

# Qihuai Liu

## Curriculum Vitae

No.1, Jinji Road, Guilin  
541004 Guangxi, China  
☎ (+86) 18290063009  
✉ qhuailiu@gmail.com



### Education

- 1998.9–2002.6 Bachelor Degree in Mathematics and Applied Mathematics - Xiangtan University  
2006.9–2011.6 PhD Degree in Mathematics - Soochow University

### Work Experience

- 2015.7–present **Professor**, *Differential Equations and Dynamical Systems Group, School of Mathematics and Computing Science.*  
Guilin University of Electronic Technology (From 2017, Professor)
- 2013.9–2015.6 **Post-doctoral**, *School of Mathematical Sciences.*  
Fudan University
- 2011.7–2013.8 **Associate Professor**, *Differential Equations and Dynamical Systems Group, School of Mathematics and Computing Science.*  
Guilin University of Electronic Technology (From 2012, Associate Professor)
- 2002.7–2006.8 **Junior Lecturer**, *Department of Computer Science.*  
Guilin University of Aerospace Technology

### Professional Interests

Qualitative Theory of Differential Equations; (Contact) Hamiltonian Dynamical Systems; Recurrence and Stability; Nonlinear oscillations of physical and biological models

### Publications

#### Journals

- "Bo, Xiaomeng; Liu, Qihuai; Liu, Wenye; ", Stability and exact periodic solutions of indefinite equations arising from the Kepler problem on the sphere, **Partial Differential Equations and Applications**, 2, 4, 1-14, 2021, Springer.
- "Li, Mengyuan; Liu, Qihuai; Zhang, Kelei; ", Modulated amplitude waves for two-color vector-soliton in nematic liquid crystals in the local response regime, **Engineering Letters**, 29, 2, EL-29-2-28, 2021.

- "Mo, Y; Liu, Q; ", Quasi Sure Strassen's Law of the Iterated Logarithm for Increments of FBM in Holder norm, **Journal of Contemporary Mathematical Analysis**, 56, 1, 66-80, 2021.
- "Liu, Qihuai; Torres, Pedro J; ", Stability of motion induced by a point vortex under arbitrary polynomial perturbations, **SIAM Journal on Applied Dynamical Systems**, 20, 1, 149-164, 2021, Society for Industrial and Applied Mathematics
- "Wang, Chao; Liu, Qihuai; Wang, Zhiguo; ", Periodic bouncing solutions for Hill's type sub-linear oscillators with obstacles, **Communications on Pure & Applied Analysis**, 20, 1, 281, 2021, American Institute of Mathematical Sciences
- "Chen, Yufei; Liu, Qihuai; Su, Heng; ", Generalized Hamiltonian forms of dissipative mechanical systems via a unified approach, **Journal of Geometry and Physics**, 160, 103976, 2021, North-Holland
- "Li, Zhanyong; Liu, Qihuai; Zhang, Kelei; ", Periodic solutions of nonlinear differential systems by the method of averaging, **Applications of Mathematics**, 65, 4, 511-542, 2020, Springer Berlin Heidelberg
- "Li, Xia; Liu, Qihuai; ", A novel result on regularity of time-periodic Lagrangians, **Mathematical Methods in the Applied Sciences**, 43, 11, 6968-6975, 2020.
- "Huang, Y., Jia, L., Sun, X., & Li, Z.; ", Stable and unstable periodic solutions for quadratic contact Hamiltonians with a small parameter, **Journal of Physics: Conference Series**, 2019, 2019, 1-10, 2019, IOP Publishing
- "Sun, Xiyang; Liu, Qihuai; Qian, Dingbian; Zhao, Na; ", Infinitely many subharmonic solutions for nonlinear equations with singular  $\phi$ -Laplacian., **Communications on Pure & Applied Analysis**, 19, 1, 279-292, 2020, doi: 10.3934/cpaa.20200015
- "WANG, Chao; LIU, Qihuai; QIAN, Dingbian; WANG, Zhiguo; ", A topological theorem and its application to the superlinear oscillations including impulses
- "Liu, Qihuai; Torres, Pedro J; Xing, Mingyan; ", Modulated amplitude waves with non-trivial phase of multi-component Bose-Einstein condensates in optical lattices, **IMA Journal of Applied Mathematics**, 84, 1, 145-170, 2019, Oxford University Press
- "Liu, Qihuai; Cai, Luocheng; ", Averaging methods for nonlinear systems with a small parameter via reduction and topological degree, **Nonlinear Analysis: Real World Applications**, 2019, 45, 461-471, 2019, Elsevier
- "Li, Zhanyong; Liu, Qihuai; Zhang, Kelei; ", Harmonic motions of a weakly forced autoparametric vibrating system, **Journal of Physics: Conference Series**, 2018, 1053, 012088, 2018, iopscience.iop.org/article/10.1088/1742-6596/1053/1/012088
- "Liu, Qihuai; Liu, Wenye; Torres, Pedro J; Huang, Wentao; ", Periodic dynamics of a derivative nonlinear Schrödinger equation with variable coefficients, **Applicable Analysis**, 99, 3, 407-427, 2020, Taylor & Francis
- "Liu, Qihuai; Torres, P. J.; Wang, Chao; ", "Contact Hamiltonian dynamics: Variational principles, invariants, completeness and periodic behavior", **Annals of Physics**, 395, 261-344, 2018,
- "Tang, H.; Xing, M.; Liu, Q.; Jiang, G.; ", On the periodic orbits of four-particle time-dependent FPU chains, **Advances in Mathematical Physics**, 2018, 2018, 1-13, 2018, hindawi

