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CAST Communications - Fall 2003

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Editorial Notes - Blame it on the Squirrels

by [Peter Rony](#) and [Karl Schnelle](#)

It is appropriate to comment here about several of the logistical issues associated with this newsletter. The *CAST Communications* newsletter has now become a permanent, online newsletter. This transformation is timely given the current, budgetary problems of the AIChE. An online newsletter has the significant advantage that its contents can be periodically updated to include new articles, new officers, new meetings, and so forth. For example, on October 27, 2003, [ExecutiveCommittee](#) and [MeetingsandConferences](#) were updated. The CAST web server for www.castdiv.org is located at the editor's office in Blacksburg. The server is a RAID-array, COMPAQ server that is quite robust and reliable. The server is maintained - at no cost to CAST - by the editor's son, Paul Rony. The web site is subject mainly to occasional problems associated with the DSL service offered by nTelos (e.g., blown hardware at the nTelos hardware center, squirrels chewing on the nTelos data line, and so forth).

Karl Schnelle, Associate Editor & Web Administrator, updates web-site files such as *MeetingsandConferences.html*, *index.html*, *ExecutiveCommittee.html*, *CallforNominations.html*, *ArchivedNewsletters.html*, *DirectorsAward.html*, *spring03.html*, *fall02.html*, and so forth; and semi-annually sends them to Peter as email attachments. Peter then promptly uploads them to the CAST web server.

Concerning the CAST listservs, with less support from AIChE National, all communications with our members will have to be done by the CAST Division itself. We may request a current CAST roster from National on an as-needed basis; from this roster, Ray Adomaitis will upload the current email addresses to the castmemb listserv. Then, the Executive Committee can send announcements to the membership.

Your editor, Peter Rony, retired on January 1, 2003 from his position as Professor of Chemical Engineering at Virginia Tech. As he promised in November 2002, there have been no changes in his existing duties, responsibilities and participation in the CAST Publications Board. He no longer has an office at the university, so his current, official address information is now:

Peter R. Rony
MERCHANTWARE
1501 Highland Circle, Blacksburg, VA 24060-5668
Phone: +1-540-9512905
Fax: +1-650-9512805
rony@vt.edu

In this issue, we are proud to publish "[Achieving Operational Excellence](#) with Information Technology," by Lawrence B. Evans, who is founder and chairman of Aspen Technology. Larry gave this keynote address at the 2003 Spring National AIChE meeting. CAST is also pleased to present several parts of Manfred Morari's award address, "[Beyond Process Control](#)", from the CAST Division banquet at the 2002 AIChE National Meeting.

The [CAST Award Winners](#) for 2003 are Professor Liang-Tsang Fan (Kansas State University), who received the Computing in Chemical Engineering Award; Dr. Joseph S. Alford, Jr. (Eli Lilly & Co.) and Professor W. L. Luyben (Lehigh University), who jointly received the Computing in Practice Award; and Dr. Sagar B. Gadewar (PDC Process Design Center, Inc.), who received the Ted Peterson Student Award for his work supervised by Michael F. Doherty and Michael F. Malone at the University of Massachusetts.

[New members](#) of the CAST Executive Committee are Wayne Bequette as 2004 2nd Vice Chair and Joe Qin and Jimmy Humphrey as 2004-2006 Directors.

We have no other articles or communications in this Fall 2003 issue, a situation that leads to our request for all members of the CAST division – specially members of the Executive Committee – to actively seek contributions to the newsletter.


And don't forget to read the [Quote of the Day](#) on alchemy.

Articles

Achieving Operational Excellence with Information Technology

by Lawrence B. Evans

Larry Evans, founder and chairman of Aspen Technology, gave the keynote address on Operational Excellence with IT as part of the 2003 Spring National Meeting in March in New Orleans. Dr. Evans's presentation was part of the topical conference, "Using Information Technology to Increase Profitability and Productivity."


 The [full presentation](#) [790 KB] may be downloaded in pdf format.

Beyond Process Control

by Manfred Morari (with notes by Peter Rony)


Manfred Morari, CAST Division Computing in Chemical Engineering award winner for 2002, gave the CAST Division banquet award address, "Beyond Process Control", at the AIChE National Meeting in Indianapolis in November 2002. His address was highlighted by numerous videos, one of which we are attempting to provide to division members as a download in this Fall 2003 issue.


Instead of clicking on the links below, an easier and faster method may be to right click on them and select "Save Target As..." if you are using MS Internet Explorer:


 [Part A](#) [1236 KB] is an introduction in pdf format.

 [Part B](#) [977 KB] discusses control of automotive powertrains.

