

**Minutes of the
American Society of Mechanical Engineers - Aerospace Division
Adaptive Structures and Material Systems Technical Committee**

**Meeting held at the
SPIE Smart Structures and Materials Symposium
San Diego, CA**

**Tuesday, March 8, 2005
7:30-9:30 PM
Town & Country Resort and Convention Center
Sunrise Room**

1.0 Attendance and acknowledgment of visitors (Chris Lynch, Chair)

Janet Sater began with a thank-you note from Diann Brei. Chris Lynch introduced all of the TC officers. There were 42 people were in attendance at the start of the meeting.

**2.0 Review and acceptance of minutes of committee meeting held at the 2004 ASME
IMECE ASMS Symposium, Anaheim, CA (Don Leo)**

Janet Sater, Arnold Lumsdaine, and Jordan Massad had corrections to the minutes. The minutes were accepted pending revisions that will be emailed to Don Leo.

Action: JS / AL / JM will email DJL the corrections.

3.0 Membership Report (Don Leo)

- 1.0 Circulation of Roster for Updating**
- 2.0 Current Committee Membership**

Don Leo summarized the current membership of the committee. Don Leo announced that there were 9 Industry Members, 16 Government Members, 27 Academic Members currently serving on the committee.

**4.0 Treasury Report (Zoubeida Ounaies)
Status and update**

Zoubeida Ounaies circulated a treasury report for the committee.

Draft Strategic Plan (Gregory Washington)

A draft of the ASME Strategic Financial Plan (Draft) was circulated to the committee. The document is attached to the minutes. Greg Washington emphasized an interest in giving a Young Faculty award of (tentatively) \$1000. This is modeled after an award given by the IEEE Society. Raising the quality of the plaques and certificates was also emphasized. It was stated that the present budget needs to be doubled to achieve the stated goals. The concept of pursuing an endowment was also raised. A tentative goal of \$100,000 over a period of 2 to 5 years was suggested as a goal. Methods include corporate sponsorships and voluntary endowment fee from members (\$1000-\$1500). Corporate naming rights for conferences or awards were discussed.

Chris Lynch raised the question regarding the tax deductability of the gifts. Greg Washington answered that the money would go to ASME. Our TC account is already set up for an endowment.

Ephraim Garcia asked if this had been passed by Elio Manes. The answer was yes.

Inderjit Chopra suggested the possibility of beginning the Young faculty award next year. Ephraim Garcia reminded the committee that the awards should be in line with other ASME awards. He was concerned that this award would also put undue burdens on the committee.

Greg Washington reminded the committee of the need for the budget. Anna McGowan inquired about the motivation for raising the amount for the award. CL and JS stated that the money is not the issue with the awards, but the prestige associated with the recognition. ALumsdaine inquired whether there was a minimum required to set up an endowment. Alison Flatau suggested that the Vice-Chair should look into beginning this award since the Vice Chair is in charge of the awards for the committee. JSater indicated that we should investigate criteria for awards in other societies. DLAGoudas stated that the SES has a Young Investigator award. Anna McGowan suggested that allowing corporations to sponsor the award will improve sponsorship.

Action: Don will email document to all of the members.

Action: Include as a discussion item for the November committee meeting.

Action: The Chair and Vice Chair will present a draft plan in the November Meeting.

5.0 Reports on ASME IMECE

2005 ASMS Symposium: Marcelo Dapino and Mehrdad Ghasemi-Nejhad

Marcelo Dapino summarized the current status of the 2005 ASMS Symposium to be held in Orlando in November 2005. There were 60 submissions as of March 7, 2005. The deadline has been extended to March 21, 2005. The symposium has 15 sessions; 2 or 3 of which will be devoted to Multifunctional Materials. The symposium needs 60 to 75 papers. Asanuma inquired about the number of papers from overseas. Marcelo Dapino replied approximately 20%.

2006 ASMS Symposium: Mehrdad Ghasemi-Nejhad and Arnold Lumsdaine

2007 ASMS Symposium: Arnold Lumsdaine and Kara Peters

6.0 Reports on AIAA SDM

2005 Adaptive Structures Conference: Lee Peterson and Steven Griffin

Darryl Pines gave the report for the 2005 Adaptive Structures Conference. There were 65 papers for the conference. 1 special session organized by Terry Weisshaar on morphing. The conference will be on April 17-20, 2005 in Austin, TX. Mike Obal will be giving the overview.

2006 Adaptive Structures Conference: Steven Griffin and

It was announced that D. Ambur – NASA – Glenn will be co-chair for the 2006 meeting.

