…Serving Chemical Engineers Who Serve the World

Mid-Michigan Section Newsletter

AIChE Mid-Michigan Section Mission: To provide opportunities to continuously develop our members professionally while working with the community to provide a positive view of science and engineering.

Editor: Paul Kehl (voice mail: 989-496-3021, fax: 989-496-4900, e-mail: Paul Kehl)

Title:	AIChE Mid-Michigan Section Newsletter
Issue date:	May 8, 2008
Statement of frequency:	Published irregularly
Address:	American Institute of Chemical Engineers, Mid-Michigan Section P.O. Box 2496 Midland, MI 48641-2496
Issue no.:	Volume 12, Issue 1
Web site:	http://www.mmaiche.org

Newsletter Highlights…

The Mid-Michigan Section has chosen its yearly scholarship winners. Read starting on page 6.

This month, the Mid-Michigan Section will hold its awards banquet with keynote speaker **Peter Sinclair** "**Climate and Energy: Planning for a New Paradigm**." See page 3.

In this issue…

Words from the Chair…

It is hard to believe another AIChE year is about to come to a close.

In September, I had grand plans on all I wanted to accomplish this year. First and foremost on my mind was the question we as a section had been pondering the last several years – how do we increase the relevancy of AIChE among today's professionals? This is not a unique challenge to our section, as the Institute on the national level is also in a state of transition to meet the ever-changing needs of today's chemical engineers. I felt a logical place to start was within our executive leadership team. I challenged each committee leader to identify the top one or two goals he or she saw as most important for the section and how their specific role tied into those goals. Each member was faithful in giving their feedback and I was excited to see where it would lead us as we sought to "re-brand" the Mid-Michigan Section; to pare the Section down to a few basic areas in which we excel rather than trying to be all things to all people.

Then, life happened. I was out of town frequently on business travel. In November, we welcomed a second daughter into our family and I took a subsequent three-month maternity leave. (Kudos to the Executive Committee for keeping the ship sailing during my absence.) Upon my return, implementation of the plans that I started seemed insurmountable.

I will be proud to turn over the gavel this year to Kip Mercure as our next Section Chair. Kip has been extensively involved in the local Section for as long as I can remember and is the obvious choice to move the Section forward in ways that I could only dream of this year. The topic of relevancy is still a burning question and Kip and the rest of the Executive Committee remain poised to tackle that challenge in the coming months.

Although I would not classify my tenure as Chair as a success, I remain committed to the organization and am proud to be part of a section that values Education Outreach. From providing scholarships to young scientists and engineers to participating in classroom demonstrations, I believe our commitment to the next generation is what will keep the Mid-Michigan Section strong and relevant. As our Section continues to evolve, what we do today will have an impact on meeting the needs of tomorrow.

As always, comments and suggestions are appreciated. I hope to see you at the upcoming banquet.

Erin Lacher
Mid-Michigan AIChE Section Chair

Mid-Michigan AIChE to Hold Annual Awards Banquet

The Mid-Michigan Section of the American Institute of Chemical Engineers
cordially invites you to its **annual banquet** to be held on
Thursday, May 22, 2008

Join the AIChE at its annual banquet at the **Tuscany Hall in Midland**. The guest speaker, **Peter Sinclair**, will deliver the talk "**Climate and Energy: Planning for a New Paradigm**."

Peter Sinclair is a lifelong resident of Michigan, a graduate of the University of Michigan, and a long-time advocate of environmental awareness in the Great Lakes area. An award-winning graphic artist, illustrator, and animator, Mr. Sinclair runs Greenman Studio from his home in Midland, MI.

Mr. Sinclair is one of a thousand individual Climate Presenters trained by the world's leading climate experts and Nobel Winner Al Gore to present the facts of global climate change to grassroots audiences throughout America. Since January of 2007, He has made this presentation throughout Michigan to thousands of citizens in civic groups, churches, schools, universities, colleges, and regulatory and governmental groups.

Mr. Sinclair will present an update on current conditions in the arctic, climate feedback loops and amplifiers, and the prospect of climate "tipping points." With vivid animations and video, the presentation will summarize the latest data from NASA, the Jet Propulsion Laboratory, the National Snow and Ice Data Center, the National Academy of Science, and the US Navy.

In addition, there will be an illuminating overview of the technology currently being deployed for a carbon-free, renewable energy system, a smart electrical grid, and the emerging "Electranet."

When: Thursday, May 22, 2008

Where: **Tuscany Hall, 801 E. Wackerly St., Midland, MI 48642-7046, 989-631-3821**

Agenda: 5:30–6:00 p.m., Social time with cash bar
6:00–6:05 p.m., Welcoming comments by Erin Lacher
6:05–7:00 p.m., Dinner
7:00–7:20 p.m., Scholarship presentations
7:20–7:50 p.m., Presentation of chapter awards and committee gifts, passing of the gavel
7:50–8:30 p.m., Peter Sinclair, "Climate and Energy: Planning for a New Paradigm." Question and answer period to follow.

