The Department of

Chemical Engineering

Fifty-fourth
Annual Report to the Alumni
2002

College of Engineering
The Ohio State University
Columbus, Ohio
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Message from the Chair

Dear Alumni:

It gives me great pleasure to update you on the activities of our faculty and students in the Department of Chemical Engineering in 2002. I am most pleased to announce that Dr. W.S. Winston Ho has joined the Ohio State University as University CMR Scholar Professor, a chair professorship in Chemical Engineering and Materials Science and Engineering. Prior to joining Ohio State University, Dr. Ho had three years academic experience at the University of Kentucky, after having over 28 years of industrial R&D experience in membranes and separation processes. This included serving as Senior Vice-President of Technology at Commodore Separation Technologies where he directed R&D for the development of supported liquid membrane technology for the removal and recovery of toxic metals from wastewaters. He was elected a member of the National Academy of Engineering this year in recognition of his distinguished contributions to engineering, including the invention and commercialization of novel separation technologies and the development of new theoretical models for membrane separations. A New Jersey Inventor of the Year (1991), Dr. Ho holds 50 U. S. patents, plus several pending, in membranes and separation processes, generally with foreign counterparts. He is Co-editor of Membrane Handbook, recipient of the Professional and Scholarly Publishing Award for the most outstanding engineering work in 1993. His research interests have included molecularly-based membrane separations, fuel-cell fuel processing and membranes, transport phenomena in membranes, separations with chemical reaction, supported liquid membranes, facilitated transport, gas treating, aromatics/saturates separation, and pervaporation. He has recently focused on new membranes and materials for fuel cell and environmental areas.

This year we submitted an interim report to the Engineering Accreditation Commission describing the course of action taken by the Department to meet some of the new ABET requirements identified in the ABET report following the 1999 – 2000 evaluation of the OSU Chemical Engineering Program. A summary was presented of various surveys designed to assess our program, including the alumni survey, supervisor (employer) survey, exit survey of graduating seniors, and a survey of co-op/internship employers. This interim report was favorably reviewed by ABET, ensuring the department’s continued status as an accredited program. The next review of our program by ABET will take place in 2006.

Once again our Department has distinguished itself by the numerous awards and recognitions received by faculty and students alike. One of the strong indicators of the excellence of faculty research is research support from peer-reviewed federal, state, and foundation funding agencies. I am pleased to report the number of new research awards received by the faculty during this academic year has exceeded $7 million, which places
the Department’s research funding per faculty ($0.5 million/faculty) among the highest in all the Chemical Engineering departments in the country. The funding sources include National Science Foundation, National Institute of Health, U.S. Department of Energy, and Ohio Department of Development, among others. Professor David Tomasko was surprised in his classroom and recognized by President Kirwan with the Alumni Award for Distinguished Teaching. Professor Umit Ozkan received the Industry & Technology Council of Central Ohio Top Cat Award for Outstanding Woman in Technology. Umit is the first female Associate Dean for Research at OSU’s College of Engineering. She also received the 2002 Columbus Section Award of the American Chemical Society (ACS). In October she received the Society of Women Engineers 2002 Achievement Award for outstanding accomplishments as an internationally recognized and highly respected researcher in heterogeneous catalysis, as an excellent engineering educator, and as a dedicated leader in higher education and professional societies. This award is given biennially to a scientist who has excelled in academics, industry, and/or teaching. Professor Kurt Koelling, Professor L. James Lee, and Professor David Tomasko all received the first College of Engineering Lumley Interdisciplinary Research Award. This award was established in 2002 to recognize interdisciplinary research accomplishments of the College faculty and research staff. Professor Kurt Koelling and I both received the College’s Lumley Research Award, which is given to those who have shown exceptional activity and success in pursuing new knowledge of a fundamental or applied nature. Professor L. James Lee received the Clara M. & Peter Scott Faculty Award for Excellence in Engineering Education. Professor Jack Zakin received the Camille and Henry Dreyfus Foundation Senior Scientist Mentor Award for Emeritus Faculty, for close advising and mentoring of undergraduate student researchers. Professor Robert Brodkey was recognized by a symposium in his honor. The "Robert S. Brodkey Symposium on Turbulence in Chemical Processing" was held during the 14th U.S. National Theoretical and Applied Mechanics Congress, Blacksburg, Virginia, June 23-30, 2002. Bhavik Bakshi and Jim Rathman will participate in a Technology Action Funds grant to support the Chemical Genomics Discovery Platform. Genomics screening is used in the drug discovery process to treat conditions and illnesses. The goal of this project is to develop commercially available chemical genomics platform software to bridge the existing gap between genomics and drug discovery.

Many student members of the Department also received awards. At the Women in Engineering Recognition Banquet, Jennifer Adams, Annette Bryan, Megan Cavanaugh, Megan Miller, and Ling Zhang won Outstanding Academic Awards. Lisa Ringler received a Top Academic Award, and Bobbie Arebalo, Nicole Florea, Amanda Jelley, Imogen Pryce, Diana Snelling, Meghan Ward, Sherry Wunderle, and Amando Yano each received First Quarter Certificates of Achievement. The AIChE Chemical Engineering student chapter won OSU’s Outstanding Student Organization Award for Web Development. This award is campus wide and is open to all 300 plus undergraduate student organizations. Special thanks go to Michael Beachy, the webmaster, and his team for doing such a great job on the website. At this year’s annual Lowrie Banquet, many top students were rewarded for their hard work. Matthew Nilsen won the American Institute of Chemists Foundation (AIC) Undergraduate Student Award, Yunying Qi won the AIC Outstanding Graduate Student Award, and Dr. W. Warsito
won the AIC Outstanding Postdoctoral Award. Nicholas Brunelli won the Dow Outstanding Junior Award and Shona Patel won the Dow-Corning Co-Op Award. The AIChE Central Ohio Section Outstanding Student Award went to Rick Wentling and the Donald F. Othmer AIChE Sophomore Academic Excellence Award went to Nicholas Brunelli. Outstanding Undergraduate Awards for Research Excellence went to Adam Baxter and Yeny Hudiono. Outstanding Graduate Awards for Academic Achievement went to Xia Cao, Xiangmin Han, Siyi Lai, Jun Luo, Changchun Zeng, and Ying Zhu. Outstanding Postdoctoral Awards for Research Excellence went to Caixia Chen and Xueqin Wang. The Chemical Engineering Alumni Society awarded Outstanding Senior Awards for Academic Excellence to Stephen Cummings and Lisa Ringler and an Outstanding Sophomore Award for Academic Excellence to Kurt Frey.

