

# Curriculum Vitae

WENJIA JING

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## Research Interests

Applied analysis of PDEs, Stochastic homogenization, Quantitative estimates.  
Wave propagations in random media. Imaging methods. Kinetic and diffusion limits.

## Education

05/2011 Ph.D. in Applied Mathematics (with distinction), Columbia University  
Advisor: Guillaume Bal  
07/2006 B.S. in Theoretical and Applied Mechanics, Peking University

## Employment

09/2016–present Assistant Professor, Tsinghua University, Beijing, China  
09/2013–08/2016 L.E. Dickson Instructor, The University of Chicago  
09/2011–08/2013 Postdoctoral Researcher, Ecole Normale Supérieure Paris

## Grant and Awards

NSFC Grant 11871300 (co PI), 2019–2022  
The Recruitment Program of Global Experts of China, 2019–2021  
NSFC Grant 11701314 (Principal Investigator), 2018–2020  
NSF Grant DMS-1515150 (Principal Investigator), 2015–2016

## Seminars

11/2019 Analysis and PDEs Seminar, The University of Tokyo, Japan  
03/2019 Applied Mathematics Seminar, Chinese Academy of Science, Beijing  
02/2019 Geometric Analysis and PDEs Seminar, University of Wisconsin at Madison, USA

12/2018 Math Colloquium, Beijing Institute of Technology, Beijing  
 12/2018 Applied Math Annual Forum, Chinese Academy of Science, Beijing  
 10/2018 Applied Math Seminar, Chinese Acadamey of Science, Beijing  
 07/2017 Math Colloquium, Beijing Normal University, Beijing  
 05/2017 Math Colloquium, National Cheng Kung University, Tainan, Taiwan  
 05/2017 Analysis & PDEs Seminar, National Taiwan University, Taipei, Taiwan  
 04/2017 Applied Math Seminar, Beijing Computational Science Research Center, Beijing  
 01/2017 PDE and Analysis Seminar, Beihang University, Beijing  
 10/2016 IAS Program on Inverse Problems, Imaging and PDEs, HKUST, Hong Kong  
 09/2016 Computational and Applied Math Seminar, YMSC, Tsinghua University  
 09/2016 PDE and Analysis Seminar, BICMR, Peking University  
 04/2016 Applied Mathematics Seminar, Colorado State University  
 01/2016 Applied and Industrial Mathematics Seminar, Northeastern University  
 01/2016 Joint Applied Math/Stochastics Seminar, University of Utah  
 01/2016 Department Colloquium, University of Utah  
 12/2015 Analysis Seminar, University of Texas at Austin  
 10/2015 Analysis Seminar, University of Texas at Austin  
 09/2015 Applied Mathematics Seminar, University of Wisconsin at Madison  
 05/2015 Applied Mathematics Colloquium, Columbia University  
 04/2015 Nonlinear PDE Seminar, University of California at Irvine  
 10/2014 CAMP Seminar, The University of Chicago  
 09/2014 Analysis Seminar, Sun Yat-Sen University, Guangzhou, China  
 09/2013 CAMP Seminar, The University of Chicago  
 05/2013 Oxford-Man Institute, Oxford University  
 01/2013 Pontificia Universidad Catolica de Chile, Santiago, Chile  
 12/2012 Seminar on mathematical methods of imaging, ENS Paris  
 11/2011 Journée de rentrée d'analyse, ENS Paris  
 10/2011 Seminar on mathematical methods of imaging, ENS Paris  
 11/2010 Numerical Analysis Seminar, University of Texas at Austin

