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CAST Communications - Winter 2008-09

30th Anniversary Issue

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Editorial Notes - 2008 in Review

by Karl Schnelle and Peter Rony

Welcome to the 12th online issue of *CAST Communications*. 2008 was not only the 100th Anniversary of AIChE but also the 30th for the CAST Division. We were not alone, as many other significant anniversaries took place in '08:

- 25th Anniversary of the column [Computing Science](#)
- 30th Anniversary of the movie *Grease*
- 60th Anniversary of [Porsche](#)
- 75th Anniversary of *Esquire* magazine
- 100th anniversary of [GM](#) (oops)
- 150th anniversary of the Theory of Evolution by [Natural Selection](#)

If you can think of some better examples, let the [Editors](#) know.

The CAST Division was established in 1978 and documented in the first issue of the *Newsletter of the CAST Division*. The "History of Formation of CAST" from pages 6 and 7 of that Newsletter are reproduced as pdf files to the right. (Click on the page images to bring up the full-size pdf.) The current newsletter name, *CAST Communications*, did not appear until Volume 8 in 1985! The name change was the first decision that Peter Rony made after he was selected by Ed Rosen to become Editor. Twenty-four years later, both name and Editor remain.



In addition to publishing some recollections by previous CAST Division Chairs (below), we have a lot of news and information this time. Please keep reading this issue to learn about Knowledge Management and Organizational Learning, CAST Award and Grant Winners, the 2008 Award Lecture and Banquet (with photos!), the new student video contest, and recent election results.

And, finally, the [Quote of the Day](#) is by Larry Page, cofounder of Google.

Articles

Editors' Note: Karl Schnelle and Peter Rony, the editors of *CAST Communications*, invited all the past Chairs to submit a short "Reflections" that is related to their one-year term in office as Chair of the CAST Division of AIChE. Here are a few of the replies. More will be published in future newsletters.

The Birth of the CAST Division

by Vern Sterba, 1978 CAST Division Chair

As one of the founders and the first chairman of the CAST Division, I felt a strong obligation to respond to Peter Rony's call for reflections. The most appropriate topic for me was to reflect on the formation of the division in 1977 (the year of the Apple I).

Way back in 1976, several of us in the AIChE Machine Computation Committee were convinced that there was a strong and growing interest in machine computation and we needed to work toward forming an AIChE Division. Back then, the MCC membership was at 66, up from 57 members in 1975.

There was a lot of work to do, not only in generating support for the division, but also in putting together all the voluminous and necessary paperwork. I wish I could remember and thank all those who contributed, but one name stands out: R. L. Morris. Bob was the key contributor in putting together a set of by-laws and also the petition to the AIChE Council.

One of the significant problems (and frustrations) in 1977 was to convince a skeptical AIChE Council that we could actually find at least one hundred AIChE members who would join the division. I think the survey we sent to 1876 AIChE members did the trick. Of the 975 who responded, 470 said they supported the idea and would join and an additional 274 said they might join (don't you just love it when you can prove you're right).

Another item we had to address is one that you may find of interest: why did we pick the division name we did? There was a lot of discussion about the name. We deliberately chose "Computing" rather than "Computer" because we saw the Ch.E. being an applications rather than a hardware oriented person. The word "Systems" was added because many Ch.E.'s who used computers heavily in their work were dealing with large and/or complex systems. Suggestions to include "Process" and "Design", while nobly supported, did not survive the review process. Finally, "Technology" was added because we are not as interested in the science of computing as we are in the practical application of the science. Our final decision seems to have survived the past thirty years!

"More Reflections" by Past CAST Division Chairs

Edward M. Rosen, 1985 -

Some of the best legacies that one can leave are the people you are able to recruit during your stay in office. Such was my legacy during 1985.

In the Spring (May) of 1985 the CACHE Corporation held its meeting at the old Coronado hotel on Coronado Island (San Diego). I was fortunate to room with Peter Rony. (Both Peter and I were CACHE trustees).

At the time Peter had recently resigned as editor-in-chief of the IEEE Computer Society magazine "IEEE Micro". Under Peter the IEEE MICRO had become the second highest-subscription magazine in the IEEE Computer Society.

Being a chemical engineer I believed he would be at home editing AIChE's CAST Division Newsletter which was undergoing a transition at the time.

It was a fortunate choice since Peter has now been an editor for CAST Communications for the last twenty some years! It has received three Max Isaacs awards as the outstanding newsletter in the AIChE.

As legacies go, it was exceptional!

