



CAST Communications



VOL. 22 NO. 1

Winter 1999

CAST (Computers and Systems Technology) is a division of the AICHE (American Institute of Chemical Engineers)

Table of Contents

Editorial Notes

About This Issue, Peter R. Rony and Scott E. Keeler..... 3

Articles

High Performance Computing: Are We Just Getting Wrong Answers Faster?, by Mark Stadtherr, 1998 CAST Division Computing in Chemical Engineering Awardee..... 6

Communications

What is the Fundamental Purpose of the AICHE Meeting Presentations?, by Dave Smith 16

AICHE Sub-Domain Policy for Divisions/Forums, by Margie Joy Walden and Peter Gannon..... 18

How to Contact the AICHE..... 19

DIPPR® Databases..... 20

Meetings, Conferences, Congresses, Short Courses, and Workshops

International Conference on Process Integration (PI '99), Copenhagen, Denmark, March 7-10, 1999 21

1999 AICHE Spring National Meeting Topical Conference on Process Systems Engineering, Houston, Texas, March 14-18, 1999 21

European Symposium on Computer Aided Process Engineering (ESCAPE 9) and Second Conference on Process Integration, Modeling, and Optimization for Energy Saving and Pollution Reduction (PRES '99) Joint Symposium; Budapest, Hungary, May 31-June 2, 1999 22

1999 American Control Conference, San Diego, California, June 2-4, 1999 22

Symposium on Industrial Applications of Chemical Process Control, Beijing, China, July 5-9, 1999 22

Monitoring and Control of Bioprocesses, Ninth European Congress on Biotechnology (ECB9), Brussels, Belgium, July 11-15, 1999..... 22

Fifth International Conference on Foundations of Computer-Aided Process Design (FOCAPD-99), Breckenridge, Colorado, July 18-23, 1999 23

1999 European Control Conference, Karlsruhe, Germany, August 31 - September 3, 1999..... 23

1999 AICHE Fall Annual Meeting, Dallas, Texas, October 31-November 5, 1999..... 23

2000 AICHE Spring National Meeting, Atlanta, Georgia, March 26-30, 2000 25

ADCHEM 2000, Pisa, Italy, June 14-16, 2000..... 26

2000 American Control Conference, Chicago, Illinois, June 28-30, 2000 27

Seventh International Symposium on Process Systems Engineering (PSE-2000), Keystone, Colorado, July 16-21, 2000 27

International Conference on Foundations of Molecular Modeling and Simulation (FOMMS-2000), Keystone, Colorado, July 23-28, 2000 27

2000 AICHE Fall Annual Meeting, Los Angeles, California, November 12-17, 2000 27

Calls for Papers for CAST Sessions

First Call for CAST Sessions, 1999 AICHE Fall Annual Meeting, Dallas, Texas, October 31-November 5, 1999 32

First Call for CAST Sessions, 2000 AICHE Spring National Meeting, Atlanta, Georgia, March 26-30, 2000 44

Advertisements

BatchPro Designer -- Intelligen, Inc. 5

EMR Technology Group 15

Turn-Key Training in Process Control [c/o Dr. Doug Cooper, cooper@enr.uconn.edu] 17

CAST Communications Advertising Policy 20

EnviroPro Designer – Intelligen, Inc. 47

Join the CAST Division of AICHE 49

1999 Award Nomination Form..... 50

CAST Division of AIChE - 1999 Executive Committee

Elected Members

PAST CHAIR

Bjorn D. Tyreus
E.I. duPont de Nemours Co.
Experimental Station
P.O. Box 80101
Wilmington, DE 19880
Phone: 302-695-8287
Fax: 302-695-2645
Fax: 617-253-9695
tyreusbd@esvax.dnet.dupont.com

CHAIR

Lorenz T. Biegler
Chemical Engineering Department
Carnegie Mellon University
Pittsburgh, PA 15213-3890
Phone: 412-268-2232
Fax: 412-268-7139
lb01+@andrew.cmu.edu

FIRST VICE-CHAIR

Herb Britt
Aspen Technology, Inc.
10 Canal Park
Cambridge, MA 02141-2201
Phone: 617-577-0100
Fax: 617-577-0303
britt@aspentec.com

SECOND VICE-CHAIR

James F. Davis
Department of Chemical Engineering
Ohio State University
Columbus, OH 43210-1180
Phone: 614-292-0090
Fax: 614-292-3769
jfdavis@osu.edu

SECRETARY/TREASURER

Scott E. Keeler
Dow AgroSciences, 306/D2
9330 Zionsville Road
Indianapolis, IN 46268-1054
Phone: 317-337-3138
Fax: 317-337-3215
skeeler@dowagro.com

Directors 1997-1999

Michael F. Malone
University of Massachusetts
Chemical Engineering Department
Amherst, MA 01003
Phone: 413-545-0838
Fax: 413-545-1647
mmalone@ecs.umass.edu

Jorge A. Mandler
Air Products and Chemicals, Inc.
7201 Hamilton Blvd.
Allentown, PA 18195-1501
Phone: 610-481-3413
Fax: 610-481-2446
mandleja@ttown.apci.com

Karen A. High
School of Chemical Engineering
Oklahoma State University
Stillwater, OK 74078-0537
Phone: 405-744-9112
Fax: 405-744-6187
high@master.ceat.okstate.edu

Directors 1998-2000

Urmila M. Diwekar
Environmental Institute
Carnegie Mellon University
Pittsburgh, PA 15213-3890
Phone: 412-268-3003
Fax: 412-268-3757
urmila@cmu.edu

James J. Downs
Eastman Chemical Company
P.O. Box 511
Kingsport, TN 37662-5054
Phone: 423-229-5318
Fax: 423-224-0453
jjdowns@eastman.com

Andrew N. Hrymak
Dept. of Chemical Engineering
McMaster University
Hamilton, Ontario L8S 4L7
CANADA
Phone: 905-525-9140 x23136
Fax: 905-521-1350
hrymak@mcmaster.ca

Directors 1999-2001

Christodoulos A. Floudas
Department of Chemical Engineering
Princeton University
Princeton, NJ 08544-5263
Phone: 609-258-4595
Fax: 609-258-0211
floudas@titan.princeton.edu

Babu Joseph
Chemical Engineering Department
Washington University
St. Louis, MO 63130-4899
Phone: 314-935-6076
Fax: 314-935-4434
joseph@wuche2.wustl.edu

Ex-Officio Members

DIVISION PROGRAMMING CHAIR
Michael F. Malone
Department of Chemical Engineering
University of Massachusetts
Amherst, MA 01003-3110
Phone: 413-545-0838
Fax: 413-545-1647
mmalone@ecs.umass.edu

CAST DIVISION PROGRAMMING VICE-CHAIR

Amy R. Ciric
Department of Chemical Engineering
University of Cincinnati
Cincinnati, OH 45221-0171
Phone: 513-556-2763
Fax: 513-556-3473
amy.ciric@uc.edu

Area 10a: Systems and Process Design

PROGRAM COORDINATOR FOR 1999
Mahmoud El-Halwagi
Chemical Engineering Department
Auburn University
Auburn, AL 36849-5127
Phone: 205-844-2064
Fax: 205-844-2063
mahmoud@eng.auburn.edu

PROGRAM COORDINATOR FOR 2000

Urmila M. Diwekar
Dept. of Engineering and Public Policy
Carnegie Mellon University
Pittsburgh, PA 15213-3890
Phone: 412-268-3003
Fax: 412-268-3757
urmila@cmu.edu

PROGRAM COORDINATOR FOR 2001

Ka M. Ng
Department of Chemical Engineering
University of Massachusetts
Amherst, MA 01003-3110
Phone: 413-545-0096
Fax: 413-545-1647
ng@ecs.umass.edu

Area 10b: Systems and Process Control

PROGRAM COORDINATOR FOR 1999

B. Wayne Bequette
Dept. of Chemical Engineering
Rensselaer Polytechnic Institute
110 Eighth St.
Troy, NY 12180-3590
Phone: 518-276-6683
Fax: 518-276-4030
bequeb@rpi.edu

PROGRAM COORDINATOR FOR 2000

Ahmet N. Palazoglu
Department of Chemical Engineering
and Materials Science
University of California
Davis, CA 95616-5294
Phone: 530-752-8774
Fax: 530-752-1031
anpalazoglu@ucdavis.edu

PROGRAM COORDINATOR FOR 2001

Jorge A. Mandler
Air Products and Chemicals, Inc.
7201 Hamilton Blvd.
Allentown, PA 18195-1501
Phone: 610-481-3413
610-481-4948 (FAX)
mandleja@apci.com

Area 10c: Computers in Operations and Information Processing

PROGRAM COORDINATOR FOR 1999
Nikolaos V. Sahinidis
Department of Chemical Engineering
University of Illinois
600 S. Mathews Ave.
Urbana, IL 61801
Phone: 217-244-1304
Fax: 217-333-5052
nikos@uiuc.edu

PROGRAM COORDINATOR FOR 2000

Conor M. McDonald
Experimental Station
E.I. du Pont de Nemours & Company
P.O. Box 80101
Wilmington, DE 19880-0101
Phone: 302-695-7394
Fax: 302-695-2645
conor@magellan.es.dupont.com

PROGRAM COORDINATOR FOR 2001

Paul I. Barton
Department of Chemical Engineering
MIT 66-464
Cambridge, MA 02139
Phone: 617-253-6526
Fax: 617-258-5042
pib@mit.edu

Area 10d: Applied Mathematics and Numerical Analysis

PROGRAM COORDINATOR FOR 1999

Pedro Arce
Dept. of Chemical Engineering
FAMU/FSU College of Eng.
Tallahassee, FL 32316-2175
Phone: 904-487-6166
Fax: 904-487-6150
arce@evax12.eng.fsu.edu

PROGRAM COORDINATOR FOR 2000

Anthony N. Beris
Dept. of Chemical Engineering
University of Delaware
Newark, DE 19716
Phone: 302-831-8018
Fax: 302-831-1048
beris@che.udel.edu

PROGRAM COORDINATOR FOR 2001

Prodromos Daoutidis
Department of Chemical Engineering and
Material Science
University of Minnesota
Minneapolis, MN 55455-0132
Phone: 612-625-8818
Fax: 612-626-7246
daoutidis@cems.umn.edu

AIChE Council Liaison

Gintaras V. Reklaitis
School of Chem. Engineering
Purdue University
West Lafayette, IN 47907-1283
Phone: 765-494-4075
Fax: 765-494-0805
reklaiti@ecn.purdue.edu

Other Members

PUBLICATIONS BOARD CHAIR

Peter R. Rony
Dept. of Chemical Engineering
Virginia Tech
Blacksburg, VA 24061
Phone: 703-231-7658
Fax: 703-231-5022
rony@usit.net

ASSOCIATE EDITOR

Scott E. Keeler
Dow AgroSciences
Bldg. 306/D2
9330 Zionsville Road
Indianapolis, IN 46268-1054
Phone: 317-337-3138
Fax: 317-337-3215
skeeler@dowagro.com

EDITORIAL NOTES

About This Issue; About the CAST Web Site

By Peter Rony and Scott Keeler

As of this issue, we say adieu to our eleven-year (1989-1998) Programming Board Chair, Jeffrey Siirola, who moves on to the role of director of the AIChE (1999-) and perhaps AIChE president, if he is interested in the position.

As editor of CAST Communications, I cannot thank and praise Jeff enough for the skill and organization that he exhibited in his role as Programming Board Chair. Over the years, his participation in the newsletter creation process increased to the point where he became a key member of our multi-person virtual publication process, which now consists of

- I. Overall editorial direction, selection of feature article, and writing of articles for the Communications section of the newsletter (Peter Rony).
- II. Creation of both the Calls for Papers and the Meetings, Conferences sections of the newsletter (Jeff Siirola).
- III. Preparation of the final newsletter copy, suitable for reproduction by AIChE (Scott Keeler).
- IV. Printing and mailing of the newsletter (Gordie Ellis, AIChE headquarters).

The lesson that the editor has learned from working on the newsletter since 1986 is that a successful volunteer activity benefits greatly from the distribution of key tasks to responsible volunteers, among which Jeff is a prime example. We shall comment more about Jeff's contribution to CAST programming in the Summer 1999 issue.

In this issue, we also direct your attention to the communication, "AIChE Sub-Domain Policy for Divisions/Forums", by Margie Joy Walden and Peter Gannon. We combined two recent AIChE documents into this communication, (1) the sub-domain policy and (2) the memorandum concerning simplified web addresses. Margie is the manager of AIChE member activity groups, and Peter is an AIChE staff associate for electronic information.

Shortly after you receive this issue, we shall submit a web-link URL to AIChE so that you will be able to reach the CAST division web site through the URL, www.castdiv.aiche.org. Other accessible divisions will include:

Division/Forum	AIChE Sub-domain
Catalysis and Reaction Engineering	www.crediv.aiche.org

Computing & Systems Technology	www.castdiv.aiche.org
Engineering & Construction Contracting	www.eccdiv.aiche.org
Environmental	www.envdiv.aiche.org
Food, Pharmaceutical & Bio-Engineering	www.fpbediv.aiche.org
Forest Products	www.fpddiv.aiche.org
Fuels & Petrochemical	www.fueldiv.aiche.org
Heat Transfer & Energy Conversion	www.htecdiv.aiche.org
Management	www.mgtdiv.aiche.org
Materials Engineering & Sciences	www.mesdiv.aiche.org
North American Mixing Forum	www.namfdiv.aiche.org
Nuclear Engineering	www.nediv.aiche.org
Particle Technology Forum	www.ptfdiv.aiche.org
Safety and Health	www.shdiv.aiche.org
Separations	www.sepdiv.aiche.org

Selected CAST information is already stored on the Wisconsin server. AIChE will simply be given that URL for their link from the AIChE Web page. This issue was discussed at Monday's (March 15, 1999) CAST Executive meeting. We are also going to approach Joe Rosetti at AIChE again about putting the CAST Newsletter on the AIChE Web site. They indicated in the past that they are willing to work with us (for a price) on this.

At the moment, none of the CAST Newsletters are electronically available anywhere on the Web (to the best of our knowledge). The CAST website contains mostly meeting and conference notices and the archives from the Listserv. Once we figure out how interested AIChE is in doing the work required to take the Newsletter from a Word document to an HTML document, then we can decide if we need someone with HTML expertise to oversee their work. The issue of paper versus electronic newsletters will be interesting. We will have to sort that out as we go along. Initially, we will retain both versions. Long term, the future of the newsletter will depend on the response of the membership.

Speaking about the CAST website, as stated on web page, <http://www.che.wisc.edu/cast10/welcome.html>, "The purpose of the CAST10 e-mail List is to promote the activities of AIChE Area 10, also known as the Computing and Systems Technology (CAST) Division. The e-mail list provides a mechanism for the rapid distribution, by internet mail, of calls for papers, meeting announcements, announcements of postdoctoral positions, and related types of information. It's been in operation since CPC IV held in February 1991. Though it originated among people interested in Area 10b - Process Control, the list has been used increasingly by the other subgroups of the CAST Division."

"The email traffic on this list is relatively low. Most messages are posted in mid-spring and mid-summer during the weeks before the submission deadlines for the annual AIChE and ACC meetings. At its inception in 1991, there were 55 subscribers to the list. The size of the list has grown steadily since then, and there are now more than 775 subscribers."

"Subscribing and Unsubscribing: The cast10 list has an open subscription policy. The mailing list is managed by SmartList. To subscribe to the list, send a message like this

subscribe

to cast10-REQUEST@bevo.che.wisc.edu. "Likewise, if you want to remove yourself from the list, send the message:

unsubscribe

to the same address. "For a complete list of SmartList commands, use the command:

help

Please do not send requests to be added or removed from the mailing list, or other administrative details to the list itself."

"Posting a Message to the List: The cast10 mailing list is moderated. To post a message to the list, send it to cast10@bevo.che.wisc.edu. If the moderator approves of the posting, it will be forwarded to all the members of the list. Messages sent to the list should have an appropriate subject line and should be formatted exactly as you want them to appear. The current moderator of the cast10 mailing list is James B. Rawlings."

"Postings to the list are automatically archived and available via the WWW at the URL, <http://www.che.wisc.edu/cast10/mailling-lists>. In addition to the archive of past messages, the WWW site also has links to a meeting calendar, an address book, and lists of job postings, software postings, and other internet resources."

The home page of the CAST web site, URL <http://www.che.wisc.edu/cast10/>, provides a visitor with the following Information and Recent Postings links:

"[Postings for the current year](#) -- The archive of messages sent to the CAST10 mailing list.

[Meeting Calendar](#) -- A list of meetings, announcements, and calls for papers of interest to CAST.

[Job Opportunities, Positions Wanted, and Resumes](#) -- Professional opportunities in process systems engineering and related fields.

[Address and Phone Book](#) -- Look up the address, phone, fax, and email addresses for persons on the CAST Email List.

[CAST News](#) -- A list of the people involved in the CAST division and its various activities.

[Educational Materials](#) -- Materials related to education in process systems engineering.

[Software and Preprints](#) -- A short list of software and preprints that have been announced on the Email List.

[Links to related information](#) -- Related information, including the WWW Virtual Library on Control Engineering and Chemical Engineering."

Placing the Newsletter on the Web is a fairly simple task. Rather than having one document, it can be broken down into the various sections with a link from a Table of Contents Page to each section.

We solicit reader input concerning the continuing viability of the printed version of CAST Communications. Your editor continues to like paper, and has a very active Laserjet printer. How about you? Please send your opinions on this issue to the editor, rony@usit.net. Thank you in advance.

AICHe ANNOUNCES THE RELOCATION OF ITS OFFICES TO:

3 Park Avenue
New York, NY 10016-5901
Call Center (800) 242-4363
Fax (212) 591-8888
International (212) 591-7338
email: xpress@aiche.org
website: www.aiche.org

The CAST Email List provides a mechanism for rapid distribution by electronic mail of meeting announcements, calls for papers, and related types of information. To subscribe to the List, send a message consisting of the single word **subscribe** to cast10-REQUEST@bevo.che.wisc.edu.

INSERT BATCHPRO DESIGNER—Intelligen, In. Ad HERE

ARTICLES

HIGH PERFORMANCE COMPUTING: ARE WE JUST GETTING WRONG ANSWERS FASTER?¹

Mark A. Stadtherr

Department of Chemical Engineering
University of Notre Dame
Notre Dame, IN 46556 USA

In the first part of this presentation we will take a brief look at the tremendous growth in computational power that is ongoing, from desktop machines to high performance computing hardware. It will come as no surprise to this audience that computational power has grown very quickly and continues to grow very quickly. The availability of all this power allows us to solve problems much faster. This means we can solve larger problems involving more complex and more realistic models. It allows us to solve problems we probably would not have even considered trying to solve years ago, because of their computational demands. All of this has made possible significant advances in many fields of science and engineering. But, another thing we can use all this computer power for, that is often overlooked in the quest to solve problems faster and faster, is that we can use it to solve problems more reliably—in fact to actually provide mathematical and computational guarantees of reliability. So in the second part of this presentation we will focus on issues of reliability—what good is high performance computing if we are just computing the wrong answer faster?

Growth in computational power.

The historical trend is that computational performance increases by about two orders of magnitude a decade, and this is a trend that we should expect to see continue into the foreseeable future. What is happening is that we have been riding the rapid growth stages of a continuing series of technological advances. As growth in one type of advance levels off, rapid growth due to some other advance kicks in, and thus growth continues at a rapid pace.

Looking at single-user PC performance in Figure 1, the two orders of magnitude per decade growth rate is apparent, putting us over 100 MFLOPS (millions of floating point operations per second) today. This is based not on a theoretical peak rate, but the rate on solving a 100 x 100

system of linear equations (the LINPACK-100 benchmark). For reference, Figure 1 also shows a couple of old machines that I used to work with: the CDC Cyber 175 mainframe and the Cray X-MP supercomputer. Clearly, we now have come a long ways since then, especially in price/performance ratio. The Cray X-MP cost around 8-10 million dollars; a comparably performing machine today would run around 1000 dollars, and by Christmas shopping time in 1999 we should expect this to drop to around 200 dollars. The PC is rapidly becoming a "disposable" appliance.

The growth in performance of multi-user workstations (Figure 2) has followed a very similar pattern, again about two orders of magnitude a decade. However, the growth here, at least based on single processor machines, has not been quite as fast as in the PC case, leading to the increasing overlap today in the low-end workstation and high-end PC markets.

Looking at high performance computing hardware (Figure 3), the situation is somewhat different, but in the end still the same. If we look at the growth in single processor performance using vector processing technology (based on the Cray T94), it is not that impressive—less than an order of magnitude per decade. This is based on performance solving a 1000 x 1000 linear system (the LINPACK-1000 "Toward Peak Performance" benchmark). If we allow for multiple vector processors (based on the Cray T932), we can do much better. However, to really see the growth here we need to compare state of the art then (Cray 1-S) with state of the art now (Intel Sandia Red) and look at performance on the largest problem solved (the R_{\max} benchmark). R_{\max} for the Cray 1-S is little different than its performance on the LINPACK-1000 benchmark, so again we see the two orders of magnitude per decade growth rate, which, if anything, in recent years has actually been accelerating, due to the use of massively parallel architectures.

Looking at the current situation in parallel computing (Table 1), the latest hardware gives a peak performance of around 4 teraflops (million MFLOPS), with a likely R_{\max} of over 3 teraflops. At Notre Dame, I am currently working with a group of people that is already working on the technology and algorithms for petaflop machines—that is, 10^{15} floating point operations per second (a billion MFLOPS). One trend that we can see here is that these high end machines use massively parallel computing; and they do this with commodity level chips. For example, the Intel Red machine is based on Pentium Pro processors. On a more commercial mainstream level, the trend is toward shared-memory machines, from 4 to 32 to 64 processors.

