University at Buffalo The State University of New York

# CHEMICAL ENGINEERING NEWS

Fall 1999 1999

## Message From The Chair

**Carl R. F. Lund**

Well, we're finally doing it: a U. B. Chemical Engineering Newsletter. Hopefully you received a letter from me this summer telling you that this newsletter was coming. The response to that mailing was very encouraging; it was great to hear back from so many of you. It's always very rewarding as faculty to hear how well our former students have done and to see their careers advancing. You'll find a tear-off in this issue where you can send us some recent news, or if you have internet access, you can send it by e-mail or via our web site. In future issues we'd like to have a section of the newsletter devoted to alumni news.

This being the first issue of our newsletter, we had enough ideas to fill dozens of pages, but we're holding most of them for future issues. Since the vast majority of you graduated before 1997, you probably don't know 40% of the present faculty. For this reason, we felt it was good to use this issue to introduce you to our five assistant professors. They are an outstanding and highly talented group, and their presence here bodes very, very well for the future of the department.

Last summer's symposium in honor of Professor Ruckenstein was quite successful. The prestigious group of invited speakers delivered an outstanding set of lectures reflecting the state of the art in several branches of chemical engineering. You may already know that there will also be a full day's symposium at the AIChE meeting in Dallas to further honor Professor Ruckenstein. After that symposium, on the evening of Monday, November 1, the department will host an open house. We hope that if you're at the meeting, you'll stop in and see us. Also at the meeting, our undergraduates will be competing in the environmental design contest, following up on their winning performance in the northeast region. While you're at the meeting, you might want to add your congratulations to ours for Dr. Scott Diamond, a former member of our faculty who was selected as this year's Allan P. Colburn Award winner.

A few of the other things we're working on include a complete redesign and modernization of our undergraduate labs. We are entering the planning stage to overhaul the labs so that they better reflect current industrial practice. We're also starting some long-overdue post-graduation assessments of our program. If you'd be interested in participating in these assessments, by which we hope to identify areas of strength and weakness in our curriculum, please let us know. And, of course, we'll be getting the spring issue of the newsletter together, too. ●

You are cordially invited to join us in honoring Dr. Eli Ruckenstein at our hospitality room at the AIChE Meeting in Dallas

The Coral Room
Wyndham Anatole Hotel
Monday, November 1, 1999
6:30 - 8:30 pm

# Meet CE's Most Recent Faculty Members

***Dr. Paschalis Alexandridis*** joined the Chemical Engineering Department at the University at Buffalo in January 1997. Professor Alexandridis received his PhD degree in chemical engineering from the Massachusetts Institute of Technology in 1994. He held a postdoc position at the Division of Physical Chemistry 1 at Lund University in Sweden before arriving at UB.

His research spans the areas of polymers, colloids and surfaces, with a current focus on block copolymers in the presence of selective solvents. Of particular interest are the thermodynamics (phase behavior), (self-assembled) microstructure, and dynamics (diffusion, rheology, dissolution). Other ongoing polymer projects deal with gels and adhesion. In the fields of colloids and surfaces, Professor Alexandridis has contributed to the self-assembly of amphiphiles in solution (micelles, microemulsions, vesicles, solubilization), lyotropic liquid crystals, polymer-surfactant interactions, molecular recognition, adsorption of amphiphiles at surfaces, and wetting.

Dr. Alexandridis is the author or co-author of more than 60 journal articles and book chapters, and co-editor of a book on "Amphiphilic Block Copolymers." His honors include the U.S. National Science Foundation Faculty Early Career Development Award, the Dow Outstanding New Faculty Award from the American Society for Engineering Education, the Riefler Award from the University at Buffalo, and the American Oil Chemists' Society Outstanding Presentation Award.

