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# NEWSLETTER

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COMPUTING AND SYSTEMS TECHNOLOGY DIVISION

*American Institute of Chemical Engineers*



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## Personal Computing

by

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After using a personal computer for two years I've found that while it may not have the sophistication or speed of a large mainframe, it enhances my life by simplifying it. This small machine can be used like a calculator, it can store and retrieve information easily, and it eliminates dependence on information written on paper. In other words, a personal computer eliminates clutter.

Storing and retrieving information is indeed one of the chief advantages of a personal computer. While there are commercial databases available for home computers I eliminated the need for purchasing one by writing my own in BASIC. This simple to use programming language has enabled me to personalize the use of my home computer. I keep track of household accounts, tax information, and stock investments. The personal computer eliminates stockpiling paper in the form of statements which are often misplaced or lost. As a matter of fact, I envision the day when sending mail electronically will be commonplace.

While I use my computer for many of the mundane chores daily living mandates, I also use it for more complex and challenging problems. For instance, some of my early research involved solving partial differential equations for modelling chemical reactors. I find I can now easily solve the problems on my home computer. Not only is the problem solved, but a graph of the solution is made at the same time. I can change

parameters in the model and easily see the effect. On a personal computer this function is easy and inexpensive. For example, for flow through porous media, it is a simple matter to investigate allowable time step sizes, and grid sizes, and then see the incorrect choices shown dramatically on the screen.

In fact, it is the easy-to-use graphics system that makes the personal computer especially powerful. Drafting programs can also be written for personal computers. While the quality is not as good as on computers oriented to graphics and drafting it is adequate for many uses.

After several months of using a personal computer I discovered it was perfect for numerous small engineering calculations. Using the BASIC language I can write, test, and run programs more quickly than when using FORTRAN and a bigger machine. In this manner the small computer serves the same function as a programmable calculator, yet offers more sophistication when required.

For me the benefits of owning a home computer have been many. It has increased my efficiency in handling my personal accounts, and has also increased my work efficiency. And all this increased efficiency has left me more time for more important things, like playing arcade games!

*This Newsletter was published, courtesy of University Computing Company, Computing Services Division.*

## ORLANDO SYMPOSIUM SCHEDULE:

### Computer Applications Affect Everyone

An excellent program of eleven CAST-sponsored sessions has been coordinated by Professor Richard S. H. Mah (Northwestern University) for the winter AIChE meeting, March 1-3, 1982. The application of computers and systems technology to the tools for chemical engineering management, design and operations is increasingly affecting our methods of analysis, control and communication. The wide variety of topics in these sessions reflects the many areas influenced by these CAST-sponsored symposia.

In Area 10a, "Process Design", the symposium addresses modeling efforts ranging from particulates to processes, including both dynamic (coal gasifiers and steel ingot soaking pits) and steady-state (an alumina process, particulate systems, distillation and economic evaluation). Papers include both theoretical approaches to modeling and examples of modeling as applied in industrial practices. Presentations on software packages include IBM's dynamic simulation program CSMP, a program to assist in evaluation of software for commercialization and eleven papers relating to ASPEN.

Two sessions are scheduled on "Computer Aided Process Design and Simulation with ASPEN". Professors J.D. Seader and Babu Joseph, Chairmen of the Symposium, report that the eleven papers will cover a variety of industrial and governmental applications of ASPEN, two papers will summarize experiences in the installation of ASPEN on the VAX 11-780 and CRAY computers, while the first paper will report on the status of the ASPEN Process Simulator.

Heat integration is one process synthesis problem that has been investigated in some detail over the past decade. Papers in the session entitled "Energy Integration Techniques" will describe recent refinements to improve the applicability of these techniques. Extensions to include mechanical and electrical in addition to thermal energy, as well as applications, particularly in separation systems will also be discussed.

