



## Notes from the Chair

The 2003 AIChE Annual Meeting is now history, and it was a truly historical meeting both for the Institute, and for the Materials Engineering and Sciences Division. This year's San Francisco meeting attracted 6,031 participants (a new record), with well over 500 technical sessions. MESD was well-represented: the Division had primary sponsorship or co-sponsorship for 91 technical sessions, an increase of nearly 55% over the 2002 meeting program! In addition to our traditional offerings, the Division was involved in the programming for a number of topical conferences, most notably the topical conferences on Polymerization and Polymer Processing, Membrane-Based Separations, Advanced Microelectronics Processing, and Nanotechnology. Highlights of the meeting included the presentation of the Charles M.A. Stine Award to Prof. Thomas Kuech of the University of Wisconsin (pictured to right), the MESD Plenary Session, and the Division-wide poster session and student poster awards.

Planning for the 2004 Annual Meeting (Austin, TX) is nearly complete, and the Call for Papers is available at [www.aiche.org/conferences/](http://www.aiche.org/conferences/). Our 2004 program chair, Prof. Alon McCormick, has worked closely with the programming chairs from each of our individual materials areas to assemble an outstanding program featuring over 100 primary and co-sponsored sessions. To appreciate the growth of MESD programming over the last decade, please see the accompanying figure (page 2) which charts our session activity since 1993. The increased prominence that materials-related programming has enjoyed in AIChE is a direct result of the exceptional technical accomplishments and leadership of our members. If you are aware of colleagues who are not presently members of the Division, I encourage you to

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invite them to join us.

Additional information on membership is available at our Divisional website.

Douglass Kalika  
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Thomas Kuech, left, accepts the 2003 Charles M.A. Stine Award from Dennis Hess, right, at the AIChE Fall Annual Meeting in San Francisco.

## 2004 Charles M.A. Stine Award

The annual Charles M.A. Stine Award applications are due February 15<sup>th</sup>, 2004. This \$1500 award sponsored by E.I. duPont de Nemours & Company recognizes an individual's outstanding contribution to the scientific, technological, education or service areas of materials engineering and science. The award is presented at the Materials Engineering and Sciences Division Banquet held during the AIChE Annual Meeting. The awardee will be invited give a presentation at the Division's plenary session.

Selection criteria for the award include:

1. Nominees must be members of AIChE.
2. The award can be given to an individual or a team.
3. Significant discoveries, important research, the development of new processes and products, the initiation of new materials and management, education concepts, or outstanding service to the materials community.

Again the deadline for nominations is February 15, 2004. Nominations must be submitted by members of AIChE, by using the General Nomination form found in [2003 Awards Brochure](#). Send the original and eight copies of nominations to the Materials Engineering & Sciences Division Awards Committee Chair:

Dennis W. Hess  
Ford Environmental Science & Technology Building  
311 Ferst Drive, N.W.  
Atlanta, GA 30332-0100  
Ph: 404-894-5922  
dennis.hess@che.gatech.edu

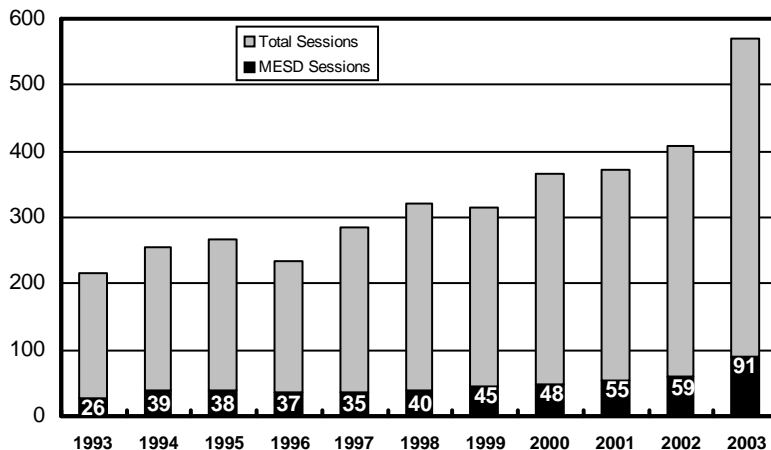
For more information or the Award form go to:

<http://www.aiche.org/awards>  
<http://www.aiche.org/pdflibrary/awards.htm>

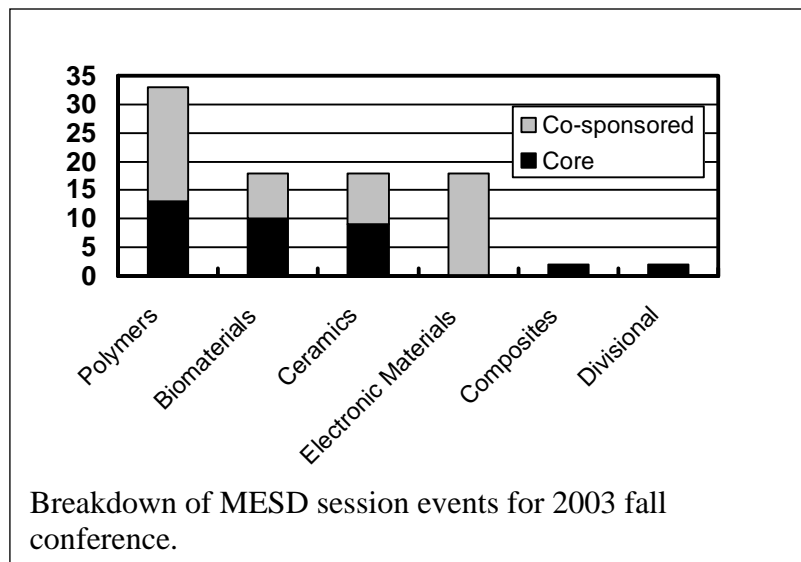
## 2003 Fall Annual Meeting Highlights

In his “Notes from the Chair,” Doug Kalika gave some of the impressive statistics from last fall’s Annual Meeting. Here are some more: the 91 sessions sponsored or co-sponsored by MESD were 16% of the entire sessions offered at the conference; this is an increase of 250% from the 26 sessions at the Fall Annual Meeting only a decade ago. A breakdown of MESD sessions offered by area in 2003 is shown in the plot to the immediate right.

Special MESD events held at the 2003 Annual Meeting included the Plenary Session, featuring the Stine Award Lecture by Tom Kuech, and the Division Poster Session. As in the past, posters were judged and prizes were awarded to the best posters. This year, the 1st place poster was presented by Kai Wang of the University of California Berkeley. His poster was entitled “Role of Hydrophobic Amino Acid Residues in Self-assembly of Artificial Peptides. The 2nd place poster, titled "Self Assembly of Tethered Nano Building Blocks" was presented by Mark Horsch of the University of Michigan, and 3rd place went to Lei Kerr of the University of Florida for her poster "Rapid Thermal Processing of Cu-In-Se Precursors for Photovoltaic Applications." Congratulations to the winners!



MESD session activity since 1993. See Notes from the Chair.



Breakdown of MESD session events for 2003 fall conference.



The 2003 MESD Poster Session winners are from left to right, Lei Kerr (3<sup>rd</sup> place), Mark Horsch (2<sup>nd</sup> place), and Kai Want (1<sup>st</sup> place).

## *Materials This Minute!*

As we all know the Mars Exploration Rover has recently landed on Mars. Much of the supporting research that enabled the successful flight was conducted at Ames Research Center. The following article describes some fundamental research involved in making this mission a success.

**Parachute Wind Tunnel Tests:** Series of tests conducted in NASA Ames' 80- by-120 Foot Wind Tunnel, which took place from September 2002 through January 2003, aided the selection of the optimum parachute design for the Mars Exploration Rover mission. Parachutes play an important role in the MER mission. When each 400-pound rover, encased in a lander, enters Mars' atmosphere, a parachute 28 feet in diameter will slow its descent.

During the tests, which simulated entry into the thin martian atmosphere, engineers tested a dozen different parachutes, firing them from mortars in the test section, with the wind tunnel running at speeds of up to 100 miles per hour. The Mars mission structural requirement for the parachute was that it be able to sustain an opening drag load of at least 24,200 pounds, 25 percent greater than the expected load on Mars. The testing involved NASA JPL, NASA Ames and NASA Langley Research Center teams.

