Curriculum Vitae

WENJIA JING

Yau Mathematical Sciences Center
Tsinghua University
No.1 Tsinghua Yuan
Beijing 100084, China

Phone: +86 135-0104-7975
Email: wjjing@tsinghua.edu.cn
ORCID iD: 0000-0001-8860-6880
https://wjingmath.github.io/index.html

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

12/2022–present	Associate Professor, Tsinghua University, Beijing, China
09/2016–12/2022	Assistant Professor, Tsinghua University, Beijing, China
06/2021–present	Adjunct Faculty, BIMSA, Beijing, China
09/2013–08/2016	L.E. Dickson Instructor, The University of Chicago (Mentor: Panagiotis E. Souganidis)
09/2011–08/2013	Postdoctoral Researcher, Ecole Normale Supérieure Paris (Mentor: Habib Ammari, Josselin Garnier)

Grant and Awards

Invited speaker (45 minutes talk) in the 9th ICCM, 2022

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

Invited speaker (45 minutes talk) in the 8th ICCM, 2019

ICCM distinguished paper award, 2017

Invited speaker (45 minutes talk) in the 7th ICCM, 2016

Seminars

10/2023 Applied Math Colloquuim, ETH Zürich, *Switzerland*

07/2023 PDEs Seminar, University of Chinese Academy of Sciences, Beijing

03/2023 PDEs Seminar, Morningside Center of Mathematics, CAS, Beijing

12/2022 Math Colloquuim, Lanzhou University, *Online*

12/2021 Applied Math Seminar, Shanghai Jiao Tong University, *Online*

08/2021 PDEs Seminar, Anhui University, *Online*

04/2021 PDEs Seminar, Nanjing Normal University, Nanjing

11/2020 PDEs Seminar, Beihang University, Beijing

11/2019 Analysis and PDEs Seminar, The University of Tokyo, *Japan*

04/2019 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

10/2023 The 21st "*CSIAM Annual Meeting*", Yunnan, China **(Invited speaker)**

08/2023 "*Beijing-Osaka joint workshop for PDEs and related topics*", Osaka University, *Japan* **(Invited speaker)**

08/2023 The 10th "*International Congress on Industrial and Applied Mathematics*", Tokyo, *Japan* **(Invited speaker)**

05/2021 International Conference on "*PDEs Related to Material Science*", Beijing Normal Univ., Online conference, China **(Invited speaker)**

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

Analysis - 2	Spring 2023, Spring 2024
Analysis - 1	Fall 2022, Fall 2023
Probability Theory - I	Spring 2022
Linear Algebra	Fall 2019, Fall 2020 Fall 2021
Probability Theory - I (co-teaching with Hao WU)	Spring 2019
Applied Analysis	Spring 2019
Mathematical Analysis - I (assistant teacher to Pin YU)	Fall 2018
Linear Algebra - I	Fall 2017

II. Graduate level

Topics in Applied PDEs: Elliptic PDEs and inverse problems	Spring 2020
Topics in Applied PDEs: Control theory of PDEs (co-teaching with Long JIN)	Spring 2021
Introduciton to the Theory of Homogenization	Spring 2017
Kinetic Limits for Waves in Random Media	Spring 2018

At University of Chicago

I. Undergraduate level

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

Students and Postdoctors

Graduate student

- Xin FU, 2020-now
- Yuanhang LIU, 2023-now
- Yuxin DU, 2023-now
- Beichen WANG, 2023-now

Postdoctoral ressearcher

- Yiping ZHANG, 2021-2023 (now lecturer in Central China Normal University)
- Qi ZHANG, 2022-now

Undergraduate students

- Yuanhang LIU, undergraduate thesis, 2023.
- Yixin LIN, undergraduate thesis, 2023.
- Jialiang ZHOU, undergraduate thesis, 2021.
- Zhiqiang YANG, undergraduate thesis, 2020.
- Xin FU, undergraduate thesis, 2020.
- Sylvain WOLF, summer internship, 2018.
- Anna SONG, summer internship, 2018.

