



# Experimentally Speaking...

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## Message from the President



Eric N. Brown, SEM President, 2021-2022

AS WE ENTER THE NEW YEAR of 2022, I would like to spend some time with you reflecting on the past year behind us and the new year ahead. Looking back at 2021, it was in many ways a year like no other and in some ways hopefully a year not soon repeated. In years to come, 2021 will hopefully be talked about like that one year SEM had a conference in Detroit with a big snowstorm and no one could get there, it was challenging at the time but ultimately just a footnote in the society's history. In the Brown household, we started 2021 hunkering down in our home in the mountains of northern New Mexico. We were fortunate that we lived in an area touched less by the pandemic than many family, friends, and colleagues around the US and the world. We started the year with kids in some combination of remote school and homeschool, which reinforced the value I have put on education and the respect I have for those with a calling to be teachers. For those members of SEM in academia who have managed to continue to teach through the pandemic, know that is impactful and will pay dividends for generations of our field to come. For those of you who taught me in decades past, let me take this moment for a belated heart felt thank you. We enjoyed more time together as a family and learned, especially from our teenager, that there is such a thing as too much time with family. I was grateful to have a job and an employer with flexibility to work-from-home (even if it sometime felt like living-at-work) and that embraced safety best practices for the pandemic. I also learned that I am less of an introvert than I thought I was and that I deeply missed the day-to-day engagement with colleagues and the opportunities that travel for work meetings and conferences provided to meet face-to-face. While virtual tools like Zoom,

WebEx, MS Teams, and Skype allowed us new ways to engage and be productive, they did not fully replace what I look for from in-person interactions. Like many of you, my family appeared in the background of many meetings, and were probably more exposed to SEM leadership meetings than they would have been in any other year. In the latter part of 2021, our whole family benefited from our children's return to in-person classes. I enjoyed the increasing return to being in the office and in the lab. While still greatly reduced from the before times, I did enjoy a few opportunities for work travel and one in-person conference. I will share that perhaps like some of you, I developed some bad habits of multitasking during the pandemic and may have on occasion had more than one Zoom meeting going at a time. At my one in-person conference I observed someone on a Zoom meeting while sitting in session; I truly hope that this kind of multitasking is not part of our future. Not only did I find those face-to-face interactions enjoyable and reinvigorating, I found those meetings to have a renewed level of productivity and impact. While I suspect some meetings will forever be relegated to virtual tools, I optimistically look forward to our return to in-person conferences.

For the Society for Experimental Mechanics, 2021 included two fully virtual conferences with IMAC and SEM Annual expertly organized by the SEM staff employing lessons learned from the 2020 SEM annual that had been shifted to virtual due to the pandemic. We also held the fall officers meeting virtually for the second year in a row. All things considered, SEM has remained healthy and vibrant through 2021. It was indeed a unique year to begin one's

### IN THIS ISSUE

- 1** Message from the President
- 3** 2021: IMAC-XL Message from the Organizers
- 4** From the Directors
- 6** State of the Journals
- 8** 2022 SEM Executive Board Nominees
- 10** Member News
- 12** Upcoming Events

# Message from the President *continued from pg.1*

term as SEM President. I hope you and everyone engaged in SEM also found some uniquely positive experiences from the past year and managed to negotiate those experiences of 2021... those we will look forward to not repeating.

Now, looking forward to 2022, I'm excited and optimistic about returning to in-person conferences for IMAC in February in Orlando and SEM annual in June in Pittsburgh. I hope to see many of you at one of these conferences. The SEM staff continue doing an outstanding job of meeting planning while being responsive to safety practices, while learning from other meetings that have been returning to in-person formats by also supporting the society's three journals, and ensuring the continuous operation of the society.

As part of starting a new year, I would like to remind and encourage people to renew your SEM membership. In many societies, including SEM, I have seen a decline in membership in recent years. Prior to COVID, SEM had seen decreasing membership numbers, while at the same time having many of our largest conferences in terms of participation numbers. SEM, like many technical societies, experienced a downturn in participation during the pandemic, which further exacerbated the decrease in membership. I attended my first SEM annual conference in 2000 in Orlando. I presented a talk on fracture testing of self-healing polymers and I met several members of the society who have played seminal rolls in my life and career over the past two plus decades. We often talk about SEM as the friendly society, and it is. I often think of SEM as extended family where once a year I get to meet with friends and colleagues who I have gotten to know and who have touched my life over many years. It is a place where I get to learn the latest developments in the field and new ideas are shared and grown. Every year since that first conference, I participated in SEM every year through presentations at conferences, through serving as a reviewer, author, or editor in all three SEM journals and in leadership roles in the society at all levels. But participation and membership are two different things. For those of you who regularly participate in SEM conferences and wonder why to become a member, I would like to share what I see as some of the opportunities of membership. Being solidly Generation X, the first generation of non-joiners, I have to say I did not grow up as much of one for joining teams or club. I liked hanging out with and engaging with people I wanted to at the time. I like sports like rock climbing and snowboarding that are about individual performance. Membership is not necessarily in my DNA. That said, my membership in SEM is very important to me. In part, I see my membership in SEM as an extension of my participation in SEM. It ensures that I am always connected to the society, receiving the latest updates, announcements and information on the conferences. I am a member of SEM because I find many of the benefits of membership beyond conference participation to be valuable, including free access to society journals, and other