7.0 Reports on SPIE Symposium

2005 – Chair: Vasundara Varadan, Co-Chair: Yoseph Bar-Cohen

2006 – Chair: Yoseph Bar-Cohen, Co-Chair: Alison Flatau

7.1 Smart Structures & Integrated Systems Conference

2005 - Chair: Alison Flatau, Co-Chairs: Yuji Matsuzaki, Don Leo

Alison Flatau summarized the statistics for the 2005 Smart Structures and Integrated Systems Conference. There were 80 submissions, 10 posters, 3 advance cancellations. Currently there are zero no-shows.

2006 - Chair: Yuji Matsuzaki, Co-Chair: Don Leo

7.2 Active Materials: Behavior and Mechanics

2005 – Chair: Bill Armstrong, Co-Chair: Marcelo Dapino

Bill Armstrong summarized the statistic for the 2005 Active Materials Conference. There were 72 oral presentations and 4 posters.

2006 - Chair: Bill Armstrong, Co-Chair: Marcelo Dapino

2007 – Chair: Marcelo Dapino, Co-Chair: Zoubeida Ounaies

7.3 Damping and Isolation

2005 – Chair: Kon-Well Wang, Co-Chair: William Clark

Kon-Well Wang summarized the statistics for the 2005 Damping and Isolation Conference. There were 70 papers (60 papers in 2004). Of the 70 papers submitted, 66 were oral presentations and 4 were posters. There were 13 sessions at the conference.

2006 – Chair: William Clark, Co-Chair: ?

It was announced that Mehdi Ahmadian and Arnie Lumsdaine will be co-chairs for the 2006 meeting. Mehdi Ahmadian will become chair after William Clark and then Arnold Lumsdaine will become chair.

7.4 Industrial and Commercial Applications

2005 – Chair: Ed White, Co-Chair: Porter Davis

The statistics for the 2005 Industrial and Commercial Applications Conference were summarized. There were 43 abstracts; 40 oral presentations; 2 cancellations. There was some confusion about scheduling on papers. There are several presenters whose presentations do not show up. The video quality has been poor. People have noticed there were several projectors replaced during the meeting.

2006 – Chair: Ed White, Co-Chair: Porter Davis

It was announced that in 2007 / 2008 Porter Davis will be chair. A co-chair should be identified, preferably from industry.

7.5 Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems

2005 – Masayoshi (Tomi) Tomizuka and Victor Giurgiutiu and Chung Bang Yun

Victor Giurgiutiu reported on this conference. He stated that submissions were up 30% and that parallel sessions were required. There were 130 submissions; a number of submissions were from Asia.

2006– Masayoshi (Tomi) Tomizuka and Victor Giurgiutiu and Chung Bang Yun

1.0 Best Student Paper competition: Arnold Lumsdaine

Arnold Lumsdaine stated that there were 49 submissions to the competition. One issue is the length of the meeting; it has been 11pm before the meeting is complete. One suggestion is to decrease from 6 to 5 papers. Award amounts were increased. Sponsors were Sage Publications. It was suggested that the winners should be told about the award; although it was stated that this is difficult due to the timing of the award discussions. Inderjit Chopra suggested that the award should simply be the ‘best student’ award; do not make too many categories.

8.0 Reports on International Conference on Adaptive Structures & Technology (ICAST) 2005 Paris, France, Roger Ohayon

Roger Ohayon gave the report on the 2005 ICAST conference. The abstract deadline is in May. The conference will be held in Paris. Conference papers will be due at the conference.

2006 Taiwan, C.K. Lee

It was announced that the 2007 meeting will be in Canada. It was noted that the CANSMART conference is in conflict with the ICAST meeting time.

9.0 Honoric Subcommittee

9.1 ASME Adaptive Structures and Material Systems Prize (Dan Inman)

Dan Inman’s document was read to the committee regarding the current status of the award and suggestions for future awards. It was suggested that the committee be nominated; it was suggested that the Vice Chair be the member. Inderjit Chopra suggested that the process should stay the same. Chris suggested that we defer discussion when Dan Inman was present.

Action Item: Agenda item for November

1.0 ASMS Best Paper Awards (Mary Frecker)

Chris Lynch requested that anyone who saw a good paper please tell Mary that information.

Structures and Structural Dynamics (Don Leo)

Norm Wereley will chair the committee in the future. It was suggested by Don Leo that unless we receive a minimum number of nominations we do not hold a paper.

Action Item: Each chair will bring nominations (two maximum) from their conferences (SPIE and ASME)

Action Item: Sub-committee will change rules to allow nominations from any smart materials and structures paper.

Materials and Material Systems (Marty Dunn)

The best paper was (Cal Tech group).

2.0 Recognition Campaign (Kon-Well Wang)

Dr. Yuji Matsuzaki was named as a Fellow of ASME.

