

# Qian Wang

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## Education

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### Ph.D. in Mathematics, Princeton University, September 2006

Advisor: Professor Sergiu Klainerman

Dissertation: Causal Geometry of Einstein Vacuum Spacetimes

### Bachelor of Science in Mathematics, Nanjing University, 2001

## Research Interests

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Partial Differential Equations, Geometric Analysis, Mathematical Relativity

## Professional Experience

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September 2006 - August 2007: Visiting Postdoc in Department of Mathematics, Stanford University

September 2007 - August 2010: Simons instructor, Department of Mathematics, Stony Brook University

October 2010 - September 2012: Postdoc in Max Planck Institute for Gravitational Physics

February 2011 - May 2011: Visiting Postdoc in IHES

September 2012: Associate professor, Oxford Center for Nonlinear PDE, Mathematical Institute, University of Oxford

## Publications

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- Q. Wang, Causal geometry of Einstein vacuum spacetimes. Ph.D thesis, Princeton University 2006.
- Q. Wang, On the geometry of null cones in Einstein Vacuum Spacetimes, *Ann. Inst. H. Poincaré Anal. Non Linéaire*, 26 (2009), no. 1, 285–328.
- Q. Wang, Improved breakdown criterion for Einstein vacuum equation in CMC gauge, *Comm. Pure Appl. Math*, 65 (2012), Issue 1, 0021–0076.
- Q. Wang, On Ricci coefficients of null hypersurfaces with time foliation in Einstein vacuum space-time: Part I, *Calculus of Variations and Partial Differential Equations*, 46 (2013), Issue 3-4, pp 461–503.
- Q. Wang, On Ricci coefficients of null hypersurfaces with time foliation in Einstein vacuum space-time: Part II, *Preprint*. (see arXiv:1006.5963)
- Q. Wang, Rough solutions of Einstein vacuum equations in CMCSH gauges, *Communications in Mathematical Physics*, 328 (2014), Issue 3, 1275–1340.

- Q. Wang, Breakdown criteria of Einstein equations in CMC gauge, *XVIIth International Congress on Mathematical Physics*, 392–399, World Sci. Publ., Hackensack, NJ 2014.
- Q. Wang, Rough Solution of Einstein vacuum equation in CMCSH gauge, *Mathematisches Forschungsinstitut Oberwolfach Report No. 37/2012, Mathematical Aspects of General Relativity*, pp.2321-2324, (DOI: 10.4171/OWR/2012/37)
- Q. Wang, Causal geometry of rough Einstein CMCSH spacetime *Journal of Hyperbolic Differential Equations*, 11 (2014), No. 3, 563–601.
- Q. Wang, A geometric approach for sharp local well-posedness of quasilinear wave equations, *Annals of PDE*, 3 (2017), no. 1, 108 pages. (arXiv:1408.3780v1, 2014)
- Q. Wang, An intrinsic hyperboloid approach for Einstein Klein-Gordon equations, 80 pages, arXiv: 1607.01466v1, 2016, accepted by Journal of Differential Geometry, 3 July, 2018
- Q. Wang, A geometric perspective of method of descent. *Communications in Mathematical Physics* 360(3):827-850, Jun 2018
- S. Klainerman, Q. Wang, and S. Yang, Global solution for massive Maxwell-Klein-Gordon equations, arXiv: 1801.10380, 40 pages. Accepted by Communications on Pure and Applied Mathematics, Oct 3, 2018.
- Q. Wang, On the exterior stability of nonlinear wave equations. 70 pages, arxiv:1808.02415, submitted
- A. Fang, Q. Wang and S. Yang, Global solution for Massive Maxwell-Klein-Gordon equations with large Maxwell field. Preprint 2019, 47 pages.

## Invited Talks

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Invited to give seminar talks in various universities and institutes, including home institutes, Institut Henri Poincaré, Jussieu at Paris, Oberwolfach, Princeton University, various universities in Europe including Cambridge, Imperial College London, Edinburgh, Warwick, EPFL, etc, as well as Shanghai Jiaotong university and Peking University in China. Some of the talks are listed below.

- September, 2013, an invited talk at women program in general relativity in MSRI
- September, 2014, a talk on the Sharp local well-posedness of quasilinear wave equations in the Analysis seminar at Princeton University
- January, 2015, an invited talk on global solution of Einstein massive scalar fields, in Simons Center Program at Stony Brook: Mathematical Problems in General Relativity
- November 17, 2015, plenary talk in the conference “ A celebration of the 100th anniversary of general relativity” at Institut Henri Poincar, Paris.
- February, 2016, a talk in Cambridge HEP/GR Colloquium
- May 15-20 2016, a minicourse in Oberwolfach Seminar: Recent Advances on the Global Nonlinear Stability of Einstein Spacetimes
- Invited speaker in international Conference on Nonlinear Waves and General Relativity, 13-15 December 2017 at The Chinese University of Hong Kong (cancelled)

- April, 2018, a talk in the meeting of UK Network on Hyperbolic Equations and Related, ICMS, University of Edinburgh
- Invited to the program in Institut Mittag-Leffler, October 2019