- "Liu, Qihuai; Huang, Lukai; Jiang, Guirong; ", Periodic oscillations of the relativistic pendulum with friction, **Electronic Journal of Differential Equations**, 2017, 40, 1-10, 2017
- "Liu, Qihuai; Torres, Pedro J; Qian, Dingbian; ", "Periodic, quasi-periodic and unbounded solutions of radially symmetric systems with repulsive singularities at resonance", **Nonlinear Differential Equations and Applications NoDEA**, 22, 5, 1115-1142, 2015, Springer Basel
- "Liu, Qihuai; Wang, Kaizhi; Wang, Lin; Yan, Jun; ", A necessary and sufficient condition for convergence of the Lax-Oleinik semigroup for reversible Hamiltonians on  $\mathbb{R}^n$ , **Journal of Differential Equations**, 261, 10, 5289-5305, 2016, Academic Press
- "Liu, Qihuai; Li, Xia; Qian, Dingbian; ", An abstract theorem on the existence of periodic motions of non-autonomous Lagrange systems, **Journal of Differential Equations**, 261, 10, 5784-5802, 2016, Elsevier
- "Wang, Xuelei; Liu, Qihuai; Qian, Dingbian; ", Existence and multiplicity results for some nonlinear problems with singular  $\Delta$ -Laplacian via a geometric approach, **Boundary Value Problems**, 2016, 1, 1-27, 2016, SpringerOpen
- "C. Wang, D. Qian, Q. Liu; ", Impact oscillators of Hill's type with indefinite weight: Periodic and chaotic dynamics, **Discrete and Continuous Dynamical Systems**, 36, 2305-2334, 2016
- "Liu, Qihuai; Li, Xinxiang; Yan, Jun; ", Large time behavior of solutions for a class of time-dependent Hamilton-Jacobi equations, **Science China Mathematics**, 59, 5, 875-890, 2016, Science China Press
- "Liu, Qihuai; Xing, Mingyan; Li, Xinxiang; Wang, Chao; ", Unstable and exact periodic solutions of three-particles time-dependent FPU chains, **Chinese Physics B**, 24, 12, 120401-120401, 2015
- "Long, Tengfei; Jiang, Guirong; Liu, Qihuai; ", The dynamics of an SIS epidemic model with birth pulses and pulse treatments at different moments, **Proceedings of the Romanian Academy Series A-Mathematics Physics Technical Sciences Information Science**, 16, 2, 235-242, 2015, EDITURA ACAD ROMANE
- "Wang, C.; Liu, Q.; Qian, D.; Wang, Z.; ", A topological theorem and its application to the superlinear equations including impulses for the existence of periodic solutions, **Science China Mathematics**, 44, 9, 957-968, 2014, Science China Press
- "Zhu, W.; Chen, A; Liu, Q.; ", "Periodic wave, solitary wave and compacton solutions of a nonlinear wave equation with degenerate dispersion", **Communications in Theoretical Physics**, 63, 1, 57, 2015, IOP Publishing
- "Liu, Qihuai; Wang, Chao; Wang, Zhiguo; ", On Littlewood's boundedness problem for relativistic oscillators with anharmonic potentials, **Journal of Differential Equations**, 257, 12, 4542-4571, 2014, Academic Press
- "Liu, Qihuai; Guo, Yishuang; Tang, Hongwu; ", Complete Orbits for Twist Maps with Exponential Generating Functions, **Advanced Nonlinear Studies**, 14, 2, 375-391, 2014, **Advanced Nonlinear Studies**, Inc.
- "Fu, H; Tang, Y; Tang, S; Yan, H; Liu, Q; ", "Peaked and smooth solitons for  $K^*(3, 1)$  equation", **Indian Journal of Physics**, 88, 1, 83-91, 2014, Springer India

