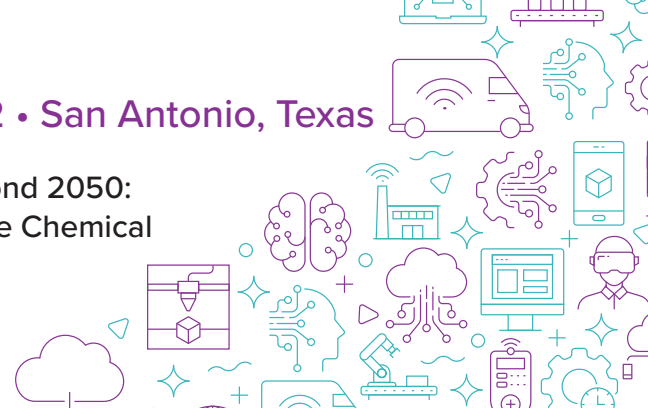


SPRING22 + 18TH GCPS

A Joint AIChE and CCPS Meeting

April 10-14, 2022 • San Antonio, Texas

Transformation Beyond 2050:
Sustainability and the Chemical
Plant of the Future



Process Engineers, Plant Engineers, and Operators contribute unique engineering judgement to each successful enterprise. They are as unique as the diverse fields they serve and they bring their own honed engineering judgement to diverse plants to solve process problems and as such can benefit from specific programming. Take advantage of this users guide developed especially for process and plant engineers to get the best from the Spring Meeting and GCPS. This guide is just a starting point for what the meeting has to offer.

All sessions take place in the Henry B. González Convention Center.

MONDAY, APRIL 11, 2022		
TIME (CDT)	ABSTRACT TITLE	ROOM
9:30 AM - 9:45 AM	Fuels and Petrochemicals Division Introduction	214CD
9:35 AM - 9:55 AM	Methods of Fan Controls	Hemisfair Ballroom C3
9:45 AM - 9:55 AM	Industry 4.0 Introduction	214CD
9:55 AM - 10:25 AM	Transitioning Toward Net Zero Refining	214CD
10:25 AM - 10:55 AM	The Role of AI in Decarbonization for Heavy-Industry Players	214CD
10:30 AM - 11:00 AM	Simplified Approach for Making Risk Decisions in a Fast Paced Business Environment	007BCD
11:00 AM - 11:30 AM	OSHA Process Safety Management and the Distillery Industry - Evaluating Regulatory Applicability and Practical Application of PSM Concepts	008AB
1:30 PM - 1:55 PM	Keynote - Les Jackowski, Chevron: Operational Issues Caused By Incorrect Heat Exchanger Design Choices	209
1:30 PM - 2:00 PM	Implementation of Feed Forward with PID Controllers	212AB
1:30 PM - 2:00 PM	Digitalization's Role for Optimizing Sustainability	214CD
1:30 PM - 2:00 PM	Systematic Incorporation of Safety Assessment in Process Design, Intensification, and Control	211
1:30 PM - 2:00 PM	Integrating Cybersecurity into the Risk Based Process Safety (RBPS) Program	008AB
1:30 PM - 3:00 PM	Sponsored Technology Workshop - Enhance Reliability of Refinery Operations with Electrolyte Based Process Simulation Solutions - OLI Systems	208
2:00 PM - 2:30 PM	Siting and Co-Location with Hydrogen: What Are the Risks?	4
2:00 PM - 2:30 PM	Signal Filtering for Control – Why and How	212AB
2:00 PM - 2:30 PM	Cybersecurity Testing: Industrial Automation Control Systems Design; The Value and Need of IACS Security FAT and IACS Security SAT	008AB
2:00 PM - 2:30 PM	When and Where Relief Systems Design Meets Process Design	4

