Alpha Eta Mu Beta

NATIONAL BIOMEDICAL ENGINEERING HONOR SOCIETY

MAY 2009
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National News Letter

Alpha Eta Mu Beta
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MESSAGE FROM THE PRESIDENT

It is with great pride that I address you. I'd like to express my thanks to the AEMB membership for electing me as your president. I am excited about starting my presidency and working to build on the success that the organization has made during the presidency of Dr. Teresa Murray and Dr. Herbert Voigt. I am especially appreciative of our past-presidents who I have worked closely with over the past years.

Alpha Eta Mu Beta was founded by Dr. Daniel Reneau in 1979 at my alma mater, Louisiana Tech University. As one of the newest engineering disciplines and honor societies, we are still defining the vision and goals of the Society. Thank you for riding the ups and downs with us. I will focus my presidency upon the following areas:

- ***Foster ethical and social responsibility*** of future biomedical engineers concerning product development, translational research, and public policy.
- ***Increase communication*** among the chapters.
- ***Promote education and diversity*** of the next generation of biomedical engineers, providing guidance for their career path, and affecting leadership in AEMB.

To address the goals, we will host top-quality ethics sessions at the frontiers of biomedical engineering and bioengineering. Each year, the participants are amazed at the diversity of opinion and ethical dilemmas raised. Further, many of the issues raised have yet been introduced into public policy; therefore the session also serves to impress upon biomedical engineers the importance for us to participate in the debate of how our research impacts health and disease treatment and public policy.

Since membership and communication among the chapter is a key priority, AEMB realizes that we need to be more responsive to our members. Thus, we are examining ways to keep our members informed via the newsletter and our updated and revamped website. We are also developing an Awards Committee to recognize outstanding individuals and chapters, outlined later in the newsletter.

I am also delighted to be working with the new executive board: Dominic Nathan, serving as the Vice-President, Shawn Carey as the Treasurer, Priti Das, who is our current Secretary, and Pat Horner, the executive director of AEMB. They have all been imperative to the success of the organization.

Melodie E. Benford
National Student President
2008 - 2010

ADVISOR FOCUS

Name : Brent L. Vernon
Position : Associate Professor of Bioengineering, Harrington Department of Bioengineering, Arizona State University
Education : **BSE** Biomedical Engineering Arizona State University
PhD in Bioengineering - Utah State University
Postdoctoral Training in Biomaterials at the University of Zurich, Switzerland

Dr. Brent Vernon currently serves as the director of the Center for Interventional Biomaterials at Arizona State University. The primary research theme of his lab is the development of injectable, in situ gelling biomaterials for drug delivery and for tissue reconstruction. This work covers aspects from polymer synthesis, polymer characterization, bench top testing, and extensive in vivo experiments.

In the classroom, Dr Vernon teaches courses that are relevant to his research areas of interest, topics in which he is holds dear to his heart. In particular, he teaches a Sophomore level Conservations Principle course, a Junior level Biomaterials course, and a Graduate level Polymeric Drug Delivery course.

Apart from the arena of research and teaching, Dr. Vernon has also played an instrumental role in the field of Graduate studies at Arizona State University by serving as the Director of the Bioengineering Graduate Program, for the last 3 years. He is an active mentor and great role model for bioengineering graduate and undergraduate students in their academic journeys on campus.

Dr. Vernon's involvement in AEMB began in the early 1990s when he was inducted into AEMB, the very first year that the society had a chapter at Arizona State University. His zeal and enthusiasm for the society did not end there and in October 2008, he was bestowed with the privilege of serving as the National President of the Society.

UNDERGRAD STUDENT FOCUS

Name : Shawn P. Carey
School : Worchester Polytechnic Institute
Degree : BS Biomedical Engineering
Biology Minor
Material Sciences Minor

Shawn's involvement in Alpha Eta Mu Beta began in the spring of his junior year when he was inducted as a charter member of the Worcester Polytechnic Institute (WPI) chapter of AEMB. Since then he has played an active role on campus, serving as president of both BMES and AEMB (2008 - 2009) at WPI. In the fall of 2008, Shawn attended the 2008 National BMES Conference in St. Louis to represent his school. There he was elected National AEMB Treasurer.