The Department is organizing a Centennial Celebration to take place in 2002-2003. In April 2003 the Department will host a one and a half-day symposium with several eminent chemical engineers, who will be invited to give talks on some unsolved chemical engineering problems. Other talks will cover chemical engineering history and educational issues and history and reminiscences of the Department. The invited speakers will prepare manuscripts and the articles will be published in a commemorative issue. This event will take place Thursday and Friday, April 24 and 25, 2003, so please mark your calendars now so that you can join us for this celebration. A dinner will be held at the new restaurant in the Blackwell Inn on Friday night. The Spring Scarlet and Gray football game is tentatively scheduled for Saturday, April 26. We are trying to get some idea of the number of alumni who will attend. At the end of this report there is a short questionnaire. Please fill it out and let us know your plans. We will provide more details on the program to those who plan to attend (see form at the end of report, page 77).

Finally, I must inform you that I intend to step down as Chair of the Department June 30, 2003. I am looking forward to putting more time and effort into working with students and continuing my research. I have greatly enjoyed my tenure as Department Chair and will do everything in my power to ensure a smooth transition for the Department. Professor Marty Feinberg will serve as the Chair of the Department Chair Search Committee in the search for our new Department Chair.

I would like to thank all of you who have continued to support the Department through donations and service. We very much appreciate your support and the difference it makes. Please remember when sending donations that the check should be clearly
marked Chemical Engineering. We appreciate any input you care to give and invite you to stop by the Department any time you are in the area.

Best regards,

L.S. Fan
Professors

Robert S. Brodkey (Emeritus)
Jefferey J. Chalmers
Liang-Shih Fan
Martin Feinberg
Ed Haering (Emeritus)
Harry Hershey (Emeritus)
Winston Ho
L. James Lee
Umit Ozkan
H.C. (Slip) Slider (Emeritus)
Edwin E. Smith (Emeritus)
Thomas L. Sweeney (Emeritus)
Shang-Tian Yang
Jacques L. Zakin (Emeritus)

Associate Professors

Bhavik R. Bakshi
Kurt W. Koelling
James F. Rathman
Karlis Svanks (Emeritus)
David L. Tomasko

Assistant Professor

Isamu Kusaka

Visiting Scholars, Post Doctoral
& Research Associates

Nuray Oktar
Oktar Okan
Xueqin Wang
Chen Caixia
Yang Zhao
Raja A. Jadhav
W. Warsito
Li Yanpeng

Department Faculty and Staff

Administrative Staff

Academic Advisor
Sherry McDonald

Assistant to the Department Chair
Sherry Stoneman

Assistant to the Graduate Chair
Kathleen Monegan

Fiscal & Human Resources
Administrator
Ibrahima Ndoye

Administrative Assistant, Editorial
Brenda Lynch
Daniel Kline

Design Engineer
Leigh Evrard

Building Coordinator
Carl Scott

Laboratory Supervisor
Paul Green

Director, ChE/MSE Joint Computing
Lab
Geoff Hulse

Systems Analyst
Mike Davis

Systems Engineer
Dave Jones

CAPCE Administrator
Paula Stevenson
Faculty Research Areas


Fan, Liang-Shih, Distinguished University Professor and Chair, Ph.D., West Virginia University 1975. Fluidization, Powder Technology, Multiphase and Particulate Reaction Engineering, Energy and Environmental Engineering, and Mathematical Modeling.


Hershey, Harry C., Professor Emeritus, Ph.D., University of Missouri-Rolla 1965. Thermodynamics and Environmental Engineering.

Ho, Winston W.S., University CMR Scholar Professor, Ph.D., University of Illinois at Urbana 1971. Moleculary-based Membrane Separations, Bioprocessing with Membranes, Fuel-Cell fuel Processing, Transport Phenomena in Membranes, Polymer membranes, and Separations with Chemical Reaction.

Koelling, Kurt W., Associate Professor, Ph.D., Princeton University 1992. Advanced Polymer Processing, Microfluidics, Bubble and Drop Dynamics, Rheology of Complex Fluids, Biocompatible Polymers, Nanocomposite Foams, Gas-assisted and Thin-wall Injection Molding.

Kusaka, Isamu, Assistant Professor, Ph.D., California Institute of Technology 1998. Molecular Level Theory and Computer Simulation of Nucleation.


Ozkan, Umit S., Professor, Ph.D., Iowa State University 1984. Application of Heterogeneous Catalysis to Energy and Environmental Issues, Catalytic Materials, and Heterogeneous Kinetics.

Tomasko, David L., Associate Professor, Ph.D., University of Illinois at Urbana 1992. Intermolecular Interactions in Supercritical Fluids Separations and Materials Processing, Particle Formation using Supercritical Solutions, Molecular Thermodynamics, High Pressure Phase Equilibria.

Yang, Shang-Tian, Professor Ph.D., Purdue University 1984. Biotechnology, Bioprocesses for Production of Value-added Products, Fermentation, Cell Culture, Tissue Engineering, Nanofiltration, Membrane Extraction for Fementation Product Recovery.


Row 1: Prof. L.S. Fan, Prof. Martin Feinberg, Prof. David L. Tomasko, Prof. Robert S. Brodkey, Prof. Isamu Kusaka, Prof. S.T. Yang, Prof. L. James Lee
Row 2: Prof. Jeffrey J. Chalmers, Prof. Umit S. Ozkan, Prof. Kurt W. Koelling, Prof. Jack Zakin, Prof. Bhavik R. Bakshi, Prof. James F. Rathman
Department Highlights in Teaching & Research

Award and Honors Received by Faculty Members

Chalmers, Jeffrey J.
Recipient of 2001 Lumley Research Award.

Appointed as Director of The University Cell Analysis and Sorting Core.

Elected as a member of the American Institute for Medical and Biological Engineering (AIMBE).

Fan, Liang-Shih
Elected to the National Academy of Engineering.

Awarded an Honorary Doctoral Degree (Doctorate Honoris Cause) from the Instituto de Estudios Superiores en Ingenieria, Puebla, Mexico, September 12, 2002.

Feinberg, Martin
Awarded 2001 Clara M. and Peter L. Scott Faculty Award for Excellence in Engineering Education.

