

# THE MIDLAND CHEMIST

A publication of the Midland Section of the American Chemical Society

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## MMI Announces 2013 TAVP Program and Visit Dates

*Steve Keinath, Director and TAVP Program Coordinator*



The Michigan Molecular Institute (MMI) is pleased to announce that Professor Kenneth R. Shull from Northwestern University will be the 2013 Turner Alfrey Visiting Professor (TAVP). The full details for the 2013 TAVP course, *Elasticity and Fracture of Soft Materials* (pre-registration required no later than one week in advance, June 10<sup>th</sup>), and for the joint technical society dinner meeting, *The Role of Soft Materials Characterization in Art Conservation* (RSVP deadline one week in advance, June 12<sup>th</sup>), is available at <http://www.mmi.org/tavp2013.html>.

Professor Shull's Northwestern University website (<http://shullgroup.northwestern.edu>) will also give you a more thorough view of the depth and breadth of his current R&D activities and interests.

Professor Shull will be in residence at MMI from Monday, June 17, through Wednesday, June 26. The first week (June 17–21) will be the week in which he will give a series of five afternoon course lectures (3:00–6:00 PM, each day), plus make quick visits to MSU and SVSU, and participate in an opening reception at MMI, and a joint technical society dinner meeting (June 19, 6:30 PM). The second week (June 24–26) will be dedicated to full-day site visits to Dow, Dow Corning, and CMU. Please mark your calendars with the 2013 TAVP visit dates now, and sign up early for the course lectures and the dinner meeting.

**Joint Technical Society Dinner Meeting**  
*Steve Keinath, Director and TAVP Program Coordinator*

**The Role of Soft Materials Characterization in Art Conservation**

Professor Kenneth R. Shull

Professor of Materials Science and Engineering, Northwestern University, Evanston, IL 60208

**Abstract**

Art conservators face challenges that are conceptually similar to those faced by scientists and engineers tasked with preserving an aging and decaying infrastructure. In both cases models to assess the current physical state of an object at microscopic length scales are needed, as is a model for projecting behavior into the future. Art conservators face two additional challenges, however. The first of these is the magnitude of the time scales that are involved—often involving centuries. The second challenge is the difficulty in obtaining reliable experimental data. In developing treatment protocols to restore or clean very old paintings, model systems are generally needed that accurately mimic the properties of coatings that have been aged for long periods of time. This talk will focus on the role that modern materials science techniques are playing in this effort.

**Date**

Wednesday, June 19, 2013

**Time**

Social 6:30 p.m. • Dinner 7:00 p.m. • Program 8:00 p.m.

**Location**

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

**Cost**

\$25 for SPE and ACS members (or members of other professional societies such as AIChE, ASM, etc.) and guests, \$15 for students. Note: Mid-Michigan SPE will charge individuals who make reservations and do not attend the meeting.

**Reservations**

Reservations can be made via phone, fax, or e-mail to Molly Warren-Haycock at MMI. Reservations must be received no later than Wednesday, June 12, 2013. Phone: (989) 832-5555, ext. 554, Fax: (989) 832-5560, or E-mail: [warren-haycock@mmi.org](mailto:warren-haycock@mmi.org)

**Announcing the 2013 Spring Science Awards Banquet**  
*Lauren Huffman, Awards Committee Chair*

**23<sup>rd</sup> Annual**  
**American Chemical Society – Midland Section**  
**Awards Banquet**



April 23<sup>rd</sup>, 2013 at the Great Hall Banquet and Convention Center  
5121 Bay City Road, Midland, Michigan 48640  
(<http://greathallmi.com>)

**Scheduled Activities:**

6:00 pm Opening Remarks  
6:15 pm Chemistry Olympiad Honorees  
6:30 pm Dinner  
7:15 pm Featured Speaker: Dr. Deborah Huntley  
7:45 pm ACS Awards

Dinner cost is \$11.50/person. Vegetarian options are available.