¹ Presentation given at CAST Division Awards Banquet, November 17, 1998, Miami Beach, FL

These are very easy to use machines, and the word "mainstream" should be emphasized here. These machines are very widely used in the business world, as servers and for various other applications. For example, looking at the June 1998 listing of the top-500 supercomputing sites, one will find several banks, several telecommunication companies, and various other companies such as American Airlines, Raytheon, Federal Express, Rubbermaid, Allstate, etc. So we should no longer think of parallel computing as some kind of exotic technology—it is much more widespread than most people probably think.

Another trend is toward the use of network-based systems. Essentially, if you have a number of computers connected in a network, you have a parallel computer. The rapid growth in networking and its projected future growth, including all the new wireless technology, has led people to think about a concept called "metacomputing". Metacomputing refers to the use of a heterogeneous network of computing resources that may range from simple microprocessors to high-end multiprocessors. The analogy that is frequently used is that plugging into a metacomputer would be just like plugging into the electrical power grid. You would get as much computational power as you need, when you need it and where you need it, by grabbing compute cycles off the network. And just like I do not know or necessarily care where the electricity running my workstation has been generated, you would not necessarily know where the compute cycles you are using are actually coming from. This is a still developing concept, with much research still needed in algorithms, software and applications. In fact, there is a metacomputing group at Notre Dame that I currently interact with, looking at process engineering applications.

One interesting development along these lines is Jini. This is a system developed by Sun Microsystems, and announced in Summer 1998. It is based on Java, and is designed to allow machines ranging from computer-controller appliances to supercomputers to talk to each other and share computing power across a network. The idea that a lot of excess processing power resides today in appliances, such as refrigerators, is something that was mentioned in July 1998 at the FOCAPO meeting in Snowbird by Larry Smarr, who was the keynote speaker. This led to some joking about the potential power of a "Refrigerator-Net". Something like Jini makes that a little less far fetched. In fact it may not be far fetched at all. On September 30, 1998 a story appeared on the New York Times web site proclaiming "Refrigerator, Computer Combined." The story went on to say that this product is being marketed as an "Internet Refrigerator," and that it has a Pentium II microprocessor, a huge hard drive—and separate compartments for fruits and vegetables.

What does this growth in computational power mean in process engineering? This is a question that will be discussed in concluding this presentation. For now, I want

to emphasize that a problem has been, in this area and in others, that existing problem solving strategies were developed under a serial computing paradigm, and thus may take little advantage of advanced computing architectures, such as vector and/or parallel computing. So, there really is a need to be rethinking the way we solve problems. This is an area that I have been very interested in over the years, and I will provide one example to demonstrate the point.

This example (Figure 4) involves a dynamic simulation run using Aspen Technology's SPEEDUP package on a Cray C90 vector machine not too many years ago, and shows what happens when you change sparse matrix solvers in order to try to take better advantage of vectorization. This was a comparison done by Steve Zitney in collaboration with people at Bayer [1]. What this shows is that with the conventional sparse matrix solver of the time, MA28, the simulation took about 12 hours, which, since this was a simulation of a much shorter period of actual plant time, was not a good thing. By changing to the FAMP solver, which was developed by Steve Zitney in my group, and which takes advantage of the vector computer architecture, the simulation time was reduced by an order of magnitude, and the time to solve a single linear system by two orders of magnitude.

Reliability in Computing

Now shifting gears, consider the question: With all this computing power, can we in fact reliably compute the right answers? To explore this issue, we will look at some examples. The first example is the relatively well-known problem due to Rump [2]. Here we are asked to evaluate the expression

$$f(x,y) = 333.75y^6 + x^2(11x^2y^2 - y^6 - 121y^4 - 2) + 5.5y^8 + x/2y$$

for $x = 77617$ and $y = 33096$. All numerical inputs in this calculation are exact machine numbers, so any errors we get in the result are due to the computation. Looking at the computed results from a Fortran program, which Rump did on a IBM S/370, and others have repeated on many other machines, we see that when using single precision the result is

$$f = 1.172603\dots$$

when using double precision, the result is

$$f = 1.1726039400531\dots$$

and when using extended precision, the result is

$$f = 1.172603940053178\dots$$

The fact that the answer does not change with increasing precision is often taken as confirmation that the correct

answer has been obtained. However, the correct answer is, in fact,

$$f = -0.827396059946\dots$$

So we didn't even get the sign right!

The problem here is due to rounding errors, combined with other difficulties, such as cancellation errors, that are inherent in the use of floating point arithmetic. A frequent reaction when people see this example is "so what, this will never happen to me" and "even if it does happen to me, it will be no big deal." So consider now a couple of real world examples.

On February 25, 1991, during the Gulf War, an American Patriot missile battery fired at an incoming Scud missile but failed to intercept it. The Scud missile struck an American Army barracks and 28 soldiers were killed. During the Gulf War, the U. S. Army had been claiming a successful intercept rate by Patriot missiles of 80% in Saudi Arabia. This estimate was scaled back to 70% shortly after the war. However, in a later congressional investigation, testimony indicated that "the Patriot's intercept rate could be much lower than ten percent, perhaps even zero."

So, what was the problem? It turns out that the computation of time in a Patriot missile, which is critical in tracking a Scud, involves a multiplication by a constant factor of $1/10$. The number $1/10$ is a number that has no exact binary representation, so every multiplication by $1/10$ necessarily causes some rounding error. In the case of the Patriot missile, the accumulated rounding error was sufficient to cause it to mistrack incoming Scuds and thus miss them, with deadly consequences—and all due to bad computer arithmetic.

The European space agency spent 10 years and 7 billion dollars to develop the Ariane-5 rocket. On June 4, 1996, the first Ariane-5 was launched. At 39 seconds after liftoff it exploded, destroying the rocket and cargo valued at half a billion dollars. So what happened? It turns out that the explosion was caused by activation of the self-destruct mechanism built into the rocket. The self-destruct was triggered by unusually large aerodynamic forces that were ripping off the boosters. These forces were due to an abrupt course correction made by the on-board steering computer, which was in compensation for a wrong turn off course that in fact *never took place*. The inertial guidance computer had told the steering computer that the rocket had gone way off course, when in fact it was not off course at all.

What caused this turn of events? It seems that what happened was that in the computations done by the inertial guidance computer it was converting a 64-bit floating point number into a 16-bit signed integer number. At about 36 seconds into the flight, a number was encountered that was

larger than 32768, which is the largest possible 16-bit signed integer, so the conversation failed. Thus, erroneous numbers were sent to the steering computer, causing it to think the missile was off course and leading to the explosion at 39 seconds into the flight. Again a very costly disaster due to bad computer arithmetic.

Difficulties like this have caused some in the computing industry to suggest a rethinking of computer arithmetic paradigms. Originally computers used fixed point arithmetic. However, while fixed point arithmetic continues to be used in some special applications, there was a major paradigm shift in the mid-1950s to floating point arithmetic. At the time, this shift was the cause of some controversy. Accuracy was one main concern, since error analysis is much more complicated under the floating point paradigm. Alston Householder reportedly pronounced that he would never fly in an aircraft designed with the help of floating point arithmetic. The biggest drawback to floating point, however, was that it was very much slower than fixed point, and given the computers of the time, this was a very serious concern. But it was much easier to write programs in floating point arithmetic and so that paradigm won out.

Today, at least one major computer hardware and software company is seriously considering another computer arithmetic paradigm—namely, interval arithmetic. This is slower than floating point, so in that sense presents an issue similar to what had to be considered in moving from fixed to floating point in the 1950s. However, today we have ample computing power to deal with this issue. What is the advantage of interval arithmetic relative to floating point? Mainly it is an issue of reliability. In floating point arithmetic, if we add two numbers, say $c = a + b$, even if a and b have exact binary representations, the result c in general will not, and so the result of the computation will have rounding error, which may then continue to propagate. In interval arithmetic, if we add two numbers, we actually add two degenerate intervals, $[a,a] + [b,b] = [(a+b), (a+b)]$. Then the lower bound of the result is rounded down to $(a+b)^-$ and the upper bound rounded up to $(a+b)^+$. In this way, the computed result $C = [(a+b)^-, (a+b)^+]$ is a very narrow interval that is known to contain the correct result c . The use of interval arithmetic has some interesting implications when it comes to problem solving. For instance, just consider the problem of solving $10x = 1$. Mathematically the answer is $1/10$, but as we have already seen, this has no exact binary representation. So, in fact, solving the equation $10x = 1$ on a binary computer is not possible—you cannot find the correct solution because the number $1/10$ does not exist in a binary computer. However, if we use interval arithmetic to solve $10x = 1$ we will come up with a narrow interval enclosure than is guaranteed to contain the correct solution.

Consider now some more difficult equation solving problems, and what the role of interval mathematics might

be. One at the core of many chemical engineering problems is that of computing phase equilibrium. To do this we could solve the equifugacity equations. But these frequently have multiple solutions, so to be sure that we have the right solution we really need to be able to find *all* the solutions. Another way to compute phase equilibrium is do a minimization of the Gibbs energy. But this may have multiple local minima, so we need a reliable way to be sure that we get the *global* minimum.

Problems like this, involving issues of the existence and uniqueness of solutions, are difficult ones, but there are some misconceptions about how difficult they really are. For example, in Dennis and Schnabel's classic book [3] it is said that "In general, the questions of existence and uniqueness—does a given problem have a solution and is it unique?—are beyond the capabilities one can expect of algorithms that solve nonlinear problems." This, however, is not entirely true, as we shall soon discuss. In a more recent textbook, Heath [4] says "It is not possible, in general, to guarantee convergence to the correct solution or to bracket the solution to produce an absolutely safe method" [for solving nonlinear equations]. Again this is not quite right.

In fact, there do exist methods, based on interval mathematics, in particular interval-Newton methods, that can, given initial bounds on the variables, enclose any and all solutions to a nonlinear equation system, or determine that there is no solution, or find the global optimum of a nonlinear function [5]. These methods provide a *mathematical* and also *computational* guarantee of reliability. The latter is important since mathematical guarantees can be lost once things are implemented in floating point arithmetic. In my group at Notre Dame, we are actively involved in developing algorithms and applications using these concepts [e.g., 6,7]. So why isn't everyone using these methods? A primary reason is that they can be significantly slower than standard local point methods. However, my feeling on this and on other issues of reliability is that we have lots of computing power, so why not use it to solve problems more reliably? The use of interval mathematics is one potential approach for doing this.

Now consider briefly another question. If we cannot be sure that we are getting the right answers, are we in danger of relying too heavily on computing power? Again we will explore the question by looking at a couple examples.

The USS Yorktown is a guided missile cruiser, and the first in the Navy to be outfitted with so-called SmartShip technology, which would allow reducing crew levels by computerizing many ship functions. (This is reminiscent of the Starship Enterprise's ill-fated encounter with Dr. Daystrom and the M-5 Multitronic computer system in "The Ultimate Computer" episode of the original Star Trek series.) In September of 1997, the Yorktown suffered a

complete propulsion system failure and was dead in the water for about two hours and 45 minutes. The subsequent investigation determined that "the Yorktown lost control of its propulsion system because its computers were unable to divide by the number zero." Apparently a crew member entered a zero into a field of some application program, leading to a complete crash of the system and leaving the ship dead in the water.

Now if I write a computer program, run it on the Unix workstation in my office, and it mistakenly divides by zero, about the worst that will happen is that the program will stop and I will see some message on my monitor saying "overflow error." It will not lead to a complete shut down of every computer on the Notre Dame campus network—which is the analog of what happened on the Yorktown. There is still some controversy about why this seemingly simple error could have such severe consequences, but a popular theory attributes it to the use of the Windows NT operating system. A report from the Atlantic Technical Fleet Support Center concluded that "Using Windows NT ... on a warship is similar to hoping that luck will be in our favor."

Sleipner A is an offshore drilling platform in the North Sea. Such platforms are constructed on shore in two parts, a concrete base and the platform itself. These are then mated in a deep water area near shore (a fjord typically) and then floated out to the desired position in the North Sea. Thus the concrete base has a number of large buoyancy cells allowing it to float. The process of mating the platform to the base is the most critical part of this process. During mating, the concrete base is lowered so that the support pillars are just under water, allowing the platform to be properly positioned over it. At this time, the buoyancy cells are deeper than they will ever be, and thus subject to the highest water pressure they will ever see. The cells must thus be designed with this in mind. On August 23, 1991 while the original concrete base for Sleipner A was being lowered for mating, it sprang a leak and sank, causing a seismic event registering 3.0 on the Richter Scale, and an economic loss of about 700 million dollars.

So what went wrong? It seems that the concrete base structure was designed using a well known and quite sophisticated finite element algorithm and code, and one that had been successfully employed before in this same type of application. There was great trust placed in this particular algorithm and code, and a sophisticated design was produced. Later investigation, using a different finite element algorithm, showed however that the algorithm used initially made a poor finite element approximation of a critical area in the cluster of cells, resulting in an underestimate of stresses by about 50% and a design in which the cell walls were too thin in critical places.

After the original base sank, the operator was faced with an economic loss of production of about a million dollars a

day. And, they no longer trusted the computer analysis. So what could they do to get this project moving? What they did was to make a decision "to proceed with the design using precomputer sliderule era techniques" [8]. The resulting design was not as sophisticated as the first, and reportedly somewhat more costly to build, but it *did not sink*. One of the investigative reports later concluded with a simple lesson [8], namely that "relatively simple hand calculations ... should always be done, both to check the computer results and to improve the engineers' understanding of the critical design issues." This is a point that many of us make in teaching the senior design class in which students may make extensive use of simulation packages. However, in my experience this is a point that does not take easily with students and has to be repeatedly pounded in.

These two examples suggest that, without good algorithms and software, putting too much trust in computing power may be downright dangerous. Perhaps more importantly, these examples show we must always keep in mind that, no matter how powerful the computer or sophisticated the software, results must be viewed with sound engineering judgement.

Concluding Remarks

Now that I have too long played devil's advocate, I want to conclude on a very positive note. The fact is that chemical engineers today are using high performance computing, and computing at all levels, to break computational barriers and truly expand the frontiers of process engineering. For the chemical process industries, effective and appropriate use of computing technology has much to offer: cleaner, safer, more efficient and less costly manufacturing processes, new and better products, faster times to market, and faster responses to changes in economic, regulatory, and technological environments. This adds up to a bottom line of enhanced competitiveness in the global marketplace.

Acknowledgements

I want to give particular thanks to my early mentors, namely Skip Scriven, whom I worked with as an undergraduate at the University of Minnesota, and Dale Rudd, who was my Ph.D. advisor at the University of Wisconsin. Thanks also

Table 1. Leading Parallel Computers in Late 1998.

	R_{\max}	R_{peak}
	(GFLOPS)	
Cray/SGI Mountain Blue (1999)		~4000
IBM Blue Pacific (5800 processors)		3880
Intel Sandia Red (9152 processors)	1338	1830

to all my graduate students, and others who have worked in my group. I think it is well known that it is these students who do most of the work. I also want to thank the various funding agencies and others who have supported this work, both in terms of dollars and computing time. These include the National Science Foundation, the ACS Petroleum Research Fund, the Environmental Protection Agency, the Department of Energy, the Army Research Office, the Dreyfus Foundation, Sun Microsystems, Cray Research, IBM, Dow Chemical, Du Pont, Shell Oil, the University of Illinois at Urbana-Champaign, and the University of Notre Dame.

References

- [1] S. E. Zitney, L. Brüll, L. Lang and R. Zeller. *AIChE Symp. Ser.* **91**(304), 313-316 (1995).
- [2] S. M. Rump. In *Reliability in Computing* (R. E. Moore, ed.), pp. 109-126, Academic Press (1988).
- [3] J. E. Dennis and R. B. Schnabel. *Numerical Methods for Unconstrained Optimization and Nonlinear Equations*, Prentice-Hall (1983).
- [4] M. T. Heath. *Scientific Computing: An Introductory Survey*, McGraw-Hill (1997).
- [5] R. B. Kearfott. *Rigorous Global Search: Continuous Problems*, Kluwer (1996).
- [6] J. Z. Hua, J. F. Brennecke and M. A. Stadtherr. *Ind. Eng. Chem. Res.* **37**, 1519-1527 (1998).
- [7] R. M. Maier, J. F. Brennecke and M. A. Stadtherr. *AIChE J.* **44**, 1745-1755 (1998).
- [8] M. P. Collins, F. J. Vecchio, R. G. Selby, P. R. Gupta. *Concrete International* **19**(8), 28-35 (1997).

Cray T3E-1200E (1080 processors)	891.5	1296
IBM SP/604e (1900 processors)	547	1262
SGI Origin 2000/250MHz (512 processors)	195.6	256

PC PERFORMANCE

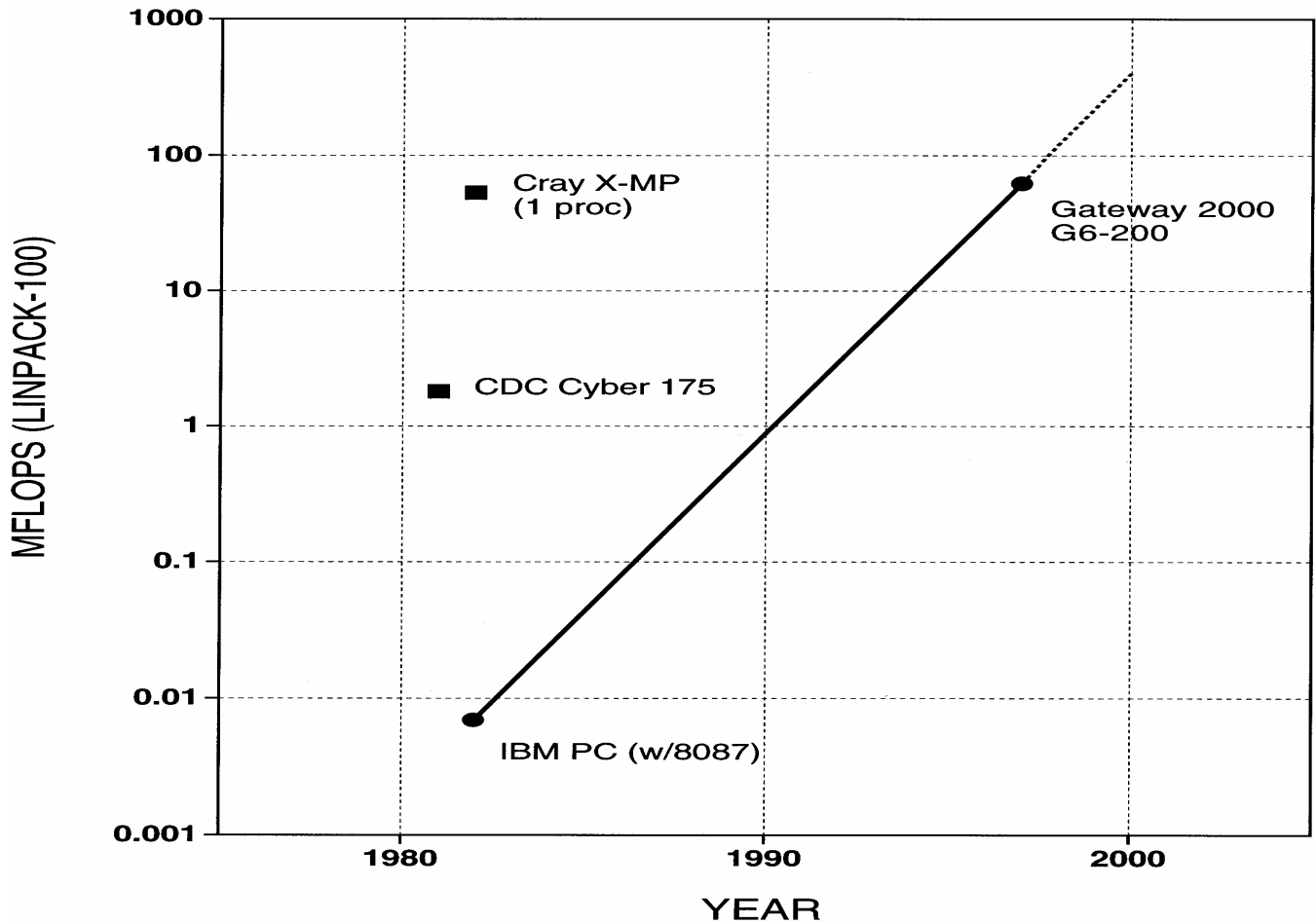


Figure 1. Growth in PC performance. See text for discussion.