Lee, L. James
Elected a Fellow of the Society of Plastics Engineers.

Selected as the CIC Academic Leadership Program Fellow.

Ozkan, Umit S.
2002 Society of Women in Engineering (SWE) Achievement Award.

Industry and Technology Council of Central Ohio's Top Cat 2002 Award: Outstanding Woman in Technology.

Columbus Section of American Chemical Society 2002 Award.

Elected to the Executive Committee of the North American Catalysis Society for a four year term as the Society Secretary.

Rathman, James F.
Received the 2001 Charles Ellison Macquigg Award for Outstanding Teaching.

Tomasko, David L.
2002 University Distinguished Teaching Award.

Yang, S.T.
Recipient of the 2001 Lumley Research Award.
Zakin, Jacques L.
Received 2001 Japanese Government Research Award for Foreign Specialist.

Award and Honors Received by Staff Members

Davis, Mike
Nominated for the College of Engineering Above and Beyond Award.

Award and Honors Received by Students

Matter, Paul
Presented his research at Ohio State’s Denman Undergraduate Research Forum and at the National American Chemical Society’s Annual Conference in San Diego.

Presented his research at the University of Sao Paolo in Brazil.

Accomplishments

Lee, L. James, Koelling, Kurt, and Tomasko, D.
Developed a method to manufacture dense plastic foam that may replace solid plastics in the future.

Developed innovative manufacturing techniques to eliminate the use of CFC in foam productions.

New Faculty

Ho, Winston W.S.
University CMR Scholar Professor, Ph.D., University of Illinois at Urbana-Champaign 1971.
Publications and Proceedings

Publications

Books and Book Chapters


**Refereed Papers**


Lee, L.J. and Li, L., Effect of A Chelating Agent- 2,4 P on Low Temperature Cure of Vinylester and Unsaturated Polyester Resins, Polymer Composites, in press.


Rathman, J.F., Yang, C., Bakshi, B.R., and Blower, P.E., *Multiscale and Bayesian Approaches to Data Analysis in Genomics High Throughput Screening*, Current Opinion in Drug Discovery and Development, accepted for publication (Invited submission).


**Proceedings**


**Zakin, J.L. and Qi, Y.,** Some Recent Developments in Surfactant Drag Reduction, Proc 2nd Symposium Smart Control of Turbulence, Tokyo, Japan, March 4-6, (2001).


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**Technical Reports**


**Patents**


Invited Lectures, Seminars, and Short Courses


Bakshi, B.R., Energy seminar series, School of Natural Resources, Ohio State University, October (2001).


Bakshi, B.R., Presentation at Ohio State University, Department of Chemical Engineering, January (2001).


Lee, L.J., Department of Chemical Engineering, Georgia Institute of Technology, Atlanta, GA, December (2001).

Lee, L.J., Presentation, Department of Mechanical Engineering, Chung Yuan Christian University, Chung Li, Taiwan, December (2001).


Rathman, J.F., Exploiting Molecular Self-Assembly to Form Biocomposite Films, Rice University, Department of Chemical Engineering, Seminar Speaker, October (2001).


Yang, S.T., Bioprocessing for Value-Added Products from Agricultural Commodities and Wastes, Department of Chemical Engineering, National Taiwan University of Science and Technology, Taipei, Taiwan, December 6, (2001).

Yang, S.T., Biotechnology for Sustainable Environment, National Central University, Chung-Li, Taiwan, December 10, (2001).

Yang, S.T., Advances in Biotechnology for Production of Biobased Industrial Products, National Cheng Kung University, Tainan, Taiwan, ROC, December 14, (2001).
Yang, S.T., *Fibrous-Bed Bioreactor: from Biocatalysis to {PRIVATE}Cell Cultures and Biochips*, Hong Kong University of Science and Technology, Hong Kong, February 26, (2002).

Yang, S.T., *Chemical Engineering Research Frontiers*, Hong Kong University of Science and Technology, Hong Kong, February 26, (2002).


**Additional Paper Presentations**


Brodkey, R.S., Kiprovksa, A., Nielsen, M., Lynch, L., Zang, D., Zhao, Y. and Nakamura S., *Particle Tracking Velocimeter Applied to an Opposed-Jet*


Yang, S.T., Li, Y., Kniss, D.A. and Lasky, L.C., *“Culturing and Hematopoietic Differentiation of Murine Embryonic Stem Cells in 3-D*


Organizers and Session Chairs of National and International Meeting


Fan, L.S., Member, Organizing Committee, National Research Council, Board of Chemical Sciences and Technology’s Workshop on National Security and Homeland Defense, Irvine, CA, Jan. 14-16 (2002).


Koelling, K.W., Session Chair, Polymer Processing and Rheology, American Institute of Chemical Engineering Annual Meeting, Reno, NV, November (2001).


Ozkan, U.S., Organizer, Metals and Metal Oxides, 18th Meeting of the North American Catalysis Society, Cancun, Mexico, June (2003), in progress.

Tomasko, D.L., Session Chair, Reactions in Supercritical Fluids, 10th International Symposium on Supercritical Fluid Chromatography, Extraction, and Processing, Myrtle Beach, SC, August (2001).


Yang, S.T., Chair, session on Chemical Engineering in Biotechnology, 2001 ChemTech Conference in Chicago, IL, September 7-8, 2001. (Joint meeting between US and Taiwan organized and sponsored by National Science Council, Taiwan, Chicago Office.


Zakin, J.L., Chair, Session on Rheology of Surfactants, 3rd Pacific Rim, Conference on Rheology, Vancouver, Canada, July 8, (2001).

Editorial Boards, National Committees, and Other Professional Activities


Fan, L.S., Editorial Board, Journal of Engineering Chemistry and Metallurgy (China) (1999 to date); International Journal of Multiphase Flow (July 1997 to date)


Fan, L.S., Editorial Advisory Board, eFluids (March 2001 to date).


Fan, L.S., AIChE National Program Committee: Societal Impact Operating Council Member (2000-date), Vice-Chair (2001-date); Chair, Diversity Task Force, 2001 to 2002; Chair, Security Task Force, 2001-date; Institute Service to Society Award Committee, 2001-date.

Fan, L.S., ASEE Division Award Committee.

Fan, L.S., Director, Ohio State University Coal Research Program, 1987 to date (Program theme: Dry sorbent injection technology for air pollution control in coal combustion).


