



Applied Mechanics Division

Newsletter

2017

Applied Mechanics Executive Committee (2016-2017)

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Dennis M. Kochmann,
Newsletter Editor

Applied Mechanics Division 2016-2017 Executive Committee



Pradeep Sharma
Vice-Chair



Arun Shukla
Chair



**Balakumar
Balachandran**
Program Chair



Yonggang Huang
Program Vice-Chair



Yuri Bazilevs
Secretary

Message from the Chair

It has been a great pleasure working with the members of the AMD-Executive Committee and many members of AMD at large over the past five years. I was nominated into the committee five years ago by **Ares Rosakis**, and since then I have had the honor to work with various members of the AMD-EC including **Larry Bergman**, **Huajian Gao**, **Ken Liechti**, **Peter Wriggers**, **Pradeep Sharma**, **Balakumar (Bala) Balachandran**, **Yonggang Huang** and **Yuri Bazilevs**. I have learned a lot from each one of them and truly want to thank them for making this experience highly enjoyable and enriching. I also want to thank **Dennis Kochmann** for serving as the AMD Newsletter Editor and **Pedro Reis** for serving as the Recording Secretary of AMD.

AMD thrives with a strong membership base, very successful conference, and highly prestigious journals. As I finish my term with the AMD-EC, I want to thank **Dr. Jennifer Haythornthwaite** and the **Haythornthwaite Foundation** for their generous support of the Research Initiation Grants and the Graduate Student Travel Awards. This funding supports four young investigators and ten students in their pursuit for research and higher education. I convey my best wishes to **Pradeep Sharma**, the incoming Chair of the AMD-EC, and a warm welcome to **Pradeep Guduru** as an incoming member of the committee.

The committee has faced many challenges during the past year stemming from the ASME headquarters. The implementation of the newly created *Group Pathways & Support* (GPS) system caused unnecessary delays and mistakes. In the past, the AMD-EC has had significant autonomy and success in making financial decisions, completing required tasks, and fundraising. Now, minimal staff support for AMD activities, micro-management of AMD-EC resources, and the lack of communication from ASME headquarters has been contributing to significant operational problems. These difficulties have caused tremendous stress among the AMD-EC. An example of this frustration was our inability to award a matching young investigator grant, which we were successfully able to do in the past using AMD funds. ASME agreed to fund this award during our June 2016 summer AMD-EC meeting using our funds. However, we were told in September 2016 that these funds would not be approved. This caused immense problems as a commitment had already been made to the Haythornthwaite Foundation that supports four such awards for AMD. The former chairs of AMD along with the current AMD-EC met during the IMECE 2016 EC meeting and discussed this situation followed by a discussion with ASME staff members. After considerable effort, ASME approved our request for this one matching award in March 2017. The effect of all the effort that we put into this discussion was short lived as this year again ASME has refused to let us use our funds for this matching award. I truly believe that the AMD-EC will have to take some strong measures in the near future to gain control over their funding and thus ensure the smooth functioning of AMD.

I would like to emphasize that the AMD-EC membership and leadership has put in considerable effort to advance the goals of AMD. It is my belief that, if the ASME headquarters is willing to support our mission, then we will continue to be the dominant group in applied mechanics. I am confident that AMD will remain a strong and vibrant community and will continue to attract the best and the brightest mechanicians in the world.

IMECE 2016

IMECE 2016 was held in Phoenix, Arizona, from November 11-17, 2016. **Bala Balachandran** and **Yonggang Huang** were the Chair and Vice-Chair, respectively, of Track 12, Mechanics of Solids, Structures and Fluids, the traditional forum for AMD. The Medalists' session included presentations by the Daniel C. Drucker medalist, **Kyung-Suk Kim** (Brown University) and the Ted Belytschko Applied Mechanics Award recipient, **Andrea Prosperetti** (Johns Hopkins University). The Warner T. Koiter Lecture was delivered by **Pedro Ponte Castañeda** (University of Pennsylvania).

The Applied Mechanics Division's annual Honors and Awards Banquet and Ceremony on Tuesday night was well attended. A highlight of the evening was the Timoshenko Medal acceptance speech by **Ray Ogden** (University of Glasgow). Others receiving Society-level awards included **Pedro Ponte Castañeda**, the Warner T. Koiter Medalist, and **Kyung-Suk Kim**, the Daniel C. Drucker Medalist. Those receiving Division-level awards were **Andrea Prosperetti**, the Ted Belytschko Applied Mechanics Awardee, and **Pedro Reis** (Massachusetts Institute of Technology), the Thomas J. R. Hughes Young Investigator Awardee. The AMD-Haythornthwaite Research Initiation Grant (HRIG) Program had another successful year, with 53 proposals submitted for review by the AMD. In view of the large number of high-quality proposals, Professor **Jennifer Haythornthwaite** of The Johns Hopkins University, representing the Haythornthwaite Foundation, supported four HRIG awards and one additional award was supported by the AMD. The five successful proposals were authored by **Lihua Jin** (University of California, Los Angeles, "Concurrent reaction and diffusion in photo-responsive hydrogels"), **Howon Lee** (Rutgers University, "3D Printed Reconfigurable Metamaterials with Tunable Mechanical Properties"), **Timothy Fitzgerald** (Gonzaga University, "Capturing the mechanics of insect flight"), **Ryan Harne** (The Ohio State University, "Instrumentation for a Unique Platform to Elucidate the Complex Responses of Coupled Multistable Structures"), and **Marco Salviato** (University of

Washington, "Bio-Inspired Hierarchical Materials: A Multi-Scale Analysis of the Fatigue Behavior"). The Haythornthwaite Travel Grant Award Program, sponsored by the Haythornthwaite Foundation, once again supported ten graduate students.

IMECE 2017

Preparations are well under way for IMECE 2017, to be held in Tampa, FL, from November 5-8, 2017. **Yonggang Huang** and **Yuri Bazilevs** will serve as chair and co-chair, respectively, of Track 12, Mechanics of Solids, Structures and Fluids. The following AMD members will be recognized at the AMD Honors and Awards Banquet and Ceremony on Tuesday, November 7:

Viggo Tvergaard (Technical University of Denmark)	Timoshenko Medal
David Parks (Massachusetts Institute of Technology)	Drucker Medal
Wei Yang (National Natural Science Foundation of China)	Koiter Medal
J. S. Chen (University of California, San Diego)	Ted Belytschko Appl. Mech. Award
Richard H. Rand (Cornell University)	Thomas K. Caughey Dynamics Award
José Andrade (California Institute of Technology)	T.J.R. Hughes Young Invest. Award

Please join the members of the AMD EC in congratulating all awardees.

Technical Committees

The Technical Committees operating under the auspices of the AMD will continue to be encouraged to remain active. The primary functions of the committees include proposing and organizing symposia at IMECE and other meetings, providing nominations for the Society- and Division-level awards as well as the Haythornthwaite award programs, and maintaining a significant web presence.

