



Fig. 1 (a) Layered composite with materials *A* (stiff constituent) and *B* (soft viscoelastic constituent). T_A and T_B are the layer thicknesses. The volume fraction of material *A* is $\phi_A = T_A / (T_A + T_B)$. The composite is loaded in the layer direction, *Y*. (b) Unit cell of height *H* and width *W*. (c) Mode of deformation of the unit cell with a buckling wavelength much larger than the unit cell height (longwave instability). (d) Mode of deformation of the unit cell with a finite wavelength (wrinkling instability).



Professor Julien Meaud

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See:

<https://www.me.gatech.edu/faculty/meaud>
<https://petitoinstitute.gatech.edu/julien-meaud>
<https://scholar.google.com/citations?user=jJTt8i8AAAAJ&hl=en>
<https://www.researchgate.net/lab/Julien-Meaud-Lab-2>

The George W. Woodruff School of Mechanical Engineering
 Georgia Institute of Technology, Atlanta, Georgia, USA

Biography:

Dr. Julien Meaud joined Georgia Tech as an Assistant Professor of Mechanical Engineering in August 2013. Before joining Georgia Tech, he worked as a research fellow in the Vibrations and Acoustics Laboratory and in the Computational Mechanics Laboratory at the University of Michigan, Ann Arbor. Dr. Meaud investigates the mechanics and physics of complex biological systems and the mechanics and design of engineering materials

using theoretical and computational tools. In Dr. Meaud's research group, students learn theoretical and computational techniques that are used extensively to solve engineering problems in academic research and industry. Students will develop knowledge and expertise in a broad array of mechanical engineering areas. The knowledge that students will gain in computational mechanics, nonlinear and structural dynamics, structural acoustics, dynamics and composite materials could be applied to many domains in their future career.

Education:

Ph. D., Mechanical Engineering, University of Michigan, Ann Arbor, 2010
M.S., Mechanical Engineering, University of Michigan, Ann Arbor, 2006
B.S., Ecole Centrale de Lyon, France, 2005

Research Interests:

Acoustics and Dynamics; Mechanics of Materials and Bioengineering; Auditory mechanics; physiological acoustics; composite materials; computational mechanics; finite element method; viscoelasticity

Selected Publications:

Sain, T., Meaud, J., Hulbert, G., Arruda, E. M., and A. M. Waas, 2013, "Simultaneously High Stiffness and Damping in a Class of Wavy Layered Composites," *Compos. Struct.*, 101, pp. 104–110.

Meaud, J., Sain, T., Hulbert, G., and Waas, A., 2013, "Analysis and Optimal Design of Layered Composites With High Stiffness and High Damping," *Int. J. Solids Struct.*, 50(9), pp. 1342–1353.

Meaud, J., and Hulbert, G., 2013, "Dependence of the Dynamic Properties of Voigt and Reuss Composites on the Poisson's Ratio and Bulk Loss Factor of the Constituent Materials," *J. Compos. Mater.*, 47(26), pp. 3237–3247.

Sain, T., Meaud, J., Yeom, B., Waas, A. M., and E. M. Arruda, 2014, "Rate Dependent Finite Strain Constitutive Modeling of Polyurethane and Polyurethane–Clay Nanocomposites," *Int. J. Solids Struct.*, 54, pp. 147–155

Meaud, J., Sain, T., Yeom, B., Park, S. J., Shoultz, A. B., Hulbert, G., Ma, Z.-D., Kotov, N. A., Hart, A. J., Arruda, E. M., and Waas, A. M., 2014, "Simultaneously High Stiffness and Damping in Nanoengineered Microtruss Composites," *ACS Nano*, 8(4), pp. 3468–3475.

Alur, K., and Meaud, J., 2015, "Nonlinear Mechanics of Non-Dilute Viscoelastic Layered Composites," *Int. J. Solids Struct.*, 72, pp. 130–143.

Kashyap Alur, Thomas Bowling and Julien Meaud "Finite-element analysis of rate-dependent buckling and postbuckling of viscoelastic-layered composites", *J. Appl. Mech.* 2015;83(3):031005-031005-8. doi:10.1115/1.4032024. March 2016

Che K., Yuan C., Wu J., Qi H.J., Meaud J., Three-dimensional-printed multistable mechanical metamaterials with a deterministic deformation sequence, *J. Appl. Mech.*, 84 (1) (2016), Article 011004

Meaud J., Che K., Tuning elastic wave propagation in multistable architected materials, *Int. J. Solids Struct.*, 122 (2017), pp. 69-80

Haiqi Wen, Thomas Bowling and Julien Meaud, "Investigation of the $2f_1-f_2$ and $2f_2-f_1$ distortion product otoacoustic emissions using a computational model of the gerbil ear", *Hearing Research*, Vol. 365, May 2018, DOI: 10.1016/j.heares.2018.05.011

Julien Meaud, Thomas Bowling and Charlsie Lemons, "Computational modeling of spontaneous otoacoustic emissions by the mammalian cochlea", *ASME 2018 Dynamic Systems and Control Conference*, September 2018, DOI: 10.1115/DSCC2018-9044

Kaikai Che, Michael Rouleau and Julien Meaud, "Temperature-tunable time-dependent snapping of viscoelastic metastructures with snap-through instabilities", *Extreme Mechanics Letters*, Vol. 32, Article 100528, October 2019