Shuqiang Zhu

Associate professor
School of Mathematics
Southwestern University of Finance and Economics
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Education

University of Victoria — Ph.D., Applied Mathematics, Sept 2013-July 2017
Victoria, BC — under the supervision of Florin Diacu

Sichuan University — M.A., Mathematics and Applied Mathematics, June 2013
Chengdu, China — under the supervision of Shiqing Zhang

Sichuan University — B.S., Mathematics and Applied Mathematics, June 2010
Chengdu, China

Academic Positions

University of Science and Technology of China — Assistant Professor, Sept 2017-2020
Hefei, Anhui, China

Southwestern University of Finance and Economics — Associate Professor, Sept 2020-
Chengdu, Sichuan, China

Visiting

Instituto Tecnológico Autónomo de México — March 2019-May 2020
Mexico City, Mexico — Advisor: E. Pérez-Chavela

Grants

National Natural Science Foundation of China, No. 11801537 2019-2021.

China Scholarship Council, Young Backbone Teachers' Overseas Research Program, No. [2018]10038, 2019-2020.

Teaching experience

University of Victoria

2013-2017,	Tutorial leaders for various math courses
2016, Fall	Introduction to Calculus

University of Science and Technology of China

2018, Spring	Linear Algebra

Instituto Tecnológico Autónomo de México

2019, Summer	Differential and Integral Calculus III
2019, Fall	Calculus II

Southwestern University of Finance and Economics

2021, Spring	Real analysis and complex analysis, Real analysis
2021, Fall	Calculus I, Ordinary differential equations
2022, Spring	Real analysis and complex analysis
2022, Fall	Ordinary differential equations
2023, Spring	Real analysis and complex analysis, Real analysis
2023, Fall	Calculus I
2024, Spring	Real analysis, Calculus II
2024, Fall	Calculus I
2025, Spring	Real analysis

Supervised students

Zhengyang Tang, Anqi Qi, Jiwei Gu (In process)

Current Research Interests

The subject of my work is the n-body problem, both the classical n- body problem in 3-dimensional Euclidean space, and the curved n-body problem in the 3-dimensional sphere and hyperbolic sphere. More precisely, my current interest mainly lies in the study of relative equilibria, the nonlinear stability of periodic orbits associated with relative equilibria, central configurations, and the study of the expansion orbits.

Published Papers

1. **S. Zhu***, Eulerian relative equilibria of the curved 3-body problems in $\mathbb{S}^2$, Proc. Amer. Math. Soc. 142 (2014), no. 8, 2837-2848.
2. **S. Zhu***, S. Zhao, three-dimensional central configurations in $\mathbb{H}^3$ and $\mathbb{S}^3$, J. Math. Phys. 58 (2017), no. 2, 022901.
3. E. Boulter, F. Diacu*, **S. Zhu**, The n-body problem in spaces with uniformly varying curvature, J. Math. Phys. 58(2017), no. 5, 052703; doi: 10.1063/1.4983681.
4. F. Diacu*, J.M. Sánchez-Cerritos, **S. Zhu**, Stability of fixed points and associated relative equilibria of the 3-body problem on $\mathbb{S}^1$ and $\mathbb{S}^2$, J. Dynam. Differential Equations 30 (2018), no. 1, 209-225. Modification after publication at arXiv:1603.03339.
5. F. Diacu, C. Stoica, **S. Zhu***, Central configurations of the curved n-body problem, J. Nonlinear Sci., 28 (2018), no. 5, 1999-2046.

6. Y. Deng, F. Diacu, **S. Zhu***, Variational property of Keplerian orbits by Maslov-type index, J. Differential Equations 267 (2019), no. 10, 5851-5869.

7. F. Diacu, **S. Zhu***, Almost all 3-body relative equilibria are inclined, Discrete Contin. Dyn. Syst. Ser. S. 13 (2020), no. 4, 1131-1143.

8. X. Yu, **S. Zhu***, Regular polygonal equilibrium configurations on $\mathbb{S}^1$ and stability of the associated relative equilibria, J Dyn Diff Equat (2020). https://doi.org/10.1007/s10884-020-09848-1

9. X. Yu, **S. Zhu**, On the classification of $(n+1,1)$-stacked central configurations in $\mathbb{R}^3$, J. Nonlinear Sci., 31(2021), no.1, 1-21.

10. **S. Zhu**, Compactness and index of relative equilibria for the curved n-body problem, Regul. Chaotic Dyn. 26(2021), no.3, 236-257.

11. **S. Zhu**, Dziobek equilibrium configurations on a sphere, J. Dynam. Differential Equations, 34(2022), 1269-1283.

12. A. Hernández-Garduño, E. Pérez-Chavela, **S. Zhu**, Stability of regular polygonal relative equilibria on $\mathbb{S}^2$, J. Nonlinear Sci. 32(2022), https://doi.org/10.1007/s00332-022-09824-7.

13. Zhengyang Tang, **S. Zhu**, Perturbing Masses: A Study of Centered Co-Circular Central Configurations in Power-Law n-Body Problems , Physica D: Nonlinear Phenomena, 2024, 461.

14. **S. Zhu**, The Schubart Orbits in the Curved Three-Body Problem with Two Equal Masses, J. Nonlinear Sci. 34(2024).

15. T. Fujiwara, E. Pérez-Chavela, **S. Zhu**, Equivalence of Rigid Motions and Relative Equilibria in the N-Body Problem on the Two-Sphere, Nonlinearity, 38(2025)

16. X. Yu, **S. Zhu**, On finiteness of stationary configurations of the planar five-vortex problem, Mathematische Annalen, (2025) https://doi.org/10.1007/s00208-025-03183-w

Talks given

"Central configurations of the curved N-body problem," 12th Annual PIMS Young Researchers Conference in Mathematics and Statistics, University of Calgary, May 2015.

"Stability of fixed points and associated relative equilibria of the 3-body problem on $\mathbb{S}^1$ and $\mathbb{S}^2$," Applied Math Seminar talk at University of Victoria, September, 2016.

" On Dziobek special central configurations," 14th Annual PIMS Young Researchers Conference in Mathematics and Statistics, University of Saskatchewan, June 2017.

"Almost all 3-body relative equilibria on $\mathbb{S}^2$ and $\mathbb{H}^2$ are inclined", The 4784-th Guanghua Pulpit, Southwestern University of Finance and Economics, December, 2017.

" Index and compactness of central configurations for the curved n-body problem", The Vth AMMCS 2019 International Conference, Wilfrid Laurier University, Waterloo, Canada, August, 2019.

" Relative equilibrium configurations of the curved n-body problem", Applied Math Seminar at Instituto Tecnológico Autónomo de México, México, September, 2019.

"Stability of regular polygonal relative equilibrium on $\mathbb{S}^2$", Celestial Mechanics and Beyond (In honor of Professor Don Saari, on the occasion of his 80th birthday), Hotel NH-Puebla Centro Histórico, Puebla, México, March, 2020.

"On the Finiteness of Four-body Central Configurations", Workshop on Celestial Mechanics and Hydrodynamics, Henan University, January, 2023.

"Equivalence of Rigid Motions and Relative Equilibria in the N-Body Problem on the Two-Sphere", The 2025 Annual Symposium on Theoretical Celestial Mechanics, Huaiyin institute of technology, April, 2025.