Closing Remarks

During my five years as a member of the AMD-EC, I have observed the field of applied mechanics permeate into an immense range of exciting unrealized engineering problems. Applied mechanics continues to grow and its future looks bright. I want to take this opportunity to thank all the members of the AMD-EC and AMD for their continued support in assuring the success of AMD. Our journals have done extremely well in recent years with their impact factors more than doubling. Sincere thanks to the editors of JAM and AMR, **Yonggang Huang** and **Harry Dankowicz**, respectively, for this tremendous achievement. I also want to thank Dennis Kochmann, the editor of our newsletter, and Pedro Reis, our recording secretary for their continued service. Further thanks to the organizers of the many symposia at IMECE and other AMD-related conferences and to the members of AMD for their attendance at these conferences, publishing and reviewing technical papers, and participating in Technical Committees. Finally, I thank the ASME staff **Christine Reilley**, **Ty Booker** and **Christine Nicholson** for their assistance during the last year.

Arun Shukla,
2016-2017 Chair, Applied Mechanics Division

THE 2016 AMD AND ASME SOCIETY AWARDS

TIMOSHENKO MEDAL

Ray W. Ogden



The Timoshenko Medal was established in 1957 and is conferred annually in recognition of distinguished contributions to the field of applied mechanics. Instituted by the AMD, it honors Stephen P. Timoshenko, world renowned authority in the field, and it commemorates his contributions as author and teacher.



The 2016 Timoshenko Medal was awarded to **Ray W. Ogden**, George Sinclair Professor of Mathematics at the University of Glasgow, “*for distinguished work that transformed the research area of non-linear elasticity into a well-established discipline; and for stimulating the work of a large number of practitioners in the multiphysical behavior of materials and modeling in biomechanics*”. The acceptance speech that follows below was delivered at the AMD Honors and Awards Banquet at the 2016 ASME International Mechanical Engineering Congress and Exposition held in Phoenix, Arizona on Tuesday, November 15, 2016:

“Thank you, Arun, for the very kind introduction. However, I think the citation is rather too generous and more than a little exaggerated!

It is indeed a great honour to be awarded the Timoshenko Medal, and I would like to give a sincere vote of thanks to those good friends and colleagues who thought it might be worthwhile to take the chance to nominate me and write supporting letters. And to the awards committee for believing their fabrications.

It is quite humbling to look down the illustrious list of mechanicians who have been previous recipients of the Timoshenko medal, and to realize that my name has been added in 2016. It is still difficult to believe.

Actually, I didn’t hear the great news until late in May because I was away from Glasgow visiting my good friend Gerhard Holzapfel in Graz, Austria, and the letter from ASME was sitting in my Department unopened. It wasn’t until I received an email from Peter Wriggers while I was in Graz that I received the news, so I immediately went out and bought an expensive bottle of red wine to celebrate!

I wasn’t quite sure what should be involved in the Timoshenko Lecture, so, as most recipients do, I did my homework by studying the texts of a few previous Timoshenko lectures, which, fortunately, are conveniently collected together in iMechanica. There I discovered that the typical length of a lecture is about 2500 words, so that’s what I aimed for, more or less.

As a mathematician I was not, unfortunately, exposed to Timoshenko’s books while a graduate student, but I do have them on my shelves now and benefit from dipping into them occasionally. I was actually raised on Truesdell and Noll...

I mentioned Glasgow a moment ago. I’ve been there, at Glasgow University, for more than 30 years. However, I’m not Scottish (you can tell that from my accent or lack of accent) so I’m certainly not following Bob McMeeking’s example and wearing a kilt.

As many people know, Bob, himself the 2014 Timoshenko medallist, did his undergraduate studies in Glasgow in Civil Engineering and received some of his mathematics training from the late Professor Ian Sneddon and was to some extent influenced by him, in particular by his recommendation to go to Brown for his PhD with Jim Rice (Timoshenko medallist in 1994).

Ian was instrumental in my appointment at Glasgow, although I wasn't his direct successor because we overlapped for a year before he retired, and my Chair, the George Sinclair Chair, was different from his. George Sinclair, incidentally, held the first Chair in Mathematics at Glasgow, to which he was appointed in 1691. So, you realize that Glasgow is an ancient university, established in 1451 and the fourth oldest university in the UK.

Let me take a step back – to High School (actually, it was called a Grammar School). There I had an excellent mathematics teacher, called Mr. Barker-Jones (I never knew his first name). He somehow recognized that I had some ability in mathematics and persuaded me to focus on the subject, along with physics. In those days, there was quite a lot of mechanics in the mathematics curriculum and I really enjoyed working out problems of projectiles, pulleys, moments of inertia and rolling rigid bodies, for example.

This set me off on the path that I haven't strayed from throughout my career. Under his guidance I sat the entrance exam for Cambridge University and was fortunate enough to be offered a place to study Mathematics. I was based at Gonville and Caius College, which is the college where Stephen Hawking is based – in those days he was mobile, and occasionally I saw him walking around, albeit with difficulty, in the Cambridge streets.

Incidentally, many of the sorts of theories and problems I worked on in Grammar School are not normally covered in today's curriculum, and, because of this lack of background, it is distressing that I am not able to teach this sort of material until the third year of our undergraduate course, and even at that level the students struggle with it. This is all part of the dumbing down of school education in the UK, and I'm sure it is true elsewhere – many students are not well prepared for university work.

I had the good fortune to be able to study a wide range of mathematics topics at Cambridge for four years, the first three as an undergraduate and the fourth year in the one-year graduate course known as "Part III of the Mathematical Tripos". In the latter two years I focused very much on the applied side and this included a lot of fluid mechanics (George Batchelor, Timoshenko medallist in 1988, was one of the lecturers and at that time he was completing his now very famous text on fluid dynamics).

*There was some linear elasticity and elastic waves in the course, although there was not a lot of solid mechanics available at that time, but rather more exotic things like general relativity, cosmology and quantum theory, *inter alia*. It was certainly a very inspiring course.*

After Part III, I had to decide what to do for my PhD – my inclination was towards Solid Mechanics, although I could equally have gone for Fluid Mechanics. It seemed natural to stay in Cambridge and no one suggested anything else. The obvious choice for an advisor (supervisor in the UK) at that time was Rodney Hill, and I embarked on my PhD with him.

At the very start, in his characteristic handwriting, he wrote out a list of problems for me to work on and let me get on with it. Unfortunately, I couldn't find that list to refer to this evening (I'm not sure if I kept it), but I do know that none of those problems have been solved to this day. Basically, it was sink or swim, so I learnt to swim and developed my own research problems and studied the nonlinear theory of elasticity intensively (largely following the likes of Truesdell and Noll and Rivlin). This led to my first publications, which dealt with constitutive inequalities, wave propagation and special material models (such as harmonic and Hadamard materials).