The WPI chapter of AEMB is still in its infancy, having gained their charter in 2008, however through Shawn's leadership and the support of his executive board the chapter has continued to expand in their involvement around campus and in the Worcester community. Members of AEMB were offered the opportunity to tutor Worcester-area junior and senior high school students in math and the sciences as well as participate in after-school activities such as the Microgravity Club. In this capacity, they were able to help students learn, encourage excellence in math and science, and promote the field of engineering. Together Shawn and the AEMB chapter have carved out plans for the future in which AEMB at WPI will include an on-site tutoring program that would benefit BME under classmen, immersion in community service, collaboration with other honor societies on campus, and more significant involvement around the WPI campus.

In his own words, Shawn says that "My experience with AEMB has shown me that by becoming involved and enthusiastic members of Alpha Eta Mu Beta, we will be able to continue to work with our schools, our communities, and industry professionals in an effort to spread awareness of our organization and its members, our mission, and the field of Biomedical Engineering".

Shawn will be pursuing something that he is passionate about, a PhD in biomedical engineering at Cornell University in the fall of 2009.

Grad Student Focus

Name : Melodie Benford
School : Texas A&M
Degree : PhD Biomedical Engineering
Research Focus : Optical Biosensors

Melodie Benford is a graduate student at Texas A&M University under the guidance of Dr. Gerard Coté at the Optical Bio-Sensing Laboratory. Melodie's research is focused on developing biosensors based on surface enhanced Raman spectroscopy (SERS) where she develops suitable substrates and assays to create biosensors by detecting the Raman signature of the target molecule. Currently, her research projects are investigating sensors to detect indicators of cardiac disease to aid in diagnosis and prognosis of a patient in addition to another project in which her biosensor knowledge is being applied toward Alzheimer's disease by detecting β-amyloid.

Apart form the world of research, Melodie is passionate about reading, writing, and creative endeavors, and has done very well in the technical fields. She enjoys working with people and taking on new tasks. As a result, it is no wonder that she was strongly drawn to biomedical engineering, a new field that has yet to take on its final form. In her reflections Melodie states that when people ask "What is biomedical engineering," so many ideas and concepts come to mind it can be overwhelming.

When Melodie was first invited to join Alpha Eta Mu Beta, she was intrigued to learn that as one of the newest honors societies, AEMB's role had not yet been firmly established. As the national student president, she would ultimately like to see the members of Alpha Eta Mu Beta inform people of the social and ethical issues surrounding the merge of technology with biology. Melodie strongly believes that debate should be led with integrity and conclusions made based on logic and empathy. This is crucial for biomedical engineers serve as the bridge between doctors, who know what technology is needed for the best care of patients, and engineers, who understand how to bring this technology into fruition. Furthermore, policy makers turn to biomedical engineers for insight and advice. Therefore as developers of these technologies, through the annual AEMB ethics sessions, Melodie hopes that innovators will consider even the social implications of these products, especially those technologies that have only previously resided in the imagination of science fiction authors.

Alumni Focus

Name : Priti Das
Employer : The Dial Corporation
A Henkel Company
Education : BSE Biomedical Engineering
Arizona State University

Priti Das graduated from Miami High School from Globe/Miami, Arizona and was awarded the Arizona State University's Provost Scholarship. At ASU, Priti pursued a degree in Biomedical Engineering, an area in which she is passionate about. Through the years, Priti has played a prominent role on the ASU campus. She served as a Fulton School Ambassador of the Ira A. Fulton School of Engineering and was a founding member of the Arizona INROADS Association in which she held the position of President in 2006. It was through this program that Priti was able to obtain her very first internship position working as a Research & Development Intern for The Dial Corporation for summers of 2005 and 2006. In the summer of 2006, she was presented the INROADS Intern of the Year award. Priti's internship experience did not just stop at The Dial Corp, and she has also interned at companies such as Bard Peripheral Vascular/Bard Biopsy Systems and BME Career Alliance.