Fan, L.S., Member, Board of Judges, Kirkpatrick Award for Chemical Engineering Achievement, sponsored by McGraw-Hill Co. (2001).


Feinberg, M., American Institute of Chemical Engineers National Awards Committee: Chair, AIChE Professional Progress Award Committee (for award in 2002).

Koelling, K.W., Associate Editor, Journal of Injection Molding Technology.


Lee, L.J., Director of NSF Center for Advanced Polymer and Composite Engineering.

Lee, L.J., Proposal Reviewer for National Science Foundation, Department of Defense, Kuwait
University Research Office, Hong Kong Science Foundation.

Lee, L.J., Paper Reviewer for many technical journals in the field of polymer and chemical engineering.

Rathman, J.F., Member: AIChE, ACS.

Tomasko, D.L., AIChE Area 1f (High Pressure) - Chairman (Elected in 1999 to a 2-year term).

Tomasko, D.L., Tri-State Supercritical Fluids Discussion Group –President.


Zakin, J.L. ABET Accreditation Panel Registered Professional Engineer (Ohio) Chair, Nominating Committee – Society of Rheology, University of Missouri - Rolla, Department of Chemical Engineering Industrial Advisory Board, Egypt /Israel Fulbright Review Committee.
<table>
<thead>
<tr>
<th>PI/Title/Sponsor</th>
<th>Project Period</th>
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<tbody>
<tr>
<td>Bakshi, Bhavik R.</td>
<td>06/01/1998-05/31/2003</td>
</tr>
<tr>
<td>$50,000</td>
<td>CAREER: Data rectification, process monitoring, fault diagnosis, and integration by multiscale empirical modeling. ( NSF \text{ Chem &amp; Transport} )</td>
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<tr>
<td>Bakshi, Bhavik R.</td>
<td>06/01/1998-05/31/2003</td>
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<tr>
<td>$260,000</td>
<td>CAREER: Data rectification, process monitoring, fault diagnosis, and integration by multiscale empirical modeling. ( NSF \text{ Chem &amp; Transport} )</td>
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<tr>
<td>Bakshi, Bhavik R.</td>
<td>09/01/1999-12/31/2001</td>
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<td>$198,672</td>
<td>A systems ecology approach to life-cycle product assessment and process design (TSE99-H) ( NSF \text{ Bio &amp; Environment} )</td>
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<td>Brodkey, Robert S</td>
<td>08/15/1999-03/31/2003</td>
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<tr>
<td>$60,000</td>
<td>Validation of DNS, development of LES, and CFD modeling of an opposed jet mixer based on time-resolved, full field, velocity vector measurements. ( Petroleum \text{ Res Fund} )</td>
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<tr>
<td>Brodkey, Robert S</td>
<td>08/15/1999-03/31/2003</td>
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<tr>
<td>$64,900</td>
<td>Dynamic mixing in stirred vessels: An application of particle tracking velocimetry and flow visualization in a convective frame of reference. ( NSF \text{ Chem &amp; Transport} )</td>
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<tr>
<td>Chalmers, Jeffrey J.</td>
<td>09/01/1998-08/31/2002</td>
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<tr>
<td>$460,175</td>
<td>Determination of cellular properties based on the distribution of cell velocities induced by external fields. ( NSF \text{ Bio &amp; Environment} )</td>
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<td>Amount</td>
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<td>$278,993</td>
<td>Chalmers, Jeffrey J.</td>
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<td>$169,000</td>
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<td>Fan, Liang-Shih</td>
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<td>$79,958</td>
<td>Fan, Liang-Shih</td>
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<td>$295,000</td>
<td>Fan, Liang-Shih</td>
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<td>$195,823</td>
<td>Feinberg, Martin R.</td>
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<td>$211,350</td>
<td>Koelling, Kurt</td>
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<td>$56,702</td>
<td>Koelling, Kurt</td>
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</tbody>
</table>
$203,922  Koelling, Kurt
Analysis of the de-airing process in the glass windshield lamination.
DUPONT (EI) NEMOURS
09/01/1997-08/31/2003

$50,749  Kusaka, Isamu
EMSI: Role of environmental molecular interfaces on the chemical and biological reactivity of pollutants (Atmospheric-5).
NSF Chem
09/15/2000-08/31/2003

$224,465  Lee, L. James
Improvement and optimization of a newly developed vacuum infusion resin transfer molding process (SCRIMP).
NSF Design, Manuf., Ind.
07/15/1997-12/31/2001

$20,000  Lee, L. James
Improvement and optimization of a newly developed vacuum infusion resin transfer molding process (SCRIMP)—REU supplement.
NSF Design, Manuf., Ind.
04/03/1998-12/31/2001

$22,674  Lee, L. James
FY01 funding for the Center for Advanced Polymer and Composite Engineering at The Ohio State University.
OIH Dept. Development
11/01/2000-01/31/2002