At UB, Professor Alexandridis teaches graduate and undergraduate courses on polymers, colloids, and surfaces, as well as the Introduction to Chemical Engineering course, and is supervising the research of 6 graduate students. His research is currently being funded by the National Science Foundation, Petroleum Research Fund, Bausch & Lomb, Xerox, as well as other sources, and it involves numerous national and international collaborations.•

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***Dr. Stelios T. Andreadis*** recently joined the department in August 1998. He attended Aristotle University in Thessaloniki, Greece where he graduated with a B.S. in chemical engineering in 1991. He received his M.S. in chemical engineering from the University of Michigan in 1992. In 1996, he received both, his M.S. degree in applied mathematics and his Ph.D in chemical engineering, also from the University of Michigan. The next two years he spent as a post-doctoral fellow at the Massachusetts General Hospital/Harvard Medical School and the Shriners Burns Hospital for Children.

Dr. Andreadis' research interests lie in the field of gene therapy and tissue engineering of skin substitutes. Work in his laboratory focuses on the kinetic and quantitative aspects of retrovirus-mediated gene transfer and involves both experimental and mathematical approaches. The technology of gene transfer is also used in tissue engineering to prepare genetically modified skin equivalents for studies on tissue morphogenesis and wound healing. The ultimate goal is to develop skin grafts with improved properties for the treatment of patients with burns, injuries or genetic defects. His research is funded by the Whitaker Foundation.

While at UB, Dr. Andreadis has taught the undergraduate Chemical Reaction Kinetics course and graduate Advanced Biochemical Engineering.•

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***Dr. Ashish Gupta*** joined the Chemical Engineering Department as Assistant Professor in January 1997. Dr. Gupta grew up in New Delhi, India. He received his B.E. in chemical engineering with honors from the University of Roorke, India, in 1989. In 1995, he earned a Ph.D. in chemical engineering at the University of California, Los Angeles, with a minor in operations research. His thesis research was on mass exchange network synthesis for process design and integration. He was awarded an ARCO Research Fellowship, and an award for the Best Teaching Assistant in the department. He stayed on at UCLA as a postgraduate researcher. In 1996, he worked as a Senior Engineer at Simulation Sciences, Inc., Brea, CA, where he implemented a new distillation simulation algorithm for PRO/II, their mainstay process simulation software.

Dr. Gupta's primary research interest is in the area of process synthesis and optimization, especially for pollution prevention. The broad goal of this research is to develop a

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framework for systematic process and plant design. The approach exploits waste recycling and reduction opportunities inherent in current designs, leading to low cost, environmentally benign processes. Along with Dr. Michael Ryan, he runs a summer research experience for undergraduates site at UB on this topic funded by the National Science Foundation (NSF).

Currently his group is working on the global optimization of thermodynamically accurate, hybrid power cycles. His research group is being funded by the U.S. Departments of Education and Energy, NSF, UB, NY State Great Lakes Protection Fund, and local companies.

Dr. Gupta teaches the senior design course, and graduate courses on Pollution Prevention in the Great Lakes, separation process design, and optimization. He and his wife, Hira, live in Snyder, NY.•

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***Dr. Sriram Neelamegham*** joined the department in the Fall of 1997. He completed his Ph.D. at the Rice University followed by a two-year postdoctoral fellowship at the Baylor College of Medicine in Houston, Texas.

Professor Neelamegham currently conducts research at the Biotechnology Laboratory on the 9$^{th}$ floor of Furnas Hall. His primary research interests lie in the field of biomedical engineering, as it relates to inflammatory and cardiovascular disorders. In collaboration with other researchers at the UB Dental School and Roswell Park, his research projects examine the function of blood cells and endothelial cells in regulating vascular diseases. Based on these studies, new mechanisms to control the progress of these diseases are proposed.

Dr. Neelamegham has taught the undergraduate Transport Processes II course and undergraduate and graduate Biochemical Engineering.•

***Dr. Mark Swihart*** joined the Chemical Engineering Department as Assistant Professor in August 1998. Dr. Swihart grew up in rural Indiana. He attended Rice University in Houston, Texas, where he graduated Summa Cum Laude with a B.S. in chemical engineering. He earned his Ph.D. in chemical engineering at the University of Minnesota, where his thesis research was on gas phase chemical kinetics and the detailed modeling of chemical vapor deposition processes. He was awarded a National Science Foundation Graduate Fellowship and a University of Minnesota Doctoral Dissertation Fellowship for his graduate work. Before joining the faculty at UB, he spent one year as a postdoctoral researcher in the Department of Mechanical Engineering at the University of Minnesota, studying the formation of silicon nanoparticles and modeling the chemical vapor deposition of diamond thin films.