WORKSTATION PERFORMANCE

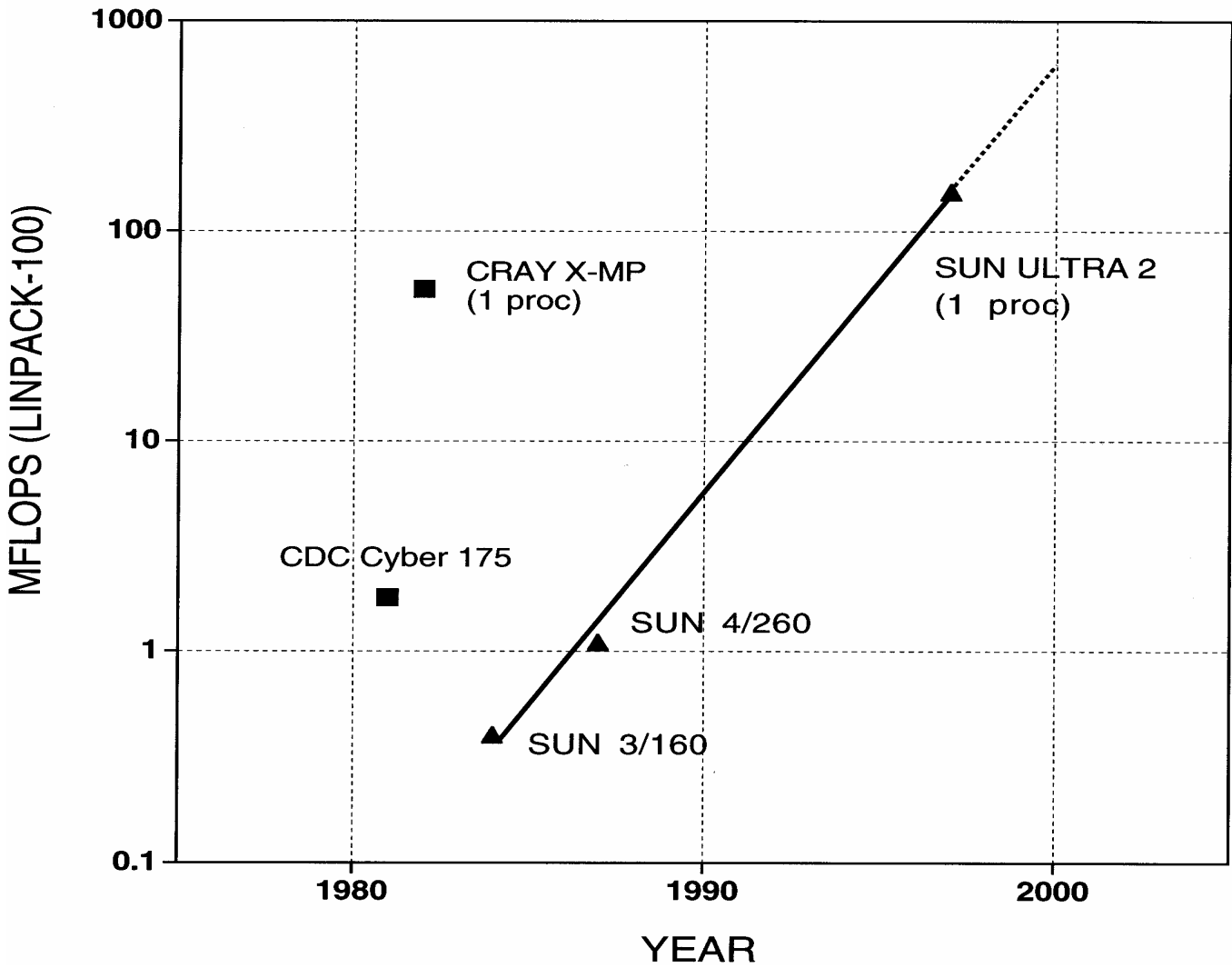


Figure 2. Growth in workstation performance. See text for discussion.

HIGH PERFORMANCE COMPUTING (SUPERCOMPUTING)

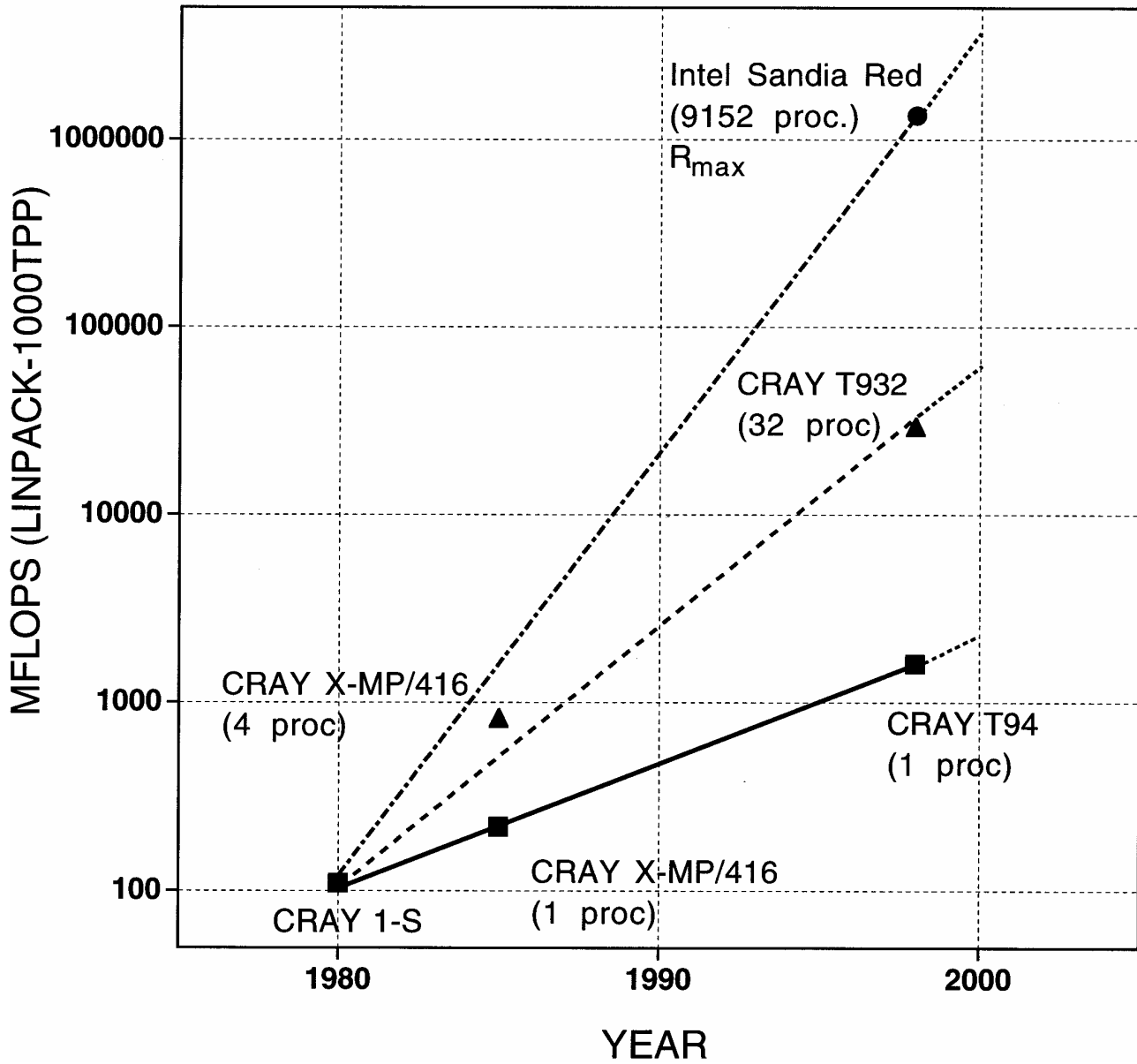


Figure 3. Growth in high performance computing. See text for discussion.

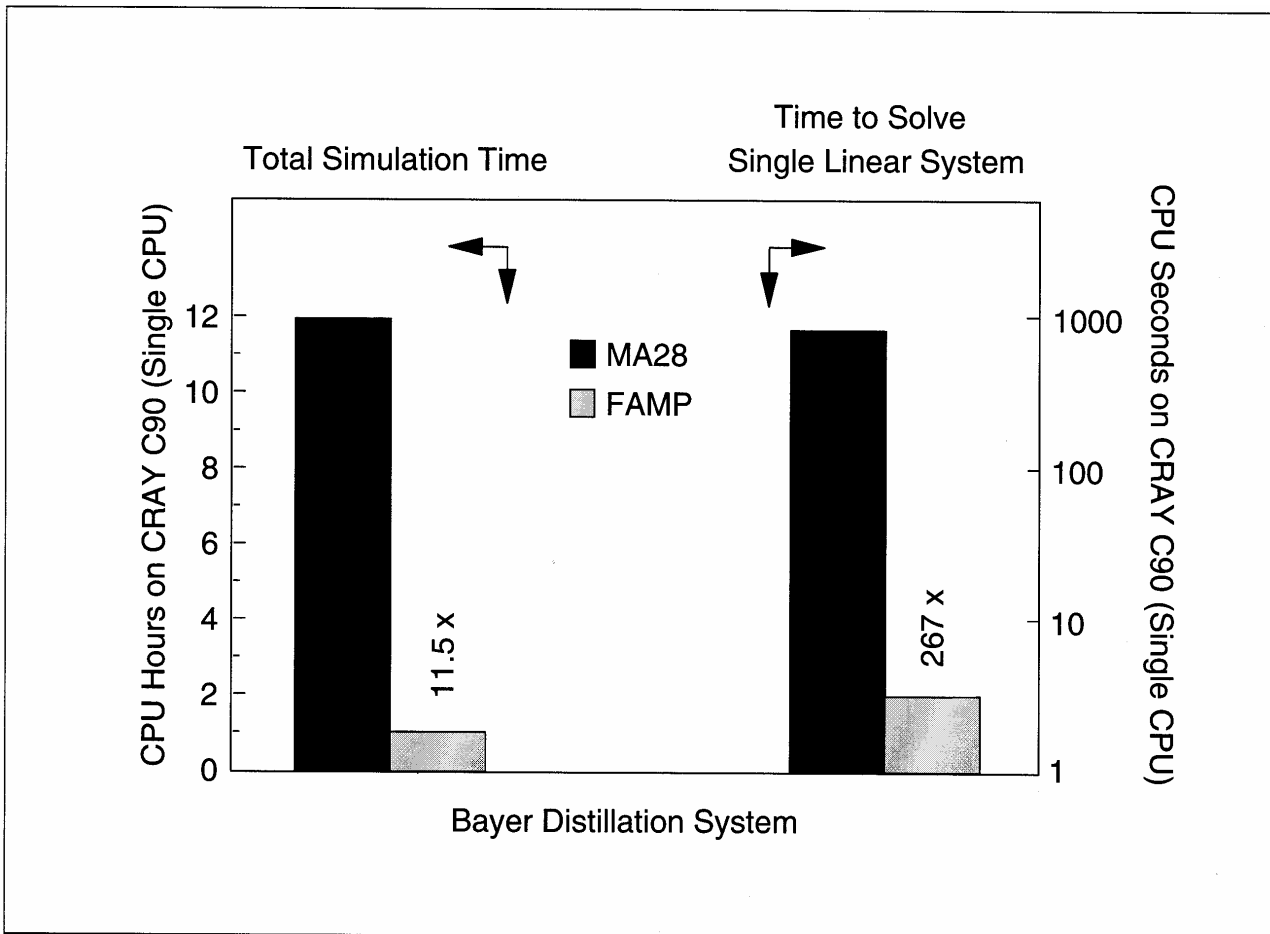


Figure 4. Comparison of sparse matrix solvers [1]. See text for discussion.

In Plant Spreadsheet Training

Spreadsheet Usage for Scientists and Engineers Using Excel 7.0

A Two Day Short Course for Industry Conducted At Your Facility

The use of Visual Basic for Applications (VBA) in Excel makes this spreadsheet a powerful computational tool. Many of the computing tasks of interest to scientists and engineers can be carried out effectively and easily without leaving *Excel*.

Intended for those who already have a familiarity with *Excel*.

Topics Included

1. Writing subroutine and function procedures in VBA.
2. Using add-ins.
3. Creating and utilizing user defined functions.
4. Integration/Differentiation /Interpolation.
5. Utilizing *Solver* and *Goal Seek*.
6. Solving ordinary differential equations.
7. Solving partial differential equations.
8. Executing available *.exe modules.
9. Linking workbooks.

Special Introductory Cost: \$575/student

Presented by:

Edward M. Rosen

EMR Technology Group

Phone: 314-434-5498

e-mail: EMRose@compuserve.com

COMMUNICATIONS**What is the Fundamental Purpose of the AIChE Meeting Presentations?***Dave Smith*

December 1, 1998

Professor Jay Lee
School of Chemical Engineering
Purdue University
West Lafayette, IN 47907

Dear Jay:

Since you included me on the distribution list of your CAST10B note I decided to spend some time trying to organize my thoughts and recall some of the salient points from past discussions I've had with many of you on this matter. The following is the result and I hope that you find it helpful.

I concur with your concern about the frequent comments made by respected members of the process control community about the current mediocre caliber of the AIChE Process Control presentations. However, while the procedures that you are suggesting may work for awhile, (that is until the "wise guys" figure out how to beat or modify the system) I am afraid you are "treating the symptoms and not the disease."

The essential question, it seems to me, is: What is the fundamental purpose of the AIChE Meeting presentations? I am sure we won't all agree on the answer but it is a question that I have been struggling with for some time. Some of us attend because we want to LEARN new things (new knowledge) of interest to us while others are more interested in SHARING new information relevant to their research. So one might ask the related question: Are we meeting to share information or present new knowledge? I suspect that the correct answer is that we need to do both, but somehow in recent years I believe that the sharing of information has become more prevalent than the presentation of new knowledge. A possible explanation is that very little new knowledge is being generated. I am uncomfortable with that interpretation so I find myself wondering if we have forgotten the distinction between information and knowledge. I believe the relevant transformations are:

data → information → knowledge → understanding.

Since it is much easier to generate information than it is to synthesize new knowledge from information, we are being bombarded by lots of information; e.g. "look at what I

and my students did in the last three months", instead of "this is what we learned in the last two to three years of hard work on a particular problem." To turn it around, we don't learn very much at AIChE Meetings because we are being presented with much more information than knowledge and the resulting overload causes confusion and may even slow down progress in the field. The notion that someone can present 14 significant contributions to our knowledge in one meeting is absurd while 2 presentations in one meeting is a stretch but perhaps possible on occasion.

As I see it there is only one remedy for this situation and that is to go back to 25-30 minute presentations and present many fewer papers, namely those that contribute new knowledge to the field. There is no doubt that it puts more of a burden on the reviewers. However, it also puts a much heavier burden on the researchers/authors to start contributing knowledge to the process control community instead of subjecting us to mini-research updates or presenting minor variations of work recently presented elsewhere. The "short papers" that you propose should be presented in a poster session which is the proper format for "information sharing" and the "discussion of preliminary results." In that way you can go talk to the few authors who may have information in which you are interested and you would have the opportunity to discuss that work at more length than the present format allows.

In essence, we, the members of CAST10B, have to decide how to balance the needs of presenting knowledge in a thorough and understandable way and sharing information or discussing preliminary research results in a timely way. The present format does not do a satisfactory job of satisfying either need. I submit that the precious time devoted to formal oral presentations should be used to further the scholarly activity of creating and presenting knowledge and that poster sessions be used to promote the sharing of information and preliminary research results.

Best regards,

Dave Smith
Research Manager
Advanced Process Control
E. I. DuPont

Turn-Key Training in Process Control

A Specialty of the Process Control Consortium
at The University of Connecticut

Designed for Industry

Our popular training system is comprised of virtual-world software, a 150 page workbook and a series of self-paced computer exercises in automatic process control. The training is perfect for engineers and operators, designers and managers who want to learn practical control analysis and tuning methods for production and pilot-plant operation. Early lessons build a useful background for novices interested in important fundamentals while later lessons expand and refine existing skills of the experienced practitioner.

Self-Paced or Instructor Guided

Membership in UConn's Process Control Consortium provides your company access to this training system. Your learning can be self-paced or an instructor guided experience. Your own in-house guru can lead a class using the materials provided to Consortium members, or we can provide an expert instructor who will run a turn-key course at your site at your convenience.

Hands-On and Real-World

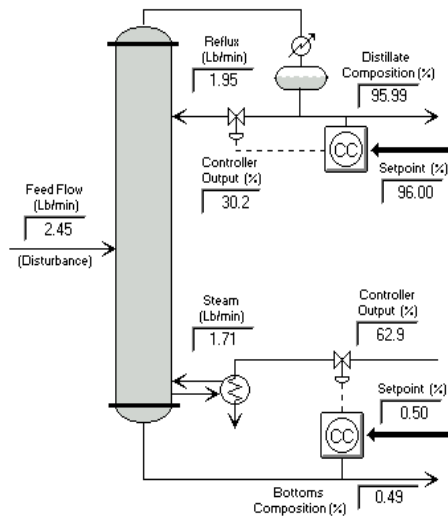
Consortium members receive a corporate site license to Control Station™, a novel training simulator used in over 100 control courses worldwide. Use Control Station to explore control challenges on a heat exchanger, mixing tank, jacketed reactor and distillation column. You can even design your own custom transfer function process.

Teaching Proven Methods

- Fundamentals of Process Dynamics and Control
- Fitting Process Models to Plant Data
- Using Process Models for Controller Tuning
- Tuning P-Only, PI, PD, and PID Controllers
- Cascade Controller Design and Implementation
- Feed Forward Control with Feedback Trim
- Smith Predictor for Dead Time Compensation
- Multivariable Control and Decoupling
- Parameter Scheduling and Adaptive Control

Download a Demo

A demo copy of Control Station and information about the Process Control Consortium and our unique training system is available at: www.ControlStation.com



www.ControlStation.com

Contact Doug Cooper at (860) 486-4092 or cooper@enr.uconn.edu

AICHE Sub-domain Policy for Divisions/Forums, by
Margie Joy Walden and Peter Gannon

AICHE is pleased to announce the availability of Internet sub-domains to our Divisions and Forums. This is a procedure that allows a Division/Forum to utilize "**aiche.org**" within the address of its Web Site.

Web pages maintained by AICHE Divisions/Forums are required to:

- Promote excellence in chemical engineering education and global practice;
- Advance the development and exchange of knowledge;
- Uphold and advance the profession's standards, ethics, and diversity; and
- Highlight Division/Forum operations.

The Institute, upon written request, will create and register a sub-domain for each Division and Forum using a standardized naming scheme. Each registered sub-domain will be the property of the Institute. This service will allow easy portability should a site be moved or recreated. It also will allow identity with the Institute and a shorter homepage URL.

The following example indicates how this works. The Web site of the Environmental Division is currently located at <http://www.endiv.seas.ucla.edu>. The new address would be <http://www.envdiv.aiche.org> using the *AICHE* sub-domain link.

The advantages of this are:

- The address is short and easy to remember.
- The address gives a clear indication of what the site is about and an association with *AICHE*.
- The address is permanent. If the local host of a site is changed the address will remain the same to the user.
- Stationery and business cards will not have to be updated as often.

Finding a host for the Web site is the responsibility of the Division/Forum. The Institute is not responsible for updating, managing, or creating functionality for content that appears on Division/Forum web sites. If a host storage facility is terminated or transferred, the Institute should be notified immediately.

Divisions and Forums must supply site URLs and contact information for Web site administration and ISPs to The Institute prior to activation. The Institute strongly recommends that web pages be updated regularly and the

name of the person maintaining the Web site must be submitted to the Electronic Information Associate at the Institute at 212-591-7525 or electronicinfo@aiche.org.

Content must not conflict with, be a replacement for, or compete with the features of The Institute's web site or Institute business practices both existing or planned. Web pages that contain material offensive to the general public, that compromise the reputation of the Institute, or that promote personal interests, will have links terminated at the discretion of The Institute. The Institute's Web Strategy team, comprised of key cross-functional staff, is responsible for resolving any issues of conflict.

Divisions/Forums may only use the Institute sub-domain for lawful purposes. Transmission of any material in violation of any Federal, State or local regulation is prohibited. This includes, but is not limited to copyrighted material, material legally judged to be threatening or obscene, and material protected by trade secrets. The Institute expressly forbids the use of its sub-domains for the propagation, distribution, housing, processing, storing, or otherwise handling of material that advocates discrimination on the basis of race, color, sex, age, disability, religion, national origin, marital status, sexual orientation, ancestry, or political belief or activity; that advocates particular political or religious views; or is in any way lewd, obscene, or pornographic. The designation of any materials as such is left entirely to the discretion of the Institute.

Institute services are intended for the end user only. Customers cannot sublease, sub-host, or give away control of any portion of the Institute's resources. Doing so will result in immediate account cancellation, and/or appropriate legal action.

Permission from the Institute is required to reproduce any and all content/functionality, (including the logo), from the Institute's web site. Logos may be downloaded from the AICHE Web at:

<http://www.aiche.org/welcome/logpass.asp>

Contact Joseph Roseti, Manager, Creative services and Web Development for further information at 212-591-7966; or via email: joer@aiche.org.

Advertising on Division/Forum sites is permitted with all proceeds going to host Division/Forums as appropriate.

Division(s)/Forum(s) agree that they shall defend, indemnify, save and hold the Institute harmless from any and all demands, liabilities, losses, costs and claims, including reasonable attorney's fees asserted against the Institute, its agents, its customers, officers and employees, that may arise or result from any service provided or performed or agreed to be performed or any product sold by

Division(s)/Forum(s), its agents or employees. Division(s)/Forum(s) agree to defend, indemnify and hold harmless the Institute against liabilities arising out of: (1) any injury to person or property caused by any products sold or otherwise distributed in connection with the Institute sub-domain: (2) any material supplied by customer infringing or allegedly infringing on the proprietary rights of a third party: (3) copyright infringement and (4) any defective products sold to customer from the Institute sub-domains.

The Institute makes no warranties of any kind, expressed or implied for services we provide. The Institute disclaims any warranty or merchantability or fitness for a particular purpose. That includes loss of data resulting from delays, non-deliveries, wrong delivery, Institute Internet Service Provider outages, and any and all service interruptions caused by the Institute and its employees.

The Institute reserves the right to revise its policies at any time.

How is this implemented ?

1. Each Division/Forum will be assigned a sub-domain in accordance with a set naming convention (see below).
2. The Division/Forum agrees to AIChE's sub-domain policy (attached) and submits an application to Member Activity Groups (attached).
3. The sub-domain service is established by the Institute.
4. There will be no charge to the Division/Forum for this service.
5. It is important to note that this is not a hosting agreement.

