

# FOCAPO 2012 / CPC VIII

## Foundations of Computer-Aided Process Operations Chemical Process Control

January 8 –13, 2012

Westin Savannah Harbor Golf Resort & Spa ♦ Savannah, Georgia

### FINAL AGENDA

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*All General Sessions will be located in Grand Ballroom C*

FOCAPO 2012 – Sunday, Monday and Tuesday

#### **Sunday, January 8**

1:00 p.m. to	7:00 p.m.	Conference Registration
<b>6:30 p.m. to</b>	<b>7:30 p.m.</b>	<b>Welcome Reception</b> ( <i>Grand Ballroom B</i> )
<b>7:30 p.m. to</b>	<b>7:45 p.m.</b>	<b>Welcome Address</b> Conference Chair: <i>Wayne Bequette (Rensselaer Polytechnic Institute)</i>
<b>7:45 p.m. to</b>	<b>9:00 p.m.</b>	<b>Keynote Address</b> Forecasting and Other Games of Chance <i>Andy Boyd (University of Houston)</i>
9:00 p.m. to	11:00 p.m.	Hospitality ( <i>Harbor Ballroom B</i> )

## Monday, January 9

7:00 a.m. to	5:00 p.m.	Conference Registration
<b>8:00 a.m. to</b>	<b>12:00 p.m.</b>	<b>ENTERPRISE-WIDE OPTIMIZATION</b> <i>Chair: C. Pantelides (Imperial College &amp; PSE)</i>
8:00 a.m. to	8:50 a.m.	Advances in Mathematical Programming Models for Enterprise-Wide Optimization <i>I. Grossmann (Carnegie Mellon University)</i>
8:50 a.m. to	9:40 a.m.	An Overview of Maritime Inventory Routing at ExxonMobil <i>K. Furman (ExxonMobil)</i>
<b>9:40 a.m. to</b>	<b>10:10 a.m.</b>	<b>Refreshment Break</b>
10:10 a.m. to	11:00 a.m.	Challenges and Opportunities in Enterprise-Wide Optimization in the Pharmaceutical Industry <i>R. Reklaitis (Purdue University) and G. Schaefer (J &amp; J)</i>
11:00 a.m. to	12:00 p.m.	Panel Discussion
<b>12:00 p.m. to</b>	<b>2:30 p.m.</b>	<b>Poster Session A with Contributed Papers (Grand Ballroom B)</b> <i>Chairs: D. Varvarezos (Aspen Tech)</i> <i>F. You (Northwestern University)</i>
<b>2:30 p.m. to</b>	<b>6:30 p.m.</b>	<b>OPTIMIZATION OF MULTISCALE SYSTEMS</b> <i>Chair: L. Biegler (Carnegie Mellon University)</i>
2:30 p.m. to	3:10 p.m.	Towards Novel Hybrid Biomass, Coal, and Natural Gas to Liquid Systems: Process Synthesis, Global Optimization, and Supply Chain Approaches <i>C. Floudas, J. Elia &amp; R. Baliban (Princeton University)</i>
3:10 p.m. to	3:50 p.m.	Algorithms for Derivative-Free Optimization <i>M. Wright (New York University)</i>
<b>3:50 p.m. to</b>	<b>4:10 p.m.</b>	<b>Refreshment Break</b>
4:10 p.m. to	4:50 p.m.	Risk Adverse Stochastic Programming <i>S. Ahmed (Georgia Tech University)</i>
4:50 p.m. to	5:30 p.m.	From Multi-Parametric Programming Theory to MPC-on-a-Chip Multi-Scale Systems Applications <i>E. Pistikopoulos (Imperial College)</i>
5:30 p.m. to	6:30 p.m.	Panel Discussion
	<b>6:30 p.m.</b>	<b>Dinner on own</b>
9:00 p.m. to	11:00 p.m.	Hospitality ( <i>Harbor Ballroom B</i> )

