

KNOXVILLE-OAK RIDGE SECTION AMERICAN INSTITUTE OF CHEMICAL ENGINEERS

Newsletter

May 1999

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PRADOS IS ENGINEER OF THE YEAR



John Prados was awarded the section's 1999 Engineer of the Year Award at the April meeting.

John was cited "for distinguished service to the chemical engineering profession through leadership activities on the AIChE Board of Directors, accreditation activities through ABET and AIChE, and educational activities for the Department of Chemical Engineering and the University of Tennessee."

A brass plate bearing his name will be added to the display of winners in the Dougherty Building at UT. Congratulations, John!

Contacts

Awards

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Incineration Symposium

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This Month: Incineration
Symposium (see insert)

Recap of April Meeting

As usual, the April meeting, which also serves as our student awards night, was a very enjoyable experience. Thirty-nine attendees were treated to an excellent buffet that was up to Foundry standards, featuring a dessert of peach cobbler with sundae toppings!



Outstanding Senior Award winner Sjon-Paul Conyer happily displays his dessert masterpiece at the April meeting.

After the meal, Sancy Hail was recognized for her contributions to the section. Sancy is retiring at the end of the Spring semester. She was presented with a certificate of recognition, and a gift certificate for a meal at the Regas restaurant. John Prados was presented with the section's Engineer of the Year Award (see p.1). Awards were then presented to UT chemical engineering students. Those recognized included:

Amy Akard (Dow Chemical Co. outstanding junior), Clifton Arbogast (Hoescht Celanese outstanding junior), Paul Bowers (American Chemical Society), Susan Cobbs (Kimberly Clark outstanding junior), Wesley Heinlein (Kenneth Elliott upper-class scholarship), Russell Warford (AIChE sophomore scholastic award) and Jennifer Zurawick (Alpha Chi Sigma Alber Cooper Scholarship).

Two awards, each including a \$100 prize, were made by the section:

AIChE Faculty Service award - Jennifer Zurawick, and AIChE Outstanding Senior - Sjon-Paul Conyer.

We were privileged to host Dr. Jeffrey J. Sirola, a Technology Fellow of Eastman Chemical Company in Kingsport. Dr. Sirola is also a fellow of AIChE, as well as a current member of the AIChE Board of Directors. Dr. Sirola called upon his vast practical experience to present a thought-provoking talk titled "Industrial Examples of Process Synthesis and Integration." Dr. Sirola began the presentation with the question "How do

you go about inventing a process?" He gave three main approaches: "evolutionary modification" (copying), "superstructure modification" (optimization of a redundant design with all possible options - an intractable optimization problem), and systematic generation

Dr. Jeff Sirola describes process synthesis at the April meeting.



(process synthesis from basic components). Methods of the last type have been under investigation for thirty years, with several techniques now developed to the point of serious industrial applicability. A major point in providing freedom to identify novel, improved processes is identifying *tasks* rather than equipment (e.g., when outlining the elements of a process, one would identify the *task* of separating component A from component B rather than defining a distillation step). Once the tasks are identified, the key is in integrating and coordinating the tasks to maximize efficiencies. Dr. Sirola presented some examples of issues in task coordination; for instance, for integration of distillation columns, latent-heat integration is more efficient than sensible-heat integration, but gives less degrees of freedom for control, while steam generation allows heat recovery with less interactions between columns. Dr. Sirola concluded the talk with a very impressive example of task integration - Eastman's methyl acetate process. A complicated reaction/separation process was simplified; 7 tasks are performed in a single 80-m reactive distillation column. The result was 80% savings in capital and operating costs compared with the original design that had been produced by the old "evolutionary modification" approach. That kind of savings gets people's attention!

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Remember to stop by Leaf & Ale to
sample the product of our March
bioprocessing lab session!
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Tennessee's Technology Summit

Tennessee's Technology Summit of 1999 will be held June 1-3 at the Holiday Inn-World's Fair Park in Knoxville. This year's Summit theme is "Showcasing Our Technology for Economic Development." More information on the Summit

Smart Growth – Ecologically Sound Economic Development; Joint session with Southern Appalachian Man and the Biosphere (SAMAB).

2:00-5:30 p.m., Wednesday, June 2, Room 5

Chairs: Jeannette B. Berry and Robert S. Turner.

Robert S. Turner, the Executive Director of SAMAB, will discuss how perceptions of environmental issues are evolving from water, air, and soil pollution to community livability and ecologically, economically, and culturally sustainable places. Environmental-protection tools are evolving from sledge-hammer-type regulations to include market-based incentives, mediation, and regulatory flexibility. Developers and regulators are moving from planning for compliance to life-cycle analysis, zero emissions, and integrated environmental planning and management systems for sustainable living. This session highlights some approaches and experiences that facilitate ecologically-sound economic development. Thought-provoking presentations be followed by a panel discussion so that session attendees can discuss these evolving issues with expert speakers.

1. *Environmental Indicators and the Southern Appalachian Assessment (SAA)*; John Peine, U.S. Geological Survey.

2. *Air Pollution Effects in the Great Smoky Mountains Park*; James R. Renfro, Air Quality Program Manager, National Park Service

3. *EPA Initiatives to Reduce Air Pollution through Prevention*; Kathleen Hogan, Director, Atmospheric Pollution Prevention, U.S. Environmental Protection Agency

4. *Economic Incentives for Sustainable Growth*; Dan W. Reicher, Assistant Secretary, Office of Energy Efficiency and Renewable Energy, US Department of Energy (invited)

5. *An Overview of Saturn's Environmental Programs with an Emphasis on Life Cycle Analysis and Greening the Supply Chain*; William R. Miller, Saturn Corporation

6. *Cleaner Power and a Restructured Electric Market: Hand-in-Hand or Tooth-and-Nail*; Stanton W. Hadley, Oak Ridge National Laboratory

7. *Smart Growth – A Community Process*; Mary R. English,

Recent Trends in Chemical Engineering Research and Education with Economic Potential

2:00-5:00 p.m., Thursday, June 3, Room 5

Chair: Tse-Wei Wang

Several new directions in education and research in chemical engineering in recent years will be presented. These new efforts have far-reaching potential in improving societal economical outlook by improving process efficiency, providing prediction of material properties for greener processes, and providing human resources through industry-university internship education opportunities.

1. *Molecular Simulation of Complex Systems Using Massively Parallel Supercomputers*; Peter Cummings, University of Tennessee and Oak Ridge National Laboratory

2. *Process Monitoring and Fault Diagnostics Using Multivariate Statistical Process Control Approach*; Tse-Wei Wang, University of Tennessee

3. *An Honors Capstone Design Experience University-Industry Cooperative*; R. M. Counce, University of Tennessee

4. *A General Approach for the Economic Analysis of a Waste Minimization Pathway - A Case Study*; William Rains, University of Tennessee

5. *Use of Advanced Photonics for Treatment of Disease*; Timothy C. Scott, Photogen Technologies

6. *Oak Ridge and the Chemical Industry - A Winning Combination*; Alan Zimmerman, Oak Ridge Center for Manufacturing Technology

To register for Tennessee's Technology Summit:

Download a registration form: <http://www.kornnet.org/wattec/registration.pdf>



Prof. Charlie Moore with UT student award winners at the April meeting: (from left) Russell Warford, Paul Bowers, Jennifer Zurawick, and Sjon-Paul Conyer.

Section Web Resources

Home Page: <http://www.ornl.gov/aiche/>

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(directions: <http://www.ornl.gov/aiche/mail.htm>)

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