The parachute tests at Ames were conducted in three phases. Phase one demonstrated that NASA could get the data it needed using a wind tunnel. Phase two tested different parachute candidates provided by Pioneer Aerospace Corp., enabling engineers to choose the best design. Phase three tested the chosen parachute to ensure that it met structural standards for the Mars mission.

**Thermal Protection Systems:** NASA Ames Research Center supported the design, manufacture and test of the thermal protection system (TPS) used on the Mars Exploration Rover aeroshell structure. The TPS protects the aeroshell, which contains components like the parachute, payload and rover, from the extreme heating caused by deceleration into Mars' atmosphere during the entry phase of the mission. NASA Ames' Arc Jet complex was used in qualifying all of the MER aeroshell TPS

materials in a simulated high-temperature entry environment.

Ames-manufactured TPS material, known as SIRCA (Silicone Impregnated Reusable Ceramic Ablator), was attached to the back part of the aeroshell, called the backshell interface plate. SIRCA also was used to protect the three Transverse Impulse Rocket System (TIRS) located on the sides of the aeroshell. The SIRCA TPS material originally was developed at Ames and flight-tested during the successful July 4, 1997 Mars Pathfinder landing.

This article is an excerpt from Ames Research Center For the complete article go to: <http://www.arc.nasa.gov>

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## Newsletter Changes

In the fall 2003 meeting it was decided to transfer responsibility of the MESD newsletter to a joint production. Accordingly this year the newsletter will be shared by both Brian Mitchell and Matt Stefanick. This will enable MESD to have representation from both academia and industry. For the time being Brian Mitchell will fill the academia position, however, a replacement is being sought out, so if interested please contact Doug Kalika.

As for Matt, he is relatively new to the industry, having graduating over a year ago with a BS in Chemical Engineering with a specialization in polymers from the University of Akron. He has put this degree to work at Caterpillar Inc. where he work as part of a rubber manufacturing team that produces rubber for industrial goods such as hydraulic hose assemblies, mounts, belts, etc. With regard to editing the newsletter, Matt has the following ideas:

“While I am open to changing the presentation and discussion enclosed in the newsletter I would request that some feedback be provided as I recognize the importance in keeping the format easy to read and professional. My primary professional interests on a day to day basis differ significantly from typical articles I have seen in previous newsletters. Feedback from what MESD is particularly looking to capture from industry would be helpful as well. I sincerely look forward to helping MESD out with this production.”

Please welcome Matt and thank him for volunteering.

## 2002 Executive Council Meeting Minutes

Materials Engineering & Science Division of the American Institute of Chemical Engineers

Boardroom 1, Westin Hotel, Indianapolis, Indiana

2:00 – 4:10 PM, November 5, 2002

### Introduction and Elections - John Torkelson, Northwestern University

John Torkelson called meeting to order at 2:00 pm. Meeting attendees were introduced. J. Torkelson announced the new officers elected: Alon McCormick as Second Vice Chair and Alec Scranton and Don Paul as Directors with 2-year terms ending in 2004.

### 2002 Program Chair Report - John Ekerdt, University of Texas - Austin

The MESD will have 55 sessions, with the standard core allocation of 18 MESD sessions and a poster session. J. Ekerdt asked for feedback on the move of the plenary session to Wednesday, and in general, the distribution of talks throughout the week. Specifically, should talks be bunched over only a few days, or spread out over the entire the week? The Executive Council discussed this topic but there was no general consensus. It is expected that there will be a move to three sessions per day, starting with the 2003 San Francisco meeting.

### Short Course on Polymer Crystallization - Raj Krishnawamy, Chevron Phillips

There was a good turnout for the short course Sunday on polymer crystallization - 14 total participants with 11 from industry. Advertisement was the key to success as there was only one registrant one month before meeting! R. Krishnaswamy used the SPE membership list to send out email announcements - this generated the most interest. Six of the attendees were from P&G, and the MESD has been invited to deliver the same short course at P&G. However, the room arrangements were unsatisfactory: no water was available and the room was cramped. Good discussions actually made session run long (to 5:30 instead of 3:30). The registration fee was \$200, but it appears that none of the money raised will be returned to the MESD. In fact, AIChE provided only \$500 to be divided among the five lecturers! There was discussion as to how much of the MESD should get back. T. Anderson suggested a proposal be made to National to return a portion of proceeds to the MESD

As to recommendations for the success of future short courses: Choose topic relevant to location; for example, electronic materials would be appropriate next year in San Francisco. Have it on a weekday instead of Sunday to keep people at the meeting; the downside of this option is that lecturers might have to miss sessions.