## Tuesday, January 10

7:00 a.m. to	5:00 p.m.	Conference Registration
<b>8:00 a.m. to</b>	<b>12:00 p.m.</b>	<b>SUSTAINABLE ENTERPRISE MANAGEMENT</b> <i>Chair: D. Miller (NETL)</i>
8:00 a.m. to	8:40 a.m.	Enhanced Biomass-to-Liquids - Project Development and Modeling Tools <i>S. Chakravarti, D. Bonaquist, R. Drnevich and M. Shah (Praxair)</i>
8:40 a.m. to	9:20 a.m.	Mathematical Models to Support Renewable Energy Investment Decisions <i>S. Bollapragada (General Electric)</i>
<b>9:20 a.m. to</b>	<b>9:40 a.m.</b>	<b>Refreshment Break</b>
9:40 a.m. to	10:20 a.m.	Catalyzing the Nuclear and Chemical Industries through the Pursuit of Clean, Sustainable Energy <i>K. Jackson (Westinghouse Electric Company)</i>
10:20 a.m. to	11:00 p.m.	Smart Grid Technologies and Applications for the Industrial Sector <i>T. Samad (Honeywell) and S. Kiliccote (LBL)</i>
11:00 a.m. to	12:00 p.m.	Panel Discussion
<b>12:00 p.m. to</b>	<b>2:30 p.m.</b>	<b>Poster Session B with Contributed Papers (Grand Ballroom B)</b> <i>Chairs: D. Varvarezos (Aspen Tech)</i> <i>F. You (Northwestern University)</i>
<b>2:30 p.m. to</b>	<b>6:30 p.m.</b>	<b>RISK MANAGEMENT</b> <i>Chair: V. Venkatasubramanian (Purdue University)</i>
2:30 p.m. to	3:10 p.m.	Safety and Reliability in Operations – More Complex Than You Think <i>D. Grubbe (Operations and Safety Solutions, LLC)</i>
3:10 p.m. to	3:50 p.m.	Risk and Optimization in Equity Portfolios: Is it a Match Made in Heaven? <i>S. Ceria (Axioma)</i>
<b>3:50 p.m. to</b>	<b>4:10 p.m.</b>	<b>Refreshment Break</b>
4:10 p.m. to	4:50 p.m.	Why Do They Call That a Black Swan? An Engineer's View of the Mortgage Meltdown <i>A. King (IBM)</i>
4:50 p.m. to	5:30 p.m.	Assessment of Catastrophe Risk in Industry <i>U. Oktem (University of Pennsylvania)</i>
5:30 p.m. to	6:30 p.m.	Panel Discussion
	<b>6:30 p.m.</b>	<b>Dinner on own</b>
9:00 p.m. to	10:00 p.m.	Reception ( <i>Harbor Ballroom</i> )
10:00 p.m. to	11:00 p.m.	Hospitality ( <i>Harbor Ballroom</i> )

