Alpha Eta Mu Beta

NATIONAL BIOMEDICAL ENGINEERING HONOR SOCIETY

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Dr. Marcia Pool
Stephanie Naufel
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National News Letter

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Alpha Eta Mu Beta
206 S. Martin Jischke Dr.
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Please visit us on the web at
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Message from the National President

It gives me pleasure to wish you all a happy new year. This past year has been one of big successes for the Society. We elected a new National Treasurer (Teresa Murray from Louisiana Tech University) a new Board of Directors (listed below in this newsletter) to replace what was previously an Advisory Board. Recall that last year we added the position of National Vice President (Dominic E. Nathan, PhD). Of course we depend heavily on the hard work of our Executive Director (Marcia Pool, who has newly moved from Purdue University to University of Illinois) and of course all of the student officers who really do the brunt of the work keeping the Society strong. We are excited about a new program, VineUp, which we are close to officially rolling out. This is an online platform to help our members communicate with each other, find job opportunities, mentor newer members and receive mentoring from more experienced alumni members. We are currently in the *beta* phase and hope to fully implement it in the coming month. The annual meeting, held once again in conjunction with the BMES conference, was a huge success. The society provided assistance to twenty students to travel to the meeting, and 37 members, representing 22 chapters attended the society main meeting. We once again sponsored the Ethics and Public Policy sessions and for the first time held a reception rather than a luncheon as we have in the past. We invited department chairs and representatives from industry and believe that it was successful in providing members a better environment to socialize and interact with other attendees. Please let us know how you liked the event and if we should continue with that format. Last year we added four new chapters and 25 chapters inducted new members. We still have a few chapters that are inactive and many ABET accredited BME programs that we will work on starting a chapter, so we have room to grow. If you are reading this newsletter and do not have an AEMB chapter, contact us. We will be happy to help you get going. I want to encourage the chapters to visit the Society website to get ideas for activities and to provide us feedback on what we can do to make a better experience for our members.

Anthony McGoron, PhD
National President
Spring 2014

ADVISOR FOCUS

Name : Jeffrey LaMack

Position : Associate Professor Dept. Biomedical Engineering, Milwaukee School of Engineering

Education : **BS(with high honors)** Biomedical Engineering MSOE
MS Biomedical Engineering, The Ohio State University
PhD Biomedical Engineering, Duke University
Post doc Duke University

Jeffrey LaMack is an Assistant Professor in biomedical engineering at the Milwaukee School of Engineering (MSOE). LaMack received a Bachelor's degree in biomedical engineering with high honors from the Milwaukee School of Engineering. He successfully completed his Masters in Biomedical Engineering under the mentorship of Dr. Morton H. Friedman at The Ohio State University and subsequently, completed his Doctoral studies in Biomedical Engineering at Duke University. After graduation, Dr. LaMack completed post-doctoral training at Duke University where he investigated the effects of blood fluid dynamics in arteries and the phenotypic analysis of endothelial cells *in vivo* and *in vitro*.

Dr. LaMack first became involved with AEMB as an undergraduate student member in 1996. As a faculty member he is currently the chapter advisor for AEMB at MSOE and has been recently elected to the AEMB board of directors in the fall of 2013. He was actively involved in endeavors to promote scholarship and success of biomedical engineering students at MSOE for several years. These activities have included serving on graduate school panels, as an academic advisor, and as a faculty advisor of the MSOE Tau Beta Pi chapter. Dr. LaMack has also served as the conference chair for the 2012 and 2013 Great Lakes Biomedical Conference and has received numerous awards from organizations such as the American Society of Engineering Education, and the American Society of Microbiology, to name a few, for his outstanding contributions to the field. Dr. LaMack shares his passion for his research with his students by teaching several courses on topics such as applied biophysical transport, fluid and mass transport, and cell biology and genetics.

In his own words, Dr. LaMack greatly looks forward to the opportunity to participate in AEMB at the national level, where he hopes to contribute to ensuring success of the next generation of talented biomedical engineering students.