resources that are not available through my employer, to help me in my career and access to other member only benefits. I also feel membership is part of service to the society. While SEM is a nonprofit, its operations come with costs that are covered in many ways and our membership dues are certainly one of those ways that ensures the continued vitality and operation of the Society. And, I find it is worth noting that there are aspects of participation in SEM that are only available to members. As much as I would like to encourage you to become a member, if you were not already, I also want to stress that SEM truly values and welcomes everyone who chooses to participate. For me, SEM is my home Society that I participate in year in-year out, no matter what. That said, there are certainly other conferences that I attend when there is a particularly interesting topic, it happens to align with my schedule, or a colleague invites me to participate in a special session. If that is what SEM is to you, we welcome you and encourage you to continue to participate and consider whether SEM should be a home Society for you. If you have been a long-term participant and hope someday to be considered for SEM Fellow recognition, then there is a requirement to have been a member for 10 years. If you are interested in lending your name to the nomination of a colleague to the rank up of Honorary SEM member, then you will need to be a current member. If you would like to serve in a SEM leadership role or receive one of SEM's awards, membership and service in the society expand your opportunities. If membership is not for you, I look forward to your continued participation in SEM. If you have ever wondered, "why should I become a member of SEM?", I hope you now have some ideas and I encourage you to become a member. I would also be interested in your ideas on how to make membership even more meaningful. And, if you have been a long time member, please continue to renew your annual membership. Like many of you, I would frequently renew my membership as part of my registration for the conference each year. After a decade of that routine, I decided to simplify my life and just become a lifetime member of SEM. That way it was always taken care of and if I were ever to miss a conference, I would not have to worry about dropping my membership. In the long run, it is proving to be the more cost effective option.

As we start to meet again in person, please thank and check-in with the outstanding SEM staff including the familiar faces of Shari Mathews and Jen Tingets, new faces with Dan Trombetta who joined SEM staff in time to participate in IMAC 2020 just before the pandemic and Nicole Trombetta who hired on during the pandemic, SEM Managing Director Nuno Lopes, and SEM Executive Director Kristin Zimmerman. Thank you to all of the volunteer leaders who continue to support SEM. See you in 2022!

**Eric N. Brown**  
SEM President

# 2021: IMAC-XL Message from the Organizers

WE ARE APPROACHING two years since COVID was declared a pandemic. For some this has been a time fraught with hardship and loss. For those of you that have suffered personally or experienced loss, we grieve with you. Others have celebrated successes and joy without the usual connection to friends and family. For those happy moments, we cheer with you – albeit from a distance. In the last two years everyone's life has been impacted, and some greatly changed. Whether you are optimistic about the pandemic end or looking towards a new normal with COVID in the picture long term, we all can agree that we must continue to persevere.

In the face of this world-wide turmoil, our collective dedication to technical and scientific pursuits remains strong. For the IMAC community, that brings us together whether we can meet in person or must meet remotely. One way or another we will meet in 2022 and so we encourage everyone to continue to prepare to share your recent technical advances with our community.

For IMAC-XL, we are cautiously planning for an in-person conference. We are incorporating lessons learned from last year's virtual conference format that we think will give everyone the best chance to present their work and encourage the discussions and interactions that we all love about IMAC, while taking care for the safety of all participants. The pandemic has been polarizing, and we encourage each of you to respect those who desire social distance, the protection afforded by masks or opportunities to not wear a mask, and other measures.

Each author will be asked to write a paper as usual and attend in-person to present, but because some participants will not be able to attend in person this year, we will still be asking each of you for a prerecorded 10-15 minute presentation. This will also allow every participant to see presentations that they might otherwise miss and to review the talks after the conference. The prerecorded videos will be available at least a week or two before the conference begins. We will also



David Epp



Matthew Allen

continue to use the Whova App to provide information, allow offline discussion of the papers, and to provide as many avenues for interaction as possible.

We are looking forward to seeing you all at IMAC-XL February 7-10, 2022!

Regards,

**David Epp, IMAC Conference Director**  
**Matthew Allen, IMAC Advisory Board Chair**



**REGISTRATION  
NOW OPEN**

**IMAC** is a conference and exposition focusing on structural dynamics and has evolved to encompass the latest technologies supporting that field. This broad focus on structural dynamics includes topics in modal analysis, nonlinear dynamics, data science, uncertainty quantification, and many other related topics spanning the full range of engineering disciplines. This year we are focusing on "The Human Experience of Sound and Vibration," our theme for IMAC-XL. We invited proposals for paper presentations at IMAC-XL focused on the conference theme as well as on broader topics related to structural dynamics listed in this call.