# FOCAPO 2012 / CPC VIII Joint Session

## Wednesday, January 11

7:00 a.m. to	5:00 p.m.	Conference Registration
<b>8:00 a.m. to</b>	<b>12:00 p.m.</b>	<b>INTEGRATION OF OPERATIONS AND CONTROL</b> <i>Chair: S. Pistikopoulos (Imperial College)</i>
8:00 a.m. to	8:40 a.m.	Integration of Control Theory and Scheduling Methods for Supply Chain Management <i>J. Rawlings &amp; C. Maravelias &amp; K. Subramanian (University of Wisconsin) and J. Flores-Cerrillo &amp; L. Megan (Praxair)</i>
8:40 a.m. to	9:20 a.m.	Monitoring, Fault Diagnosis, Fault-Tolerant Control and Optimization: Data Driven Methods <i>J. MacGregor (McMaster University) and A. Cinar (IIT – Chicago)</i>
<b>9:20 a.m. to</b>	<b>9:40 a.m.</b>	<b>Refreshment Break</b>
9:40 a.m. to	10:20 a.m.	Optimal Operation: Scheduling, Advanced Control, and Their Integration <i>S.Engell (Dortmund University) and I. Harjunkoski (ABB)</i>
10:20 a.m. to	11:00 p.m.	Systems Thinking in the Management of Process Operations <i>G. Stephanopoulos (MIT)</i>
11:00 a.m. to	12:00 p.m.	Panel Discussion <i>I. Grossmann, Jim Rawlings, C. Maravelias, J. MacGregor., A. Cinar, S. Engell, I. Harjunkoski, &amp; G. Stephanopoulos</i>
<b>12:15 p.m. to</b>	<b>2:30 p.m.</b>	<b>Education Panel Discussion Session (lunch included)</b> <i>L. Biegler (CMU), T. Edgar (UT-Austin), B. Ogunnaike (U Delaware), R. Reklaitis (Purdue), W. Bequette (RPI), T. Marlin (McMaster), V. Grassi (Air Products) &amp; G. Stephanopoulos (MIT)</i>
<b>2:30 p.m. to</b>	<b>5:00 p.m.</b>	<b>NEW DOMAINS FOR OPERATIONS AND CONTROL RESEARCH</b> <i>Chair: J. Lee (KAIST)</i>
2:30 p.m. to	3:15 p.m.	Renewable Resources, Biofuels and Biorefineries: Challenges and Opportunities for Process Design and Operations <i>L. Zullo (VerdeNero)</i>
3:15 p.m. to	4:00 p.m.	Process Energy Systems: Control, Economic and Sustainability Objectives <i>J. Siirola (Eastman) and T. Edgar (UT-Austin)</i>
<b>4:00 p.m. to</b>	<b>4:15 p.m.</b>	<b>Refreshment Break</b>
4:15 p.m. to	5:00 p.m.	Smart Manufacturing, Manufacturing, Intelligence and Demand-Dynamic Performance <i>J. Davis (UCLA), T. Edgar (UT-Austin), J. Porter (DuPont), J. Bernaden (Rockwell Automation) &amp; M. Sarli (ExxonMobil)</i>
7:30 p.m. to	10:00 p.m.	Reception and Banquet ( <i>Harbor Ballroom</i> )  <b>Keynote Address (after dinner)</b> Bridging Control and Operations <i>M. Morari (ETH)</i>

## CPC VIII – Thursday and Friday

### Thursday, January 12

7:00 a.m. to	5:00 p.m.	Conference Registration
<b>8:00 a.m. to</b>	<b>12:00 p.m.</b>	<b>LARGE SCALE AND NETWORKED PROCESS SYSTEMS</b> <i>Chair: D. Bartusiak (ExxonMobil)</i>
8:00 a.m. to	8:45 a.m.	Distributed Model Predictive Control: A Tutorial Review <i>P. Christofides (UCLA), R. Scattolini (Milano), D. Munoz de la Pena (Seville) and L. Liu (UCLA)</i>
8:45 a.m. to	9:30 a.m.	Dynamics and Control of Process Networks <i>E. Ydstie (Carnegie Mellon University), M. Baldea (UT-Austin) and N. El-Farra (UC-Davis)</i>
<b>9:30 a.m. to</b>	<b>10:00 a.m.</b>	<b>Refreshment Break</b>
10:00 a.m. to	10:45 a.m.	Fast Nonlinear Model Predictive Control: Optimization Strategy and Industrial Process Applications <i>F. D'Amato &amp; A. Kumar (General Electric) and R. Lopez-Negrete &amp; L. Biegler (Carnegie Mellon University)</i>
10:45 a.m. to	12:00 p.m.	Panel Discussion: Future of Control Technology – Industry / Vendor Perspectives <i>D. Williams (Equistar Chemicals), D. White (Emerson), E. Vogel (Eastman Chemical), D. Schnelle (Dupont), A. Venkat (Bloom Energy) and J. Lu (Honeywell)</i>
<b>12:00 p.m. to</b>	<b>2:30 p.m.</b>	<b>Poster Session C with Contributed Papers (Grand Ballroom B)</b> <i>Chairs: A. Armaou (Penn State University) and T. Soderstrom (ExxonMobil)</i>
<b>2:30 p.m. to</b>	<b>6:30 p.m.</b>	<b>RENEWABLE ENERGY SYSTEMS AND SUSTAINABLE PROCESSES</b> <i>Chair: S. Skogestad (NUST)</i>
2:30 p.m. to	3:10 p.m.	Systems and Control Challenges in Photovoltaic Manufacturing Processes: A Modeling Strategy for Passivation and Anti-Reflection Films <i>R. Adomaitis (University of Maryland) and A. Schwarm (Applied Materials)</i>
3:10 p.m. to	3:50 p.m.	Predictive Control Methods to Improve Energy Efficiency and Reduce Demand in Buildings <i>J. Qin (USC), P. Mhaskar (McMaster), T. Salsbury (Johnson Controls)</i>
<b>3:50 p.m. to</b>	<b>4:10 p.m.</b>	<b>Refreshment Break</b>
4:10 p.m. to	4:50 p.m.	Process Systems Opportunities in Power Generation, Storage and Distribution <i>M. Soroush (Drexel University) and D. Chmielewski (IIT)</i>
4:50 p.m. to	5:30 p.m.	Computer-Aided Process Engineering in Oil and Gas Production <i>M. Nikolaou (University of Houston)</i>
5:30 p.m. to	6:30 p.m.	Panel Discussion: Systems and Control Opportunities in Energy Research <i>A. Schwarm, T. Salsbury, D. Chmielewski, M. Nikolaou, M. Henson, L. Zullo and J. Siirola</i>
	<b>6:30 p.m.</b>	<b>Dinner on own</b>
9:00 p.m. to	11:00 p.m.	Hospitality ( <i>Harbor Ballroom B</i> )