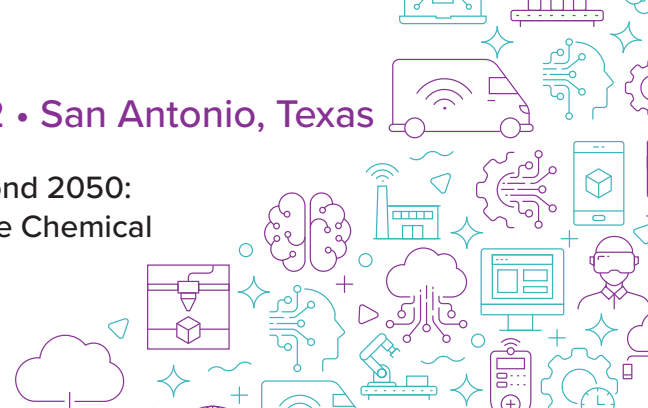
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MONDAY, APRIL 11, 2022

TIME (CDT)	ABSTRACT TITLE	ROOM
2:00 PM - 2:30 PM	Sensitivity of Distillation Column Design to Data Against Which Thermodynamic Models Are Correlated	205
2:00 PM - 2:30 PM	Enhancing Integrity Management of Aging Assets Using Risk-Based Methodologies to Improve Cost, Safety, and Productivity	006ABC
2:05 PM - 2:30 PM	Utilization of Dynamic Simulation for New Steam Cracker Start-up Activities	Hemisfair Ballroom C1
2:30 PM - 2:55 PM	Promising Chemical Treatment Approach for 1,3-Butadiene Fouling	Hemisfair Ballroom C1
2:30 PM - 3:00 PM	Leveraging State Based Control Value in a Program Approach	212AB
2:30 PM - 3:00 PM	Prioritizing Combustible Dust Engineering Controls for Global Operations	006ABC
3:30 PM - 4:00 PM	Can Digital Twins Solve the Workforce (people) Challenges of the Process Industry?	213AB
3:30 PM - 4:00 PM	A Simple, Powerful, Binning Approach to MPC Model Gain Conditioning	212AB
4:00 PM - 4:30 PM	Transforming Operations Optimization and Operator Training with Digital Twins, Augmented Reality, and Advanced Simulation	213AB
4:00 PM - 4:30 PM	pH Modeling and Control	212AB
4:00 PM - 4:30 PM	The Wild West: Quality Control Deficiencies in Certification Testing of Explosion Isolation Flap Valves	007BCD
4:00 PM - 4:30 PM	Building Proactive Organizational Resilience Against Risk of Major Process Safety Incidents	006ABC
4:00 PM - 4:30 PM	Advanced Performance Monitoring in Steam Surface Condensers	214AB
4:14 PM - 4:36 PM	Designing Crude Slates That Minimise Fouling to Reduce Refinery CO2 Emissions and Maximise Profitability	214CD
4:30 PM - 5:00 PM	Geometric Process Control Digital Twin Models for Process Operation	213AB
4:30 PM - 5:00 PM	Robust Batch Process Control Applications: Do's & Don'Ts	212AB
4:30 PM - 5:00 PM	Safehx: Buffered HEAT Exchangers for Increased Safety and Temperature Control of Sensible Fluids.	209
4:36 PM - 4:58 PM	Gas Pipeline System Integrity Management Software Platform Based on Dynamic Corrosion Bayesian Network Predictive Modeling	211

TUESDAY, APRIL 12, 2022

8:00 AM - 8:30 AM	Digital Transformation of Process Safety	213AB
8:00 AM - 8:30 AM	Modeling of Carbon Capture Process	206B

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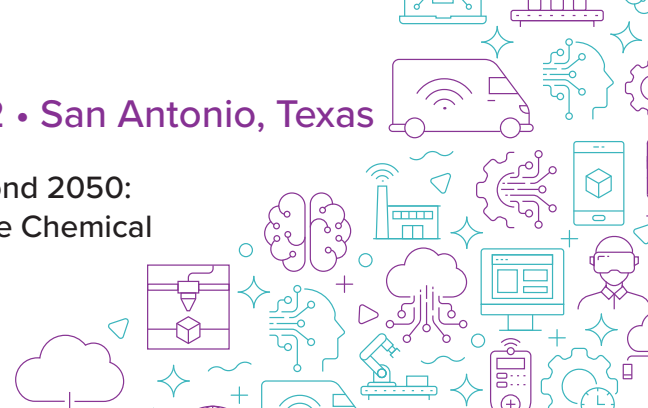
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TUESDAY, APRIL 12, 2022