As most people of my generation know, Hill was quite an unusual man, and there are many stories about him. He was actually very reticent and this is reflected in the little anecdote I will now relate. The usual mid-morning ritual in DAMTP (Department of Applied Mathematics and Theoretical Physics) was for supervisors and students to gather for tea/coffee, and on one occasion Hill and his students were joined by a visitor from the Technion in Israel (not a visitor of Hill). It came to light that he was a colleague of Sol Bodner and Hill indicated that he knew him. The visitor (whose name I don't remember) said he would mention to Bodner that he had met Hill, and asked Hill what his first name was. Hill seemed embarrassed at this and thought for a little while, and then said 'the initial is R.' The graduate students never dared to address him as Rodney!

During the final few months of my PhD I applied for some academic positions. I was offered a lectureship at the University of Liverpool, where the well-known rheologist Jim Oldroyd was Head of Department (of Mathematics). At about the same time I was offered an SERC (Science and Engineering Research Council) Research Fellowship at the University of East Anglia (UEA), in Norwich, and I decided to accept that so I could focus on research for two years before committing to a teaching career. SERC was the previous incarnation of what is now the EPSRC (Engineering and Physical Sciences Research Council), the UK's counterpart of NSF.

My mentor at East Anglia was Peter Chadwick, who also happened to be my thesis examiner – he clearly had something to do with my Fellowship appointment since he was a member of the SERC Committee at the time – and I am very grateful for that – I had a wonderful time at UEA. I immersed myself in rubber elasticity and it was during my two years there that I devised what have become known as the 'Ogden materials'. This modelling work was very much driven by the need to understand and capture data, a theme that has permeated much of my subsequent work.

At UEA I didn't only do research – I also had my first experience of lecturing – I lectured on the mathematical theory of cracks at MSc level for two years, helped by reading some of Jim Rice's papers and some lecture notes that John Willis (Timoshenko medallist in 1997) generously provided.

In my second year at UEA John Willis, who was in Cambridge at the time, accepted the chair of mathematics at the University of Bath, and invited me to join him as a lecturer, which I duly did – my first proper academic job. John was always very supportive and I was very grateful for his encouragement.

I stayed in Bath for 8 years, and then moved to Brunel University, which turned out to be a brief encounter but a period during which I wrote my first book "Nonlinear Elastic Deformations". In 1984 I moved to Glasgow, where I have been until now, except for a two-year sojourn at the University of Aberdeen from 2010-2012, but a change in the administration there turned out to be a disaster and I was happy when Glasgow persuaded me to return.

In my time at Glasgow I have been able to travel a great deal and I am fortunate to have developed, and benefited enormously from, collaborations with a number of talented colleagues in other universities worldwide, in a variety of different research areas, which has enabled me to expand my range of interests and perspectives.

Long term and ongoing collaborators include my good friends David Steigmann (Berkeley), Gerhard Holzapfel (Graz), Luis Dorfmann (Tufts), José Merodio (Madrid), Giuseppe Saccomandi (Perugia) and Michel Destrade (Galway), more or less in chronological order of our initial collaboration. This sort of collaboration, with like-minded colleagues, is both stimulating and one of the pleasures and rewards of being an academic.

It was Gerhard Holzapfel in 1996 who introduced me to the subject of biomechanics, which offered, and still does, a wealth of interesting problems in mechanics (increasingly so at a range of different scales,

from subcellular through to organ level). We have continued our collaboration quite intensively since then, and developed successful models of soft tissue mechanics, increasing in complexity as more detailed data on soft tissue structure and behaviour became available as a result of advances in imaging and experimental techniques.

Data are absolutely vital for the modelling – in order to capture the material structure and mechanical behaviour that current experimental techniques are able to bring forth, to build descriptive mathematical models and to use them both for understanding the mechanical interactions and for prediction for parts that experiments can't reach (this sounds a bit like the advert "Heineken refreshes the parts that other beers cannot reach").

Education in the discipline is also a very important part of our activities, which have included organization of a series of week-long intensive Summer Schools in Graz aimed mainly at PhD students on the model that has been running at CISM (the International Centre for Mechanical Sciences) in Udine, Italy, for many years. This last July, for example, around 120 students attended our course from over 25 different countries (and the next course is scheduled for September 2018).

I now want to make particular mention of Luis Dorfmann. We have worked on several topics, but it was he who introduced me to magneto-mechanical interactions way back in about 2002. This led to our development of forms of the equations and constitutive laws governing magnetoelastic and electro-elastic deformations of magnetosensitive and electrosensitive elastomeric materials that have been used by quite a number of researchers, which is very gratifying.

This is an area that has much potential for applications as 'smart materials' in transducer devices, for example. Unfortunately, at present, there is a shortage of appropriate data for informing the development of truly reliable material models, so we fall back on simple prototype constitutive laws, for now. More good data are needed, and this is why it is important for theoreticians and experimenters to collaborate.

My contributions would not have been possible without a strong grounding in nonlinear continuum mechanics. I am sure that many people here will agree that it is important not to lose sight of the fundamentals, which all too often are being dropped from curricula. This is reflected in my reviewing of papers – I often come across errors which are basically down to an inadequate grasp of the fundamentals. Unfortunately, such errors also appear in the literature, sometimes in quite respectable journals, in which case the reviewers are also at fault!

Also, unfortunately, it is very difficult to secure funding for fundamental work, and in the drive for funding the fundamentals are very often forgotten. That reminds me of a little anecdote about Sir Harold Jeffreys, a famous geophysicist/applied mathematician in Cambridge who died in 1989 (some of you may know his book entitled "The Earth"). On one occasion, he was visited by some scientists from an oil company who wanted to know if he could help them with a technical problem. After they explained the problem he is reported as saying "I'm glad it's your problem and not mine" – in those days it was possible to turn down the opportunity for funding.

Nowadays, mechanics is very much a multidisciplinary endeavour and benefits enormously from interaction with many other areas, which bring forward new, challenging problems for mechanics and different perspectives. Thus, I believe that mechanics is in a very healthy state, underpinning, as it does, so many different areas of application, and it has much potential for new entrants to the subject. I must say, however, that young faculty have a much tougher time now than was the case when I was a young faculty member, particularly with the pressure to bring in funding, so they need as much support and encouragement as possible from established faculty.

To finish, I have to say that it has been very rewarding to be an academic in a university and to have had the privilege to do more or less what research I liked and to have interacted with so many excellent colleagues, many of whom I consider to be close friends. I count myself as being very lucky.

2016 has been an especially good year for me since not only have I been awarded the Timoshenko Medal, but also, in August, I received the Rodney Hill Prize in Solid Mechanics at ICTAM in Montréal. That is an incredibly prestigious combination for which I am extremely grateful and humbled!

Well, I think that those of you who are still awake will have heard enough from me by now. That brings me to the end of my Timoshenko Lecture (or acceptance speech as it is otherwise known), and I am delighted and honoured to be able to accept the Timoshenko Medal, and I sincerely thank again all those who made it possible. Thank you so much!"

