



Leonard J. Bond

Professor

Department of Aerospace Engineering

Department of Mechanical Engineering (Courtesy)

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Education

Ph.D. Physics, The City University, London, 1978

M.S. Applied Physics (1st Class Honours), The University, London, 1974

Academic Appointments

Iowa State University (2012-present)

Department of Aerospace Engineering

Department of Mechanical Engineering (courtesy appointment)

- *Professor*, July 2012 - present
- *Director of Center for NDE*, July 2012 – May 2018
- *Interim Director*, Institute for Physical Research and Technology, October 2012- June 2014

Pacific Northwest National Laboratory (1998-2012)

- *Laboratory Fellow*

University of Colorado at Boulder (1990 - 1998)

- *Research Professor*

University College London (1979- 1992)

- Progressed from *Lecture* to *Reader in Ultrasonics*

Awards and Honors

- Fellow, American Association Advancement Science (AAAS)
- Fellow, Institute of Physics (UK)
- Senior Member, Institute of Electrical and Electronic Engineers (IEEE)
- Honorary Professor, Beijing University of Technology (BJUT) - 2019
- Honorary visiting professor, Jiangsu University - 2019

Teaching

UNDERGRAD: EM 362 Principles of Nondestructive Testing, EM 362L Nondestructive Evaluation (Laboratory), EM 425 Introduction to Finite Elements.

GRADUATE: EM 518 Waves in Elastic Solids with Applications to ultrasonic NDE.

Research

Interest Areas:

- **Ultrasonics:** ▪ sensing and material characterization; ▪ high power (nonlinear); ▪ sensors harsh environments;
- **Nondestructive Evaluation/Prognostics:** ▪ process monitoring (additive manufacturing) ▪ aging and degradation characterizatio; ▪ novel NDE applications;

Sponsored Grants: More than \$5M total for research expenditures since 2012.

Selected Publications

(of 450+ pubs. including 81 journals, 19 book chapters, 18 books, 10 patents, 219 conf. proceedings; h-index (Google): 36)