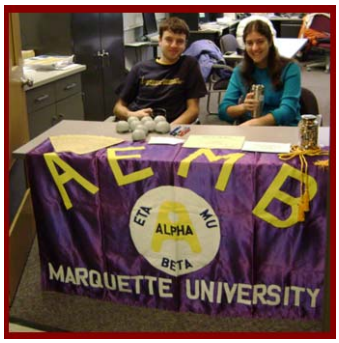
In the AEMB front, Priti served as the President of the Arizona State University Chapter and on the national level, Priti was unanimously re-elected a the AEMB secretary for the 2008 term. For her hard work and strong academic performance, Priti was honored as 'Outstanding Graduate Flag Bearer' for the Spring 2007 Engineering Convocation to represent the Arizona State University Harrington Department of Bioengineering.

Priti currently works for The Dial Corporation: A Henkel Company in Scottsdale, Arizona as a Product Development Scientist. She has been appointed as Scientist, Personal Care Technology where in her new role she is responsible for the development of new Dial hand cleansing technologies and household cleaning products.

Chapter Focus
Marquette University

This year marks the start of the renaissance of the Alpha Eta Mu Beta Chapter at Marquette University. Under the leadership of Dominic E. Nathan, the chapter president and the guidance of the of the chapter advisor Dr. Dean C. Jeutter and together with the dedication and enduring support of the committee members Michael Jirjis (VP), Megan Naber (Secretary), Timothy Gundert (Trea$urer) and Biomedical Engineering Department, Alpha Eta Mu Beta at Marquette has re-emerged as a strong and revitalized organization.

Taking into consideration the heavy schedule of the students and to ensure adequate communications, emails were sent out well in advance of each meeting to help remind and inform members of chapter activities and business. Email communications proved to be logistically effective with discussions, votes and planning thus reducing the actual meeting time needed. This enabled the executive board to implemented a new system of 'active gatherings' where chapter members met for regularly scheduled meetings in which chapter business was discussed briefly and a majority of the meeting time spent participating in an 'event of the day'. The activities that were chosen for each meeting were focused upon principles of professional and personal development, community service and social events.



Throughout the year, the Marquette AEMB chapter strived to establish increased visibility within the College of Engineering and foster stronger ties with the BMES org. Both groups had worked closely throughout the year on several projects. The first event joint event was a speaker session in which the goal was to provide current Biomedical Engineering students with information of the career options available post graduation with a Biomedical Engineering degree. There were a total of 6 speakers over two separate sessions who were currently holding positions in the areas of academics, business administration, sales, law, research, and physical therapy. AEMB was very active during the engineering open house where many members assisted faculty and administration with the event through providing demonstrations, college and lab tours and also setting up an information table with puzzles, raffles and prizes (picture above).

In the Spring, Alpha Eta Mu Beta hosted a campus wide Etiquette Dinner where a professional presenter was invited and to teach table manners and dining etiquette. This event was well received with representation from across the different colleges on campus and even the AEMB sister chapter from the Milwaukee School of Engineering (MSOE).

On the social front, the executive board helped to establish tradition by hosting several social events. These consisted of bowling games during the fall and spring semesters where several hidden talented bowlers within the AEMB chapter were discovered. Halloween was celebrated with pumpkin carving competitions, pumpkin pie and hot apple cider which made the event one that was very enjoyable on the cold fall evening. The 2008 semester Christmas party was very well received and served as a stress reliever during finals week (figure below).

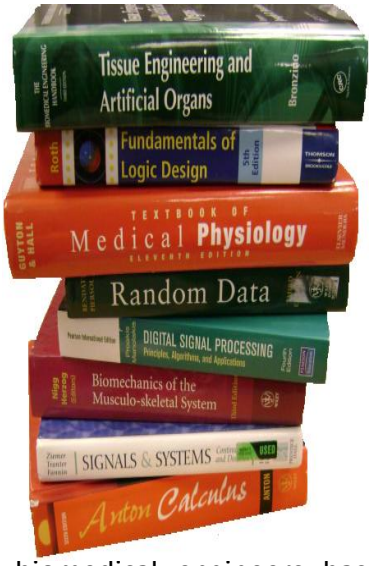
The 2009 initiation was held in April with a large class of 22 initiates. This year the requirements were to carve the image of a vitruvian man, assemble a 'beating heart circuit' and calculate some circuit parameters such as the period, frequency and pulse width. In addition, the initiates had to obtain signatures from the faculty and current members (29 in total). All the initiates were successful in assembling the vitruvian man. The signature activity helped expose students to the different faculty research and work.