Methods for uncertainty analysis have been established and are used to improve the quality of information from not only economic feasibility studies, but also system design, operations analysis and the evaluation of test data. In addition to co-sponsoring a session with the Management Division on "Uncertainty Analysis", CAST is offering several other sessions of particular interest to management. These include several papers on "Process Economics" (Chemical plant investment models, risk analysis, incentive plans, etc.) and a panel discussion on "Project Control" on Wednesday

morning. All seven of these panelists, representing owner-operators and constructors, have been innovators in the field and are in a position to make strong recommendations as to both the present and future use of computers in project management. They will discuss specific aspects of how project management, using the computer, can keep up with the demands of increased size, cost and complexity in chemical engineering projects.

The problems in establishing distributed networks using existing equipment are addressed on Monday afternoon from several viewpoints. Topics include practical experiences, new capabilities, standards, architecture, software options, economic effectiveness, and the complexities involved in networking.

Four sessions will be held in the CAST "Process Control" Area (10b), describing some new approaches to significantly improve control in industrial processes through the increased role of computers in improving dynamic control and steady-state economic optimization of processes. On Tuesday, papers presented will emphasize both theory and applications in the fields of multivariable, adaptive, inferential, and classical control. Six papers will be presented relating to the special requirements for integrating multiple disciplines in the automation of batch and sequential operations.

The Monday morning symposium on "Graphics in Chemical Engineering" is co-sponsored by CAST and the CACHE task force on computer graphics. This session examines the role of graphics in computer aided engineering through papers by leading industrial users on graphics systems for monitoring plant process control, as well as developing process and mechanical flow diagrams and plant design layouts.

#### **Announcement: CAST Executive Committee Meeting**

Monday, March 1, 1982

11:45 a.m. - 1:45 p.m.

Trophy Room, Court of Flags Hotel

Orlando, Florida

(A light catered luncheon will be available at cost.)

The Meeting is open to all CAST Members as observers, but discussions are limited to the Executive Committee members. One topic on the agenda, "Future CAST Publications", should provide a useful discussion.

## Meetings, Meetings, Meetings . . . .

### April 12–14, 1982

The International Conference on Stiff Computation, Park City, Utah. This will be a unique opportunity for leaders in stiff computation theory and software development to meet with industrial users. Sponsored by U.S. Air Force office of scientific research. Contact: Richard C. Aiken, 3062 MEB, University of Utah, Salt Lake City, Utah, 84112, (801)581-5742.

### May 3–6, 1982

The 14th Offshore Technology Conference, Astrodomain, Houston, Texas.

### May 25–27, 1982

CHEMCOMP 1982: Chemical Process Analysis and Design Using Computers, Crest Hotel, Antwerp, Belgium. Chairman: G. Froment (Rijksuniversiteit Gent, Belgium). Contact: Symposium CHEMCOMP 82, c/o K.V.I.V., Jan Can Rijswijklaan 58, B-2000, Antwerp, (Belgium).

### May 27, 1982

Trends and Applications 1982: Advances in Information Technology, Gaithersburg, MD. Sponsors: NBS, IEEE-CS. Chairman: Allen Hankinson, Rm. A209, Administration Bldg., NBS, Washington, D.C. 20234.

### June 7–10, 1982

The Third Chemical Plant Equipment Exposition and Conference, Anaheim, California. AIChE Technical Program from Meetings Dept., New York.

Although no CAST-sponsored sessions are scheduled, two Management Division sessions are noteworthy:

- "Computing & Project Management – From Design to Startup" Chairman: Ran A. Bhattacharyya (Mobil Research & Development Corp.)
- "Computers in Plant Management" Chairman: W.T. Harper (Amoco Chemicals Corp.)

### June 14–16, 1982

American Control Conference, Sheraton National Hotel, Arlington, Virginia. This conference will cover all aspects of control systems, from theory to implementation. A tutorial workshop on robotics follows on June 17, organized by A.K. Bejczy of JPL/CALTECH. Contact: Program Chairman, Professor Yaakov Bar-Shalom, EE & CS Dept., University of Connecticut, U-157, Storrs, CT. 06268, (203)486-4823.