If you have any questions, please call Peter Gannon at (212) 591-7525 or send an email to electronicinfo@aiche.org.

Naming Convention

Division/Forum	AIChE Sub-domain
Catalysis and Reaction Engineering	www.crediv.aiche.org
Computing & Systems Technology	www.castdiv.aiche.org

Engineering & Construction Contracting	www.ecdiv.aiche.org
Environmental	www.envdiv.aiche.org
Food, Pharmaceutical & Bio-Engineering	www.fpbediv.aiche.org
Forest Products	www.fpddiv.aiche.org
Fuels & Petrochemical	www.fueldiv.aiche.org
Heat Transfer & Energy Conversion	www.htecdiv.aiche.org
Management	www.mgtdiv.aiche.org
Materials Engineering & Sciences	www.mesdiv.aiche.org
North American Mixing Forum	www.namfdiv.aiche.org
Nuclear Engineering	www.nediv.aiche.org
Particle Technology Forum	www.ptfdiv.aiche.org
Safety and Health	www.shdiv.aiche.org
Separations	www.sepdiv.aiche.org

How to Contact the AIChE

Taken from the University of Florida AIChE web site, below are given several of the many ways to contact the American Institute of Chemical Engineers for information.

"One-stop shopping" for admissions, publication sales, meeting registration, dues bills, and other AIChE products and services may be obtained from the:

AIChExpress Service Center
3 Park Avenue
New York, NY 10016-5901
Telephone: 1-800-AIChemE
Fax: (212) 591-8888
E-mail: xpress@aiche.org

For the AIChE Headquarters:

American Institute of Chemical Engineers (AIChE)
3 Park Avenue
New York, NY 10016-5901
General Inquiries: (212) 591-7338
Fax: (212) 591-8882
AIChE WebSite: www.aiche.org
Insurance Programs
Seabury & Smith: (800) 982-4243

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

Dean Kevlin
Director, Education Services
Telephone: (212) 591-7526
E-Mail: deank@aiche.org

Diana McCauley
Director, Member Services
Telephone: (212) 591-7329
E-Mail: dianm@aiche.org
Betty Feehan
Manager, Career Services, Member Services
Telephone: (212) 591-7524
E-Mail: bettf@aiche.org

Margie Joy Walden
 Manager, Member Activity Groups, Member Services
 Telephone: (212) 591-7652
 E-Mail: margw@aiche.org

Jo-Anne Hand
 Manager, Membership Development
 Telephone: (212) 591-7174
 E-Mail: joanh@aiche.org

Joe Cramer
 Director, Programming
 Telephone: (212) 591-7950
 E-Mail: josec@aiche.org

Sean Bersell
 Senior Director, Public Affairs
 Telephone: (202) 962-8690
 1300 I Street, NW, Suite 1090 East Tower
 Washington, D.C. 20005

Scott Hamilton
 Manager, Communications, Public Affairs
 Telephone: (212) 591-7660
 E-Mail: scoth@aiche.org

Steve Smith
 Senior Director, Publications and Information Systems
 Telephone: (212) 591-7335
 E-Mail: steps@aiche.org

Lois DeLong
 Manager, *ChAPTER ONE*, Publications & Information
 Systems
 Telephone: (212) 591-7661
 E-Mail: loisd@aiche.org

Not sure who to call? Try (212) 705-7338. The receptionist will refer you to the appropriate person.

DIPPR® Databases by George Thomson

The original intent of the Evaluated Process Design Data database of AIChE's Design Institute for Physical Property Data (DIPPR) was to supply accurate, carefully-evaluated data for process engineering. These data can, of course, be used for other purposes as well. The database contains 29 fixed-point and 15 temperature-dependent properties for over 1600 industrially-important chemicals. The Educational Version contains the same properties for 100 compounds and was created for use in chemical and chemical engineering thermodynamics and process engineering courses. More information on the main

database and the Educational Version, as well as details for ordering the Educational Version, can be found at <http://dippr.byu.edu>. A demonstration program which shows some of the features of the main database can also be found there.

The purpose of the Environmental, Safety, and Health Data Compilation was to collect in one convenient location accurate, carefully-evaluated values of environmental, safety, and health data for use by environmental and safety engineers. This database contains 55 properties, divided into six "blocks", for 811 chemicals selected from the Clean Air Act Amendments, the OSHA list and the EPA Risk Management Program. The Academic Version contains data for the same properties for 32 chemicals. It should be quite useful in a number of chemistry, chemical engineering, and environmental engineering courses and will be available next Spring. Details on both the main database and the Academic Version can be found at <http://dippr.chem.mtu.edu>

CAST Communications Advertising Policy

Advertising Rates:

Black and White

1/4 page = \$ 60

1/3 page = \$ 70

1/2 page = \$ 90

2/3 page = \$ 120

1 page = \$ 150

Production Details:

Retain your original art, please. Submit both a *floppy diskette* (Windows or DOS) containing an electronic version of the ad (contact editor for preferred formats) and two, high-quality, positive Xerox copies (properly packaged to avoid damage) of your advertisement, in sizes either 8.5" x 11" or 8" x 10", to the CAST newsletter editor: Peter R. Rony, Department of Chemical Engineering, Virginia Tech, Blacksburg, VA 24061-0211.

Deadlines:

December 1 for the Winter issue (very tight deadline); July 1 for the Summer issue.

Payment Details:

Prior to publication of advertisement, please submit check payable to the CAST Division, AIChE to the Secretary/Treasurer: Scott Keeler, Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46268.

Editorial Department:

If you have questions, please contact:

Peter R. Rony

Department of Chemical Eng.

Virginia Tech

Blacksburg, VA 24061-0211

(W)Telephone (703) 231-7658, please leave message

(H)Telephone (703) 951-2805

FAX (703) 231-5022

E-mail: rony@usit.net

MEETINGS, CONFERENCES, CONGRESSES, SHORT COURSES AND WORKSHOPS

To submit a paper for consideration at any event listed below, please contact the symposium coordinator or session chair directly. For further information or details about each of the four CAST Division programming areas, contact the appropriate Area Program Coordinator as noted in the masthead. For general information concerning CAST Division sessions and scheduling, or to correct errors in this listing, please contact CAST Division Programming Chair: Michael F. Malone, Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-0838, 413-545-1647 (FAX), mmalone@ecs.umass.edu. Many of these and other announcements of interest are distributed by electronic mail to the CAST Email List and are archived on the world wide web at <http://www.che.wisc.edu/cast10/>.

International Conference on Process Integration (PI '99) Copenhagen, Denmark March 7-10, 1999

Process integration is a powerful tool for resource optimization in the process industries. The main objectives of this conference organized by the International Energy Agency and the Nordic Energy Research Program are to convey and demonstrate the usefulness of process integration in solving a large number of tasks in a wide range of industries, and to identify future trends and end-user needs. The role of process integration in both energy and environmental matters will be addressed through state-of-the-art presentations by leading developers and users. Sessions will discuss methodologies, industrial applications, software features, and future trends and needs. For additional information contact the conference secretariat Anette Faber, Association of Danish Electric Utilities, Rosenørns Alle 9, DK-1970 Frederiksberg C, DENMARK, 45-35-39-0111, 45-35-39-5958 (FAX), anette.faber@danel.dk.

1999 AIChE Spring National Meeting Topical Conference on Process Systems Engineering Houston, Texas March 14-18, 1999

Meeting Program Chair: Peter Wanser, 2022 Welch Street, Houston, TX 77019, 713-524-1334.

The CAST Division is planning the following sessions for the Houston Spring National Meeting. AIChE has bundled these CAST sessions into a topical conference entitled Process Systems Engineering. Presentation records for all presentations are available as a preprint volume from AIChE. The topical conference is being cosponsored by the Society for Computer Simulation.

Area 10a: Systems and Process Design

Session 17. Process Integration in Industrial Practice. Luke E. K. Achenie, University of Connecticut (Chair) and Kirtan K. Trivedi, Parsons Energy and Chemicals Group Inc. (Co-Chair).

Sessions 24 and 18. Practical Process Synthesis I and II. Andreas A. Linninger, University of Illinois at Chicago (Chair) and Metin Türkay, Mitsubishi Chemical Corporation (Co-Chair).

Session 23. Advances in Commercial Design Software. Michael F. Malone, University of Massachusetts (Chair), Raymond Rooks, Simulation Sciences, Inc., (Co-Chair), Francisco J. L. Castillo, Hypotech (Co-Chair), and Vivek Julka, Aspen Technology, Inc. (Co-Chair).

Joint Area 10a and Area 10c Session

Session 20. Internet Applications in Chemical Engineering. Matthew J. Realf, Georgia Institute of Technology (Chair) and Kirtan K. Trivedi, Parsons Energy and Chemicals Group Inc. (Co-Chair).

Area 10b: Systems and Process Control

Session 22. Theory and Advanced Applications of Advanced Process Control. Michael Nikolaou, University of Houston (Chair) and Louis P. Russo, Exxon Chemical Company (Co-Chair).

Area 10c: Computers in Operations and Information Processing

Session 19. Potential Benefits of Global Optimization in Industrial Practice. Luke Achenie, University of Connecticut (Chair) and Iauw-Bhieng Tjoa, Mitsubishi Chemical America, Inc. (Co-Chair).

Session 21. Practical Challenges of Data Reconciliation. Miguel J. Bagajewicz, University of Oklahoma (Chair) and Lionel O'Young, Mitsubishi Chemical America, Inc. (Co-Chair).

In addition to the topical conference, Area 10a and Area 9 will jointly sponsor the following session:

1. Methods and Tools for Managing Environmental Risks. Herberto Cabezas, United States Environmental Protection Agency (Chair), and Russell F. Dunn, Solutia Inc. (Co-Chair).

European Symposium on Computer Aided Process Engineering (ESCAPE 9) and Second Conference on

**Process Integration, Modeling, and Optimization for
Energy Saving and Pollution Reduction (PRES '99)
Joint Symposium
Budapest, Hungary
May 31-June 2, 1999**

The aim of the ESCAPE-9 symposium will be to review the latest developments in process systems engineering and computer aided process engineering, with emphasis on the use of computers and information technology (methods and tools) in the design and operation of the process industry. Main themes of the program will include process synthesis, design, and optimization; process dynamics, control, and operation; modeling and simulation; intelligent systems and information; industrial applications and case studies; education and training in computer aided applications; and new ideas. For more information, contact Zsolt Fonyó, Technical University of Budapest, H-1111 Budapest, Muegyetem rkp. 3, HUNGARY, 36-1-463-2202, 36-1-463-3197 (FAX), fonyo.vmt@chem.bme.hu or browse <http://www.dcs.vein.hu/ESCAPE-9/>.

The aim of the PRES '99 symposium will be to review the latest developments and applications of process integration for energy conservation and pollution reduction. Main topics of the symposium will include methods and applications concerning the planning, design, and operation of batch and continuous processes for the processing industries including chemical, petrochemical, pharmaceutical, pulp and paper, food and drink, and power generation. For more information, contact F. Friedler, University of Veszprém, H-8200 Veszprém, Egyetem u. 10, HUNGARY, 36-88-424-483, 36-88-428-275 (FAX), pres@dcs.vein.hu or browse <http://www.dcs.vein.hu/PRES>.

**1999 American Control Conference
San Diego, California
June 2-4, 1999**

The American Automatic Control Council will hold the eighteenth ACC at the Hyatt Regency Hotel, San Diego, June 2-4, 1999. Held in cooperation with the International Federation of Automatic Control, this conference will bring together people working in control, automation, and related areas in the aerospace, chemical, electrical, mechanical, manufacturing, and process engineering fields. As in the past, the CAST Division will develop a number of invited, contributed, and tutorial sessions. Invited sessions are expected to include nonlinear model reduction techniques, inferential and product quality control, biomedical control systems, and monitoring and control of polymerization processes. Tutorial sessions include model predictive control and statistical process control. The AIChE Society Review Chair is B. Wayne Bequette, Department of Chemical Engineering, Rensselaer Polytechnic Institute, Troy, NY 12180-3590, 518-276-6683, 518-276-4030

(FAX), bequette@rpi.edu. The deadline for contributed papers is September 1, 1998. For more information, browse <http://www.marquette.edu/acc1999/>.

**Symposium on Industrial Applications of Chemical
Process Control
Beijing, China
July 5-9, 1999**

A symposium on Industrial Applications of Chemical Process Control will be held as part of the 14th World Congress of the International Federation of Automatic Control. Topics to be addressed include modeling for control, identification, model-based control, nonlinear control, fault detection and safety, monitoring, and performance assessment, unit process control, plant-wide control, and optimization in operations, control, and process management. For more information contact the IFAC'99 IPC Secretariat Jifeng Zhang, Institute of Systems Science, Chinese Academy of Sciences, Beijing 100080, P. R. CHINA, 86-10-62532161, 86-10-62587343 (FAX), IFAC99@iss03.iss.ac.cn, or browse <http://www.ia.ac.cn/ifac99/ifac99.html>.

**Monitoring and Control of Bioprocesses
Ninth European Congress on Biotechnology (ECB9)
Brussels, Belgium
July 11-15, 1999**

The European Congress on Biotechnology (ECB), a fundamental science based but application directed biotechnology conference, is an event that is organized every two years. As for the previous ECBs, invited sessions on Monitoring and Control of Bioprocesses are planned. Papers are solicited which address theoretical and application problems associated with monitoring and control of bioprocesses. Topics may include, but are not limited to process monitoring and control, nonlinear and robust control, optimal control, batch process control and discrete event systems, and process control applications. Extended abstract deadline is September 1, 1998. For more information, contact Jan Van Impe, Department of Food and Microbial Technology, BioTeC - Bioprocess Technology and Control, Katholieke Universiteit Leuven, Kardinaal Mercierlaan 92, B-3001 Heverlee, BELGIUM, 32-16-321466, 32-16-321960 (FAX), jan.vanimpe@agr.kuleuven.ac.be or Denis Dochain, CESAME, Université Catholique de Louvain, Batiment Euler, 4-6 Avenue Georges Lemaître, B-1348 Louvain-la-Neuve, BELGIUM, 32-10-472378, 32-10-472180 (FAX), dochain@auto.ucl.ac.be.

**Fifth International Conference on Foundations of
Computer-Aided Process Design (FOCAPD-99)
Breckenridge, Colorado
July 18-23, 1999**

Foundations of Computer-Aided Process Design, cosponsored by the CAST Division and CACHE Corporation, is the fifth in the series of conferences dealing with the use of computers in support of chemical process design and will be held July 18-23, 1999 in Breckenridge, Colorado. Conference topics and issues are expected to include state-of-the-art and grand challenge problems in process design (green chemistries, waste minimization and recycling for pollution prevention; design for operability, control, and inherently safer processes; and capacity utilization, costs, and productivity), fundamental design theories and methods (process design and synthesis methods; operability and control issues in process design; computational fluid dynamics and transport modeling; and basic data and properties for process design), environments and new tools for effective process design (distributed computing and distributed tools for process design; integrated and open software environments for process design; dynamic models and modeling for the design of process systems; and managing the process of process design), and applications and emerging areas (batch process design for specialty chemicals and pharmaceuticals; integration of molecular and mechanistic chemistry with design; integrated process and product design; and education and training for effective design). For more information, contact the conference chairs Michael F. Malone, Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-0838, 413-545-1133 (FAX), mmalone@ecs.umass.edu or James A. Trainham, E. I. du Pont de Nemours & Company, PO Box 80101, Wilmington, DE 19880-0101, DE, 302-992-3898, 302-992-2035 (FAX), james.a.trainham@usa.dupont.com. To initiate the application process, send address information and a statement of interest to CACHE Corporation, PO Box 7939, Austin, TX 78713-7939, 512-471-4933, 512-295-4498 (FAX). Applications were due by January 15, 1999.

**1999 European Control Conference
Karlsruhe, Germany
August 31 - September 3, 1999**

The European Control Conference (ECC) is an event that is organized every two years, with the aim to stimulate contacts between scientists active in the area of Systems and Control. The first four conferences took place in Grenoble (1991), Groningen (1993), Rome (1995) and Brussels (1997). The fifth ECC will be held in Karlsruhe, Germany, in 1999. The scope of the conference includes all aspects of Systems and Control, and ranges from subjects within the framework of fundamental research to engineering applications. Topics of interest include multivariable and

nonlinear control, system modeling, system identification, adaptive control, optimal control, filtering, robotics, aerospace systems, neural networks applied to control, control of chemical processes, and bioreactor control. For more information contact Frank Allgower, Automatic Control Laboratory, ETH Zurich, CH-8092 Zurich, SWITZERLAND, 41-1-632-3557, 41-1-632-1211 (FAX), allgower@aut.ee.ethz.ch.

**1999 AIChE Fall Annual Meeting
Dallas, Texas
October 31-November 5, 1999**

Meeting Program Chair: Robert H. Davis, Department of Chemical Engineering, University of Colorado, Boulder, CO 80309-0424, 303-492-7314, 303-492-4341 (FAX), davisr@spot.colorado.edu.

The CAST Division is planning the following sessions for the Dallas Fall Annual Meeting which have been approved by AIChE and the Meeting Program Chair. A final call for papers for this meeting appears later in this issue. Deadline for submission of presentation proposals (through the AIChE web site only) for all sessions is May 1. The entire CAST program in Dallas is being cosponsored by the Society for Computer Simulation.

CAST Division Plenary Session

1. Recent Developments in Computing and Systems Technology. Mahmoud El-Halwagi, Auburn University (Chair) and B. Wayne Bequette, Rensselaer Polytechnic Institute (Co-Chair).

Area 10a: Systems and Process Design

1. Process Synthesis. Metin Türkay, Mitsubishi Chemical Corporation (Chair) and Andreas Linninger, University of Illinois - Chicago (Co-Chair).

2. Design and Analysis. Katerina Papalexandri, Chemical Process Engineering Research Institute (Chair) and Jonathan M. Vinson, G. D. Searle (Co-Chair).

3. Advanced Process Integration. Pricilla J. Hill, Mitsubishi Chemical Corporation, (Chair) and Il Moon, Yonsei University (Co-Chair).

4. Technology Transfer in Process Design. Gavin P. Towler, UOP LLC (Chair) and Vivek Julka, Aspen Technology, Inc. (Co-Chair).

5. Separations System Synthesis. Ashish Gupta, SUNY Buffalo (Chair) and Dante Bonaquist, Praxair (Co-Chair).

Joint Area 10a and Area 10b Session

1. Interaction of Design and Control. Dennis D. Sourlas, University of Missouri, Rolla (Chair) and Christine B. Seymour, Searle Company (Co-Chair), and Jorge A. Mandler, Air Products and Chemicals, Inc. (Co-Chair).

Joint Area 10a and Area 10c Session

1. Design and Operation of Batch Processes. Ekaterini Korovessi, E. I. du Pont de Nemours & Company (Chair) and Vipin Gopal, Honeywell Inc. (Co-Chair).

Joint Area 10a and Area 9 Session

1. Design for Environment. Urmila M. Diwekar, Carnegie Mellon University (Chair) and Mahmoud El-Halwagi, Auburn University (Co-Chair).

Area 10b: Systems and Process Control

1. Advances in Process Control. Oscar D. Crisalle, University of Florida (Chair) and Michael A. Henson, Louisiana State University (Co-Chair).

2. Nonlinear Control. Thomas A. Badgwell, Rice University (Chair) and Prodromos Daoutidis, University of Minnesota (Co-Chair).

3. Applications of Process Control. Sheyla L. Rivera, Frito-Lay, Inc. (Chair) and Kenneth R. Muske, Villanova University (Co-Chair).

4. Controller and Process Monitoring. Bhavik R. Bakshi, Ohio State University (Chair) and George N. Charos, Amoco Corporation (Co-Chair).

5. Process Modeling, Identification, and Estimation. Masoud Soroush, Drexel University (Chair) and Mikhail Skliar, University of Utah (Co-Chair).

6. Advances in Model Predictive Control. Alex Z. Q. Zheng, University of Massachusetts (Chair) and Michael Nikolaou, University of Houston (Co-Chair).

Joint Area 10b and Area 10c Session

1. Advances and Applications in SQC/SPC. S. Joe Qin, University of Texas (Chair) and Urmila M. Diwekar, Carnegie Mellon University (Co-Chair).

Joint Area 10b and Area 3c Session

1. Challenges in Control of Solids Processing Systems. George E. Klinzing, University of Pittsburgh (Chair) and B. Wayne Bequette, Rensselaer Polytechnic Institute (Co-Chair).

Joint Area 10b and Area 8e Session

1. Control of Microelectronic Manufacturing. Stephanie W. Butler, Texas Instruments (Chair) and Panagiotis D. Christofides, University of California, Los Angeles (Co-Chair).

Joint Area 10b and Area 17 Session

1. Process Control and Simulation in the Forest Products Industry. Eric M. Hanczyc, Weyerhaeuser (Chair) and Francis J. Doyle III, University of Delaware (Co-Chair).

Area 10c: Computers in Operations and Information Processing

1. Computer Integrated Manufacturing in the Chemical Process Industries - Advances and Industrial Applications (Cosponsored by the International Cooperation Committee of the Society of Chemical Engineers, Japan). Shinji Hasebe, Kyoto University (Chair) and Conor M. McDonald, E. I. du Pont de Nemours & Company (Co-Chair).

2. Planning, Scheduling, and Supply Chain Management. Marianthi G. Ierapetritou, Princeton University (Chair) and Antonis C. Kokossis, University of Manchester Institute of Science and Technology (Co-Chair).

Joint Area 10c and Area 12a Session

1. Advances in Optimization: Case Studies. Yinlun Huang, Wayne State University (Chair) and Miguel J. Bagajewicz, University of Oklahoma (Co-Chair).

