometric Analysis of Wave Propagation Problems</i> , Di Miao*, Murthy Guddati, Michael Borden	

Room	11:20 - 11:50 (K)	11:50 - 12:10	12:10 - 12:30	12:30 - 12:50	12:50 - 1:10
Technical Session #13-2: Application of IGA and Meshfree Methods to Coupled Problems and Contact Chair: Harald van Brummelen					
BR C	<i>Space-Time Computational Analysis with NURBS in Space and Time,</i> Tayfun Tezduyar*, Kenji Takizawa	<i>Isogeometric Modeling and FSI Analysis of Aerospace Composite Structures for Dynamically-Data-Driven Damage Prediction,</i> Artem Korobenko*, Marco Pigazzini, Varun Bhatt, Yuri Bazilevs	<i>Method of Dimensionality Reduction (MDR) in Contract Mechanics: Simulation of Normal and Tangential Contacts, Adhesion and Contact with Graded Materials,</i> Valentin Popov*, Markus Hess, Roman Pohrt, Qiang Li	<i>Fluid-Structure Interaction Simulations of a Patient-Specific Aortic Root with Valve Designs,</i> Fei Xu*, Ming-Chen Hsu, Simone Morganti, Alessandro Reali, Ferdinando Auricchio	
Room	11:20 - 11:50 (K)	11:50 - 12:10	12:10 - 12:30	12:30 - 12:50	12:50 - 1:10
Technical Session #15-2: Geometric Modeling and Integration with Analysis Chair: Bert Jüttler					
BR DE	<i>Aircraft Engine Design Using Adaptive and Isogeometric Concepts,</i> David Grossmann*	<i>Comparing Isogeometric Mesh Generation Techniques for Curve-to-area Parametrization,</i> Jasper Behrendorf*, Christoph Eckert, Volker Berkhahn	<i>Generating Low Rank Spline Surfaces from Boundary Curves,</i> Dominik Mokriš*, Bert Jüttler	<i>Automatic Isogeometric Analsis Suitable Trivariate Models Generation,</i> Thomas Elguedj*, Hassan Al-Akhras, Anthony Gavouil	<i>Recent Progress in Isogeometric Segmentation,</i> Michael Haberleitner*, Bert Jüttler
Session 3					
Room	2:10 - 2:40 (K)	2:40 - 3:00	3:00 - 3:20	3:20 - 3:40	3:40 - 4:00
Technical Session #12-1: XFEM and GFEM Chair: David Noble					
BR A	<i>A Generalized Finite Element Methods for the Simulation of 3-D Hydraulic Fracture Propagation and Interactions Near a Wellbore,</i> C. Armando Duarte*, Piyush Gupta	<i>A Partition of Unity Method for the Propagation of Hyraulic Fractures in Thermoelastic Media,</i> Albert Ziegenhagel*, Marc Alexander Schweitzer, Alexander Lukyanov	<i>From Diffuse Damage to Sharp Cohesive Cracks: A Coupled XFEM Framework for Failure Analysis of Quasi-Brittle Materials,</i> Yongxiang Wang*, Haim Waisman	<i>The Discontinuity-Enriched Generalized Finite Element Method,</i> Alejandro Aragon*, Angelo Simone	