We also encouraged everyone to get involved with the various technical divisions within the Society, submit your paper for a best paper competition, or nominate someone for an award. Your participation and ideas are needed to keep IMAC responsive to the needs of the structural dynamics community. Be sure to visit the web site to learn more about IMAC and our community.

# From the Directors

WITH THIS MESSAGE, we would like to summarize 2021 and share a few highlights in preparation for IMAC-XL in Orlando, Florida, February 7-10, 2022...an in-person conference...Finally!

The key elements of our business operations include: Conferences, Membership, Journals, and Publications (proceedings, books, etc.). We are very pleased to tell you that our business operations remained strong throughout the COVID-19 global pandemic, due in large part to many of your amazing contributions to the success of our virtual conferences, and to our staff who worked tirelessly to invent virtual conference models, using the Whova platform, Zoom, Spatial Chat, etc. that our members found valuable and fun. The details per line item of business are described below.

The COVID-19 global pandemic did not allow our SEM family to gather face-to-face for both IMAC and Annual 2021. We leveraged the direct involvement and support from our conference organizers and the Whova platform to conduct live Q&A sessions, meet-ups and breaks, a virtual exhibition and chat rooms. What we were able to collectively put together, in terms of the virtual technical programs, virtual Technical Divisions (TD) and business meetings, and social gatherings that helped us to sustain net contributions, per conference, to our business this year. We also were very grateful to receive two tranches of the U.S. Federal Government's Small Business Administration (SBA) – Payroll Protection Program (PPP) funding, which helped to

## IMAC-XL's technical program is strong with 359 presentations in 23 tracks, four courses and over 200 papers to be published in the IMAC-XL Springer/Nature Conference Proceedings.

reduce our overhead throughout the year. Both tranches of funding have been 100% forgiven in 2021.

IMAC-XL is shaping up nicely, as our first in-person conference in two years, for 2022. We are anxious to gather again in-person and will do everything possible to be sure that your conference experience is managed with your health and safety first and foremost. You will note, however, that IMAC-XL will continue to use the Whova platform and will request that conference participants submit a 10-15 minute video of their presentation so that we can host your presentation for all conference attendees to enjoy through Whova. This is because we do not wish to exclude those individuals who are unable to travel due to potential health concerns or travel restrictions.

IMAC-XL's technical program is strong with 359 presentations in 23 tracks, four courses and over 200 papers to be published in the IMAC-XL Springer/Nature Conference Proceedings. We are also excited to see that more than 20 companies will be participating

in our conference exposition. Thank you to the session organizers, course instructors, exhibitors and those who submitted to the Springer/Nature conference proceedings for teeing up IMAC-XL as an outstanding conference to attend!

There is some interest at this time from TD chairs to conduct virtual TD meetings before the conference followed by an in-person gathering over a pizza lunch at the conference. This would allow the TDs to make their virtual meeting open to all who are interested in attending without conflicting with the other TDs and will enable the TD chairs to add additional details to their plans for the 2023 technical program during the pizza lunch. Stay tuned, we may be conducting some of the 2022 Annual business meetings virtually too. This would, in addition to allowing more members and conference attendees to participate, allow our Society leadership the opportunity to enjoy listening to and participating in a presentation or two during the conference.

Our membership numbers have fallen in 2021 due in large part to our inability to meet in-person during our conferences. We expect to see this trend turn the corner in 2022 assuming we are able to meet in-person for our two main conferences.

Our Journals continue to grow in stature and quality under the leadership of our Editors in Chief; Alan Zehnder: Experimental Mechanics (EM), Jennifer Jordan: Journal of Dynamic Behavior of Materials (JDBM) and Bonnie Antoun: Experimental Techniques (ET). We are grateful that we are able to offer our members excellent peer-reviewed journals to publish their work in whether they attend our IMAC or Annual conference. The revenues from the journals continues to increase adding substantially to the business bottom line. A special thank you to Alan, Jennifer and Bonnie!

Our conference proceedings are also contributing substantially to the business revenues with our new contract with Springer/Nature garnering \$2,000 to the Society per volume published. Thank you to all of you that agree to submit your work to the SEM: Springer/Nature conference proceedings. Your proceedings contribution does not preclude you from publishing in a peer-reviewed journal, especially one of SEM's three journals. Self-plagiarism is not allowed, but extension of your proceedings publication into a journal article, with proper citation of your previously published work, is highly encouraged.

In other publications news, our Structural

Dynamics Handbook, edited by Randy Allemang and Pete Avitabile has many chapters already on-line with publication of the entire book contribution in print scheduled for January 2022. Our SEM Series of Handbooks being published by Morgan & Claypool is off and running with contributions being planned from a few of our Annual conference TDs (Thermomechanics and Infrared Imaging, Dynamic Behavior of Materials and Residual Stress). Thank you all for your invaluable contributions to SEM!