Joint Area 10c and Area 15a Session

1. Computational Methods in the Food Processing Industry. Stephen P. Lombardo, The Coca-Cola Company (Chair) and Joseph F. Pekny, Purdue University (Co-Chair).

Joint Area 10c and Group 16a Session

1. Molecular Modeling for Refinery Optimization. Michael T. Klein, University of Delaware (Chair) and Gavin P. Towler, UOP LLC (Co-Chair).

Area 10d: Applied Mathematics and Numerical Analysis

1. Pattern Formation and Instabilities in Physicochemical Systems. Vemuri Balakotaiah, University of Houston (Chair) and Ranga Narayanan, University of Florida (Co-Chair).

2. Applications of Parallel Computing Strategies in Engineering Systems. Antony N. Beris, University of Delaware (Chair) and Jeffrey J. Derby, University of Minnesota (Co-Chair).

3. Stochastic Processes. Doraiswami Ramkrishna, Purdue University (Chair) and Kyriacos Zygourakis, Rice University (Co-Chair).

4. Fundamental Advances in Applied Mathematics. Raymond A. Adomaitis, University of Maryland (Chair) and Panagiotis D. Christofides, University of California, Los Angeles (Co-Chair).

5. D. Ramkrishna Symposium: Cybernetics, Operator-Theoretic, and Self-Similar Approaches in Chemical Engineering. Pedro Arce, FAMU/FSU College of Engineering (Chair) and E. Terry Papoutsakis, Northwestern University (Co-Chair).

Joint Area 10d and Area 15de Session

1. Applied Mathematics in Bioengineering. Roseanne M. Ford, University of Virginia (Chair) and Kyriacos Zygorakis, Rice University (Co-Chair).

CAST DIVISION POSTER SESSION

Section A. Recent Developments in Systems and Process Design. Mahmoud El-Halwagi, Auburn University (Chair) and Urmila M. Diwekar, Carnegie Mellon University (Co-Chair)

Section B. Topics in Systems and Process Control. Kenneth R. Muske, Villanova University (Chair) and Richard D. Braatz, University of Illinois (Co-Chair).

Section C. High Performance Computing. Mark A. Stadtherr, University of Notre Dame (Chair) and Luke E. K. Achenie, University of Connecticut (Co-Chair).

Section D. Process Operability. Stratos Pistikopoulos, Imperial College (Chair) and Il Moon, Yonsei University (Co-Chair).

Section E. Issues in Computers in Operations and Information Processing. Nikolaos V. Sahinidis, University of Illinois (Chair) and Conor M. McDonald, E. I. du Pont de Nemours & Company (Co-Chair).

Section F. Advances in Applied Mathematics. Pedro Arce, FAMU/FSU College of Engineering (Chair) and Antony N. Beris, University of Delaware (Co-Chair).

Section G. Demonstrations of Software for Process Control Education. Douglas J. Cooper, University of Connecticut (Chair).

EDUCATIONAL COMPUTER SOFTWARE
DEMONSTRATIONS (Joint Effort with Group 4)

Douglas J. Cooper, University of Connecticut (coordinator) and John T. Bell, University of Michigan (coordinator).

Proposed CAST Division Programming 2000 Spring National Meeting March 26-30 2000 Atlanta, Georgia

SUMMARY:

Area 10a: 4.5 Sessions (4 plus 1 joint with 9)

Area 10b: 1 Session

Area 10c: 2 Sessions

CAST Total: 7.5 Sessions Requested: 7 plus 1 joint outside CAST

PROGRAM (Note entire Spring 2000 CAST program is COSPONSORED by The Society for Computer Simulation):

Area 10a: Systems and Process Design

1. Challenges for Design in Practice. Russell F. Dunn (Chair), Solutia Inc., PO Box 97, Gonzalez, FL 32560-0097, 850-968-8216, 850-968-8732 (FAX), russell.f.dunn@solutia.com and Kirtan K. Trivedi (Co-Chair), kktrive@fpe.erenj.com.

2. Advances in Methods and Tools for Process Synthesis and Design. Raymond Rooks (Chair), Union Carbide Corporation, PO Box 8361, South Charleston, WV 25303, 304-747-5826, 304-747-5744 (FAX), rooksre@ucarb.com and Vicente Rico-Ramirez (Co-Chair), Departamento de Ingenieria Quimica, Instituto Tecnologico de Celaya, Celaya, Guanajuato, MEXICO, rv2a@andrew.cmu.edu.

3. Retrofitting, Debottlenecking, and Improvements. Miguel J. Bagajewicz (Chair), School of Chemical Engineering and Materials Science, University of Oklahoma, Norman, OK 73019-0628, 405-325-5458, 405-325-5813 (FAX), bagajewi@mailhost.ecn.ou.edu and Frank X. X. Zhu (Co-Chair), Department of Process Integration, University of Manchester Institute of Science and Technology, PO Box 88, Manchester M60 1QD, UNITED KINGDOM, 44-161-200-4398, 44-161-236-7439 (FAX), f.zhu@umist.ac.uk.

4. Reviews and Tutorials in Process Design. Antonis C. Kokossis (Chair), Department of Process Integration, University of Manchester Institute of Science and Technology, PO Box 88, Manchester M60 1QD, UNITED KINGDOM, 44-161-200-4384, 44-161-236-7439 (FAX), kokossis@umist.ac.uk and Dilek Alkaya (Co-Chair), Department of Chemical Engineering, Carnegie Mellon University, Pittsburgh, PA 15213-3890, 412-268-8531, 412-268-7139 (FAX), alkaya@andrew.cmu.edu.

Joint Area 10a and Area 9 Session

1. Environmental Issues in Design. Miguel J. Bagajewicz (Chair), School of Chemical Engineering and Materials

Science, University of Oklahoma, Norman, OK 73019-0628, 405-325-5458, 405-325-5813 (FAX), bagajewi@mailhost.ecn.ou.edu and Russell F. Dunn (Co-Chair), Solutia Inc., PO Box 97, Gonzalez, FL 32560-0097, 850-968-8216, 850-968-8732 (FAX), russell.f.dunn@solutia.com.

Area 10b: Systems and Process Control

1. Control of Pulp and Paper Processes. Yaman Arkun (Chair), School of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0100, 404-894-2871, 404-894-2866 (FAX), yaman.arkun@chemeng.gatech.edu and Francis J. Doyle III (Co-Chair), Department of Chemical Engineering, University of Delaware, Newark, DE 19716, 302-831-0760, 302-831-1048 (FAX), doyle@che.udel.edu.

Area 10c: Computers in Operations and Information Processing

1. Practical Issues in Operations for the Food and Pharmaceutical Industries. Stephen P. Lombardo (Chair), Process Systems Development, The Coca-Cola Company, TEC 225c, PO Drawer 1734, Atlanta, GA 30301, 404-676-0541, 404-676-2840 (FAX), lombardo@coca-cola.com and Matthew J. Realff (Co-Chair), School of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0100, 404-894-1834, 404-894-2866 (FAX), matthew.realff@che.gatech.edu.

2. Enterprise Resource Planning in the Process Industries. Joseph F. Pekny (Chair), School of Chemical Engineering, Purdue University, West Lafayette, IN 47907-1283, 765-494-7901, 765-494-0805 (FAX), pekny@ecn.purdue.edu and Miguel J. Bagajewicz (Co-Chair), School of Chemical Engineering and Materials Science, University of Oklahoma, Norman, OK 73019-0628, 405-325-5458, 405-325-5813 (FAX), bagajewi@mailhost.ecn.ou.edu.

2000 Programming Contacts

Area 10a Program Coordinator for 2000: Urmila M. Diwekar, Environmental Institute, Carnegie Mellon University, Pittsburgh, PA 15213-3890, 412-268-3003, 412-268-3757 (FAX), urmila@cmu.edu.

Area 10b Program Coordinator for 2000: Ahmet N. Palazoglu, Department of Chemical Engineering and Materials Science, University of California, Davis, CA 95616-5294, 530-752-8774, 530-752-1031 (FAX), anpalazoglu@ucdavis.edu.

Area 10c Program Coordinator for 2000: Conor M. McDonald, Experimental Station, E. I. du Pont de Nemours & Company, PO Box 80101, Wilmington, DE 19880-0101,

302-695-7394, 302-695-2645 (FAX), conor@magellan.es.dupont.com.

CAST Division Programming Chair: Michael F. Malone, Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-0838, 413-545-1647 (FAX), mmalone@ecs.umass.edu.

Society for Computer Simulation: Ariel Sharon, Computer Simulation Technologies, Inc., 459 Quail Drive, Naperville, IL 60565, 708-983-5195, 708-983-5249 (FAX), asharon@ix.netcom.com.

ADCHEM 2000 Pisa, Italy June 14-16, 2000

The ADCHEM 2000 meeting will be held on June 14-16, 2000 in Pisa, Italy. Organized under the auspices of IFAC, ADCHEM (International Symposium on Advanced Control of Chemical Processes) is a continuing series of international meetings held most recently in Banff, Canada (1997), Kyoto, Japan (1994), and Toulouse, France (1991). These meetings have traditionally focused on advances in methods for control and estimation and are part of a three year rotation of IFAC meetings in process control, which also include DYCOPS (Corfu, 1998) and the IFAC World Congress (Beijing, 1999). For the upcoming ADCHEM meeting, contributed papers will be considered in modeling and simulation (including first principle models, data driven models, and model reduction for control and optimization), model based control (including linear and nonlinear MPC, linearizations based geometric concepts, etc.), real-time optimization (including optimization of steady state and dynamic models, and integration with control systems), process and control monitoring (including PCA and other statistical techniques, auditing of sensors, etc.), process identification (including estimation and filtering of linear and nonlinear systems), and process control applications and plant-wide control (including the control of environmental systems, petroleum refineries, etc.). The deadline for submission of contributed papers is September 6, 1999. For additional information, write to adchem2000@ing.unipi.it.

2000 American Control Conference Chicago Illinois June 28-30, 2000

The American Automatic Control Council will hold the nineteenth ACC at the Hyatt Regency Hotel, Chicago, June 28-30, 2000. Held in cooperation with the International Federation of Automatic Control, this conference will bring together people working in control, automation, and related areas in the aerospace, chemical, electrical, mechanical, manufacturing, and process engineering fields. As in the past, the CAST Division will develop a number of invited, contributed, and tutorial sessions. The AIChE Society

Review Chair is Ahmet Palazoglu, Department of Chemical Engineering and Materials Science, University of California, Davis, CA 95616-5294, 530-752-8774, 530-752-1031 (FAX), anpalazoglu@ucdavis.edu. The deadline for contributed papers is September 15, 1999. For more information, <http://www.ece.nwu.edu/~ahaddad/aacc/acc.html>.

Seventh International Symposium on Process Systems Engineering (PSE-2000)
Keystone, Colorado
July 16-21, 2000

PSE-2000 is the seventh in the triennial series of international symposia on process systems engineering and the first of the series to be held in the United States. The purpose of the meeting is to bring together the community of researchers and practitioners involved in the creation and application of computer-based methodologies for planning, design, operation, control, and maintenance of chemical processes. The special focus of PSE meetings is the integration of the enabling technologies and application domains. The conference is cosponsored by the European Federation of Chemical Engineering, The Interamerican Confederation of Chemical Engineering, and the Asian Pacific Confederation of Chemical Engineering and will be organized in large part by the CAST Division. The symposium will have both oral presentations and poster sessions in areas such as synthesis and design, modeling and simulation, control, planning and scheduling, operations, intelligent systems, and industrial applications and case studies. For further information, contact the conference chairs G. V. Reklaitis, School of Chemical Engineering, Purdue University, West Lafayette, IN 47907-1283, 765-494-4075, 765-494-0805 (FAX), reklaiti@ecn.purdue.edu or Jeffrey J. Siirola, Eastman Chemical Company, PO Box 1972, Kingsport, TN 37662-5150, 423-229-3069, 423-229-4558 (FAX), siirola@eastman.com.

International Conference on Foundations of Molecular Modeling and Simulation (FOMMS-2000)
Keystone, Colorado
July 23-28, 2000

The first Foundations of Molecular Modeling and Simulation conference (FOMMS-2000) is being organized by the Thermodynamics and Transport Properties programming group of AIChE, the CAST Division, and CACHE Corporation with an emphasis on applications for industry. The creation, design, and control of product properties often requires an understanding of how molecular and mesoscopic features influence macroscopic behavior. Quantum mechanical computations provide a means to understand atomic and molecular-scale interactions from which statistical mechanics can estimate mesoscopic and macroscopic behavior. Exponential growth in computing power and theoretical and algorithmic advances are

allowing these methods to address questions of practical importance. The aim of this conference is to bring together molecular simulation and computational chemistry innovators, hardware and software providers, and customers who use the tools of molecular modeling and simulation. The conference will consist of both invited speakers and contributed poster presentations. Focus areas are expected to include thermochemistry, catalysis and reaction kinetics, phase equilibria, transport and porous media, adsorption, fluids, micelles, colloids, and polymers, metals, ceramics, and semiconductors, computing architecture, human resource development, and education. For additional information, contact the conference chairs Peter T. Cummings, Department of Chemical Engineering, University of Tennessee, Knoxville, TN 37996-2200, 423-974-0227, 423-974-4910 (FAX), ptc@utk.edu or Phillip R. Westmoreland, Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-1750, 413-545-1647 (FAX), westm@ecs.umass.edu or <http://www.ecs.umass.edu/topical/FOMMS.html>.

Proposed CAST Division Programming
2000 Fall Annual Meeting
November 12-17 2000
Los Angeles, California

SUMMARY: Plenary: 1 Session
 Area 10a: 6 Sessions (3 plus 1 joint with 10b, 1 joint with 10c, 1 joint with 10d, 1 joint with 1a, 1 joint with 2, and 1 joint with 9)
 Area 10b: 9 Sessions (6 plus 1 joint with 10a, 1 joint with 10c, 1 joint with 10d, 1 joint with 2c, 1 joint with 3d, and 1 joint with 8e)
 Area 10c: 5.5 Sessions (3 plus 1 joint with 10a, 1 joint with 10b, 1 joint with 10d, 1 joint with 15a, and 1 joint with 15d/e)
 Area 10d: 6 Sessions (3 plus 1 joint with 10a and 1 joint with 10b, 1 joint with 10c, 1 joint with 1j, 1 joint with 8d, and 1 joint with 15d/e)

Plus: 1 Division POSTER Session (in 6 sections)
 2 Days Educational Software Demonstrations
 CAST Total: 27.5 Sessions Requested (EXCLUDING Poster Session and Software Demonstrations): 22 plus 11 joint outside CAST

PROGRAM (Note entire Fall 2000 CAST program is COSPONSORED by The Society for Computer Simulation):

CAST Division Plenary Session

1. Recent Developments in Computing and Systems Technology. Antony N. Beris (Chair), Department of Chemical Engineering, University of Delaware, Newark, DE 19716, 302-831-8018, 302-831-1048 (FAX),

beris@che.udel.edu and Conor M. McDonald (Co-Chair), Experimental Station, E. I. du Pont de Nemours & Company, PO Box 80101, Wilmington, DE 19880-0101, 302-695-7394, 302-695-2645 (FAX), conor.m.mcdonald@usa.dupont.com.

Area 10a: Systems and Process Design

1. Process Synthesis. Andreas A. Linninger (Chair), Department of Chemical Engineering, University of Illinois at Chicago, Chicago, IL 60607-7000, 312-996-2581, 312-996-0808 (FAX), linninge@uic.edu and Il Moon (Co-Chair), Department of Chemical Engineering, Yonsei University, Seodaemum-Ku, Shinchon-Dong 134, Seoul 120-749, KOREA, 82-2-361-2761, 82-2-312-6401 (FAX), ilmoon@bubble.yonsei.ac.kr.

2. Design and Analysis. Costas D. Maranas (Chair), Department of Chemical Engineering, Pennsylvania State University, University Park, PA 16802, 814-865-2574, 814-865-7846 (FAX), cdm8@psu.edu and Pricilla J. Hill (Co-Chair), Mitsubishi Chemical Corporation, Mizushima Plant, 3-10 Ushio-Dori, Kurashiki, Okayama 712-8054, JAPAN, 81-86-457-2980, 81-86-457-2989 (FAX), phill@seigi2.mt.m-kagaku.co.jp.

3. Design for Flexible Manufacturing. Vassilis Vassiladis (Chair), vsv20@cheng.cam.ac.uk and Katerina Papalexandri (Co-Chair), BP Exploration Operating Co. Ltd., Chertsey Road, Sunbury-on-Thames, Middlesex TW16 7LN, UNITED KINGDOM, 44-193-276-2995, 44-193-276-3952 (FAX), papalexk@bp.com.

Joint Area 10a and Area 10b Session

1. Integration of Design and Control. Vipin Gopal (Chair), Honeywell Technology Center, Honeywell Inc., 3660 Technology Drive, Minneapolis, MN 55418, 612-951-7236, 612-951-7548 (FAX), vipin@htc.honeywell.com and Michael L. Luyben (Co-Chair), Nemours 6541, E. I. du Pont de Nemours & Company, Wilmington, DE 19898, 302-774-2398, michael.l.luyben@usa.dupont.com.

Joint Area 10a and Area 10c Session

1. Batch Processing. Jonathan M. Vinson (Chair), G. D. Searle, 4901 Searle Parkway, Skokie, IL 60077, 847-982-4219, 847-982-7465 (FAX), jonathan.m.vinson@monsanto.com and Yinlun Huang (Co-Chair), Department of Chemical Engineering and Materials Science, Wayne State University, Detroit, MI 48202, 313-577-3771, 313-577-3810 (FAX), yhuang@chem1.eng.wayne.edu.

Joint Area 10a and Area 10d Session

1. Computational and Modeling Issues in Design. Ashish Gupta (Chair), Department of Chemical Engineering, SUNY Buffalo, Buffalo, NY 14260-4200, 716-645-2911, 716-645-3822 (FAX), ashishg@eng.buffalo.edu and Heinz A. Preisig (Co-Chair), Systems and Control, Eindhoven University of Technology, 5600 MB Eindhoven, THE NETHERLANDS, 31-040-247-2578, 31-040-243-7170 (FAX), h.preisig@ctrl.phys.tue.nl.

Joint Area 10a and Area 1a Session

1. Computational Chemistry in Design. Luke K. Achenie (Chair), Department of Chemical Engineering, University of Connecticut, Storrs, CT 06269-3222, 860-486-2756, 860-486-2959 (FAX), achenie@enr.uconn.edu and Claire S. Adjiman (Co-Chair), Centre for Process Systems Engineering, Imperial College of Science, Technology and Medicine, London SW7 2BY, UNITED KINGDOM, 44-171-594-6638, 44-171-594-6606 (FAX), c.adjiman@ic.ac.uk.

Joint Area 10a and Area 2 Session

1. Design of Reactions and Separation Systems. Viswanathan Visweswaran (Chair), Mobil Technology Company, PO Box 480, Paulsboro, NJ 08066-0480, 609-224-2942, 609-224-3832 (FAX), vishy_visweswaran@email.mobil.com and Vivek Julka (Co-Chair), Aspen Technology, Inc., 10 Canal Park, Cambridge, MA 02141-2201, 617-949-1213, 617-949-1030 (FAX), vivek.julka@aspentech.com.

Joint Area 10a and Area 9 Session

1. Design for Environment and Safety. Marianthi G. Ierapetritou (Chair), Department of Chemical and Biochemical Engineering, Rutgers University, Piscataway, NJ 08854-8058, 732-445-2971, 732-445-2421 (FAX), marianth@sol.rutgers.edu and Ahmad A. Hamad (Co-Chair), Solutia Inc., 10300 Olive Blvd., St. Louis, MO 63166-6760, 314-674-4527, 314-674-6595 (FAX), aahama@solutia.com.

Area 10b: Systems and Process Control

1. Advances in Process Control. Vasilios I. Manousiouthakis (Chair), Department of Chemical Engineering, University of California, Los Angeles, CA 90095-1592, 310-825-9385, 310-825-2394 (FAX), vasilios@ucla.edu and Mayuresh V. Kothare (Co-Chair), Department of Chemical Engineering, Lehigh University, Bethlehem, PA 18015-4791, 610-758-6654, 610-758-5057 (FAX), mvk2@lehigh.edu.

2. Modeling and Identification. Frank Allgöwer (Chair), Institut für Automatik, ETH Zentrum ETL I 26, CH-8092

Zürich, SWITZERLAND, 41-1-632-3557, 41-1-632-1211 (FAX), allgower@aut.ee.ethz.ch and Louis P. Russo (Co-Chair), Exxon Chemical Company, PO Box 4004, Baytown, TX 77522-4004, 281-834-0219, 281-834-5601 (FAX), lrusso@ix.netcom.com.

3. Plant-wide Control. Christos Georgakis (Chair), Department of Chemical Engineering, Lehigh University, Bethlehem, PA 18015-4791, 610-758-6654, 610-758-5057(FAX), c.georgakis@pmc.lehigh.edu and Kenneth A. Debelak (Co-Chair), Department of Chemical Engineering, Vanderbilt University, Nashville, TN 37235, 615-322-2088, 615-343-7951 (FAX), debelak@vuse.vanderbilt.edu.

4. Novel Methods in Nonlinear Process Control. Dennis D. Sourlas (Chair), Department of Chemical Engineering, University of Missouri, Rolla, MO 65401-0249, 573-341-6331, 573-341-4377 (FAX), dsourlas@umr.edu and Martin Guay (Co-Chair), Department of Chemical and Materials Engineering, University of Alberta, Edmonton, AB T6G 2G6, CANADA, 403-492-9384, 403-492-2881 (FAX), martin.guay@ualberta.ca.

