

## Mostafa A. Nouh

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### EDUCATION

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<b>Ph.D.</b>	<b>University of Maryland, College Park</b>	August 2013
Major: Mechanical Engineering		
Advisor: Dr. Amr Baz   GPA: 4.0		
Dissertation Topic: <i>Thermoacoustic-Piezoelectric Systems with Dynamic Magnifiers</i>		
<b>M.S.</b>	<b>University of Maryland, College Park</b>	May 2012
Major: Mechanical Engineering		
Advisor: Dr. Amr Baz   GPA: 4.0		
<b>B.S.</b>	<b>Cairo University, Egypt</b>	June 2008
Major: Mechanical Engineering		
Ranked 1st in class of ~300   GPA: 90.6%		
<b>I.G.C.S.E.</b>	<b>Cambridge University, UK</b>	June 2003
International General Certificate of Secondary Education		

### PROFESSIONAL EXPERIENCE

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<b>Associate Professor, Mechanical and Aerospace Engineering</b>	Sept. 2020 - Present
University at Buffalo, State University of New York	Buffalo, NY
<b>Assistant Professor, Mechanical and Aerospace Engineering</b>	Aug. 2015 - Sept. 2020
University at Buffalo, State University of New York	Buffalo, NY
<b>Adjunct Faculty, Mechanical Engineering Dept.</b>	Jan. 2014 - Aug. 2015
University of Maryland, College Park	College Park, MD
<b>Postdoctoral Research Associate, Smart Materials &amp; Structures Center</b>	Aug. 2013 - Aug. 2015
University of Maryland, College Park	College Park, MD
<b>Research Assistant, Mechanical Engineering Dept.</b>	Sept. 2009 - Aug. 2013
University of Maryland, College Park	College Park, MD
<b>Research Assistant, Physics Dept.</b>	Sept. 2008 - Aug. 2009
American University in Cairo	Cairo, Egypt
<b>Research Assistant, Energy Research Group, Physics Dept.</b>	June 2007 - Aug. 2007
University of Oslo	Oslo, Norway
<b>Mechanical Engineer, Home and Personal Care Factory Site</b>	July 2006 - Aug. 2006
Unilever Co.	Cairo, Egypt

## RESEARCH INTERESTS

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- **Acoustic & Elastic Metamaterials:** Phononic crystals, wave propagation and dispersion in periodic media, frequency band gaps, topological and non-reciprocal metamaterials
- **Smart and Adaptive Material Systems and Structures:** Energy harvesting, acoustic wave guidance, structural health monitoring, shape memory alloys and polymers, piezoelectric materials
- **Vibration and Noise Control:** Vibration damping, constitutive damping models, time and frequency domain analyses, viscoelastic materials and composites, metadamping and dissipation
- **Thermoacoustic Energy Conversion:** Dynamics of thermoacoustic engines, thermoacoustic power generation, thermoacoustic refrigeration and cooling, onset of thermoacoustic waves

## HONORS & AWARDS

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09/2020	<b>ASME Gary Anderson Early Achievement Award</b> For notable contributions to the field of Adaptive Structures and Material Systems by a young researcher in their ascendancy whose work has had an impact.
07/2020	<b>UB Exceptional Scholar - Young Investigator Award</b> To junior faculty whose work has garnered public and/or professional accolades beyond the norm for other bodies of work in the identified genre.
06/2019	<b>ONR Phononics Fellowship Award</b>
02/2019	<b>NSF CAREER Award</b>
12/2018	<b>SEAS Early Career Teacher of the Year Award</b>
08/2018	<b>UB Buffalo Blue Sky Gold Coin</b>
05/2018	<b>Vibration Institute Academic Award</b>
03/2018	<b>“Lunch with the Experts” Invited Guest</b> SPIE Smart Structures/NDE Conference 2018
12/2016	<b>Outstanding Reviewer of Applied Acoustics</b> In recognition of contributions made to the quality of the journal
01/2012 – 05/2013	<b>Future Faculty Fellowship</b> Awarded by the University of Maryland to select A. J. Clark School of Engineering doctoral students to prepare them for career-long success in academia
08/2009 – 05/2013	<b>UMD Graduate Research Assistantships (Steps I, II and III)</b>
05/2012	<b>Outstanding Scholar-Athlete Award</b> Awarded by the Collegiate Water Polo Association (CWPA) for student athletes of outstanding academic progress
04/2012	<b>UMD 2012 School of Engineering Sustainability Competition - 1st Place</b>
04/2011	<b>UMD 2011 School of Engineering Sustainability Competition - 2nd Place</b>

- 07/2008 – 08/2009 **KAUST-AUC Fellowship**  
Jointly awarded by King Abdullah University of Science & Technology and the American University in Cairo
- 06/2007 **Ideal Engineering Student Award**  
Awarded by Cairo University's School of Engineering
- 05/2006 **Schlumberger Scholarship Award**  
Awarded by Schlumberger for academic excellence

## PUBLICATIONS

**Orcid:** 0000-0002-2135-5391, **Researcher ID:** R-6966-2019

**Google Scholar:** <https://goo.gl/Yk2cfd>



<u>Aug. 31, 2015</u>	<u>Aug. 31, 2019</u>	<u>Sept. 4, 2020</u>
Citations: 91	Citations: 501	Citations: 728
<i>h</i> -index: 3	<i>h</i> -index: 11	<i>h</i> -index: 14
<i>i10</i> -index: 4	<i>i10</i> -index: 15	<i>i10</i> -index: 19