Dr. Swihart's current research continues along these themes in the general area of fundamental studies of vapor phase processing of advanced materials. Ongoing projects in Professor Swihart's research group here at UB involve chemical kinetic modeling of the nucleation of silicon nanoparticles; experimental synthesis and characterization of nanoparticles in a continuous laser driven reactor; measurement of high temperature chemical kinetics; and computational chemistry studies of species thermochemistry and reaction paths for combustion and materials synthesis processes.

Dr. Swihart has taught the graduate Kinetics and Reaction Engineering course and the second undergraduate Chemical Engineering Lab course.

He and his wife, Wendy, live in Williamsville, NY. They have been married for nearly 6 years and are expecting their first child in February 2000.●

**For more information on these, and other Chemical Engineering Faculty, visit our website at: www.cheme.buffalo.edu**

# A Brief History of the Department

**By Thomas W. Weber**

When I joined this Department in January of 1963 as its fourth full-time faculty member, becoming its Historian was not exactly the position I aspired to, but after 36 years, I guess I have most of the qualifications, except for a perfect memory. If I left anything important out, just let me know!

UB was actually founded in 1846 as a school of medicine and then grew to become a sizeable university. The State University of New York at Buffalo was established in 1948, and UB was merged into SUNY in 1962. In those days, tuition was a *mere* $500 a year for undergraduates and $700 a year for graduate students. Joe Bergantz, a local consultant with considerable research and development experience in industry, was hired part-time to design a Chemical Engineering program for the School of Engineering. An outgrowth of this was the hiring of Don Brutvan, who became the first full-time faculty member in the Spring of 1961. In May, a formal announcement of our B.S. and M.S. programs was made. Joe came on as a full-time Professor and Chair, and Bill Mathewson, who had just completed his Ph.D. at Cornell, was hired.

A new Chemical Engineering Building was to be built in the vicinity of Parker Engineering Building on the Main Street Campus. An architect drew up some beautiful plans for a 66,000 square-foot building with laboratories and classrooms. Earliest occupancy was planned for the middle of 1964. (As it turned out, the building was nothing more than a dream.)

The Department's first full year of operation was 1961-62. Joe, Don, and Bill taught several courses to about 40 part-time graduate students. Ray Ewell, the Vice Chancellor for Research at UB, taught a special course in thermodynamics. In the second year, new sophomore and junior courses were offered to undergraduates and a Ph.D. program was authorized. I was hired in January of 1963 to cover the newly emerging area of Process Control. I taught that course and the advanced mathematics course for graduate students in Chemical Engineering. It was a real test of endurance and a challenge to keep people awake on Tuesday and Thursday evenings. I would teach one of the courses from about 6:30 to 8:00, and the other from 8:30 to 10:00.

In the Fall of 1963, Dave Johnston joined us from the University of California. Our Graduate Program consisted of three evening courses that semester. Dave taught the course in Advanced Mathematics, Don gave a course in Phase Equilibria and Staged Operations, and I taught Transport Phenomena using a new book by Bird, Stewart, and Lightfoot. We were beginning to teach some undergraduate day courses as well. Each of us taught two courses each semester, and in most cases they were new ones which we had never taught before. We expected that we would finally graduate two M.S. and five B.S. students by the Fall of 1964.

Dave Johnston stayed on for only a year and then decided to go to divinity school – sounds a bit unusual, but Dave's father was a minister. Bill Mathewson left to seek his fortunes in industry. Three new faculty joined in 1964, namely Ken Kiser, Harry Cullinan, and Bob Good. Sol Weller came on the next year.

Most of the faculty were in Parker Engineering and a couple of us had offices and labs in Acheson Chemistry. In 1966, we finally got our own building – not the one that an architect had drawn the plans for -- but a pre-fabricated, metal-walled "Butler" building that was set up between Acheson Chemistry and Parker Engineering. It housed our departmental offices, a huge open-bay area in the center for the Unit Operations Lab, Bob Heisler's shop, and small labs around the periphery for graduate students. Aptly named the "Chemical Engineering Building," that building was a *vibrant* place! Some of the faculty had their offices in another nearby pre-fab building, Acheson Annex. Most of those offices were internal with no windows, but some of the external offices didn't have windows either. The Administration didn't want us to be distracted! One the seniors – I think it was George DiPirro – took pity on Ken Kiser. He drew a picture for Ken to hang on his wall that showed what he would have seen if he had had a window!

