



Professor Daining Fang

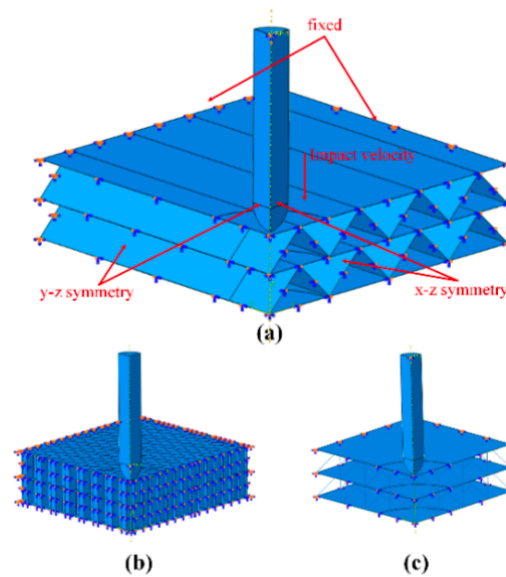


Figure 2: Finite element model of sandwich panel, taking bi-layer sandwich panel for example: (a) corrugation, (b) hexagonal honeycomb and (c) pyramidal truss.

From: Liming Chen, Bing Du, Jian Zhang, Hao Zhou, Diansen Li and Daining Fang, “Numerical study on the projectile impact resistance of multi-layer sandwich panels with cellular cores”, Latin American Journal of Solids and Structures, December 2016, DOI: 10.1590/1679-78252905

See:

<https://scholar.google.com/citations?user=jEd6e4kAAAAJ&hl=zh-CN>

<http://en.coe.pku.edu.cn/faculty/facultyaz/915990.htm>

https://www.researchgate.net/scientific-contributions/2005458088_Daining_Fang

<http://est.bit.edu.cn/english/faculty/academicians/94373.htm>

Lightweight Multi-functional Composite Materials and Structures, Institute of Advanced Structure Technology, Beijing Institute of Technology
Formerly,
Peking University, Tsinghua University

Summary:

Fang Daining, male, born in April 1958, Ph.D., professor, doctoral supervisor, expert in material mechanics, academician of Chinese Academy of Sciences.

He has long been engaged in the research of mechanical theory, calculation and experimental methods of advanced materials and structures under the coupling of force and electromagnetic heat and multiple fields. Expanded the macroscopic micro-deformation and fracture theory of ferroelectric/ferromagnetic materials, and obtained applications in finite element analysis and device design; developed the multi-field force-electromagnetic multi-scale computational mechanical method and design preparation method for lightweight multi-functional composite materials. The lightweight multi-functional materials and structures prepared were applied to the construction of national defense equipment; advanced materials, electromagnetic and thermal multi-field multi-axis loading and testing technologies and experimental methods were developed, and the basic research results were transformed into more than ten kinds of independent intellectual property rights. Scientific instruments and get popularized applications.

As a project and project leader, he is responsible for and undertakes the major, key and general projects of the National Natural Science Foundation of China, the National “973” Project, the major science and technology

projects of the Ministry of Education, the national special scientific research equipment and equipment development project, major international cooperation projects, and the national excellence. Youth Fund (A and B) projects, China-France cooperation, two base fund projects, Sino-German international cooperation fund projects, China-Korea international cooperation fund projects, etc.; responsible for and responsible for major national defense science and technology projects, "973", "863", Pre-research projects and other projects related to national defense construction. Relevant research results won the second prize of the National Natural Science Award in 2005 (the second prize winner), and won the first prize of the "Higher School Science and Technology Award (Technical Invention Award)" (the first prize winner) of the Ministry of Education in 2007, and was educated in 2008. Ministry of Science and Technology Award (Natural Science Award) First Prize (First Prize Winner), National Natural Science Second Prize (First Prize Winner) in 2010, Ministry of Education "Higher School Science and Technology Award" in 2011 (Natural Science Award) First Prize (First Prize Winner), 2011 "Zhi Zhilun Mechanics Prize".

In 2000, he was awarded with the National Outstanding Young Scientists Fund. In 2002, he was appointed as the distinguished professor of the Yangtze River Scholar Award Program of the Ministry of Education.

In 2013, he was elected as a member of the Chinese Academy of Sciences.

He is author of 5 monographs and over 300 papers in peer-reviewed journals in multiple fields such as mechanics, materials and physics. He is among the Elsevier most cited Chinese researchers for five consecutive years.