### (A) Journal Papers

M. Nouh's students are underlined. Corresponding author denoted by (\*).

#### **Publications since joining UB:**

- J40. J. Callanan, P. Ghassemi, J. DiMartino, M. Dhameliya, C. Stocking, M. Nouh, and S. Chowdhury\*, Ergonomic Impact of Multi-rotor Unmanned Aerial Vehicle Noise in Warehouse Environments, *Journal of Intelligent & Robotic Systems* (2020)
- J39. M. A. Attarzadeh, J. Callanan, and M. Nouh\*, Experimental Observation of Nonreciprocal Waves in a Resonant Metamaterial Beam, *Phys. Rev. Applied*, 13, 021001 (2020)
- J38. H. Al-Babaa, S. Nandi, T. Singh, and M. Nouh\*, Uncertainty Quantification of Tunable Elastic Metamaterials using Polynomial Chaos, *Journal of Applied Physics*, 127, 015102 (2020)
- J37. A. Aladwani and M. Nouh\*, Mechanics of Metadamping in Flexural Dissipative Metamaterials: Analysis and Design in Frequency and Time Domains, *International Journal of Mechanical Sciences*, 173, 105459 (2020)
- J36. H. Al-Babaa, M. Nouh\*, and T. Singh, Dispersion and Topological Characteristics of Permutative Polyatomic Phononic Crystals, *Proc. of the Royal Society A*, 475, 2226 (2019)
- J35. M. A. Attarzadeh, S. Maleki, J. L. Crassidis, and M. Nouh\*, Non-reciprocal Wave Phenomena in Energy Self-reliant Gyric Structures, *Journal of the Acoustical Society of America*, 146(1), 789-801 (2019)
- J34. H. Al-Babaa, J. Callanan, and M. Nouh\*, Emergence of Pseudo-Phononic Gaps in Periodically Architected Pendulums, *Frontiers in Materials*, 6, 119 (2019)

- J33. J. Callanan and M. Nouh\*, Optimal Thermoacoustic Energy Extraction via Temporal Phase Control and Traveling Wave Generation, *Applied Energy*, 241, 599-612 (2019)
- J32. H. Al-Babaa and M. Nouh\*, Control of Spatial Wave Profiles in Finite Lattices of Repelling Magnets, *Journal of Dynamic Systems, Measurement, and Control*, 141(11), 111015 (2019)
- J31. A. Aladwani, A. Almandeel, and M. Nouh\*, Fluid-Structural Coupling in Metamaterial Plates for Vibration and Noise Mitigation in Acoustic Cavities, *International Journal of Mechanical Sciences*, 159, 151-166 (2019)
- J30. W. Akl, M. Nouh, O. Aldraihem, and A. Baz\*, Energy Dissipation Characteristics of Polyurea and Polyurea/Carbon Black Composites, *Mechanics of Time-Dependent Materials*, 23(2), 223-247 (2019)
- J29. C. Bacquet, H. Al-Babaa, M. Frazier, M. Nouh, and M. Hussein\*, Metadamping: Dissipation Emergence in Elastic Metamaterials, *Advances in Applied Mechanics*, 51, 115-164 (2018)
- J28. M. A. Attarzadeh and M. Nouh\*, Elastic Wave Propagation in Moving Phononic Crystals and Correlations with Stationary Spatiotemporally Modulated Systems, *AIP Advances*, 8, 105302 (2018)
- J27. H. Al-Babaa, J. Callanan, M. Nouh\*, and T. Singh, Band Gap Synthesis in Elastic Monatomic Lattices via Input Shaping, *Meccanica*, 53(11), 3105-3122 (2018)
- J26. M. A. Attarzadeh and M. Nouh\*, Non-reciprocal Elastic Wave Propagation in 2D Phononic Membranes with Spatiotemporally Varying Material Properties, *Journal of Sound and Vibration*, 422, 264-277 (2018)
- J25. H. Al-Babaa, D. DePauw, T. Singh, and M. Nouh\*, Dispersion Transitions and Pole-zero Characteristics of Finite Inertially Amplified Acoustic Metamaterials, *Journal of Applied Physics*, 123, 105106 (2018)
- J24. H. Al-Babaa, M. A. Attarzadeh, and M. Nouh\*, Experimental Evaluation of Structural Intensity in Two Dimensional Plate-type Locally Resonant Elastic Metamaterials, *Journal of Applied Mechanics*, 85(4), 041005 (2018)
- J23. M. A. Attarzadeh, H. Al-Babaa, and M. Nouh\*, On the Wave Dispersion and Non-reciprocal Power Flow in Space-time Traveling Acoustic Metamaterials, *Applied Acoustics*, 133, 210-214 (2018)
- J22. D. DePauw, H. Al-Babaa, and M. Nouh\*, Metadamping and Energy Dissipation Enhancement via Hybrid Phononic Resonators, *Extreme Mechanics Letters*, 18, 36-44 (2018)
- J21. M. H. Ansari\*, M. A. Attarzadeh, M. Nouh, and M. Amin Karami, Application of Magnetoelastic Materials in Spatiotemporally Modulated Phononic Crystals for Nonreciprocal Wave Propagation, *Smart Materials and Structures*, 27, 015030 (2018)
- J20. H. Al-Babaa, M. Nouh\*, and T. Singh, Pole Distribution in Finite Phononic Crystals: Understanding Bragg-effects through Closed-form System Dynamics, *Journal of the Acoustical Society of America*, 142(3), 1399-1412 (2017)
- J19. H. Al-Babaa, M. Nouh\*, and T. Singh, Formation of Local Resonance Band Gaps in Finite Acoustic Metamaterials: A Closed-form Transfer Function Model, *Journal of Sound and Vibration*, 410, 429-446 (2017)
- J18. M. Nouh\*, On the Spatial Sampling and Beat Effects in Discrete Wave Profiles of Locally Resonant Acoustic Metamaterials, *Journal of the Acoustical Society of America*, 141(3), 1514-1522 (2017)

- J17. H. Al-Babaa and M. Nouh\*, Mechanics of Longitudinal and Flexural Locally Resonant Elastic Metamaterials using a Structural Power Flow Approach, *International Journal of Mechanical Sciences*, 122, 341-354 (2017)
- J16. H. Al-Babaa and M. Nouh\*, An Investigation of Vibrational Power Flow in One-Dimensional Dissipative Phononic Structures, *Journal of Vibration and Acoustics*, 139(2), 021003 (2017)
- J15. M. Nouh, O. Aldraihem, and A. Baz\*, Periodic Metamaterial Plates with Smart Tunable Local Resonators, *Journal of Intelligent Material Systems and Structures*, 27(13), 1829-1845 (2016)

