Newsletter of the LSU Macromolecular Studies Group

Fall 2000

What's New? from Paul Russo and Bill Daly, co-directors

CMC-IGERT

This year's lead story concerns a new, $2.7 Million IGERT grant from the National Science Foundation. IGERT stands for Integrative Graduate Education Research Training. Designed to reinvigorate and reform graduate training, IGERT is among NSF's most competitive programs (about 5% success rate). LSU's new Craft for Macromolecular Creativity project is the nation's first IGERT award devoted to macromolecular studies. The reviewers lauded LSU's outstanding physical resources, imaginative research ideas and commitment to interdisciplinary teaching. Who are we to argue? This program combines the resources and talents of 8 departments at LSU, plus great off-campus participants at Dow, Union Carbide, Exxon, DuPont, DSM-Copolymer, USDA, the University of Cincinnati, Middle East Technical University in Turkey and the Max-Planck Institute for Polymers in Germany. We are actively seeking additional off-campus participants, so let us know if you're interested.

more than the sum of the parts

CMC-IGERT will apply innovative teaching methods to educate and train about 30 Ph.D.'s over the next 5 years. Students, who must be U.S. citizens, will receive Ph.D. degrees in Biological Sciences (Biochemistry or Biophysics), Chemistry, Chemical Engineering, Education, Mechanical Engineering, Physics, Textiles or Veterinary Medicine. Pending university approval, they will also receive a degree certification in Macromolecular Studies. CMC-IGERT students will have special opportunities and obligations. They must complete a rigorous curriculum, designed to look at polymers and biopolymers from all sides. Their research will be co-directed by a well-funded faculty team working towards a new objective that could not be achieved outside the team environment. For example, a chemist and a chemical engineer might share two IGERT students to optimize phase relationships and characterize molecular properties in environmentally benign solvents. See the IGERT website (http://russo.chem.lsu.edu/igertweb) for

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Professor David Spivak

David Spivak joined the Chemistry Department in 1998. He is an organic/polymer chemist interested in the development of new synthetic organic methodology, polymerization methods, and novel organic polymer materials. David went to U.C. Berkeley (B.S. in Chemistry,1989), where he was involved in undergraduate research with Paul A. Bartlett and Judith Klinman. David then went on to U.C. Irvine for graduate work (Ph.D. in Polymer Chemistry under Kenneth J. Shea,1995). This work led to fundamental contributions in the field of Molecular Imprinting which set the standard for further work in this area. In 1995, David went to the Scripps Research Institute as an NIH Post-Doctoral fellowship, awarded for the first studies on polymerization catalyzed by an antibody.

David has broad interests; while his background is in polymer chemistry, synthetic organic chemistry, biochemistry, and enzymology, he has also acquired skills in immunology and molecular biology. His current research involves the development of synthetic methodology applied to construction of organic and bioorganic polymers with engineered architecture, functionality and function. Potential applications of different aspects of his work are in the areas of chromatography, catalysis, biomedical materials, molecular recognition, electronics, and sensor technology.

Since his arrival at LSU, David

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details of this project as well as others.

A major emphasis within CMC-IGERT is increasing the time professors can spend actually teaching their students. Normally, professors spend a lot of time writing proposals. As IGERT students will be supplied "free of charge" to a faculty team that has already demonstrated proficiency in obtaining funds, the professors are liberated to work side-by-side, day-by-day with the student in the lab for a period of about one month. Professors must be involved actively at the birth of their new interdisciplinary project. Thus, IGERT faculty are not mere financiers of research. They must demonstrate to the student how things get done--quickly, efficiently, with good records, good cheer and data integrity that can lead to a written report within the first year. In many cases, industrial scientists and engineers will be involved. After "apprenticeship" with Ph.D. level researchers, the student works more independently and progressively acquires more responsibilities. Students at this stage are called "artisans". They can write "minigrants" to visit other research sites such as the Max-Planck Institute in Mainz or other partners in CMC-IGERT. To encourage creativity, students can write minigrants for supplies, travel or minor equipment with which to pursue an original idea. This can lead to a sole-authored paper. They will receive formal training in scientific ethics. They will be coached on subjects ranging from patent law to starting one's own small business. They are required to complete a small community service project (example: polymer demonstrations in elementary schools). Near the end of their graduate career, qualified students can apply to study at a great research laboratory anywhere in the world. This experience will offer some of the advantages and professional contacts of a postdoctoral appointment in less time. We hope you will agree that CMC-IGERT is not "business as usual" in graduate education.

Personnel Changes

Lynn W. Jelinski (formerly of Cornell) joined LSU as Vice Chancellor for Research and Dean of the Graduate School. Unfortunately, her stay at LSU was a short one. Citing family illness, Jelinski recently resigned, after only one and a half years. We miss Lynn already!

