



## Professor Woo-Seok Ji

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School of Mechanical and Nuclear Engineering  
Ulsan National Institute of Science and Technology (UNIST), Korea

### Career:

2013.11-present: Assist. Professor, UNIST  
2010.4-2013.10: Research Fellow, University of Michigan, Ann Arbor.  
2010.6~2012.3: Technical Specialist, Comet Technology Corporation, Ann Arbor.  
2009.10~2010.4: Research Scientist, IllinoisRocstar, LLC., Illinois  
2009.1~2009.10: Postdoctoral Research Associate, University of Illinois, Urbana-Champaign  
2008.12: Ph.D. in Aerospace Engineering, University of Michigan, Ann Arbor.  
2005.4: M.A. in Aerospace Engineering, University of Michigan, Ann Arbor.  
1999.12~2003.6: Tooling Engineer, Korean Air Aerospace Division, Busan.  
1999.8: B.S. in Mechanical and Aerospace Engineering, Seoul National University.

### Biography (written in 2012 before Professor Ji joined UNIST):

Dr. Wooseok Ji is a postdoctoral research fellow in the Department of Aerospace Engineering at the University

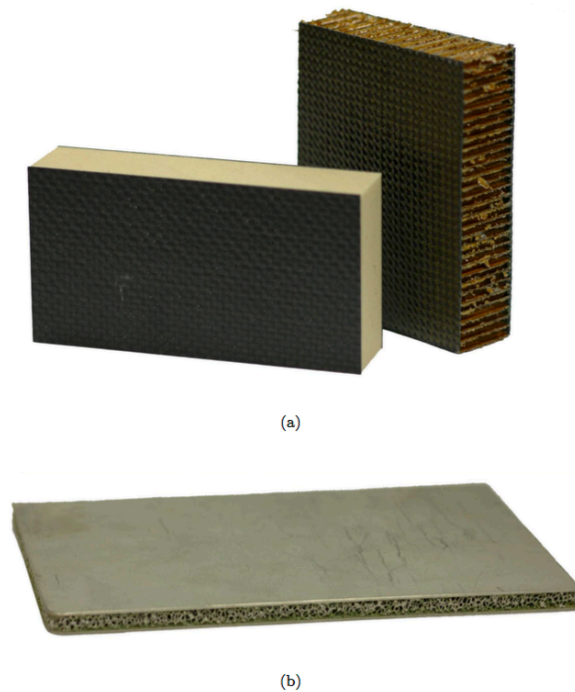


Figure 1.1: Typical examples of sandwich constructions. (a) composite laminates face sheets covering a PVC foam core or a aramid honeycomb core (b) Aluminum face sheets with a aluminum foam core

From: Wooseok Ji, “Static and dynamic response of a sandwich structure under axial compression”, Ph.D. dissertation, 2008

of Michigan Ann Arbor. He received his Ph.D. (2008) and MS (2005) in Aerospace Engineering, both from the University of Michigan, and BS (1999) in Mechanical and Aerospace Engineering from the Seoul National University. After his PhD, he joined the Center for Simulation of Advanced Rockets at the University of Illinois Urbana-Champaign as a postdoctoral research associate (2008-2009) and worked for IllinoisRocstar LLC as a research scientist (2009-2010). Prior to his PhD program, he worked as a tooling engineer for the Aerospace Division of Korean Air (1999-2003). His current research interests are in the fields of computational solid mechanics, multi-physics materials modeling from atomistic to continuum scales, fracture and failure mechanics of composite materials, advanced finite element method, and dynamic instability of composite structures.

#### **Research Interests:**

1. Textile composites for lightweight vehicles
2. Impact and ballistic response of composite structures
3. Characterization of nonlinear in-situ material properties
4. Computational tomography for reconstructing a multi-material microstructure
5. High-fidelity multi-physics and multi-scale models for composite materials and structures
6. Advanced manufacturing processes for modern composite structures

#### **Selected Publications:**

W. Ji and A. M. Waas. "A predictive model for the compressive strength of 3D woven textile composites," 54th AIAA / ASME / ASCE / AHS / ASC Structures, Structural Dynamics, and Materials Conference, number AIAA-2013-1727, 2013.

W. Ji, A. M. Waas and Z. P. Bazant, "On the importance of work-conjugacy and objective stress rates in finite deformation incremental finite element analysis," *Journal of Applied Mechanics*, 80(4), 2013.

W. Ji and A. M. Waas, "Progressive failure analysis for the interaction of interlaminar and intralaminar failure modes in composite structures with an initial delamination," *The Aeronautical Journal*, 117(1187): pp 71-84, 2013.

W. Ji and A. M. Waas. "Progressive failure analysis method of a Pi joint with uncertainties in fracture properties," 53rd AIAA / ASME / ASCE / AHS / ASC Structures, Structural Dynamics, and Materials Conference, number AIAA-2012-1544, 2012.

W. Ji and A. M. Waas, "The temporal evolution of buckling in a dynamically impacted imperfect column," *Journal of Applied Mechanics*, 80(1): pp 1-7, 2012.

Ji, W., and Waas, A. M., 2012, "Accurate Buckling Load Calculations of a Thick Orthotropic Sandwich Panel," *Compos. Sci. Technol.*, 72(10), pp. 1134–1139.

W. Ji, A. M. Waas and R. Raveendra. "Reliability-based progressive failure analysis method for advanced composite structures," 26th American Society of Composites Annual Technical Conference, number 1170, 2011.

W. Ji, A. M. Waas and Z. P. Bazant, "Errors caused by non-work-conjugate stress and strain measures in finite element programs," *Journal of Applied Mechanics*, 77(4): pp 1-5, 2010.

W. Ji and A. M. Waas, "Fragmentation of an axially impacted slender rod," *Europhysics Letters*, 89(4): p46003, 2010.

Ji, W., and Waas, A. M., 2009, "2D Elastic Analysis of the Sandwich Panel Buckling Problem: Benchmark Solutions and Accurate Finite Element Formulations," *Z. Angew. Math. Phys.*, 61(5), pp. 897–917.

Wooseok Ji and Anthony M. Waas, "Wrinkling and edge buckling in orthotropic sandwich beams", *ASCE Journal of Engineering Mechanics*, June 2008

Wooseok Ji, "Static and dynamic response of a sandwich structure under axial compression", Ph.D. dissertation, 2008

Ji, W., and Waas, A. M. 2007. "Global and local buckling of a sandwich beam." *J. Eng. Mech.*, 133(2), 230–237.