Please contact Lauren Huffman  
([lmhuffman@dow.com](mailto:lmhuffman@dow.com)) or 989-636-7361  
if you are interested in attending

**The Saginaw Valley Chapter of the ASQ Announces Dinner Presentation, April 17**  
**Section 1004 of the American Society of Quality (ASQ)**



Kristina Marsh, MBA, is a business leader, Six Sigma green belt, and writer who specializes in change management, life balance, and personal branding. Kristina consults and speaks on the topics of marketing, transfer of knowledge in the workplace, and personal branding. She has been featured in Working Mother magazine and writes a personal blog about the experience of life after corporate downsizing at <http://www.kristinamarsh.blogspot.com>. Kristina resides in Michigan with her husband and two children. You can reach Kristina directly at [klmarsh74@gmail.com](mailto:klmarsh74@gmail.com). The local ASQ Chapter cordially invites you and your friends to join us. Everyone is always welcome!

Topic: *I've Been Downsized. Now What?*

When: Wednesday April 17th, 2013

Time: 6:00 p.m.

Where: Los Cuatros Amigos

4570 Bay Rd, Saginaw Charter Township, MI 48604

(989) 799-1700

Cost: \$16 for members; \$18 for non-members (special student and unemployed rates)

Please RSVP to: [marcig@duro-last.com](mailto:marcig@duro-last.com)

**Career Workshop, April 25: *Strategies to Take Control of Your Career—What's Your Plan B?***  
**Michelle Cummings, Chair-Elect**

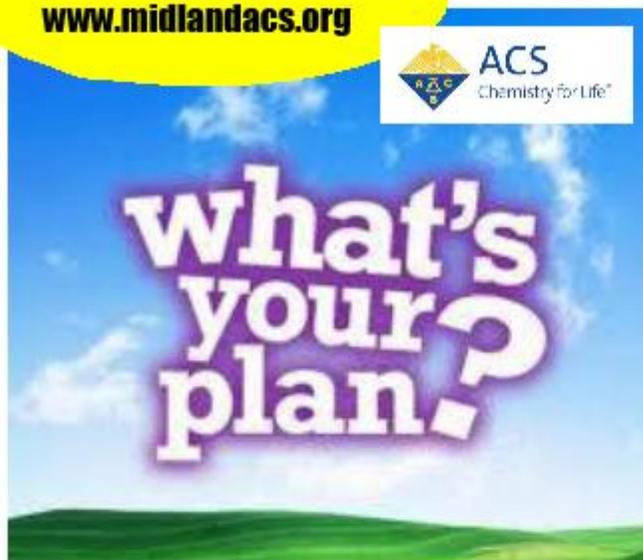
The Midland Section would like to assist our members who recently experienced a job separation. There are several resources available to you as members on the National ACS website ([www.acs.org/careers](http://www.acs.org/careers)). A team of volunteer ACS experts are standing by to assist you via e-mail and/or phone with almost any career questions you might have, including:

- Résumé preparation
- Job search strategies
- Interviewing techniques
- Making a career transition
- Salary negotiation techniques
- And more . . .

To ensure that you receive the most up-to-date information, please take the opportunity to update your contact information on [www.acs.org](http://www.acs.org).

A trained, local ACS Career Consultant, Gerard Nowaczyk ([gerard.s.nowaczyk@dowcorning.com](mailto:gerard.s.nowaczyk@dowcorning.com)), is available for you to contact regarding your personal situation. The Local Section is also offering a career workshop on April 25 at the Great Hall Banquet & Convention Center: *Strategies to Take Control of Your Career—What's Your Plan B?* For further details, please see the announcement below.