1. Koester, L.W., **Bond, L.J.**, Taheri, H., and Collins, P.C. (2019). Non-Destructive Evaluation of additively manufactured metallic parts: in-situ and post deposition, Chapter 18. *Additive Manufacturing for the Aerospace Industry*, Eds, Francis Froes & Rodney Boyer, Elsevier, pp. 401-418.
2. Taheri, H., Kilpatrick, M., Norvallis, M., Harper, W.J., Koester, L.W., Bigelow, T. and **Bond, L.J.** (2019) Investigation of nondestructive testing methods for friction stir welding, *Metals Handbook*, Vol. 9, Paper 624, pp. 22.
3. Ahmed, A. and **Bond L.J.** (Volume Editors). (2018). Nondestructive Evaluation of Materials, *ASM International Metals Handbook*, Vol. 17, 682 pages.
4. Ensminger, D. and **Bond, L.J.** (2011). Ultrasonics: fundamentals, technology, applications, *3rd Revised Edition*, CRC Press, Taylor and Francis Group (Boca Raton).
5. Koester, L.W., Hossein Taheri, H., Bigelow, T., Collins, P.C., and **Bond, L.J.** (2018). "Nondestructive Testing for Parts Fabricated Using Additive Manufacturing", *Materials Evaluation*, Vol. 76 (4), pp. 514-524.
6. Bilgunde, P.N. and **Bond, L.J.** (2018). "Model Assisted approach for Probability of Detection (POD) in High Temperature Ultrasonic NDE using Low Temperature Signals," *Nuclear Technology*, Vol. 202, pp. 161-172.
7. Rubio, F., **Bond, L.J.**, and Blandford E. (2017). "Scaled experiment investigating sonomechanically enhanced inert gas sparging mass transfer," *Nuclear Engineering and Design*, Vol. 324, pp. 171-180.
8. Taheri, H., Shoaib, M.R.M., Koester, L., Bigelow, T.A., Collins, P.C. and **Bond, L.J.** (2017). "Powder based additive manufacturing – a review of types of defects, generation mechanisms, detection property evaluation and metrology," *Int. J. Additive and Subtractive Materials Manufacturing*, 1 (2) pp. 172-209.
9. Pei, N. and **Bond, L.J.** (2017). "Comparison of acoustoelastic Lamb wave propagation in stressed plates for different measurement orientations," *The Journal of the Acoustical Society of America*, 142 (10), EL327.
10. Liu, Y., **Bond, L.J.**, and Hu, Hui. (2017). "Ultrasonic-attenuation-based technique for ice characterization pertinent to aircraft icing phenomena," *AIAA, Journal*, 55 (5) 1602-1609.
11. Liu, Y., Chen, W-L., **Bond, L.J.**, and Hu, H. (2017). "An Experimental study of the characteristics of wind-driven surface water flows by using a multi-transducer ultrasonic pulse-echo technique," *Phys. Fluids*, 29 (1) 012102.
12. Pei, N. and **Bond L.J.** (2016). "Higher order acoustoelastic Lamb wave propagation in stressed plates," *J. Acoust. Soc. Am.* 140 (5) 3824-3843.
13. Rubio, F., Blandford, E.D. and **Bond, L.J.** (2016). "Opportunities for sonoprocessing in advanced nuclear technologies," *Ultrasonics Sonochemistry*, Vol. 71, pp. 211-222.
14. Coble, J., Ramuhalli, P., **Bond, L.J.**, Hines, W., and Upadhyaya, B, (2015). "A review of prognostics and health management applications in nuclear power plants," *Int. J. Prognostics and Health Management*, 6 (3) 1-22.
15. Chakrapani, S.K., Edwards, R. and **Bond, L.J.** (2018). "Rayleigh Wave Nondestructive Evaluation (NDE) for Defect Detection and Material Characterization," *Metals Handbook*, Vol. 17, Nondestructive Evaluation of Materials, eds. A. Ahmed, L. J. Bond (ASM International) pp. 266- 282.

Thesis Advisor/Co-advisor and Postgraduate-Scholar Sponsor

Postgraduate-Scholar (1): L. Koester (2015-18)

Doctoral (20): H. Taheri (2018), P. Bilgunde (2018), N. Pei (2017), T. Eason (2017), Y. Liu (2016), U-W, Lee (1993), R. Nici (1994), C-H Chiang (1994), Q. Tan (1997), A. Mairal (1997), W. Kepler (1998), N. Saffari (1986), M. Punjani (1986), R.J. Blake (1988), C.A. Chaloner (1988), R.P. Clark (1989), P.A. Albach (1989), A.K. Som (1991), G. Hughes (1991), J. Yang (1992).

Masters (USA - 8): J. Nagel (2019), J. Taylor (2018), J. Van Dam & L. Smart (2015), A. Metters & R. Peterson (1996).

Professional and Outreach Activities

- Professional Society: IEEE, Director IEEE Region 6, (IEEE Board of Directors, 2009-10, IEEE-USA Board 09-10, IEEE MGA Board 09-10, Director elect 2007-08, Past-Director 2011-12 and various major IEEE committees 07-12; society roles (ongoing);
- Members of IOP (1970 –present: Fellow 1999), IET (formerly IEE: ~1981-present); Acoustic Society America (1991-present), ANS (~2000-present); ASME (2011-present);
- International Congress Ultrasonics (and meetings from which it evolved): Board Member. (various roles 1987-present, including proceedings editor, international scientific committee, and organizer special sessions – when Elsevier Sponsored – editor-in chief, journal);
- Annual Review of Progress in QNDE: President, QNDE Programs (2013 – 2018), organizer and meeting proceedings co-editor;
- Editorial Board: J. Nondestructive Evaluation (Springer);
- Reviewer: NSF, DOE, Journal of NDE, Ultrasonics, Nuclear Engineering Design, Int. J. PHM, Journal of the Acoustical Society America; IOP, Measurement Science and Technology; Elsevier – various.