Three new hires are Assistant Professor David Spivak (see feature—page 1), Assistant Professor

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Alumni News

Paul Russo and Graduate Students Randy Cush and Garrett Doucet attended the American Physical Society Centennial Meeting in Atlanta, Georgia, March 1999 (Thanks to the National Science Foundation and the LSU Macromolecular Studies Group for support).

Co-operative Internships in Industry. Mr. Garrett Doucet pioneered an internship with Dow Chemical in Plaquemine, Louisiana, and also in Freeport, Texas. He was supported for one semester in lieu of his regular teaching / research support. Both parties seemed to benefit from the arrangement. The Department hopes this kind of industrial interaction and support will prove increasingly popular. If your company has an interest in identifying great talent at an early stage, while providing the student with a nurturing, professional environment, please contact us.

Zimei Bu (Ph.D. 1994 with Russo) has completed her NIH Fellowship at Yale University and will move to the National Institute for Standards and Technology in Gaithersburg, Maryland, to pursue neutron scattering studies.

Tahir Jamil (Postdoc 1995 with Russo) has taken a position with the Saudi Arabian Basic Industry Council in Saudi Arabia.

Dr. Mazidah Mustafa (Ph.D. 1994, Russo) is raising two adorable sons in the Detroit, Michigan, area. She says returning to the science lab is looking better all the time, but moms have the most important job.

Dr. Daewon Sohn (Ph.D. 1995, Russo) is an assistant professor at Han Yang University in Seoul, Korea. He is building a nicely equipped lab, including dynamic light scattering, surface methods and fluorescence photobleaching recovery. He sent a student for extended study at LSU last spring.

Debbie Tipton (Ph.D. 1994 with Russo) has accepted a position at Chevron in Orange, Texas. She will soon be relocated to Bartlesville, Oklahoma.

Dr. Keunok Yu (Ph.D. 1995, Russo) is an instructor at Kunsan National University in Korea. She has graciously synthesized some two-dimensional dendrimers for studies of self-assembly.

Doris Culberson (Ph.D., 1995, Daly) is currently working as a Senior Research Chemist at Solutia, P. O. Box 97, Gonzalez, FL 32560-0097. Bill Daly saw Doris at the ACS meeting in New Orleans and

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(**What's New**, *Continued from page 2*)

Vince Licata (Biological Sciences and Chemistry) and Assistant Professor Thomas Cleij (Chemical Engineering).

John and Billie Collier took positions at the University of Tennessee in Knoxville. Billie is associate dean of Human Ecology there, and John chairs the chemical engineering department. Although we were sad to see John and Billie leave, it's great that they can be close to their new grandchild in Knoxville. We are thankful for their hard work on behalf of the Macromolecular Studies Group and other interdisciplinary activities at LSU. Mac Radosz of Chemical Engineering has just moved to the University of Wyoming, where he will chair the Department of Chemical and Petroleum Engineering. Mac's genteel presence will be sorely missed.

New Curriculum

After many years, we have revised the curriculum. Entering graduate students and qualified undergrads can take a two-semester, integrated lab/lecture course called Macromolecular Systems I and II. These courses are team-taught by faculty across several departments. In the lab, students learn by using absolutely first-rate, research-grade polymer equipment which is surely among the best available in any academic institution. In addition to synthesis, they discover methods such as GPC (in its several incarnations), dynamic light scattering, microscopy, analytical ultracentrifugation, densitometry, rheology, NMR and gel electrophoresis. The IGERT program commits us to develop synchrotron small angle X-ray scattering, and still other experiments will be added as the courses evolve. Also, two additional, graduate-only courses and an interdepartmental seminar will be developed. Meanwhile, check the growing website for MS-I and MS-II: http://russo.chem.lsu.edu/.

Thank You

We are grateful to all those who donated to the program last year. Wyatt Technology Corporation generously assisted with the upgrade to the Polymer Analysis Laboratory. We now have two fully functional DAWN DSP GPC/LS instruments, one for organic solvents and one for aqueous work. They ensure that all students can acquire expertise in the important GPC/LS method, both in the classroom and in research. Wyatt's support permits absolute characterization for most samples, and the instruments are used routinely by several groups. We have

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Recent Seminars

Jeffrey Moore, University of Illinois at Urbana Champaign, "Folding Nonbiological Oligomers in Solution

Lynn Jelinski, LSU, "Spider Silk: NMR Studies of Structure, Orientation, & Dynamics"

George Newkome, University of South Florida, "Supra-Supermolecular Chemistry: Chemistry Within the Dendrimer"

Karen Wooley, Washington University in St. Louis, "Nanostructured Materials: Design, Synthesis, and Characterization"