Education and Professional Preparation:

Nanjing Chemical University, Mechanical Engineering, B.S., 1982

Nanjing Chemical University, Mechanical Engineering, M.S., 1986

Technion-Israel Institute of Technology, Aerospace Engineering, Ph.D., 1993

Tel-Aviv c Solid Mechanics and Materials Structures, postdoctoral, 1993-1994

Maryland University, Mechanical Engineering, Research associate, 1994-1995

Appointments:

2009– Chair Professor, College of Engineering, Peking University

1995–2009 Chair Professor, School of Aerospace, Tsinghua University, China

Research Interests:

Mechanics of electromagnetic materials, microelectronics devices and batteries

Mechanics of advanced materials and lightweight lattice composite materials

Mechanics of materials and structures under high temperature and extreme environment

Mechanics of advanced manufacturing including 3D & 4D printing

Micromechanics and physics-based continuum models across length scales

Selected Publications:

Books:

Fang Daining and Liu Jinxi, Fracture Mechanics of Piezoelectric and Ferroelectric Solids, In Chinese, Beijing: Tsinghua University Press, 2008; In English, Berlin: Springer, 2010

Fang Daining, Zhang Yihui and Cui Xiaodong, Mechanics and Multifunctional Design of Light-weight Lattice Materials, In Chinese, Beijing: Science Press, 2009

Journal Articles, etc.:

Yihui Zhang, Zhenyu Xue, Liming Chen and Daining Fang, "Deformation and failure mechanisms of lattice cylindrical shells under axial loading", International Journal of Mechanical Sciences, Vol. 51, No. 3, March 2009, pp. 213-221

Hualin Fan, Fengnian Jin and Daining Fang, "Uniaxial local buckling strength of periodic lattice composites", Materials & Design, Vol. 30, No. 10, December 2009, pp. 4136-4145

Hualin Fan, Tao Zeng, Daining Fang and Wei Yang, "Mechanics of advanced fiber reinforced lattice composites", Acta Mechanica Sinica, Vol. 26, pp 825-835, 2010

Xiaodong Cui, Longmao Zhao, Zhihua Wang, Han Zhao and Daining Fang, "Dynamic response of metallic lattice sandwich structures to impulsive loading", *International Journal of Impact Engineering*, Vol. 43, pp 1-5, May 2012

Liming Chen, Hualin Fan, Fangfang Sun, Long Zhao and Daining Fang, "Improved manufacturing method and mechanical performances of carbon fiber reinforced lattice-core sandwich cylinder", *Thin-Walled Structures*, Vol. 68, pp 75-84, July 2013

Ran Xu, Yu Wang, Bin Liu and Daining Fang "Mechanics interpretation on the bending stiffness and wrinkled pattern of graphene", *J. Appl. Mech.* 2013;80(4):040910-040910-5. doi:10.1115/1.4024178. July 2013

Fangfang Sun, Hualin Fan, Chuwei Zhou, Daining Fang, "Equivalent analysis and failure prediction of quasi-isotropic composite sandwich cylinder with lattice core under uniaxial compression", *Composite Structures*, Vol. 101, pp. 180-190, July 2013

He Zhang, Fangfang Sun, Hualin Fan, Haosen Chen, Liming Chen, Daining Fang, Free vibration behaviors of carbon fiber reinforced lattice-core sandwich cylinder, *Compos. Sci. Technol.* 100 (2014) 26-33.

Wu Hong, Hualin Fan, Zhicheng Xia, Fengnian Jin, Qing Zhou and Daining Fang, "Axial crushing behaviors of multi-cell tubes with triangular lattices", *International Journal of Impact Engineering*, Vol. 63, pp 106-117, January 2014

Kaige Zhu, Mingji Chen, Qiuhai Lu, Bo Wang, Daining Fang, "Debonding detection of honeycomb sandwich structures using frequency response functions", *Journal of Sound and Vibration*, Vol. 222, No. 21, pp 5299-5311, October 2014

Hongshuai Lei, Xiaolei Zhu, Haosen Chen, Hualin Fan, Mingji Chen, Daining Fang, Macroscopic response of carbon-fiber pyramidal truss core panel taking account of local defect, *Compos. Part B Eng.* 79 (2015) 311-321.

Mingji Chen, Ziaolei Zhu, Hongshuai Lei, Heosen Chen and Daining Fang, "Effect of defect on the compressive response of sandwich structures with carbon fiber pyramidal truss cores", *International Journal of Applied Mechanics*, Vol. 7, No. 1, 1550004, February 2015

Yong Tao, Mingji Chen, Yongmao Pei and Daining Fang "Strain rate effect on mechanical behavior of metallic honeycombs under out-of-plane dynamic compression", *J. Appl. Mech.* 2015;82(2):021007-021007-6. doi:10.1115/1.4029471. February 2015