Service Activities

⋆ **Referee** for the following journals:

· Ann. IHP Anal. Non Linéaire
· Ann. Math. Sci. & Appl.
· Asymptotic Analysis
· Cal. Var. & PDEs
· Commun. Math. Sci.
· Comm. PDEs
· Comm. Pure Appl. Math.
· Comput. Methods Appl. Math.
· Contemp. Math.
· IEEE Trans. Image Process.
· Invent. Math.
· Inverse Problems
· Inverse Probl. Sci. Eng.
· J. Amer. Math. Soc.
· J. Differential Equations
· J. Functional Analysis
· J. Math. Pure Appl.
· Math. Methods Appl. Sci.
· Math. Model. Numer. Anal.
· Netw. Heterog. Media
· Nonlinearity
· Proc. R. Soc. A
· Rocky Mountain J. Math.
· SIAM J. Appl. Math.
· SIAM Multiscale Model. Simul.
· SIAM Review

⋆ **Organizer** for the following workshop and conference minisymposiums:

· International workshop on "PDE modelling and analysis in Bioscience and Complex Media"

⋆ **Organizer** of the *Applied Analysis Seminar* in YMSC, Tsinghua University. 9/2021– present.

⋆ **Member** and **chief secretary** of the scientific committee of the *Tsinghua Sanya International Mathematics Forum*, 2/2023–present.

Personal Information

Born on March 18, 1984. Citizen of China. Married, one child.

List of Publications

Papers and preprints

1. W. Jing and Y. Zhang. On the periodic homogenization of elliptic equations in non-divergence form with large drifts. arXiv:2302.01157, *Multiscale Modeling & Simulations*, to appear.

2. X. Fu and W. Jing. Uniform convergence for linear elastostatic systems with periodic high contrast inclusions. arXiv:2207.05367, Preprint (2022), *submitted*.

3. W. Jing, H. V. Tran and Y. Yu. Effective fronts of polygon shapes in two dimensions. arXiv:2112.10747, *SIAM J. Math. Anal.*, to appear.

4. W. Jing, Convergence rate for the homogenization of stationary diffusions in dilutely perforated domains with reflecting boundaries. arXiv:2108.08533, *Minimax Theory Appl.*, **8** (2023), no.1, 85–108.

5. W. Jing, Y. Lu and C. Prange. Stokes potentials and applications in homogenization problems in perforated domains, Preprint (2021), *submitted*.

6. F. Feppon and W. Jing, High order homogenized Stokes models capture all three regimes. *SIAM J. Math. Anal.*, **54** (2022), no.4, 5013–5040.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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.

12. 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..

13. 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.

14. W. Jing, P. E. Souganidis and H. V. Tran. Homogenization of interfaces moving in spatially random temporally periodic environment. Preprint 2016, mathscidoc:1806.03001,

15. 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.

16. W. Jing, Limiting distribution of homogenization error in periodic diffusion with random potentials. *Analysis & PDE.*, **9** (2016), no. 1, 193–228.

17. 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.

18. W. Jing, Stochastic homogenization of randomly deformed conductivity resistant membranes. *Commun. Math. Sci.*, **14** (2016), no. 5, 1237–1268.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. 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.

25. 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.

26. H. Ammari, J. Garnier and W. Jing. Resolution and stability analysis in acousto-electric imaging. *Inverse Problems*, **28** (2012), 084005, 20 pp.

27. 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.

28. G. Bal and W. Jing. Corrector theory for MsFEM and HMM in random media. *Multiscale Model. Simul.*, **9** (2011), no. 4, 1549-1587.

29. 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.

30. 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.

31. 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

32. 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

33. G. Bal, W. Jing and O. Pinaud, *Uncertainty modeling and propagation in linear kinetic equations*, SEMA-SIMAI Springer Ser., 14, pp. 59–92. Springer, Cham 2017.

Conference proceedings

34. *On the homogenization of a front propagation model in oscillatory environments*, Proceedings of the 8th ICCM, to appear.