 [Part C](#) [836 KB] contains control challenges.

 [Part D](#) [1280 KB] contains slides on autonomous driving.

 [Part E](#) [925 KB] contains slides on adaptive cruise control and optimization.

 [SOCAL / IBM Movie](#) [492 KB] is a series of annotated screen captures from the Standard Oil of California and IBM joint video about "Computer Control Catalytic Cracker" in 1962. This is a marvelous video that portrays the early use of punched cards, card-image telecommunications, sensors, and so forth to achieve computer control of a catalytic cracker. For us old timers, it is a hoot; for current ChE students, it is a sobering reminder of how far computer and communications technology have progressed since the early 1960s.

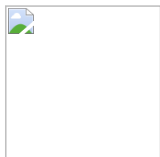
[IBM Chevron01_0001](#) [**WARNING: 101 MB**, Windows Moviemaker (*.wmv)] is a digitized version of the original SOCAL / IBM Movie. This is a huge file, of size 101 MB; it is NOT a streaming file. Your editor clicked on the link to test the downloadability of this file on November 1, 2003. He was not successful. Using a T1 line at 1.88Mbps, this file would take over 40 min to download. In comparison, the fastest DSL lines are now 1.5Mbps and a 56k modem is 53Kbps. If you have any approaches that you have successfully tested, please send the editor an email, rony@vt.edu.

2003 Election Results

by Karl Schnelle and Karlene Hoo

CAST elections were held this Fall. 80% of the CAST membership were emailed electronic voting instructions. The remaining members have not supplied AIChE with an email address, so they were sent paper ballots. The vote tallies were quite close for each position, with approximately 10% of CAST members voting. The winners are:

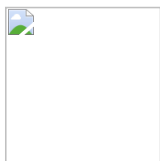
- **2004 2nd Vice Chair - Wayne Bequette**



Wayne Bequette is Professor and Acting Chair of Chemical and Biological Engineering at Rensselaer Polytechnic Institute, where he has been a faculty member for 15 years. His BSChE (1980) and Ph.D. (1986) are from the University of Arkansas and University of Texas, respectively. He was a process engineer at American Petrofina (1980-2), postdoctoral research associate at the University of Texas (1986-7) visiting lecturer at the University of California at Davis (1987-8), and he spent sabbaticals at Merck & Co. (1995) and Northwestern University (1996).

He is the author of two Prentice Hall textbooks (Process Dynamics, 1998; Process Control, 2003), and has developed a studio classroom approach for his control course. Wayne has been active in CAST division activities since 1987, chairing over 25 sessions at AIChE and related conferences. He served as the CAST 10b programming chair in 1998-1999, and as the AIChE Director on the Board of the American Automatic Control Council in 2000-2001. In addition, he has been active in the American Control Conference, serving as Finance (1991), Publications (1995), Publicity (1998), Program (2001) and General (2003) chairs. He has been an associate editor of Automatica since 1993. [photo credit: www.rpi.edu/dept/chem-eng/WWW/faculty/]

- **2004-2006 Directors - Joe Qin and Jimmy Humphrey**




S. Joe Qin received his Ph.D. in chemical engineering from University of Maryland; and his B.S. and M.S. in automatic control, Tsinghua University, Beijing. He is the holder of Paul D. and Betty Robertson Meek and American Petrofina Foundation Centennial Professorship in Chemical Engineering and Quantum Chemical Corporation Endowed Fellowship in Engineering at The University of Texas at Austin. He was a Principal Engineer at Fisher-Rosemount Systems in Austin from 1992 to 1995, Assistant Professor at UT Austin from 1995 to 2000, and Associate Professor at UT Austin from 2000 to 2003. During 2001 and 2002 he took a sabbatical at AMD in Austin.

Joe is currently an Editor of Control Engineering Practice, one of the two IFAC journals, and an International Editor of IChemE Transactions Part A: Chem. Eng. Research and Design, a European Union Journal. Joe is a Member of the Editorial Board of J. of Chemometrics. He has been an Editor for AIChE Chemical Engineering Faculty Directory since 2000. He also has chaired or co-chaired numerous sessions at AIChE Annual Meetings and American Control Conferences.

Jimmy L. Humphrey is a consultant and an internationally recognized lecturer and author. He is president of J. L. Humphrey & Associates, a consulting firm in Austin, Texas. He received B.S. and Ph.D. degrees in chemical engineering from Texas A&M University and The University of Texas at Austin (UT), respectively. He is a registered professional engineer in the state of Texas. As Adjunct Professor at The University of Texas at Austin, he will teach the course "Factory of the Future," in 2004. Humphrey is internationally recognized for his expertise in separation science and technology. His book, Separations Process Technology (McGraw-Hill), is available in English and French.