Ray W. Ogden

*George Sinclair Professor of Mathematics
University of Glasgow*

DANIEL C. DRUCKER MEDAL



The Daniel C. Drucker Medal was established in 1997 and is conferred in recognition of distinguished contributions to the field of applied mechanics and mechanical engineering through research, teaching and service to the community over a substantial period of time. Instituted by the Applied Mechanics Division, the medal honors Dr. Daniel Drucker and commemorates his service to the profession.

Kyung-Suk Kim



The 2016 Daniel C. Drucker Medal was awarded to **Kyung-Suk Kim**, Professor of Engineering at Brown University, *"for seminal contributions to the field of mechanics of materials through creative research that bridges experiments and mechanics theories to understand the motion and deformation of interfaces as well as the formation and assembly of nanostructures."*

WARNER T. KOITER MEDAL



The Warner T. Koiter Medal, established in 1996, is bestowed in recognition of distinguished contributions to the field of solid mechanics with special emphasis on the effective blending of theoretical and applied elements of the discipline, and on a high degree of leadership in the international solid mechanics community.

**Pedro Ponte
Castañeda**



The award was funded by the Technical University of Delft, The Netherlands, to honor Warner T. Koiter for his fundamental work in nonlinear stability of structures in the most general sense, for his diligence in the effective application of these theories, his international leadership in mechanics, and his effectiveness as a teacher and researcher.

The 2016 Warner T. Koiter Medal was given to **Pedro Ponte Castañeda**, Raymond S. Markowitz Faculty Fellow and Professor Mechanical Engineering and Applied Mechanics, *“for distinguished contributions as a world leader in the development of theoretical tools, with practical importance, for the analysis of the nonlinear response of composite materials”*.

TED BELYTSCHKO APPLIED MECHANICS AWARD

Andrea Prosperetti

The Ted Belytschko Applied Mechanics Award is bestowed to an outstanding individual for significant contributions in the practice of engineering mechanics. The contributions of this individual may result from innovation, research, design, leadership or education. The award was established in 1988 and was renamed the *Ted Belytschko Applied Mechanics Award* in 2008.

The 2016 Ted Belytschko Applied Mechanics Award was conferred upon **Andrea Prosperetti**, Charles A. Miller, Jr. Distinguished Professor of Mechanical Engineering at Johns Hopkins University and Berkhoff Professor of Fluid Dynamics at the University of Twente, *“for establishing a systematic way to develop the averaged equation models of dispersed multiphase flows and the development of novel methods for their direct numerical simulations”*.



THOMAS J.R. HUGHES YOUNG INVESTIGATOR AWARD

Pedro Miguel Reis

The Thomas J.R. Hughes Young Investigator Award recognizes special achievement for young investigators in Applied Mechanics. The nominees must not have reached their 40th birthday at the time of nomination. The award was established in 1998 and renamed the Thomas J.R. Hughes Young Investigator Award in 2008.

The 2015 Thomas J.R. Hughes Young Investigator Award was given to **Pedro Miguel Reis**, Gilbert W. Winslow Associate Professor of Mechanical Engineering and Civil and Environmental Engineering at MIT, *“for outstanding contributions to Experimental Mechanics, with specific recognition for his studies related to nonlinear instability phenomena in slender structures, and the exploitation of such instabilities for novel functionalities”*.



2016 HAYTHORNTWHAITE FOUNDATION AWARDS

Haythornthwaite Research Initiation Grants

In 2011 the Applied Mechanics Division, through the generosity the Haythornthwaite Foundation, established a new divisional award, the **Haythornthwaite Research Initiation Grant**. This new grant targets university faculty that are at the beginning of their academic careers engaged in research in theoretical and applied mechanics. The five recipients of the 2016 grants were **Lihua Jin** (University of California, Los Angeles), **Howon Lee** (Rutgers University), **Timothy Fitzgerald** (Gonzaga University), and **Ryan Harne** (The Ohio State University) and **Marco Salvato** (University of Washington). The winning project titles and descriptions are provided in what follows.

Haythornthwaite Research Initiation Grant

Lihua Jin

Concurrent reaction and diffusion in photo-responsive hydrogels. A hydrogel is a polymer network absorbing an aqueous solvent. Photo-responsive hydrogels are capable of a large volumetric deformation when the polymer network undergoes a reaction triggered by light, which makes them potential candidates for remotely controllable soft actuators. The kinetic behavior of photo-responsive hydrogels is governed by both the reaction of the polymer network and the diffusion of the solvent molecules. The objective of this project is to establish a theoretic framework to capture the non-equilibrium thermodynamics of photo-responsive hydrogels and experimentally characterize their kinetic behavior. The grant is being used to build a light source for controlled photo-actuation, and a characterization setup for measuring the photo-mechanical behavior of photo-responsive hydrogels.



Haythornthwaite Research Initiation Grant

Howon Lee

3D printed reconfigurable metamaterials with tunable mechanical properties. Mechanical metamaterials are artificial materials engineered to have unprecedented mechanical properties. Since their mechanical properties are defined by spatial arrangement of the micro-structural elements, employing actively reconfigurable materials enables active change of their micro-structure and layout, which can potentially lead to a significant modulation in the mechanical behavior of the structure. The objective of this research is to study mechanics of tunable mechanical metamaterials that can exhibit tunable mechanical performance through active reconfiguration of micro-architectural elements. 3D transforming microlattice will be fabricated using a digital micro additive manufacturing technique. The outcome of this research will inspire a broad range of engineering applications such as tunable shock absorbing interface and morphing lightweight aerospace structures. The grant is being used to build an experimental platform to investigate thermo-mechanical behavior of the proposed materials.



Haythornthwaite Research Initiation Grant**Timothy Fitzgerald**

Capturing the mechanics of insect flight. High-speed photogrammetry of complicated systems presents a useful method to measure the dynamics of a system without contacting it. This can be advantageous when it would be difficult or too time-consuming to alter or modify a system with sensors. A key area where this is needed is the study of insect flight. Using multiple, synchronized cameras to capture free flying insects permits natural untethered flight and behaviors to be captured, reconstructed, and analyzed. It can be used to tune models of kinematics, as well as serve as inputs to computational fluid models. The techniques developed for this problem have general application across a wide variety of moving and deforming mechanical structures. The Haythornthwaite award is being used to acquire the needed cameras and equipment to perform these experiments.

**Haythornthwaite Research Initiation Grant****Ryan Harne**

Instrumentation for a unique platform to elucidate the complex responses of coupled multistable structures. Structures with multiple static equilibria are found in many civil, mechanical, aerospace, and other engineering contexts, whether intentionally, e.g. slender arches, or due to operating circumstances, e.g. ubiquitous aircraft skin buckling. The dynamics of post-buckled structures are intricate and demand robust analytical tools to uncover underlying principles, since they are essential to characterize effective functioning and long-term integrity of structural systems. With this Haythornthwaite Research Initiation Grant, we have acquired and are utilizing instrumentation that has culminated in a unique experimental platform for state-of-the-art investigations to elucidate the complex dynamic responses of multistable structures. By correlating the obtained measurements with predictions from a new analytical framework, this research is establishing validated, efficient theoretical methods to characterize dynamic states and susceptibility of built-up multistable structural systems that may exhibit dynamic behavior far-from-equilibria.