Andy Hrymak, 2004 -

I scanned through the email history for the period that I was privileged to serve on the CAST Executive Committee and as Chair, and I was reminded of how many activities are done by so many volunteers to keep CAST as one of best run divisions within the AIChE. The CAST Awards program is a wonderful way to recognize the accomplishments of academic, student and industrial practitioners. I enjoyed serving on the award juries reading the records of publication and the support letters about the impact that the nominees have had on our profession of chemical engineering and field of process systems.

There was a dominant issue that was front and centre at the time I served on the Executive - the increasing importance of using the web as a means of communicating with the membership. The CAST [webCASTs](#) are an important response to the opportunity that the internet provides. The other issue that occupied a lot of time at the Executive meetings was support for the redesign and updating of the AIChE [website](#). CAST members knew that that the website could and should be so much better - the issue was not just about whether CAST would help support the update financially, but there were so many great ideas about what more could be done and a that CAST should make sure that it was a job well done. CAST has been very fortunate to have dedicated volunteer members who have committed their time for many years to programming, newsletters, and conference organization. This continuity of experience provides a great basis for succeeding generations of directors and executive members.

Gavin Towler, 2008 -

I have very much enjoyed leading the CAST Division during 2008. Our Division continues to provide great opportunities to meet with colleagues, whether to hear research results, discuss the challenges of applying computational methods in industry or simply socialize. We continue to innovate and help other AIChE groups to improve their use of computing. In 2008 we helped AIChE launch a webcast program modeled on our own successful [webCASTs](#). We also funded Area 10e's efforts to launch AIChE's first video contest on YouTube - you can see the results at [castvideo](#).


During 2008 we also set a new record for AIChE when we became the first Division ever to have a tied result in the election of 2nd Vice Chair. After much debate on the relative merits of different computational and other approaches to resolving this situation, we decided both Mahmoud El-Halwagi and Richard Braatz were elected and we determined the order in which they will serve by an electronic coin toss at the CAST banquet. The Division is in great shape financially, and membership increased by 15% in 2008, so I am happy to turn over the role of chair to Frank Doyle and look forward to continuing success for CAST in the future.

A History and View to the Future for Knowledge Management and Organizational Learning in the Process Industries

by Vince Grassi, Air Products and Chemicals, Inc., 7201 Hamilton Blvd, Allentown, PA 18078


This presentation discusses the history of how knowledge management has evolved from groupware information applications into an important contributor for talent management in the process industries. Evolutionary examples are given of collaboration, best practice transfer, idea management, and replication of lessons learned through communities and networks. It is then shown how KM has accelerated the use of informal learning reduce cost and provide greater effectiveness of learning across global enterprises. Finally we discuss how further developments will occur as knowledge management integrates with talent management to deploy more effective global workforce networks.



This [material](#) [2MB 


Communications

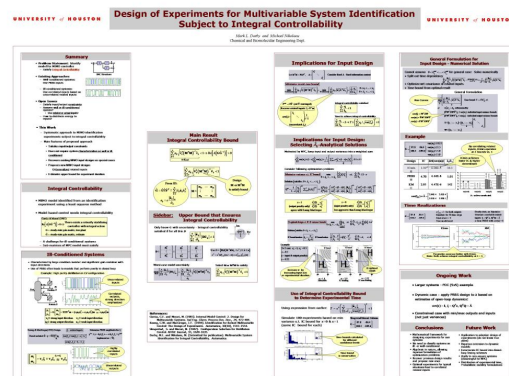
2007 CAST Directors' Award

Given for the best poster presentations at the AIChE Annual Meeting. The 2007 CAST Directors' [Award](#) was announced previously - details are on the last page of this [pdf](#) [297 KB 

First Place:

Mark Darby and Michael Nikolaou, "Design of Experiments for Multivariable Systems Subject to Integral Controllability."

Click on the [poster](#) [204 KB 



Honorable Mentions:

Foteini Makrydaki and Christos Georgakis, "Multivariate Linear Regression As A Tool in Modeling The Kinetics of Complex Chemical Reactions"

Samuel Winchenbach, M. Clayton Wheeler, Mauricio Pereira da Cunha, Bruce E. Segee, "Demonstrating a Novel Approach to the Control of Microhotplate Sensor Utilizing a Distributed Computing Approach and Numeric Modeling"

2008 CAST Award Winners


The 2008 CAST Division Awards were [announced previously](#) - details are [here](#) [297 KB 