Jimmy was Chair of the Topical Conference, "Using Information Technology to Increase Profitability and Productivity in the Process Industry," at the 2003 AIChE Spring National Meeting. He also taught the AIChE course "Information Technology Fundamentals for Chemical Engineers and Others". He is a Fellow of AIChE and is Co-founder and past Chair of the AIChE Separations Division.

Also, the revision to the CAST Bylaws, concerning awards, passed; this vote was not close.

 The new [Bylaws](#) [92 KB] are available for download.

LATEST NEWS: Nine out of 10 computer users are stressed out by such regular occurrences as performance slowdown, spam overload and lost files, and the time wasted fixing problems just makes it worse, according to security firm Symantec. Anger management experts say computer stress must be alleviated before it affects productivity and human-to-human interactions. "*If you are suffering from stress, the best thing to do is to breathe deeply, and remind yourself to keep your cool,*" says Mike Fisher, of the British Association of Anger Management. The top five stress triggers, according to Symantec, are:

- 1) Slow performance and system crashes;
- 2) Spam, scams and e-mail overload;
- 3) Pop-up ads;
- 4) Viruses; and
- 5) Lost or deleted files.

Men tend to freak out over viruses, spam and general information pollution, while crashing systems and sluggish performance really irk women. More than a third of both sexes will resort to extreme behavior during computer-related meltdown, including violence, swearing, showing and desperately hitting random keys.

-- *BBC News*, 23 Oct 2003

Communications

2003 CAST Division Award Winners

by [Andrew Hrymak](#) & [Karl Schnelle](#)

We would like to congratulate the CAST Award winners for 2003. This announcement includes short biographies and some of the particularly notable quotations from the supporting letters.

Computing in Chemical Engineering Award: Professor Liang-Tseng Fan, Kansas State University

For broad and outstanding contributions to the analysis, synthesis, and control of process and material systems. Sponsored by The Dow Chemical Company & Mitsubishi Chemical Corporation.

Professor L.T. Fan, Department of Chemical Engineering, Kansas State University, received his B.S. degree in Chemical Engineering from National Taiwan University in 1951. He then went to Kansas State where he received his M.S. in Chemical Engineering in 1954, followed by his Ph.D. in 1957 from West Virginia University. A subsequent M.S. in Mathematics followed in 1958 from WVU. After completing his degrees he, joined the Department at Kansas State and rose to become Full Professor, and served as Department Head for 30 years (1968-1998).

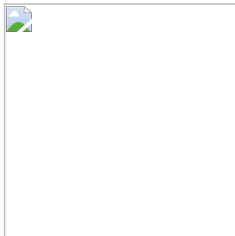
Professor Fan currently holds the University Distinguished Professorship and the Hulings Chair in Engineering. His current research areas include theoretical and experimental process synthesis, stochastic and fractal analyses of complex systems and studies of

polymer composites. He has published 5 monographs and nearly 400 archival journal articles.

"LT is one of the most prolific contributors to the modeling literature in chemical engineering. He has been alert to developments in mathematics and is among the first to import them into chemical engineering."

"He is no doubt a world-class member of our computer enhanced chemical engineering [community]."

"The fact that he has published in all areas of CAST Division makes him a unique researcher..."



Computing in Practice Award: Dr. Joseph S. Alford, Jr, Eli Lilly & Co.

*For the successful application of chemical engineering principles and computer science in advancing the state of the art of bioprocess automation. Sponsored by **Aspen Technology, Inc. and ExxonMobil Chemical Company.***

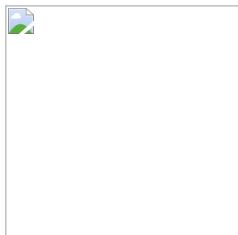
Dr. Joseph S. Alford received his Bachelor of Science degree in Chemical Engineering from Purdue University. After active duty in the U.S. Navy, he returned to graduate school at the University of Cincinnati where he earned his Masters and Ph.D. in Chemical Engineering. In 1972, Eli Lilly & Co. in Indianapolis employed Dr. Alford.

He led Eli Lilly & Co. into an international leadership position in the use of computer bioprocess control, on-line analytical instrumentation, process modeling, computer validation, artificial intelligence, and data mining. These technologies have reduced the cost of making pharmaceuticals and led to the development of more environmentally safe processes. Dr. Alford has received every major technology award from Eli Lilly & Co., which focus on achievement in science, engineering, and computer systems. These include the Career Engineering Excellence Award (1998) and the "Changing the World" Award (2001). He has also received two major awards from the Instrumentation, Systems, and Automation (ISA) Society and in 2001 was named a Distinguished Alumni of the University of Cincinnati College of Engineering.