**Secure your spot!**  
**www.midlandacs.org**



**APRIL 25, 2013**

**WORKSHOP/RESUME/INTERVIEWS 1-5PM**

**KEYNOTE/SOCIAL/PANEL DISCUSSION 5-8:30PM**

**STRATEGIES TO TAKE CONTROL OF  
YOUR CAREER**

**What's your plan B?**

Today, most workers will change jobs an average of seven times over the course of their careers, according to the latest U.S. and Canadian labor statistics.



**Midland Section** *Serving the Michigan*

*counties of Midland, Bay, Saginaw, Isabella, and Gratiot*

**Key Note Address:**  
***Current Interview  
Techniques***

—  
**Explore varied  
career options for  
chemical  
professionals**

—  
**Prioritize your  
values as they affect  
your choice of  
career**

—  
**Social/ Networking-  
hors d'oeuvres  
cash bar**

—  
**Resume Reviews  
and Mock Interviews**

**GREAT HALL**

5121 Bay City Rd.  
Midland, MI 48642  
www.midlandacs.org

**MMI Announces the 2013 Turner Alfrey Visiting Professor Course**  
*Steve Keinath, Director and TAVP Program Coordinator*

**Course 1040: ELASTICITY AND FRACTURE OF SOFT MATERIALS**

**Lecturer**

Professor Kenneth R. Shull, Professor of Materials Science and Engineering, Northwestern University, Evanston, IL 60208

**Location**

Lecture Hall, Michigan Molecular Institute, 1910 West St. Andrews Road, Midland, MI 48640

**Time**

Formal lectures: Monday-Friday, June 17–21, 2013, 3:00-6:00 PM

**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, Mid-Michigan Section of the SPE, and Midland Section of the ACS. For all others, a course fee of \$400 will be required at registration.

All participants, however, must pre-register.

**Registration**

Pre-registration is required no less than one week in advance with the Registrar by visiting <http://www.mmi.org/tavp2013.html>, e-mailing [registrar@mmi.org](mailto:registrar@mmi.org), or by calling (989) 832-5555.

**Course Description**

Many application areas for “soft” polymeric materials require that their mechanical properties be appropriately tuned. Our definition of a “soft” material includes the following situations:

1. Materials which are soft enough so that adhesive forces result in substantial deformation of the material. This criterion is met for any polymeric material when the size scale is sufficiently small, as in a nanoindentation experiment to measure the elastic properties, for example. It is also met when the modulus of the material becomes small enough so that even macroscopic samples are deformed by relatively weak adhesive forces. Pressure sensitive adhesives (sticky tapes) are an example of this type of soft material.
2. Materials with fracture stresses that exceed their elastic modulus. Standard fracture mechanics concepts are no longer applicable in this regime. The materials design strategy for producing high toughness soft materials like artificial cartilage is fundamentally different than the design strategies for producing tough, rigid materials like metals and ceramics.
3. Materials with a substantial viscoelastic character. Energy dissipation mechanisms at the molecular level often dominate the behavior of soft materials. While some features of soft material behavior can be understood from a purely elastic analysis, other features, including rate dependent issues in fracture, require that viscoelastic effects be taken into account.

This course is designed to provide the background needed to work effectively with a variety of soft materials, and to design, conduct, and interpret experiments aimed at probing soft material behavior. The course is inherently interdisciplinary, and includes both the relevant background in pure mechanics and of structure/property relationships in different soft materials. A variety of material examples will be discussed throughout the course to illustrate key concepts.

### **Lecture Topics Outline:**

#### **Deformation and Adhesive Contact of Soft Materials**

Hertzian (non-adhesive contact) of elastic solids

Adhesive contact: The JKR theory of adhesion

Geometric connections, contact splitting, etc.

