Zheyan Wan

CONTACT INFORMATION

Current position: Assistant Research Fellow
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EDUCATION

- University of Science and Technology of China.
  PhD in mathematics, 2019.
  Thesis: Cobordsim groups, cocycle formulas and their applications in classification of categories and mathematical physics
  Thesis advisor: Yu Ye and Juven Wang.

- University of Science and Technology of China.
  Bachelor in mathematics, 2014.

PAPERS

- Higher Anomalies, Higher Symmetries, and Cobordisms II: Applications to Quantum Gauge Theories, **Zheyan Wan**, Juven Wang, Yunqin Zheng. *Annals of Mathematical Sciences and Applications, Vol. 5, No. 2, 171-257 (2020)* Preprint available at arXiv: 1912.13504.

- Higher Anomalies, Higher Symmetries, and Cobordisms III: QCD Matter Phases Anew, **Zheyan Wan**, Juven Wang. *Nuclear Physics B, 115016 (2020)*. Preprint available at arXiv: 1912.13514.

- Beyond Standard Models and Grand Unifications: Anomalies, Topological Terms, and Dynamical Constraints via Cobordisms, **Zheyan Wan**, Juven Wang. *JHEP 07 (2020) 062*. Preprint available at arXiv: 1910.14668.

- Quantum 4d Yang-Mills Theory and Time-Reversal Symmetric 5d Higher-Gauge Topological Field Theory, **Zheyan Wan**, Juven Wang, Yunqin Zheng. *Phys.Rev.D 100 (2019) 8, 085012*. Preprint available at arXiv: 1904.00994.

- New Higher Anomalies, SU(N) Yang-Mills Gauge Theory and $\mathbb{CP}^{N-1}$ Sigma Model, **Zheyan Wan**, Juven Wang, Yunqin Zheng. *Annals Phys. 414 (2020) 168074*. Preprint available at arXiv: 1812.11968.

- Higher anomalies, higher symmetries, and cobordisms I: classification of higher-symmetry-protected topological states and their boundary fermionic/bosonic anomalies via a generalized cobordism theory, **Zheyan Wan**, Juven Wang. *Ann.Math.Sci.Appl. 4 (2019) 2, 107-311*. Preprint available at arXiv: 1812.11967.

- Fermionic Finite-Group Gauge Theories and Interacting Symmetric/Crystalline Orders via Cobordisms, Meng Guo, Kantaro Ohmori, Pavel Putrov, **Zheyan Wan**, Juven Wang. *Commun.Math.Phys. (2020) 1-82*. Preprint available at arXiv: 1812.11959.

- Adjoint QCD$_4$, Symmetry-Enriched TQFT and Higher Symmetry-Extension, **Zheyan Wan**, Juven Wang. *Phys.Rev.D 99 (2019) 6, 065013*. Preprint available at arXiv: 1812.11955.

- Explicit cocycle formulas on finite abelian groups with applications to braided linear Gr-categories and Dijkgraaf-Witten invariants, Hua-Lin Huang, **Zheyan Wan**, Yu Ye. *Proceedings of the Royal Society of Edinburgh Section A: Mathematics (2019)*. Preprint available at arXiv: 1703.03266.

- Tunneling Topological Vacua via Extended Operators: (Spin-)TQFT Spectra and Boundary Deconfinement in Various Dimensions, Juven Wang, Kantaro Ohmori, Pavel Putrov, Yunqin Zheng, **Zheyan Wan**, Meng Guo, Hai Lin, Peng Gao, Shing-Tung Yau. *Prog. Theor. Exp. Phys. 053A01 (2018)*. Preprint available at arXiv: 1801.05416.

- Studying complex manifolds by using groups G_n^k and Γ_n^k, Vassily Olegovich Manturov, **Zheyan Wan**. *Journal of Knot Theory and its Ramifications Vol. 29, No. 13, 2043002 (2020)*. Preprint available at arXiv: 2007.02791.

- Classification of spherical fusion categories of Frobenius-Schur exponent 2, **Zheyan Wan**, Yilong Wang. *Algebra Colloquium 28 : 1 (2021) 39-50*. Preprint available at arXiv: 1811.02004.

- On Prof. Yau's problem. **Zheyan Wan**. *ICCM Not. 9 (2021), no. 1, 74–79*.

- 3+1d Boundaries with Gravitational Anomaly of 4+1d Invertible Topological Order for Branch-Independent Bosonic Systems, **Zheyan Wan**, Juven Wang, Xiao-Gang Wen. *Phys. Rev. B 106 (2022), 045127*. Preprint available at arXiv: 2112.12148.

- Cobordism and Deformation Class of the Standard Model, Juven Wang, **Zheyan Wan**, Yi-Zhuang You. *Phys. Rev. D 106 (2022), L041701*. Preprint available at arXiv: 2112.14765.

- Proton Stability: From the Standard Model to Ultra Unification, Juven Wang, **Zheyan Wan**, Yi-Zhuang You. *Phys. Rev. D 106 (2022), 025016*. Preprint available at arXiv: 2204.08393.

PREPRINTS

- Extension of elementary p-groups and its application in classification of groups of prime exponent, **Zheyan Wan**, Yu Ye, Chi Zhang. Preprint available at arXiv: 2003.12802.

SEMINAR TALKS

- 2022   Yau center, Southeast University, Tencent meeting, Young scholars Forum (April 2022)
- 2021   YMSC, Postdoc workshop (June 2021)
- 2020   BIMSA, Mathematical Physics seminar (Aug 2020)
- 2020   BIMSA, Geometry seminar (Aug 2020)
- 2020   Moscow, Zoom, Knots and representation theory seminar (July 2020)
- 2020   Moscow, Zoom, Mathematical colloquium in BMSTU (June 2020)
- 2020   Harvard, CMSA, Zoom, Quantum matter/Condensed matter seminar (April, 2020)
- 2020   Moscow, Zoom, Knots and representation theory seminar (March 2020)
- 2019   Tsinghua University, Postdoc workshop (December 2019)
- 2019   Peking University, Topology seminar (November 2019)
- 2019   YMSC, Seminar on geometry (October 2019)
- 2019   YMSC, Moscow-Beijing topology seminar (September 2019).

TEACHING

- Teaching assistant at Tsinghua University.
  Algebraic Topology 2 in fall 2021.
- Teaching assistant at Tsinghua University.
  Geometry and Symmetry in fall 2020.
- Teaching assistant at Tsinghua University.
  Microscopic mathematics in spring 2020.
- Teaching assistant at University of Science and Technology of China.
  Topology in spring 2017. Awarded "excellent teaching assistant".
- Teaching assistant at University of Science and Technology of China.
  Linear algebra (B2) in fall 2016. Awarded "excellent teaching assistant".
- Teaching assistant at University of Science and Technology of China.
  Modern algebra in spring 2016.
- Teaching assistant at University of Science and Technology of China.
  Linear algebra (A2) in fall 2015.