**Publications prior to joining UB:**

- J14. M. Nouh, O. Aldraihem, and A. Baz\*, Wave Propagation in Metamaterial Plates with Periodic Local Resonances, *Journal of Sound and Vibration*, 341, 53-73 (2015)
- J13. M. Nouh, O. Aldraihem, and A. Baz\*, Vibration Characteristics of Metamaterial Beams with Periodic Local Resonances, *Journal of Vibration and Acoustics*, 136(6), 061012 (2014)
- J12. M. Nouh, O. Aldraihem, and A. Baz\*, Onset of Oscillations in Traveling Wave Thermoacoustic-piezoelectric Harvesters using Circuit Analogy and SPICE Modeling, *Journal of Dynamic Systems, Measurement, and Control*, 136(6), 061005 (2014)
- J11. M. Nouh, O. Aldraihem, and A. Baz\*, Piezo-driven Thermoacoustic Refrigerators with Dynamic Magnifiers, *Applied Acoustics*, 83, 86-99 (2014)
- J10. M. Nouh, O. Aldraihem, and A. Baz\*, Transient Characteristics and Stability Analysis of Standing Wave Thermoacoustic Piezoelectric Harvesters, *Journal of the Acoustical Society of America*, 135(2), 669-679 (2014)
- J9. M. Nouh, O. Aldraihem, and A. Baz\*, Theoretical Modeling and Experimental Realization of Dynamically Magnified Thermoacoustic-piezoelectric Energy Harvesters, *Journal of Sound and Vibration*, 333, 3138-3152 (2014)
- J8. M. Nouh\*, N. Arafa, and E. Abdel-Rahman, Stack Parameters Effect on the Performance of Anharmonic Resonator Thermoacoustic Heat Engine, *Archive of Mechanical Engineering*, 61(1), 115-127 (2014)
- J7. M. Nouh, O. Aldraihem, and A. Baz\*, Optimum Design of Thermoacoustic-piezoelectric Systems with Dynamic Magnifiers, *Engineering Optimization*, 46(4), 543-561 (2014)
- J6. A. Roshwalb, M. Nouh, O. Aldraihem, and A. Baz\*, Performance of a Traveling Wave Thermoacoustic Piezoelectric Energy Harvester: An Electrical Circuit Analogy Approach, *Journal of Intelligent Material systems and Structures*, 25(11), 1372-1383 (2014)
- J5. M. Nouh, O. Aldraihem, and A. Baz\*, Energy Harvesting of Thermoacoustic-piezo Systems with a Dynamic Magnifier, *Journal of Vibration and Acoustics*, 134(6), 061015 (2012)
- J4. J. Smoker, M. Nouh, O. Aldraihem, and A. Baz\*, Energy Harvesting from a Standing Wave Thermoacoustic Piezoelectric Resonator, *Journal of Applied Physics*, 111, 104901 (2012)

**Preprints currently under review:**

- J3. R. Adlakha, M. Moghaddaszadeh, M. A. Attarzadeh, A. Aref, and M. Nouh\*, Selective Directional and Frequency Wave Beaming in Nonreciprocal Acoustic Phased Arrays (preprint under review)  
<http://arxiv.org/abs/2008.04464>

- J2. A. Aladwani and M. Nouh\*, Viscoelastic Metadamping in Multi-Bandgap Polymeric Composite Metamaterials (preprint under review)
- J1. Y. Hu, Z. Guo, A. Ragonese, T. Zhu, S. Khuje, C. Li, J. C. Grossman, C. Zhou, M. Nouh, and S. Ren\*, A 3D Printed Molecular Ferroelectric Metamaterial (preprint under review)

### **(B) Conference Presentations/Proceedings**

- C40. R. Adlakha, M. Moghaddaszadeh, M. A. Attarzadeh, A. Aref, and M. Nouh, A Linear Acoustic Phased Array for Nonreciprocal Transmission and Reception, ASME International Mechanical Engineering Congress and Exposition (IMECE), Portland, OR, November 15-19, 2020
- C39. M. Moghaddaszadeh, R. Adlakha, M. A. Attarzadeh, A. Aref, and M. Nouh, Space-time Elastic Metasurfaces for Nonreciprocal Wavefront Control, 57th Annual Technical Meeting of the Society of Engineering Science (SES2020), Minneapolis, MN, September 28-30, 2020
- C38. H. Al-Babaa, J. Callanan, and M. Nouh, Wave Mitigation in Pseudo-periodic Metastructures: A Closer Look at Architected Pendulums, 57th Annual Technical Meeting of the Society of Engineering Science (SES2020), Minneapolis, MN, September 28-30, 2020
- C37. A. Behjat, M. Oddiraju, M. A. Attarzadeh, M. Nouh, and S. Chowdhury, Metamodel Based Forward and Inverse Design for Passive Vibration Suppression, ASME International Design Engineering Technical Conferences (IDETC), St. Louis, MO, August 16-19, 2020
- C36. J. Callanan, P. Ghassemi, J. DiMartino, M. Dhameliya, C. Stocking, M. Nouh, and S. Chowdhury, Ergonomic Impact of Multi-rotor Unmanned Aerial Vehicle Noise in Warehouse Environments, STRATUS 2020 Conference (Systems and Technologies for Remote Sensing Applications through Unmanned Aerial Systems), Buffalo, NY, May 18-20, 2020
- C35. M. Moghaddaszadeh, K. Atefi-Monfared, A. Aref, and M. Nouh, Omnidirectional Wave Mitigation Using Elastic Metamaterials in Axisymmetric Arrangements, Engineering Mechanics Institute (EMI) Conference, New York, NY, May 26-29, 2020
- C34. A. Ragonese and M. Nouh, System Identification of Unit Cell Bloch Modes in 2D Metamaterials, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Anaheim, CA, April 26-30, 2020
- C33. J. Callanan and M. Nouh, Piezoelectric Feedback Control of Resonant Waves in Thermoacoustic Energy Harvesters, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Anaheim, CA, April 26-30, 2020
- C32. M. A. Attarzadeh and M. Nouh, Non-Reciprocal Transmission by Gyro-Parametric Excitation in Finite Coupled Resonators, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Anaheim, CA, April 26-30, 2020
- C31. M. A. Attarzadeh, J. Callanan, and M. Nouh, Non-reciprocal Wave Propagation in a Temporally Modulated Metabeam, ASME International Mechanical Engineering Congress and Exposition (IMECE), Salt Lake City, UT, November 8-14, 2019
- C30. M. A. Attarzadeh, J. Callanan, and M. Nouh, Realization of a Non-reciprocal Metamaterial by Geometric Time-modulation, 56th Annual Technical Meeting of the Society of Engineering Science (SES2019), St. Louis, MO, October 13-15, 2019