Toward the end of the semester, Dr. Pintar, an alumni was instrumental in helping to organize a lab tour to the Vehicle Crashworthiness Lab and the new Neurosurgery Research Facility located at the Zablocki VA Medical Center in Milwaukee. Dr. Pintar is the director of these labs and the Crashworthiness lab is the only National Highway Traffic Safety Administration certified full-scale lab in an academic setting in the world.

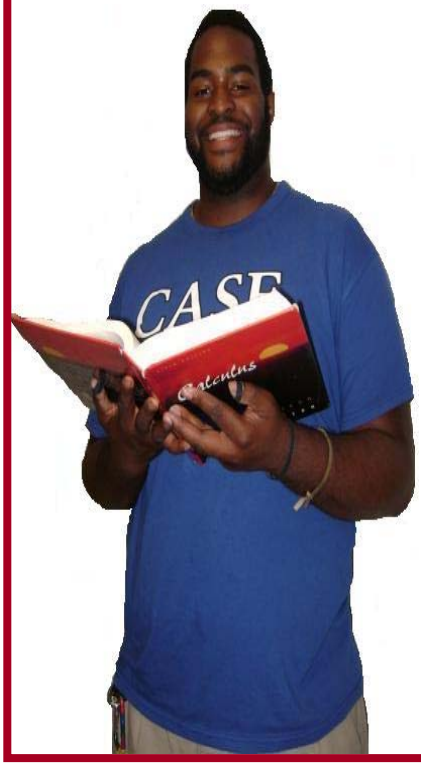
It was a bitter sweet moment during the transition meeting with the new AEMB chapter administration. However everyone in the AEMB chapter of Marquette can look back proudly with their heads held high knowing that they have been a catalyst for this renaissance.

After Graduation

Graduation for many biomedical engineering students is just around the corner or has happened recently, so what's next? Those of you who are grad**u**ating seniors should be preparing resumes, cover letters, identifying and contacting prospective recommenders, contacting and registering with your Career Services Departments for help in identifying suitable companies with which to interview. Others should be in contact with their Biomedical Engineering Departments for aid in finding graduate programs that will enhance and extend undergraduate training. There are many opportunities waiting; **preparation** and execution for the next step are essential.



The preparations for getting a job, acceptance into a graduate program, or acceptance into medical school are fundamentally the same. The process begins by getting organized and arguably with deciding on a career path. Of course, it may be difficult to make a career path decision at this point, but you should have some focus. The economics of today's job search requires hard, conscientious preparation and work. On the other hand, some engineering graduate schools are trying to improve their enrollments by extending acceptances, and often support, to a larger number of applicants than in the recent past. Graduate school hopefuls should practice the same diligence as job hopefuls in finding good placement in programs that have research foci appropriate to career goals and interests. Also, the competition for financial support in engineering graduate schools is stiff. **Be diligent** in your preparations.



Arguably, looking for companies that hire biomedical engineers has traditionally been more challenging for biomedical engineering students than for students in other engineering disciplines. One reason is that because biomedical engineering is so multifaceted there are many companies whose products may not at first suggest a biomedical engineering involvement. Many of these "hidden companies" offer excellent and exciting opportunities for biomedical engineers. There are several effective ways of ferreting out some of these companies. Check with your biomedical engineering teachers for leads. Check the trade magazines directly or peripherally involved with biomedical engineering or medical products (your teachers or former teachers probably receive these monthly). Check the companies' listings published by the various engineering organization (BMES, IEEE, ASME, etc). Make telephone calls to suspect companies. **Be tenacious.**

Another reason that some companies seem "hidden" may be that although many really need biomedical engineering expertise they are not fully aware of the potential contributions a newly hired biomedical engineering student can make. There are companies that could benefit greatly from hiring biomedical engineers but are perhaps unsure of what

impact biomedical engineers can make in their business. Fortunately today there are informed, working biomedical engineers who have attained positions of hiring authority and have enormously improved the availability of job opportunities for biomedical engineers. And there will of course be many more such individuals as time goes on. Check with your Department office for help in finding these engineers – such as the industry members of your department's Industrial Advisory Board for example. These individuals (perhaps you!) will ultimately be responsible for improved job possibilities for biomedical engineering students. **Be faithful**.