### Web Site - Pete Ludovice, Georgia Tech

The website moved from U. of Kentucky with Douglass Kalika as the webmaster to Georgia Tech with Pete Ludovice as the webmaster. P. Ludovice updated the site and asked for further suggestions on content. One proposal was to add links to relevant meetings from other societies; the Federation of Materials may already have such a list. List conference assignments of Vice Chairs; e.g. 2003 for the First Vice Chair, 2004 for Second Vice Chair. Keep statistics of website hits, although it need not be displayed on website. Ludovice also asked that photos from the Executive Meeting be sent to him.

### Newsletter - Brian Mitchell, Tulane

B. Mitchell asked for feedback on the concept of making the transition to a purely electronic newsletter. There was some interest in going this route, but others perceived downsides such as perceived loss of value of Division membership by some members. M. Tirrell suggested that we could do both for a while to ease the transition.

There needs to be electronic announcement of elections and a follow-up with election bios to improve electronic voter turnout. We need AIChE to send out an election announcement in summer.

### Council Liaison Report - Matthew Tirrell, UCSB

The Nanoscience and Nanomaterials Forum have been established in order to encourage non-members to attend – Forum participants do not need to be AIChE members. Changes in rules for membership are

proposed in order to make it easier to join AIChE. For the proposal to be adopted, it needs 20% of the membership to vote, with 75% favoring approval.

Concerns were raised about whether the new Forum will be detrimental to MESD activities. MESD will have to work with the new forum to achieve synergy rather than to compete for sessions and resources. Tirrell stated that he is committed to working on this issue to make the MESD successful in its interactions with the new Forum.

#### Student Posters Session - Amod Ogale, Clemson

There were 50 posters (22 of these were students) and the sessions were well-attended. Three awards of \$500, \$300 and \$200 were made, sponsored by Clemson's NSF Center. The posters were pre-screened by committee, and then judged on site.

The main problem was that posters had to be submitted early - by May 15 - though the deadline was extended to admit some later submissions - these were listed as an addendum to the program. Also, the undergraduate poster session ran over into MESD session, but otherwise the setup was good having it near the exhibits.

#### Minutes - Stevin Gehrke, Kansas State University

S. Gehrke had distributed a draft of the minutes to the Council ahead of the meeting. The hardcopy versions distributed at the Executive Council meeting were accepted as presented.

#### Secretary/Treasurer Report - Stevin Gehrke, Kansas State University

S. Gehrke reviewed the membership and treasurer's reports that has been sent out electronically prior to the meeting and distributed as hard copy at the meeting. The main points were that the Division continues to be financially stable with a healthy cash reserve. However, the five-year trend of steady declines of membership in the Division continues.

Discussion among the Council with regard to these trends ensued. D. Kalika pointed out that interest in the Division's activities is very high -we have a lot of interest in the sessions, relatively high participation rates and so on - people just are not checking the MESD box. T. Anderson asked whether AIChE could set up an automatic membership default on the dues statements, if that was not