**Haythornthwaite Research Initiation Grant****Marco Salviano**

Bio-inspired hierarchical materials: a multi-scale analysis of the fatigue behavior. The complex hierarchical structure of several biomaterials, such as bones and shells, has been shown to be the secret behind their outstanding mechanical properties which include high toughness, strength, and damage tolerance. Under quasi-static loading, this is generally owed to the intricate interactions between brittle and ductile phases through weak interfaces which promote damage redistribution rather than localization. However, little is known about the mechanics of the microstructure in the presence of fatigue loading. Understanding this latter aspect can pave the way for the development of ultra-strong and durable bio-inspired materials. This study proposes the design of a mechanical testing stage to investigate the fatigue deformation and damage mechanisms at the microstructure. The experimental data will be used to formulate a multi-scale computational model capable of capturing the effects of the mechanical behavior of the constituents and the sub-critical fracturing behavior of the interface on the overall fatigue performance.



Haythornthwaite Student Travel Grants

The Haythornthwaite Travel Grant Award Program for graduate students, sponsored by the Haythornthwaite Foundation, awarded ten travel grants in 2016 to the following students: **Ruobing Bai** (Harvard University), **Andres Krischok** (Stanford University), **Shaoting Lin** (Massachusetts Institute of Technology), **Zhengwei Lin** (University of Colorado at Boulder), **Yang Lai** (University of Illinois at Urbana-Champaign), **Yichao Tang** (Temple University), **D. Matt Bond** (North Carolina State University), **Dawei Song** (University of Pennsylvania), **Mansa Rajagopalan** (Arizona State University) and **Yunyao Jian** (University of New Hampshire).

AMD Honors and Awards Banquet, IMECE 2016



AMD Chair Arun Shukla presents the Timoshenko Medal to Ray Ogden (*left*) and the Warner T. Koiter Medal to Pedro Ponte Castañeda (*right*) at the AMD Honors and Awards Banquet.



Arun Shukla presents the Daniel C. Drucker Medal to Kyung-Suk Kim (*left*) and the Ted Belytschko Applied Mechanics Award to Andrea Prosperetti (*right*).



Arun Shukla presents the Thomas J. R. Hughes Young Investigator Award to Pedro Reis (*left*) and the Eshelby Mechanics Award to Samatha Daly (*right*).



Arun Shukla and AMR editor Harry Dankowicz present the Lloyd H. Donnell Applied Mechanics Reviews Paper Award to Huiling Duan (*left*) and Mahmoud Hussein (*right*).



Arun Shukla and JAM editor Yonggang Huang present the Journal of Applied Mechanics Award to Ken Kamrin (*left*). Ray Ogden is delivering the Timoshenko medal acceptance speech (*right*).

NEWS FROM THE TECHNICAL COMMITTEES

The reports that follow are from some of the Technical Committees (TCs) of the Division of Applied Mechanics. Those TCs not represented here unfortunately did not provide information.

If you are interested in the activities of a particular TC, please feel free to contact the leadership of the committees.

Computing in Applied Mechanics Technical Committee

Chair: [Harold Park](#), Boston University (2014-2016)

Vice-Chair: [Caglar Oskay](#), Vanderbilt University, USA (2015-2017)

The following minisymposia were proposed for IMECE 2017:

1. *Modeling of the Fracture, Failure and Fatigue in Solids*
2. *Multiphysics Simulations and Experiments for Solids*
3. *Multi-scale Computations in Fluids, Structures, and Materials*
4. *Peridynamic Modeling of Material Behavior*
5. *Mechanical Metamaterials*
6. *Phase Transformations in Materials Processing and their effects on mechanical properties*
7. *Additive Manufacturing of Composites*
8. *Congress-Wide Symposium on Additive Manufacturing: Failure of Additively Manufactured Materials*

Instabilities in Solids and Structures Technical Committee

Chair: [Ryan Elliott](#), University of Minnesota

Vice-Chair: Edmundo Corona, Sandia National Laboratory

The Instabilities in Solids and Structures (IiSS) Technical Committee has been very active during the 2016-2017 year. The committee is chaired by Ryan S. Elliott of the University of Minnesota and vice-chaired by Edmundo Corona of Sandia National Laboratory. During the past year, the committee has organized sessions at the ASME-IMECE-16 in Phoenix, AZ. Additionally, many IiSS regular participants attended the ICTAM 2016 conference in Montreal, Canada and the Society of Engineering Science (SES 2016) conference in College Park, MD.

At ASME-IMECE-16 the committee organized a minisymposium with five sessions and 25 presentations:

(12-7) *Instability in Solids and Structures:*

12-7-1 Instabilities in micro-structured materials:	5 presentations
12-7-2 Buckling and pattern formation in periodic media:	5 presentations
12-7-3 Instabilities leading to plasticity, damage, and failure in materials:	5 presentations
12-7-4 Harnessing instabilities for active structures and materials:	5 presentations
12-7-5 Wrinkle, wave, and kink instabilities in composites:	5 presentations

Additionally, in collaboration with the Soft Matter TC, we organized one session and 5 presentations:

(12-8) *Instabilities in Soft Matter Composites:*

12-8-1 Instabilities in Soft Matter Composites:	5 presentations
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Each of these sessions was well attended and contributed to the overall success of these events. The committee is currently organizing symposia for SES 2017 at Boston, MA and ASME-IMECE-17 at Tampa, FL with help from Kostas Danas of CNRS, Ecole Polytechnique, France, Dai Okumura of Osaka University, Suita, Japan, and Lihua Jin of UCLA, Los Angeles, CA.

The symposia organized by the committee have been very successful and regularly attract high-quality presentations and are some of the biggest symposia at these events.

We welcome members of the applied mechanics community to participate by soliciting and actively recruiting high-quality contributions to the symposia sponsored by the Instabilities in Solids and Structures Committee.

Composite Materials Technical Committee

Chair: [Caglar Oskay](#), Vanderbilt University, USA (2015-2017)

Vice Chair: [Anastasia Muliana](#), Texas A&M University, USA (2017-2019)

The AMD Composite Materials Technical Committee held its annual meeting on Tuesday, November 15, 2016 at Sheraton Grand Phoenix Hotel, Room Laveen B, Phoenix, AZ, USA. 13 members were in attendance during the meeting. Prof. Anastasia Muliana was elected Vice-Chair of the committee for the 2017-2019 time period.