Further, some companies require some job experience for entry level positions. Having worked in industry for summer jobs or internships or through a co-op program during college could immensely improve your chances of getting such a job. Requests for personal references should be made from people who know you well enough to comment on you in a positive way. Companies and graduate programs are interested in such things as your technical maturity, ability to express yourself orally and in written form, leadership, emotional maturity and stability, and motivation. I suggest that when you approach a prospective recommender you ask: "will you provide a *favorable* recommendation on my behalf?" Graduate schools always ask you to provide written reference letters from recommenders. However, industry personnel departments these days frequently obtain reference information by telephone interviews with recommenders. In any case, you should always prepare a recommender with a copy of your resume and a succinct statement of our career plans.

Resume preparation help is usually available from your university's career service department. Having your up to date resume ready to go is important for industrial job and graduate school searching and applications. Generally a college graduate's (B.S.) resume should be one page in length (perhaps two or more pages for M.S. and Ph.D.). Provide the usual personal data, education (include your overall quality point average as well as your average in engineering coursework only), job experience (especially that which strengthens your request for work in biomedical engineering), and important extra-curricular activities (e.g.: officer or committee chair of AEMB, BMES, Tau Beta Pi, etc. student chapter, summer employment at a hospital or clinic, internships, etc.).

The cover letter that accompanies your resume for an industrial or graduate school position is the vehicle you use to customize your application to the company's or school's interests. You should do some preliminary research on their activities (use your library to locate college graduate bulletins, use the internet, use the Thomas Register and trade journals to obtain information on companies). Mention things in your cover letter that you feel are of significant interest to the company or school and which are too "bulky" or specific to put in the resume. This is your chance to "toot your own horn" and focus on what your potential contributions will be to the company or graduate program.

While the search for the right job for you may seem to be a daunting and tedious process, it is of course worth the effort! **Good luck!**

Article Written by Dean C. Jeutter, PhD, PE.

Dr. Jeutter is a professor and dean of graduate studies in the Biomedical Engineering Department at Marquette University

Technology Review : Computed Tomography

Computed tomography (CT) was ranked in 2001 as the **top medical innovation** along with Magnetic Resonance Imaging, and it is estimated that more than **60 million CT exams** are performed annually. CT provides three-dimensional tomographic images, for example, the CT image of a thorax shown in Figure 1. CT images are natively acquired in the axial plane (cross-sectional slices), however the slices can be stacked to form a volume. The contrast in the image (i.e., what is light or dark) depends on the material property of linear attenuation, which is related to the density of the material.

A CT system consists of a donut-shaped gantry, as shown in Figure 2. The patient lies on the table which is translated through the gantry opening. Inside the gantry is an x-ray system – a source that produces x-rays opposite a digital detector . **X-rays** are emitted by the source and travel through the patient, where they may or may not interact. The detector measures the x-rays that exit the patient. During an acquisition, the gantry is rapidly rotated about the patient, so that x-ray projections are measured at **360 degrees** about the patient.