Room	2:10 - 2:40 (K)	2:40 - 3:00	3:00 - 3:20	3:20 - 3:40	3:40 - 4:00
Technical Session #4-3: Quadrature and Stability Issues in IGA and Meshfree Methods					
Chair: Michael Hillman					
BR B	<i>Strain Gradient Stabilization with Dual Stress Points in the Reproducing Kernel Formulation for Modeling Penetration in Soils</i> , Sheng-Wei Chi*, Thanakorn Siriakorn, Ashkan Mahdavi, C.T. Wu	<i>Control of Solution Accuracy in Meshfree Methods</i> , Grand Joldes*, Adam Wittek, Karol Miller	<i>A Quasi-Linear Reproducing Kernel Particle Method, and Its Application to Fragmentation and Material Flow Modeling</i> , Edouard Yreux*, J.S. Chen		
Room	2:10 - 2:40 (K)	2:40 - 3:00	3:00 - 3:20	3:20 - 3:40	3:40 - 4:00
Technical Session #13-3: Application of IGA and Meshfree Methods to Coupled Problems and Contact					
Chair: Ming-Chen Hsu					
BR C	<i>Recent Advances in Developing Multiscale MPM for Multiphase and Multiphysics Problems</i> , Zhen Chen*	<i>A Meshless Method for Modeling Metallic Molten Pool</i> , Yanping Lian*, Wentao Yan, Wing-Kam Liu	<i>Distributed Data Mapping for Fluid-Structure Interaction Applications</i> , Florian Lindner*, Miriam Mehl, Benjamin Uekermann	<i>High Order B-spline Material Point Method</i> , Roel Tielen*, Lisa Wobbes, Matthias Möller, Lars Beuth	<i>Enriched Isogeometric Simulations of Diffusion Driven Phase Evolution</i> , Tao Song*, Ganesh Subbarayan
Room	2:10 - 2:40 (K)	2:40 - 3:00	3:00 - 3:20	3:20 - 3:40	3:40 - 4:00
Technical Session #15-3: Geometric Modeling and Integration with Analysis					
Chair: Jessica Zhang					
BR DE	<i>Unstructures C1 Multi-Patches of Tensor Product B-splines</i> , Michel Bercovier*	<i>Isogeometric Analysis with C2-smooth Functions on Planar Two-Patch Geometries</i> , Mario Kapl*, Vito Vitrih	<i>Coupling Adaptively Refined Spline Volumes using Boundary Compatibility</i> , Bert Juettler*, Stefan Kleiss	<i>Isogeometric Analysis on Unstructured Tetrahedral and Mixed-Element Bernstein-Bezier Discretizations</i> , Luke Engvall*, John A. Evans	
Session 4					
Room	4:20 - 4:50 (K)	4:50 - 5:10	5:10 - 5:30	5:30 - 5:50	5:50 - 6:10
Technical Session #12-2: XFEM and GFEM					
Chair: Alejandro Aragon					
BR A	<i>Improved XFEM: Accurate and Robust Dynamic Crack Growth Simulation</i> , Tian Rong*	<i>Fatigue Life Estimation of Attachment Lug using Extended Isogeometric Analysis (XIGA)</i> , N. Apetre*, Subhasis Sarkar, Mehdi Amiri, Nagaraja Iyyer, Medhi Naderi	<i>Preconditioning the Enriched Conformal Decomposition Finite Element Method for Multiphase and Multimaterial Problems</i> , David Noble*	<i>Using a Common Geometry Description to Enable Optimization-Based Design</i> , Joshua Robbins*	

	4:20 - 4:50 (K)	4:50 - 5:10	5:10 - 5:30	5:30 - 5:50	5:50 - 6:10
Technical Session #7-1: High Performance Computing in IGA and Meshfree Methods					
Chair: Martin Ruess					
BR B	<i>Preconditioners for Isogeometric Analysis</i> Giancarlo Sangalli*, Mattia Tani	<i>Construction and Use of Optimal Multi-scale Enrichment Functions</i> , Marc Alexander Schweitzer*, Albert Ziegenhagel, Constance Klaar, Sa Wu	<i>Fast Isogeometric L2 Projections Algorithm with GPU Accelerators for Modeling of Tumor Growth</i> , Grzegorz Gurgul*, Witold Dzwiniel, Maciej Paszynski, Marcin Los, Adrian Klusek	<i>Algorithm for Fast Simulations of Space-time Isogeometric Finite Element Method with t-Splines</i> , Marcin Skotniczny*, Maciej Paszynski	<i>Solving Compressible Flow Problems by Isogeometric Analysis</i> , Matthias Möller*
	4:20 - 4:50 (K)	4:50 - 5:10	5:10 - 5:30	5:30 - 5:50	5:50 - 6:10
Technical Session #13-4: Application of IGA and Meshfree Methods to Coupled Problems and Contact					
Chair: Laura De Lorenzis					
BR C	<i>Algebraic Point Projection for Explicitly Tracked Interfaces and Immersed Boundaries</i> , Ganesh Subbarayan*, Tao Song	<i>Isogeometric Analysis and Quadrature Rules for the Symmetric Galerkin Boundary Element Method</i> , Maria Lucia Sampoli*	<i>A Local Kinematic/Kinetic Coupling Algorithm for Non-Matching Isogeometric/Finite Element Discretizations</i> , Eric Peters*, John Evans, Luke Engvall	<i>Isogeometric Non-Conforming Coupling using Statistical Methods</i> , Christoph Eckert*, Pierre Kerfriden, Volker Berkhahn, Michael Beer	
	4:20 - 4:50 (K)	4:50 - 5:10	5:10 - 5:30	5:30 - 5:50	5:50 - 6:10
Technical Session #15-4: Geometric Modeling and Integration with Analysis					
Chair: TBA					
BR DE	<i>Efficient Data Structures for Analysis-Suitable Geometry</i> , Kevin Tew*, Derek Thomas, Michael Scott	<i>Truncated Hierarchical Volumetric Splines over Unstructured Hexahedral Meshes</i> , Xiaodong Wei*, Yongjie Zhang, Thomas Hughes	<i>r-Refinement Method for Isogeometric Analysis with Harmonic Mapping and Monitor Functions</i> , Gang Xu*, Jinlan Xu, Bernard Mourrain, Stephane Bordas	<i>Adaptive FEM-Based Nonrigid Image Registration using Truncated Hierarchical B-splines</i> , Aishwarya Pawar*, Yongjie Zhang, Yue Jia, Xiaodong Wei, Timon Rabczuk, Chiu Ling Chan, Cosmin Anitescu	