In closing, we want to acknowledge the SEM staff for the countless hours that they put into creating new ideas to program into our virtual IMAC and Annual 2021, while balancing the challenges of working from home and managing their households. Our goal will continue to be to give our SEM family and community a valuable, learning and sharing experience through our conferences, our journals/publications, our student symposia activities and through our membership platforms that allow all to stay connected between conferences. We invite you to send an email to Jen, Shari, Dan and Nicole to acknowledge the work that they do on your behalf and on behalf of SEM. Thank You!!

We look forward to your questions and comments so please don't hesitate to email or call.

Happy and Safe Holidays to all!

**Kristin Zimmerman, Executive Director**  
**Nuno Lopes, Managing Director**

## IMAC XL REMINDER

IMAC-XL author(s)/presenter(s), a shareable link to your recorded video presentation is due:

### January 5, 2022

Your videos will be hosted through the Whova Conference App available to all attendees.

# State of the Journals

## EXPERIMENTAL MECHANICS

Alan Zehnder, Cornell University, Editor-in-Chief

IN 2021, Experimental Mechanics (EM) published 112 original papers in nine issues, on topics including: digital image and volume correlation, use of machine learning in experimental mechanics, residual stresses, thermal methods of stress analysis, contact mechanics, biomechanics, fracture, impact, vibrations, plasticity and more. These works, more often than not, integrate computation, theory and experiments to advance experimental approaches, applications and discover novel mechanical and physical behavior across many time and length scales.

The journal is increasingly international with articles from 19 nations and Technical Editors from 9 nations. The number of submissions to the journal has declined in recent years, from 489 submissions in 2019, to 439 in 2020 and by the time 2021 is over we expect about 360 submissions. It is not clear whether this is an effect of the ongoing COVID pandemic or a long-term trend. In either case, a challenge ahead for EM is to continue to attract top quality work.

Each issue featured a full cover image from a select paper to showcase the pioneering works published in the journal. All the papers and the journal covers are available at [www.springer.com/journal/11340](http://www.springer.com/journal/11340)

Three special issues or special collections were published in 2021. These include:

- Special Issue on Experimental Advances in Cardiovascular Biomechanics, edited by J. F. Wenk and S. M. Lessner, published in January 2021, containing 22 original articles, one of our largest issues ever.
- Special Issue on Tribology of Advanced Materials, edited by Alison C. Dunn, Brandon A. Krick, Kenneth M. Liechti & Frank W. DelRio, with nine articles.
- Special Collection on New Methods and Applications of Optical and Photo-Mechanics, edited by W. Qiu, H.M. Xie, and X.L. Gong with 13 articles.

Planned for 2022 is a Special Issue on Advances in Residual Stress Technology in honor of Drew Nelson, edited by Adrian DeWald and Michael Hill.



The 2020 impact factor of EM (reported in June 2021) reached the new high of 2.808 (up from 2.496), thanks to the efforts of our Editorial Board and the quality of papers submitted by our authors.

I would like to thank everyone who contributed to the success of EM in 2021, including the authors and our 452 reviewers, the Guest Editors, and our Technical Editors: Antonio Baldi, Janice Barton, Michael Brüning, Vijay Chalivendra, Weinong Chen, Samantha Daly, Frank DelRio, Adrian DeWald, Matthew Enloe, Christian Franck, Michel Grédiac, Francois Hild, Krishna Jonnalagadda, Jamie Kimberley, Francesco Lanza di Scalea, Hongbing Lu, Michael Mello, Paul Reynolds, John Shaw, Raman Singh, Junlan Wang, Huimin Xie, Satoru Yoneyama, and Yong Zhu. I would also like to thank EM's Managing Editor Nicole Trombetta, SEM's Managing Director Nuno Lopes and Executive Director Kristin Zimmerman, and Bryant Munson of Cornell University for his support with the logistics of the journal.

On behalf of the Editorial and International Advisory Boards of EM, I would like to invite all SEM members to submit your outstanding research papers to EM, to propose Special Issues on developing research topics or to propose and write Review Articles summarizing the state of research and applications and pointing towards the discoveries yet to be made.

## EXPERIMENTAL TECHNIQUES

Bonnie Antoun, Sandia National Laboratories, USA, Editor-in-Chief

IN 2021, Experimental Techniques published 63 original papers in six issues, including a Special Issue in June on Computer Vision and Scanning Laser Vibrometry Methods, co-edited by Professor Dario Di Maio of the University of Twente and Professor P. Scott Harvey of the University of Oklahoma. There are also two new Special Issues currently in progress, to be published in 2022. The number and quality of manuscript submissions has been strong throughout the year and there has been an increase in submissions compared to 2020. Since the journal is in excellent shape with accepted papers, we are excited to announce that we will be increasing the number of papers per issue from ten to twelve, starting with the first issue of Volume 46 in 2022. Please note that all papers from 2021 and earlier can be found at [link.springer.com/journal/40799/volumes-and-issues](http://link.springer.com/journal/40799/volumes-and-issues).