Menu: Buffet dinner with French rolls, garlic sticks, tossed garden salad, fruit salad, potato salad, mixed California vegetables, corn, roasted herbed potatoes, Aborio rice with vegetables, baked chicken, and cannelloni. Beverages include coffee, tea, and pop.

Cost: $25 per person for AIChE, SPE, ACS, or other society members and one guest. $30 per person for all others. Please pay with cash or a check made out to AIChE.

Please RSVP to Heather Savas, HSavas@dow.com by 4:00 p.m. on Tuesday, May 13, if you plan to attend.

Note: AIChE will charge you for the cost of your meal order if you make reservations but then do not attend the event.

Joint Technical Society Dinner Meeting Scheduled

SPE/ACS/ASM/AIChE Joint Technical Society Dinner Meeting

BLOCK COPOLYMER LITHOGRAPHY: WHERE "TOP DOWN" MEETS "BOTTOM UP"

Prof. Thomas P. Russell, Silvio O. Conte Distinguished Professor of Polymer Science and Engineering, University of Massachusetts, Amherst, MA 01003

Abstract:

As the size scale of device features becomes increasingly smaller, conventional lithographic processes become increasingly more difficult and expensive, especially at a minimum feature size of less than 50 nm. To achieve higher density circuits, storage devices or displays, alternative routes are needed to circumvent cost and manufacturing issues. An ideal process would be compatible with existing technological processes and manufacturing techniques, and these strategies, together with novel materials, could allow significant advances to be made in meeting both sort-term and long-term demands for higher density and faster devices. The self-assembly of block copolymers (BCP), two polymer chains covalently linked together at one end, provides a robust solution to these challenges. The integration of novel chemistries with the manipulation of self-assembly is giving rise to applications ranging from ultrahigh density storage devices to separations devices for virus particles. A few of these leading edge applications will be discussed to illustrate the continuing great potential of block copolymer technology.

Date: Thursday, May 15, 2008

Time:

Social	6:30 PM
Dinner	7:00 PM
Program	8:00 PM

Location: NADA Center, Northwood University, 4000 Whiting Drive, Midland, MI 48640, Phone: 989-837-4277

Cost: $25.00 for SPE/ACS/ASM/AIChE members or guests, $15.00 for students

Reservations: Reservations can be made via phone, fax, or e-mail to Dawn Wright at MMI.
They must be received no later than Thursday, May 8, 2008.
Phone: 989-832-5555, ext. 571, Fax: 989-832-5560, E-mail: wright@mmi.org

Biographical Sketch of Professor Thomas P. Russell

Silvio O. Conte Distinguished Professor of Polymer Science and Engineering,
University of Massachusetts, Amherst, MA 01003

Thomas P. Russell, the Silvio O. Conte Distinguished Professor of Polymer Science and Engineering, received his PhD in 1979 in Polymer Science and Engineering from the University of Massachusetts Amherst. He was a Research Staff Member at the IBM Almaden Research Center in San Jose, CA from 1981 to 1996, and then became a Professor of Polymer Science and Engineering at the University of Massachusetts Amherst in 1997.

He is the Director of the Materials Research Science and Engineering Center on Polymers, an Associate Director of MassNanoTech, Director of the Multi-University Research Initiative on Nanoscopic Assembly of Biologically Active Materials, and an Associate Editor of Macromolecules. He is also a fellow of the American Physical Society, the American Association for the Advancement of Science, and the Neutron Scattering Society of America.

His research interests include the surface and interfacial properties of polymers, phase transitions in polymers, directed self-assembly processes, the use of polymers as scaffolds and templates for the generation of nanoscopic structures, the interfacial assembly of nanoparticles, and the influence of supercritical fluids on phase transitions and dynamics in polymer thin films. The outcome of Prof. Russell's research and development work has resulted in about 450 publications, 13 patents, and an untold number of invited lectures and presentations.

Michigan Molecular Institute Offers Visiting Professor Course

2008 Turner Alfrey Visiting Professor Course

COURSE 1035: SURFACE AND INTERFACIAL BEHAVIOR OF POLYMERS

Lecturer: **Professor Thomas P. Russell, Silvio O. Conte Distinguished Professor of Polymer Science and Engineering, University of Massachusetts, Amherst, MA 01003**

Place: Lecture Hall (Room 101), Michigan Molecular Institute, 1910 West St. Andrews Road, Midland, MI 48640

Time: Formal lectures: Monday – Friday, May 12 – 16, 2008, 3:00 – 6:00 p.m.