Examples: Nanoindentation, biomimetics (Gecko adhesion), pressure sensitive adhesives

#### **Fracture Mechanics of Soft Materials**

Stress fields in the linear elastic limit

Nonlinear fracture mechanics and the use of strain energy functions

Fracture of elastomers and gels

Examples: Super-tough polymer gels

#### **Two-Dimensional Elasticity**

Laplace pressure equation and the relationship between membrane tension and pressure

Equilibrium shapes of liquid interfaces

The role of elasticity

Examples: Membrane inflation, membrane contact experiments

#### **Materials Characterization with Quartz Crystal Resonators**

Wave propagation in solids

Acoustic resonators and the coupling of mechanical and electrical information

Theory of the quartz crystal microbalance

High frequency characterization of materials across the complete viscoelastic spectrum

Examples: Cure monitoring of rigid coatings, quartz resonators as contact sensors

### **The Mid-Michigan Technician Group Hosted First Lunch-and-Learn of 2013**

*Jason Suhr, MMTG Chair*

The Mid-Michigan Technician Group (MMTG) hosted its first lunch-and-learn of 2013 on February 28, titled "StrengthsFinder 2.0." After reading the book and taking the online course, each member was presented with a guide describing their top five themes (or strengths). The guide included examples of what each theme sounds like, and ideas for action on how to apply them to everyday life. If you would like to know more about the StrengthsFinder 2.0 course, please visit the website for information on how to purchase the book and take your own personalized test. <http://strengths.gallup.com/110440/About-StrengthsFinder-20.aspx>

**Midland Section to Host 44<sup>th</sup> ACS Central Regional Meeting (CERM), May 2013**  
**Phil Squattrito, Meeting Chair**



The 44th Central Region Meeting (CERM 2013) of the American Chemical Society will be held on May 15–17, 2013 on the campus of Central Michigan University in Mt. Pleasant, Michigan. The general theme of the meeting is *Building Blocks for a Sustainable World*.

Technical sessions on various aspects of chemistry related to sustainability as well as general sessions in the traditional areas of chemistry and chemical education are planned.

Technical program highlights will include poster sessions, undergraduate research symposia, a beer and wine making symposium with a related visit to a brewery, a silicon science symposium to celebrate the 150th anniversary of the discovery of organosilicon compounds and the 70th anniversary of Dow Corning Corporation, a sustainability symposium, materials-related (including nanotechnology) symposia, symposia about chemistry and global health, re-examining water fluoridation, and also water-biogeochemistry, an exhibition showcasing the latest products and materials from a range of vendors, and technical and career workshops.

A series of plenary sessions will feature prominent speakers on topics of global significance. Confirmed plenary speakers include Dr. Martine Vermeulen, retired Global Manager of Product Safety & Regulatory Compliance at Dow Corning; Dr. Mark E. Jones, Executive External Strategy and Communications Fellow, The Dow Chemical Company; and Dr. Kishor Wasan, Professor and Associate Dean of Research at the University of British Columbia.

Special events will include chemistry related art and history exhibits (*History of The Dow Chemical Company Plant in Mt. Pleasant - 1903–1930*; *Images of The Dow Chemical Company from the Brush of Arthur Knighton-Hammond*; and *History of the Midland ACS Section, 1919–2013*) with an art reception.

The Awards Banquet on Thursday night will feature the presentations of the ACS Division of Chemical Education Regional Award for Excellence in High School Chemistry Teaching, the E. Ann Nalley Regional Award for Volunteer Service to ACS, and the Stanley C. Israel Regional Award for Advancing Diversity in the Chemical Sciences. The featured speaker will be Dr. Mary Kirchhoff, ACS Director of Education.

Advance registration for the meeting will end on April 19, 2013. Regular registration will continue through May 17, 2013. Please visit the CERM 2013 website (<http://2013cerm.sites.acs.org/>) for registration and contact information, useful Web links, and up-to-date details on events as they become available.

Please contact Phil Squattrito ([p.squattrito@cmich.edu](mailto:p.squattrito@cmich.edu) or 989-774-4407) to volunteer or for more information.