- C29. M. A. Attarzadeh, J. Callanan, and M. Nough, Non-reciprocal Transmission of Vibrational Energy in a Locally Resonant Elastic Metabeam, Vibration Institute Annual Training Conference (VIATC), Lexington, KY, July 23-26, 2019
- C28. M. A. Attarzadeh and M. Nough, Realization of a Vibration Diode using a Temporally Modulated Metabeam, Phononics 2019: 5th International Conference on Phononic Crystals/Metamaterials, Phonon Transport, Topological Phononics, Tucson, AZ, June 3-7, 2019
- C27. H. Al-Babaa and M. Nough, Phononic Band Gap Effects in Finite Serially Pivoted Pendulum Chains, Phononics 2019: 5th International Conference on Phononic Crystals/Metamaterials, Phonon Transport, Topological Phononics, Tucson, AZ, June 3-7, 2019
- C26. M. Nough, Exploring Finite Phononic Materials using Linear Systems Theory and Pole-zero Distributions, Phononics 2019: 5th International Conference on Phononic Crystals/Metamaterials, Phonon Transport, Topological Phononics, Tucson, AZ, June 3-7, 2019
- [\(Phononics'19 – Invited Talk\)](#)
- C25. M. A. Attarzadeh and M. Nough, Non-reciprocity in Time-periodic Phononic Materials with a Non-zero Moving Velocity, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Denver, CO, March 3-7, 2019
- C24. J. Callanan and M. Nough, Standing-to-traveling Wave Transition in Piezoelectric Thermoacoustic Energy Harvesters, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Denver, CO, March 3-7, 2019
- [\(SPIE 2019 - Best Student Paper Award\)](#)
- C23. D. DePauw and M. Nough, Dispersion Mechanics of Inertially Amplified Acoustic Metamaterials, ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, November 9-15, 2018
- [\(2018 NSF-REU ASME IMECE Competition\)](#)
- C22. H. Al-Babaa and M. Nough, Experimental Investigation of Structural Power Flow in 2D Locally Resonant Elastic Metamaterials, ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, November 9-15, 2018
- [\(2018 NSF-ASME IMECE Competition\)](#)
- C21. J. Callanan and M. Nough, Control-based Power Amplification in Thermoacoustic Piezoelectric Energy Harvesting Devices, ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, November 9-15, 2018
- C20. J. Callanan, P. Ghassemi, J. DiMartino, C. Stocking, S. Chowdhury, and M. Nough, Human Response and Perception of UAV Noise in Simulated Warehouse Environments, ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, November 9-15, 2018
- C19. M. A. Attarzadeh and M. Nough, Universal Wave Manipulation by Periodic Gyro-Elastic Structures, ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, November 9-15, 2018
- C18. D. DePauw, H. Al-Babaa, and M. Nough, Dispersion Behavior of a Hybrid Phononic Resonator, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Denver, CO, March 4-8, 2018

- C17. H. Al-Babaa, T. Singh, and M. Nough, Interpreting Phononic Bragg Band Gaps through Finite System Dynamics and Transfer Functions, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Denver, CO, March 4-8, 2018
- C16. M. A. Attarzadeh and M. Nough, Space-time Modulations of Material Property in Two Dimensional Phononic Crystals, ASME International Mechanical Engineering Congress and Exposition (IMECE), Tampa, FL, November 3-9, 2017
- C15. H. Al-Babaa and M. Nough, Evolution of Power Flow Streamlines in Plate-type Elastic Metamaterials, ASME International Mechanical Engineering Congress & Exposition (IMECE), Tampa, FL, November 3-9, 2017
- C14. H. Al-Babaa, M. Nough, and T. Singh, Towards a Comprehensive Understanding of Band Gap Emergence in Finite Inner-resonant Systems, ASME International Mechanical Engineering Congress & Exposition (IMECE), Tampa, FL, November 3-9, 2017
- C13. H. Al-Babaa, M. Nough, and T. Singh, An Analytical Model for Band Gap Behavior in Lumped Elastic Metamaterials, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Portland, OR, March 25-29, 2017
- C12. H. Al-Babaa and M. Nough, A Mechanical Power Dissipation Model for Axially-loaded Metamaterial Bars, SPIE Smart Structures/NDE, International Society for Optics and Photonics, Portland, OR, March 25-29, 2017
- C11. H. Al-Babaa and M. Nough, Vibrational Power Flow in Spatially Continuous Elastic Metamaterials, ASME International Mechanical Engineering Congress & Exposition (IMECE), Phoenix, AZ, November 11-17, 2016
- C10. M. Nough, Structural Intensity Analysis of Periodic Elastic Structures with Frequency Stop Bands, ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), Stowe, VT, September 28-30, 2016
- C9. M. Nough, O. Aldraihem, and A. Baz, Metamaterial Structures with Periodic Local Resonances, SPIE Smart Structures/NDE, International Society for Optics and Photonics, San Diego, CA, March 9-13, 2014
- C8. M. Nough, O. Aldraihem, and A. Baz, Experimental Investigation of Thermoacoustic Piezoelectric Energy Harvesters and Refrigerators with Dynamic Magnifiers, ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), Snowbird, UT, Sept. 16-18, 2013
- C7. M. Nough, O. Aldraihem, and A. Baz, Analysis and Optimization of a Thermoacoustic-Piezoelectric Energy Harvester: An Electrical Circuit Analogy Approach, SPIE Smart Structures/NDE, International Society for Optics and Photonics, San Diego, CA, March 10-14, 2013
- C6. M. Nough, O. Aldraihem, and A. Baz, Energy Harvesting of Vortex-induced Vibrations, SPIE Smart Structures/NDE, International Society for Optics and Photonics, San Diego, CA, March 11-15, 2012
- C5. D. Chinn, M. Nough, and A. Baz, Piezoelectric Driven Thermo-acoustic Refrigerator, SPIE Smart Structures/NDE, International Society for Optics and Photonics, San Diego, CA, March 11-15, 2012
- C4. J. Smoker, M. Nough, O. Aldraihem, and A. Baz, Energy Harvesting from a Standing Wave Thermo-Acoustic-Piezoelectric Resonator, 51st AIAA/ASME/ASCE/AHS Structures, Structural Dynamics, and Materials Conference, Orlando, FL, April 12-15 2010