UNDERGRAD STUDENT FOCUS

Name : Daniel Hageman

Education : BS Biomedical Engineering

School : Case Western Reserve University

Dan Hageman is currently a senior at Case Western Reserve University (CWRU) in Cleveland, Ohio, where he is majoring in Biomedical Engineering, and pursuing minors in Spanish and Polymer Science Engineering. Following graduation, Dan hopes to attend medical school after spending a gap year working in a medical clinic in Antigua, Guatemala, where he travelled twice during his undergraduate years of study. He is interested in a career in medical rheumatology, with a focus on pediatrics. Dan is the third child, in a family of five children, who spent his early childhood years in Kalamazoo, Michigan, and his high school years in Pennington, New Jersey.

Dan has been an active member of Alpha Eta Mu Beta (AEMB) chapter at CWRU since the spring of 2012, his sophomore year. For the past two years, he has served in various AEMB leadership positions, including Vice President during his junior year, and President during his senior year. During Dan's leadership, involvement with AEMB has flourished through various key initiatives that were introduced within the CWRU's AEMB chapter such as biomedical course advising, mentor/mentee pairings between undergraduate and graduate biomedical engineering students, and coordination of biomedical engineering senior awards. For each of the past two years, Dan was awarded a National AEMB Travel Award which helped to fund the costs of his attendance at the National BMES Annual Meeting and AEMB national events.

In addition to academic and AEMB involvement, Dan has spent three years working in biomedical research in a neural interfacing laboratory, under the direction of Dr. Jeff Capadona. His hard work is recognized from his conference presentations and journal paper that was accepted in the journal of Materials Chemistry (2014). Dan has also participated in summer research internships at both Saint Louis University and the National Institute of Health. Dan has enjoyed gaining clinical experience by shadowing various doctors and surgeons at the Cleveland Clinic. He also serves as the CWRU Vice President of the Class of 2014, is a long-time volunteer of the Cleveland Urban Squash Program, and is President of the CWRU Table Tennis Club. He enjoys soccer, poker and movies.

Graduate Student Focus

Name : Joey Jabbour
MS Engineering,
Lebanese University

Education : PhD Biomedical Engineering,
Texas A&M

School : Texas A&M

Joey Jabbour is currently a doctoral (Ph.D.) candidate in the Biomedical Engineering Department at Texas A&M University. Her research dissertation focuses on the development of a multi-resolution imaging endoscope for oral pre-cancer detection. She plans to continue in biomedical optics research for early disease detection, surgery guidance such as tumor removal, non invasive diagnosis and monitoring of various medical conditions. In addition to fundamental research, Joey hopes to translate laboratory ideas to products that can help improve global healthcare, an area in which she is passionate. Joey has been very fortunate to work with an interdisciplinary team consisting of engineers, research professors, medical doctors, pathologists and industry professionals, all motivated and dedicated to improving human health.

Joey first became involved with AEMB at Texas A&M as the IT/Webmaster officer in 2011, during which she renewed and updated all the content on the Texas A&M AEMB website. In 2012, Joey was elected as the president of AEMB chapter at Texas A&M. During her term as chapter president, Joey worked hard with her fellow officers to established new events for the chapter. These events encompassed workshops, mentoring opportunities, tutoring, and multidisciplinary speaker panels. These panels were a critical platform with jump-starting collaborations between biomedical engineering and other departments on campus. The workshops were awarded a grant from the student engineer's council at Texas A&M University. In addition there were also social events such as an annual international potluck themed dinner to help develop interaction between faculty, students and staff. These events were highly successful and helped to provide positive visibility for the AEMB chapter at Texas A&M and the Biomedical Engineering Department throughout campus.

In addition to her involvement with AEMB, Joey has also been an active member of many student and professional organizations such as the international society for optics and photonics (SPIE), IEEE, and the Society of Women Engineers. Joey has also served as a guest lecturer for several graduate bio-photonics courses, the interdisciplinary graduate seminar and optics journal club.

