

# 周双勇教授

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研究方向 量子场论、引力、宇宙学和粒子物理  
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## 个人经历

2012 PhD, University of Nottingham, UK  
2012--2014 Postdoctoral Research Fellow, SISSA, Italy  
2014--2016 Postdoctoral Scholar, Case Western Reserve University, USA  
2016--2017 Research Associate, Imperial College London, UK  
2017--至今 中国科学技术大学教授

## 学术研究

主要从事量子场论、引力、宇宙学及粒子物理等方面的研究。已在国际一流物理期刊发表论文 70 余篇，其中 1 篇 PRL 被其编辑部选为 Editors' Suggestion; 论文共已被引用 5000 余次，引用超过 100 次的 16 篇，其中 3 篇超过 250 次。2017 年入选国家创新人才青年项目。入选斯坦福大学和爱思唯尔发布的全球前2%顶尖科学家榜单。2017 年受邀为 Reviews of Modern Physics 撰写关于引力子质量的综述文章。2022 年受邀为美国物理学会粒子与场分部撰写关于高能标物理对低能有效场论约束的白皮书，旨在为未来 10 年相关领域的发展提供借鉴。2024年受邀为 Reports on Progress in Physics 撰写关于非拓扑孤子的综述文章。受邀担任 Chinese Physics C (2024IF: 3.1) 的编委。受邀担任 Physics Reports、PRL、JHEP、PRD、PLB、JCAP、SciPost、CGQ、CPC等 10 余种国际主流物理期刊审稿人。

近期研究兴趣:

- 量子场论和 S-矩阵 bootstrap
- 引力与粒子物理中的有效场论
- 非拓扑孤立子、早期宇宙相变及引力波

## 近期代表论文:

- Full positivity bounds for anomalous quartic gauge couplings in SMEFT, Fu-Ming Chang, Zhuo-Yan Chen, Shuang-Yong Zhou, arXiv: 2604.00107[hep-ph].
- Q-ball superradiance: Analytical approach, Guo-Dong Zhang, Shuang-Yong Zhou, Meng-Fan Zhu, Phys.Rev.D 113 (2026) 5, 056020; arXiv: 2510.27064 [hep-th].
- Primal S-matrix bootstrap with dispersion relations, Claudia de Rham, Andrew J. Tolley, Zhuo-Hui Wang, Shuang-Yong Zhou, JHEP 01 (2026) 027; arXiv: 2506.22546 [hep-th].
- Non-topological solitons and quasi-solitons, Shuang-Yong Zhou, Rept.Prog.Phys. 88 (2025) 4, 046901 (*Review article*); arXiv: 2411.16604 [hep-th].
- Matrix moment approach to positivity bounds and UV reconstruction from IR, Shi-Lin Wan, Shuang-Yong Zhou, arXiv: JHEP 02 (2025) 168; arXiv: 2411.11964 [hep-th].
- Scalar-Gauss-Bonnet gravity: Infrared causality and detectability of GW observations, Wen-Kai Nie, Lin-Tao Tan, Jun Zhang, Shuang-Yong Zhou, JCAP 08 (2025) 086; arXiv: 2410.10973 [hep-th].
- Capping the positivity cone: dimension-8 Higgs operators in the SMEFT, Qing Chen, Ken Mimasu, Tong Arthur Wu, Guo-Dong Zhang, Shuang-Yong Zhou, JHEP 03 (2024) 180; arXiv: 2309.15922 [hep-ph].
- Quantum corrected Q-ball dynamics, Qi-Xin Xie, Paul M. Saffin, Anders Tranberg, Shuang-Yong Zhou, arXiv: JHEP 01 (2024) 165; arXiv: 2312.01139 [hep-th].
- Boson star superradiance, He-Yu Gao, Paul M. Saffin, Yi-Jie Wang, Qi-Xin Xie, Shuang-Yong Zhou, Sci.China Phys.Mech.Astron. 67 (2024) 6, 260413; arXiv: 2306.01868 [gr-qc].
- Causality bounds on scalar-tensor EFTs, Dong-Yu Hong, Zhuo-Hui Wang, Shuang-Yong Zhou, JHEP 10 (2023) 135; arXiv: 2304.01259 [hep-th].
- Q-ball Superradiance, Paul M. Saffin, Qi-Xin Xie, Shuang-Yong Zhou, Phys.Rev.Lett. 131 (2023) 11, 11; arXiv: 2212.03269 [hep-th].
- Snowmass White Paper: UV Constraints on IR Physics, Claudia de Rham, Sandipan Kundu, Matthew Reece, Andrew J. Tolley, Shuang-Yong Zhou, arXiv: 2203.06805 [hep-th].
- Triple crossing positivity bounds for multi-field theories, Zong-Zhe Du, Cen Zhang, Shuang-Yong Zhou, JHEP 12 (2021) 115; arXiv: 2111.01169 [hep-th].
- Positivity in Multifield Effective Field Theories, Xu Li, Hao Xu, Chengjie Yang, Cen Zhang, Shuang-Yong Zhou, Phys.Rev.Lett. 127 (2021) 12, 121601; arXiv: 2101.01191 [hep-ph].
- Gravitational collapse of quantum fields and Choptuik scaling, Benjamin Berczi, Paul M. Saffin, Shuang-Yong Zhou, JHEP 02 (2022) 183; arXiv: 2111.11400 [hep-th].
- New positivity bounds from full crossing symmetry, Andrew J. Tolley, Zi-Yue Wang, Shuang-Yong Zhou, JHEP 05 (2021) 255; arXiv: 2011.02400 [hep-th].
- A convex geometry perspective to the (SM)EFT space, Cen Zhang, Shuang-Yong Zhou, Phys.Rev.Lett. 125 (2020) 20, 201601; arXiv: 2005.03047 [hep-ph].
- Oscillon Preheating in Full General Relativity, Xiao-Xiao Kou, Chi Tian, Shuang-Yong Zhou, Class.Quant. Grav. 38 (2021) 4, 045005; arXiv: 1912.09658 [gr-qc].
- Positivity bounds on vector boson scattering at the LHC, Cen Zhang, Shuang-Yong Zhou, Phys.Rev.D100 (2019) 095003; arXiv: 1808.00010 [hep-ph].
- Can the graviton have a large mass near black holes? Jun Zhang, Shuang-Yong Zhou, Phys.Rev.D97 (2018) 081501; arXiv: 1709.07503 [gr-qc].
- UV complete me: Positivity Bounds for Particles with Spin, Claudia de Rham, Scott Melville, Andrew J. Tolley, Shuang-Yong Zhou, JHEP 1803 (2018) 011; arXiv: 1706.02712 [hep-th].

- Graviton Mass Bounds, Claudia de Rham, J. Tate Deskins, Andrew J. Tolley, Shuang-Yong Zhou, *Rev.Mod.Phys.* 89 (2017), 025004 (*Review Article*); arXiv: 1606.08462 [astro-ph.CO].
- The  $\Lambda_2$  limit of massive gravity, Claudia de Rham, Andrew J. Tolley, Shuang-Yong Zhou, *JHEP* 1604 (2016) 188; arXiv: 1602.03721 [hep-th].
- Charge-Swapping Q-balls, Edmund J. Copeland, Paul M. Saffin, Shuang-Yong Zhou, *Phys.Rev.Lett.* 113 (2014), 231603 (*Editors' Suggestion*); arXiv: 1409.3232 [hep-th].
- Black hole hair in generalized scalar-tensor gravity, Thomas P. Sotiriou, Shuang-Yong Zhou, *Phys.Rev.Lett.* 112 (2014) 251102, arXiv: 1312.3622 [gr-qc].
- Mass-Varying Massive Gravity, Qing-Guo Huang, Yun-Song Piao, Shuang-Yong Zhou, *Phys.Rev.* D86 (2012) 124014; arXiv: 1206.5678 [hep-th].

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