$24,481  Lee, L. James
FY01 funding for the Center for Advanced Polymer and Composite Engineering at The Ohio State University.
OIH Dept. Development
11/01/2000-01/31/2002
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<th>Amount</th>
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<td>$8,318</td>
<td>Lee, L. James</td>
<td>11/01/2000-01/31/2002</td>
<td>FY01 funding for the Center for Advanced Polymer and Composite Engineering at The Ohio State University.</td>
<td>OH Dept. Development</td>
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<td>$44,527</td>
<td>Lee, L. James</td>
<td>11/01/2000-01/31/2002</td>
<td>FY01 funding for the Center for Advanced Polymer and Composite Engineering at The Ohio State University.</td>
<td>OH Dept. Development</td>
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<td>$138,691</td>
<td>Lee, L. James</td>
<td>07/15/1999-07/14/2002</td>
<td>Biomimetic sensors for environmental monitoring and control.</td>
<td>Univ. of Kentucky</td>
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<td>$179,425</td>
<td>Lee, L. James</td>
<td>06/01/2000-09/30/2002</td>
<td>Responsive drug delivery on a chip-ChipRx.</td>
<td>OH Dept. Development</td>
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<tr>
<td>$221,270</td>
<td>Lee, L. James</td>
<td>06/01/2000-09/30/2002</td>
<td>Responsive drug delivery on a chip-ChipRx.</td>
<td>OH Dept. Development</td>
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<td>$46,500</td>
<td>Lee, L. James</td>
<td>10/10/2000-10/30/2002</td>
<td>Resin properties affecting marcel generation.</td>
<td>Bell HELICPTR TEXTRN</td>
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<tr>
<td>$1,500</td>
<td>Lee, L. James</td>
<td>11/01/2000-10/31/2002</td>
<td>Devulcanization of cured rubber in extrusion aided with supercritical 2-butanol.</td>
<td>Goodyear Tire &amp; Rubber</td>
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<tr>
<td>Amount</td>
<td>Name</td>
<td>Project Description</td>
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<tr>
<td>$5,000</td>
<td><strong>Lee, L. James</strong></td>
<td>Devulcanization of cured rubber in extrusion aided with supercritical 2-butanol.</td>
<td>11/01/2000-10/31/2002</td>
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<td>$58,464</td>
<td><strong>Lee, L. James</strong></td>
<td>NER: Development of a nano-lithography based manufacturing protocol for polymer nanofluidic platforms.</td>
<td>08/01/2001-07/31/2003</td>
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<td>$67,500</td>
<td><strong>Lee, L. James</strong></td>
<td>CAPCE Year 6 industry holding account.</td>
<td>10/01/2002-09/30/2003</td>
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<td>$73,000</td>
<td><strong>Lee, L. James</strong></td>
<td>Renewing an industry/university cooperative research Center for Advanced Polymer and Composite Engineering.</td>
<td>10/01/2001-09/30/2003</td>
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<td>$79,829</td>
<td><strong>Ozkan, Umit S.</strong></td>
<td>Catalytic reduction of Nox with hydrocarbons.</td>
<td>09/01/2001-09/30/2002</td>
<td></td>
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<td>$300,921</td>
<td><strong>Ozkan, Umit S.</strong></td>
<td>Preparation and characterization of sol-gel derived materials for fuel cell applications.</td>
<td>10/01/2000-10/31/2003</td>
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Butyric acid fermentation.  
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**Yang, Shang-Tian**  
Metabolic engineering of propionibacterium for enhanced propionic acid fermentation.  
*COOP STE RES ED & EX*

$79,958  
**Zakin, Jacques L.**  
CO$_2$ separation from flue gas by carbonation and calcination of metal oxides.  
*OH UNIVERSITY*

$68,600  
**Zakin, Jacques L.**  
Second Eastern Mediterranean Chemical Engineering Conference for collaborative research.  
*NAT SCIENCE FDN*
### Graduate Students (by Advisor)

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<tr>
<th>Name</th>
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Shang-Tian Yang
Yunling Bai  PhD
Shubhayu Basu  PhD
Xiaoguang Liu  PhD
Jun Luo  PhD
Suwattana Pruksasri  PhD
Clayt Robinson  PhD
Juan Sanz-Valero  PhD
Supaporn Suwannakham  PhD
Nuttha Thongchul  PhD
Hsiu-yin Yin  MS
Ying Zhu  PhD

Jacques L. Zakin
Yunying Qi  PhD
Ying Zhang  PhD
Fellowship and Scholarship Students

Scholarships

Class of '41
Debby Cokro Setyo
Nathan Coons
Phillip Deis
Elizabeth Fanton
Jonathan Halter

Dow Chemical Outstanding Jr
Nick Brunelli

David H. George
Gabriel Berg
Chad Bernard
Evan Cuggleish
Sarah Hufft
Emily Jordan
Marcus Leatherberry
Imogen Pryce
Diana Snelling
Joshua Terflinger
Christopher Wakefield
Scott Wendell
Christopher Williams

Todd David Harris Memorial
Chanel David
Nicole Florea
Sylena Smith
Sonya Ward

Lubrizol
Christopher Harto
Bradley Ross
Todd Warnock

Ashland Oil
Samir Cheblak

Allan I. Gordon
Nathan Deutsch

Gary Koenig
Andrew Loth
Philip Wollenberg

Fenburr
Nicholas Brunelli
Miguel Garcia
Erica Jones
Jun A. Lee
Julie A. Makutonin
Sheetal Pai

Timothy Price
Zachary Schank
Robert Walters
Meghan Ward
Man-Leung Wong
Abdullabi Yusuf
Ling Zhang
Matthew Ziegler

William R. & Doris M. Harris Memorial
Leslie Bailey
Matthew Ducay
Jonathan Eshbaugh
Christopher Hansen
Jeff Joyner
Todd Longendelpher
Robert Messinger
Maren Seibold
Gary Seto
Katie Severson
Mary Shea
Aaron Walker
Tricia Williams
Jeremy Wilneff

Raymond D. Hammond
Charles Benore
Brian Chapman
Keith Clouston
Lori Engelhardt
Bradley Perrin, Jr.
Kathleen Somnitz
Angela Sparks
Mark Tornow

Smith E. Howland
Nathan Cleveinger
Michael Leesburg

Samuel S. & Grace Hook Johnston Memorial
Stefanie Sparks
Andrew Loge

Webster B. Kay
Jessica Clark
Brandon Groves
Raymond Newlin IV

Howard R. Steele
Whitney Peters
Sherry Wunderle

Aldrich Syverson
Alica Adams
Megan Cavanaugh
Garrett Pavlovicz

Harry B. Warner
Douglas French
Rami Sartawi

William H. Whirl
Glorianna Corman
Martha Rogers
Fellowship and Scholarship Students

Fellowships

Department Fellowship
Apte, Pankaj
Chiou, Nan-Rong
Nigam, Poonam
Sun, Pei
Tang, Yang Xhong

University Fellowship
Mohiddin, Syed
Mehta, Bhavya
Nirmal Kumar, Sharath Kum
Bai, Yunling
Liu, Dehua
Liu, Xiaoguang
Lu, Chunmeng
Qi, Xiaojie
Shao, Mei
Matter, Paul

Presidential Fellowship
Qi, Yunying
Zeng, Changchun
Yang, Zhu
## 2001 Chemical Engineering Graduates

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### Bachelor of Science

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### Bachelor of Science

### Spring 2001

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<td>M.</td>
<td>Howes</td>
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### Autumn 2001

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<td>H.</td>
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<td>Messer</td>
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<tr>
<td>Cheng</td>
<td>Tiong</td>
<td>Tan</td>
<td>B.S</td>
<td>N/A</td>
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---