## Conferences and Workshops

- 12/2020 Workshop on “*Analysis and Computations in Mathematical Material Science*”, Tianyuan Mathematical Center in Central China and Wuhan University, Online conference, Wuhan, China **(Invited speaker)**
- 01/2020 “*SUSTech PDE Workshop and Forum*”, Southern University of Science and Technology, Shenzhen, China **(Invited speaker)**
- 11/2019 Mini-workshop on “*Inverse Problems*”, Central South University, Changsha, China **(Invited speaker)**
- 07/2019 International Workshop on “*PDE modelling and analysis in Bioscience and Complex Media*”, Tsinghua Sanya International Mathematics Forum, Sanya, China **(Organizer)**
- 07/2019 International Workshop on “*New Trends in Hamilton-Jacobi*”, Fudan University, Shanghai **(Invited speaker)**
- 06/2019 International Conference on “*Recent Progress in Nonlinear PDEs*”, Beihang University, Beijing **(Invited speaker)**
- 06/2019 The 8th *International Congress of Chinese Mathematicians* Tsinghua University, Beijing **(Invited speaker)**
- 05/2019 Peking-Chengdu Conference on PDEs, Chengdu, China **(Invited speaker)**
- 08/2018 The 4th *Workshop on Differential Geometry and Differential Equations*, Suzhou, China. **(Invited speaker)**
- 07/2018 The 12th *AIMS International Conference on Dyn. Syst., Diff. Equations and Applications*, Taipei, Taiwan. **(Minisymposium speaker)**
- 06/2018 International workshop on “*Kinetic theory and Related Topics*”, Tsinghua Sanya International Mathematics Forum, Sanya, China. **(Invited speaker)**
- 06/2018 *Joint International Meeting of the CMS and the AMS*, Fudan University, Shanghai, China. **(Minisymposium speaker)**
- 03/2018 Workshop on “*Inverse problems, Imaging and PDEs*”, IAS of Hong Kong University of Science and Technology, Hong Kong. **(Invited speaker)**
- 10/2017 Workshop on “*Geometry, Analysis and Probability*”, BICMR, Peking University, Beijing. **(Invited speaker)**
- 10/2017 Workshop on “*Hypocoercivity and sensitivity analysis in kinetic equations and uncertainty quantification*”, University of Wisconsin at Madison, WI, USA. **(Invited speaker)**
- 10/2017 *Chinese Mathematical Society 2017 Annual Conference*, Xiangtan University, Hunan, China, **(Invited speaker)**
- 07/2017 RIMS Workshop on “*Viscosity solution approach to asymptotic problems in front propagation, dynamical system and related topics*”, Kyoto University, Japan, **(Invited speaker)**
- 05/2017 The 9th *Applied Inverse Problems Conference*, Hangzhou, China, **(Minisymposium speaker)**
- 10/2016 Workshop on “*Mini-workshop on Homogenization Theory*” Peking University, Beijing, **(Invited speaker)**

- 08/2016 The 7th *International Congress of Chinese Mathematicians*  
Chinese Academy of Sciences, Beijing **(Invited speaker)**
- 07/2016 Workshop on *Hamilton-Jacobi Equations*  
Fudan University, Shanghai **(Invited speaker)**
- 07/2016 The 11th AIMS International Conference on Dyn. Syst., Diff. Equations and Applications,  
Orlando, FL **(Minisymposium speaker)**
- 08/2015 International Congress on Industrial and Applied Mathematics, Beijing  
**(Minisymposium speaker)**
- 07/2015 BIRS workshop on “*Developments in the Theory of Homogenization*”, Banff  
**(Invited speaker)**
- 07/2014 Minisymposium on “*Wave propagation and Imaging in Random Media*”  
SIAM annual meeting, Chicago **(Minisymposium speaker)**
- 07/2013 The 7th Applied Inverse Problem Conference, Daejeon, Korea **(Minisymposium speaker)**
- 04/2013 Workshop on “*Randomness and Partial Differential Equations*”, Université de Nantes
- 04/2013 *Perspectives in Analysis and Probability: Opening conference*, Université de Rennes
- 04/2013 Workshop on “*Interplay of Theory and Numerics for Deterministic and Stochastic Homogenization*”, Oberwolfach **(Invited speaker)**
- 01/2013 Workshop on “*Coupled-Physics Inverse Problems*”  
Center of Modelamiento Matematico, Santiago, Chile **(Invited speaker)**
- 11/2011 Workshop on “*Imaging, wave propagation in complex media, and optimal control under uncertainties*”, Ecole Normale Supérieure, Paris
- 12/2011 Workshop on “*Multiple scattering in correlated disorder*”, Institut Henri Poincaré, Paris
- 09/2011 Workshop on “*Inverse problems and applications*”, Ecole Polytechnique, Palaiseau
- 03/2011 BIRS workshop on “*Stochastic Multiscale Methods*”, Banff **(Invited speaker)**
- 01/2011 IPAM workshop on “*Random Media: Homogenization and Beyond*”, UCLA
- 01/2010 *Joint Mathematics Meetings*, San Francisco
- 06/2009 AMS Mathematics Research Communities summer school on “*Inverse problems*”  
Snowbird, UT