- "Liu, Qihuai; Qian, Dingbian; Wang, Zhiguo; ", Quasi-periodic solutions of the Lotka-Volterra competition systems with quasi-periodic perturbations, 2011
- "Jia, Leilei; Liu, Qihuai; Ma, Zhongjun; ", A good approximation of modulated amplitude waves in Bose-Einstein condensates, **Communications in Nonlinear Science and Numerical Simulation**, 19, 8, 2715-2723, 2014, Elsevier
- "Jia, Leilei; Liu, Qihuai; Tang, Shengqiang; ", Dynamics of Bose-Einstein condensates: Exact representation and topological classification of coherent matter waves, **Abstract and Applied Analysis**, 2014, 2014, Hindawi
- "Liu, Qihuai; Qian, Dingbian; ", Nonlinear dynamics of differential equations with attractive/repulsive singularities and small time-dependent coefficients, **Mathematical Methods in the Applied Sciences**, 36, 2, 227-233, 2013, Wiley Online Library
- "Liu, Qihuai; Qian, Dingbian; Zhiguo Wang; ", Quasi-periodic solutions of the Lotka-Volterra competition systems with quasi-periodic perturbations. **Discrete & Continuous Dynamical Systems-Series B**, 2012, 17(5): 1537-1550.
- "Liu, Qihuai; Qian, Dingbian; ", Construction of modulated amplitude waves via averaging in collisionally inhomogeneous Bose-Einstein condensates, **Journal of Nonlinear Mathematical Physics**, 19, 2, 255-268, 2012, Taylor & Francis Group
- "Liu, Qihuai; Qian, Dingbian; ", Modulated amplitude waves with nonzero phases in Bose-Einstein condensates, **Journal of Mathematical Physics**, 52, 8, 082702, 2011, American Institute of Physics
- "Wang, Zhiguo; Liu, Qihuai; Qian, Dingbian; ", Existence of quasi-periodic solutions and Littlewood's boundedness problem of sub-linear impact oscillators, **Nonlinear Analysis: Theory, Methods & Applications**, 74, 16, 5606-5617, 2011, Pergamon
- "Liu, Qihuai; Qian, Dingbian; Chu, Bin; ", Nonlinear systems with singular vector Laplacian under the Hartman-type condition, **Nonlinear Analysis: Theory, Methods & Applications**, 74, 8, 2880-2886, 2011, Pergamon
- "Liu, Qihuai; Wang, Zhiguo; ", Periodic impact behavior of a class of Hamiltonian oscillators with obstacles, **Journal of Mathematical Analysis and Applications**, 365, 1, 67-74, 2010, Academic Press
- "Liu, Qihuai; Qian, Dingbian; Wang, Zhiguo; ", The stability of the equilibrium of the damped oscillator with damping changing sign, **Nonlinear Analysis: Theory, Methods & Applications**, 73, 7, 2071-2077, 2010, Elsevier
- "Liu, Qihuai; Qian, Dingbian; Sun, Xiying; ", Coexistence of unbounded solutions and periodic solutions of a class of planar systems with asymmetric nonlinearities, **Bulletin of the Belgian Mathematical Society-Simon Stevin**, 17, 4, 577-591, 2010, The Belgian Mathematical Society