52
CLASS OF 2002
Row 1: Prof. James F. Rathman, Angela Latif, Jennifer Adams, Christine Reinhold, Lisa Deafenbaugh, Yen Yu Hudianto, Xia Cao, Yunying Qi, Prof. Robert Brodkey
Row 2: Tony Sherer, Srinivason Ganesan, Lindsay Harper, Lisa Ringler, Melissa DeMora, Kathleen Sommert, Brian Villarreal, Adam Baxter, Prof. David L. Tomasko
Row 3: Changchun Zeng, Matt Nilsen, Justin Nellet, Aaron McCoy, Marc Graeagle, Jeff Riddle, Nathan Clevenger
Row 4: Elizabeth Lynch, Austin Partee, Jeremy Miller, Gene Arkenberg, Josiah Smith, David Michalski, Timothy Price, Kate Fischer, Mark Hamilton

Placement Information

<table>
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53
2001-2002 Academic and Industrial Awards and Recognition

Lowrie Lectureship Award
Dr. Alexis T. Bell

American Institute of Chemists
Outstanding Senior
Matthew Nilsen

Outstanding Graduate Student
Yunying Qi

Outstanding Postdoctoral Award
W. Warsito

Dow Outstanding Junior Award
Nicholas Brunelli

Dow-Corning Co-Op Award
Shona Patel

AIChE Student Chapter
Recognition of (retiring) Officers
Samer Cheblak-President
Jennifer Adams-Vice President
Nihar Patel-Treasurer
Rami Sartawi-Secretary
Michael Beachy-Webmaster
Adam Baxter-E-Council Representative
Christine Reinhold-Philanthropy Chair
Paul Hobson-Publications Chair
Rick Wentling-Events Coordinator
Bartev Sakadjian-Membership Chair
Tony Sherer-Publicity Chair
Melissa DeMora-Historian
Nzinga Turner-Sophomore Representative
Chris Williams-Sophomore Representative
Chanel David-Junior Representative
Jeff Strempel-Junior Representative

AIChE Central Ohio Section
Outstanding Student Award
Rick Wentling
Donald F. Othmer AIChE Sophomore
Academic Excellence
Nicholas Brunelli

Recognition of Chess Officers
Thomas Abraham
Shubhayu Basu
Puneet Gupta
Chang Liu
Clayt Robinson
Ying Zhang

OSU Chemical Engineering
Department
Outstanding Undergraduate Award
For Research Excellence
Adam Baxter
Yeny Hudiono

Outstanding Graduate Award
For Academic Achievement
Xia Cao
Xiangmin Han
Siyi Lai
Jun Luo
Changchun Zeng
Ying Zhu

Outstanding Postdoctoral Award
For Research Excellence
Caixia Chen
Xueqin Wang

OSU Chemical Engineering Alumni Society (CEAS)
Outstanding Senior Award
For Academic Excellence
Stephen Cummings
Richard Lenz
Lisa Ringler

Outstanding Sophomore Award
For Academic Excellence
Kurt Frey
Graduate School Leadership Award
Clayt Robinson

Graduate Student Alumni Research Award
Ying Zhu

Second Best Poster Award
Chang Liu
# 2001 Course Enrollement

## Winter Quarter 2001

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<th>Course Code</th>
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### Summer Quarter 2001

**First Term**
- ChE 630  
  Unit Operations  
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**Second Term**
- ChE 779  
  Experimental Design  
  20

**Full Term**
- ChE 489  
  Professional Practices in Industry  
  1
- ChE 693  
  Individual Studies  
  5
- ChE 981  
  Research Seminar  
  3
- ChE 999  
  Graduate Research  
  65

### Autumn Quarter 2001

- ChE 200  
  ChE & Process Calculations  
  53
- ChE 489  
  Professional Practices in Industry  
  2
- ChE 508  
  ChE Thermodynamics  
  47
- ChE 521  
  Transport Phenomena II  
  48
- ChE 624  
  Chemical Process Dynamics & Control  
  78
- ChE 693  
  Individual Studies  
  3
- ChE 694A  
  Group Studies in ChE  
  1
- ChE 717  
  Colloids and Surfaces  
  34
- ChE 760  
  ChE Economy & Strategy  
  76
- ChE 761  
  Che Processes  
  23
- ChE 765  
  Principles of Biochemical Engineering  
  43
- ChE 773  
  Intro to High Polymer Engineering  
  36
- ChE 783H  
  Undergraduate Honors Program Research  
  1
- ChE 801  
  Advanced Special Problems in Ch.E.  
  17
- ChE 815.08  
  Advanced Momentum Transfer I  
  18
- ChE 899  
  Teaching Practicum in Chemical Engr  
  7
- ChE 999  
  Graduate Research  
  73
- ChE 999F  
  Graduate Research  
  63
Autumn 2001

October 4  Dr. Jiri Myska, Czech Academy of Science, Institute of Hydrodynamics, “Thirty Years of Drag Reduction Research at The Institute of Hydrodynamics, Prague.”

October 11  Fernando J. Muzzio, Professor, Rutgers, The State University of New Jersey, “Analytical Approaches to Powder Blending Scale Up and Segregation.”

October 12  Edit Ambrozy, Graduate Student, Rutgers, The State University of New Jersey, “Computational Analysis of Mixing Dynamics in 3D Chaotic Flows.”

October 17  Sotiris E. Pratsinis, Professor, Swiss Federal Institute of Technology Institute of Process Engineering, Department of Mechanical and Process Engineering, Zurich, Switzerland, “Flame Synthesis of Nanoparticles.”

October 18  Arup K. Chakraborty, Warren and Katharine Schilinger Distinguished Professor of Chemical Engineering and Professor of Chemistry, University of California, Berkeley, “Immunological Synapse Assembly: A Crossroad of Physical Science and Cell Biology.”

October 25  Christodoulos A. Floudas, Professor, Princeton University Chemical Engineering Department, “Structure Prediction in Protein Folding.”

November 15  Tang Yi, California Institute of Technology Chemical Engineering Department, “Expanding the Genetic Alphabet: Incorporation of Unnatural Amino Acids in Vivo.

November 29  Julio M. Ottino, Professor, Northwestern University, “Complex Systems: Self-Organization in Granular Matter.”

Winter 2002

January 10  Robert Johnson, Principal Consultant, Unwin Company, “Chemical Engineering and the Quantitative Analysis of Risk.”