Alumni Focus

Name : Teresa Murray

Education : **BS** Biomedical Engineering
Arizona State University
PhD Biomedical Engineering
Arizona State University
Post Doc Yale University

Employer : Louisiana Tech University

Teresa enrolled in an undergraduate program in the Bioengineering Program at Arizona State University (ASU) to learn about neural engineering and then entered their PhD program and received a prestigious NSF Graduate Research Fellowship to help her continue her own line of research. After she graduated in 2009, Dr Murray received a postdoctoral research appointment at Yale University in Connecticut. Her research involves using imaging tools to observe cell signaling in the brain, a domain she is very passionate about.

Dr. Murray accepted a tenure track professor position at Louisiana Tech and worked hard to establish the Integrated Neurosciene and Imaging Lab. It is here that Dr. Murray has brought her research one step further. Together with her students, she have developed a lens that can be permanently implanted. This lens provides a means to observe neuronal communications, as well as morphological changes, that occur slowly over time, like neurodegenerative disease or brain injury. Dr. Murray hopes to be able to identify windows of time when administering specific therapeutic compounds will be most beneficial.

Dr. Murray has played a vital role in AEMB. During her time as the national student president, she laid the ground work for the annual AEMB ethics sessions. While at Yale, Dr. Murray took her wealth of accumulated knowledge about public policy, ethics, and other broader issues surrounding biomedical devices, and turned it into a science course for undergraduate non-majors entitled "Biomedical Innovations and Their Impacts." Students learned how to evaluate the social, economic, legal, ethical, and healthcare-related impacts of diseases, injuries, and the innovations meant to treat these maladies. She has taught this same course twice at Louisiana Tech as a dual enrollment course for both undergraduates and graduate students. One of Dr. Murray's greatest joys is to see a group of her students gathered after class debating one of the issues discussed in class. She is actively realizing her aspirations to teach, make discoveries and help people.

Imitating Nature

To glide through the air as free as a bird is a dream as old as humanity itself. It is a dream that the ancient Greeks also pursued: 2000 years ago the poet Ovid told the tale of Daedalus, who built wings with birds' feathers to allow him and his son to flee captivity on Crete. "The description mentions that feathers are concave, so people had already observed this natural phenomenon back then," says Albert Baars, Professor of Bionics at the University of Bremen. The word "bionics" is a composite of biology and electronics; it was coined in 1960 at a military conference in the United States, where experts were trying to develop radar devices using bat sonar. Bionics is an interdisciplinary field which brings together biologists, physicians, engineers and mathematicians. Leonardo da Vinci, who wrote about bird flight in 1505 and built flying machines, is widely considered the world's first bionic engineer. The German aviation pioneer Otto Lilienthal was also a forerunner. He studied the flight of storks and applied their aerodynamics to the flying machines he built and flew between 1891 and 1986. "Bionics fundamentally means understanding the phenomenon, i.e. the underlying physics, and then applying it to benefit humanity," explains Baars. Nature is the template, whether humans want to swim like fish or build like insects. And one discipline that has been shaped more than any other by these principles is light. "It is the deep desire to expand the human radius that has made bionics so important in aviation," says Baars. "Until now humans have used less than one percent of all the ideas nature provides," estimates Knut Braun, Chairman of the International Center for Bionics in Saarbrücken, "and there are more bionics applications in aviation and elsewhere that we haven't even thought of yet."

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A concept for the future: Airbus is developing a cabin framework based on the bone structure of birds. This will reduce weight and offer passengers a better view

Optimized flow – inspired by shark skin

The lower an aircraft's friction drag, the less engine power and less energy is needed to propel it forward. To improve the aerodynamics of passenger aircraft, the surface microstructure is modified to replicate the "riblet" effect that sharks exhibit. Riblets are very fine longitudinal ridges on the sharks' scales which reduce frictional resistance in water. "The structured surface influences the turbulence flow. The less turbulence, the lower the resistance," explains bionics expert Baars. A joint Lufthansa Technic, Fraunhofer Institute and Airbus research project is examining potential applications. Two Lufthansa A340s have been equipped with eight "skin sections" coated with a special paint system which replicates this flow-optimized microstructure. The long-term aim is to cover the entire plane with this coating system. Airbus estimates that this could result in fuel savings of up to three percent.