5. Process and Control System Monitoring. Ali Cinar (Chair), Department of Chemical and Environmental Engineering, Illinois Institute of Technology, Chicago, IL 60616-3793, 312-567-3042, 312-567-8874 (FAX), cinar@charlie.cns.iit.edu.

6. Theory and Practice of Model Predictive Control. Alex Z. Q. Zheng (Chair), Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-2916, 413-545-1647 (FAX), zzheng@ecs.umass.edu and Evelio Hernandez (Co-Chair), Shell Development Company, Houston, TX, 713-493-8838, vster@shell.com.

Joint Area 10b and Area 10c Session

1. Real Time Optimization. Iauw-Bhieng Tjoa (Chair), Mitsubishi Chemical America, Inc., 99 W. Tasman Drive, Suite 200, San Jose, CA 95134-1712, 408-232-6246, 408-954-8494 (FAX), tjoa@mcaca.com and Thomas E. Marlin (Co-Chair), Department of Chemical Engineering, McMaster University, Hamilton, Ontario L8S 4L7, CANADA, 905-521-9140, 905-521-1350 (FAX), marlint@mcmail.cis.mcmaster.ca.

Joint Area 10b and Area 10d Session

1. Distributed Parameter Systems. Panagiotis D. Christofides (Chair), Department of Chemical Engineering, University of California, Los Angeles, CA 90095-1592, 310-794-1015, 310-206-4107 (FAX), pdcc@seas.ucla.edu.

Joint Area 10b and Area 2c Session

1. Control of Separation Processes. Athanasios Tsirukis (Chair), Air Products and Chemicals, Inc., 7201 Hamilton Blvd., Allentown, PA 18195-1501, 610-481-4452, 610-481-2556 (FAX), tsiruka@ttown.apci.com.

Joint Area 10b and Area 3d Session

1. Control of Particulate Systems. E. Scott Meadows (Chair), Department of Chemical Engineering, University of Delaware, Newark, DE 19716, 302-831-0726, 302-831-1048 (FAX), esm@fourier.che.udel.edu.

Joint Area 10b and Area 8e Session

1. Control of Microelectronics Processes. Raymond A. Adomaitis (Chair), Department of Chemical Engineering, University of Maryland, College Park, MD 20742-2111, 301-405-2969, 301-314-9920 (FAX), adomaiti@isr.umd.edu and T. J. Mountziaris (Co-Chair), Department of Chemical Engineering, State University of New York, Buffalo, NY 14260, 716-645-2911 x2212, 716-645-3822 (FAX), tjm@eng.buffalo.edu.

Area 10c: Computers in Operations and Information Processing

1. Computer Integrated Manufacturing (Cosponsored by the International Cooperation Committee of the Society of Chemical Engineers, Japan). Frank X. X. Zhu (Chair), Department of Process Integration, University of Manchester Institute of Science and Technology, PO Box 88, Manchester M60 1QD, UNITED KINGDOM, 44-161-200-4398, 44-161-236-7439 (FAX), f.zhu@umist.ac.uk and Matthew J. Realff (Co-Chair), School of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA 30332-0100, 404-894-1834, 404-894-2866 (FAX), matthew.realff@che.gatech.edu.

2. Planning and Scheduling. Viswanathan Visweswaran (Chair), Mobil Technology Company, PO Box 480, Paulsboro, NJ 08066-0480, 609-224-2942, 609-224-3832 (FAX), vishy_visweswaran@email.mobil.com and Marianthi G. Ierapetritou (Co-Chair), Department of Chemical and Biochemical Engineering, Rutgers University, Piscataway, NJ 08854-8058, 732-445-2971, 732-445-2421 (FAX), marianth@sol.rutgers.edu.

3. Simulation and Optimization of Dynamic Systems. Vipin Gopal (Chair), Honeywell Technology Center, Honeywell Inc., 3660 Technology Drive, Minneapolis, MN 55418, 612-951-7236, 612-951-7548 (FAX), vipin@htc.honeywell.com and Ashish Gupta (Co-Chair), Department of Chemical Engineering, SUNY Buffalo, Buffalo, NY 14260-4200, 716-645-2911, 716-645-3822 (FAX), ashishg@eng.buffalo.edu.

Joint Area 10c and Area 10d Session

1. High Performance Parallel Computing Applications. Ioannis P. Androulakis (Chair), Exxon Research and Engineering Company, Route 22, Clinton Township, Annandale, NJ 08801, 908-730-2111, 908-730-3344 (FAX), ipandro@erenj.com and Mark A. Stadtherr (Co-Chair), Department of Chemical Engineering, University of Notre Dame, Notre Dame, IN 46556, 219-631-9318, 219-631-8366 (FAX), markst@nd.edu.

Joint Area 10c and Area 15a Session

1. Computational Methods in the Food, Agricultural, and Pharmaceutical Industries. Matthew H. Bassett (Chair), Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46268-1054, 317-337-3891, 317-337-3628 (FAX), mhassett@dowagro.com.

Joint Area 10c and Area 15d/e Session

1. Modeling and Operations Methods in Biosystems. Robert S. Parker (Chair), Department of Chemical Engineering, University of Delaware, Newark, DE 19716, 302-831-0726, 302-831-1048 (FAX), rparker@che.udel.edu and Vassily Hatzimanikatis (Co-Chair), Cargill Corn Milling Division, 2301 Crosby Road, Wayzata, MN 55391, 612-742-3308, 612-742-2381 (FAX), vassily_hatzimanikatis@cargill.com.

Area 10d: Applied Mathematics and Numerical Analysis

1. Nonlinear Dynamics and Pattern Formation. Ranganathan Narayanan (Chair), Department of Chemical Engineering, University of Florida, Gainesville, FL 32611, 352-392-9103, 352-392-9513 (FAX), ranga@gibbs.che.ufl.edu and Vemuri Balakotaiah (Co-Chair), Department of Chemical Engineering, University of Houston, Houston, TX 77204-4792, 713-743-4318, 713-743-4323 (FAX), bala@uh.edu.

2. Numerical Analysis. Yuriko Renardy (Chair), Department of Mathematics, Virginia Polytechnic Institute and State University, Blacksburg, VA 24061-0123, 703-231-8258, renardy@math.vt.edu and Duane Johnson (Co-Chair), University of Alabama, Tuscaloosa, AL 35487-0203.

3. Novel Computer Applications in Chemical Engineering. Ashish Gupta (Chair), Department of Chemical Engineering, SUNY Buffalo, Buffalo, NY 14260-4200, 716-645-2911, 716-645-3822 (FAX), ashishg@eng.buffalo.edu.

Joint Area 10d and Area 1j Session

1. Novel Numerical Methods in Fluid Mechanics. R. Sureshkumar (Chair), Department of Chemical Engineering,

Washington University, St. Louis, MO 63130-4899, 314-935-4988, suresh@poly1.wustl.edu.

Joint Area 10d and Area 8d Session

1. Applied Mathematics in Materials Processing. Stratis V. Sotirchos (Chair), Department of Chemical Engineering, University of Rochester, Rochester, NY 14627-0166, 716-275-4626, 716-442-6686 (FAX), sv2@che.rochester.edu and Raymond A. Adomaitis (Co-Chair), Department of Chemical Engineering, University of Maryland, College Park, MD 20742-2111, 301-405-2969, 301-314-9920 (FAX), adomaiti@isr.umd.edu.

Joint Area 10d and Area 15d/e Session

1. Applied Mathematics in Bioengineering. Kyriacos Zygorakis (Chair), Department of Chemical Engineering, Rice University, Houston, TX 77005-1892, 713-285-5208, 713-285-5478 (FAX), kyzy@rice.edu and Ching-An Peng (Co-Chair), Department of Chemical Engineering, University of Southern California, Los Angeles, CA 90089-1211, 213-740-2067, 213-740-8053 (FAX) and D. Rumschitzki (Co-Chair), Department of Chemical Engineering, The City College of the City University of New York, New York, NY 10031, 212-650-5430, 212-650-6660 (FAX).

CAST DIVISION POSTER SESSION

Section A. Recent Developments in Systems and Process Design. Urmila M. Diwekar (Chair), Environmental Institute, Carnegie Mellon University, Pittsburgh, PA 15213-3890, 412-268-3003, 412-268-3757 (FAX), urmila@cmu.edu and Ka M. Ng (Co-Chair), Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-0096, 413-545-1647 (FAX), ng@ecs.umass.edu.

Section B. Topics in Systems and Process Control. Jorge A. Mandler (Chair), Air Products and Chemicals, Inc., 7201 Hamilton Blvd., Allentown, PA 18195-1501, 610-481-3413, 610-481-4948 (FAX), mandleja@apci.com and Costas Kravaris (Co-Chair), Department of Chemical Engineering, University of Michigan, Ann Arbor, MI 48109-2136, 313-764-1674, 313-763-0459, costas@engin.umich.edu.

Section C. Advances in Optimization. Miguel J. Bagajewicz (Chair), School of Chemical Engineering and Materials Science, University of Oklahoma, Norman, OK 73019-0628, 405-325-5458, 405-325-5813 (FAX), bagajewi@mailhost.ecn.ou.edu and Scott E. Keeler (Co-Chair), Dow AgroSciences, 9330 Zionsville Road, Indianapolis, IN 46268-1053, 317-337-3138, 317-337-3215 (FAX), skeeler@dowagro.com.

Section D. Process Safety - Design and Operation. Katerina Papalexandri (Chair), BP Exploration Operating Co. Ltd., Chertsey Road, Sunbury-on-Thames, Middlesex TW16 7LN, UNITED KINGDOM, 44-193-276-2995, 44-193-276-3952 (FAX), papalexk@bp.com and Il Moon (Co-Chair), Department of Chemical Engineering, Yonsei University, Seodaemum-Ku, Shinchon-Dong 134, Seoul 120-749, KOREA, 82-2-361-2761, 82-2-312-6401 (FAX), ilmoon@bubble.yonsei.ac.kr.

Section E. Issues and Topics in Computers and Operations and Information Processing. Paul I. Barton (Chair), Department of Chemical Engineering, Massachusetts Institute of Technology 66-464, Cambridge, MA 02139, 617-253-6526, 617-258-5042 (FAX), pib@mit.edu and Conor M. McDonald (Co-Chair), Experimental Station, E. I. du Pont de Nemours & Company, PO Box 80101, Wilmington, DE 19880-0101, 302-695-7394, 302-695-2645 (FAX), conor.m.mcdonald@usa.dupont.com.

Section F. Advances in Applied Mathematics. Antony N. Beris (Chair), Department of Chemical Engineering, University of Delaware, Newark, DE 19716, 302-831-8018, 302-831-1048 (FAX), beris@che.udel.edu and Prodromos Daoutidis (Co-Chair), Department of Chemical Engineering and Material Science, University of Minnesota, Minneapolis, MN 55455-0132, 612-625-8818, 612-626-7246 (FAX), daoutidis@cems.umn.edu.

EDUCATIONAL	COMPUTER	SOFTWARE
DEMONSTRATIONS (Joint Effort with Group 4)		

Douglas J. Cooper (Coordinator), Department of Chemical Engineering, University of Connecticut, Storrs, CT 06269-3222, 860-486-4092, 860-486-2959 (FAX), cooper@eng2.uconn.edu and John T. Bell (Coordinator), Department of Chemical Engineering, University of Michigan, Ann Arbor, MI 48109-2136, 313-763-4814, 313-763-0459 (FAX), johnbell@umich.edu.

2000 Programming Contacts

Area 10a Program Coordinator for 2000: Urmila M. Diwekar, Environmental Institute, Carnegie Mellon University, Pittsburgh, PA 15213-3890, 412-268-3003, 412-268-3757 (FAX), urmila@cmu.edu.

Area 10b Program Coordinator for 2000: Ahmet N. Palazoglu, Department of Chemical Engineering and Materials Science, University of California, Davis, CA 95616-5294, 530-752-8774, 530-752-1031 (FAX), anpalazoglu@ucdavis.edu.

Area 10c Program Coordinator for 2000: Conor M. McDonald, Experimental Station, E. I. du Pont de Nemours & Company, PO Box 80101, Wilmington, DE 19880-0101, 302-695-7394, 302-695-2645 (FAX), conor@magellan.es.dupont.com.

Area 10d Program Coordinator for 2000: Antony N. Beris, Department of Chemical Engineering, University of Delaware, Newark, DE 19716, 302-831-8018, 302-831-1048 (FAX), beris@che.udel.edu.

CAST Division Programming Chair: Michael F. Malone, Department of Chemical Engineering, University of Massachusetts, Amherst, MA 01003-3110, 413-545-0838, 413-545-1647 (FAX), mmalone@ecs.umass.edu.

Society for Computer Simulation: Ariel Sharon, Computer Simulation Technologies, Inc., 459 Quail Drive, Naperville, IL 60565, 708-983-5195, 708-983-5249 (FAX), asharon@ix.netcom.com.

Society of Chemical Engineers, Japan: Iori Hashimoto, Chemical Engineering Department, Kyoto University, Yoshida-Honmachi Sakyo-ku, Kyoto 606-01, JAPAN 81-75-753-5567, 81-75-752-9639 (FAX), hashimoto@cheme.kyoto-u.ac.jp.

CALLS FOR PAPERS FOR CAST SESSIONS

**Final Call for CAST Sessions
1999 AIChE Fall Annual Meeting
Dallas, Texas
October 31-November 5, 1999**

The names, addresses, and telephone numbers of the session chairs are given on the next several pages, as are brief statements of the topics to receive special emphasis in selecting manuscripts for these sessions. Prospective session participants are encouraged to observe the deadlines which have been established, but may be changed, by the Meeting Program Chair, Robert H. Davis. A complete call for papers for all sessions at this meeting may be accessed at <http://www.aiche.org/meeting/1999/annual/cfp/>.

AIChE is currently soliciting electronic submission of proposals-to-present via the world wide web only. To submit via the web, access <http://www.aiche.org>. Do not send proposals-to-present to the session chair email addresses.

SPECIAL NOTE TO AUTHORS SUBMITTING ABSTRACTS FOR ANNUAL MEETING SESSIONS:

Because of the large number of anticipated presentation proposals for annual meetings and the limited symposia space available, and in order to maximize the number of good proposals that can be accepted and generally improve programming quality, all proposals for Fall 1999 CAST programming will be subjected to a Centralized Review process:

1. Abstracts will receive anonymous reviews by three or four session chairs, co-chairs, and Area Program Coordinators for technical content, novelty and style. Submissions may be shifted between sessions or other CAST areas as appropriate.
2. Each area will sponsor one or more sections of the Division Poster Session. Some areas may develop topical themes for their sections while others may have a more general scope to accommodate late news. Unless directed otherwise by the author, all proposals will be considered for both symposium and poster sessions.

Dallas Meeting Deadlines:

May 1, 1999: Submit a proposal-to-present electronically to AIChE via web access at <http://www.aiche.org>. All proposals to CAST-sponsored sessions at the Dallas meeting will be subject to centralized reviews by the appropriate CAST area. Submission prior to this deadline is encouraged.

May 15, 1999: Session content finalized and authors informed of selection. Authors of accepted proposals may update abstracts electronically.

October 1, 1999: Authors submit hardcopy manuscript (presentation record) with a Permission to Reproduce Manuscript form to the AIChE Manuscript Center in New York.

October 31, 1999: Speakers bring 60 hardcopies of visual aids for distribution to the audience at the presentation. (This is a CAST Division policy intended to improve the quality of presentations and the benefit to the audience.)

Please note that there is an AIChE limitation that no person may author or coauthor more than four contributions at any one meeting.

Authors submitting by the above deadlines will be notified of decisions on acceptance as close to May 15 as the schedules of the reviewers, session chairs, the Meeting Program Chair, and AIChE permit. Abstracts of accepted proposals will be available on the web for public browsing approximately one month before the meeting.

Presenters at AIChE meetings are reminded to send a hardcopy record of their presentation to the AIChE Manuscript Center in New York no later than one month before the meeting. The purpose of this requirement is to improve the quality of presentations generally as well as to enable AIChE to more broadly disseminate ideas and results by filling requests for copies of presentation records during and after each meeting. Formal full-length manuscripts are encouraged by AIChE and many of the programming groups. The CAST Division has elected not to mandate any specific length or format requirements for presentation records for its sessions. However, the minimally acceptable content does consist of an introduction, results, discussion, and references which may be augmented with figures and tables, presentation visual aids, or poster panels. The Executive Board of the National Program Committee has adopted the policy that the advanced submission of a hardcopy presentation record be a condition for presenting at AIChE-sponsored meetings.

CAST Division Plenary Session

1. Recent Developments in Computing and Systems Technology.

Plenary papers describing recent advances, and new challenges in each of the CAST areas (Systems and Process Design, Systems and Process Control, Computers in Operations and Information Processing, and Applied

Mathematics and Numerical Analysis) will be invited by the CAST programming board. The papers are intended to be accessible to a wide audience with interests in any and all of the CAST areas. It is anticipated that this session will be scheduled on Monday morning and that no other CAST sessions will be scheduled in parallel in order to facilitate the broadest possible communication.

Session Chair

B. Wayne Bequette
Department of Chemical Engineering
Rensselaer Polytechnic Institute
Troy, NY 12180-3590
518-276-6683
518-276-4030 (FAX)
bequeb@rpi.edu

Co-Chair

Mahmoud El-Halwagi
Chemical Engineering Department
Auburn University
Auburn, AL 36849-5127
334-844-2064
334-844-2063 (FAX)
mahmoud@eng.auburn.edu

Area 10a: Systems and Process Design

1. Process Synthesis.

This session invites contributions from academia and industry in the area of process synthesis. Topics of interest include but are not limited to flowsheet synthesis, synthesis of energy integrated processes, reactor network synthesis, synthesis of separation and reactive separation systems, and synthesis of environmentally friendly processes. Practical applications, and new strategies for flowsheet generation, model development and solution techniques are particularly encouraged.

Session Chair

Metin Türkay
Mitsubishi Chemical Corporation
Mizushima Plant
3-10 Ushio-Dori
Kurashiki, Okayama 712-8054
JAPAN
81-86-457-2809
81-86-457-2989 (FAX)
mturkay@seigi2.mt.m-kagaku.co.jp

Past postings on the CAST10
Email List are archived on the
World Wide Web at <http://www.che.wisc.edu/cast10>

Co-Chair

Andreas Linninger

Department of Chemical Engineering
University of Illinois - Chicago
Chicago, IL 60607-7000
312-996-2581
312-996-0808 (FAX)
linninge@uic.edu

2. Design and Analysis.

Technologies that support the design and analysis of chemical processes are the main focus of this session. We invite papers describing developments, methodologies, tools and case-studies in areas such as process modeling, analysis and modeling of unit operations, integrated design, process optimization, etc. Emphasis is placed on studies aiming to improve production versatility and responsiveness and increase process efficiency and environmental awareness. We would like to encourage the submitters to discuss the impact of their research on traditional engineering practice towards these targets.

Session Chair

Katerina Papalexandri
Chemical Process Engineering Research Institute
PO Box 361
GR-570 01 Thessaloniki
GREECE
30-31-980-149
30-31-980-180 (FAX)
kpp@alexandros.cperi.forth.gr

Co-Chair

Jonathan M. Vinson
G. D. Searle
4901 Searle Parkway
Skokie, IL 60077
847-982-4219
847-982-7465 (FAX)
jmvins@searle.monsanto.com

3. Advanced Process Integration.

We invite papers that deal with new and innovative methods for integration of chemical process systems. Topics of interest include but are not limited to heat exchanger, reactor, or separation system networks; optimization of process flowsheets; process units with simultaneous reaction and separation; and interdisciplinary areas such as safety or environmental analysis which integrate design with operation aspects. Both industrial and academic papers are sought describing general procedures, theoretical developments, methodologies, tools and case studies.

Session Chair

Pricilla J. Hill
Mitsubishi Chemical Corporation
Mizushima Plant
3-10 Ushio-Dori

Kurashiki, Okayama 712-8054
 JAPAN
 81-86-457-2980
 81-86-457-2989 (FAX)
 phill@seigi2.mt.m-kagaku.co.jp

Co-Chair

Il Moon
 Department of Chemical Engineering
 Yonsei University
 Seodaemum-Ku
 Shinchon-Dong, 134
 Seoul 120-749
 KOREA
 82-2-361-2761
 82-2-312-6401 (FAX)
 ilmoon@bubble.yonsei.ac.kr

4. Technology Transfer in Process Design.

This session will address experiences in transferring design tools and methodologies from developers to industrial users. Developers include academics, software companies, consultants and industrial researchers. Papers describing novel approaches to technology transfer and giving case examples that show how new methods gained industrial application will be given preference.

Session Chair

Gavin P. Towler
 UOP LLC
 25 East Algonquin Road
 Des Plaines, IL 60017-5017
 847-391-2788
 847-391-3491 (FAX)
 gptowler@uop.com

Co-Chair

Vivek Julka
 Aspen Technology, Inc.
 10 Canal Park
 Cambridge, MA 02141-2201
 617-949-1213
 617-949-1030 (FAX)
 vivek.julka@aspentech.com

CAST Programming Tips

1. Submit Proposals-to-Present early via the world wide web. Submissions to the Fall Annual Meeting sessions participating in Centralized Review automatically will be considered for all appropriate sessions.

5. Separations System Synthesis.

Session Chair

Ashish Gupta
 Department of Chemical Engineering
 SUNY Buffalo

Buffalo, NY 14260-4200
 716-645-2911
 716-645-3822 (FAX)
 ashishg@eng.buffalo.edu

Co-Chair

Dante Bonaquist
 Praxair
 dante_bonaquist@praxair.com

Joint Area 10a and Area 10b Session

1. Interaction of Design and Control.

This session focuses on the general topic of the interaction between process design and process control. Poor control of a chemical process can sometimes be the result of limitations in the plant design. Significant improvements in dynamic process controllability can often be achieved at the design stage by examining issues such as disturbance rejection, startup/shutdown, and variable grade/rate production. Both industrial and academic papers are sought which address the problem of incorporating controllability and operability into the process design (general procedures, methodologies, tools, case studies, etc.).