Yong Tao, Mingji Chen, Haosen Chen, Yongmao Pei and Daining Fang, "Strain rate effect on the out-of-plane dynamic compressive behavior of metallic honeycombs: Experiment and theory", *Composite Structures*, Vol. 132, pp 644-651, November 2015

Hongshuai Lei, Kai Yao, Weibin Wen, Hao Zhou and Daining Fang, "Experimental and numerical investigation on the crushing behavior of sandwich composite under edgewise compression loading". *Composites Part B: Engineering*, Vol. 94, pp 34-44, June 2016

Liming Chen, Bing Du, Jian Zhang, Hao Zhou, Diansen Li and Daining Fang, "Numerical study on the projectile impact resistance of multi-layer sandwich panels with cellular cores", *Latin American Journal of Solids and Structures*, December 2016, DOI: 10.1590/1679-78252905

Shu Jiang, Fangfang Sun, Hualin Fan and Daining Fang, "Fabrication and testing of composite orthogrid sandwich cylinder", *Composites Science and Engineering*, Vol. 142, pp 171-179, April 2017

Yong Tao, Shengyu Duan, Weibin Wen, Yongmao Pei and Daining Fang, "Enhanced out-of-plane crushing strength and energy absorption of in-plane graded honeycombs", *Composites Part B: Engineering*, Vol. 118, pp 33-40, June 2017

Yunong Zhao, Mingji Chen, Fan Yang, Ling Zhang and Daining Fang, "Optimal design of hierarchical grid-stiffened cylindrical shell structures based on linear buckling and nonlinear collapse analyses", *Thin-Walled Structures*, Vol. 119, pp 315-323, October 2017

Yanfei Chen, Shigang Ai, Rujie He, Kai Wei and Daining Fang, "A study on the compressive performance of C/SiC lattice sandwich panel at high temperature", *International Journal of Applied Mechanics*, Vol. 9, No. 8, 1750120, December 2017

Shengyu Duan, Yong Tao, Hongshuai Lei, Weibin Wen, Jun Liang and Daining Fang, "Enhanced out-of-plane compressive strength and energy absorption of 3D printed square and hexagonal honeycombs with variable-thickness cell edges", *Mechanics Letters*, Vol. 18, pp 9-18, January 2018

Kai Wei, Yong Peng, Zhaoliang Zu, Hao Zhou, . . . Daining Fang, "Lightweight composite lattice cylindrical shells with novel character of tailorable thermal expansion", *International Journal of Mechanical Sciences*, Vol. 137, pp 77-85, March 2018

Ming Li, Fanggang Sun, Changliang Lai, Hualin Fan, Bin Ji, Xi Zhang, Debo Liu and Daining Fang, "Fabrication and testing of composite hierarchical isogrid stiffened cylinder", *Composites Science and Technology*, Vol. 157, pp 152-159, March 2018

Kai Wei, Qidong Yang, Bin Ling, Zhaoliang Qu, Yongmao Pei and Daining Fang, "Design and analysis of lattice cylindrical shells with tailorable axial and radial thermal expansion", *Extreme Mechanics Letters*, Vol. 20, pp 51-58, April 2018

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Liming Chen, Jian Zhang, Bing Du, Hao Zhou, Houchang Liu, Yongguang Guo(1,2), Weiguo Li and Daining Fang, "Dynamic crushing behavior and energy absorption of graded lattice cylindrical structure under axial impact load", *Thin-Walled Structures*, Vol. 127, pp 333-343, 2018

Bing Du, Liming Chen, Wenjun Wu, Houchang Liu, Yang Zhao, Shiwei Peng, Yongguang Guo, Hao Zhou, Liliang Chen, Weiguo Li and Daining Fang, "A novel hierarchical thermoplastic composite honeycomb cylindrical structure: Fabrication and axial compressive properties", *Composites Science and Technology*, Vol. 164, pp 136-145, August 2018

Chuanlei Li, Hongshuai Lei, Yabo Liu, Xiaoyu Zhang, Jian Xiong, Hao Zhou and Daining Fang, "Crushing behavior of multi-layer metal lattice panel fabricated by selective laser melting", *International Journal of Mechanical Sciences*, Vol. 145, pp 389-399, September 2018

Chao Ma, Hongshuai Lei, Jian Hua, Yingchun Bai, Jun Liang and Daining Fang, "Experimental and simulation investigation of the reversible bi-directional twisting response of tetra-chiral cylindrical shells", *Composite Structures*, Vol. 203, pp 142-152, 1 November 2018

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Mengchuan Xu, Yanzhi Yang, Hongshuai Lei, Panding Wang, Xinyu Li, Zhong Zhang and Daining Fang, "Dynamic response of fiber metal laminates subjected to localized high impulse blast loading", *Composite Structures*, Vol. 243 Article 112216, 1 July 2020

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