Fee: There is no fee for auditors if they belong to organizations that are financial sponsors of the Turner Alfrey Visiting Professor Program – The Dow Chemical Company, Dow Corning Corporation, Central Michigan University, Michigan State University, Saginaw Valley State University, Midland Section of the ACS, and Mid-Michigan Section of the SPE. For all others, a course fee of $300 will be required at registration.

All participants must register.

Registration: Pre-registration is required no less than one week in advance with the Registrar by visiting *www.mmi.org*, emailing *registrar@mmi.org*, or by calling (989) 832-5555, ext. 571.

Abstract:

There has been an enormous surge of interest in the surface and interfacial behavior of polymeric materials. This interest, in part, arises from the remarkable interest in nanostructured materials where the surfaces and interfaces become increasingly important. Yet, age-old questions continue to be of interest, like wetting, adhesion, and the glass transition temperature, where surfaces and interfaces provide unique avenues to arrive at some answers. Wrapped up with all of this has been the tremendous growth in the number of techniques that have emerged with sufficient spatial resolution and sensitivity to address questions on the nanoscopic level. This short course is designed to delve into the area of the surface and interfacial behavior of polymers by discussing some of the techniques that have emerged that enable questions to be answered. It will then discuss the interactions that polymers experience at surfaces and interfaces (favorable or otherwise) and the ramifications of these interactions. It then moves into the use of external fields to overcome interfacial interactions and to use these external fields to impart marked orientation and ordering in polymeric, specifically block copolymeric materials, and the use of these structures as scaffolds and templates for the fabrication of nanostructured materials. Unlike polymers, the interfacial behavior of nanoparticles is strongly influenced by the physical size of the particles. The assembly of nanoparticles at interfaces will be discussed in terms of self-healing and self-corralling systems that are beginning to emerge as candidates for photovoltaic devices. Finally, the ultrathin films formed by nanoparticles are known to wrinkle and the manner in which the wrinkling occurs can be used to determine the modulus, relaxation behavior, and Tg of thin films.

Lecture Topics Outline:

I. Characterization Methods. Optical microscopy, dynamic secondary ion mass spectroscopy, forward recoil spectroscopy, neutron and x-ray reflectivity, ellipsometry, electron tomography, transmission electron microscopy, grazing incidence x-ray scattering, resonance x-ray scattering, near edge x-ray adsorption spectroscopy, x-ray microscopy, scanning force microscopy, laser scanning fluorescence spectroscopy.

II. Preferential Interfacial Interactions. Interfacial interactions, surface energy, adhesion, polymer mixtures, block copolymers, patterned surfaces, ultrahydrophobic surfaces, commensurability.

III. Balanced Interfacial Interactions. Interfacial interactions, surface modification, block copolymer templating, internal fields (salts, homopolymers), long-range lateral ordering, commensurability.

IV. External Fields. Electrohydrodynamic instabilities, microdomain orientation (electric fields, magnetic fields, solvent fields), block copolymer lithography (scaffolds).

V. Interfacial Behavior. Block, random, and multi-block copolymers at interfaces (influence on adhesion), nanoparticles at fluid interfaces (assembly, dynamics, chemistries, encapsulation, self-healing systems, nanorods at interfaces), self-healing and self-corralling (applications).

VI. Wrinkling in Thin Polymer Films. Modulus thickness, relaxation behavior, Tg in thin films.

Mid-Michigan Section Announces 2006 Scholarship Winner

Contributed by Joshua Maurer, Mid-Michigan AIChE Scholarship Committee Chair

Laura Swierzbin from Midland High School was awarded the 2007 Mid-Michigan AIChE College Scholarship at last year's annual Section Banquet. Laura had a 4.46 GPA and was ranked tenth in her graduating class of nearly 400 students. While at Midland High, Laura participated in numerous activities including Meistersingers and the marching and symphonic bands. She also was involved in the local community through the Dow Chemical Community Advisory Panel and Lunchbox Learners. Laura attended the Women in Engineering and Summer Youth Programs at Michigan Technological University and is currently enrolled at the University of Michigan.

The Mid-Michigan AIChE College Scholarship offers financial support to students who wish to study and ultimately become professionals in the field of chemical engineering. The scholarship is a $2000 award disbursed over four years. Recipients are selected based on past academic performance as well as school and community involvement.

Mid-Michigan Section Selects 2007 MTUSYP Scholarship Winners

Mid-Michigan Section Selects 2007 MTU SYP Scholarship Winners

Contributed by Erin Lacher, MTU SYP Scholarship Committee Chair

At last year's annual Section Banquet, the MTU Summer Youth Program Scholarship committee (**Norm Lake, Megan McHenry, Kimberly Moore, Erik Ohare, Dennis Phillips, Rachel Wright,** and **Erin Lacher**) had the pleasure of announcing the recipients of the 2007 scholarships: **Brooke Demers** and **Jacob Hand**. These two winners were chosen from five applicants based on their widespread involvement in activities, relative interest in the fields of science and engineering, and strength and creativity of their essays.