Chris Lynch raised the question of whether our committee should encourage our members to become SPIE Fellows. Rick Claus is an SPIE Fellow.

Action Item: Chris Lynch will email Rick Claus to investigate the requirements.

10.0 Operating Procedures

TC Database (Diann Brei and Mehrdad Ghasemi-Nejhad)

Add Don Leo, Marcelo Dapino, and Greg Agnes to the notes on the database. Mehrdad reviewed the database procedures.

11.0 AIAA Business (F. Staub)

Darryl Pines – TC meeting will be on Wednesday night at the AIAA meeting in Austin, TX. Meeting is April 18-20. A number of new initiatives have been proposed: (1) newsletter from both committees and send to database.

Janet Sater recalled that there was a newsletter in the past. The length was typically 7 or 8 pages.

Action Item: Include as an agenda item in November.

Action Item: Alison Flatau will forward information from previous year to Chris Lynch.

12.0 Nominations for new TC members

Action Item: Don Leo will go through membership lists to determine recent attendance / activity of members.

The vote on Wenbin Yu of Utah State University was tabled until the 2005 meeting at the IMECE conference.

Sergio Lucato, UCSB (now at Rockwell) was accepted for membership in the committee.
Mohammad Elahinia, University of Toledo, was accepted for membership in the committee.
Shiv Joshi, NextGen, was accepted for membership in the committee.

13.0 Adjourn

The meeting was adjourned.

ASME Strategic Financial Plan (Draft)

Increasing the revenue of our committee is necessary to complete our mission as a technical committee. Presently we have the following yearly commitments:

1. Adaptive Structures Prize (\$1000.00)
2. ASME Congress Wine and cheese reception (\$1000.00)
3. SPIE Student paper competition (\$0.0)
4. Best Paper awards (Materials and Structures \$1000.00 - total)
5. Food for Technical Committee meetings (\$500.00)
6. Miscellaneous (Plaques, Certificates etc. \$500.00)

Because of the generally esoteric nature of the research we perform there is not a venue where researchers in the adaptive structures arena can get recognized for significant achievement. The best paper awards and the SPIE student paper competition fulfill this mission. We believe it is imperative that we maintain these awards and their monetary dollar values for the foreseeable future. These awards inspire competition and collaboration and allow us to evaluate what achievements are truly significant. We receive the following revenue: (\$2K from SPIE) and ~\$400.00 from the ASME Aerospace Division (Discontinued after 9/11).

The proposal herein offers both near term (< 3 months) and longer term (9 to 18 months) suggestions by which we can increase our revenues.

Recommendation:

The monetary values for the awards should be upgraded significantly and an additional award for younger faculty should be added.. Here are some preliminary recommendations:

- a. Adaptive Structures Prize (\$2500.00)
- b. Best paper awards Materials and Structures (\$1000.00 each)
- c. A “Named” best paper award for Younger faculty (\$1000.00). This should be named after one of our pioneers or maybe even our largest sponsor.
- d. Plaques and Certificates (\$1000.00)

It is recommended that an **endowment** be raised to pay for our best paper awards and the SPIE money would be used to pay for yearly operating expenditures (food, miscellaneous cost, etc.). This means an endowment capable of providing about (\$7000.00) per year is needed.

ASME Named Endowment

Endowed gifts can be setup in two ways:

1. (Lifetime Endowment) Only the **income** from the invested contributions is used to support the desired activities. In this case the initial funds are invested in perpetuity and there is a higher threshold for initial investment
2. (Limited Term Endowment) The **income and part of the principle** are used to support the desired activity. In this case the endowment has a finite lifetime but requires a lower

threshold for initial investment. The endowment will thus expire in a finite period say 20 years.

Endowed funds are established for a variety of reasons: to provide scholarships, to honor distinguished careers, to memorialize loved ones or simply to express appreciation to the TC. In most cases the donor's motivation for establishing or contributing to an endowed fund is a desire to permanently enhance the field of smart materials and its programs.

Investment policy

A university or the ASME will manage the endowment on a mutual fund basis. The endowed fund will be assigned a number of shares based on the value of gifts to the fund. The value of each share will be calculated monthly using the number of existing shares and the fund's market value at month's end. Monies would then be distributed annually based on a fixed percentage of the average market value per share of the endowment during a fixed period of time. A formula for this distribution will be adopted at a later date but should be consistent with large teaching and research universities.

Because of the nature of the funds distribution a **minimum** initial goal of \$50,000 - \$75,000 is recommended depending on option chosen.