The 2020 impact factor of Experimental Techniques (reported in June 2021) increased to 1.167 due to the dedicated efforts of our esteemed Editorial Board, Guest Editors, technical reviewers and authors. I am grateful for the deep and vast subject matter expertise that the Technical Editors bring to the journal, needed to cover our large subject area scope that covers applications and developments in experimental mechanics and dynamics: Matt Allen, Javad Baqersad, Allison Beese, Yuanchang Chen, Alfredo Cigada, Aaron Forster, Jeff Helm, Luciano Lamberti, Zhu Mao, Ricardo Mejia-Alavarez, Brian Owens, Paul Reynolds, Wei-Chung Wang, Justin Wilbanks, Caroline Winters, Yongfeng Zu, Hao Yi, Xing Zhang and Kristin Zimmerman. The Technical Editors were working diligently towards our goal of reducing the average time between manuscript submission and first decision and successfully improved that metric by reducing from 78 to 55 days.

We greatly appreciate the support and guidance of our International Advisory Board members: Kristin Zimmerman (Chair), Jonathan D. Rogers, José Freire, Nancy Sottos, Jeff Helm, Raman Singh, Wei-Chung Wang, Sven Bossuyt, Wayne Chen and Cosme Furlong. Thank you also to SEM staff for their support of the journal, particularly Nicole Trombetta and Nuno Lopes.

We continue to be highly motivated to publish one or more Special Issues each year. Please contact me directly or [journals@sem.org](mailto:journals@sem.org) if you have a topic you would like to propose and we will be very happy to help get the process started. We would also like SEM members to consider submitting review articles in their areas of expertise. Review articles are extremely valuable to our readers, are highly cited and will also help further increase our Impact Factor.

I look forward to receiving a large number of high quality submissions in 2022 so we can continue to publish the new and exciting advances in experimental techniques and methods for our readers. Lastly, we want to continue to strongly encourage all SEM members to submit their work to Experimental Techniques at [www.editorialmanager.com/exte/default.aspx](http://www.editorialmanager.com/exte/default.aspx).

## JOURNAL OF DYNAMIC BEHAVIOUR OF MATERIALS

Jennifer Jordan, Los Alamos National Laboratory, Editor-in-Chief

I AM PLEASED to share that 2021 was another successful year for the Journal of Dynamic Behavior of Materials. We published over 40 outstanding papers in four issues, including the Special Issue



High-Pressure Dynamic Strength of Materials guest edited by Curt Bronkhorst, Justin Brown, and Tracy Vogler. All papers can be found at [link.springer.com/journal/40870/volumes-and-issues](http://link.springer.com/journal/40870/volumes-and-issues).

Thank you to everyone who continues to make the Journal of Dynamic Behavior of Materials a success, including the authors without whom the journal would not have been possible. I would like to thank Dan Casem and Paulo Rigg, whose terms on the Editorial Board will end in December 2021, for their service. We're welcoming Brian Schuster (University of Texas at El Paso) and Michael May (Fraunhofer EMI) to the Editorial Board starting in January 2022! I would also like to send a warm thank you to the Editorial Board members who are continuing their terms: Minta Akin, Nadia Bahloul, Nicola Bonora, Duane Cronin, Daniel Eakins, Veronica Eliasson, Juan Escobedo-Diaz, Pascal Forquin, Leslie Lamberson, Yulong Li, James LeBlanc, Xu Nie, Parameswaran Venkitanarayanan, David Williamson, and Clarissa Yablinsky.

For the International Advisory Board, I would like to thank Eric Brown, Chair, Neil Bourne, Stefan Hiermaier, Suhithi Peiris, Vikas Prakash, K.T. Ramesh, Hareesh Tippur, and Tracy Vogler for their continued service.

At the end of my second year as Editor-in-Chief, I'm pleased with the progress that the journal has made in 2021. We're still facing challenges, particularly in recruiting reviewers. However, overall, we're still doing very well, and have been accepted to Clarivate's Emerging Sources Citation Index, which is the first step in acceptance to the Science Citation Index-Expanded (SCIE) and being allocated an official Impact Factor. We are working to partner with SEM's Dynamic Behavior of Materials Technical Division to provide a path for publication in conjunction with the Annual Meeting.

We are highly motivated to continue to publish one or more Special Issues each year. Please contact me directly or [journals@sem.org](mailto:journals@sem.org) if you have a topic you would like to propose and we will be very happy to help get the process started. We would also like SEM members to consider submitting review articles in their areas of expertise.

I look forward to 2022 bringing many new advances in the field of dynamic behavior of materials and exciting work published in the Journal of Dynamic Behavior of Materials. Please submit your work in the field at [www.editorialmanager.com/jdbm/default.aspx](http://www.editorialmanager.com/jdbm/default.aspx)! ■

# 2022 SEM Executive Board Nominees

The SEM Nominating Committee has announced the following updates for the 2022–2023 SEM Executive Board. Biographies for each member appear in this article. Once elected, these members will join current Board members whose terms extend to 2023.