January 17  L. James Lee, Helen C. Kurtz Professor, The Ohio State University Department of Chemical Engineering, “Micro-Nano-Processing of Polymers for Biomems Applications.”
January 24  Sandro da Rocha, postdoctoral fellow with Peter Rossky, The University of Texas at Austin, NSF Center for CO₂ Utilization, Department of Chemistry and Biochemistry, “Amphiphiles at the CO₂ Water Interface: Experiments and Computer Simulations.”

January 31  Roseanne M. Ford, Associate Professor, University of Virginia Chemical Engineering Department, “Transport Phenomena of Motile Bacteria in Porous Media.”

February 7  Derek J. Hansford, Assistant Professor, The Ohio State University Department of Materials Science and Engineering and the Biomedical Engineering Center, “Thin film polymer microfabrication techniques for biomedical microdevices.”

February 21  Krishna Mahadevan, University of Delaware, Chemical Engineering Department, “Nonlinear Optimization for Control and Analysis of Bioprocesses.”


March 7  Ian Burdett, Dow Chemical, “Particle Growth and Fluidization in Gas-Phase Polymerization Reactors.”

March 14  Winston S. Ho, Professor, University of Kentucky, Department of Chemical and Materials Engineering Center for Applied Energy Research, “Engineering Membranes for Environmental and Energy Applications.”

March 21  Vassilios Sikavitsas, Rice University Department of Bioengineering, “Bioreactor Design for Bone Tissue Engineering.”

Spring 2002

April 11  Nicholas L. Abbott, Professor, University of Wisconsin-Madison Department of Chemical Engineering, “Active Control of Surfactants.”

April 18  Vishwanath V. Subramanian, Professor, The Ohio State University Department of Mechanical Engineering & Chemical Physics Program, “Organization of Particulates in Dusty Plasmas.”

April 25  Alexis T. Bell, Professor, University of California, Berkeley Chemical Engineering Department, “Structure-Function Relationships in Catalysis: Illustrations of Lessons Learned from Experiments and Theory,” Lowrie Lecture.
May 2  Ed Lightfoot, Professor Emeritus, University of Wisconsin-Madison, Department of Chemical Engineering, “Emergence and the Evolution of Novel Designs.”

May 9  Michael R. Ladisch, Professor, Purdue University Department of Agricultural and Biological Engineering, “Structure/Function Fundamentals of Enzyme Mimetics for Cellulose Hydrolysis.”

May 16  Philippe A. Tanguy, Ecole Polytechnique, Department of Chemical Engineering, Montreal, Canada, “CFD Applications in Industrial Reactors with Validations.”

May 23  Chung-Chiun Liu, Professor and Department Chair, Case Western Reserve University, “Applications of Microfabrication Technology To the Integration of a Microsystem.”

May 30  Hendrik Verweij, Professor, Orton Chair in Ceramic Engineering, The Ohio State University Department of Materials Science and Engineering, “Inorganic Membranes, Coatings and Composites made from Particle with 1-400 nm diameter.”
### Alumni and Friends who Contributed to the Department

<table>
<thead>
<tr>
<th>Year</th>
<th>Names</th>
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</table>
| 1930 | Parker S. Dunn  
Rodney R. Midlam  
Richard R. Whiston |
| 1932 | Harry J. Green, Jr.  
Halvor S. Christianson  
Dalton F. Drake  
Glenn L. Glifford  
Leonard A. Harris  
James R. Randall  
Roy E. Schneider  
Carlyle E. Shoemaker  
Wade Wolfe, Jr.  
Hong T. Yee |
| 1933 | Kermit K. Fligor |
| 1934 | Edward E. Slowter |
| 1935 | Linton E. Simerl |
| 1936 | Richard A. Miller  
Joseph G. Mravec |
| 1937 | Andrew E. Chute  
Nicholas Fatica  
Donald C. Miller  
Robert T. Whitaker |
| 1939 | Dillard W. Kuhlman  
Ralph E. Quigley  
Howard G. Rohrer |
| 1940 | Charles Boardman III  
Loren F. Grandey  
Henry J. Jacoby  
John H. Miller  
Walter C. Wendschuh |
| 1941 | George L. Meyers, Jr.  
David Thomas |
| 1942 | Donald S. Arnold  
Forrest R. Hurley |
| 1943 | | J. Guilford Gerlach  
Earl W. Goodman  
William L. Gray  
David R. Grove  
J. Howard Kerstetter, Jr.  
Robert E. Kraus  
Cloyd P. Reeg  
Arthur C. Secrest, Jr.  
Jack C. Stewart  
Robert M. Tarr  
F. Morgan Warzel |
| 1944 | Wallace L. Bostwick  
William R. Harris  
Clarence A. Haverly, Jr.  
Edward W. Powell  
Edwin E. Smith  
Grover C. Strickler, Jr. |
| 1945 | Robert S. Atkinson |
| 1946 | Kenneth A. Brandstetter |
| 1947 | Charles C. Ballard  
William K. Fell  
Thurman L. Graves  
Lewis C. Hullinger  
John M. Kolbas  
J. Bruce Martin  
Bryce McMullen  
Aloysius M. Sebian  
Donald F. Stauffer  
Leroy Streett |
| 1948 | Saul Barron  
Irving B. Chang  
Donald E. Garrett |
| 1949 | | William D. Arthur  
Paul E. Bates  
Gordon G. Cross  
Raymond D. Hammond  
J. Howard Kerstetter, Jr.  
Rine Kruger, Jr.  
Frederick A.  
MacDougall  
Richard N. Miller  
Donald R. Roberts  
Charles R. Shepherd  
Roland I. Spencer |
| 1950 | | Walter E. Donham  
David R. Hamilton III  
David W. Hardesty  
Richard H. Immel  
Verne R. Rinehart  
Richard L. Scott  
Ralph E. Sieber  
Robert E. Thompson  
David W. Wilson  
Alfred E. Withrow |
| 1951 | | Charles E. Breithaupt  
Joseph N. Craver, Jr.  
Richard N. Eilerman  
James H. Hoorman  
Rob R. MacGregor, Jr. |
Alumni and Friends who Contributed to the Department

1951
John R. Parkinson
David B. Speed
David A. Strang
Robert M. Yarrington

1952
James F. Froning
Donald E. Haupt
M. Frank Rummel
Charles J. Schmitz
David G. Stephan

1953
Robert A. Bates
Roger L. Briggs
Donald E. Findlay
James F. Froning
Wilfred C. Ling
William L. Maag
Kenneth E. Whitehead
James L. Wilson