Ben Chu, SUNY at Stony Brook, "DNA Capillary and Surface Electrophoresis"

Jimmy Mays, University of Alabama at Birmingham, "Novel Graft Copolymer Architectures by Anionic Polymerization"

Bob Pelton, McMaster University, "Thermoresponsive Aqueous Microgels"

Peter Butko, University of Southern Mississippi, 'Membrane interactions of the delta-endotoxin CytA from Bacillus thuringiensis var. israelensis"

Charles Han, NIST, "Structure Formation and Scaling in Polymer Mixtures Under Simple Shear Flow"

John Reynolds, University of Florida, "Redox Properties of Conjugated and Electrochromic Polymers"

Mark DeLong, Union Carbide Co. "Flow Injection Analysis Static Light Scattering: Two-minute Molecular Weight Determination "

David Lohse, Exxon, "The Role of Chain Packing in Polyolefin Rheology and Mixing "

Matthew Tirrell, University of California at Santa Barbara, "Creating Functional Biomolecular Architectures on Surfaces"

Alan Guymon, U. of Southern Mississippi, "Photopolymerization of Lyotropic Liquid Crystalline Systems: A New Route to Nanostructured Materials "

David Venerus, Illinois Institute of Technology, "Anisotropic Thermal Conductivity in Deforming Polymers"
Warren Ford, Oklahoma State Univ., "[60] Fullerene-Containing Polymers: What Happens to a Compound

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(**Thank You,** *Continued from page 3*)

welcomed several industrial visitors who are interested in the GPC/LS method. There's more! The Polymer Analysis Laboratory is now the proud owner of a new Viscotek T60A GPC/LS/Vis instrument, and we thank Viscotek for providing much assistance and advice. The T60A also figures prominently in coursework training, and plays a special role in the synthetic research effort by providing rapid, high-quality characterization data.

We also thank Dow Chemical for their contribution of $30,000 to the Macromolecular Development Fund. Additionally, Dow established an annual student award for Excellence in Macromolecular Studies. Each year, the top student in any member department will receive a portion of the proceeds from this $10,000 endowment. Students will be encouraged to spend these funds productively (if they choose to attend a meeting, they will probably receive additional funds). The first winner is Mr. Garrett Doucet of St. Charles parish, Louisiana. Garrett completed a one-semester internship in polymer characterization at Dow's facilities in Plaquemine, LA, and Freeport, TX. This was a very beneficial experience for both parties, so it's appropriate that Garrett receive the first Dow Excellence award.

During a well-organized tour, Exxon provided the MS-I class with a long look at the real world of polymer production and processing. Exxon's Baton Rouge plant is well equipped for this type of training, as it is here that many of the nation's polyethylene processors train. This is the type of practical knowledge that no university can provide; most chemists and many engineers graduate without an appreciation for the sheer scale of commercial production and processing operations, or the emphasis on safety and efficiency. The students looked great in their Exxon jumpsuits and hard-hats. Next year we have got to get that photo.

Union Carbide again provided an internship for undergraduate student Holly Ricks (we suspect that they may have identified a potential hire at a very early stage). If your company is interested in a co-op student, at either the graduate or undergraduate level, please notify any MSG member. You can find us on the website easily: http://msg.chem.lsu.edu

We challenge all our corporate partners to contribute what they can. MSG is an excellent investment in the future. Don't forget about tax-deductible individual contributions to the Macromolecular Development Fund! Many companies will match your individual donation, and these funds help provide critical educational and research opportunities for the next generation of MSG graduates. A special request to all you former MSG students. It may have seemed a hard life in graduate school, but you almost surely benefited in some way from the generosity of previous donors. Now it's your turn! Every little bit helps.

(**Recent Seminars,** *Continued from page 3)*

with 30 Double Bonds during Radical Polymerization?"

Ron Kander, Virginia Tech, "Materials-Related Challenges in Fuel Cell Research"

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she is doing well.

Jack Dean Davies (Ph.D., 1996, Daly) is currently working at Shakespeare Monofilament, Inc. as a Senior Polymer Chemist. The company address is Shakespeare Road, Columbia SC 29223. Jack is responsible for developing new products for Shakespeare and has several new materials in the pipeline.

Tim Evenson (Ph.D., 1999, Daly) Deceased March 28, 1999. Tim's degree was awarded posthumously May 1999.

Carey C. Geiger (Ph.D., 1993, Daly) is currently working at First Mississippi Chemical in Pascagoula, MS 39558 and living at 2513 San Jacinto Drive, Gauthier, MS 39553.