### July 26–30, 1982

SIGGRAPH '82 Ninth Annual Conference on Computer Graphics and Interactive Techniques, Boston, Mass. Sponsor: ACM. Chairman: Elaine L. Sonderegger, P.O. Box 353, Derby, CT. 06418; (203)735-9980.

### August 29 – September 1, 1982

AIChE's Summer 1982 National Meeting, Stouffers Inn on the Square, Cleveland, Ohio.

### August 30 – September 3, 1982

International Symposium on Mathematical Foundations of Computer Science, Gdansk, Poland.

### September 7–10, 1982

ICCC82, 6th International Conference on Computer Communications, London, England.

### September 13–16, 1982

6th International Conference on Software Engineering, Tokyo, Japan. Sponsors: ADM, IEEE-CS & MBS. Co-Chairman: Victor R. Basili, Dept. of Computer Science, University of Maryland, College Park, MD. 20742.

### September 19–22, 1982

The Joint AIChE/Chemical Industry and engineering Society of China Joint Meeting will be held in Beijing, China. Registration information: AIChE, New York.

### October 13–15, 1982

The Double Jubilee of the Institute of Chemical Engineers, London, England. Theme of meeting: "Energy: Money, Materials and Engineering".

### October 18–22, 1982

Third International Conference on Distributed Computing Systems, Ft. Lauderdale, Fla. Sponsor: IEEE-CS.

### October 25–27, 1982

1982 ACM Annual Conference, Dallas, Texas.

### November 14–18, 1982

AIChE's Fall 1982 Annual Meeting, Los Angeles Bonaventure Hotel. Meeting Program Chairman: Professor Edward Hohmann, California State Polytechnic University, 3801 W. Temple Ave., Pomona CA., 19768.

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## Final Call for Papers Los Angeles Annual Meeting November 14–18, 1982

Eleven CAST sessions are scheduled for the technical program at AIChE's Annual Meeting this fall. Anyone wishing to present a paper in one of the following sessions, contact the individual session chairman prior to March 15, 1982.

CAST Program Coordinator: Professor Warren D. Seider, Department of Chemical engineering, University of Pennsylvania, Philadelphia 19104. (215)243-7953.

### Systems and Process Design

- "Computer Modeling and Simulation – Are they Cost Effective?" (1 session). Chairman: Professor Lawrence B. Evans, Department of Chemical Engineering, Massachusetts Institute of Technology, Cambridge, MA. 02139.
- "Computers in Process Design and Analysis" (2 sessions). Chairman: Professor Warren D. Seider, University of Pennsylvania, Philadelphia, PA. 19104. Vice-Chairman: Dr. Joseph F. Zemaitis, Jr., Morristown, NJ. 07932.
- "Process Data Reconciliation and Rectification" (1 session). Chairman: Professor Richard S.H. Mah, Department of Chemical Engineering, Northwestern University, Evanston, IL. 60201. Vice-Chairman: Dr. John C. Hales, E. I. duPont de Nemours & Co., 3118 Louviers Building, Wilmington, DE. 19898.
- "Recent Advances in Applied Mathematics and Numerical Methods" (1 session). Chairman: Professor Bruce Finlayson, Department of Chemical Engineering, University of Washington, Seattle, WA. 98195. Vice-Chairman: Professor M. Malone, Department of Chemical Engineering, University of Massachusetts, Amherst, MA. 01003.
- "Interface Between Process Design and Process Control" (1 session). Chairman: Professor James M. Douglas, Department of Chemical Engineering, University of Massachusetts, Amherst, MA. 01003.

### Systems and Process Control

- "Dynamic Process Models for Control Systems" (1 session). Chairman: Professor Thomas McAvoy, Department of Chemical Engineering, University of Maryland, College Park, MD. 20742.

- "New Approaches to Process Control Problems" (1 session). Chairman: Professor Klavs Jensen, Department of Chemical Engineering, University of Minnesota, Minneapolis, MN. 55455.