Tuesday, October 11
8:00 – 8:40 Plenary - Ballroom C

**Current Industrial Applications and Emergent Needs in Isogeometric Analysis
and Meshfree Methods**
David Benson (Isogeometric Analysis) and C.T. Wu (Meshfree Methods)

Session 5					
Room	9:00 – 9:30 (K)	9:30 – 9:50	9:50 – 10:10	10:10 – 10:30	10:30 – 10:50
Technical Session #2-1: Basis Function Technology and Local Refinement for IGA and Meshfree Methods					
Chair: Tom Lyche					
BR A	<i>Modelling and Simulation with Triangular NURPS</i> , Hendrik Speleers*	<i>Isogeometric Analysis with Bezier Tetrahedra</i> , Xiaoping Qian*, Songtao Xia	<i>Hybrid Volume Completion for Complex Shapes</i> , Elaine Cohen*, Yang Song	<i>Design and Analysis for Irregular Quad Layout</i> , Jorg Peters*, Thien Nguyen, Kestutis Karciauskas	<i>Multi-sided Holes and Singular Parameterizations</i> , Deepesh Toshniwal*, Hendrik Speleers, Thomas Hughes, Rene Hiemstra
Room	9:00 – 9:30 (K)	9:30 – 9:50	9:50 – 10:10	10:10 – 10:30	10:30 – 10:50
Technical Session #9-1: Nonlocal Mechanics and Peridynamics					
Chair: John Foster					
BR B	<i>Meshfree Peridynamics for Soft Materials</i> , Stewart Silling*	<i>A Multi-Time-Step Method for Partitioned Time Integration of Peridynamics</i> , Michael L. Parks*, Payton Lindsay, Arun Prakash	<i>The Simulation of Strain Localization for Granular Material with Micro-Macro Two-Scale Method of Discrete Element-Cosserat Continuum Finite Element</i> , Hongxiang Tang*		
Room	9:00 – 9:30 (K)	9:30 – 9:50	9:50 – 10:10	10:10 – 10:30	10:30 – 10:50
Technical Session #13-5: Application of IGA and Meshfree Methods to Coupled Problems and Contact					
Chair: Harald van Brummelen					
BR C	<i>Aorta and Heart Valve Flow Analysis with the Space-Time Topology Change (ST-TC) Method and NURBS in Space</i> , Kenji Takizawa*, Takyua Terahara, Uchikawa Hiroaki, Tayfun Tezduyar	<i>Isogeometric Methods for Acoustic Scattering</i> , Trond Kvamsdal*, Jon Vegard Venas, and Trond Jenserud	<i>Towards Simulation of Sloshing Tanks Using a Partitioned Approach and Spline-Based Methods</i> , Norbert Hosters*, Marek Behr, Stefanie Elgeti	<i>Isogeometric Mortar Methods in Vibroacoustics</i> , Linus Wunderlich*, Ericka Brivadis, Annalisa Buffa, Thomas Horger, Barbara Wohlmuth	<i>Estimation of Arterial Element-Based Zero-Stress State with T-Splines Wall Discretization</i> , Takafumi Sasaki*, Kenji Takizawa, Tayfun Tezduyar