- C3. M. Nouh, N. Arafa, and E. Abdel-Rahman, Stack Parameters Effect on the Performance of an Anharmonic Resonator Thermoacoustic Heat Engine, 3rd International Conference on Integration, Reliability and Failure (IRF), Porto, Portugal, July 20-24, 2009
- C2. M. Nouh, N. Arafa, K. Larsson, and E. Abdel-Rahman, Design Study of Anharmonic Standing Wave Thermoacoustic Heat Engine, 16th International Congress on Sound and Vibration, Krakow, Poland, July 5-9, 2009
- C1. N. Arafa, M. Nouh, and E. Abdel-Rahman, Design Study of Small Scale Thermoacoustic Heat Engine, 16th International Congress on Sound and Vibration, Krakow, Poland, July 5-9, 2009

### (C) Book Chapters & Monographs

- B4. C. Bacquet, H. Al-Babaa, M. Frazier, M. Nouh, and M. Hussein, **Chapter 2** – Metadamping: Dissipation Emergence in Elastic Metamaterials, Volume 51 (*Advances in Crystals and Elastic Metamaterials, Part 1*), 2018, ISBN (978-0-12-815100-6)
- B3. M. Nouh, O. Aldraihem and A. Baz, **Chapter 12** – Thermoacoustic Piezoelectric Energy Harvesters in *High Temperature Materials and Mechanisms*, Editor: Yoseph Bar Cohen, Publisher: CRC Press/Taylor and Francis Group, 2014, ISBN (978-1-4665- 6645-3)
- B2. M. Nouh, M. Eldeeb, W. Mostafa and M. Beshr, HVAC Design of a Healthcare Facility - Basic Concepts & Methodologies, LAP Academic Publishing 2010, ISBN (978-3-8433-5717-3)
- B1. M. Nouh, Testing New Material for Flat Polymer-based Solar Collectors: An Experimental Study, Annual IAESTE Report, University of Oslo, 2007

### DIGITAL MEDIA & ONLINE FEATURES

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- 16. [Nouh awarded UB Exceptional Scholar - Young Investigator Award](#) (July 2020)
- 15. [Nouh's team breaks reciprocity in acoustic waves - UBNOW](#) (March 2020)
- 14. [Nouh's work on spacetime-varying metamaterials featured by the American Association for the Advancement of Science \(AAAS\) - EurekAlert!](#) (Feb. 2020)
- 13. [Nouh's work selected as a featured article in the Journal of Applied Physics](#) (Jan. 2020)
- 12. [Nouh awarded National Science Foundation CAREER award](#) (May 2019)
- 11. [Nouh's student \(Callanan\) receives SPIE Best Paper award](#) (March 2019)
- 10. [Nouh awarded UB SEAS Early Career Teacher of the Year award](#) (Dec. 2018)
- 9. [Nouh's student \(Callanan\) awarded BMW internship as part of NSF's INTERN program](#) (Dec. 2018)
- 8. [Nouh to chair Track 1 of the 2019 ASME IMECE conference on Acoustics/Vibrations](#) (Nov. 2018)
- 7. [Nouh's course on \*Acoustics and Wave Propagation\* featured in the Technische Universität \(TU\) Darmstadt's-UB handbook](#) (Sept. 2018)
- 6. [Nouh's student \(Callanan\) wins Mr. Miyagi award for the best LSAMP summer program mentor](#) (Aug. 2018)
- 5. [Nouh's student \(Attarzadeh\) earns 3rd place in SEAS graduate poster competition](#) (April 2018)
- 4. [Nouh gives invited talk in Aerospace Engineering at the U. of Colorado Boulder](#) (March 2018)

3. [Nouh's research featured in Science Trends](#). One-way Sound Propagation: Breaking Acoustic Reciprocity in 2D Materials, *doi*: 10.31988/SciTrends.11856 (Feb. 2018)
2. [Nouh elected to Group Leadership Team of the Noise Control and Acoustics Division \(NCAD\) at ASME for a 5-year term](#) (Aug. 2017)
1. [Nouh named a Future Faculty Fellow at the Univ. of Maryland](#) (Jan. 2012)

## INVITED TALKS & SEMINARS

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- 06/2020 **A Faculty Mentor's Perspective of Research**  
Invited talk, Collegiate Science & Technology Entry Program (CSTEP), Buffalo, NY
- 10/2019 **Elastic Wave Control and Non-reciprocity in Tunable Phononic Metamaterials**  
Invited talk, Air Force Research Laboratory (AFRL), Dayton, OH
- 09/2019 **Noise Regulation in Drones for Co-Robotic Environments: Investigating Impact on Human Hearing and Cognition**  
Invited talk, "Four Years of Communities of Excellence at UB", Buffalo, NY
- 07/2019 **Why Earn a Ph.D.?**  
Invited panel, 25th McNair Undergraduate Research Conference, Niagara Falls, NY
- 06/2019 **Exploring Finite Phononic Materials using Systems Theory and Pole-zero Distributions**  
Invited talk, University of Arizona (Phononics 2019), Tucson, AZ
- 02/2019 **Noise Regulation in Small Unmanned Aerial Vehicles: Towards Ergonomic Integration in Complex Warehouse Environments**  
Invited talk, "Convergent Conversation" - SMART Community of Excellence, Buffalo, NY
- 07/2018 **Why Earn a Ph.D.?**  
Invited panel, 24th McNair Undergraduate Research Conference, Niagara Falls, NY
- 03/2018 **Dynamics of Periodic Media: Understanding Band Gap Evolution in Phononic Materials**  
Invited talk, University of Colorado Boulder, Boulder, CO
- 10/2017 **Dynamics of Thermoacoustic Systems: Recent Progress and Future Outlook**  
Invited talk, NSF "Acoustics: New Fundamentals/Applications" Workshop, Alexandria, VA
- 02/2015 **Wave Propagation and Vibration Characteristics of Metamaterial Structures with Periodic Resonators**  
Invited seminar, University of Massachusetts, Lowell, MA
- 02/2015 **Broadband Vibration Attenuation in Elastic Metamaterials with Internal Resonators**  
Invited seminar, San Francisco State University, San Francisco, CA
- 02/2015 **Band-gap Control and Directional Filtering in Periodic Metastructures**  
Invited seminar, Southern Illinois University, Edwardsville, IL
- 02/2015 **Dynamics of Metamaterial Structures for Broadband Vibration Control and Suppression**  
Invited seminar, California State University, Fresno, CA
- 01/2015 **Metamaterials with Periodic Local Resonances for Vibration Suppression Applications**  
Invited seminar, Purdue University, West Lafayette, IN