TIME (CDT)	ABSTRACT TITLE	ROOM
8:00 AM - 8:30 AM	Simulation of the Combustion of Propane in a Bubbling Fluidised Bed Using the Inbuilt Aspen Plus Block	211
8:00 AM - 8:30 AM	Parallel Column Model for Reactive Dividing Wall Column Simulation	205
8:00 AM - 8:30 AM	Comprehensive Guide to Alarm Management, Rationalization and Suppression to Achieve Optimum Situational Awareness in the Control Room	4
8:00 AM - 8:30 AM	“the Book of Beacons, an Improved Resource of Process Safety Lessons”	006ABC
8:00 AM - 8:30 AM	Bayesian Transfer Learning to Improve Predictive Performance of an ODE-Based Kinetic Model	214AB
8:00 AM - 8:30 AM	Leading Indicators to Improve Sustainability and ESG	008AB
8:30 AM - 9:00 AM	Prediction of Surfactant Retention Using Intelligent Algorithms	213AB
8:30 AM - 9:00 AM	A New Conceptual Design on Natural Gas Comprehensive Utilization for Simultaneous Power, Ammonia, Fertilizer, and LNG Productions with Inherent Carbon Capture	207A
8:30 AM - 9:00 AM	Distillation Dynamics and Control	210AB
8:30 AM - 9:00 AM	Reframing PSM in the Context of Operational Risk Management and ESG Sustainability	008AB
8:30 AM - 9:00 AM	Cybersecurity Risk Assessment Strategies Based on Process Safety Risk Assessment Techniques	006ABC
8:30 AM - 9:00 AM	Sensor-Agnostic Data Platforms – Enabling Best-in-Class Monitoring Solutions	214AB
8:44 AM - 9:06 AM	Green Hydrogen Production and Distribution System Simulation	206A
9:00 AM - 9:30 AM	Mobile Worker Testbed for Chemical & Process Industries	213AB
9:00 AM - 9:30 AM	Ideal Stage Vs. Rate-Based Simulation of Gas Treating Processes	210AB
9:00 AM - 9:30 AM	Design and Techno-Economic Analysis for the Lignin Oil Production Process from Lignocellulosic Biomass	207A
10:15 AM - 10:45 AM	Safety Education 4.0 - a Response to the Needs of Process Industry 4.0	213AB
10:15 AM - 10:45 AM	Modeling Adsorption of Organics-Laden Air from Wood Drying Using Equilibrium Approaches	207B
10:15 AM - 10:45 AM	A New Modeling Framework for Batch Process Optimization	214AB
10:15 AM - 10:45 AM	Efficient and Accurate Simulation of Stirred Mixing Tanks in a Wider Context	211
10:15 AM - 10:45 AM	Innovations in Pilot Plant Process Distillation Design	205