Session Chair

Dennis D. Sourlas
 Department of Chemical Engineering
 University of Missouri
 Rolla, MO 65409-1230
 573-341-6331
 573-341-4377 (FAX)
 dsourlas@umr.edu

Co-Chair

Christine B. Seymour
 G. D. Searle Company
 4901 Searle Parkway
 Skokie, IL 60077
 847-982-7628
 847-982-7465 (FAX)
 christine.b.seymour@monsanto.com

Co-Chair

Jorge A. Mandler
 Air Products and Chemicals, Inc.
 7201 Hamilton Blvd.
 Allentown, PA 18195-1501
 610-481-3413
 610-481-4948 (FAX)
 mandleja@ttown.apci.com

Joint Area 10a and Area 10c Session

1. Design and Operation of Batch Processes.

Papers are invited in the general area of design and operation of batch processes. Topics of interest include, but are not limited to, flowsheet synthesis, scale-up, process modeling, design, rating and/or retrofit of existing facilities, operations planning and modeling (including modeling under uncertainty), sequencing and scheduling, and optimization. Contributions that describe industrial applications are particularly encouraged.

Session Chair

Ekaterini Korovessi
E. I. du Pont de Nemours & Company
Experimental Station E1/104
PO Box 80101
Wilmington, DE 19880-0101
302-695-8828
302-695-2645 (FAX)
ekaterini.korovessi@usa.dupont.com

Co-Chair

Vipin Gopal
Honeywell Technology Center
Honeywell Inc.
3660 Technology Drive
Minneapolis, MN 55418
612-951-7236
612-951-7548 (FAX)
vipin@htc.honeywell.com

Joint Area 10a and Area 9 Session

1. Design for Environment.

Chair

Urmila M. Diwekar
Environmental Institute
Carnegie Mellon University
Pittsburgh, PA 15213-3890
412-268-3003
412-268-3757 (FAX)
urmila@cmu.edu

Co-Chair

Mahmoud El-Halwagi
Chemical Engineering Department
Auburn University
Auburn, AL 36849-5127
334-844-2064
334-844-2063 (FAX)
mahmoud@eng.auburn.edu

Area 10b: Systems and Process Control

1. Advances in Process Control.

This session emphasizes papers that address recent advances in the control of chemical process systems. Priority will be given to papers that discuss novel theories, new and innovative strategies, novel applications or the definition of new problem areas. Papers which demonstrate the application of existing theory to new problem areas are also welcome. The contribution of the paper to the advancement of the state-of-the-art should be clearly stated in the abstract. The topic and research area are open; however, authors are strongly discouraged from submitting to this session papers that would be better suited for presentation in the following sessions sponsored by the Area 10b of CAST: Nonlinear Control, Applications of Process Control, Controller and Process Monitoring, Process Modeling, Identification, and Estimation, Advances in Model Predictive Control, Advances and Applications in SQC/SPC, Challenges in Control of Solids Processing Systems, Control of Microelectronics Manufacturing, and Process Control and Simulation in the Forest Products Industry.

Session Chair

Oscar D. Crisalle
Department of Chemical Engineering
University of Florida
Gainesville, FL 32611-6005
352-392-5120
352-392-9513 (FAX)
crisalle@che.ufl.edu

Co-Chair

Michael A. Henson
Department of Chemical Engineering
Louisiana State University
Baton Rouge, LA 70803-7303
504-388-3690
504-388-1476 (FAX)
henson@nlc.che.lsu.edu

2. Nonlinear Control.

Contributions are sought in the general area of nonlinear control including, but not limited to, model predictive control, control of differential-algebraic systems, differential geometric control, modeling of nonlinear systems, and nonlinear dynamic analysis of control systems.

Session Chair

Thomas A. Badgwell
Department of Chemical Engineering
Rice University
Houston, TX 77005-1892
713-737-5830
713-285-5478 (FAX)
tab@rice.edu

Co-Chair

Prodromos Daoutidis
Department of Chemical Engineering and Material Science
University of Minnesota
Minneapolis, MN 55455-0132
612-625-8818
612-626-7246 (FAX)
daoutidis@cems.umn.edu

3. Applications of Process Control.

All interested persons are invited to submit papers that address the application of advanced control to the chemical processing industry. We are soliciting papers that demonstrate how industry has benefited or how industry could benefit from advanced control.

Session Chair

Sheyla L. Rivera
Frito-Lay, Inc.
PO Box 660634
Dallas, TX 75266-0634
972-334-4975
972-334-2329 (FAX)
sheyla.rivera@fritolay.com

Co-Chair

Kenneth R. Muske
Department of Chemical Engineering
Villanova University
Villanova, PA 19085
610-519-6195
610-519-7354 (FAX)
krmuske@kayak.che.vill.edu

4. Controller and Process Monitoring.

The focus of this session is on the theoretical and application studies related to control system performance monitoring and process performance monitoring and diagnosis. It covers the methods to ensure process safety, high product quality, process operability, optimum process performance, economic viability, and process profitability. Industrial implementations are particularly welcome. Topics include but are not limited to multivariate statistical methods, neural networks, process chemometrics, fuzzy logic, artificial intelligence for monitoring and diagnosis, and statistical process control.

Session Chair

Bhavik R. Bakshi
Department of Chemical Engineering
Ohio State University
Columbus, OH 43210-1180
614-292-4904
614-292-3769 (FAX)
bakshi.2@osu.edu

Co-Chair

George N. Charos
Amoco Corporation
3700 Bay Area Blvd.
Houston, TX 77058
713-212-7178
713-212-1614 (FAX)
gcharos@amoco.com

5. Process Modeling, Identification, and Estimation.

Contributions are sought in the general areas of process modeling, identification, and estimation. Papers presenting new theoretical and/or application results are solicited. Higher priority will be given to real-time studies and to contributions from the process industry. Areas of interest include, but are not limited to, first-principles modeling for control and monitoring; open-loop and closed-loop model identification for control and monitoring; model reduction for control and monitoring; state and/or parameter estimation; and industrial challenges in modeling and estimation.

Session Chair

Masoud Soroush
Department of Chemical Engineering
Drexel University
Philadelphia, PA 19104
215-895-1710
215-895-5837 (FAX)
masoud.soroush@coe.drexel.edu

Co-Chair

Mikhail Skliar
Department of Chemical and Fuels Engineering
University of Utah
Salt Lake City, UT 84112-9203
801-581-6918
801-581-3344 (FAX)
mikhail.skliar@m.cc.utah.edu

6. Advances in Model Predictive Control.

Papers addressing new theoretical developments, applications and implementations in the area of model predictive control are solicited. Topics of interest include, but are not limited to, novel MPC algorithms; stability issues; robustness issues; tracking; estimation techniques; implementation issues; applications and case studies.

Session Chair

Alex Z. Q. Zheng
Department of Chemical Engineering
University of Massachusetts
Amherst, MA 01003-3110
413-545-2916
413-545-1647 (FAX)
zzheng@ecs.umass.edu

Co-Chair

Michael Nikolaou
 Department of Chemical Engineering
 University of Houston
 Houston, TX 77204-4792
 713-743-4309
 713-743-4323 (FAX)
 nikolaou@jetson.uh.edu

Joint Area 10b and Area 10c Session

1. Advances and Applications in SQC/SPC.

This session invites contributions in the state of the art advances and applications in the area of statistical quality control and statistical process control (SQC/SPC). Contributions are encouraged in, but are not limited to the following topics: advances in the theory of multivariate SPC/SQC; root cause identification and classification; dynamic process monitoring; SPC in the context of controller feedback; multiscale analysis for process monitoring; controller performance and process monitoring; and new applications in both batch and continuous industrial processes.

Session Chair

S. Joe Qin
 Department of Chemical Engineering
 University of Texas
 Austin, TX 78712-1062
 512-471-4417
 512-471-7060 (FAX)
 qin@che.utexas.edu

CAST Programming Tips

2. Submission of Proposals-to-Present to multiple sessions is permitted by AIChE and the web software, but may decrease chances of acceptance by the CAST Division.

Co-Chair

Urmila M. Diwekar
 Environmental Institute
 Carnegie Mellon University
 Pittsburgh, PA 15213-3890
 412-268-3003
 412-268-3757 (FAX)
 urmila@cmu.edu.

Joint Area 10b and Area 3c Session

1. Challenges in Control of Solids Processing Systems.

Solids processing has generally not been associated with high tech and as such the topic of control in this field has not progressed beyond a few applications. With our increased understanding of these operations and the ability to employ new sensors and computer interfaces the potential for controlling these processing has increases significantly.

The proposed session will explore solids processing control operations mainly from a case study viewpoint. A number of industries and individuals have been applying modern control techniques and philosophies to the field and these individuals will be sought as prime presenters in the session.

Session Chair

George E. Klinzing
 Department of Chemical and Petroleum Engineering
 University of Pittsburgh
 Pittsburgh, PA 15260
 412-624-0784
 412-624-1108 (FAX)
 klinzing@pop.pitt.edu

CAST Programming Tips

3. It is AIChE policy that a person may not author or co-author more than four presentations at any one meeting. The CAST Division supports this policy.

Co-Chair

B. Wayne Bequette
 Department of Chemical Engineering
 Rensselaer Polytechnic Institute
 Troy, NY 12180-3590
 518-276-6683
 518-276-4030 (FAX)
 bequeb@rpi.edu

Joint Area 10b and Area 8e Session

1. Control of Microelectronic Manufacturing.

Papers are sought which describe process control applications to microelectronic manufacturing processes. Real-time (within a batch) control and run-to-run (batch to batch) control are both of interest, especially papers examining the co-optimization of both levels. Papers concerning controller design, including model development for control, model reduction, and optimization methods are desired. Controller monitoring and performance assessment papers are also applicable. In addition to fault detection, fault classification papers are also solicited. Novel integrated metrology solutions are also of interest. For all papers, a clear statement of the engineering problem to be solved should be provided, along with an assessment of the solution being proposed and the benefits achieved.

Session Chair

Stephanie W. Butler
 Texas Instruments, MS 3701
 13570 N. Central Expressway
 Dallas, TX 75243
 972-995-4241
 972-995-1916 (FAX)
 butler@spdc.ti.com

Co-Chair

Panagiotis D. Christofides
 Department of Chemical Engineering
 University of California
 Los Angeles, CA 90095-1592
 310-794-1015
 310-206-4107 (FAX)
 pdc@seas.ucla.edu

Joint Area 10b and Area 17 Session

1. Process Control and Simulation in the Forest Products Industry.

The pulp and paper industry (PPI) represents a very capital-intensive component of the US manufacturing sector. In order to maintain and enhance the global competitiveness of the US PPI, new results in advanced simulation and control technology are required to complement the existing systems in the pulp and paper mills. In this session, we invite contributions from both academia and industry. Although not limited to the following areas, we seek papers that describe the development and application of modeling and control techniques in the broad areas of model-based control design (including, e.g., internal model control (IMC) and model predictive control (MPC)); grade transition control (e.g., hardwood/softwood swings, production rate changes); fundamental dynamic modeling (from single unit to mill-wide); and process performance monitoring. These techniques can be considered for individual units (e.g., pulp digester, paper machine, etc.), mill sections (e.g., chemical recovery, papermaking, etc.), or the entire mill-wide enterprise.

Session Chair

Eric M. Hanczyc
 Weyerhaeuser Technology Center
 P.O. Box 2999
 Tacoma, WA 98477-2999
 253-924-6167
 253-924-4380 (FAX)
 ehanczyc@wdni.com

Co-Chair

Francis J. Doyle III
 Department of Chemical Engineering
 University of Delaware
 Newark, DE 19716
 302-369-8098
 302-831-0457 (FAX)
 fdoyle@udel.edu

Area 10c: Computers in Operations and Information Processing

1. Computer Integrated Manufacturing in the Chemical Process Industries - Advances and Industrial Applications

(Cosponsored by the International Cooperation Committee of the Society of Chemical Engineers, Japan).

Contributions are sought describing methodological developments, implementations, and experiences with all aspects of CIM in the process industries. Subjects of particular interest include integration of application areas such as plant information systems, monitoring, diagnosis, control, scheduling, planning, optimization, and design, as well as developments within application areas themselves that focus on integration issues. Presentations of industrial experiences with CIM technology and critical discussions of limitations/advantages of current approaches are also welcomed.

Session Chair

Shinji Haebe
 Department of Chemical Engineering
 Kyoto University
 Yoshida-Honmachi Sakyo-ku
 Kyoto 606-01
 JAPAN
 81-75-753-5587
 81-75-752-9639 (FAX)
 hasebe@cheme.kyoto-u.ac.jp

Co-Chair

Conor M. McDonald
 Experimental Station
 E. I. du Pont de Nemours & Company
 PO Box 80101
 Wilmington, DE 19880-0101
 302-695-7394
 302-695-2645 (FAX)
 conor@magellan.es.dupont.com

2. Planning, Scheduling, and Supply Chain Management.

Papers are solicited in the area of process operations with an emphasis on contributions that present applications of optimization to planning, scheduling, and supply chain management problems. Papers with a strong relevance to industrial applications are particularly encouraged.

Session Chair

Marianthi G. Ierapetritou
 Department of Chemical and Biochemical Engineering
 Rutgers University
 Piscataway, NJ 08855-0909
 marianth@titan.princeton.edu

Co-Chair

Antonis C. Kokossis
 Department of Process Integration
 University of Manchester Institute of Science and
 Technology
 PO Box 88
 Manchester M60 1QD
 UNITED KINGDOM
 44-161-200-4384
 44-161-236-7439 (FAX)
 kokossis@umist.ac.uk

Joint Area 10c and Area 12a Session

1. Advances in Optimization: Case Studies.

Papers are solicited which describe case studies in optimization of processes in the chemical industries. Papers that address the following issues are especially encouraged: 1) Usage of new algorithms for nonlinear, mixed integer, global and stochastic optimization for design and retrofit as well as for process and product development, and 2) novel applications of optimization techniques for solving problems related to chemical process operations, scheduling and planning. Priority will be given to methods that have proven useful in practice. Industrial examples are especially welcomed.

Session Chair

Yinlun Huang
 Department of Chemical Engineering and Materials Science
 Wayne State University
 Detroit, MI 48202
 313-577-3771
 313-577-3810 (FAX)
 yhuang@chem1.eng.way
 ne.edu

Co-Chair

Miguel J. Bagajewicz
 School of Chemical
 Engineering and
 Materials Science
 University of Oklahoma
 Norman, OK 73019-0628
 405-325-5458
 405-325-5813 (FAX)
 bagajewicz@ou.edu

Joint Area 10c and Area
15a Session

1. Computational
 Methods in the Food
 Processing Industry.

There has been an explosion of new food and beverage products in recent years. As a result processors are constantly looking for methods to maximize the flexibility and agility of new and existing manufacturing facilities. To aid in the prioritization of potential improvements and assessment of new technologies, they are applying computer modeling tools to evaluate costs/benefits. Simulation, scheduling, and design software tools are being employed to optimize manufacturing layouts, material flows, and task sequencing. The purpose of this session is to examine existing applications in the food process industry, and innovative academic and industrial research which could lead to new areas of opportunity in the future.

Session Chair

Stephen P. Lombardo
 Process Systems Development
 The Coca-Cola Company
 TEC 225c, PO Drawer 1734
 Atlanta, GA 30301
 404-676-0541
 404-676-2840 (FAX)
 lombardo@coca-cola.com

Co-Chair

Joseph F. Pekny
 School of Chemical Engineering
 Purdue University
 West Lafayette, IN 47907-1283
 765-494-7901
 765-494-0805 (FAX)
 pekny@ecn.purdue.edu

Joint Area 10c and Group 16a Session

1. Molecular Modeling for Refinery Optimization.

There have been considerable recent advances in the modeling of hydrocarbon mixtures, and the reaction and separation processes of oil refining and petrochemicals manufacture. Molecular modeling approaches allow detailed chemical information to be captured for use in refinery design and optimization. This session will describe fundamental advances in refinery modeling and show how these can be implemented to improve prediction and optimization of refinery performance.

Session Chair

Michael T. Klein
 Department of Chemical Engineering
 University of Delaware
 Newark, DE 19716
 302-831-8155
 302-831-1048 (FAX)

CAST Programming Tips

4. Every presenter is expected to send a hardcopy record of their presentation (with a Permission to Reproduce Manuscript Form) to the AIChE Manuscript Center no later than one month before the meeting. Full-length manuscripts are encouraged by AIChE. The CAST Division has elected not to mandate any specific length or format requirements for presentation records for its sessions. However, the minimally acceptable content does consist of an introduction, results, discussion, and references which may be augmented with figures and tables, presentation visual aids, or poster panels.

klein@che.udel.edu

Co-Chair

Gavin P. Towler
UOP LLC
25 East Algonquin Road
Des Plaines, IL 60017-5017
847-391-2788
847-391-3491 (FAX)
gptowler@uop.com

Area 10d: Applied Mathematics and Numerical Analysis

1. Pattern Formation and Instabilities in Physicochemical Systems.

Papers are sought on nonlinear spatio-temporal patterns in chemical systems. Of specific interests are reaction-diffusion systems, wave dynamics, mixing kinematics and fluid dynamics and dynamics of systems under control. Experimental, computational and theoretical papers are all welcomed.

Session Chair

Vemuri Balakotaiah
Department of Chemical Engineering
University of Houston
Houston, TX 77204-4792
713-743-4318
713-743-4323 (FAX)
bala@uh.edu

Co-Chair

Ranga Narayanan
Department of Chemical Engineering
University of Florida
Gainesville, FL 32611
352-392-9103
352-392-9513 (FAX)

2. Applications of Parallel Computing Strategies in Engineering Systems.

Parallel computing offers our best hope to escape the computational limitations of single processor performance. Moreover, in addition to the adaptation of standard numerical methods to this new computational environment (like finite elements, spectral methods, boundary element methods, Monte Carlo methods etc.) we also see new emerging computational paradigms: Cellular automata, Bounding Optimization Methods, etc. Chemical Engineering Applications could not have remained unaffected from these revolutionary changes. As a result, we invite contributions from all areas in chemical engineering where parallel computers have or are about to have a substantial impact.

Session Chair

Antony N. Beris
Department of Chemical Engineering
University of Delaware
Newark, DE 19716
302-831-8018
302-831-1048 (FAX)
beris@che.udel.edu

CAST Programming Tips

5. In addition, it is a CAST Division requirement that every speaker bring a sufficient number of hardcopies of their visual aids for distribution to the audience at the presentation.

Co-Chair

Jeffrey J. Derby
Department of Chemical Engineering and Materials Science
University of Minnesota
Minneapolis, MN 55455-0132
612-625-8881
612-626-7246 (FAX)
derby@maroon.tc.umn.edu

3. Stochastic Processes

This symposium will focus on applications of probabilistic concepts to continuous and discrete models of chemical engineering systems. Topics of interest include (but are not limited to) chemical reaction models, percolation processes and population balance models.

Session Chair

Doraiswami Ramkrishna
School of Chemical Engineering
Purdue University
West Lafayette, IN 47907-1283
765-494-4066
765-494-0805 (FAX)
ramkrish@ecn.purdue.edu

Co-Chair

Kyriacos Zygourakis
Department of Chemical Engineering
Rice University
Houston, TX 77005-1892
713-527-8101 x-3509
713-285-5478 (FAX)
kyzy@rice.edu

4. Fundamental Advances in Applied Mathematics.

Papers are solicited which focus on fundamental developments in applied mathematics which are useful in the context of chemical engineering problems. Of particular interest are developments related to the model reduction of nonlinear distributed parameter systems, such as nonlinear Galerkin and other, advanced discretization methods.

Issues in mathematical fluid dynamics, geometric methods, developments in stochastic PDEs, and nonlinear dynamics will also be considered.

Session Chair

Raymond A. Adomaitis
Department of Chemical Engineering
University of Maryland
College Park, MD 20742
301-405-2969
301-314-9920 (FAX)
adomaiti@isr.umd.edu

Co-Chair

Panagiotis D. Christofides
Department of Chemical Engineering
University of California
Los Angeles, CA 90095-1592
310-794-1015
310-206-4107 (FAX)
pdc@seas.ucla.edu

5. D. Ramkrishna Symposium: Cybernetics, Operator-Theoretic, and Self-Similar Approaches in Chemical Engineering.

Professor D. Ramkrishna, the Harry C. Pfeffer Distinguished Professor of Chemical Engineering at Purdue University, has made seminal contributions to our profession. Among the areas where they can be found include operator-theoretic methods, dynamics of biosystems (where he has pioneered a cybernetic modeling approach that has helped to understand the complex behaviors of such systems), and the self-similar and scaling approaches applied to liquid-liquid dispersions. Professor Ramkrishna has distinguished himself by elegant and systematic approaches to the analysis of the problems in the areas mentioned above. This session will highlight his efforts by research contributions and keynote lectures that will help to provide a perspective to the subject.

Session Chair

Pedro Arce
Department of Chemical Engineering
FAMU/FSU College of Engineering
Tallahassee, FL 32316-2175
850-487-6166
850-487-6150 (FAX)
arce@eng.fsu.edu

Co-Chair

E. Terry Papoutsakis
Department of Chemical Engineering
Northwestern University
Evanston, IL 60208-3120
847-491-7455
847-491-3728 (FAX)
e-paps@nwu.edu

Joint Area 10d and Area 15d/e Session

1. Applied Mathematics in Bioengineering.

The symposium will focus on the application of mathematics to bioengineering, with an emphasis to experimental results and computational simulations. Topics include (but are not limited to) models describing cell biophysics, drug delivery, microbial transport, environmental interactions, genetic engineering and pharmacokinetic applications, cybernetic model development and reflex circuitry modeling.