New faculty were added in 1966-67 – Julian Szekely, Ken O'Driscoll, Paul Ehrlich, and John Howell. Harmon Ray followed in 1970. In 1968, Joe went on a sabbatical to England and Sol Weller stepped in as Acting Chair. Upon his return, Joe became an Associate Dean and Harry Cullinan became the Chair. When Harry went on sabbatical in 1972, Sol again served as Acting Chair. In 1976, Joe unexpectedly passed away. Harry left to become the Vice President of Academic Affairs at the Pulp and Paper Institute in Appleton, Wisconsin. The Department was then under Acting Chairs for two years – first Sol Weller, and then Ken Kiser. In the meantime, Bill Gill had joined the Engineering School as Dean in 1971, Eli Ruckenstein came in 1973, Paul Phillips in 1974, Mike Ryan in 1976, and Pieter Stroeve in 1977.

As we moved to the new campus in 1978, Jarda Ulbrecht arrived from England to become Chair. Carel van Oss from Microbiology became an Adjunct member of the Department and has played an active role in the Department since then. Ralph Yang joined the Department shortly thereafter, followed by Graham Andrews in 1979, and by Rakesh Gupta and Vladimir Hlavacek in 1981. Jarda went on a leave-of-absence in 1982 and I became Chairman, a position I held for seven years.

Chester Ho arrived in 1984, John Tsamopoulos, in 1985, and the next year, Carl Lund. Bill Gill, who had stepped down as Dean in 1976, left in 1987 to become Department Chair at R.P.I. In 1989, I was replaced as Chair by Ralph Yang. After six years, he left to become Chair at the University of Michigan. Ken Kiser, who had been Associate Dean of Engineering, returned to the Department full-time as Chair until he retired in 1997.

Most of the current faculty have been hired since 1989: Dave Kofke and Lakis Mountziaris in 1989, Johannes Nitsche and Scott Diamond (now at U. of Pennsylvania) in 1990, Deborah Leckband in 1993 (now at U. of Illinois), Ashish Gupta, Paschalis Alexandridis, and Sriram Neelamegham in 1997, and Stylianos Andreadis and Mark Swihart in 1998.

Our first retirees were Don Brutvan and Sol Weller in 1989, and Paul Ehrlich and Bob Good in 1991. Ken Kiser retired in 1997. All are still living in the area except Paul who moved to New Hampshire. Both Sol and Bob can be found in their offices several times a week.●

**1999 Chemical Engineering Graduate Research Symposium**

**Friday, November 12, 1999**
**414 Bonner Hall**
**UB North Campus**

**3:15 p.m. – Dr. Randal M. Hill**
*Central R&D, Dow Corning Corp., Midland, MI*
*"Aqueous Phase Behavior of Silicon Surfactants"*

**4:20 p.m. – Prof. David Mooney**
*Dept. of Chemical Engineering, University of Michigan, Ann Arbor, MI*
*"Cell Interactive Polymers for Tissue Engineering"*

**5:15 p.m. – Chemical Engineering Graduate Research Poster Presentation**
*Introductory remarks by Dr. Carl Lund, Chair*

**6:15 p.m. – "Best Poster" Awards and Closing Remarks**
*Dr. Carl Lund, Chair*

*Wine and cheese will be served.*

Congratulations to

*Jian Hang Yu*

winner of the

1998-1999

Donald F. Othmer

Sophomore Academic

Excellence Award!

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We would like to hear from you! Please take a few minutes to fill out the form below and mail it to us, and let us know how you're doing. Having now put your education to practice, you might also have suggestions on how we can do a better job in training chemical engineers. Please tell us; we are eager to hear your comments and advice.

Name: _____

UB CE degree(s) and years: _____

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Address: _____

News/Comments: _____

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