1954
Richard E. Dudley
Gilbert E. Raines
Charles C. Thacker Jr.

1955
John Hoge
Phillip J. McAteer

1956
Robert A. Cody
William D. Coe

1957
Walter R. Andrews, Jr.
Jon D. Helms
Paul J. Kienholz
Ronald P. Rowand

1958
Edward H. Bollinger

1959
Lee W. Addie
James O. Albery
James H. Laughlin
Darryl J. Von Lehmden
Gerald A. Wilcox

1960
Virgil L. Anderson
Guy A. Crossley
Edgar W. Fasig, Jr.
Orville W. Greubmeyer, Jr.
Gordon R. Howard
K.D. Kurtz
Marion H. Marshall
Warren E. McAdams
Irwin Weinstock
Edward L. White
Russell L. Wilt

1961
Paul R. Bigley
Richard B. Cooper
Edward R. Corino
Ronald L. Follmer
Ted J. Hanson
Ronald D. Harris
John N. Rapach
Larry E. Woodworth

1962
David E. Bidstrup
Richard L. Hoffman
C. David Osbun
Dean Snider

1963
Nelson W. Barnhill
Myers G. Hammond
Robert P. Kasper
Fred A. Shaftstall
W. Howard Sidner
Kay Logan Snider

1964
Alkis Constantinides
Michael B. Cutlip
Michael F. Dague
William R. Ferris
James B. Sapp
William V. Whitmer
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Centennial Celebration to be observed next year

Chemical Engineering at the Ohio State University can trace its roots back over 100 years. Offered initially as a “B.S. in Chemistry from the College of Engineering”; the first degree was awarded to Samuel Vernon Peppel in 1899. Beginning with the 1902-1903 bulletin, *The Outline of the Course in Chemical Engineering* was listed for the first time. In 1904 the name of the degree changed to “Bachelor of Science in Chemical Engineering.” Its first two recipients were: the late Arno Fieldner and Lewis Benjamin Case. The first M.Sc. was issued in 1910 to Orlando Sweeney, the first Ph.Ds in 1918 to Drs. Herbert Spencer Coith and James Howard Young.

From 1902 to 1924, Chemical Engineering was a division of the Chemistry Department, a common practice amongst universities at that time. (The beginning of chemical engineering education is usually attributed to M.I.T. where the first course in Chemical Engineering was started in 1888.) Its first Chairman was Dr James Withrow who served from 1924-1948. In 1925, it became one of the first 10 schools to be accredited by the American Institute of Chemical Engineers.

Groundbreaking for the current building took place in 1958. It has been named for Dr. Joseph Koffolt, the department’s Chair from 1948-1968. Plans are currently underway to initiate the construction of a new facility within the next 10 years, as the department enters its second century of service to the University.
Centennial Program to be held in the Blackwell Inn – April 24-25, 2003

The theme of the April 24, 2003 all-day Symposium is “Unsolved Problems in Chemical Engineering.” The speakers will be:

Professor Michael Shuler, Cornell University, Biotechnology
Professor Matthew Tirrell, University of California at Santa Barbara, Self-Assembly (with emphasis on Nanotechnology)
Professor Arthur Westerberg, Carnegie Mellon University, Systems Engineering
Professor Howard Brenner, Massachusetts Institute of Technology, Fluid Dynamics

The theme of the April 25, 2003 morning Symposium will be “Development of the Chemical Engineering Profession in the 20th Century.” There will be a keynote speaker and talks by alumni and faculty on reminiscences and highlights of their time in the Department at Ohio State. Speakers will include:

Professor “Skip” Scriven, University of Minnesota, “Development of the Chemical Engineering Profession in the 20th Century”
Ed Slawter, B.C.1934, M.S.1935, P.R.1939
Alex Lemmon, B.C. 1943
Tom Kofolt
Eric Grulke, B.S. 1971, Ph.D. 1975

A power point show has been developed and will be shown in the afternoon. Tours of the Department will also be offered. Friday night there will be a banquet at the new Blackwell Inn.

An intrasquad football game is scheduled for Saturday, April 26.

We would like to get an idea of how many alumni will attend the April 25, 2003 Centennial Session and Banquet. Please cut out this questionnaire and mail it to Professor Fan, Chemical Engineering, Ohio State University, 140 West 19th Avenue, Columbus, Ohio 43210.

[ ] I plan to attend.
[ ] I would like to attend but I am not sure I will be able to.
[ ] I will not be able to attend.

Name_________________________________________ Class____________________
Jewels Club

As you know, the Chemical Engineering Alumni Society has been formed and every graduate of the department is a member. However, the board of governors has voted to create a special category of membership, called the JEWELS CLUB, comprised of members who contribute $50 or more annually to the general development fund of the department. If you are already a donor to the Department, that is very much appreciated and we hope that you will continue with your support. If you are in this category, we will count the first $50 of your gift as membership in the JEWELS CLUB.

All of us receive several requests annually to give to The Ohio State University, the College of Engineering and other OSU organizations. However, the Chemical Engineering Department has not done this. As a result, the department often benefits only indirectly from alumni generosity. By contributing directly to the Department, however, it is possible not only to help your alma mater, but also to focus your giving on the area of higher education that provided you with your degree.

Your giving can help make a difference. With state support declining, sometimes the only difference between an excellent chemical engineering department and a superior one are the extra funds that come from individuals and corporations. Hence, you have this opportunity to invest in the value of your degree.

In securing Dr. L.S. Fan’s endorsement of this approach, we agreed that we had no idea regarding the amount that might be donated. However, there was no uncertainty about possible use of the funds. The Chemical Engineering Department needs scholarship funds, seed money to help attract new faculty, continual upgrades of the unit operations lab, and seed money for new research projects. In addition, Koffolt Lab is aging and there currently is no really suitable meeting room for visitors from industry and others to use. When we see what funds members of the JEWELS CLUB contribute, we can be sure that L.S. will put them to good use.

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<th>Jewels Club Membership</th>
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Make Check Payable to: The Ohio State University
Department of Chemical Engineering
121A Koffolt Laboratory
140 West 19th Avenue
Columbus, OH 43210
(and on the memo line - Fund # 302693)