Session Chair

Roseanne M. Ford
Department of Chemical Engineering
University of Virginia
Charlottesville, VA 22903-2442
804-924-6283
804-982-2658 (FAX)
rmf3f@flory.che.virginia.edu

Co-Chair

Kyriacos Zygourakis
Department of Chemical Engineering
Rice University
Houston, TX 77005-1892
713-527-8101 x-3509
713-285-5478 (FAX)
kyzy@rice.edu

CAST DIVISION POSTER SESSION

Section A. Recent Developments in Systems and Process Design.

This poster session will present new and interesting results in systems and process design. Poster topics include but are not limited to process synthesis and optimization, design under uncertainty, synthesis of reaction, separation, heat exchanger networks, and hybrid systems, environmentally oriented design, and design for controllability and flexibility.

Section Chair

Mahmoud El-Halwagi
Chemical Engineering Department
Auburn University
Auburn, AL 36849-5127
334-844-2064
334-844-2063 (FAX)
mahmoud@eng.auburn.edu

Co-Chair

Urmila M. Diwekar
Environmental Institute
Carnegie Mellon University

Pittsburgh, PA 15213-3890
412-268-3003
412-268-3757 (FAX)
urmila@cmu.edu

219-631-9318
219-631-8366 (FAX)
markst@nd.edu

Section B. Topics in Systems and Process Control.

All interested persons are invited to submit poster presentations that address topics in the area of chemical process control. Papers that present new theoretical results, innovative strategies, new applications, and new problem areas are strongly encouraged. Prospective authors should clearly state the contribution of their work to the advancement of the current state of knowledge in the field. The topic and research area is open.

Section Chair

Kenneth R. Muske
Department of Chemical Engineering
Villanova University
Villanova, PA 19085-1681
610-519-6195
610-519-7354 (FAX)
krmuske@kayak.che.vill.edu

Co-Chair

Richard D. Braatz
Department of Chemical Engineering
University of Illinois
Urbana, IL 61801-3792
217-333-5073
217-333-5052 (FAX)
braatz@uiuc.edu

Section C. High Performance Computing.

Impressive gains in computing technology, especially the widespread availability of parallel computing hardware, as well as recent advances in the enabling software technology, are making possible today the solution of large-scale, realistically modeled chemical process engineering problems, even in a real-time environment. Papers are sought that describe: 1. novel numerical algorithms and codes that promote the use of high performance computing in process engineering; and 2. applications of high performance computing technology and techniques to solve large-scale process engineering problems. Applications of interest include process simulation, online and off-line optimization, and control. Also of interest are applications in fundamental process modeling, including transport phenomena, molecular dynamics, etc. Industrial applications are particularly welcome.

Section Chair

Mark A. Stadtherr
Department of Chemical Engineering
University of Notre Dame
Notre Dame, IN 46556

Co-Chair

Luke E. K. Achenie
Department of Chemical Engineering
University of Connecticut
Storrs, CT 06269-3222
860-486-2756
860-486-2959 (FAX)
achenie@engr.uconn.edu

Section D. Process Operability.

Contributions are sought describing new ideas and methodologies for the operability of chemical processing systems. Research areas include, but are not limited to, operability objectives such as flexibility, reliability, controllability, maintainability, safety and environmental protection. We would like to encourage submitters to discuss the impact on the incorporation of model uncertainties in the suggested approach. Industrial practice in plant operation should be emphasized.

Section Chair

Stratos Pistikopoulos
Centre for Process Systems Engineering
Imperial College
London SW7 2BY
UNITED KINGDOM
44-171-594-6620
44-171-594-6606 (FAX)
e.pistikopoulos@ic.ac.uk

Co-Chair

Il Moon
Department of Chemical Engineering
Yonsei University
Seodaemum-Ku, Shinchon-Dong 134
Seoul 120-749
KOREA
82-2-361-2761
82-2-312-6401 (FAX)
ilmoon@bubble.yonsei.ac.kr

Section E. Issues in Computers in Operations and Information Processing.

Poster papers are solicited that describe results in the area of process operations and information processing. Theoretical developments and applications are welcome. Topics may include, but are not limited to: planning, scheduling, and supply chain management; decision support systems; process performance monitoring and diagnosis;

optimization; fault detection and classification; quality management; chemometrics and applied statistics.

Section Chair

Nikolaos V. Sahinidis
Department of Chemical Engineering
University of Illinois
Urbana, IL 61801
217-244-1304
217-333-5052 (FAX)
nikos@uiuc.edu

Co-Chair

Conor M. McDonald
Experimental Station
E. I. du Pont de Nemours & Company
PO Box 80101
Wilmington, DE 19880-0101
302-695-7394
302-695-2645 (FAX)
conor@magellan.es.dupont.com

Section F. Advances in Applied Mathematics.

Posters describing recent original results of interest in the areas of applied mathematics and numerical analysis are solicited.

Section Chair

Pedro Arce
Department of Chemical Engineering
FAMU/FSU College of Engineering
Tallahassee, FL 32316-2175
850-487-6166
850-487-6150 (FAX)
arce@eng.fsu.edu

Co-Chair

Antony N. Beris
Department of Chemical Engineering
University of Delaware
Newark, DE 19716
302-831-8018
302-831-1048 (FAX)
beris@che.udel.edu

Section G. Demonstrations of Software for Process Control Education.

Process control education is benefiting from software tools that help in the design, analysis and simulation of dynamic processes and their associated control systems. New training simulators which bridge the gap between the abstraction of the textbook theory and the tactile nature of the laboratory are also gaining importance in process

control education. This session will showcase such software currently available for the benefit of student learning in process control. Presenters will be provided space including a table, power strip and bulletin board where you can demonstrate your software and display poster material.

Section Chair

Douglas J. Cooper
Department of Chemical Engineering
University of Connecticut
Storrs, CT 06269-3222
860-486-4092
860-486-2959 (FAX)
cooper@engr.uconn.edu

EDUCATIONAL	COMPUTER	SOFTWARE
DEMONSTRATIONS (Joint Effort with Group 4)		

This session will present live software demonstrations which showcase how computers are enhancing instruction in the chemical engineering curriculum. Software will be considered which show a novel pedagogy for the classroom or laboratory, for presenting information, assessing student knowledge, helping students explore new concepts, or helping them analyze important problems. Presenters will be provided space including a table, power strip and bulletin board where you can demonstrate your software and display poster material.

Coordinator

Douglas J. Cooper
Department of Chemical Engineering
University of Connecticut
Storrs, CT 06269-3222
860-486-4092
860-486-2959 (FAX)
cooper@engr.uconn.edu

Coordinator

John T. Bell
Department of Chemical Engineering
University of Michigan
Ann Arbor, MI 48109-2136
313-763-4814
313-763-0459 (FAX)
johnbell@umich.edu

**First Call for CAST Sessions
2000 AIChE Spring National Meeting
Atlanta, Georgia
March 26-30, 2000**

The names, addresses, and telephone numbers of the session chairs are given on the next several pages, as are brief statements of the topics to receive special emphasis in selecting manuscripts for these sessions. Prospective

session participants are encouraged to observe the deadlines which have been established, but may be changed, by the Meeting Program Chair, Winston Ho. A complete call for papers for all sessions at this meeting may be accessed at <http://www.aiche.org/meeting/2000/spring/cfp/>.

AICHE is currently soliciting electronic submission of proposals-to-present via the world wide web only. To submit via the web, access <http://www.aiche.org>. Do not send proposals-to-present to the session chair email addresses.

Atlanta Meeting deadlines:

September 1, 1999: Submit a proposal-to-present electronically to AIChE via web access at <http://www.aiche.org>. AIChE will forward proposals to the corresponding session chairs. Submission prior to this deadline is encouraged.

October 1, 1999: Session content finalized authors informed of selection. Authors of accepted proposals may update abstracts electronically.

February 15, 2000: Authors submit hardcopy manuscript (presentation record) with a Permission to Reproduce Manuscript form to AIChE Manuscript Center.

March 26, 2000: Speakers bring 60 hardcopies of visual aids for distribution to the audience at the presentation. (This is a CAST Division policy intended to improve the quality of presentations and the benefit to the audience.)

Please note that there is an AIChE limitation that no person may author or coauthor more than four contributions at any one meeting.

Authors submitting by the above deadlines will be notified of decisions on acceptance as close to October 1 as the schedules of the session chairs, the Meeting Program Chair, and AIChE permit. Abstracts of accepted proposals will be available on the web for public browsing approximately one month before the meeting.

Presenters at AIChE meetings are reminded to send a hardcopy record of their presentation to the AIChE Manuscript Center no later than one month before the meeting. The purpose of this requirement is to improve the quality of presentations generally as well as to enable AIChE to more broadly disseminate ideas and results by filling requests for copies of presentation records during and after each meeting. Formal full-length manuscripts are encouraged by AIChE and many of the programming groups. The CAST Division has elected not to mandate any specific length or format requirements for presentation records for its sessions. However, the minimally acceptable content does consist of an introduction, results, discussion,

and references which may be augmented with figures and tables, presentation visual aids, or poster panels. The Executive Board of the National Program Committee has adopted the policy that the advanced submission of a hardcopy presentation record be a condition for presenting at AIChE-sponsored meetings.

Area 10a: Systems and Process Design

1. Challenges for Design in Practice.

There has been considerable activity over the past decade focused toward the development of new process design methodologies and tools. However, the major benefit derived from new design tools occurs when the tools are applied to real chemical process problems to reduce costs, reduce emissions, debottleneck processes, increase capacity, etc. In this light, there are often significant challenges that are encountered when applying new design technology in industrial practice. Some of these hurdles include: 1. management-based issues - does management support new design technology from both a monetary and time allotment perspective, what are the benefits and drawbacks for employing technical resources within the industry to use new design technology versus using consultants, etc; 2. technology-based issues - which design approaches should be used, for what types of design tasks, is the technical approach acceptable for the size of the design task (superstructure approaches for large problems, ability to obtain global solutions from non-linear programming design algorithms), etc; and 3. personnel-based issues - how do we train engineers to use new design methodologies, how do we train engineers to accept new design approaches even if they can not use these approaches themselves, etc. Papers are invited that highlight actual experiences regarding these and other challenges encountered in design, in addition to papers that propose solutions to the above challenges.

Session Chair

Russell F. Dunn
Solutia Inc.
3000 Old Chemstrand Road
Cantonment, FL 32533
850-968-8216
850-968-8732 (FAX)
russell.f.dunn@solutia.com

Co-Chair

Kirtan K. Trivedi
Exxon Research and Engineering Company
180 Park Avenue (FP102/D412)
Florham Park, NJ 07932
973-765-2612
973-765-1648 (FAX)
kktrive@fpe.erenj.com

2. Advances in Methods and Tools for Process Synthesis and Design.

Papers are requested that describe the development and use of systematic methods or computational tools for process synthesis and design. Of particular interest are those papers which describe successful applications in process development. While all papers are welcomed, we encourage industrial contributors to share their recent experiences in process design and synthesis. Commercial software vendors are also welcomed to describe new technological improvements in software tools.

Session Chair

Raymond Rooks
Union Carbide Corporation
PO Box 8361
South Charleston, WV 25303
304-747-5826
304-747-5744 (FAX)
rooksre@ucarb.com

Co-Chair

Vicente Rico-Ramirez
Departamento de Ingenieria Quimica
Instituto Tecnologico de Celaya
Celaya, Guanajuato
MEXICO
rv2a@andrew.cmu.edu

3. Retrofitting, Debottlenecking, and Process Improvements.

Changes in economic structure and stricter environmental regulations have forced chemical industries to retrofit existing systems to improve production and performance. Retrofit projects are performed to improve process efficiency, energy efficiency, reduce emissions, debottleneck to increase throughput, and sometimes to address controllability. This session will focus on new methods, new techniques, and their applications in the above areas. Industrial experience and case studies are encouraged.

Session Chair

Miguel J. Bagajewicz
School of Chemical Engineering and Materials Science
University of Oklahoma
Norman, OK 73019-0628
405-325-5458
405-325-5813 (FAX)
bagajewicz@ou.edu

Co-Chair

Frank X. X. Zhu
Department of Process Integration

University of Manchester Institute of Science and Technology
PO Box 88
Manchester M60 1QD
UNITED KINGDOM
44-161-200-4398
44-161-236-7439 (FAX)
f.zhu@umist.ac.uk.

4. Reviews and Tutorials in Process Design.

Review papers and tutorials are being sought for recent applications and developments in chemical process design. The contributions can address proven success stories both in academic and industrial practice. Tutorials on new concepts that have a high potential for successful implementations in industry in the context of process design are also encouraged.

Session Chair

Antonis C. Kokossis
Department of Process Integration
University of Manchester Institute of Science and Technology
PO Box 88
Manchester M60 1QD
UNITED KINGDOM
44-161-200-4384
44-161-236-7439 (FAX)
kokossis@umist.ac.uk

Co-Chair

Dilek Alkaya
Department of Chemical Engineering
Carnegie Mellon University
Pittsburgh, PA 15213-3890
412-268-8531
412-268-7139 (FAX)
alkaya@aqua.cheme.cmu.edu

Joint Area 10a and Area 9 Session

1. Environmental Issues in Design.

Environmental regulations changed the structure of the chemical industry forcing the existing chemicals productions systems to be re-designed so that pollution is prevented. For a while, these retrofit projects consisted mainly of end-of-pipe designs whose goal is to remove pollutants and assure their proper disposal. Later, the term pollutant interception was coined to introduce the concept of removal of pollutants throughout the process and eventually recycling them so that disposal in whatever form is avoided. Finally, the idea of preventing the production of pollutants within the chemical process in the first place started to gain acceptance. All these forms of grassroots design and retrofit design coexist today and have to conform not only to the aforementioned regulations about

disposal, but also make plants profitable, controllable, safe and flexible. This session will focus on theoretical and practical approaches, new trends, and new methods in the area of environmentally sensitive (green) designs. Topics of special interest include environmental design tools, design software packages, case studies, and techniques. Industrial case studies where systematic approaches have been used are especially encouraged to be submitted.

Session Chair

Miguel J. Bagajewicz
School of Chemical Engineering and Materials Science
University of Oklahoma
Norman, OK 73019-0628
405-325-5458
405-325-5813 (FAX)
bagajewicz@ou.edu

Co-Chair

Russell F. Dunn
Solutia Inc.
3000 Old Chemstrand Road
Cantonment, FL 32533
850-968-8216
850-968-8732 (FAX)
russell.f.dunn@solutia.com

Area 10b: Systems and Process Control**1. Control of Pulp and Paper Processes.**

Papers are invited on topics related to the development and application of new control and systems theory and technology to pulp and paper processes. Applications can range from single process units (e.g. digester, lime kiln, paper machine) to collections of units (e.g., bleaching section) and complete mill operations. Topics of interest include, but are not limited to, mill-wide control and information systems; on-line optimization; performance monitoring and product quality control; dynamic modeling and model predictive control; integration of new sensors with advanced control implementations; data mining, and operator decision support systems.

INSERT ENVIRPRO DESIGNER—Intelligen, In. Ad HERE

Session Chair

Yaman Arkun
 School of Chemical Engineering
 Georgia Institute of Technology
 Atlanta, GA 30332-0100
 404-894-2871
 404-894-2866 (FAX)
 yaman.arkun@chemeng.gatech.edu

Co-Chair

Francis J. Doyle III
 Department of Chemical Engineering
 University of Delaware
 Newark, DE 19716
 302-831-0760
 302-831-1048 (FAX)
 doyle@che.udel.edu

Area 10c: Computers in Operations and Information Processing

1. Enterprise Resource Planning in the Process Industries.

The process industries are making heavy investments in Enterprise Resource Planning (ERP) systems to serve as platforms for tighter cost control and more agile business. To realize gains from these investments, companies must grapple with issues such as data integrity, building business models, electronic interchange of data, collaborative inter-business planning, enterprise optimization, integration of ERP systems with lower level software platforms, and employee training. The purpose of this session is to serve as a review of ERP activity in the process industries and discuss technology trends that will have an impact on ERP systems.

Session Chair

Joseph F. Pekny
 School of Chemical Engineering
 Purdue University
 West Lafayette, IN 47907-1283
 765-494-7901
 765-494-0805 (FAX)
 pekny@ecn.purdue.edu

Co-Chair

Miguel J. Bagajewicz
 School of Chemical Engineering and Materials Science
 University of Oklahoma
 Norman, OK 73019-0628
 405-325-5458
 405-325-5813 (FAX)
 bagajewicz@ou.edu

1. Applications of Modeling and Optimization in Food, Pharmaceutical and Agricultural Chemical Design and Production.

The pharmaceutical, agricultural and food chemical segments have many features that have lead to difficulty in applying traditional process analysis, design and simulation techniques. Several software vendors have produced tools to address this segment of the process simulation market. In this session we seek papers that describe the application of these types of tools to various industrial problems in these segments of the chemical industry. We particularly solicit submissions from practitioners who are willing to share their experiences in process modeling and simulation and who can address the outstanding needs of this segment within the process modeling and optimization domain. We also seek submissions that describe the application of computational modeling techniques in the broad areas of: 1. product design - e.g. use of molecular modeling techniques to predict and design product properties; 2. process design - e.g. methods for and case studies in supporting process design for the food industry, characterizing process variability, representing complex recipes, and modeling unit operations; 3. process planning, scheduling and operation - e.g. methods for proactive and reactive scheduling and batch recipe control; 4. process optimization - e.g. methods, and/or examples of successful optimization of processes using computational tools; and 5. online control and reactive scheduling - e.g. methods to respond to process variability in real time.

Session Chair

Stephen P. Lombardo
 Process Systems Development
 The Coca-Cola Company, TEC 225c
 PO Drawer 1734
 Atlanta, GA 30301
 404-676-0541
 404-676-2840 (FAX)
 lombardo@coca-cola.com

Co-Chair

Matthew J. Realff
 School of Chemical Engineering
 Georgia Institute of Technology
 Atlanta, GA 30332-0100
 404-894-1834
 404-894-2866 (FAX)
 matthew.realff@che.gatech.edu

Joint Area 10c and Area 15b Session

Join the CAST Division of AIChE!

Receive this Newsletter!

Already a member? Please ask a friend 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 computers and system technology. Shouldn't you join the CAST Division now? The cost is \$10 per year, and includes a subscription to this newsletter.

Application for Membership

I wish to join the Computing and Systems Technology (CAST) Division of AIChE.

Date: _____

Name: _____

Title: _____

Company/University: _____

Business Address: _____

City: _____

Home Address: _____

City: _____

E-mail Address: _____

Preferred mailing address: Home Office

I am a member of AIChE: Yes No

(If not, I understand that I must join AIChE within a one-year period to continue as a CAST Division member.)

My CAST dues of \$10 are enclosed

I will pay my CAST Division dues with my annual AIChE dues

Please mail this application to:

<p>American Institute of Chemical Engineers Computing and Systems Technology Division 3 Park Avenue New York, NY 10016-5901</p>

American Institute of Chemical Engineers
1999 Award Nomination Form*

A. Background Data

1. Name of the Award _____ Today's Date _____
2. Name of Nominee _____ Date of Birth _____
3. Present Position (exact title) _____

4. Education

Institution	Degree Received	Year Received	Field
-------------	-----------------	---------------	-------

5. Positions Held

Company or Institution	Position or Title	Dates
------------------------	-------------------	-------

_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

6. Academic and Professional Honors (include awards, memberships in honorary societies and fraternities, prizes) and date the honor was received. Use separate page.
7. Technical and Professional Society Memberships and Offices. Use separate page.
8. Sponsor's Name and Address

Sponsor's Signature

*A person may be nominated for only one award in a given year.

THE DEADLINE FOR AWARD NOMINATIONS IS April 15, 1999.

B. Citation

1. A brief statement, not to exceed 250 words, of why the candidate should receive this award. (Use separate sheet of paper, please.)
2. Proposed citation (not more than 25 carefully edited words that reflect specific accomplishments).

C. Qualifications

Each award has a different set of qualifications. These are described in the awards brochure. After reading them, please fill in the following information about the nominee where appropriate. Use a separate sheet for each item if necessary.

1. Selected Bibliography (include books, patents, and major papers published).
2. Specific identification and evaluation of the accomplishments on which the nomination is based.
3. If the nominee has previously received any award from AIChE or one of its Division, an explicit statement of new accomplishments or work over and above those cited for the earlier award(s).
4. Other pertinent information.

D. Supporting Letters and Documents

List of no more than five individuals whose letters are attached.

	Name	Affiliation
1.		
2.		
3.		
4.		
5.		

Please send the completed form and supplement sheets to the CAST Division 2nd Vice Chair, Jim Davis,
Department of Chemical Engineering, Ohio State University, Columbus, OH 43210-1180, Phone: 614-292-0090, Fax:
614-292-3769, E-Mail: jfdavis@osu.edu

THE DEADLINE FOR AWARD NOMINATIONS IS April 15, 1999.

CAST COMMUNICATIONS



**The Semi-Annual Publication of the
Computers and Systems Technology Division of AIChE
Volume 22, No. 1 Winter 1999**

Editor:

Peter R. Rony

**Department of Chemical Engineering
Virginia Tech**

Blacksburg, VA 24061-0211

Deadlines: December 1 (tight deadline), July 1

**American Institute of Chemical Engineers
345 East 47th
New York, NY 10017**

Non-Profit Org. U.S. Postage PAID L.I.C. N.Y. 11101 Permit No. 198

**DATED MATERIAL
DO NOT DELAY**