Approved by the Regents
May 19, 2022

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Kai Sun, associate professor of physics, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of physics, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

Ph.D.	2009	University of Urbana-Champaign
B.S.	2002	Peking University, China

Professional Record:

2017-present	Associate Professor, Department of Physics, University of Michigan, Ann Arbor
2012-2017	Assistant Professor, Department of Physics, University of Michigan, Ann Arbor

Summary of Evaluation:

Teaching: Professor Sun has successfully taught several courses, including Physics 505/506 (Electricity and Magnetism), Physics 520/540 (Electricity and Magnetism I/II), and Physics 460 (Undergraduate Quantum Mechanics II). Student feedback through numerical scores and comments has been excellent. Professor Sun has also employed an innovative approach to teaching Physics 505/506—a famously difficult course for graduate students—that has met with wide approval from both students and faculty peers.

Research: Professor Sun is a leading condensed matter theoretical physicist who is highly collaborative, internationally recognized, and well-funded. He studies the many-body properties of matter, which arise when many atoms and their electrons are joined together and interact. This situation gives rise to collective behaviors characteristic of distinct phases. Water and ice are two phases familiar in everyday life. Professor Sun is particularly expert at utilizing the newly appreciated organizing principle of topology, which involves extensions of geometrical concepts to both classical and quantum mechanics. In recent times, the systematic understanding of novel topological phases and related topological properties is greatly clarifying a number of fundamental problems in condensed matter physics. Professor Sun is very well known for his foundational contributions to this exciting new program, and for work on many-body phases and phase transitions generally, including highly fruitful collaborations with experimentalists both at the University of Michigan and elsewhere in the world.

Recent and Significant Publications:

Sun, K. & Mao, X. (2021). Fractional solitons in non-Euclidian elastic plates. *Physical Review Letters*, *127*(9). https://doi.org/10.1103/PhysRevLett.127.098001

Invited Review: Li, L., Sun, K., Kurdak, C., & Allen, J. W. (2020). Emergent mystery in the Kondo insulator samarium hexaboride. *Nature Reviews Physics*, *2*, 463-479.

Li, H. & Sun, K. (2020.) Pfaffian formalism for higher-order topological insulators. *Physical Review Letters*, *124*(3). https://doi.org/10.1038/s42254-020-0210-8

Dağ, C. B., Duan, L.-M., & Sun, K. (2020). Topologically induced prescrambling and dynamical detection of topological phase transitions at infinite temperature. *Physical Review B*, *101*(10). https://doi.org/10.1103/PhysRevB.101.104415

Service: Professor Sun has made important service contributions to the Department of Physics and to the wider physics community. Within the department, he has expertly led the Graduate Qualifying Exam committee for several years, which is one of the most intensive service assignments. He has revamped the Physics 505/506 curriculum as a service assignment and has served on a UM ADVANCE program faculty launch committee. In the wider community, he served on the organizing committee of the International Conference on Magnetism (ICM 2018/SCES 2018), where he also organized three sessions. He has also served as a guest editor for a special issue of *Applied Physics A*.

External Reviewers:

Reviewer (A): "…the promotion case of Prof Sun is so clear cut that it does not require many words/convincing. Simply put, he is one of the leaders of his generation…I rank him in the top 5 people in CMT of his generation."

Reviewer (B): "Professor Sun is a creative theoretical physicist that combines both depth and breadth, and he is currently in his prime years of productivity. I think the case for his promotion is strong…My advice is to try to keep him as happy as possible so that he does not get lured away. Professor Sun has my unequivocal support."

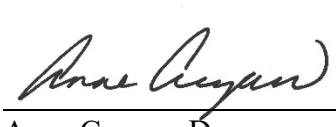
Reviewer (C): "…I believe [Professor Sun] has made unique and singular contributions to the field of quantum condensed matter research, and he deserves the recognition of the promotion."

Reviewer (D): "…I wish I had time to go deeper into [Professor Sun's] recent work. However, I think I now have enough familiarity with his work to be able to unambiguously recommend him for promotion to the rank of full professor with tenure."

Reviewer (E): "I am writing to strongly support the promotion of Kai Sun to full Professor from Associate Professor with tenure..."

Reviewer (F): "…Professor Sun has become one of our leading scientists in the field of condensed matter physics and especially in the modern areas of topological materials, low dimensional systems and strongly correlated electronic systems. I strongly recommend him for promotion to a full professor level."

Summary of Recommendation:
Professor Sun has shown the highest intellectual quality, productivity, and leadership in creating and disseminating knowledge in physics. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Kai Sun be promoted to the rank of professor of physics, with tenure, College of Literature, Science, and the Arts.



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May 2022