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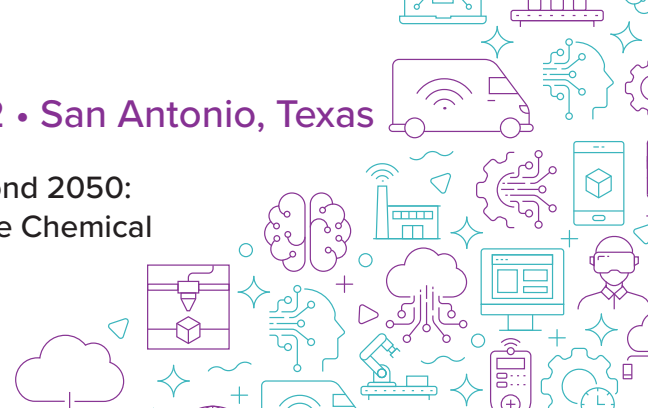
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TIME (CDT)	ABSTRACT TITLE	ROOM
10:15 AM - 11:45 AM	Sponsored Technology Workshop - Thermoplastic Design Considerations; Choosing the Ideal Material for a CPI Piping System - IPEX USA	208
10:45 AM - 11:15 AM	Best Practices on Standardizing Process Historian Data and Empowering Plant Workers to Boost Overall Equipment Effectiveness (OEE)	213AB
10:45 AM - 11:15 AM	Energy Efficient Design of Industrial Processes through Life Cycle Cost Optimization	207A
10:45 AM - 11:15 AM	Next-Generation Simulation Platform for Sustainable Process Design and Operation	211
10:45 AM - 11:15 AM	Model-Based Design and Intensification of a Catalytic Fluidized Bed Membrane Reactor for Oxidative Coupling of Methane	207B
10:45 AM - 11:15 AM	Introduction to Troubleshooting Distillation Columns	210AB
10:45 AM - 11:15 AM	Advanced Analytics for Process Experts: Accelerate Root Cause Analysis & Improve Data-Driven Decision Making	214AB
10:59 AM - 11:21 AM	Optimizing Absorption to Improve Haber-Bosch Synthesis	206A
11:15 AM - 11:45 AM	Tip of the Speardow's Digital Transformation Journey (Thus Far)	213AB
11:15 AM - 11:45 AM	Modeling Aqueous Lithium Salt Systems with Association Electrolyte Nonrandom Two-Liquid Activity Coefficient Model	207B
11:15 AM - 11:45 AM	Coupling Process Simulation and Computational Fluid Dynamics to Efficiently Design and Improve Multi-Scale Processes	207A
11:15 AM - 11:45 AM	Defensible Rationale for Fire & Gas System Design	008AB
12:00 PM - 12:30 PM	Use of a Tank Car Terminal Valve Emergency Shutoff in an SIS to Control Pressurized Toxic Gas Release	007BCD
12:00 PM - 12:30 PM	Catalyst Safety Assessment: A Risks Assessment of Catalysts/ Adsorbents in the Transient Phases of Start-up	008AB
12:00 PM - 12:45 PM	Process Safety Culture Development: Beyond the Metrics	Stars at Night Ballroom B3-B4
1:30 PM - 1:52 PM	Vapor Cloud Explosions at Nil Wind	210AB
1:30 PM - 2:00 PM	Dataset Considerations for Rapid Product Development Applications	214AB
1:30 PM - 2:00 PM	Three Challenging Applications of Quantifying Critical Characteristics with Machine Vision	213AB
1:30 PM - 2:00 PM	A Data-Driven Approach for Modeling and Energy Optimization of Smr Hydrogen Production Process	211
1:30 PM - 2:00 PM	Optimizing and Future-Proofing Green Diesel Operations	212AB