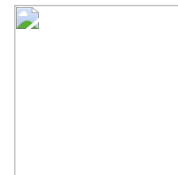
- Computing in Chemical Engineering: **Dr. Yannis Kevrekidis**, Princeton University
- Computing Practice Award: **Dr. David Vinson**, Air Products and Chemicals Inc.
- W. David Smith, Jr. Graduate Publication Award: **Dr. Christos Maravelias**, University of Wisconsin
- CAST Outstanding Young Researcher Award: **Dr. Panagiotis D. Christofides**, University of California, Los Angeles

Award Introduction

by B. Wayne Bequette, 2006 CAST Chair

Computing in Chemical Engineering Award - *Recognizes outstanding contributions in the application of computing and systems technology to chemical engineering*

The [introduction](#) [1.1MB 



[www.eng.rpi.edu]

2008 Computing in Chemical Engineering Award Lecture

by Yannis Kevrekidis, Princeton University

Yannis Kevrekidis became fascinated with dynamics - instabilities, oscillations, pattern formation - when he attended graduate school at the University of Minnesota. This interest has been a steady focus of his entire research career (from his postdoctoral year at the Center for Nonlinear Studies in Los Alamos through the years at Princeton).

Along with his students, postdocs and collaborators, he has explored nonlinear dynamical phenomena computationally in problems ranging from adaptive control and heterogeneous catalytic reactions to transitional fluid flows and chemotaxis. Over the last eight or so years, his work has focused on linking traditional, macroscopic continuum numerical algorithms with fine scale (atomistic/stochastic) simulation codes: a way to systematically model complex/multiscale systems. The main idea is to use the fine scale code as an experiment that can be initialized and executed at will. This way, traditional numerical analysis becomes a set of protocols for the design of computational experiments - and "standard" systems tools (model identification, estimation, observability, model reduction) can be used to link the fine scale at which simulations are executed to the "systems level" scale at which we want to pose and answer engineering questions.



[www.princeton.edu]

In his award talk given at the 2008 CAST Awards Dinner in Philadelphia, Yannis outlines what he calls the "equation-free" approach to complex systems modeling and simulation. The presentation may be viewed as three files: [ppt_a](#) [3MB], [ppt_b](#) [1MB], and [ppt_c](#) [6MB]. During his presentation, Yannis used the animation feature of MS PowerPoint. If you do not have PowerPoint or the free Viewer, then the pdf's are available (and smaller): [pdf_a](#) [2MB], [pdf_b](#) [1MB], and [pdf_c](#) [1MB].

Photos from the 2008 CAST Awards Dinner taken by Karl Schnelle, CAST Secretary



Michael Nikolaou, Mark Darby, and Scott Keeler



Christos Maravelias



Panagiotis Christofides



David Vinson



Gavin Towler



Yannis Kevrekidis

And here are some casual shots from the banquet.



Wayne talking about the history of the Award...



... back into the early 20th century.



Yannis making a joke.

CAST Election Results

by Jeffery S. Logsdon and Bhavik R. Bakshi, CAST Directors

The CAST elections committee is pleased to announce the results of the election of officers for 2009.

Please join us in congratulating Mahmoud M. El-Halwagi, Richard D. Braatz, Martha A. Grover, and Marianthi Ierapetritou.



2008 SECOND VICE-CHAIR: Mahmoud M. El-Halwagi

Mahmoud El-Halwagi is a Professor and Holder of the McFerrin Professorship at the Artie McFerrin Chemical Engineering Department, Texas A&M University. Mahmoud's main areas of expertise are process integration, synthesis, design, operation, and optimization, molecular and product design, as well as industrial pollution prevention. In addition to the theoretical foundations he helped lay down in these areas, he has been active in education, technology transfer, and industrial applications. He is the coauthor of about 120 papers and book chapters and is the author/co-author/co-editor of four books including the widely used textbooks: "Process Integration", Elsevier (2006) and "Pollution Prevention through Process Integration: Systematic Design Tools", Academic Press (1997) which has been translated and published in Korean and Chinese editions.

Mahmoud is the recipient of several awards including the National Science Foundation's National Young Investigator Award, the Walker Superior Teaching Award, the Mortar Board Favorite Educator Award, the Birdsong Merit Teaching Award, the Panhellenic Council Outstanding Faculty Award, the Outstanding Faculty Member Award, the Fred H. Pumphrey Award, the Texas A&M Association of Former Students Distinguished Achievement Award, and the Fluor Distinguished Teaching Award.

Mahmoud received his Ph.D. in Chemical Engineering from the University of California, Los Angeles and his M.S. and B.S. from Cairo University. He has been active in CAST for about 20 years. He has organized, chaired, and presented in numerous CAST sessions and has served as area 10a's Programming Coordinator for 1999-2000. Mahmoud will also be co-chairing the Foundations of Computer Aided Design conference (FOCAPD 2009).