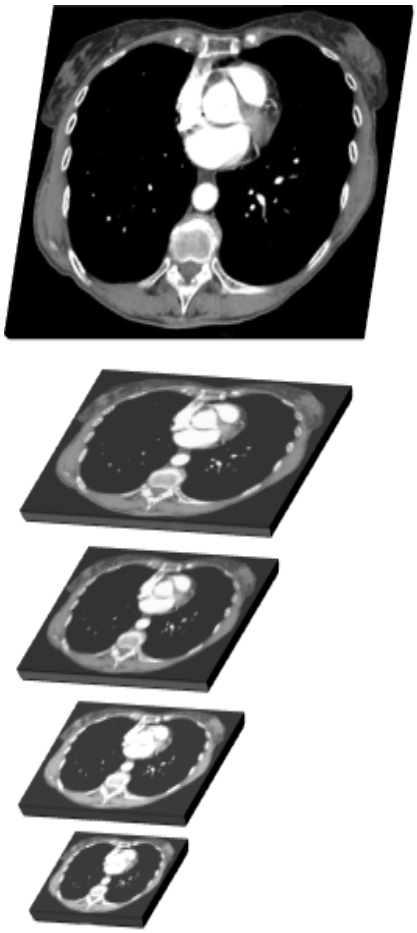


Figure 1 : CT image of the thorax

The mathematical theory for reconstructing an object from projections at multiple views was first described by Radon in 1917, however the practical application of this theory required the invention of computers. The first experimental CT systems were developed independently by Allan M Cormack and Godfrey Hounsfield in the 1960s, and the first clinical scanner was installed in **1971** For their work in the development of CT, Cormack and Hounsfield were awarded the Nobel Prize in Medicine in 1979.

The first CT scanner required 4.5 minutes to produce an image of a slice. Numerous technological advances throughout the past 30+ years have resulted in an exponential improvement in the performance of CT scanners. For example, in 1980, a typical CT system required 10 seconds to complete one rotation of the gantry, and a typical acquisition consisted of 25-35 slices, each of 10-mm thickness. In comparison, a state-of-the art scanner in 2005 performed a rotation in **0.33 seconds** and an acquisition consisted of **600-4000** slices each consisted of 0.5 mm thickness. Today's scanners are approaching isotropic spatial resolution of **0.25 mm** . These advances were made possible by numerous technological breakthroughs, for example slip-ring technology that enabled continuous rotation of the gantry, helical scanning and reconstruction algorithms that enabled continuous translation of the patient, and multi-row detectors that enabled parallel acquisition of multiple slices (up to 320 for current scanners).

A recent advance is Siemen's dual-source system, whose gantry contains two sets of x-ray sources and detectors which enable faster scanning and improved temporal resolution.

The clinical applications of CT are too numerous to list. Due to the **fast scan times** (seconds), CT scanning is used in cases of trauma, stroke, and internal bleeding. CT is especially useful for imaging **lung disease**, as MR and ultrasound have limited image quality in this region. **Contrast agents** such as Iodine make CT a useful modality for imaging vasculature. The high temporal resolution enables effective cardiac imaging, for example imaging the entire heart in fewer than five heart beats. One current clinical research question is whether **CT angiography** can replace the more invasive x-ray angiography as the primary method for screening and diagnosing coronary artery disease.

Like all imaging modalities, CT is not without limitations. One major disadvantage of CT imaging is the radiation dose given to the patient. It is estimated that CT exams account for 13% of all radiological exams in the United States, yet are responsible for roughly 30% percent of total radiation to the population. A recent study calculated the lifetime attributable cancer incidence risk of a CT angiography exam to range from 1 in 143 for a 20-year-old woman to 1 in 3261 for an 80-year-old man. Numerous manufacturers and researchers are investigating methods of reducing dose while maintaining image quality.

Figure 2 : CT system showing gantry and patient table

CT technology is continuing to evolve in a variety of directions. Today's state-of-the art scanners enable imaging with **two x-ray spectrums** in order to perform material decomposition (e.g., atomic number, and density). Scanners are being designed that can better utilize the knowledge of the energy of the detected photons. **Advanced statistical reconstruction** algorithms are being developed to improve the tradeoffs between resolution and noise in the reconstructed images. And, as has been the case for the past 30 years, CT systems are continually being developed to perform faster imaging larger region of anatomy with smaller voxels. As the amount of information presented to the radiologists increases, new visualization methods and software tools are required to facilitate interpretation, for example 3D volume rendering and computer aided detection.

Overall, despite being in existence for nearly 40 years, CT technology continues to advance. Biomedical engineers are needed to facilitate the next generation of CT system hardware, reconstruction algorithms, image processing and visualization software, and clinical applications.

For further information:

A.C. Kak and M. Slaney, Principles of Computerized Tomographic Imaging, New York: IEEE Press, 1988.

J. Hsieh, Computed Tomography: Principles, Design, Artifacts, and Recent Advances, 2nd Edition, Washington, SPIE Press Monograph Vol. PM188, 2009.

W.A. Kalender, Computed Tomography: Fundamentals, System Technology, Image Quality, Applications, New York, Willey-VCH, 2006.

Article Written by Taly Gilat-Schmidt, PhD.