- 04/2014 **Vibration Characteristics of Periodic Beams with Viscously-damped Internal Resonators**  
Invited seminar, University of Missouri, Columbia, MO
- 06/2013 **Energy Harvesting from Standing-wave Thermoacoustic-Piezoelectric Systems**  
Invited seminar, Graduate Student Association, University of Maryland, College Park, MD
- 03/2012 **Thermoacoustic Refrigeration: Recent Progress and Potential Improvements**  
Invited talk, Spring Consortium Meetings of the Center for Environmental Engineering, University of Maryland, College Park, MD

## TEACHING EXPERIENCE

### (1) Assistant/Associate Professor

Aug. 2015 - Present

University at Buffalo, State University of New York

#### MAE 467/567: Vibrations & Shock:

Fall 2019 (567)	Instructor Evaluation: 5/5	(Dept. Average: 4.2/5)	Response Rate: 13/21
Fall 2019 (467)	Instructor Evaluation: 4.9/5	(Dept. Average: 4.2/5)	Response Rate: 10/22
Fall 2018 (567)	Instructor Evaluation: 5/5	(Dept. Average: 4.2/5)	Response Rate: 10/16
Fall 2018 (467)	Instructor Evaluation: 5/5	(Dept. Average: 4.2/5)	Response Rate: 12/26
Fall 2017 (567)	Instructor Evaluation: 5/5	(Dept. Average: 4.2/5)	Response Rate: 12/18
Fall 2017 (467)	Instructor Evaluation: 4.7/5	(Dept. Average: 4.1/5)	Response Rate: 7/14
Fall 2016	Instructor Evaluation: 4.64/5	(Dept. Average: 4.21/5)	Response Rate: 26/39

#### EAS 208: Dynamics:

Spring 2019	Instructor Evaluation: 4.9/5	(School Average: 4.2/5)	Response Rate: 37/77
Spring 2018	Instructor Evaluation: 4.9/5	(School Average: 4.1/5)	Response Rate: 32/90
Spring 2017	Instructor Evaluation: 5/5	(School Average: 4.1/5)	Response Rate: 34/62
Spring 2016	Instructor Evaluation: 4.97/5	(School Average: 3.29/5)	Response Rate: 32/63

#### MAE 565: Acoustics & Wave Propagation: [Newly developed course; offered at UB for the first time]

Fall 2019	Instructor Evaluation: 5/5	(Dept. Average: 4.2/5)	Response Rate: 10/16
Fall 2018	Instructor Evaluation: 5/5	(Dept. Average: 4.2/5)	Response Rate: 8/9

#### MAE 571: Systems Analysis:

Fall 2015	Instructor Evaluation: 5/5	(Dept. Average: 4.04/5)	Response Rate: 18/20
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### (2) Adjunct Instructor

Jan. 2014 - Aug. 2015

University of Maryland, College Park

- ENME 361: Vibrations (Spring 2014, Summer 2014)
- ENME 462: Controls & Optimization (Summer 2013, Summer 2015)

**(3) Teaching Assistant**

Sept. 2011 - Dec. 2011

University of Maryland, College Park

- ENME 462: Controls & Optimization (Fall 2011)

**(4) Assistant Lecturer**

Sept. 2008 - May 2009

Cairo University, Egypt

- MEP 304: Heat & Mass Transfer (Spring 2009)
- MEP 407: Mechanical Engineering Laboratories (Spring 2009)
- MEP 302: Applied Thermodynamics (Fall 2008)

**PROFESSIONAL MEMBERSHIP & SERVICE**

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● **Intramural Service at UB**

- MAE Graduate Studies Committee (2017 – Present)
- SEAS Search Committee - Mechanics Instructor (2018)
- SEAS Adjudication Committee Chair (2018)
- SEAS Presidential Fellowship Review Committee (2019)
- SENS Search Committee - Software Engineer (2019)
- SENS Search Committee - IT Specialist (2019)

● **Society Membership**

- American Society of Mechanical Engineers, ASME (2009 – Present)
- International Society for Optics and Photonics, SPIE (2015 – Present)

● **Scientific Community & Technical Committees**

- Noise Control and Acoustics Division (NCAD), ASME
  - Group Leadership Team (Elected for 2017–2022 term)
    - Member at large (2017 – 2018)
    - Secretary (2018 – 2019)
    - Treasurer (2019 – Present)
  - Phononics & Metamaterials Technical Committee Member (2016 – Present)
- Adaptive Structures and Material Systems (ASMS) Branch, ASME
  - Energy Harvesting Technical Committee (2016 – Present)
  - Active and Multifunctional Materials Technical Committee (2016 – Present)

● **Proposal Reviewer**

- National Science Foundation: Division of Civil, Mechanical and Manufacturing Innovation (CMMI)

- National Science Foundation: Graduate Research Fellowship Program (GRFP)
- Netherlands Organization for Scientific Research (NWO) – Applied and Engineering Sciences
- Office of Naval Research