At IMECE 2016, the committee members organized 10 multidisciplinary topics: *"Multiscale Models and Experimental Techniques for Composite Materials and Structures"* (Organizers: Evan Pineda, Caglar Oskay and Dianyun Zhang); *"Biological Tissues and Materials: Modeling, Synthesis and Characterization"* (Organizers: Guy Genin, Hai-Chao Han and Karen Yan); *"A Short Course on Integrated Computational Materials Engineering (ICME): A Transformational Discipline"* (Organizers: Natasha Vermaak and Evan Pineda); *"Synthesis and Performance of Nanocomposites"* (Organizers: Davood Askari and Mohammad Naraghi); *"Modeling and Experiments in Nanomechanics and Nanomaterials"* (Organizers: Yozo Mikata and Jeffrey W. Kysar); *"Advanced Multiscale Materials, Natural Fiber- and Metal-based Biomaterial Composites"* (Organizers: Emmanuel Ayorinde, Joon Sang Lee and Gururaj Kathawate); *"Time Dependent Materials and their Composites: Experimental, Theoretical and Numerical Studies"* (Organizers: Anastasia Muliana, Daniel Tscharnuter and Ioannis Chasiotis); *"Multi-field Studies in Heterogeneous Materials: Experimental, Theoretical and Numerical Approaches"* (Organizers: Anastasia Muliana, Valeria La Saponara, Rani Elhajjar, Wahyu Lestari and Arun Srinivasa); *"Interphase Phenomena"* (Organizers: Pavan Kolluru and Oscar Lopes-Pamies); *"Multifunctional and Micro/Nano-structured Materials: Modeling and Characterization"* (Organizer: Xin-Lin Gao).

The following minisymposia were proposed for IMECE 2017:

1. *Processing and Performance of Nanocomposites* organized by Dr. Davood Askari, Wichita State University, USA and Dr. Mohammad Naraghi, Texas A & M University, USA.
2. *Mechanical Metamaterials* organized by Jaehyung Ju (Shanghai Jiao Tong University, China), Jongmin Shim (University at Buffalo, USA), Yaning Li (University of New Hampshire, USA), Sung Hoon Kang (Johns Hopkins University, USA) and Eduard Karpov (University of Illinois at Chicago, USA)
3. *Multi-Field Studies in Heterogeneous Materials: Experimental, Theoretical and Numerical Approaches* organized by Dr. Anastasia Muliana (Texas A&M University, USA), Dr. Wahyu Lestari (Embry-Riddle Aeronautical University, USA), Dr. Rani Elhajjar (University of Wisconsin-Milwaukee, USA), Dr. Valeria La Saponara (University of California-Davis, USA),

Dr. Addis Kidane (University of South Carolina, USA) and Dr. Charles Wojnar (Missouri S&T, USA)

4. *Mechanics and Design of Cellular Materials* organized by Muhammad Ali (Ohio University, USA) and Huanyu (Larry) Cheng (Pennsylvania State University, USA)
5. *Multifunctional and Micro/Nano-Structured Materials, Modeling and Characterization* organized by Dr. Xin-Lin Gao (Southern Methodist University, USA)
6. *Additive Manufacturing of Composites* organized by Dr. Ashfaq Adnan (University of Texas, Arlington, USA) and Dr. Dmitry Papkov (University of Nebraska-Lincoln, USA)
7. *Structural Nanocomposites* organized by Dr. Yuris Dzenis (University of Nebraska-Lincoln, USA) and Dr. Dmitry Papkov (University of Nebraska-Lincoln, USA)
8. *Multiscale Models and Experimental Techniques for Composite Materials and Structures* organized by Dr. Dianyun Zhang (University of Connecticut, USA), Dr. Caglar Oskay (Vanderbilt University, USA) and Dr. Evan Pineda (NASA Glenn, USA).

Technical Committee on Fluid-Structure Interaction

Chair: Ming-Chen Hsu, Iowa State University

Vice Chair: Artem Korobenko, University of Calgary

Another productive year for the Committee on Fluid-Structure Interaction (CFSI). We focused on the following activities:

CFSI organized the following minisymposia at international conferences:

1. Ming-Chen Hsu (Iowa State University), Artem Korobenko (University of Calgary), and Mike Scott (Brigham Young University) organized a thematic session titled "*Industrial Applications of IGA and Meshfree Methods*" at the 2016 USACM Conference on Isogeometric Analysis and Meshfree Methods in La Jolla, California on October 10–12, 2016.
2. At the same conference, Harald van Brummelen (Eindhoven University of Technology), Ming-Chen Hsu, and Laura De Lorenzis (Technische Universität Braunschweig) organized a thematic session titled "*Application of IGA and Meshfree Methods to Coupled Problems and Contact*".
3. Three minisymposia (Biomedical Fluid Mechanics and FSI; Flows with Moving Boundaries and Interfaces; Fluid-Structure Interaction) took place at the 19th International Conference on Finite Elements in Flow Problems (FEF 2017) in Rome, Italy on April 5–7, 2017. Organizers were CFSI Committee members Yuri Bazilevs (University of California, San Diego), Kenji Takizawa (Waseda University), and Tayfun Tezduyar (Rice University).
4. At the same conference, John Evans (University of Colorado Boulder), Tom Hughes (The University of Texas at Austin), Artem Korobenko, and Ming-Chen Hsu organized a minisymposium titled "*Stabilized, Multiscale, and Isogeometric Methods in CFD*".
5. At the same conference, Ming-Chen Hsu, Clemens Verhoosel (Eindhoven University of Technology), and Dominik Schillinger (University of Minnesota) organized a minisymposium titled "*Immersed Finite Elements in Fluid Flow*".
6. Three minisymposia (Biomedical Fluid Mechanics and FSI; Flows with Moving Boundaries and Interfaces; Fluid-Structure Interaction) took place at the Engineering Mechanics Institute Conference 2017 (EMI2017) in San Diego, California on June 5–7, 2017. Organizers were CFSI Committee members Yuri Bazilevs, Kenji Takizawa, and Tayfun Tezduyar.

7. At the same conference, Artem Korobenko, Ming-Chen Hsu, Mike Borden (North Carolina State University), and Tom Hughes organized a minisymposium titled "*Isogeometric Methods in Computational Mechanics*".
8. At the same conference, Chung-Hao Lee (The University of Oklahoma), Ming-Chen Hsu, Yue Yu (Lehigh University), Dominik Schillinger, Ankush Aggarwal (Swansea University) organized a minisymposium titled "*Computational Biomechanics for Biological Tissues & Human Body Systems*".

The following activities are planned for the future:

1. Artem Korobenko, Ming-Chen Hsu, Kenji Takizawa, Yuri Bazilevs, and Tayfun Tezduyar will organize a minisymposium titled "*Computational Fluid-Structure Interaction: Methods and Applications*" at the 14th US National Congress on Computational Mechanics in Montréal, Canada on July 17–20, 2017.
2. At the same conference, Michael Sacks (The University of Texas at Austin), Chung-Hao Lee, Andrew Drach (The University of Texas at Austin), Ming-Chen Hsu, Suvranu De (Rensselaer Polytechnic Institute) will organize a minisymposium titled "*Imaged-Based Models for Biomedical Applications*".
3. Harald Van Brummelen, Kenji Takizawa, and Ming-Chen Hsu will organize an invited session titled "*IGA of Fluids and Fluid-Structure Interaction*" at the V. International Conference on Isogeometric Analysis (IGA 2017) in Pavia, Italy on September 11-13, 2017.

