

# CAST Division Newsletter

Summer 2016

## *Opportunity for service in CAST*

The CAST Division is looking for a new newsletter editor, or more broadly for a CAST social media leader. Contact CAST Secretary/Treasurer Martha Grover if you are interested in this position or have questions or ideas for this role ([martha.grover@chbe.gatech.edu](mailto:martha.grover@chbe.gatech.edu)).

We also thank the past Publications Board Chair Laksh Samavedhan for his contributions to CAST over the past years.

## *New CAST Young Professionals Liason*

Thang Ho has taken on a new role in CAST, focused on creating and coordinating new programming aimed at Young Professionals. AIChE has already created a [Young Professionals Community](#) (for anyone under the age of 35), and Thang Ho is the current vice-chair. Thang is also a member of the CAST community, earning his PhD under the advisement of Bob Parker at the University of Pittsburgh. Thang is now a Research Scientist at Vertex Pharmaceuticals. Welcome Thang!



CAST Young Professionals: Please watch your email for an upcoming survey about your interests for future YP programming.

## *WebCAST*

The next WebCAST is on September 20 at 11 am Eastern: “Modeling and Optimization in Upstream Engineering” by Tekin Kunt, Weatherford. Further updates can be found on the [WebCAST webpage](#)., along with an archives of recent WebCASTs.

## *New programming for the 2016 Annual Meeting*

This year CAST will participate in the **Undergraduate Student Poster Competition**. Submissions to the “Computing and Process Control” Topical Area will be judged by CAST members. Awards will be given for the first place (\$100) and second place (\$50) posters. The poster session is usually held on Monday mornings. Stay tuned for updates on the submission process and schedule.

In 2016, CAST will hold a single session for all of the **Graduate Student Presentation Award** Finalists. The session will be held on Sunday from 3:30–6 pm.

<b>2016 Best Graduate Student Presentation Award Finalists</b>			
<b>Student</b>	<b>Advisor</b>	<b>University</b>	<b>Paper</b>
Brandon Corbett	Prashant Mhasker	McMaster University	Subspace Based Quality Control of Variable Duration Batch Processes
Markus Drouven	Ignacio Grossmann	Carnegie Mellon University	Optimization Models for Shale Gas Development Planning: A Real-World Marcellus Shale Case Study
Omar Guerra	Rex Reklaitis	Purdue University	Decision Making under Uncertainty in Integrated Planning of Generation and Transmission Capacities in Interconnected Power Systems
Nikolaos Lappas	Chrysanthos Gounaris	Carnegie Mellon University	A Theoretical and Computational Study of Continuous-Time Process Scheduling Models in the Context of Adjustable Robust Optimization
Yu Luo	Venkat Venkatasubramanian	Columbia University	The Control of Self-Interested Agents: Learning from Nature's Wisdom of Crowds
Richard Pattison	Michael Baldea	University of Texas	Moving Horizon Closed-Loop Scheduling of Processes Operating under Dynamic Constraints
Joel Paulson	Richard Braatz	MIT	An Efficient Method for Deriving Normalization Constants for Eigenfunctions of Sturm-Liouville Problems and Its Application to the Graetz Problem for Diffusive and Convection Heat/Mass Transfer
Michael Zachar	Prodromos Daoutidis	University of Minnesota	Economic Model Predictive Control for Integrating Scheduling and Dispatch of Microgrid Power Systems

*Meet the new CAST officers*

Our newest CAST officers include the 2018 CAST Programming Coordinators, as well as two new directors and the new Second Vice President.

2018 CAST Programming Coordinators

- 10a: Monica Zanfira, Praxair
- 10b: Mona Bavarian, Brewer Science
- 10c: Chrysanthos Gounaris, Carnegie Mellon University
- 10d: Ashlee Ford Versypt, Oklahoma State University
- 10e: Matthew Realf, Georgia Institute of Technology

2016-2018 Directors: Ruth Misener and Dimitrios Papavassiliou

**Ruth Misener** is a Lecturer (USA equivalent Assistant Professor) in the Computational Optimisation Group of the Quantitative Analysis and Decision Science Section. Foundations of her research are in numerical optimisation algorithms and computational software frameworks; current applications include bioprocess optimisation under uncertainty and petrochemical process network design and operations.



Ruth concurrently holds a Royal Academy of Engineering Research Fellowship (2012–2017) in association with the Centre for Process Systems Engineering and the Biological Systems Engineering Laboratory. She received an SB from MIT (2007), MA from Princeton University (2009), and a PhD from Princeton University (2012). Ruth has co-authored several publicly-available software tools for global optimisation including: APOGEE (pooling); GloMIQO (MIQCQP); ANTIGONE (MINLP).

**Dimitrios Papavassiliou** is the C.M. Sliepcevich Professor in the School of Chemical, Biological and Materials Engineering at the University of Oklahoma. Since Summer, 2013, he also serves as the Program Director for Fluid Dynamics at the National Science Foundation and as the Engineering Directorate liaison for Cyberinfrastructure and Computing within NSF. He has received a BS degree from the Aristotle University of Thessaloniki, and MS and Ph.D. degrees from the University of Illinois at Urbana-Champaign. He joined Oklahoma in 1999, after 2.5 years with Mobil's Upstream Strategic Research Center in Dallas, Texas. His research contributions are in the area of computations and numerical methods for turbulent flows and flows in porous media, in the area of micro- and nano-fluidics, and in the area of biologically relevant flows.