2008 "THIRD VICE-CHAIR": Richard D. Braatz

Richard D. Braatz is Professor and Millennium Chair of Chemical and Biomolecular Engineering at the University of Illinois at Urbana-Champaign where he does research in the modeling, design, and control of chemical, pharmaceutical, and biomedical systems. He received a BS degree from Oregon State University and MS and PhD degrees from the California Institute of Technology. Richard maintains close interactions with industry and has consulted and/or collaborated with 15 companies including DuPont, IBM, UTC Power, Merck, and Eli Lilly. Honors include the AACC Donald P. Eckman Award, ASEE Curtis W. McGraw Research Award, CAST Outstanding Young Researcher Award, and AIChE Excellence in Process Development Research Award. He is a Fellow of the Institute of Electrical and Electronics Engineers, the International Federation of Automatic Control, and the American Association for the Advancement of Science.

Braatz' has served as CAST Director, Program Coordinator for the Systems and Process Control subdivision, AIChE Society Review Chair for the American Control Conference, AIChE representative on the Board of Directors of the American Automatic Control Council, and Chair of the [WebCAST](#) Committee. He serves as the Chair of the IEEE Technical Committee on Industrial Process Control, is an Associate Editor of *IEEE Transactions on Automatic Control*, *Automatica*, and the *Journal of Process Control*, and is the Editor-at-Large of *Optimal Control and Applications*.



2008-2010 DIRECTOR: Martha A. Grover

Martha Grover is an Assistant Professor in the School of Chemical & Biomolecular Engineering at Georgia Tech. She earned her B.S. from the University of Illinois at Urbana-Champaign in 1996, her M.S. from Caltech in 1997, and her Ph.D. from Caltech in 2003. Her research in graduate school was on microstructure control in thin film deposition, and she continues to work in this area in her own research program. She is also working on other applications of systems engineering in materials processing, including polymer branching, batch crystallization, and nanoparticle synthesis.

Martha has been an active member in the AIChE CAST Division, organizing and chairing sessions at the Annual and Spring AIChE Conferences in Areas 10b and 10d. She also recently joined the [WebCAST](#) committee. In the wider community of process control, Martha is a member of the IEEE Technical Committee on Process Control, was a member of the Program Committee for the 2007 American Control Conference, and is the Vice-Chair of Special Sessions for the upcoming 2010 American Control Conference.



2008-2010 DIRECTOR: Marianthi Ierapetritou

Marianthi Ierapetritou is an Associate Professor in the Department of Chemical and Biochemical Engineering at Rutgers University in Piscataway, New Jersey. She obtained her BS from National Technical University in Athens, Greece, her PhD from Imperial College in 1995 and subsequently completed post-doctoral research at Princeton University before joining Rutgers University in 1998. Among her accomplishments is the Board of Trustees Research Fellowship for Scholarly Excellence that recognizes faculty members who have recently been promoted to associate professor with tenure and whose work shows exceptional promise, and the prestigious NSF CAREER award.

She has published 85 papers in first rated journals and presented in national and international conferences (89 presentations). She was invited to present her work in a number of universities and conferences around the world (39 invitations). She is an active member of AIChE chairing and organizing sessions at the annual meetings. She was the program coordinator for Systems and Process Design (10a) Division in 2006. She is a member of INFORMS and SIAM and she active participant in the scientific advisor committees of ESCAPE 16, 17 and PSE 2006. This year she organized the FOCAPO conference in Boston together with Matt Bassett and Stratos Pistikopoulos. At Rutgers she is currently the director of undergraduate studies.

She is an active educator both in the classroom teaching graduate and undergraduate classes in the Chemical Engineering department and as an advisor currently supervising the Ph.D. of 7 students, 3 postdoctoral fellows and 3 undergraduate students. Her research work is supported by federal (NSF, ONR, PRF, EPA) and industrial support (Pfizer, ExxonMobil, BOC).

SECRETARY/TREASURER: Karl Schnelle

Karl Schnelle was again elected to a two-year term starting in 2009.



2008 CAST Directors' Award


by Martha Grover, CAST Director

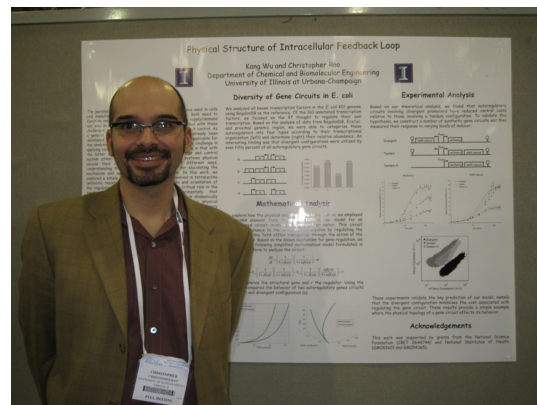
Given for the best poster presentations at the AIChE Annual Meeting.