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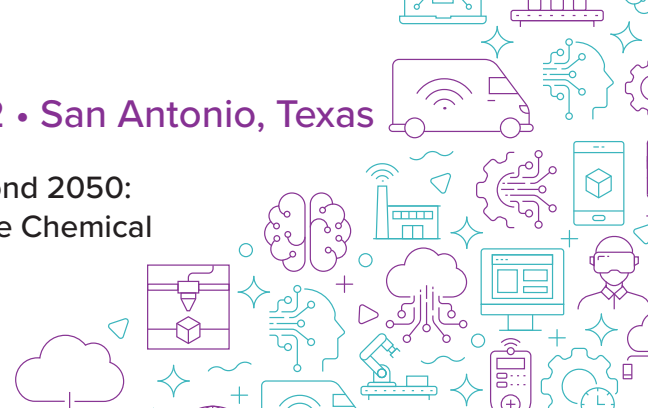
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TIME (CDT)	ABSTRACT TITLE	ROOM
1:30 PM - 3:00 PM	Sponsored Technology Workshop - Can Digital Twins Solve our Industry's Workforce Challenges? - Voovio Technologies	208
1:52 PM - 2:14 PM	VCE Potential Cascade Effects	210AB
2:00 PM - 2:30 PM	Overcoming Challenges in AI for Formulations Development	214AB
2:00 PM - 2:30 PM	Smart Anchor Technology, Offering a Complete Foundation Assessment Monitoring Solution to a Project in Llanycil, North Wales, UK	213AB
2:00 PM - 2:30 PM	Consequence/risk/modeling/facility siting	4
2:00 PM - 2:30 PM	Estimation of the Binary Interaction Parameters of the Anrtl Model Using Molecular Simulations	211
2:00 PM - 2:30 PM	Evaluating Impact of Increasing Unit Throughput: Is It Just a Linear Scale-up of Required Relief Rates?	007BCD
2:00 PM - 2:30 PM	Surface Tension and Distillation Design	205
2:00 PM - 2:30 PM	Hazard Identification and Risk Analysis at Mining Industry - Vale's Experience	5
2:00 PM - 2:30 PM	Life Cycle Assessments: Corporate Value or Potential Risk Lies in the Details	207A
2:14 PM - 2:36 PM	Potential Mitigations for LNG Pool Fires	210AB
2:30 PM - 3:00 PM	A Lower-Risk Pathway to Digital-Centric Chemical Product R&D	214AB
2:30 PM - 3:00 PM	Mass Balance and It's Impact on lot Strategies	213AB
2:30 PM - 3:00 PM	Batch Distillation Robust Design and Operation in the Face of Feed Variability and Thermodynamic Uncertainties Using Stochastic Modeling in Multibatchds™	205
2:36 PM - 2:58 PM	Study on Mass Burning Rate of LNG Pool Fire Using a Validated CFD Model	210AB
3:30 PM - 3:52 PM	Improving Measurements to Improve Energy Efficiency	214CD
3:30 PM - 4:00 PM	Safety Challenges and Objectives in Rapid Lab to Plant Scale-up	207A
3:30 PM - 4:00 PM	Machine Learning Approaches to Predict Density and Resiliency of Polyurethane Flexible Foams	214AB
3:30 PM - 4:00 PM	Risk Based Approach for Determining Fireproofing Requirements	210AB
3:30 PM - 4:00 PM	The Development of a Swift and Practical Hyperspectral Imaging Sensor	213AB
3:30 PM - 4:00 PM	Managing Safety Critical Equipment and Design Performance Standards in Major Capital Projects - BP Mad Dog 2 Project	007BCD

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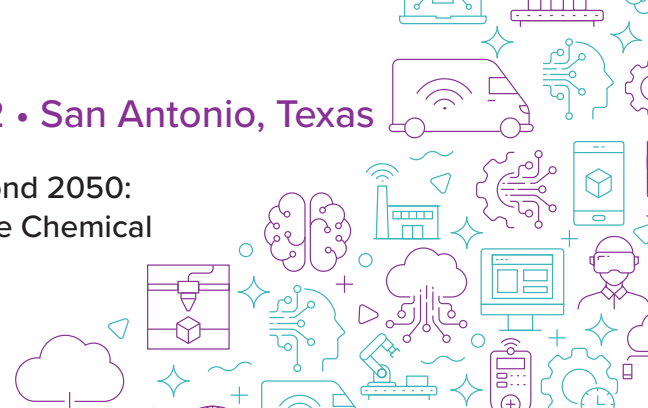
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TIME (CDT)	ABSTRACT TITLE	ROOM
3:30 PM - 5:00 PM	Sponsored Technology Workshop - Dynamic Barrier Management: Integrating PSM into Operational Risk Management - Wolters Kluwer Enablon	006D
4:00 PM - 4:30 PM	Revalidating Risk Assessments in Laboratory and Pilot Plant Facilities: A Model	207A
4:00 PM - 4:30 PM	The Combination of Data-Driven and Physics-Based Modeling with Application in Protein Formulations.	214AB
4:00 PM - 4:30 PM	Experimental and Theoretical Study on the Bund Overtopping Process after a Catastrophic Failure of LNG Storage Tanks	210AB
4:00 PM - 4:30 PM	Actionable Insights from Automated Measurements : Using Cloud Technology to Drive Performance Improvement	213AB
4:00 PM - 4:30 PM	The Unexpected Weirdness of Rate-Based Simulation of Some High-Pressure Column Operations	205
4:00 PM - 4:30 PM	Use of a Tank Car Terminal Valve Emergency Shutoff As an SIS in Control of Toxic Gas Releases	007BCD
4:00 PM - 4:30 PM	Catalyst Safety Assessment: Safer Start-Ups Via Risks Assessment of Catalysts/Adsorbents in the Transient Phases of Start-up	008AB
4:00 PM - 4:30 PM	Putting the Edge Pieces in Place – Managing Risk at the Boundaries of a Batch Process	006ABC
4:14 PM - 4:36 PM	Heat Exchanger Network (HEN) Retrofit for a Sustainable Energy Efficient Design in Aramco's Lube Refinery	214CD
4:30 PM - 5:00 PM	Accelerating Product Development with Diverse Training Data	214AB
4:30 PM - 5:00 PM	Multi-Objective Transportation Route Optimization for Hazardous Materials Based on GIS	210AB
4:30 PM - 5:00 PM	Best Practices in Implementing a Digital Transformation Strategy	213AB
4:30 PM - 5:00 PM	Alignment of High Hazard Risk Assessment Scenarios	006ABC
4:36 PM - 4:58 PM	Heavy Crude Oil Processing to Improve Pipe Line Transportation Properties	214CD