Dr. Taly Gilat-Schmidt is an assistant professor in the Biomedical Engineering Department at Marquette University. Her research interest include Medical Imaging Systems, Computed Tomography and Image Reconstruction.

AWARDS

All of us are familiar with awards. Awards come in many shapes and forms ranging from ribbons, to medals, certificates, etc. However the true significance an award that is bestowed upon an individual is to recognizing their sincere effort and contributions towards creating significant positive outcomes amongst the people and communities that surround them. This year the e-board of Alpha Eta Mu Beta has decided to recognize outstanding chapters and members of AEMB throughout the nation by the presentation of awards. The following are the award and their details :

MOST IMPROVED CHAPTER

This award is given to the chapter that has shown the most improvement in terms of membership, activities, funds and involvement on campus. An official report of the past and present is needed from the officers regarding the above mentioned activities, current status of the chapter and future plans. This report must also be signed by the chapter advisor.

MOST ACTIVE CHAPTER

This award is given to the chapter that has shown remarkable involvement in the department, on campus and within the community. An official report of all activities to be considered for this award is required from the officers and this report must also be signed by the chapter advisor.

OUTSTANDING CHAPTER OFFICER

This award recognizes a chapter officer who has given his/her utmost dedication and support toward advancing the goals and status of the chapter while maintaining strong leadership, academics and character. A formal letter for nomination shall be written by the chapter advisor highlighting the above mentioned traits and contributions of the respective chapter officer.

OUTSTANDING CHAPTER ADVISOR

This award recognizes a chapter advisor who has strived to be a strong mentor, given his/her utmost dedication and support while advancing the goals and status of the chapter and being instrumental growing and developing the chapter and its members. A formal letter for nomination should be written by the chapter president highlighting the above mentioned requirements and subsequently signed by all the chapter officers.

OUTSTANDING CHAPTER MEMBER

This award recognizes an AEMB chapter member who has had good involvement in chapter activities and events, and has served as a positive role model within the chapter and the department. A formal letter for nomination shall be written by the chapter president that highlights the above mentioned traits and the letter is subsequently signed by the chapter advisor.

OUTSTANDING CHAPTER ACTIVITY

This award recognizes an AEMB chapter that has presented a creative activity that maximizes the development and growth of its members. A formal letter for nomination shall be written by the chapter officers reporting on the activity, it's objectives, outcomes and participation and subsequently signed by the chapter advisor.

BEST WEBSITE

This award recognizes an AEMB chapter that has the most informative and updated website that balances utility and appearance. A formal letter for nomination shall be written by the chapter president highlighting the above mentioned traits. The letter should be signed by all officers and the chapter advisor.

BEST COMMUNITY SERVICE EVENT

This award recognizes an AEMB chapter that has been actively involved in their department, school or community through a significant event that brings about positive change and contribution to their community. A formal letter for nomination shall be written by the chapter president reporting on the activity, it's objectives, outcomes and participation. The letter is to be signed by all the officers and the chapter advisor.

PLEASE DO NOT DELAY !

Please send in all documents no later than September the 20th, 2009 to the National Student Secretary, Ms. Priti Das via email at Priti.das@gmail.com. If you have any questions or concerns, please do not hesitate to contact Ms. Priti Das. Awards will be presented at the National AEMB Meeting in the fall

Just for Fun

1. Describe the entropy and enthalpy changes when you open a soda(or favorite beverage).
2. If you could bring any text book on a date which would you bring and why?
3. Describe the average day in the life of a business major
4. Define photoplethysmography
5. Explain the proper uses of electrical stimulation
6. If you had to be stranded on a deserted island with a Professor who would it be and why?
7. If you could be any electronic component, what would you be and why?
8. Using triple integrals, calculate the air speed velocity of a coconut laden swallow.

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Puzzle by websudoku.com

Would you like to contribute an article to any of our sections ?

Please feel free to contact the editor
Mr. Dominic E. Nathan via email
dominic.nathan@mu.edu
We are always looking for articles for each of the focus columns and also the main content.

Do you have a question or concern about AEMB ?

Please feel free to contact
Mr. Dominic E. Nathan via email
dominic.nathan@mu.edu
Our response is a promise.