#### 2002 MESD Executive Council Meeting Attendees

E-mail	Name	Affiliation	2001-02 Office
sgehrke@ksu.edu	Stevin Gehrke	Kansas State	MESD Sec./Treasurer
jld@psu.edu	Larry Duda	Penn State	MESD Past Chair
tim@nersp.nerdc.ufl.edu	Tim Anderson	U. of Florida	MESD Director (ends 2002)
tirrell@engineering.ucsb.edu	Matthew Tirrell	UCSB	AIChE Director
dennis.hess@che.gatech.edu	Dennis Hess	Georgia Tech	Stine Award Chair
ekerdt@che.utexas.edu	John G. Ekerdt	U. of Texas	First Vice Chair
palmese@coe.drexel.edu	Giuseppe Palmese	Drexel University	MESD Director (ends 2002)
ogale@clemson.edu	Amod A .Ogale	Clemson	Poster Chair
j-torkelson@northwestern.edu	John M. Torkelson	Northwestern	MESD Chair
kalika@engr.uky.edu	Doug Kalika	U. of Kentucky	2 <sup>nd</sup> Vice Chair
pete.ludovice@che.gatech.edu	Pete Ludovice	Georgia Tech	MESD Webmaster
brian@tulane.edu	Brian Mitchell	Tulane University	MESD Newsletter Editor
mccormic@cems.umn.edu	Alon McCormick	U of Minnesota	Rising MESD 2 <sup>nd</sup> Vice Chair
dbaird@vt.edu	Don Baird	VA Tech	MESD Director (ends 2003)
krishrk@cpchem.com	Raj Krishnaswamy	ChevronPhillips	MESD Director (ends 2003)
drp@che.utexas.edu	Donald R. Paul	U of Texas	Rising MESD Director (ends 2004)
jingwu@adm.njit.edu	Jing Wu	NJIT	
hammond@mit.edu	Paula Hammond	MIT	
vadim.gulians@uc.edu	Vadim Gulians	U of Cincinnati	
kofinas@eng.umd.edu	Peter Kofinas	U of Maryland	
lopina@uakron.edu	Stephanie Lopina	U of Akron	
alec-scranton@uiowa.edu	Alec Scranton	U of Iowa	Rising MESD Director (ends 2004)

already done. He pointed out that only 10% of AIChE members join any division. The cost of meeting attendance is the main inhibition for more students to come and participate, so why did AIChE increase meeting registration costs significantly some years back? Some people thought the intention had in fact been to cut the costs associated with student attendance at reduced rates, but this was disputed by others. D. Baird suggested the possible use of the reserve funds for travel grants to students.

#### CTOC Meeting Review - John Torkelson, Northwestern University

J. Torkelson reviewed the Division's status from the perspective of the CTOC. He was asked by CTOC how could AIChE support MESD further. He stated that AIChE needed help itself to stem AIChE's overall membership losses, that AIChE needs to improve technical quality or have a higher concentration of talks in focused areas, make it possible to waive registration for invited speakers and so on in order to attract non-ChE's to AIChE meetings. Extensive discussion and brainstorming ensued among the Council members.

T. Anderson noted that AIChE Council considers MESD to be a very strong division. The Council is willing to try new things - new journals, more plenaries (including the free registration possibility), whatever may help. According to Anderson, approximately 12 % of attendees are non-members and approximately 22% are international. So there are a fair number of non-AIChE members attending, though this is perhaps not as diverse as at other meetings. It was noted that the MESD's interdisciplinary, 'open borders' nature leads to both challenges and opportunities. J. Torkelson noted that Gil Lee of the "Nano-Forum" wants to be work with MESD on programming etc. as MESD is the division most closely related to the Forum. According to J. Ekerdt, because MESD is at the interface of disciplines, it will always be in competition with APS, MRS and so on. We need to define a unique identity for the MESD. Anderson said that we need to think 'outside the box' and that AIChE is willing to support novel ideas. He believes that AIChE would help underwrite J. Ekerdt's proposal that the MESD Areas apply to the Division to fund new initiatives. Since the Division does have about \$30K in the bank, we could use that as leverage with AIChE. Anderson suggested that AIChE be approached first, they do commit money to topical conferences and related events. Other ideas raised included:

D. Baird - can we define a journal that we propose to AIChE?

D. Kalika - can we invite eminent people and define a session around them - encourage others to show up - former students, collaborators, etc.?

B. Mitchell - can we offer free registration to such invited speakers? Such people would be a draw for others to attend.

J. Torkelson – we need to encourage conference attendees at our sessions to sign up for MESD when they pay their dues, especially students.

Finally, J. Ekerdt moved to increase the Stine Award to \$1,500 and the honorarium to the plenary speakers at the Stine Award sessions be set at \$500. This would include the speakers from the plenaries last year (2001) and this year (2002). This passed unanimously by voice vote of the Council. Tim Anderson will ask for \$3500 (or more) from du Pont to cover these increases.