WEDNESDAY, APRIL 13, 2022

8:00 AM - 8:22 AM	Design Criteria for Mitigation of Fouling in Reboilers	209
8:00 AM - 8:30 AM	Pilot Testing for Liquid-Liquid Extraction Feasibility	207A
8:00 AM - 8:30 AM	A Tutorial on Physics-Informed Bayesian Optimization for Multi-Scale Process Design and Operation	213AB

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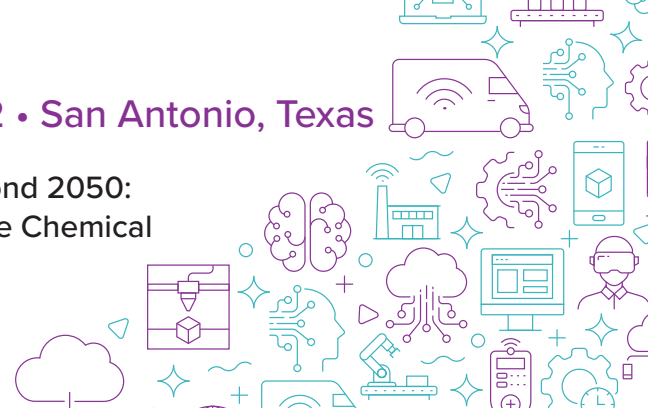
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TIME (CDT)	ABSTRACT TITLE	ROOM
8:00 AM - 8:30 AM	Towards a Framework for Resilient-Aware Design of Distributed Manufacturing Networks	211
8:00 AM - 8:30 AM	Limiting Reactive Feeds By Inherently Safe Design Methodology	008AB
8:5 AM - 8:55 AM	Ethylene Risk and Technology Review What'S the PATH Forward?	Hemisfair Ballroom C3
8:22 AM - 8:44 AM	Testing to Improve the Reliability of Fouling Mitigation	209
8:30 AM - 9:00 AM	Grams to Tons: Rapid Scale up of a First of Its Kind Chemienzymatic Process	207A
8:30 AM - 9:00 AM	Proven Techniques for Effective Implementation of Inherent Safety in Design	008AB
8:44 AM - 9:06 AM	Anti-Fouling Ceramic Coating Technology for Heat Exchanger Tubes.	209
8:50 AM - 9:15 AM	Olefin Plant Digitalization: Model-Based Coke Monitoring, Sensing of KPIs and Optimization for Steam Cracking Furnaces	Hemisfair Ballroom C1
9:00 AM - 9:30 AM	Efficient and Sustainable Manufacturing of MOF-Polymer Composites	207A
9:00 AM - 9:30 AM	Hydrotreating of Bio-Oil Model Compounds: Experimental Results and Kinetic Modeling	214CD
9:06 AM - 9:28 AM	Anti-Fouling Coatings: A Critical Review and Development Roadmap	209
9:15 AM - 9:40 AM	Using thermal imaging and a cloud platform to optimize cracking furnace efficiency in real time	Hemisfair Ballroom C1
10:5 AM - 10:30 AM	Aligning Ethylene Plant Production Planning with Online Optimization	Hemisfair Ballroom C1
10:15 AM - 10:45 AM	Analysis of Safety and Security Challenges and Opportunities Related to Cyber-Physical System	213AB
10:15 AM - 10:45 AM	Optimizing Water Jetting Cleaning of Heat Exchangers	209
10:15 AM - 10:45 AM	Hydrogen Safety and Quantitative Risk Assessment – Key Knowledge Sharing	206A
10:15 AM - 11:45 AM	Sponsored Technology Workshop - Renewable Energy: Integrating Process Safety, Asset Integrity, and Risk Management - Siemens Energy Process & Safety Consulting	006D
10:37 AM - 10:59 AM	Impact of Cool Water Blowdown from District Cooling on Surface Water Using Water Quality Analysis Simulation Program (WASP 8)	207B
10:45 AM - 11:15 AM	Automation Cybersecurity in the Chemical Industry: Connectivity's Double-Edged Sword	213AB
10:45 AM - 11:15 AM	Molecular Simulation: A Powerful Design Tool for Fischer-Tropsch Synthesis	210AB