Soo Lee (Ph.D., 1988, Daly) is a Professor in the Department of Chemistry Technology Changwon National Univ. in Changwon, Kyungnam, Korea. His home address is Lucky Apt. 12-1001, Banlim-dong,
Changwon, Kyungnam. Korea. Bill Daly visited Soo Lee in 1997 and found him working very hard to establish a research group at his university on fiber spinning techniques. He had spent several years working in a local fiber company and is receiving some support from them.

Javier Macossay (Ph.D., 1995, Daly) is an Assistant Professor on Facultad de Ciencias Quimicas at Escuela de Graduados en Administracion y Ingenieria Industrial, Guerrero y Progreso Apartado Postal 1864, Monterrey, N.L., Mexico C. P. 64550. He lives at Ave. Adolfo Lopez Mateos #904, Col. La Roco, Guadalupe, N. L. 67180 Mexico and has three children at last count. Javier is currently the visiting scholar at Southwest Texas State University in San Mar-

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(**Alumni News**, Continued from page 4)

cos, Texas, working with Prof. Patrick Cassidy.

Melissa Manuszak Guerrini (Ph.D., 1997, Daly) is completing the second year of an industrially sponsored post-doc at Universite' Pierre et Marie Curie, Laboratoire de Chimie Macromole'culaire, Tour 44 - 4 Place Jussieu, 75252 Paris, Cedex 05, France.

James Larry Morris (Ph.D., 1994, Daly) is working at C. K. Witco Corporation, P. O. Box 391, 31191 Highway 30, Geismar, LA 70734. He is finding that scaling up chemical reactions to a 10,000 lb/hr productions is quite challenging.

Saad Moulay (Ph.D., 1986, Daly) is a Professor at Institut de Chemie Industrialle, Universite' de Blida, Route de Soumaa, BP 270 Blida, Algeria.

Javier Nakamatsu (Ph.D., 1995, Daly) is a Professor at Pontificia Universidad Catolica del Peru, Departamento de Quimica, Antequera 740, San Isidro - Lima 27, Peru. He is conducting research on plasma modification of polymer surfaces and has been successful in attracting grant support for the project.

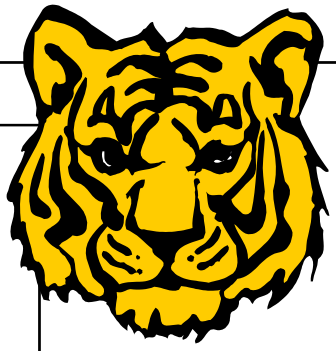
Drew Poche'(Ph.D., 1990, Daly) is back at Dow Plaquemine Research Laboratories, Plaquemine, LA after a successful sojourn at University of Southeastern University in Hammond. Drew trained some excellent undergraduate students, and conducted research leading to publications and a successful grant proposal, but Dow made him an offer which he could not refuse.

Zhaoyao Qiu (Ph.D., 1994, Daly) moved from Grant Chemical to DSM Copolymer, 5955 Scenic Highway, Baton Rouge, LA 70821, where he is a research chemist.

Frederick Roos (Ph.D., 1994, Daly) was employed as an independent computer consultant in New York. After recovering from a bout with hepatitis, he has relocated to Minneapolis where he works for Minnesota Public Radio. Think of Fred when you listen to the Prairie Home Companion.

Cholchita (Sue) Rungaroonthaikul (Ph.D., 1986, Daly) is a Professor of Chemistry in the Department of Chemistry, Kasetsart University, P.O. Box 1011, Kasetsart, Bangkok 10903, Thailand. Sue writes that she is focusing her research in the field of "biodegradable polymers" especially polymer blends using tapioca starch.

Amnard Sittattrakul (Ph.D., 1985, Daly) is a Professor of Chemistry, Faculty of Science, Silpakorn University, Nakorn, Pathom 73000 Thailand.



(**David Spivak**, Continued from page 1)

has formed a group of five graduate students, and a post-doctoral researcher. He has received several research grants and awards including an NSF-CRIF award, a PRF grant, and the Oak Ridge Associated Universities, Ralph E. Powe Junior Faculty Enhancement Award. While at LSU, David has also found time to marry his sweetheart Adele, and they are expecting twins next June. When not in the lab or writing proposals (a rare occurrence) David likes canoeing the Louisiana bayous and rivers, camping, and participating in the Southdowns Mardi Gras Parade.

Please send us your announcements, material, and submissions for this newsletter.

Dear Friend of Macromolecular Science:

This year marks the beginning of a new era full of hopeful possibilities. A new generation of students fueled by a new method of teaching can propel macromolecular training at LSU to the highest levels. At this time, we ask for your moral support and financial assistance with MSG projects now underway, and those planned for the year 2001 and beyond. Consider yourself invited to visit LSU any time and see the progress for yourself.

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✓ I wish to contribute

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Again, please send us your announcements and submissions for this newsletter.