#### 2003 Program Chair Report - Doug Kalika, University of Kentucky

There are 60 MESD sponsored and co-sponsored sessions for the annual meeting. These include a plenary session and a poster session. The allocations among the areas are:

8a	20
8b	9
8d	13
8e	14
8f	2

A future topical session will be sponsored by Area 8a. 'Nano' sessions will be an upcoming major emphasis. At the San Francisco meeting, 45 sessions are requested. However, only about 340 sessions can be accommodated at San Francisco Hilton. Thus there is the possibility of going to a format of three 2.5 hour sessions per day in order to accommodate all the sessions requested by the divisions.

All session chair names and related information needs to be entered via the web. D. Kalika needs session information by November 22<sup>nd</sup> from area chairs and the Meeting Program Chair (MPC) needs the information by December 5<sup>th</sup>. The MESD poster session will need a new co-chair to assist A. Ogale to maintain continuity into the future. J. Torkelson suggests that programming organizers try to match junior

co-chairs with more senior people to aid their network development and cement their involvement with AIChE and the MESD.

#### Awards - D. Hess, Georgia Tech

There were nine nominations for the Stine Award this year. This was a step up in activity from previous years. The nominations were of very high quality so it was tough to make a selection. Therefore re-nominations are encouraged. He has the award plaque and the \$1500 check from AIChE to present to this year's winner, Richard Register of Princeton, on Wednesday.

#### 2004 Programming - Alon McCormick, Minnesota

A. McCormick would like to have an experienced person come along to the January programming meeting. We can have 3 co-sponsors per session; in such cases we will be charged only 1/3 session against our base allocation. However there can be only two co-chairs assigned per session. McCormick asked what topical conference ideas the MESD would like to consider for 2004 (note: J. Ekerdt will be MPC for this meeting). Specific suggestions were not presented for consideration, but considering Texas location, semiconductors or energy-related concepts were considered feasible.

J. Torkelson noted that we have only 18 core sessions, and we have been there for approximately 10 years. We should be able to increase this considering division's activity level. T. Anderson suggests that we contact Joe Cramer or Phil Westmoreland in this regard. To this point, we've used co-sponsorship to grow the number of sessions of interest to the MESD membership. There hadn't been much pressure to change this recently because we've been at venues with lots of rooms. However, J. Ekerdt notes that they want a cap at 340 oral sessions and 245 sessions have been spoken for already. The main criteria for getting additional sessions are to have an attendance at sessions be greater than the overall session average. This average is usually approximately 35, while the MESD usually has about 50. So we may have a basis to be successful in getting an increase in base session allocation.

Finally, T. Anderson noted that the current AIChE meeting is 3<sup>rd</sup> from the record pre-registration so far. The final registration may be a record, so the annual meeting must still be considered successful despite everything.

#### Membership - John Torkelson, Northwestern University

As has been discussed extensively at this meeting, declining membership is perhaps the only problem the MESD faces at this time; otherwise the Division is very strong. Perhaps we should poll the membership to find out how to better serve them. Can we find out what good ideas or experiences other divisions have had with polling? S. Gehrke pointed out that 1993 survey was done. One finding from that survey was that the low level of involvement of industrial people in division was seen as a weak point (especially in programming), and that doesn't seem to have changed. J. Torkelson noted that companies don't send too many people to the meetings, and probably at even lower rates than ten years ago. R. Krishnaswamy notes most industrial people come from within approximately 200 miles of meeting location, so we should try to target this population with each meeting. A McCormick suggested that we email all presenters at MESD sessions about the importance of Division membership. J. Ekerdt suggested that we add a section or article to the newsletter on "How to Get Involved." P. Hammond suggests that the MESD promote areas of involvement that targets younger people entering the profession

#### Conclusion – J. Ekerdt, University of Texas

At the conclusion of the meeting, J. Ekerdt thanked J. Torkelson for his service to the Division as Chair over the past year, and welcomed him to the status of Past Chair with the conclusion of this meeting.

*Meeting was adjourned at 4:10 pm.*



### Upcoming Meetings

AIChE has its annual spring meeting in April 25-29, 2004 Hyatt Regency, New Orleans, LA With keynote speaker Jim Gallogly, President and CEO of Chevron-Phillips Chemical Company -Sponsored by the Fuels and Petrochemical Division

ACS's 227 National Meeting and Exposition -Anaheim California March 28 – April 1, 2004<sup>th</sup>

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