## Teaching Experience

At Tsinghua University

## **I. Undergraduate level**

<i>Linear Algebra</i>	Fall 2019, Fall 2020
<i>Probability</i> (co-teaching with Professor Hao WU)	Spring 2019
<i>Applied Analysis</i>	Spring 2019
<i>Mathematical Analysis - I</i> (assistant teacher to Professor Pin YU)	Fall 2018
<i>Linear Algebra - I</i>	Fall 2017

## **II. Graduate level**

<i>Topics in Applied PDEs</i>	Spring 2020
<i>Introduciton to the Theory of Homogenization</i>	Spring 2017
<i>Kinetic Limits for Waves in Random Media</i>	Spring 2018

## **At University of Chicago**

### **I. Undergraduate level**

Math 195 <i>Mathematical Methods for Social Science</i>	Winter 2014
Math 196 <i>Linear Algebra</i>	Fall 2013
Math 200 <i>Mathematical Methods for Physical Science 1</i>	Winter 2014
Math 201 <i>Mathematical Methods for Physical Science 2</i>	Spring 2014
Math 203 <i>Analysis in <math>\mathbb{R}^n</math> - 1</i>	Fall 2014, Fall 2015
Math 204 <i>Analysis in <math>\mathbb{R}^n</math> - 2</i>	Winter 2015
Math 205 <i>Analysis in <math>\mathbb{R}^n</math> - 3</i>	Fall 2014, Spring 2016

## **At Columbia University**

### **I. Undergraduate level**

Teaching assistant for <i>Numerical Methods</i>	Spring 2007, Spring 2008
Teaching assistant for <i>Introduction to Dynamical Systems</i>	Fall 2007, Fall 2008
Teaching assistant for <i>Partial Differential Equations</i>	Fall 2006
Teaching assistant for <i>Functions of one complex variable</i>	Fall 2006

### **II. Graduate level**

Teaching assistant for <i>Analytic Methods for PDE's</i>	Spring 2007, Spring 2008
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## **Service Activities**

**Referee** for the following journals:

Ann. Inst. H. Poincaré Anal. Non Linéaire  
Ann. Math. Sci. & Appl.  
Asymptotic Analysis  
Contemporary Mathematics  
Commun. Math. Sci.

CPAM  
CPDE  
Inventiones Mathematicae  
Inverse Problems  
Inverse Problem in Science & Engineering  
JAMS  
J. Comput. Appl. Math.  
J. Differential Equations  
J. Mathematics Pures & Appl.  
Math. Model. Numer. Anal.  
Networks and Heterogeneous Media  
Nonlinearity  
Proc. R. Soc. A  
Rocky Mountain Journal of Mathematics  
SIAM Multiscale Model. Simul.  
SIAM Review

## **Personal Information**

Born on March 18, 1984. Citizen of China. Married, no children.

# List of Publications

## Papers and preprints

1. F. Feppon and W. Jing, High order homogenized Stokes models capture all three regimes. HAL-03098222, Preprint (2021), *submitted*.
2. W. Jing, Layer potentials for Lamé systems and homogenization of perforated elastic medium with clamped holes. arXiv:2007.03333, *Calculus of Variations & PDEs.*, **60** (2021), Paper No.2.
3. W. Jing, H. V. Tran and Y. Yu. Effective fronts of polytope shapes. arXiv:1909.11067, *Minimax Theory Appl.*, **5** (2020), no.2, 347—360.
4. W. Jing, H. Mitake and H. V. Tran. Generalized ergodic problems: existence and uniqueness structures of solutions. arXiv:1902.05034, *Journal of Differential Equations*, **268** (2020), no. 6, 2886–2909.
5. W. Jing. A unified homogenization approach for the Dirichlet problem in perforated domains. arXiv:1901.08251, *SIAM J. Math. Anal.*, **52** (2020), no.2, 1192–1220.
6. W. Jing, O. Pinaud. A backscattering model based on corrector theory of homogenization for the random Helmholtz equation. *DCDS-B*, **24** (2019), no.10, 5377–5407.
7. W. Jing, H. V. Tran and Y. Yu. Inverse problems, non-roundedness and flat pieces of the effective burning velocity from an inviscid quadratic Hamilton-Jacobi model. *Nonlinearity*, **30** (2017), no. 5, 1853–1875..
8. W. Jing, P. E. Souganidis and H. V. Tran. Stochastic homogenization of viscous superquadratic Hamilton-Jacobi equations in dynamic random environment. *Research Math. Sci.*, **4** (2017), Paper No. 6, 20pp.
9. W. Jing, P. E. Souganidis and H. V. Tran. Homogenization of interfaces moving in spatially random temporally periodic environment. Preprint 2016, mathscidoc:1806.03001,
10. G. Bal and W. Jing, Fluctuations in the homogenization of semilinear equations with random potential. *Comm. Partial Differential Equations*, **41** (2016), no. 12, 1839–1859.
11. W. Jing, Limiting distribution of homogenization error in periodic diffusion with random potentials. *Analysis & PDE.*, **9** (2016), no. 1, 193–228.
12. W. Jing, P. E. Souganidis and H. V. Tran. Large time average of reachable sets and applications to homogenization of interfaces moving with oscillating spatio-temporal velocity. *Discrete Contin. Dyn. Syst. - S*, **11** (2018), no. 5, 915–939.
13. W. Jing, Stochastic homogenization of randomly deformed conductivity resistant membranes. *Commun. Math. Sci.*, **14** (2016), no. 5, 1237–1268.
14. H. Ammari, J. Garnier, L. Giovangigli, W. Jing and J.K. Seo. Spectroscopic imaging of a dilute cell suspension, *J. Math. Pures Appl.*, **105** (2016), no. 5, 603–661.
15. H. Ammari, E. Bretin, J. Garnier, W. Jing, H. Kang and A. Wahab. Localization, stability and resolution of topological derivative based imaging functionals in elasticity. *SIAM J. Imaging Sci.*, **6** (2013), no. 4, 2174–2212.