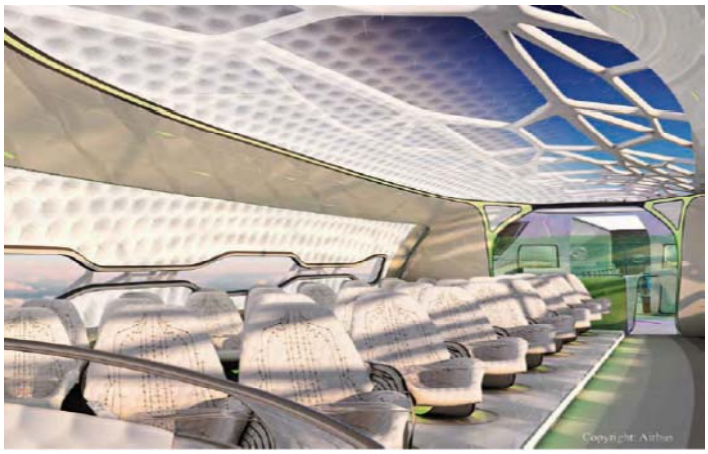
A close-up of shark-skin riblets; Lufthansa Technik is testing their potential for aircraft

The spoiler effect – inspired by stork wings

Otto Lilienthal observed that stork wings are concave; the cross-section reveals a profile that is thick at the front and tapers towards the back. “The concavity creates an asymmetric flow around the profile, which generates uplift even with an angle of attack of zero degrees,” explains Baars. “The reverse can be found in rear spoilers on cars.” The constant pull of gravity on a bird or a plane must be counteracted by a static or dynamic lift that is either equal or bigger. Concave wings provide exactly the lift that is needed to remain airborne.

Lightweight construction – inspired by bird bones

Airbus is designing the aircraft of the future. A key change could be replacing the standard, uniform structure of the fuselage. “Inspired by bird bones, we are working on a weight-optimized design that provides stability where it is needed,” says Ingo Wuggetzer, Vice President Cabin Innovation & Design at Airbus. Bird bones combine high stability with low mass. A hare and a duck are roughly similar in body length, but the duck has just roughly one quarter of the hare’s mass, mainly because bird bones are hollow with several diagonal and vertical trusses for strength. “This gives bird bones maximum stability with a minimum of material,” explains Knut Braun of the Bionics Center in Saarbrücken.



ABOVE: Sturdy, lightweight, open: The bone structure of birds (a pelican, above) shows similarities with cabin designs for 2050.

BELOW: Sailplane wings are modelled on those of the albatross. With a wingspan that sometimes exceeds three meters, these seabirds can glide up to 120/km/h

Long-distance gliding – inspired by the albatross

With a wingspan of up to three and a half meters and weighing between seven and nine kilos, the wandering albatross is the largest flying bird in the world. Although it reaches the physiological limits for flight, this seabird is a first-rate glider and can reach top speeds of up to 120 kilometers per hour without beating its wings. The functional principle of all high-performance gliders is based on the wandering albatross. Engineers use long, narrow wings and a high aspect ratio to improve glider design. “This minimizes the wingtip vortices which have a negative impact on the lift,” explains Professor Albert Baars. The result is a clear aerodynamic advantage. The ability to glide is further enhanced by a high surface load, which is why lightweight construction is not so crucial for sailplanes.