Room	9:00 - 9:30 (K)	9:30 - 9:50	9:50 - 10:10	10:10 - 10:30	10:30 - 10:50
Technical Session #8-1: Industrial Applications of IGA and Meshfree Methods					
Chair: Adarsh Krishnamurthy					
BR DE	<i>Development of a Commercial Platform for Isogeometric Analysis</i> , Derek Thomas*, Kevin Tew, Michael Scott	<i>Isogeometric Modeling and Analysis of a Real-World Application: An Automotive Hood Inner</i> , Zhihui Zou*, Michael Scott, Derek Thomas, Kevin Tew, Mohamed-El-Essawi, Jim Alanoly, Raghuraman Baskaran	<i>Isogeometric Free-Surface Fluid Structure Iterations</i> , Jinhui Yan*, Artem Korobenko, Yuri Bazilevs	<i>Parametric Design, Trivariate Analysis Suitable Mesh Generation and Shape Optimization of Aeronautic Blades</i> , Arnaud Duval*, Tristan Maquart, Thomas Elguedj, Thibaut Hirscher	<i>Using an Isogeometric Indirect Boundary Element Method for Studying Unbounded Acoustic Problems Containing Complex Geometries</i> , Laurens Coox*, Emin Inci, Onur Atak
Session 6					
Room	11:10 - 11:40 (K)	11:40 - 12:00	12:00 - 12:20	12:20 - 12:40	12:40 - 1:00
Technical Session #2-2: Basis Function Technology and Local Refinement for IGA and Meshfree Methods					
Chair: N. Sukumar					
BR A	<i>A Meshfree Continuous-Discontinuous Approach for the Ductile Fracture Modeling in Explicit Dynamics Analysis</i> , C.T. Wu*, Ninshu Ma, Kenji Takada, Hideyuki Okada	<i>An Interactive Adaptive FEM/Meshfree Coupling Approach For The Ductile Fracture Simulation In 3D Solids</i> , Bo Ren*, C.T. Wu	<i>Phase-aware Meshfree Framework for Strong Thermo-mechanical Coupling Problems</i> , Bo Li*, Mathieu Foca, Laurent Stainier	<i>Optimal Convergence for Adaptive IGA Boundary Element Methods</i> , Gregor Gantner*, Michael Feischl, Alex Haberl, Dirk Praetorius, Stefan Schimanko	<i>Bivariate Polynomial Splines for Designing Smooth 3D Space Surfaces</i> , Ming-Jun Lai*
Room	11:10 - 11:40 (K)	11:40 - 12:00	12:00 - 12:20	12:20 - 12:40	12:40 - 1:00
Technical Session #9-2: Nonlocal Mechanics and Peridynamics					
Chair: Stewart Silling					
BR B	<i>Peridynamic Models for Corrosion Damage and Stress Corrosion Cracking</i> , Florin Bobaru*, Ziguang Chen, Jafarzadeh Siavash, Guanfeng Zhang	<i>On the Consistency Between Nearest-Neighbor Peridynamic Discretizations and Discretized Classical Elasticity Models</i> , Pablo Seleson*, Qiang Du, Michael L. Parks	<i>Visualization of Stress in the Process Zone of the Bond-Based Softening Peridynamic Model</i> , Patrick Diehl*, Robert Lipton, Marc Alexander Schweitzer	<i>A Model for the Transport of Miscible Fluids in the Presence of Anomalous Diffusion</i> , John Foster*, Rambod Tabasi	

Room	11:10 – 11:40 (K)	11:40 – 12:00	12:00 – 12:20	12:20 – 12:40	12:40 – 1:00
Technical Session #11-1: Modeling of Extreme Events					
Chair: Jason Roth					
BR C	<i>Extreme Event Computational Mechanics: Opportunities for State-of-Art Advancement with Meshfree Methods</i> , Andy Frank*, Jason Roth	<i>A Riemann-SNNI Galerkin Meshfree Method for Solid and Fluid Dynamics</i> , G. Zhou*, J.S. Chen, Michael Hillman	<i>Modeling Damage Evolution of an Ultra-High Performance Concrete in a Meshfree Framework</i> , Jason Sherburn*, W. Heard, B. Williams	<i>A New Immersed Isogeometric-Meshfree Technique for Fluid-Structure Interaction Problems Involving High Mach Numbers, Part I</i> , Jesus Bueno*, G. Moutsanidis, K. Kamran, Michael Hillman, H. Gomez, J.S. Chen, Y. Bazilevs	<i>A New Immersed Isogeometric-Meshfree Technique for Fluid-Structure Interaction Problems Involving High Mach Numbers, Part II</i> , G. Moutsanidis*, J. Bueno, K. Kamran, M. Hillman, H. Gomez, J.S. Chen, Y. Bazilevs
Room	11:10 – 11:40 (K)	11:40 – 12:00	12:00 – 12:20	12:20 – 12:40	12:40 – 1:00
Technical Session #8-2: Industrial Applications of IGA and Meshfree Methods					
Chair: Michael Hillman					
BR DE	<i>Prediction for Deformation Modes of Automotive Frames Using the Isogeometric Analysis and Fast NURBS Generator</i> , Kenji Takada*, Tohru Kikuchi, Takehisa Tsuduki, Kazushi Sasaya, David J. Benson, Ninshu Ma, Norio Shimizu	<i>Analysis of Large Deformation Failure Processes using Smoothed Particle Galerkin Formulation</i> , Youcai Wu*, Cheng-Tang Wu, Wei Hu, Guo Yong, Ren Bo	<i>Finite Pointset Method (FPM) in Industrial Applications</i> , Joerg Kuhnert*	<i>A Finite Pointset Model for Reactive Mixing</i> , Timo Wächtler*, Jörg Kuhnert	<i>Simulation 2D Machining of Composite Materials Using Element Free Galerkin Method</i> , Fadi Kahwash*, Islam Shyha, Alireza Maheri
Session 7					
Room	2:00 – 2:30 (K)	2:30 – 2:50	2:50 – 3:10	3:10 – 3:30	3:30 – 3:50
Technical Session #5-1: Galerkin and Collocation Methods					
Chair: Dominik Schillinger					
BR A	<i>The Variational Collocation Method: A Direct Connection between Galerkin and Collocation Methods</i> , Hector Gomez*, Laura De Lorenzis	<i>Isogeometric Collocation: Results, Applications, and Open Problems</i> , Alessandro Reali*, Thomas JR Hughes	<i>High-Order Explicit Dynamics Using Isogeometric Collocation</i> , René Hiemstra*, Alessandro Reali, Thomas Hughes	<i>Low Rank Representations for Isogeometric Galerkin Methods</i> , Angelos Mantzaflaris*, Bert Juettler, Boris Khoromskij, Ulrich Langer	<i>Study of B-splines Finite Element Discretization of Physic-Based Preconditioning for MHD Models</i> , Emmanuel Franck*, Ahmed Ratnani, Eric Sonnendrücker