The following [Award](#) is for work presented at the 2008 AIChE Annual Meeting in Philadelphia.

First Place:

Kang Wu and Christopher Rao, University of Illinois, "The Physical Structure of Intracellular Feedback Loops"

Click on the [poster](#) [147KB ] for the full-size pdf of the winning poster.



Christopher Rao

Student Travel Grants

by Ray Adomaitis

Please congratulate the following individuals for winning the second annual CAST Travel Grant (for attending the 2008 AIChE Annual Meeting):

Ashlee Ford, Gangshi Hu, Michael Wartmann, Ben Davis, Sivakumar Pitchaiah, Matt Percival, Charles Sung, Josh Enszer, Fengqi You, Zuyi Huang

Nominations are due August 1st for the [2009 grants](#).

AIChE Centennial Student Video Contest: "The Future of Chemical Engineering"

"In celebration of AIChE's Centennial, the Computing and Systems Technology Division (CAST) Group 10e (Information Technology) sponsored a video contest seeking innovative perspectives on the future of chemical engineering.

Students and groups were invited to submit original videos no longer than 7 minutes long that demonstrated their use of creativity and articulated their vision about the future of chemical engineering. Prizes were awarded for top videos and contest finalists had their videos showcased at the Annual Student Conference Bash and the CAST Banquet."

Click [youtube](#) to view these videos and [AIChE](#) to see the winners!

Announcements

How to Contact AIChE

Publication sales, meeting registration, applications for membership, technical training, and other AIChE products and services may be obtained by using the contact information below or visiting [AIChE Contacts](#).

American Institute of Chemical Engineers (AIChE)
3 Park Avenue
New York, NY 10016-5991
General Inquiries: 800-242-4363
International calls: 212-591-8100
Fax: 212-591-8888
[On-line contact form](#)

For answers to questions, try one of the following [AIChE Staff](#):

Felicia Guglielmi Director of Volunteer & Membership Activities	Bette Lawler Director of Operations
Technical Programming	Steve Smith Director of Technical Activities & Journals


CAST10 E-Mail List

The following websites are used to participate in the list:

1. listserv.umd.edu/archives/cast10.html is the link that subscribers can use to read and post emails.
2. www.ench.umd.edu/cast10/ has lots of archived emails.

The address to post messages to the list is CAST10 at LISTSERV.UMD.EDU .

2009 Award Nomination Form

 Please use the [2008 Award Nomination Form](#) [52KB, MS Word], which should be completed by April 15, 2009. See [CAST Division Awards](#) for submission guidelines. Electronic submissions are encouraged.

Quote of the Day

Google cofounder Larry Page proclaimed that "science has a serious marketing problem." As a solution, he suggested that tenure and grants be tied to the media impact of research.

-- from "The Future of Public Engagement", published in [The Scientist](#)

Advertisements

CAST Communications Advertising Policy

Advertising Rates:	1/4 page = \$60; 1/3 page = \$70; 1/2 page = \$90; 2/3 page = \$120; 1 page (8.5" x 11") = \$150
Production Details:	Retain your original art, please. Submit an e-mail containing a WORD or PDF version (contact editor for preferred formats) of your advertisement, to the CAST newsletter editor: Peter R. Rony .
Deadlines:	December 1 for the Winter issue; July 1 for the Summer issue.
Payment Details:	Prior to publication of advertisement, please submit check payable to CAST Division, AIChE to the CAST Division Secretary/Treasurer
Questions:	Peter R. Rony , Telephone (540) 951-2805

Join the CAST Division of AIChE

Already a member? Please ask a colleague to join.

The Computing and Systems Technology (CAST) Division of AIChE is responsible for the wide range of activities within AIChE that involve the application of computers and mathematics to chemical engineering problems including process design, process control, operations, and applied mathematics. We arrange technical sessions at AIChE Meetings, organize special conferences, and publish this newsletter - *CAST Communications* - twice a year. These activities enable our members to keep abreast of the rapidly changing fields of computing and system technology. The cost is \$10 per year, and includes a subscription to this newsletter. Shouldn't you join the CAST Division now?

To join the CAST Division, please contact [AIChE](#).

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