Winglets – inspired by the Andean condor

Most modern commercial aircraft are equipped with winglets, those wingtip extensions that stick up at an angle to the wing. They minimize wingtip vortices, reduce air resistance and enable fuel savings of up to three percent. Winglets are the simplified version of the wingtip feathers of the Andean condor. These birds of prey are excellent gliders and capable of flying distances of up to 250 kilometers daily at a speed of up to 55 kilometers per hour. In flight, their long, powerful tip feathers bend upwards and open up like a fan. “This has the effect of reducing the drag,” explains Baars, “by breaking down the large wingtip vortices into smaller ones and thus reducing resistance.”

Anti-stall mechanism – inspired by the skuas

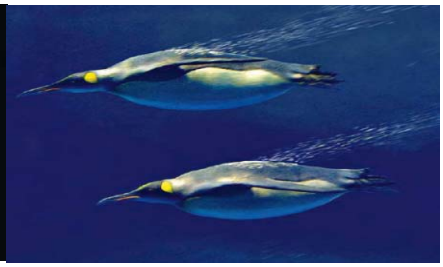
In order to remain airborne, a plane needs constant lift, and a sudden reduction in lift, called a stall, must be avoided. Stalls occur when a plane that is traveling at low speed exceeds a certain angle of attack. Birds have to be careful not to stall, too, especially when, like skuas, they are exposed to constantly changing, gusty winds over the Atlantic. Skuas, which belong to the gull family, have adapted to the problem in the following way: They raise their alulae, the covert feathers on the anterior edge of their wing to create a small slot called an eddy flap. This allows them to achieve a higher angle of attack and prevent stalling. Since the 1980s, scientists have been working on developing eddy flaps for gliders. Tests have shown that they are effective and could conceivably also be used on commercial aircraft. However, flap technology is still in its infancy.

Thumbs up – inspired by the kestrel

Passengers looking out of an aircraft window can watch the flaps lift up on the trailing edge of the wing as the plane comes in to land and retract again after touchdown. These high-lift devices are used at low flight speeds and a high angle of attack. The principle is based on the alula, the broad, pointed feathers on the "thumb" of birds such as the kestrel. "You could compare it it a hand with the 'thumb' jutting out slightly over the edge, which in turn is like the self-actuating flaps of modern aircraft," explains Professor Albert Baars. "Their purpose is to prevent stall with the aid of the airstream that forms behind the leading edge of the wing." However, the extended flaps also create a certain amount of noise, and bionic engineers are currently looking at developing a fan rotor based on owl feathers and moths' wings to eliminate noise.

Streamlining – inspired by the penguin

Aircraft fuselages are similar in shape to fish and birds in that they have a slim, streamlined form. "Bodies like these are built to perform well in flows," says Professor Albert Baars. "Thanks to their spindle-shaped bodies, penguins, as well as other birds and fish, are able to avoid flow resistance." The bodies of commercial aircraft are, of course, slightly different: Most have a large cylindrical middle, as a spindle shape would be too expensive to manufacture. In terms of aerodynamic properties, cars would also benefit from a spindle shape. "But then either the space for the passengers would be too narrow or the car would be too long," says Baars.



TOP LEFT: No large aircraft is yet able to fly like a dragonfly. Dragonflies pose a huge challenge for bionics. By moving both pairs of wings independently, they are able to stop abruptly, hover in mid-air, glide, maneuver in all directions, even backwards. The BionicOpter robot built by Festo is the first model based on dragonfly characteristics that is capable of flight. CENTER and TOP RIGHT: Modern aircraft fuselages are modelled on the spindle-shaped bodies of penguins

Aerial magic – inspired by the dragonfly

Dragonflies can beat their wings fast and alter the angle slightly to remain hovering in the air – or fly forward at speeds of up to 40 kilometers per hour, achieving roughly the same speed as champion sprinters such as Usain Bolt (43.9 km/h). Leonardo da Vinci tried to build a flying machine based on the dragonfly, but even modern helicopters never achieve the perfection of their natural models. "Hummingbirds are also aerial artists. They can move their wings forwards and backwards and twist them on down stroke to create lift from above and below," says Professor Baars."This gives them incredible possibilities for maneuvering." Mass inertia means that it is impossible to build large dragonfly or hummingbird helicopters – the principle only works for smaller aircraft