## **President James DeClerck**

Dr. James De Clerck is a Professor of Practice in the Mechanical Engineering – Engineering Mechanics Department at Michigan Technological University. He earned BS, MS and PhD degrees from Michigan Tech, receiving his Ph.D. in Engineering Mechanics in 1991.

Prior to joining the Michigan Tech faculty in 2009, Jim was a Project Design Engineer at the General Motors Noise and Vibration Center where he worked on improving vehicle noise and vibration performance at every stage of the vehicle development process. Jim led the development and implementation of new vibration analysis and testing technology. He also developed techniques for establishing design performance requirements and for validating analytical model predictions.

In addition to advising the Michigan Tech Formula SAE Team, Jim teaches classes on Model Based Design, Dynamics, System Dynamics Senior Capstone Design, Analytical and Experimental Modal Analysis, Machine Design, and Analytical Vibro-Acoustics classes. Jim's areas of expertise include noise and vibration, structural dynamics, design, modal analysis, model validation, inverse methods applied to design, and advanced measurement techniques.

Raman's academic interests are in student mentorship, development, and re-tention with a focus on new pedagogical methods. His research interests are in the mechanics of advanced materials, with an emphasis on the investigation of modern engineered materials and development of new techniques for mechanical characterization at highly localized length scales. His research has been funded by the National Science Foundation, NASA, the Oklahoma Center for the Advancement of Science & Technology, the Oklahoma Transportation Commission, the US Army Research Office, the Department of Energy, and industry. He has authored or co-authored several archival journal publications and conference proceedings and holds two patents. He is an active member of the Society of Experimental Mechanics (SEM)



## **Vice-President Jason Blough**

Dr. Blough received his BSME and MSME from Michigan Technological University. Dr. Blough attended the University of Cincinnati to obtain his Ph.D. in structural dynamics. Dr. Blough's Ph.D. was on rotating machinery signal processing methods. Dr. Blough is

currently a Professor in the Mechanical Engineering-Engineering Mechanics Department at Michigan Technological University. Dr. Blough has been active in SEM and IMAC for over 20 years publishing papers, serving on the SEM Executive Board, and continues to be an instructor in the "Young Engineers" program at IMAC. Dr. Blough's research is industry funded, with support from the auto and powersports industries, and defense. Dr. Blough has graduated over 40 graduate students and published over 135 papers. Dr. Blough has taught over 40 short courses to industry on various NVH topics.



## **President-Elect Raman P. Singh**

Dr. Raman P. Singh serves as the Associate Dean for Engineering at OSU-Tulsa and as the Head of the School of Materials Science and Engineering in the College of Engineering, Architecture and Technology at Oklahoma State University (OSU). He also serves as the

Director of the Helmerich Advanced Technology Research Center on the OSU-Tulsa campus and is appointed as the Helmerich Family Endowed Chair Professor of Engineering.

Raman holds M.S. and Ph.D. degrees in Mechanical Engineering and Applied Mechanics from the University of Rhode Island, and a B.Tech. degree in Mechanical Engineering from the Indian Institute of Technology–Kanpur, India. Prior to joining OSU in 2006 he was a faculty member at the State University of New York at Stony Brook, and before that a post-doctoral scholar at the California Institute of Technology.



### Member-at-Large Dario DiMaio

I have graduated in Mechanical Engineering from the University Politecnica delle Marche (IT). I obtained a PhD in Mechanical Engineering from Imperial College London. After that, I worked as Post-Doc in the Rolls-Royce Composites technology centre in the

Aerospace department of the University of Bristol. After that, I was appointed Assistant Professor of Dynamics in the Mechanical Engineering department of the University of Bristol. I currently work as an Assistant Professor of Structural Dynamics at the University of Twente.

I am an experimental dynamicist who is an expert in modal testing, laser vibrometry, composite vibration fatigue, nonlinear modal testing and vibration testing. I also used my skills to transfer technology from academia to industry up to a technology readiness level 6 by developing measurement methods, control panels for vibration measurements and testing methods. I was awarded a patent for discovering a damage initiation criterion in composites vibration fatigue.

I taught Nonlinear Structural Dynamics at the University of Bristol. I currently teach Mechanical Vibrations, Structural Dynamics and Advanced Dynamics at the University of Twente.



### Member-at-Large Julie Harvie

Julie Harvie is currently on sabbatical, travelling and doing part-time consulting to quench her thirst for structural dynamics. Prior to this chapter, she spent three years at VIBES.technology in the Netherlands as a project engineer and manager, using

dynamic substructuring to help automotive customers solve noise and vibration problems. She also worked at Sandia National Laboratories for five years as an environments engineer, developing shock and vibration qualification tests for aerospace systems and constructing the BARC challenge problem that is highly popular at IMAC. She earned B.S. (2012) and M.S. (2013) degrees in Mechanical Engineering from the University of Massachusetts - Lowell, where she worked as a research assistant to Dr. Peter Avitabile in the Structural Dynamics and Acoustics Laboratory.