Room	2:00 - 2:30 (K)	2:30 - 2:50	2:50 - 3:10	3:10 - 3:30	3:30 - 3:50
Technical Session #16-1: IGA and Meshfree Methods for Thin Structures					
Chair: Roger Sauer					
BR B	<i>Isogeometric Enhanced Quasi-Convex Meshfree Analysis</i> , Dongdong Wang*	<i>Modelling Delamination in Composites Using the Isogeometric Rotation-Free Shell Formulation</i> , Marco Simone Pigazzini*, Yuri Bazilevs, David Benson, Hyonny Kim, Andrew Ellison	<i>Isogeometric Phase-Field Modeling of Brittle Fracture in Thin Plates and Shells</i> , Josef Kiendl*, Marreddy Ambati, Laura De Lorenzis, Hector Gomez, Alessandro Reali		
Room	2:00 - 2:30 (K)	2:30 - 2:50	2:50 - 3:10	3:10 - 3:30	3:30 - 3:50
Technical Session #11-2: Modeling of Extreme Events					
Chair: Jesse Sherburn					
BR C	<i>Peridynamics Simulations of Fragmentation of Granular Materials</i> , S. Li*, H. Fan	<i>Application of Meshfree Methods to Penetration and Blast Effects Modeling</i> , J. Roth*, J. Sherburn, A. Frank, M. Hillman, J.S. Chen	<i>Severe Material Response Predictions with Lagrangian Meshfree Method</i> , K. Danielson*, N. Williams, M. Adley, J. O'Daniel	<i>Multimaterial Aspects of Meshfree Modeling of Underbody Blast</i> , T.N. Williams*, S. Akers	<i>Fragment-Impact Modeling of Concrete Structures</i> , F. Beckwith*, M. Hillman, J.S. Chen
Room	2:00 - 2:30 (K)	2:30 - 2:50	2:50 - 3:10	3:10 - 3:30	3:30 - 3:50
Technical Session #8-3: Industrial Applications of IGA and Meshfree Methods					
Chair: Artem Korobenko					
BR DE	<i>Immerso-geometric Fluid-Flow Analysis Using B-Rep CAD Models with Analytic Surfaces</i> , Adarsh Krishnamurthy*, Chenglong Wang, Fei Xu, Ming-Chen Hsu	<i>Immerso-geometric Fluid-Structure Interaction Analysis with div-Conforming B-splines: Application to Heart Valve Simulation</i> , David Kamensky*, Ming-Chen Hsu, John A. Evans, Yuri Bazilevs, Michael S Sacks, Thomas J. R. Hughes	<i>Immerso-geometric Fluid-Structure Interaction Design Optimization of Hydraulic Arresting Gear</i> , Michael Wu*, David Kamensky, Yuri Bazilevs, Ming-Chen Hsu	<i>Tire Aerodynamic Analysis with the Space-Time Slip Interface Topology Change (ST-SI-TC) Method and NURBS in Space</i> , Kuraishi Takashi*, Kenji Takizawa, Tayfun E. Tezduyar	