Natural repellent – inspired by the lotus leaf

Ideas from nature can also be found in the galleys of modern commercial aircraft where the toilet bowls are coated with a special layer of dirt-repellent coating, a concept that was borrowed from the surface of the lotus leaf. The lotus leaf "uses molecular effects. It is coated with a dense layer of tiny wax crystals that prevent water droplets from actually touching the surface; instead, they simply roll off," explains Baars. "The surface of the water picks up dirt because it, like the water, is electrically charged, allowing the water to carry away the dirt."

Hollow holders – inspired by bamboo

Until now, the brackets Airbus has used to attach luggage compartments or other cabin fittings to the aircraft body have been milled from solid blocks of metal. Each of these brackets weighs around 1.2 kilos. In a newly developed method, a 3D printer is used to create what are called bionic brackets which mimic the structure of bamboo. This method of production not only reduces the overall amount of material needed but also reduces the weight of the brackets by half. "Bamboo is mostly hollow but it has a knot at intervals of ten to 15 centimeters; although bamboo is thin and delicate, it is exceptionally strong," explains bionics engineer Knut Braun.

Unbreakable cells – inspired by the honeycomb

Beehives consist of a honeycomb structure of hexagonal cells. For many years, aircraft manufacturers have been using materials inspired by the way bees build, especially for walls and panels in the cabin. "You need very little material and the structure of honeycomb is incredibly strong," says Professor Baars, adding, "it also reduces noise." The honeycomb material used in aircraft construction is usually made of the polymer Aramid.

The water-repellent effect of the lotus leaf is emulated by the coating of toilet bowls in aircraft galleys. The result: Everything slips right off.

2013 AEMB Annual Convention, Seattle Washington

Following the yellow brick road to the emerald city, this year the BMES conference was held at the Washington State Convention Center, in Seattle Washington. The first AEMB event was the annual convention which had over 37 attendees consisting of students and faculty from 22 chapters present. The focus of the meeting was on ratifying the constitution, clarification of the role of the Board of Directors (formerly the advisory board), building the national alumni database, and discussing the initiation ceremony. An important aspect of individual chapter management is continuity. This process begins with the initiation process, and the national student secretary, Ms. Stephanie Naufel presented the national initiation script and project (available at http://alphaetamubeta.org/documents.html). Following this a discussion was held pertaining to the optimal time to have an initiation ceremony. A key advantage of having the initiation ceremony in the fall semester or early in the spring would be for the new initiates to learn the ropes and be better prepared for leadership positions within the chapter. A major project that Alpha Eta Mu Beta has undertaken is building of the national alumni data base. Due to some missing records during the national transition period, Alpha Eta Mu Beta is reaching out to all chapters to help identify and provide up-to-date contact information for alumni members. This is critical in aiding AEMB reach out to the community and also develop stronger alumni – student relationship.

Using member feedback over the past 2 years, Alpha Eta Mu Beta hosted its inaugural evening reception, instead of a formal luncheon. This reception followed an informal gathering format that enabled members to mix and mingle with fellow members, faculty, and representatives from industry, academia and organizations (government and non-profits) while enjoying delicious hors d'oeuvres at the Daily Grill. During this reception, national awards were presented by Dr. Anthony McGoron, AEMB National President and Mr. Rupak Dua, the National Student President.

Patricia I. Horner Outstanding Chapter Advisor Award –
Dean C. Jeutter, PhD, Marquette University Chapter
Outstanding Chapter Officer – Ms. Joey Jabbour, Texas A&M Chapter
Outstanding Chapter Member – Mr. Kaleb Vinehout, Marquette University
Outstanding Chapter Activity – Marquette University
Most Active Chapter – Florida International University
Best Community Service Award – Florida International University
Most Improved Chapter – Boston University
Best Chapter Website Award - Marquette University

Representatives from the Boston University Chapter receiving the national award for Most Improved Chapter.