Dimitrios has joined AIChE in 1993, has been an officer in the Central Oklahoma local section of the AIChE, and since 2012, Dimitrios serves in the Consulting Editors Board of the AIChE Journal. Dimitrios has consistently served as chair or co-chair in CAST-sponsored sessions in the AIChE Annual Meeting during the last 15 years. He was the CAST area 10d program coordinator for the 2010 and 2012 Annual Meetings, he was an ex-officio member of the CAST executive committee (2008-2010), and he is an elected member of the Fluid Mechanics Programming Committee of the AIChE – a role that can be beneficial in advancing CAST interests outside the division.

Second Vice-President: Carl Laird

**Carl Laird** is an associate professor in the School of Chemical Engineering at Purdue University. Dr. Laird's research interests include large-scale nonlinear optimization and parallel scientific computing. Focus areas include chemical process systems, homeland security applications, and large-scale infectious disease spread. Dr. Laird is the recipient of several research and teaching awards, including the CAST Division Outstanding Young Researcher Award, National Science Foundation Faculty Early Development (CAREER) Award and the Montague Center for Teaching Excellence Award. He is also a recipient of the prestigious Wilkinson Prize for Numerical Software and the IBM Bravo award for his work on IPOPT, a software library for solving nonlinear, nonconvex, large-scale continuous optimization problems. Dr. Laird earned his Ph.D. in Chemical Engineering from Carnegie Mellon in 2006 and his Bachelor of Science in Chemical Engineering from the University of Alberta.



*Awards for Presentations at the 2015 AIChE Annual Meeting*

2015 CAST Directors' Best Poster Award

The winner of the eighteenth annual CAST Directors' Award is **Kristen Severson** from MIT, along with her co-authors, for their contribution

“Elastic Net with Monte Carlo Sampling for Data-Based Modeling in Biopharmaceutical Manufacturing Facilities,” Kristen Severson, Jeremy G. VanAntwerp, Venkatesh Natarajan, Chris Antoniou, Jörg Thömmes and Richard D. Braatz.

They will receive a \$250 honorarium, and the formal presentation of the plaque recognizing their award will be made at the CAST Award Dinner at the 2016 AIChE Annual Meeting in San Francisco.

2015 CAST Directors' Graduate Student Presentation Award

Congratulations to Helen Durand from UCLA, for her presentation “Stiction Compensation through Economic Model Predictive Control.” The formal presentation of the plaque recognizing her award will be made at the CAST Award Dinner at the 2016 AIChE Annual Meeting in San Francisco.

2015 Best Graduate Student Presentation Award Finalists				
Student	Advisor	University	Paper	Session
Helen Durand	Panagiotis Christofides	UCLA	(162b) Stiction Compensation through Economic Model Predictive Control	Optimization and Predictive Control
Daniel Griffin	Martha Grover	Georgia Tech	(481c) Mass-Count Framework for Crystal Size Control	Modeling and Control of Crystallization
Elcin Icten	G. Reklaitis	Purdue	(481e) Modeling of Crystallization of Melt-Based Oral Dosages in a Drop-on-Demand Manufacturing System	Modeling and Control of Crystallization
Davood Pourkargar	Antonios Armaou	Penn State	(583a) Estimation of Spatially Distributed Processes Via Adaptive Model Reduction Using Mobile Sensors Network	Dynamics, Reduction and Control of Distributed Parameter Systems
Taha Ahooyi	Masoud Soroush	Drexel	(663h) A Method of Proactive Model-Based Alarm System Design	Process Monitoring and Fault Detection I

*A recap of the 2015 CAST Awards Banquet at the AIChE Annual Meeting*

CAST recognized **Maria Burka** for her many contributions to our community, upon her retirement from the National Science Foundation. Members of the community shared remarks and words of appreciation, and a plaque was presented by CAST president Ray Adomatis.



The **2015 CAST Division Awards** were also recognized at the CAST Banquet.

A plaque and award check were presented to **Benoit Chauchat** for his 2014 CAST Directors' Best Poster Award:

“Higher-Order Inclusions of Nonlinear Systems” (Co-authors: Jai Rajyagurua, Mario E. Villanueva, and Boris Houskab)






Teng Zhou also won a 2014 CAST Directors' Best Poster Award for his poster “Integrated Solvent and Process Design Exemplified for a Diels-Alder Reaction,” but did not attend the CAST Banquet.

The David Himmelblau Award for Innovations in Computer-Based Chemical Engineering Education was awarded to John Falconer, Garret Nicodemus, J. Will Medlin, and Janet deGrazia. This award is sponsored by CACHE. The plaque and award check were presented to John Falconer by past CAST President Marianthi Ierapetritou, who is also the current CACHE president.



First Vice President Stratos Pistokoupoulos presented the other four division award winners with a plaque and an award check.

<p>Computing in Chemical Engineering, Rafiqul Gani</p>  <p>Sponsored by the Dow Chemical Company</p>	<p>Computing Practice Award, Lawrence Megan</p>  <p>Sponsored by Aspen Technology Inc. and ExxonMobil Research &amp; Engineering Company</p>
<p>W. David Smith, Jr. Graduate Publication Award, Ali Mesbah</p>  <p>Sponsored by Process Systems Enterprise, Inc.</p>	<p>CAST Outstanding Young Researcher Award, Carl Laird</p>  <p>Sponsored by Air Products and Chemicals, Inc.</p>

CAST also recognized **Marianthi Ierapetritou** for her service as past chair. A plaque was presented by First Vice President Stratos Pistokoupoulos.



Congratulations again to all our CAST award winners.



Please visit the CAST webpage for more information about CAST:

<http://www.castdiv.org/>

and join the CAST listserv for continued updates

<https://listserv.umd.edu/archives/cast10.html>