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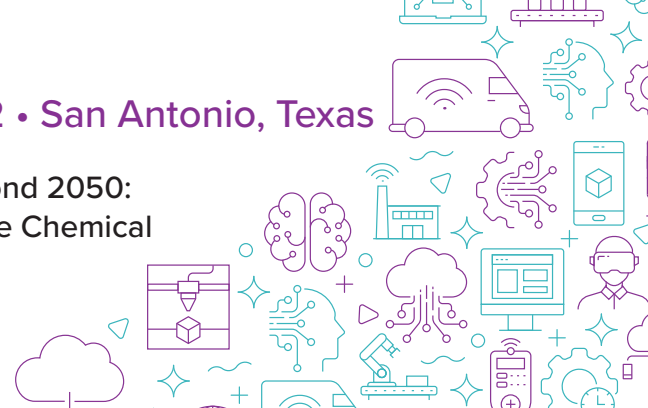
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TIME (CDT)	ABSTRACT TITLE	ROOM
10:45 AM - 11:15 AM	De-Risking the Use of Compact Heat Exchanger Designs through Better Cleaning	209
10:45 AM - 11:15 AM	Pilot Plant Design for Biological Systems in Heavy Industry	207A
10:45 AM - 11:15 AM	Implementation of Latest Digital Technology to Improve Process Safety & Operational Excellence with Effective Engineering Controls	008AB
10:45 AM - 11:15 AM	Only the Best Is Good Enough – Managing the Risks of Glass in Hazardous Service	006ABC
10:45 AM - 11:15 AM	Combination of Data Visualization Tool and Risk Analysis Tool for Manufacturing Intelligence	214AB
11:15 AM - 11:45 AM	Cyber-Informed Chemical Engineering	213AB
11:15 AM - 11:45 AM	The Active Site and Mechanism for Catalytic Hydrogenation on Metal Cation Catalysts Supported on Nu-1000: Insights from Experiments and Microkinetic Modeling	214CD
11:15 AM - 11:45 AM	Improving Our Understanding of Hydrogen through Testing and Advanced Modeling to Avoid Possible Pitfalls and Ensure Its Safe Use	007BCD
11:15 AM - 11:45 AM	Optimizing Manufacturing Data and Analytics with Cloud Computing	214AB
11:21 AM - 11:43 AM	Development of Optimization Model and Evaluation for Biological Wastewater Treatment Process	207B
1:30 PM - 2:00 PM	Democratizing Machine Learning with Seeq SME-Powered Advanced Analytics	214AB
1:30 PM - 2:00 PM	Sustainable Specialty Foams Via Recycling and Bio-Based Chemistry	213AB
1:30 PM - 3:00 PM	Negotiation for Chemical Engineers: Negotiation Strategies and Tactics and Evaluating a Job Offer	007A
2:00 PM - 2:30 PM	How a Chemical Industry Technology Supplier Approaches Sustainability Needs	213AB
2:00 PM - 2:30 PM	A Different Approach to Predicting the Impurity in the Product Stream of a Typical Chemical Refining Process – Using the Canvass AI No-Code Platform Built for Engineers.	214AB
2:00 PM - 2:30 PM	Corn Bale Deconstruction Using Physical Techniques for Improved Anatomical Separation	207A
2:25 PM - 2:50 PM	Online Repacking of Valves in Liquid Hydrocarbon Service Risk Awareness & Mitigation	Hemisfair Ballroom C1
2:30 PM - 3:00 PM	Data Science for Industrial Digital Transformation Hype or Hallelujah ?	214AB
2:30 PM - 3:00 PM	Optimization Framework for Sustainable Land Management	213AB