Mr. Kaleb Vinehour receiving the Outstanding Chapter Member National award from Dr. Anthony McGoron and Mr. Rupak Dua.

Members from Alpha Eta Mu Beta Chapter across the country mixing and mingling at the AEMB reception.

AEMB was also very pleased to have awarded 20 travel awards this year. These travel awards were made possible through the generosity of the Pat Horner AEMB Memorial Travel Fund. Furthermore, the following new chapters were warmly welcomed into the growing AEMB family: Ohio State University, University of California Irvine, University of Tennessee Knoxville and St. Louis University. Based on the feedback obtained from the attendees of the reception, the event was a success and AEMB plans to host a similar event at the next BMES conference.

This year we were thrilled to have Dr. James B. Bassingthwaighte, a Professor of Bioengineering with joint appointments in the departments of Biomathematics and Radiology at the University of Washington as our distinguished ethics speaker. His presentation was titled "The importance of reproducibility in research publishing". Through his presentation, Dr. Bassingthwaighte highlighted the importance of having reproducible results in research publications. Furthermore, he presented key guidelines and efforts to ensure that research integrity and high quality standards are present in research publications. This is critical, for research publications are the bridge that brings cutting edge results from the lab to the outside world and could be game changers in the field. The session was very well attended with over 38 attendees.

In addition, Alpha Eta Mu Beta co-hosted a public policy session with the American Institute for Medical and Biological Engineering (AIMBE) on how legislation and presidential decisions affect students. This session was chaired by Dr. Teresa Murray, AEMB National Treasurer and previous advisory board member, and Mr. Milan Yeager, the executive director of AIMBE. The session examined several important features and concerns regarding current health care in the US, potential changes and policy related measures that are being implemented and their impact on the health care and biomedical engineering field.

Overall, the 2013 BMES conference was a great experience, and while no one was swept away by a tornado to the land of Oz, everyone's heart was swept away by the memorable experience of the conference, the beautiful and scenic views of Seattle and of the ocean. This was another unforgettable and exciting conference. AEMB is looking forward to another great conference at the 2014 BMES conference in San Antonio, Texas and to seeing you there ☺

Please check out our latest mentoring and alumni network initiative - Vineup. All AEMB members are invited to join VineUp.

https://alphaetamubeta.vineup.com/login

Please feel free to contact us with any questions or concerns.

Newsletter survey

Please take a moment to tell us what you think of the newsletter with the following survey

http://tinyurl.com/lm9e47f

Just for Fun

MATH SQUARE Fill in the numbers 1 to 9 to complete the equations. Use each number only once. Follow the natural Order of Operations.

	+		-		= 3
+		-		X	
	-		X		= 4
X		+		+	
	X		/		= 15
	=		=		
	39		13		29

BME PROBLEM SOLVING

A taxi driver was heading down a street in Seattle toward the AEMB banquet. He went right past a stop sign without stopping, he turned left where there was a 'no left turn' sign and he went the wrong way on a one-way street. Then he went on the left side of the road past a cop car. Still, he didn't break any traffic laws. Why not?

ANSWER: He was walking

	29		13		39
	=		=		
= 15	2	/	6	X	5
	+		+		X
= 4	3	X	1	-	7
	X		-		+
= 3	9	-	8	+	4

MATH SQUARE ANSWER: (More than one solution may exist)

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

Please feel free to contact the Editor-in-Chief Dr. Dominic E. Nathan via email dominic.nathan@alphaetamubeta.org
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 the National Executive Director, Dr. Marcia A. Pool via email marcia.pool@alphaetamubeta.org
Our response is a promise.

REMEMBER TO CHECK THE WEBSITE !

Please remember to check the national website www.alphaetamubeta.org for important information relating to award applications, upcoming AEMB Events and other important topics.