- **Editorship for Scientific Journals**

- Associate Editor: ASME Journal of Vibrations and Acoustics (2020 – 2023)
- Guest Editor: Crystals – *Special Issue: Emerging Trends in Phononic Crystals* (2020 – 2021)
- Guest Editor: Smart Materials and Structures – *SMASIS Special Issue* (2019)
- Guest Editor: Smart Materials and Structures – *SMASIS Special Issue* (2018)

- **Reviewer/Referee for Scientific Journals**

- Physical Review Letters
- Physical Review Applied
- Physical Review B
- Applied Physics Letters
- Scientific Reports
- Journal of Applied Physics
- Journal of Sound and Vibration
- Extreme Mechanics Letters
- Mechanics of Materials
- International Journal of Solids and Structures
- Journal of Vibration and Acoustics\*
- Journal of Applied Mechanics\*
- Journal of Dynamic Systems, Measurement and Control\*
- Journal of Mechanisms and Robotics\*
- Journal of Computational and Nonlinear Dynamics\*
- Journal of Computing and Information Science in Engineering\*
- Journal of the Acoustical Society of America †
- Applied Acoustics
- AIAA Journal ‡
- Waves in Random and Complex Media
- Acta Mechanica
- Journal of Physics D: Applied Physics
- Journal of Intelligent Material Systems and Structures

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\*Transactions of the American Society of Mechanical Engineers (ASME)

†Transactions of the Acoustical Society of America (ASA)

‡Transactions of the American Institute of Aeronautics and Astronautics (AIAA)

- Smart Materials and Structures
- Composite Structures
- Shock and Vibration
- IEEE Access
- Mechanical Systems and Signal Processing
- International Journal of Non-linear Mechanics
- Journal of Low Frequency Noise Vibration and Active Control
- Thin-Walled Structures
- Energy Conversion and Management
- Applied Energy
- Applied Thermal Engineering
- Vibration
- Ultrasonics
- Sensors
- Micromachines
- Measurement Science and Technology
- Journal of Micromechanics and Microengineering
- Materials
- Energy
- Meccanica
- International Journal of Modern Physics
- European Physics Journal Plus
- International Journal of Applied Mechanics
- International Journal of Numerical Modeling: Electronic Networks, Devices and Fields
- HVAC&R Research

- **Conference Organization**

- **Track/Symposium Chair:**

- **(Chair) Track 1: Acoustics, Vibration and Phononics:** ASME International Mechanical Engineering Congress and Exposition (IMECE), Salt Lake City, UT, Nov. 8-14, 2019
- **(Co-chair) Phononic Crystals and Metamaterials:** ASME International Mechanical Engineering Congress and Exposition (IMECE), Salt Lake City, UT, Nov. 8-14, 2019
- **(Co-Chair) Energy Harvesting:** ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), Louisville, KY, Sept. 9-11, 2019
- **(Co-chair) Elastic and Acoustic Metamaterials:** SPIE Smart Structures/NDE Conference, Denver, CO, March 3-7, 2019

- **(Co-Chair) Track 1: Acoustics, Vibration and Phononics:** ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, Nov. 9-15, 2018
  - **(Co-chair) Phononic Crystals and Metamaterials:** ASME International Mechanical Engineering Congress and Exposition (IMECE), Pittsburgh, PA, Nov. 9-15, 2018
  - **(Chair) Energy Harvesting:** ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), San Antonio, TX, Sept. 10-12, 2018
  - **(Co-chair) Student and Young Professional Development:** ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), San Antonio, TX, Sept. 10-12, 2018
  - **(Co-chair) Elastic and Acoustic Metamaterials:** SPIE Smart Structures/NDE Conference, Denver, CO, March 4-8, 2018
  - **(Co-chair) Phononic Crystals and Metamaterials:** ASME International Mechanical Engineering Congress and Exposition (IMECE), Tampa, FL, Nov. 3-9, 2017
  - **(Co-chair) Energy Harvesting:** ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), Snowbird, UT, Sept. 18-20, 2017
  - **(Co-chair) Student and Young Professional Development:** ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), Snowbird, UT, Sept. 18-20, 2017
  - **(Co-chair) Elastic and Acoustic Metamaterials:** SPIE Smart Structures/NDE Conference, Portland, OR, March 25-30, 2017
  - **(Chair) Wave Propagation and Vibration Control:** ASME Conference on Smart Materials, Adaptive Structures and Intelligent Systems (SMASIS), Stowe, VT, Sept. 28-30, 2016
- **Awards Committees and Judging Panels**
    - (Judge) Energy Harvesting Best Paper Award (Energy Harvesting TC – ASME), 2019
    - (Chair) Best Student Paper Competition (Noise Control and Acoustics Division – ASME), 2018
    - (Co-chair) Best Student Paper Competition (Smart Materials and Structures – ASME), 2018
    - (Co-chair) Best Student Paper Competition (Smart Materials and Structures – ASME), 2017
    - (Judge) Best Student Paper Competition (Smart Materials and Structures – ASME), 2016
- **Community Outreach and Engagement**
    - McNair Scholars Program, 2018, 2019
    - STEAM (Science, Tech., Eng., Arts, Math) Competition, Boys & Girls Clubs of Buffalo, 2016, 2017
    - K-12 Science Fair, Montgomery County, Maryland, 2012
    - Science Fair, Washington Latin Public Charter School, Washington D.C., 2012
- **Mentor**
    - Center for Undergraduate Research and Creative Activities (CURCA), UB
    - Collegiate Science and Technology Entry Program (CSTEP), UB
    - Louis Stokes Alliance for Minority Participation (LSAMP), UB

- IIT Gandhinagar Undergraduate Summer Internship Program, UB
- Capstone Senior Design Projects, UB
- NASA/New York Space Grant Consortium, UB
- NSF Research Experience for Undergraduates (REU)
- Gemstone Honors Program (GEM), UMD

## STUDENTS & ADVISEES

### (1) Ph.D. Students (*completed*)

- **Hasan Al-Babaa**

May 2019 – “Dynamics of Finite Phononic Crystals and Metamaterials”

Currently: Postdoctoral Fellow at the University of Southern California (USC)