### Member-at-Large Jamie Kimberley

Jamie Kimberley is an Associate professor in Mechanical Engineering at New Mexico Institute of Mining and Technology. He received his B.S. in Mechanical Engineering from the State University of New York at Binghamton. Thereafter he attended the University of Illinois at Urbana-Champaign, receiving his M.S. in Theoretical & Applied Mechanics and his Ph.D. in Aerospace Engineering. Upon completion of his Doctoral degree he joined the Department of Mechanical Engineering at Johns Hopkins University as a postdoctoral fellow under the supervision of K.T. Ramesh. He is the recipient of the 2019 J.W. Dally Young Investigator Award, and was appointed a Dean's Research Scholar in 2021. His research group, the Dynamic Deformation and Failure Lab, focuses on the experimental characterization of materials/structures subjected to high rate loading and the development of physics-based models based on the observed behavior.



### Member-at-Large Gordon Shaw

Gordon Shaw received a BA in chemistry in 1997 from Skidmore college and shortly thereafter began work in the semiconductor industry at EKC Technology, Inc. (now DuPont Electronic Chemicals.) Subsequently he completed a PhD in analytical chemistry in 2004 at the University of Wisconsin at Madison advised by Wendy Crone and Arthur Ellis. His dissertation work centered on the characterization of the nanometer-scale mechanical properties of nickel-titanium shape memory alloys. It was during this time that Gordon began attending SEM meetings. He joined the U.S. National Institute of Standards and Technology (NIST) the same year as a National Research Council postdoctoral fellow, and transitioned to a staff scientist position as a Research Chemist in the Physical Measurement Laboratory's Mass and Force Group. He is the current PI of the Small Mass and Force project which develops metrology for the measurement of mass less than 1 gram and force less than 10 millinewtons. He has been earned the Charlotte W. Fahey undergraduate chemistry award, the SEM Young Investigator Lecture, two Department of Commerce bronze medals, and authored more than 30 peer reviewed publications. Gordon's current research interests center around using the recent redefinition of the kilogram in the International System of Units (SI) to develop new methods to realize primary standards for the optical watt using photon pressure forces and the becquerel using an electrostatic force balance. ■

# Member News

## Brown Elected Fellow of the American Physical Society

ERIC N. BROWN, a Scientist at Los Alamos National Laboratory, has been elected a Fellow of the American Physical Society (APS). Brown was nominated "for technical leadership in the physics of materials at high pressures and strain rates, for technical advances in the understanding of the mechanical behavior of polymers, and for sustained leadership and service to the American Physical Society and the shock physics community" through the Shock Compression of Condensed Matter Topical Group.



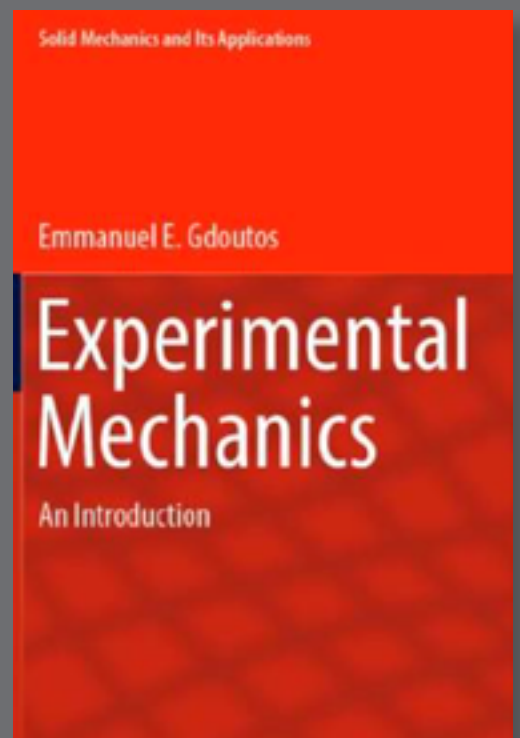
The APS Fellowship Program recognizes APS members who may have made advances in physics through original research and publication, or made significant innovative contributions in the application of physics to science and technology. They may also have made significant contributions to the teaching of physics or service and participation in the activities of the APS.

Eric Brown's research has spanned fracture and damage of complex heterogeneous polymers and polymer composites for energetic, reactive, and structural applications including crystalline phase transitions, plasticity, dynamic loading conditions, and self-healing materials. He is also a Fellow of the Society for Experimental Mechanics, where he was the inaugural Editor-in-Chief of the Journal of Dynamic Behavior of Materials and is the current society President.