Mechanics of Soft Materials Technical Committee

Chair: Kevin N. Long, Sandia National Laboratories
 Vice-Chair: Shawn Chester, New Jersey Institute of Technology
 Secretary: Shengqiang Cai, University of California at San Diego
 Editor: Sung Hoon Kang, John Hopkins University

The Mechanics of Soft Materials Committee had another great year. Our sessions at conferences continue to be highly active, full of high quality talks, and well attended. The committee is chaired by Kevin N. Long of Sandia National Laboratories. The Vice-Chair is Shawn Chester of the New Jersey Institute of Technology. The secretary is Shengqiang Cai of the University of California at San Diego, and the editor is Sung Hoon Kang of the John Hopkins University. Over the past year we routinely provide information to our membership and have organized topics and sessions at the ASME IMECE. Specifically, at the ASME IMECE 2016 the committee organized the following sessions with 35 talks:

12-51 *Mechanics of Soft Materials:*

- Active Materials
- Mechano-Chemistry
- Mechanics of Active Biological Materials and Structures
- 3D Printed Soft Materials
- Mechanical Characterization of Soft Materials
- Degradation and Failure in Soft Materials
- Computational Methods for Soft Materials

12-8 *Instabilities* (joint with the Instabilities TC)

12-25 *Interphase Phenomena* (joint with the Composites TC)

For the upcoming ASME IMECE 2017 the committee is in the process of organizing the following topics and sessions:

12-23 *Mechanics of Soft Materials:*

- Active Materials
- Mechano-Chemistry
- Mechano-Biology
- Gels
- Mechanical Characterization of Soft Materials
- Degradation and Failure in Soft Materials
- Adhesion
- Computational Methods of Soft Materials

12-11 *Instabilities in Soft Matter Solids and Structures* (jointly with the Instabilities Committee)

Congress Wide Symposium on Additive Manufacturing: 3D Printed Soft Materials.

We encourage active new members to participate by contributions to the sessions, and taking leadership roles in this committee. We look forward to another promising year.

NEWS FROM THE ASME-AMD JOURNALS

Journal of Applied Mechanics

JAM continues to be the fastest mechanics journal in the world. It has attracted a lot of junior authors in the past 12 months, as well as senior authors including Zdenek Bazant, Mary Boyce, Richard Christensen, Earl Dowell, Daining Fang, John Hutchinson, Keh-Chih Hwang, Michael Ortiz, Leon Keer, George Pharr, Byron Pipes, JN Reddy, James Rice, John Rogers, Pol Spanos, Kaspar Willam, Wei Yang, Wanxie Zhong, and Weiqiu Zhu. Its 2016 impact factor, released in June 2017, has increased to 2.133.

Yonggang Huang

Editor, Journal of Applied Mechanics

The Journal of Applied Mechanics Award

The Journal of Applied Mechanics Award is provided by the Applied Mechanics Division of the American Society of Mechanical Engineers to honor the best paper, which has been published in the Journal of Applied Mechanics during the two calendar years immediately preceding the year of the award. The award will be made annually to the corresponding author of the paper who received their Ph.D. no more than 10 years prior to July 1 of the year of award. Corresponding authors who have yet to receive a Ph.D. may also be considered. The award will be presented at the AMD Honors and Awards Banquet at IMECE. The award is selected by a committee appointed by the Technical Editor of JAM, with the Vice-Chair of the AMD EC as the committee chair. Professor ***Yihui Zhang*** from Tsinghua University will receive the 2017 JAM Award for his paper "*Mechanics of fractal-inspired horseshoe microstructures for applications in stretchable electronics*".

Applied Mechanics Reviews



Applied Mechanics Reviews (AMR) publishes state-of-the-art surveys and retrospective reviews of theoretical, computational, and/or experimental advances in the broad areas of applied mechanics and engineering science. Also of interest are original pedagogical treatments of a discipline that could be used in self-study. There are no page limits or page charges for papers published in Applied Mechanics Reviews. The journal accepts unsolicited manuscripts, but contributors are encouraged to first complete an author prospectus and forward this to the editor for initial editorial evaluation. Authors should expect a quick turn-around between initial submission and editorial decision,

especially if submission is preceded by correspondence with the editor or members of the editorial board during the development of a manuscript.

The 2016 InCites™ Journal Citation Reports statistics for AMR show a total of 3,435 citations in 2016, up from 2,862 in 2015 and 2,573 in 2014. In 2016, the journal's two-year impact factor without self-citations was 7.736, up from 4.072 in 2015 and 2.529 in 2014. Its 5-year impact factor is 6.452.

In 2016, Applied Mechanics Reviews published 6 issues, totaling 331 pages. Recent publications include:

1. Sipp and Schmid, "[Linear Closed-Loop Control of Fluid Instabilities and Noise-Induced Perturbations: A Review of Approaches and Tools](#)"
2. Kriegseis *et al.*, "[Towards In-Flight Applications? A Review on Dielectric Barrier Discharge-Based Boundary-Layer Control](#)"
3. Gupta *et al.*, "[Vapor Bubble Formation, Forces, and Induced Vibration: A Review](#)"
4. Hayatdavoodi and Ertekin, "[Review of Wave Loads on Coastal Bridge Decks](#)"
5. Xue *et al.*, "[Underwater Superhydrophobicity: Stability, Design and Regulation, and Applications](#)"
6. Karagozian, "[Acoustically Coupled Combustion of Liquid Fuel Droplets](#)"
7. Xu *et al.*, "[Transport Phenomena and Properties in Treelike Networks](#)"
8. Siegmund *et al.*, "[Manufacture and Mechanics of Topologically Interlocked Material Assemblies](#)"
9. Saeb *et al.*, "[Aspects of Computational Homogenization at Finite Deformations: A Unifying Review From Reuss' to Voigt's Bound](#)"
10. Vester *et al.*, "[Turbulent Flows in Curved Pipes: Recent Advances in Experiments and Simulations](#)"
11. Baah-Dwomoh *et al.*, "[Mechanical Properties of Female Reproductive Organs and Supporting Connective Tissues: A Review of the Current State of Knowledge](#)"
12. Chakroborty and Roy, "[Seismic Behavior of Horizontally Irregular Structures: Current Wisdom and Challenges Ahead](#)"
13. Young *et al.*, "[Adaptive Composite Marine Propulsors and Turbines: Progress and Challenges](#)"
14. Young *et al.*, "[Ventilation of Lifting Bodies: Review of the Physics and Discussion of Scaling Effects](#)"
15. Zhu, "[Mechanics of Crystalline Nanowires: An Experimental Perspective](#)"
16. Shu *et al.*, "[Fluid Velocity Slip and Temperature Jump at a Solid Surface](#)"

17. Younis *et al.*, "[Dynamic Forces Induced by a Single Pedestrian: A Literature Review](#)"
18. Wang *et al.*, "[Weak Form Quadrature Element Method and Its Applications in Science and Engineering: A State-of-the-Art Review](#)"
19. Srinivasa and Reddy, "[An Overview of Theories of Continuum Mechanics With Nonlocal Elastic Response and a General Framework for Conservative and Dissipative Systems](#)"

In addition to individual manuscripts solicited by members of the editorial board, as well as unsolicited manuscripts submitted to the Editor, ongoing initiatives include special issues of AMR in collaboration with the ASME Journals of [Tribology](#) (JTRIB) and [Mechanisms and Robotics](#) (JMR) to appear in 2017, as well as a planned special issue of AMR in collaboration with the ASME [Journal of Computational and Nonlinear Dynamics](#) (JCND).