*Honors & Awards during PhD Tenure:*

MAE Poster Competition 3rd Place Award	(Spring 2017)
MAE Ph.D. Teaching Fellow	(Summer 2018)
Dean’s Graduate Achievement Award	(Spring 2019)
Silent Hoist and Crane Materials Handling Award	(Summer 2019)

### (2) Ph.D. Students (*in progress*)

- **Mohammad A. Attarzadeh**

Anticipated Graduation Date: May 2020

*Honors & Awards during PhD Tenure:*

MAE Poster Competition 1st Place Award	(Spring 2018)
SEAS Poster Competition 3rd Place Award	(Spring 2018)
MAE Ph.D. Teaching Fellow	(Summer 2019)

- **Jesse Callanan**

Anticipated Graduation Date: May 2021

*Honors & Awards during PhD Tenure:*

MAE Poster Competition 2nd Place Award	(Spring 2018)
LSAMP Best Mentor “Mr. Miyagi” Award	(Summer 2018)
NSF Internship Recipient	(Fall 2018)
SPIE Best Student Paper Competition 2nd Place Award	(Spring 2019)

- **Mohammadreza Moghaddaszadeh**

Anticipated Graduation Date: May 2023

*Honors & Awards during PhD Tenure:*

CSEE Poster Competition 2nd Place Award	(Spring 2020)
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- **Revant Adlakha**

Anticipated Graduation Date: May 2024

### (3) M.S. Students

- **Andrew Ragonese**

- **Manaswin Oddiraju** (Co-advised w/ Prof. Souma Chowdhury)



- **Ahmed Elbanna** (Completed: May 2021)  
*Asymmetric Transmission in Gyroscopically-Pumped Coupled Resonators*
- **Chuan (Cindy) Hsin Chang** (Completed: May 2020)  
*Elastic Energy Propagation in a Shive Wave Motion Demonstrator*
- **Chris Romero-Fischer** (Completed: Feb 2020)
- **Vincent Dirienzo** (Completed: Feb 2020)
- **Ge Dai** (Completed: May 2018)
- **Xiawei Song** (Completed: May 2017)  
*Standing-to-Travelling Wave Thermoacoustic Systems*

#### (4) Undergraduate Students

##### Undergraduate Research at UB:

<b>David DePauw</b>	NSF REU Fellowship Recipient for Summer 2017, Summer 2018 Dean's Undergraduate Achievement Award for 2018
<b>Steven Herrera</b>	CSTEP Intern, Summer 2018 Zimmer Award Recipient for Spring 2019 NASA/New York Space Grant Consortium Fellow for 2018-2019
<b>Ramzy Abu-Ramadan</b>	Zimmer Award Recipient for Spring 2019
<b>Adrian Denner</b>	LSAMP Intern, Summer 2018
<b>Alexander Poulin</b>	
<b>Chris Romero-Fischer</b>	CSTEP Intern, Summer 2017
<b>Chris Rector</b>	Zimmer Award Recipient for Spring 2017
<b>Joshua Abraham</b>	Zimmer Award Recipient for Fall 2016
<b>Alex Rodriguez</b>	
<b>Chris Gnam</b>	CSTEP Intern, Summer 2016 1st place Award at the 10 <sup>th</sup> CSTEP Research Poster Symposium
<b>Akshay Gupta</b>	CURCA Research Award Recipient for Spring 2016
<b>Vincent Dirienzo</b>	CURCA Research Award Recipient for Spring 2016
<b>Benjamin Grace</b>	
<b>Stephen Gagnon</b>	Zimmer Award Recipient for Summer 2017, Fall 2017
<b>Harrison Fay</b>	Visiting Student from Cornell University

##### Senior Design Projects:

CAPSTONE 2016-17	Max Clark, Mason Kyi, Chukwuemeka Ngwu, Macclaud St. Rose, Jeong Kim
CAPSTONE 2016-17	Anthony Laffrado, Michael Forcucci, Kevin Scott, Hasitha Hewakuruppu
CAPSTONE 2015-16	Abel Taye, Chris Landschoot, John Forrestel, Joe Szabo, Steve Weinheimer
GEMSTONE 2012-14	Edward Mulhern, Mihir Patel, Chandan Kittur, Mark Lee, Alden Grobicki

#### (5) Thesis/Dissertation Committee Member

##### Ph.D. Dissertations:

- Muath Bani-Hani, Ph.D., MAE, Sept. 2016
- Adonis Pimienta-Peñalver, Ph.D., MAE, Aug. 2017
- Mohammad Ansari, Ph.D., MAE, May 2018

- Aditya Nanda, Ph.D., MAE, May 2018
- Taewook Lee, Ph.D., MAE, May 2018
- Souransu Nandi, Ph.D., MAE, May 2019
- Oladapo Ogunbodede, Ph.D., MAE, May 2020
- Saeed Maleki, Ph.D., MAE, Expected Date: May 2021
- Adrian Stein, Ph.D., MAE, Expected Date: May 2023

M.S. Theses:

- Antonio Galbier, M.S., MAE, Jan. 2017
- Revant Adlakha, M.S., MAE, Aug. 2019
- Rey Yoshinaga, M.S., MAE, Oct. 2019

**TRAINING & COURSEWORK**

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**University at Buffalo (SUNY), Buffalo, NY** Sept. 2017 - Jan. 2018  
 Collaborative Institutional Training Initiative (CITI) Program

- Social & Behavioral Research Investigators
- Biomedical Research Investigators
- Good Clinical Practice

**University of Maryland, College Park, MD** Sept. 2009 - May 2013  
 Advanced Dynamics, Vibration Damping, Linear System dynamics, Applied Finite Element Methods, Active Vibration Control, Finite Element Methods, Computational Structural Mechanics, Continuum Mechanics, Linear Vibrations, Structural Dynamics, Professional Preparation and Program Management

**Cairo University, Giza, Egypt** Sept. 2008 - May 2009  
 Theory of Fine Measurements, Computational Methods in Energy Sciences, Advanced Fluid Dynamics, Thermal Convection, Advanced Heat Transfer

***Training Provided by M. Nouh:***

**ITT Enidine, Orchard Park, NY** June 2019 - Aug. 2019  
 Shock & Vibration: 8-Session Professional Development Course