Article source: Nick Njegomir Los Alamos National Laboratory News Release - [www.discover.lanl.gov/news/releases/1020-aps-fellows](http://www.discover.lanl.gov/news/releases/1020-aps-fellows)

## Experimental Mechanics - An Introduction

SEM IS ANNOUNCING Experimental Mechanics, An Introduction written by past SEM president Emmanuel E. Gdoutos. The book, published by Springer, can be accessed from the Springerlink website: [www.link.springer.com/book/10.1007/978-3-030-89466-5](http://www.link.springer.com/book/10.1007/978-3-030-89466-5).



## Remembering Mary Baker

IT WAS A VERY sad day when I learned of Dr. Mary Baker's passing. Mary passed away on September 7, 2021. I have spent my entire career working alongside Mary, first at Structural Dynamics Research Corporation (SDRC), then at ATA Engineering. She has been a source of knowledge and wisdom that I have valued throughout our time together. Mary and I both joined SDRC in San Diego within a month of each other in 1977. I was a recent college graduate and Mary came from Rohr Industries having industry experience and a PhD from Caltech. Mary's technical expertise and knowledge preceded her. She soon was leading the analysis group as the business rapidly grew. She was instrumental in transforming the business from heavy industrial and ground transportation focus, to an aerospace centric consulting business. She was always interested in the engineering consulting business and helping customers succeed at problem solving. She envisioned a business which would lead to technology improvements; not simply solving the same problems over-and-over; but how to enhance the problem solving for the future. Early business development meant teaching customers about new methods, and Mary was an avid teacher in the days before seminars became the norm.



Mary had a great understanding of how various engineering disciplines complement each other and can be used to enhance the engineering process. She advocated against letting engineering silos impede progress. Multi-disciplinary engineering solutions were a key focus as Mary led project activity for the International Space Station and launch vehicle liquid rocket engine development. Mary saw engineering disciplines going that direction in the future. She was enthusiastic about robotics and how the engineering disciplines could all come together in

robotic applications. I think this interest and enthusiasm directly led to much of the work that ATA did with JPL for both the Curiosity and Perseverance rover programs. She was always very engaged in these activities and provided engineering leadership to her colleagues working on these programs as well as others.

Mary was a wonderful teacher and she had a strong belief in the value of the co-operative education system. She developed a strong co-op foundation at SDRC and expanded on it at ATA. She believed that students learning on real engineering projects led to much more capable engineers. She served on the advisory boards for multiple universities to maintain strong ties between the universities and industry. As a mentor to so many students, she influenced many future engineers; some who became ATA employees. Mary's keynote talk at the 2019 IMAC highlighted the ways that engineers can be successful and influential in industry, and resulted in students approaching her afterward to learn more. Mary was elected to the National Academy of Engineering and received Distinguished Alumni Awards from Caltech and the University of Wisconsin-Madison College of Engineering, which speak to her strong engineering and academia influence.

Her enthusiasm and love of life and new things was ever present. She was always in a search for more knowledge and understanding in everything that she did. And she always encouraged those around her to learn and strive for more also. She wanted others to succeed – perhaps more than herself. Mary's leadership was inspirational. She will be greatly missed.

*Remembrance by  
Ralph Brillhart | ATA Engineering*

Full obituary can be found [here](#). ■

## Remembering Fred C. Bailey

FRED C. BAILEY, AN SEM Honorary member since 1992, passed away in 2021. Fred became a member of the Society for Experimental Stress Analysis, SESA, in January of 1951. In the early 50s, while active in SESA, he also worked for the National Research Council and the Academy of Sciences. Fred served as SESA's Treasurer from 1961-1966 and became president of SESA from 1967-69. Fred was awarded the honor of SESA Fellow in 1976. SESA became SEM in



1985. Fred was president of Lessels and Company in Boston, MA, in the mid-50s. During this time he led the acquisition of Lessels by Teledyne Engineering Services and retired from Teledyne in 1986. As a note, SEM's Brewer Award was once named the Brewer Teledyne Award (back in 1989) in memory of Given Brewer who sold his Brewer Engineering Laboratories to Teledyne. We welcome our members to offer memories of Fred that we can share on our website. Fred's obituary is available by clicking on the link: [www.legacy.com/us/obituaries/bostonglobe/name/fred-bailey-obituary?pid=197573526](http://www.legacy.com/us/obituaries/bostonglobe/name/fred-bailey-obituary?pid=197573526).

# Upcoming Events

## 2022

**IMAC-XL** | February 7–10, 2022

**Rozen Plaza Hotel**

Orlando, FL USA

**2022 SEM Annual** | June 13-16, 2022

**Omni William Penn Pittsburgh**

Pittsburgh, PA US

**iDICs 2022 Conference and Workshop** | November 7-10, 2022

**Revere Hotel Boston Common**

Boston, MA USA

## 2023

**IMAC-XLI** | February 13-16, 2023

**Renaissance Austin Hotel**

Austin, TX USA

**2023 SEM Annual Conference** | June 12-15, 2023

**Hyatt Regency Albuquerque**

Albuquerque, NM USA