Session 8					
Room	4:10 - 4:40 (K)	4:40 - 5:00	5:00 - 5:20	5:20 - 5:40	5:40 - 6:00
Technical Session #5-2: Galerkin and Collocation Methods Chair: Mike Hillman					
BR A	<i>Multiscale GFEM for High Contract Suspensions using Optimal Local Basis Functions,</i> Michael Stuebner*, Robert Lipton, Paul Sinz	<i>The Generalized Finite Difference Method for Three-Dimensional Sloshing Phenomenon,</i> Chia-Ming Fan*, Jin Zhang, Po-Wei Li	<i>Meshfree Reduced Order Modeling of Fracture,</i> Qizhi He*, Camille Marodon, J.S. Chen	<i>Voronoi Cell Based RKPM,</i> Jacob Koester*, J.S. Chen, Mohamed Ebeida, Scott Mitchell, Joseph Bishop, David Littlewood	
Room	4:10 - 4:40 (K)	4:40 - 5:00	5:00 - 5:20	5:20 - 5:40	5:40 - 6:00
Technical Session #16-2: IGA and Meshfree Methods for Thin Structures Chair: Josef Kiendl					
BR B	<i>On Locking-Free Isogeometric Analysis of Geometrically Exact Three-Dimensional Beams,</i> Kjell Mathisen, Tore A. Helgedagsrud*, Yuri Bazilevs	<i>Coupling of Shell Element with MPM for Bird Strike Simulation,</i> Xiong Zhang*, Bo Wu, Xiong Zhang	<i>A New Rotation-Free Isogeometric Thin Shell Formulation and a Corresponding Continuity Constraint for Patch Boundaries,</i> Roger Sauer*, Thang X. Duong, Farshad Roohbakhshan	<i>A Parameter-Free Variational Coupling Approach for Isogeometric Thin Shells,</i> Yujie Guo*, Martin Ruess, Dominik Schillinger	
Room	4:10 - 4:40 (K)	4:40 - 5:00	5:00 - 5:20	5:20 - 5:40	5:40 - 6:00
Technical Session #8-4: Industrial Applications of IGA and Meshfree Methods Chair: David Kamensky					
BR DE	<i>A Hybrid IGA-FEM Mortar Method and Applications,</i> Federico Marini*, Pablo Antolin, Massimiliano Martinelli, Israel Wander, Maxime Pallud	<i>Planar Multi-Patch Domain Parameterization for Isogeometric Analysis,</i> Florian Buchegger*, Bert Jüttler, David Großmann	<i>A General Purpose Mesh Generation Method for Fluid Mechanics Computations with the IGA,</i> Yuto Otoguro*, Takuya Terahara, Kenji Takizawa, Tayfun E. Tezduyar		

Conference Banquet : 7:00-7:45 Reception; 7:45-10:00 Dinner , SME Building Terrace, UCSD Campus (see map at end of program)

Wednesday, October 12

8:00 - 8:40 Plenary - Ballroom C

Process-Based Multiscale Material Modeling to Additive Manufacturing Wing-Kam Liu

Session 9

Room	9:00 - 9:30 (K)	9:30 - 9:50	9:50 - 10:10	10:10 - 10:30	10:30 - 10:50
Technical Session #17-1: IGA and Meshfree Methods for Solids					
Chair: Kjell Mathisen					
BR A	<i>A Meshfree Approach for Higher-Order Gradient Crystal Plasticity</i> , Yuichi Tadano*, J.S. Chen	<i>An Objective Form for Projectile Penetration Analyses</i> , Timothy R. Brewer*, Joseph M. Magallanes, John Crawford, Hossein Sadeghi	<i>Coupled Lagrangian and Semi-Lagrangian RKPM</i> , Marco Pasetto*, J.S. Chen	<i>Rock Slope Stability Analysis Based on ICMP and Graph Theory</i> , Jianqiu Wu*, Yongchang Cai	
Room	9:00 - 9:30 (K)	9:30 - 9:50	9:50 - 10:10	10:10 - 10:30	10:30 - 10:50
Technical Session #18-1: IGA and Meshfree Methods for Fluids, Turbulence, and Transport Phenomena					
Chair: Trond Kvamsdal					
BR B	<i>The Ultimate IGA Space for Turbulent Incompressible Flow?</i> , Timo Van Opstal*, Trond Kvamsdal, Arne Morten Kvarving	<i>Differential Subgrid-Scale Modeling for Isogeometric Large Eddy Simulation</i> , Christopher Coley*, John Evans	<i>Stabilized Isogeometric Collocation Methods for Transport and Incompressible Flow</i> , John A. Evans*, Corey Nelson	<i>Free-Surface Flow Simulation with Space-Time Methods and Isogeometric Analysis</i> , Florian Zwickel*, Marek Behr, Stefanie Elgeti	
Room	9:00 - 9:30 (K)	9:30 - 10:00 (K)	10:00 - 10:20	10:20 - 10:40	
Technical Session #14-1: Phase-field Modeling					
Chair: Hector Gomez					
BR C	<i>A Phase-Field Fracture Model for Anisotropic Shells</i> , Martin Ruess*, Mohit Pundir, Yujie Guo, Dominik Schillinger, Sergio Turteltaub	<i>Sharp and Diffuse Interface Methods: Two Fundamental Paradigms for Non-Boundary-Fitted Modeling and Discretization</i> , Dominik Schillinger*, Lam H. Nguyen, Martin Ruess, Atanas Stavrev, Stein K.F. Stoter, Ying Zhao	<i>Phase-field Models for Predicting Failure Mechanisms in Solids</i> , Michael Borden*, Di Miao, Pulama Bhattacharya	<i>Isogeometric Finite Element Modeling Of Phase-Fields on Deforming Surfaces</i> , Christopher Zimmerman*, Chad Landis, Thomas Hughes, Roger Sauer	