"Clearly, Joe has had a major impact on Eli Lilly. I firmly believe that their computer monitoring and control capability for bioprocessing is the best in the world."

"Of Joe's many technical achievement, one that stands out is [his involvement in the team that] developed the FADS data historian that is used by all major Lilly fermentation development and manufacturing sites."

"Joe is one of those truly unique individuals who are comfortable and productive in both academic and industrial settings. ... Besides bringing in novel technologies to his company, Joe has simultaneously supported and helped direct the development of new technologies in data management in the academic setting."



and Professor W. L. Luyben, Lehigh University

*For pioneering the practice of process control and the integration of process control and design, emphasizing practical distillation control systems, through outstanding contributions to the literature and education. Sponsored by **Aspen Technology, Inc. and ExxonMobil Chemical Company.***

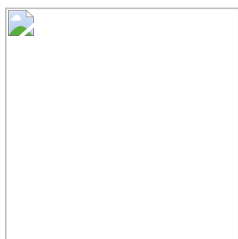
Professor Luyben of the Department of Chemical Engineering, Lehigh University, earned his Bachelors degree from Penn State in 1955 and his Ph.D. from Delaware in 1963. He then worked for Exxon as a process engineer and for DuPont as a control engineer. He joined the Lehigh faculty in 1967, and was promoted to full professor in 1973. His area of teaching and research expertise is chemical process design and control, with special interest in the control of distillation systems.

Luyben has authored or co-authored eight textbooks and more than 180 journal articles, most of which contain practical solutions to engineering problems. In 1985, Luyben played a key role in founding Lehigh's Chemical Process Modeling and Control Research Center (PMC) as an Industry-University Cooperative Research Center. The center, which Professor Luyben co-directs, is recognized internationally for its research, for its collaboration with industry, and for the quality of the graduate students it has helped to educate.

"Bill's concern for practical relevance has been the single most consistent driving force behind all he has done; and this is the defining characteristic that best captures the essence of his impact on computing practice as it relates to process systems analysis in general."

"One of Bill's principal contributions to industry is a recognition and promotion of the interdependence between process design and process control."

"If I had a tough industrial control problem that needed an innovative, practical solution, Bill Luyben is the person I would seek."



Ted Peterson Student Award: Dr. Sagar B. Gadewar, PDC Process Design Center Inc.

*For the journal paper "A Systematic Method for Reaction Invariants and Mole Balances for Complex Chemistries", with M.F. Doherty and M.F. Malone, Computers and Chemical Engineering, 25, 1199 (2001). Sponsored by **E.I. du Pont de Nemours and Company.***

Dr. Gadewar is currently with PDC Process Design Center Inc., after completing his PhD at the University of Massachusetts, Amherst, and his Bachelor's degree at the University of Mumbai. He has six publications, including Best Paper of the Year Award for 2001 from *Computers and Chemical Engineering*.

"This paper ... fills an important gap by providing a systematic method for determining mole balances for reaction systems of arbitrary complexity, and in particular for systems in which the extent of reaction cannot be followed by a unique component. "

"This paper represents an outstanding contribution that resolves in a very elegant and rigorous way a long standing important problem related to the mole balances for reaction systems of arbitrary complexity."

"The scope and significance of the new method is large - it may be used in planning of experiments, validating the consistency of experimental data, and most importantly, to automate the formulation of overall mole balances for a chemical plant."

New Society for Biological Engineering

This November, AIChE's 2003 Annual Meeting in San Francisco will introduce a new entity and a new era for the Institute. The launch of AIChE's Society for Biological Engineering demonstrates AIChE's commitment to the future of chemical engineering and to this fast-developing area of practice.

The application of biological systems to chemical engineering is contributing to a dramatic evolution of the discipline and industry. It is also creating a new opportunity for AIChE to assume a position of leadership. The society will help connect, cultivate, and catalyze the Institute and the broader biological engineering community with its five key programs. These programs are designed so that companies, organizations, and academia can come together and work on projects that benefit their interests and the greater engineering and scientific community.

- (1) SBE Conference Series: The Society will co-sponsor conferences and partner with other organizations to establish new biological engineering conferences.
- (2) SBE Training Initiatives: The SBE training programs will fill voids in biological training for chemical engineers and engineering training for scientists and technicians.
- (3) SBE Guidance Projects: These programs will provide a forum for industry to appropriately share best practices in bioprocessing, biomedical manufacturing, and pharmaceutical production.
- (4) SBE Data Collaborations: These programs will allow for appropriate sharing, standardizing, and collecting knowledge of biological properties, models, and methods.
- (5) SBE Foundation: The SBE Foundation will help influence the direction of research and education through research grants, scholarships, and student contests.