Endowment Fund Raising

There are a number of ways to raise revenue for the endowment:

Solution 1. ASME TC Members

Before funds are solicited from the outside an internal drive could be initiated. TC members could pay a “voluntary” one-time endowment fee of between \$1000.00 - \$1500.00. The goal would be to raise 30% - 50% of our required goal. When future members joined the TC they could be asked for the fee as well. In exchange for the fee members could get lifetime membership in the TC (Lifetime Endowment) or limited term membership (Limited Term Endowment).

Solution 2. Corporate Sponsorships

A number of companies have benefited tremendously from advances in smart materials and related technology. In many cases the technology had its origins in this technical committee (TC). In addition there are program managers who are part of this TC who may be able to creatively get a large sum of money to the TC (perhaps through a workshop or conference). Sponsoring companies will receive recognition at TC events and any publications and written correspondence of the committee.

There are two forms of sponsorships:

a) ***Major Naming Rights*** (Adaptive Structures Prize) \$25,000.00

- . A major donor will have rights to the name of the endowment, and the Adaptive Structures Prize. These would be announced as the “Lockheed”, “CSA”, etc. Adaptive Structures Prize.

b) ***Minor Naming Rights***

- . The idea here is to really give the companies some advertisement for their revenue. This can be accomplished by providing professional looking posters and maybe a banner bearing their name.
 - . “Named” best paper awards Materials and Structures (\$5000.00 each)
 - . “Named” best paper award for Younger faculty (\$5000.00)

We are requesting that TC members provide ‘the proper’ leads to start the process. In the past we have made contact with various people from various companies. The idea here is to contact the **key** individuals who have benefited directly from advances in this field. An incomplete list of companies where contacts are needed is the following:

<i>Company</i>	<i>Contact Person</i>
Lockheed Martin	
NextGen Aeronautics	Jay Kudva
Boeing	Ed White
Northrop Grumman	Probably will not be involved in this area anymore with Jay gone
TRS Ceramics	
TSI Ceramics	
ACX	
Dynamic Structures and Materials	Jeff Paine
Sensortech Limited	
CSA	Conor Johnson
Continuum Photonics	Aaron Bent

Solution 3. Proceeds from the Sponsorship of a Conference

The field of smart materials is reaching a crossroads. The infusion of new ideas into the field is needed to sustain and accelerate its growth. A major *international* conference or workshop incorporating this theme could be developed with the revenue being used to provide a major portion of the endowment.

For this 1-1.5 day tutorial-based workshop/conference we can have a series of talks FOR the members of our community instead of BY the members of our community. The theme is long-term growth of our community. This conference will address emerging research areas or advanced topics? What are the technical hurdles that need to be cleared for our involvement? We can also add some of our own people to talk about new areas and limitations. Here's a listing of possible topics for these camps

1. Micro and Nanotechnology and Smart Materials: Can smart materials play a role? Incorporating smart materials as an integral part of next generation integrated circuits using semiconductor materials. A number of semiconductor materials are either piezoelectric or piezoresistive).

-Self Assembled smart materials

2. Bio-inspired Material Systems: Letting nature inspire what we do

- Bio-Electric and Bio-Magnetic Phenomena

- Bio-Inspired Robotic Systems and devices
- Biomimetic Vision
- Molecular Motors

3. High Stroke Advanced Actuators (more of a materials science flavor than devices)

- Ferromagnetic SMA's: (James, Ohandley) (6% - 10% Strains)
- Relaxor Ferroelectrics (Shrout – PSU) (1.7% strains)
- Alkaline based Piezoelectric materials (.85% strains) (Yet-Ming Chiang)
- Electroactive Polymers:

4. Advanced Camp. This will be a 1-day session where key DARPA, NIH and HSARPA personnel will make presentations about their core needs and capabilities. The reason for choosing these three agencies lies in the fact that not all of our members have access to them. Insight into future platforms will be solicited and true needs will be assessed. May be more general or smart material based. Specific problems that have been unresolved for long periods of time can also be addressed.

The key for all these camps is that they be tutorial or knowledge generating in nature. For the conference, we should pick somewhere really nice (maybe exotic and somewhat secluded) and stress a family atmosphere. Thus the sessions should end by 2:00 PM both days. We should also NOT have any order to the talks. Thus no one receives an “ordered” agenda until they get to the conference and therefore should plan for being there the whole time. There should also be ample time in between sessions for discussion and collaboration

The long-term solution is something that we believe we need to consider. We believe a 1-2 year lead-time is required for a workshop; the earliest possible date for such a meeting would be Summer 2006. A successful workshop hinges on obtaining upfront money from DARPA, NSF, ARO, etc. to defray much of the cost. If that does not happen then a workshop is *NOT* a good idea. Towards that end we need to make sure that key supporters are sympathetic to the needs of the committee. It may present a conflict of interest to invite program managers on the TC and then ask them for money.