The **AMR Podcast** series, launched in 2014, features informal conversations on topics ranging from a professional career in science and academia to personal reflections on research funding, scientific dissemination, and the contributions of applied mechanics to engineering technology. The podcast repository, available at

<http://appliedmechanicsreviews.asmedigitalcollection.asme.org/podcasts.aspx>

and

<https://itunes.apple.com/us/podcast/asme-amr-podcasts/id1078670485?mt=2>

includes interviews with Avram Bar-Cohen, David Barnett, Markus Buehler, Howard Stone, Joe Goddard, Anthony Bloch, Karl-Johan Åström, Irene Beyerlein, Philip Holmes, Stuart Antman, Katia Bertoldi, Zhigang Suo, Edwin Kreuzer, Igor Mezic, Julia Greer, Melany Hunt, Gabor Stepan, Thomas Hughes, Rodney Clifton, and Simon Ostrach. Interviews may be listened to online or downloaded for offline use.

Applied Mechanics Reviews is served by an editorial board of *Section Editors* (SEs) and *Associate Editors* (AEs). Section Editors serve as lead sources of creativity and initiative and work closely with the Editor to ensure the integrity and quality of the journal. Associate Editors handle the review process and collaborate with the Editor in soliciting invited contributions to the journal. Recent additions to the editorial board include Sergei Chernyshenko (AE), Samantha Daly (AE), and Vicky Nguyen (AE). There are several openings on the editorial board in the areas of dynamics, vibration, structures, composite materials, and mechanisms. Interested candidates should contact the editor.

Applied Mechanics Reviews welcomes collaboration in service of the applied mechanics community and continued engagement with its contributors and readers in maintaining high standards of significance, quality and impact.

Harry Dankowicz
Editor, Applied Mechanics Reviews

The Lloyd Hamilton Donnell Applied Mechanics Reviews Paper Award

Applied Mechanics Reviews was founded in 1948 under the editorship of Lloyd Hamilton Donnell. The biennial Lloyd Hamilton Donnell Applied Mechanics Reviews Paper Award recognizes an outstanding contribution to the applied mechanics archival literature, published in Applied Mechanics Reviews during the preceding two-year period. In 2016, the award was given to **Mahmoud I. Hussein, Michael J. Leamy, and Massimo Ruzzene** for their paper "*Dynamics of Phononic Materials*

and *Structures: Historical Origins, Recent Progress, and Future Outlook*", published in Applied Mechanics Review 66(4), in July 2014; and to **Yahui Xue, Pengyu Lv, Hao Lin, and Huiling Duan** for their paper "*Underwater Superhydrophobicity: Stability, Design and Regulation, and Applications*", published in Applied Mechanics Review 68(3), in May 2016.

OTHER ASME-AMD AWARDS

Eshelby Mechanics Award for Young Faculty

The recipient of the 2016 Eshelby Mechanics Award for Young Faculty was Professor **Samantha Daly** from the University of California at Santa Barbara. The award was formally presented at the AMD Honors and Awards Banquet at IMECE 2016. This award is given annually to rapidly emerging junior faculty who exemplify the creative use and development of mechanics. The intent of the award is to promote the field of mechanics, especially among young researchers.

The selection committee consisted of: Roger Fosdick (University of Minnesota), Huajian Gao (Brown University), Yonggang Huang (Northwestern University), K. Ravi-Chandar (UT Austin), and G. Ravichandran (Caltech). The award consists of a \$ 1,500 cash prize and a commemorative plaque.

OTHER NEWS

Conference Announcements 2017/2018

The **54th Society of Engineering Science (SES) Technical Annual Meeting** will be held at North-eastern University from July 25-28, 2017. More information can be found on the SES [conference website](#).

The **14th US National Congress of Computational Mechanics (USNCCM)** will be held in Montreal, Canada from July 17-20, 2017. Conference details may be found on the meeting's [website](#).

SEM's 75th anniversary of the annual **Conference and Exposition on Experimental and Applied Mechanics** will take place in Greenville, SC from June 4-7, 2018 with information found [online](#).

The **13th World Congress in Computational Mechanics (WCCM)** will be held jointly with the **2nd Pan-American Congress on Computational Mechanics (PACAM)** at the Marriott Marquis in New York City from July 22-27, 2018. More information can be found on the [conference website](#).

The **18th US National Congress for Theoretical and Applied Mechanics (USNCTAM)** will be organized jointly with the Chinese Society of Theoretical and Applied Mechanics (CSTAM) and will be hosted by Northwestern University at the Hyatt Regency O'Hare from June 5 to June 9, 2018. See the [conference website](#) for further details.

The **10th European Solid Mechanics Conference (ESMC)**, organized by the University of Trento and the University of Bologna, will be held in Bologna, under the auspices of EUROMECH, from July 2-6, 2018. More information may be found on the [conference website](#).

The **16th European Mechanics of Materials Conference (EMMC)** will be held at École Centrale de Nantes in France from March 26-28, 2017. The [conference website](#) provides further information.

The joint **6th European Conference on Computational Methods (ECCM)** and the **7th European Conference on Computational Fluid Dynamics (ECFD)** will be held jointly in Glasgow, UK from June 11-15, 2018. More information can be found [online](#).

2017 Haythornthwaite Research Initiation Grant Proposals

With funding from the Haythornthwaite Foundation, the Executive Committee of the Applied Mechanics Division is soliciting proposal for the **Haythornthwaite Research Initiation Grant** Program, targeting university faculty engaged in research in theoretical and applied mechanics that are at the beginning of their academic careers. Proposals will be due by **August 15, 2017**. Further information can be found online in the [program announcement](#).

2017 AMD/ASME Awards – Call for Nominations

The Applied Mechanics Division, of the American Society of Mechanical Engineers, seeks nominations for **all society- and division-level awards**. All the awards are international. Neither the nominee nor the nominator need be a member of the ASME. However, nominators must not be active members of the respective award committees. Further descriptions of the awards are given [online](#). Nominations should be submitted as PDF files to the Chair of the Division, Pradeep Sharma, by [email](#), before **September 15, 2017**. Please take notice of this new deadline, after which no nominations will be accepted. More information can be found [online](#).