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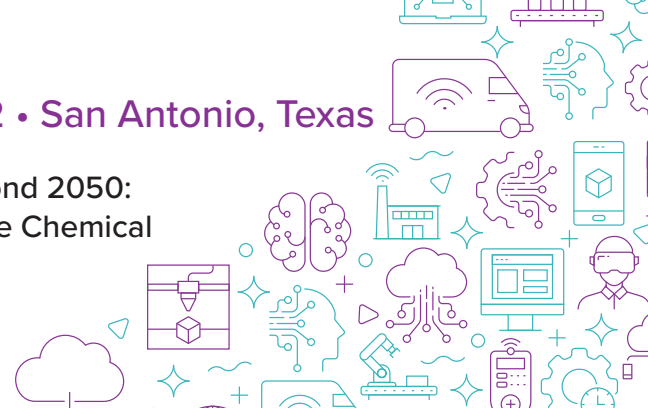
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2:30 PM - 3:00 PM	Effective Troubleshooting of Shell-and-Tube Heat Exchangers Using CFD	209
2:30 PM - 3:00 PM	Key Methods and Strategies to Accelerate Speed to Market and Reduce Cost and Risk for Scaleup of Chemical Processes	207A
2:36 PM - 2:58 PM	Cost Modeling of Desalination Technologies for the Treatment of Shale Gas Waste Water (SGWW)	210AB
2:55 PM - 3:20 PM	Combined Experimental and Kinetic Modeling Study of Thermal Decomposition of Deha: Formation of NO and HCN	Hemisfair Ballroom C3
3:30 PM - 4:00 PM	Leveraging a 3D Digital Twin and Robotics to Improve and Optimize Physical Security & Operations	213AB
3:30 PM - 4:00 PM	Rethink Your Distillation Condenser Optimization to Reduce CAPEX and Improve Project ROI	209
3:30 PM - 4:00 PM	Model Development for Real-Time Monitoring of the Thermal Performance of a Hybrid-Draft Cooling Tower	214AB
3:35 PM - 3:45 PM	Life cycle of petroleum from exploration & production to refining and downstream processes, role of water in each step and importance of modeling	207B
4:00 PM - 4:30 PM	The Future Is Robotic Industrial Cleaning	213AB
4:00 PM - 4:30 PM	Comparing Numerical Optimization on Neural Networks Versus Multivariate Predictive Models	214AB
4:15 PM - 4:35 PM	Modeling for API separators and activated sludge biological wastewater treatment process in downstream operation	207B
4:30 PM - 5:00 PM	The Advantages of Using Robots in the Chemical and Petrochemical Process Industries	213AB
4:30 PM - 5:00 PM	A Novel Data Augmentation Method for Process Modeling and Monitoring	214AB
4:30 PM - 5:00 PM	Sustainable Energy Efficiency Improvements through Methodology of Prioritizing Selections	207A

THURSDAY, APRIL 14, 2022

8:00 AM - 8:30 AM	Natural Gas Cryogenic Demethanizer Troubleshooting:an Internal Look of the Column Operation	207A
8:30 AM - 9:00 AM	Troubleshooting Tower Internal Foulings	207A
10:45 AM - 11:15 AM	Best Practices for Separation Vessel Design	207A

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