## Friday, January 13

<b>8:00 a.m. to</b>	<b>12:00 p.m.</b>	<b>METHODS AND ENABLING TECHNOLOGIES</b> <i>Chair: D. Dochain (Louvain)</i>
8:00 a.m. to	8:40 a.m.	State Reduction in Molecular Simulations <i>Y. Kevrekidis, L. Nedialkova &amp; C. Dsilva (Princeton University) and M. Grover, Y. Xue &amp; P. Ludovice (Georgia Tech University)</i>
8:40 a.m. to	9:20 a.m.	Advances and Selected Recent Developments in State and Parameter Estimation <i>C. Kravaris (University of Patras), J. Hahn &amp; Y. Chu (Texas A&amp;M)</i>
<b>9:20 a.m. to</b>	<b>9:40 a.m.</b>	<b>Refreshment Break</b>
9:40 a.m. to	10:20 a.m.	Towards a Low Cost and High Performance MPC: The Role of System Identification <i>Y. Zhu (Zhejiang) and R. Patwardhan (Saudi Aramco)</i>
10:20 a.m. to	11:00 p.m.	The Online Use of First-Principles Models in Process Operations: Review, Current Status & Future Needs <i>C. Pantelides (Imperial College &amp; PSE) and J. Renfro (Honeywell)</i>
11:00 a.m. to	12:00 p.m.	Panel Discussion: Unsolved Problems and Needs in Fundamental Research <i>E. Ydstie, M. Guay, D. Bonvin, C. Pantelides, C. Kravaris and Y. Zhu</i>
<b>12:00 p.m. to</b>	<b>2:00 p.m.</b>	<b>Lunch on Own</b>
<b>2:00 p.m. to</b>	<b>5:30 p.m.</b>	<b>NON-TRADITIONAL APPLICATION DOMAINS: SUCCESS STORIES AND CHALLENGES</b> <i>Chair: J. Kantor (Notre Dame)</i>
2:00 p.m. to	2:45 p.m.	Control of Nano and Microchemical Systems <i>R. Braatz, Z. Ulissi and M. Strano (MIT)</i>
2:45 p.m. to	3:30 p.m.	Process Systems Engineering Tools in the Pharmaceutical Industry <i>C. Georgakis (Tufts University) and G. Troup (Merck)</i>
<b>3:30 p.m. to</b>	<b>3:45 p.m.</b>	<b>Refreshment Break</b>
3:45 p.m. to	4:30 p.m.	Design and Control of the Artificial Pancreas <i>F. Doyle, E. Dassau, R. Harvey and H. Zisser (UCSB)</i>
4:30 p.m. to	5:30 p.m.	Panel Discussion: Process Control Opportunities in Emerging Technologies
	<b>5:30 p.m.</b>	<b>Conference Concludes</b>