Exhibitors Sought for Earth Day 2013  
Cara Baker, Midland Center for the Arts

## **Earth Day Participant Registration Form**

April 20, 2013

10am – 2pm

Set-up begins at 9am

Brick Lobby of the Midland Center for the Arts

**This year's theme is officially "Our Earth: Handle with Care!"**  
**The 10th anniversary theme focuses on the general topics of water, air, plants/soil, and recycling. We welcome any Earth Friendly Organizations to Participate this year.**

As in past years, lunch will be provided to all volunteers and vendors. Please be sure to accurately depict your booth personnel count. Donations will be graciously accepted.

Name of Organization \_\_\_\_\_  
Organization Contact \_\_\_\_\_  
Phone # \_\_\_\_\_ # people at booth \_\_\_\_\_  
Email Address \_\_\_\_\_  
Booth Topic \_\_\_\_\_  
\_\_\_\_\_

Display Title \_\_\_\_\_

**Please Check Your Needs Below:**

- |   |   |
|---|---|
| <input type="checkbox"/> 5 foot banquet table (#____) | <input type="checkbox"/> electricity access |
| <input type="checkbox"/> chairs (#____)               | <input type="checkbox"/> easels (#____)     |
| <input type="checkbox"/> other, (wi-fi etc) _____     |   |

Will your organization be providing give-aways at your booth? **Yes No**  
If yes, please describe \_\_\_\_\_

Will your booth have a hands-on activity? **Yes No**  
If yes, please describe \_\_\_\_\_

Questions about set-up please contact Cara Baker at 631-5930 x 1205.

Please return this form by fax 631-7890 or email [baker@mcfta.org](mailto:baker@mcfta.org)



## **Anderson Development Company Seeking to Hire a Quality Control Specialist**

**Mark Kramer, Anderson Development Company**

Anderson Development Company is a fine and specialty chemical company located in Adrian, MI, about 45 min SW of Ann Arbor, MI and 40 min NW of Toledo, OH. Although, many people have never heard of us, I can guarantee that you have seen our products without knowing it, in someone else's product. We have done custom synthesis work for Midland area chemical companies.

We are seeking to hire a quality control specialist. We are looking for a person with an Associate's degree or equivalent in laboratory experience (10+ years in QC lab). The following experience is necessary for this position:

- Instrument calibrations, troubleshooting, and repairs (GC, LC, FTIR, Titrator, GC-MS, etc.)
- GC (Varian CP-3800, 3900 & 450-GC)
- LC (Varian 410)
- FTIR (Varian Excalibur 3100)
- Titrator (Brinkmann or Metrohm)
- Knowledge of Galaxie Analytical Software or equivalent
- Method Development and Material Verification
- Proficient with Microsoft Office, Visual Basic, and Access
- Knowledge of Sample Manager LIMS (Laboratory Information Management System) or equivalent
- Ability to multi-task and adapt to a fast pace laboratory environment

For more information, contact Mark Kramer ([mark.kramer@anddev.com](mailto:mark.kramer@anddev.com)) or send inquiries to the Anderson Human Resources group in Adrian ([HR.Adrian@anddev.com](mailto:HR.Adrian@anddev.com)).

### **In Past Issues of *The Midland Chemist***

**Wendell Dilling, Director and Historian**

#### **40 Years Ago**

In *May Meeting Notice* by Jack Arrington, Program Chairman: "Monday, May 21, 1973, 8:00 p.m., Place to be announced – posters on bulletin boards, and postcards to your home. LIQUID REFRESHMENTS WILL BE PROVIDED. Our Councilors Lin Dorman, Fred Leavitt, and Dave Young are going to discuss with us recent developments within the ACS on Professional Relations. This should be very informative since they attended several meetings on this topic at the National ACS meeting last month."

#### **30 Years Ago**

In *Chairman's Corner* by David Watson, Chairman, Midland Section ACS: "The Midland area certainly has received a lot of publicity during the last few months regarding chlorinated dioxins. I think this points to a problem and hopefully the Midland Section ACS can play a role in helping to solve it. The problem as I see it is not dioxins, per se, nor the scientific facts but more the way they are interpreted or, as some may say, misinterpreted. Without trying to sound too editorial, I think most would agree that the media has grossly exaggerated the issue to the public. Once it becomes a public issue, then the politicians become involved and, at least for the short term, everything is a mess."