Room	9:00 - 9:30 (K)	9:30 - 9:50	9:50 - 10:10	10:10 - 10:30	10:30 - 10:50
Technical Session #6-1: Progress in Software Development for IGA and Meshfree Methods					
Chair: David Benson					
BR DE	<i>Algorithms for Adaptive Isogeometric Methods using Hierarchical Splines and Implementation of GeoPDEs</i> , Rafael Vázquez*, Eduardo M.Garau	<i>IGA Implementation for Solids in Radioss</i> , Matthieu Occelli*, Thomas Elguedj, Lionel Morançay	<i>Development of Isogeometric Solid Element in LSDYNA</i> , Liping Li*		
Session 10					
Room	11:10 - 11:40 (K)	11:40 - 12:00	12:00 - 12:20	12:20 - 12:40	12:40 - 1:00
Technical Session #17-2: IGA and Meshfree Methods for Solids					
Chair: Thomas Elguedj					
BR A	<i>On the Development of a Non-Intrusive Coupling Strategy for NURBS Local Modeling</i> , Robin Bouclier*, Jean-Charles Passieux, Michel Salaun	<i>An Extended Isogeometric Analysis Based on PHT-splines for Crack Propagation</i> , Nhon Nguyen-Thanh*, Kun Zhou	<i>Isogeometric Analysis for 2D Plate with Complex Topology Starting from FEA Model</i> , Long Chen*, Qiping Chan, Gang Xu	<i>Small and Large Deformation Analysis with Material Point Method within the Isogeometric Framework</i> , Yousef Ghaffari Motlagh*, William M. Coombs	
Room	11:10 - 11:40 (K)	11:40 - 12:00	12:00 - 12:20	12:20 - 12:40	12:40 - 1:00
Technical Session #18-2: IGA and Meshfree Methods for Fluids, Turbulence, and Transport Phenomena					
Chair: Gregory Wagner					
BR B	<i>A Mesh-Free Method to Simulate Phase Transitions</i> , Lindsay Crowl Erickson*, Jeremy Templeton, Karla Morris	<i>RKPM Formulation for Fully Coupled Hydro-Mechanical Analysis of Fluid-Saturated Porous Media</i> , Haoyan Wei*, J. S. Chen, Michael Hillman	<i>Molecular Dynamics Modeling of a Clay-Water-Air Capillary Meniscus under Non-Isothermal Conditions</i> , Xiaoyu Song*, Miao-Chun Wang	<i>Random Isogeometric Analysis (RIGA) for Seepage in Unsaturated Soils</i> , Shahriar Shahrokhbadi*, Farshid Vahedifard	<i>Parallel Isogeometric Simulations and Inversion of Hazardous Environmental Effects during Oil/Gas Extraction</i> , Maciej Wozniak*, Marcin Los, Maciej Paszynski, Leszek Siwik, Aleksander Byrski, Marek Kisiel-Dorohinicki