## Book

- Jiang Guirong, Liu Qihuai, Long Tengfei, Jiang Hui. **Bifurcation Chaos Theory of Impulsive Dynamical System and its Application**. Publisher: Science Press Publishing, Beijing ISBN: 9787030463937, 2015.
- Jiang Guirong, Liu Qihuai, Jiang Hui, Hui Xianfei. **Fundamentals of Dynamical system**, China Atomic Energy Press, Beijing, 2020.

---

## Projects

- CO-PI **Guangxi Science and Technology Development Plan Project, 2020AC19200**, Research on solutions of nonlinear singular elliptic equations on compact Riemannian manifolds (PI: Nanbo Chen), 2021-04 to 2024-03.
- CO-PI **Natural Science Foundation of Guangxi Province, 2018GXNSFAA138177**, Dynamics of impulsive differential game models (PI: Guirong Jiang), 2018-07 to 2021-07.
  - PI **National Natural Science Foundation of China, 11662001**, Weak KAM Theory and Large Scale Behavior of Hamiltonian Dynamical System, 2018-01 to 2021-12.
  - PI **Natural Science Foundation of Guangxi Province, 2014GXNSFFA198012**, Weak KAM Theory and Contact Hamiltonian system, 2017-05 to 2021-07.
- CO-PI **National Natural Science Foundation of China, 11662001**, Dynamics of nonsmooth systems under random and impulsive action (PI: Guirong Jiang), 2017-01 to 2020-12.
  - PI **China Postdoctoral Science Foundation (the first class funding), 2014M550210**, Long time behavior of solutions of Hamilton-Jacobi equation, 2014-03 to 2015-07.
- CO-PI **Natural Science Foundation of Guangxi Province, 2015GXNSFGA139004**, Differential dynamical system and Hamiltonian system (PI: Aiyong Chen), 2015-09 to 2019-08.
  - PI **Natural Science Foundation of Guangxi Province, 2014GXNSFBA118017**, Qualitative study of modulated amplitude waves in Bose-Einstein condensates, 2014-06 to 2017-5.
- CO-PI **Natural Science Foundation of Guangxi Province, 2014GXNSFBA118004**, Research on the self limiting element method for the Electrodiffusion model of biomolecular system (PI: Yang Ying), 2014-06 to 2017-05.
  - PI **National Natural Science Foundation of China, 11301106**, Nonlinear dynamics of Bose-Einstein condensates, 2014-01 to 2016-12.
- CO-PI **National Natural Science Foundation of China, 11261013**, Some symbolic computation problems for properties and bifurcation of singularities in differential systems(PI: Wentao Huang), 2013-01 to 2016-12.
  - PI **National Natural Science Foundation of China, 11226130**, Qualitative research of solutions for singular systems, 2013-01 to 2013-12.
- CO-PI **National Natural Science Foundation of China, 11071181**, Wave form of coupled oscillator chain(PI: Wenxin Qin), 2011-01 to 2013-12.

---

## Awards

- 2005 National First-class Award of China Undergraduate Mathematical Modeling Contest (instructor)
- 2011 The Excellent Doctoral Dissertation of Jiangsu Province
- 2014 Mathematical Reviews Reviewer of MathSciNet & Zentralblatt MATH
- 2016 Guangxi Third-class Award for Natural Sciences
- 2017 Winner of Guangxi outstanding youth fund
- 2020 National Second-class Award of China Undergraduate Mathematical Modeling Contest (instructor)