The Society for Biological Engineering is still in its formative stages. At press time, AIChE staff members were working with executives from industry leading companies like Eli Lilly and Merck for support. AIChE members and their companies interested in helping to shape the SBE, are encouraged to support the Society for Biological Engineering's five key thrusts. For more information, visit the SBE exhibit booth at the Fall Showcase during AIChE's Annual Meeting or email bio@aiiche.org.

To show your support for this interest area and to receive regular updates on the SBE and other bio-related activities, send your name, company, address, phone and email to bio@aiiche.org.

How to Contact AIChE

One-stop shopping for conferences, publications, membership, divisions, employment, training, government relations, student engineers, and other AIChE products and services may be obtained from:

AIChE Customer Service

American Institute of Chemical Engineers
3 Park Avenue
New York, NY 10016-5991
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Tel. International: (212) 591-8100
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xpress@aiiche.org

Insurance Programs: Seabury & Smith: (800) 982-4243

For answers to questions, try one of the following staff:

Betty Feehan Senior Manager, Career Services Telephone: (212) 591-7524	Bette Lawler Director, Member Development and Services Telephone: (212) 591-7207
Joe Cramer Director, Programming Telephone: (212) 591-7950	Darlene Schuster Director, Public Affairs Telephone: (202) 962-8690 1300 I Street, NW, Suite 1090 East Tower Washington, D.C. 20005
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Telephone: (212) 591-7660

Senior Director, Publications and Information Systems
Telephone: (212) 591-7335

[Lois DeLong](#)

Manager, *ChAPTER ONE*, Publications & Marketing Systems
Telephone: (212) 591-7661

CAST10 E-Mail List

The following items are used to participate in the list:

1. To post messages to the list, please send mail to cast10@ench.umd.edu.
2. Subscribe/unsubscribe messages should be mailed to emailman@ench.umd.edu.
3. Archived messages can be found at www.ench.umd.edu/cast10.
4. Specific instructions on (un)subscribing and posting messages are located at www.ench.umd.edu/cast10/subscribe.shtml.
5. Include keywords as the first line of your message: **Keywords: software, jobs, education, meetings** using any or all of the keywords.

The list moderator, adomaiti@Glue.umd.edu, would like to invite comments on the operation of the e-mail list and archive website, especially suggestions for new services.

2004 Award Nomination Form

 The [Award Nomination Form](#) [451 KB, PDF] should be completed by April 1. See [CAST Division Awards](#) for more information.

Quote of the Day

"I have learnt more from art galleries, theatres, cinemas and concert halls than I ever did from textbooks. Travel too, the chance to dwell for a time in other cultures, provides a different lens through which to view one's own world, to question things whose very familiarity have rendered them, almost invisible to us. America, India, and Italy, three very different cultures, have each taught me a lot. 'Life is for lunch' they say in Tuscany, but they still manage to work productively as well as live convivially, combining leisure and work in a way that eludes other cultures. America, that land of the free, taught me that the future is something to be welcomed because it can be shaped by us, while India's Kerala state demonstrated to me how a combination of socialism and capitalism, properly directed, can transform poverty into prosperity.

Most important of all, however, was the lesson that I learnt from the study of people who create something in their lives out of nothing -- we termed them alchemists. They proved to me that you can learn anything if you really want to. Passion was what drove these people, passion for their product or their cause. If you care enough you will find out what you need to know and chase the source of the knowledge or the skill. Or you will experiment and not worry if the experiment goes wrong. The alchemists never spoke of failures or mistakes but only of learning experiments. Passion as the secret of learning is an odd solution to propose, but I believe that it works at all levels and all ages."

The Elephant and the Flea: Memoirs of a Reluctant Capitalist
Charles Handy

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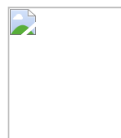


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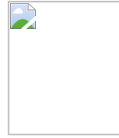
[Practical Process Control](#) - November 5 & 6, 2003

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Seeking Graduate Student

- Begin your PhD studies in chemical engineering starting fall 2004
- Must be interested in process modeling, simulation and control
- Must possess an entrepreneurial spirit
- For more info: [Grad Student Details](#) (PDF)

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Doug Cooper, Ph.D.

Email: cooper@controlstation.com

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Questions:	Peter R. Rony , Telephone (703) 231-7658 (W); Telephone (703) 951-2805 (H); FAX (703) 231-5022

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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?

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