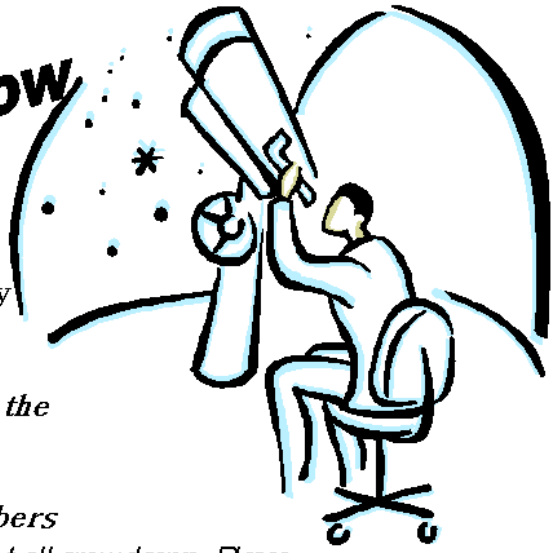
Brooke is now a senior at H.H. Dow High School. She is very active in the National Honor Society and volunteers with her time as a math and science tutor. She is also involved with several important advocacy groups, including Students Against Destructive Decisions (SADD), Students Against Violence Everywhere (SAVE), and Students Tackling Alcohol and Resisting Temptations (START). Her passion for computers led her to choose to attend the Computer Engineering session at MTU.

Jacob is now a senior at Bullock Creek High School. He is actively involved in the Dow College Opportunity Program and participates in Students Against Detructive Decisions (SADD) and Science Olympiad. Jacob also volunteers a great deal of his time at the West Midland Family Center. Jacob was interested in exploring careers within the medical field and thus chose to attend the Medical Physiology session at MTU.

The Summer Youth Program is a one-week program at the MTU campus, which gives students an opportunity to explore careers and develop skills. The students will participate in laboratory, classroom, and field experiences in a selected career area. For details of the SYP, please visit their website at http://youthprograms.mtu.edu. This scholarship is specific to explorations in engineering and science and covers room, board, tuition, and a $100 travel allotment. 2007 was the 22nd year MMAIChE has offered scholarships to the Summer Youth Program.

The 2008 recipients of the MMAIChE scholarship to the Summer Youth Program will be announced and honored at the Section Banquet on May 22 at Tuscany Banquet Hall.

Delta College Planetarium Activity Scheduled for May 13



You're Invited to the AIChE Planetarium Show

Where: Delta College Planetarium in Bay City
When: May 13th at 6:45pm
Show: ***On Orbit ? Astronaut training and the International Space Station***
Cost: ***Free for AIChE member and their families -$3/person for non-AIChE Members***

The show will be geared towards elementary school kids, but all are welcome. Please arrive before 6:45 as no one will be seated once the show begins. The presentation will last about an hour. For more information you can visit http://www.delta.edu/planet/ or contact Christine Ringlein at christineringlein@dowcorning.com or Katie Erikson at katieerikson@dowcorning.com

Please RSVP to katie.erikson@dowcorning.com so that we know how many people plan to attend. There are a limited number of seats in the planetarium.

2008 AIChE Annual Meeting: Philadelphia, PA

Philadelphia Marriott &
Pennsylvania Convention Center
November 16-21, 2008
Philadelphia, PA

AIChE Annual Meeting: Registration – Coming Soon.

Visit **http://www.aiche.org/Conferences/AnnualMeeting/index.aspx** for further details.

The 2008 AIChE Annual Meeting in Philadelphia offers a unique capacity to focus on a comprehensive participation and learning experience over the full range and diversity of the profession. Planning is already beginning.

Tentative Schedule and Key Dates:

- **May 11, 2008 -** Call for Papers closes
- **July 16, 2008 -** Technical Program opens
- **November 16 - 21, 2008 -** AIChE Annual Meeting in Philadelphia

The primary objectives over the next five months are to make contact with division and area chairs for the 2008 meeting, review and understand core and topical program plans and meeting needs for each group, and complete the meeting programming requests. Working in close collaboration with the division and area chairs, we will build the view forward to 2008 by understanding trends and changes across the past several Annual meetings but especially with the 2007 programming at Salt Lake City.

View the Preliminary Program

Mid Michigan AIChE Officers

A current list of Officers representing the Mid Michigan AIChE section can be found on the website at http://www.mmaiche.org/officers.html.