## 20 Years Ago

In *From the Chair* by Gretchen Kohl, Chair ACS Midland Section: "Our community, as many others across the nation, has been experiencing the realities of industry downsizing. Premature retirement or job termination is an abrupt or involuntary change, as many of us have experienced, personally or through close friends. During this time of change, many Midland Section members have been actively working to communicate what resources the National ACS offers which could help those members of the community who have lost their jobs, or who are considering other career options. We chose to host a seminar, open to ACS members and non-members, to alert chemical professionals to what services are available and how they can be utilized to facilitate change."

## 10 Years Ago

In *Chair Column* by Mike Owen, Chair ACS Midland Section: "ACS regional meetings have been with us since 1908 and are organized by volunteers in the local sections. This will soon have a big impact on us because we have committed the Midland Section to host the 2006 Central Regional Meeting. It is not too soon to begin identifying lead volunteers for this exciting event. Indeed, I have made it one of my personal goals to identify two co-chairs for the meeting."

## Upcoming Dates, Events, and Other Updates

- April 19 – Advance registration deadline for 44<sup>th</sup> ACS Central Regional Meeting (CERM). Visit the CERM 2013 website (<http://2013cerm.sites.acs.org/>) for registration details and other information.
- April 23 (6:00 PM) – Midland Section ACS Spring Science Awards Banquet, Great Hall Banquet and Convention Center, Midland. Contact Lauren Huffman ([lmhuffman@dow.com](mailto:lmhuffman@dow.com)), Awards Committee Chair, for questions.
- April 25 (1:00-8:30 PM) – Midland Section ACS Career Day, Great Hall & Convention Center, Midland. Contact Michelle Cummings ([michelle.cummings@dowcorning.com](mailto:michelle.cummings@dowcorning.com)), Midland Section Chair-Elect, for more information.
- May 6 (7:00-9:00 PM) – ACS Board meeting, MCFTA Board Room (in person), or via conference call at phone number: 866-299-7945, participant code: 9837036#.
- May 15–17 (Wednesday-Friday) – 44<sup>th</sup> ACS Central Regional Meeting (CERM) (<http://2013cerm.sites.acs.org/>), Central Michigan University, Mount Pleasant, MI. For more information, contact the 44<sup>th</sup> CERM Meeting Chair, Phil Squattrito, at [p.squattrito@cmich.edu](mailto:p.squattrito@cmich.edu) or by phone at 989-774-4407.
- June 3 (7:00-9:00 PM) – ACS Board meeting, MCFTA Board Room (in person), or via conference call at phone number: 866-299-7945, participant code: 9837036#.
- June 17–21 (3:00-6:00 PM, each day) – 2013 TAVP course lectures, *Elasticity and Fracture of Soft Materials*, featuring Prof. Kenneth R. Shull of Northwestern University, MMI Lecture Hall, Midland. For more information and to pre-register for the course, see <http://www.mmi.org/tavp2013.html>. **Pre-registration is required by June 10<sup>th</sup>**. Contact Steve Keinath ([keinath@mmi.org](mailto:keinath@mmi.org)) for questions.
- June 19 (6:30-9:00 PM) – TAVP joint technical society dinner meeting, NADA Center, Northwood University. Prof. Kenneth R. Shull will give an interesting presentation on *The Role of Soft Materials Characterization in Art Conservation*. RSVP deadline is June 12<sup>th</sup> to Molly Warren-Haycock ([warren-haycock@mmi.org](mailto:warren-haycock@mmi.org)). Contact Steve Keinath ([keinath@mmi.org](mailto:keinath@mmi.org)) for any other questions.