### Computers in Management and Information Process

- "Large Scale Optimization: State of the Art" (1 session). Chairman: Professor G.V. Reklaitis, School of Chemical Engineering, Purdue University, West Lafayette, IN. 47907. Vice-Chairman: Professor I. Grossman, Chemical Engineering, Carnegie-Mellon, Pittsburgh, PA. 15213.
- "Optimization of Entire Plant Operations" (1 session). Chairman: Dr. H. Grekel, HG Consultant Associates, Inc., Houston, TX. 77024.
- "Nonlinear Programming as Management Forecasting Tool" (1 session). Chairman: Professor R.E.C. Weaver, College of Engineering, University of Tennessee, Knoxville, TN. 37916.

### **The China Connection**

In September of this year, the AIChE is holding a joint conference with the Chemical Industry and Engineering Society of China in Beijing, People's Republic of China.

Professor J.D. Seader reports that four papers will be presented in the session entitled "Computer Applications in Chemical Engineering":

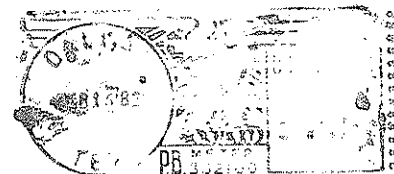
| <u>Author</u>   | <u>Paper</u>  |
|---|---|
| ● Warren D. Seider<br>(University of Pennsylvania, Philadelphia)              | "Integration of Stiff Ordinary Differential Equations in Chemical Process Analysis" |
| ● Bruce A. Finlayson<br>(University of Washington, Seattle)                   | "Methods for Solving Partial Differential Equations in Chemical Engineering"        |
| ● Youqi Yang and Lawrence B. Evans<br>(Massachusetts Institute of Technology) | "Advances in Computer-Aided Process Design"   |
| ● Thomas F. Edgar<br>(University of Texas, Austin)                            | "Some Recent Developments in Digital Algorithms"                                    |

Also, Richard R. Hughes, AIChE President and former Chairman of the CAST Division, will be giving an opening address for the conference.

## CAST Division Executive Committee

|                           |  |   |   |
|---------------------------|--|---|---|
| Chairman                  | Mr. Paul Gallier<br>Aspen Technology, Inc.<br>Cambridge, MA 02142<br>(617)497-9017   | AIChE Council Liaison                   | Dr. Lawrence B. Evans<br>Aspen Technology, Inc.<br>Cambridge, MA 02142  |
| First Vice Chairman       | Professor David M. Himmelblau<br>University of Texas, Austin<br>Austin, TX 78712<br>(512)471-3434                                    | CACHE Chairman<br>Director (80-82)      | Professor Thomas F. Edgar<br>University of Texas, Austin<br>Dept. of Chemical Engineering<br>Austin, TX 787112<br>(512)471-3434 |
| Second Vice Chairman      | Dr. Mike T. Tayabkhan<br>Mobil Oil<br>P.O. Box 1026<br>Princeton, NJ 08540<br>(609)737-3000  | Membership Chairman<br>Director (80-82) | Dr. Robert E. Harris<br>Standard Oil Company of Ohio<br>Cleveland, Ohio 44115<br>(216)575-5116                                  |
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| Publications Chairman     | Dr. Edward Gordon<br>Fluor E & C, Inc.<br>3333 Michelson Drive<br>Irvine, CA 92730<br>(714)975-3531                                  | Director (82-84)                        | Mr. Pete Hanik<br>Northern Petroleum Co.<br>Box 459<br>Morris, IL 60450   |
| Program Board<br>Chairman | Professor Warren D. Seider<br>Dept. of Chemical Engineering<br>University of Pennsylvania<br>Philadelphia, PA 19104<br>(215)243-7953 | Director (82-84)                        | Prof. Dale E. Seborg<br>Dept. of Chemical & Nuclear Eng.<br>University of California<br>Santa Barbara, CA 93106                 |

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