16. H. Ammari, J. Garnier and W. Jing. Passive array correlation based imaging in a weakly random waveguide. *Multiscale Model. Simul.*, **11** (2013), no. 2, 656–681.
17. G. Bal and W. Jing. Corrector Analysis of a Heterogeneous Multi-scale Scheme for Elliptic Equations with Random Potential. *Math. Model. Numer. Anal. (M2AN)*, **48** (2014), no. 2, 387–409.
18. H. Ammari, E. Bossy, J. Garnier, W. Jing and L. Seppecher. Radiative transfer and diffusion limits for wave field correlations in locally shifted random media. *J. Math. Phys.*, **54** (2013), 021501.
19. H. Ammari, T. Boulier, J. Garnier, W. Jing, H. Kang, and H. Wang. Target identification using dictionary matching of Generalized Polarization Tensors. *Found. Comput. Math.*, **14** (2014), no. 1, 27–62.
20. H. Ammari, J. Garnier, W. Jing and L. Nguyen. Quantitative thermo-acoustic imaging: an exact formula. *J. Differential Equations*, **254** (2013), no. 3, 1375–1395.
21. H. Ammari, J. Garnier and W. Jing. Resolution and stability analysis in acousto-electric imaging. *Inverse Problems*, **28** (2012), 084005, 20 pp.
22. G. Bal, J. Garnier, Y. Gu and W. Jing. Corrector theory for elliptic equations with long-range correlated random potentials. *Asymptotic Analysis*, **77** (2012), no. 3-4, 123-145.
23. G. Bal and W. Jing. Corrector theory for MsFEM and HMM in random media. *Multiscale Model. Simul.*, **9** (2011), no. 4, 1549-1587.
24. G. Bal and W. Jing. Corrector theory for elliptic equations in random media with singular Green’s function. *Commun. Math. Sci.*, **9** (2011), no. 2, 383-411.
25. G. Bal and W. Jing. Homogenization and corrector theory for linear transport in random media. *Discrete Contin. Dyn. Syst.*, **28**(2010) no. 4, 1311-1343.
26. G. Bal and W. Jing. Fluctuation theory for radiative transfer in random media. *Journal of Quantitative Spectroscopy and Radiative Transfer*, **112** (2011), no. 4, 660-670.

### Book

27. H. Ammari, J. Garnier, W. Jing, Hyeonbae Kang, Mikyoung Lim, Knut Sølna, Han Wang *Mathematical and Statistical Methods for Multistatic Imaging*. Lecture Notes in Mathematics, Volume 2098, Springer-Verlag, Cham, 2013.

### Book chapter

28. G. Bal, W. Jing and O. Pinaud, *Uncertainty modeling and propagation in linear kinetic equations*, Preprint 2017, submitted.

### Conference proceedings

29. *On the homogenization of a front propagation model in oscillatory environments*, Proceedings of the 8th ICCM, submitted.