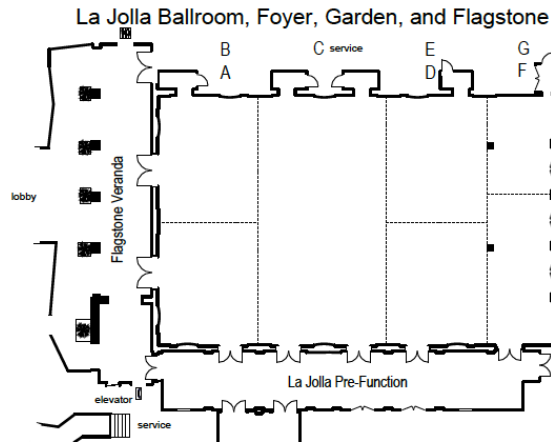
Room	11:10 - 11:40 (K)	11:40 - 12:00	12:00 - 12:20	12:20 - 12:40	12:40 - 1:00
Technical Session #14-2: Phase-field Modeling					
Chair: Dominik Schillinger					
BR C	<i>Large-Scale Phase-Field Computations of Dendrite Growth by GPU</i> Tomohiro Takaki*, Shinji Sakane, Munekazu Ohno, Yasushi Shibuta, Takashi Shimokawabe, Takayuki Aoki	<i>A Comparative Study on Multi-Material Topology Optimization with Perimeter Penalization: Isogeometric SIMP vs FEM-Based Phase Field Method,</i> Alireza H. Taheri*, Krishnan Suresh	<i>Multi-Phase-Field Modeling and Simulations of Multiphase Flow with Three and More Phases,</i> Shintaro Aihara*, Tomohiro Takaki, Naoki Takada		
Room	11:10 - 11:40 (K)	11:40 - 12:00	12:00 - 12:20	12:20 - 12:40	12:40 - 1:00
Technical Session #6-2: Progress in Software Development for IGA and Meshfree Methods					
Chair: C.T. Wu					
BR DE	<i>Algebraic Multigrid for Constrained Linear Systems,</i> Bram Metsch*, Fabian Nick, Hans-Joachim Plum, Klaus Stüben	<i>Algebraic Multigrid for Particle-Based and Meshfree Methods,</i> Fabian Nick*, Bram Metsch, Hans-Joachim Plum, Klaus Stüben	<i>Overview of LS-DYNA® Advanced FEM and Meshfree Methods for Solid and Structure Analysis,</i> W. Hu*, C.T. Wu, Y. Guo, B. Ren, Y. Wu		

Information

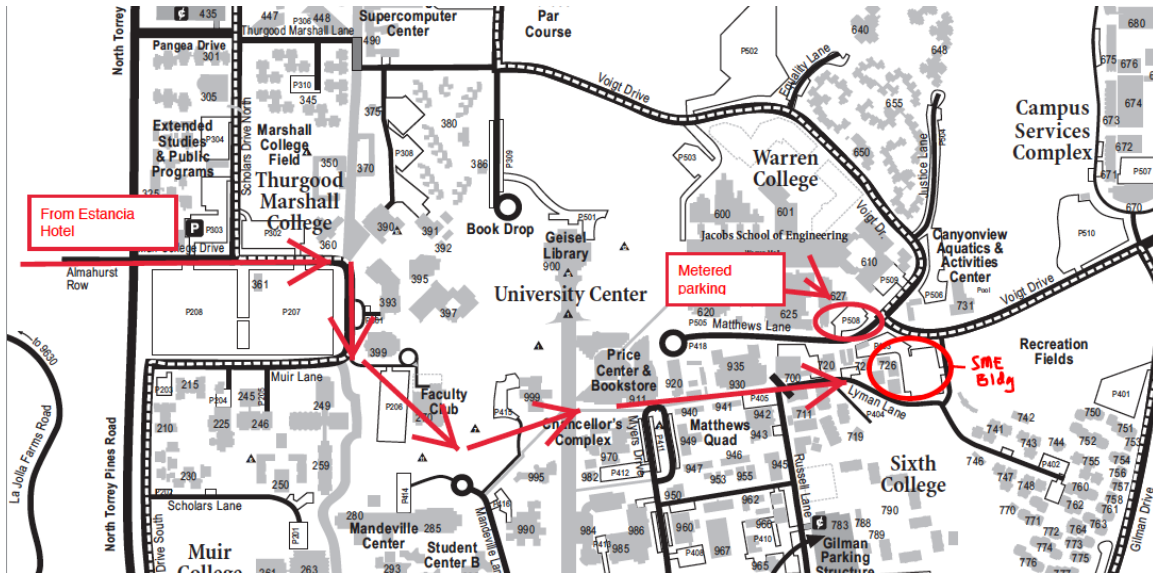
Lunch: All lunches are for registered guests only and will be held in the Grande Room.

Internet: There is guest complimentary basic wifi throughout all the hotel. Select the “Estancia La Jolla” network to access. No password required.

Ballroom FG: Seating and tables are available in Ballroom FG for informal gathering/meetings. See map of La Jolla Ballroom meeting rooms below.



Conference Banquet: The conference banquet will be held on Tuesday, October 11, on the UCSD campus at the SME Building Terrace, a 15-minute walk from La Estancia. See map below for walking directions. There is also paid parking (metered) available if you wish to drive.



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