**Approved by the Regents**
**May 18, 2023**

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

Xiaoming Mao, 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:

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| Ph.D. | 2008 | University of Illinois at Urbana-Champaign |
| B.S. | 2002 | Peking University |
| B.A. | 2002 | Peking University |

Professional Record:

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| 2019-present | Associate Professor, Department of Physics, University of Michigan |
| 2012-2019 | Assistant Professor, Department of Physics, University of Michigan |
| 2008-2012 | Post-doctoral Fellow, University of Pennsylvania |

Summary of Evaluation:

Teaching: Professor Mao is an effective and dedicated teacher. She has put significant effort into improving the delivery of difficult content to students in graduate and upper-level undergraduate courses, especially in required core courses where student backgrounds may vary widely. She has also worked to make classes more inclusive and interactive, with students more directly engaged in critical thinking. This effort has paid off, as in all courses she taught, her average student evaluation responses are higher, sometimes quite significantly, than those of the comparison group of faculty who taught the same courses. Professor Mao has also been very active in supporting trainees at all levels, from undergraduates to post-doctoral fellows; in particular, in the past three years she has mentored six students from the University of Michigan and from the physics department's NSF-supported summer research program, an unusually high figure for a theoretical physicist. Professor Mao takes a holistic approach to mentoring, taking care to provide long-term career guidance and professional training.

Research: Condensed matter physics studies the behavior of systems—like liquids and solids—where atoms and molecules are densely packed together, with little space between them. Professor Mao's research in theoretical condensed matter focuses on complex materials with structures intermediate between simple crystals and simple liquids; such materials are central to many emerging technologies and also figure prominently in most living and biologically-derived systems. Since her promotion to associate professor in 2019, Professor Mao has further developed her already strong research program in this area into a world-leading effort. She has published sixteen peer-reviewed primary research papers in slightly more than three years, including multiple articles in prestigious and highly selective journals, and is widely sought as an invited speaker at conferences and seminars. Professor Mao is currently supported by five different major grants that together bring more than $730,000 annually to her research group, a truly exceptional level of external funding for someone in her field. One particular highlight is a very competitive MURI grant on "Active and reconfigurable topological mechanical

metamaterials," of which she is the principal investigator, which provides $7.5 million over five years to her and her collaborators.

Recent and Significant Publications:

Cheng, N., Serafin, F., McInerney, J., Rocklin, Z., Sun, K., & Mao, X. (2022). Band theory and boundary modes of high-dimensional representations of infinite hyperbolic lattices. *Physical Review Letters*, *129*(8), 088002.

Serafin, F., Lu, J., Kotov, N., Sun, K., & Mao, X. (2021). Frustrated self-assembly of non-Euclidean crystals of nanoparticles. *Nature Communications 12*(1), 1-11.

Sun, K. & Mao, X. (2020). Continuum theory for topological edge soft modes. *Physical Review Letters*, *124*(20), 207601.

Zhang, S., Zhang, L., Bouzid, M., Rocklin, D.Z., Del Gado, E., & Mao, X. (2019). Correlated rigidity percolation and colloidal gels. *Physical Review Letters*, *123*(5), 058001.

Service: Professor Mao has made significant service contributions at the department, university, and national levels. At the departmental level, Professor Mao has served on multiple committees, most notably chairing the Graduate Curriculum Subcommittee as part of the departmental Curriculum Committee, where she led a review that led to several substantial changes in the curriculum. Professor Mao was an LSA representative for the Faculty Senate Assembly from 2017 to 2020. Beyond the University of Michigan, three leadership posts within the condensed matter physics community that Professor Mao has taken on within the past few years deserve special comment: she is on the advisory board of the Boulder Summer School in Condensed Matter and Materials Physics; she recently was recruited to the executive committee of the Institute for Complex Adaptive Matter (ICAM); and as of June 2022 she has joined the editorial board of the journal *Physical Review Letters* as a divisional associate editor. All three of these boards count among their members some of the leading names in physics. That Professor Mao was asked to join them is indicative of her growing stature in the community.

External Reviewers:

Reviewer A: "...I have carefully evaluated the materials that support the case and on the basis of my evaluation below strongly recommend promotion....Professor Mao has consistently identified interesting new questions at the frontiers of soft condensed matter...Professor Mao is making strong contributions to the discipline through service as an editor/co-editor, collaborative grant leader and summer school organizer...."

Reviewer B: "...[Professor Mao] has established herself unquestionably as one of the top theorists in the field of soft matter...I was amazed by how many grants she has...Her publication record is strong by any numerical measure, but more important, it is creative and hews to a high level of scholarship...This promotion is a no-brainer."

Reviewer C: "...She is a gem, and you should act quickly to promote. She has an outstanding research record, and she has defined an unusual and visionary research program for the future...If we had an appropriate search to fill a full professorship at [my institution], [Professor Mao] would certainly be on our short list for it...."

Reviewer D: "...[Professor Mao] certainly belongs to the small handful of emerging leaders in theoretical soft matter...I strongly support [her] promotion…If she were to come up for a similar promotion in either Chemical & Biomolecular Engineering or Physics & Astronomy at [my institution], I am fully confident that she would be promoted..."

Reviewer E: "...She has established highly productive collaborations with other scientists at Michigan and is widely sought after by people at other institutions...Prof. Mao is widely viewed as one of the outstanding theorists working in soft materials... Prof. Mao's work [is] well ahead of other very strong researchers in soft matter…"

Reviewer F: "...I strongly recommend Prof. Mao for promotion. Prof. Mao's excellent publication record, her recent high profile funded projects, her leadership roles in the community, and the extensive network of high caliber researchers she collaborates with place her among the leaders in her fields of study...."

Summary of Recommendation:
Professor Xiaoming Mao has shown outstanding 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 Xiaoming Mao be promoted to the rank of professor of physics, with tenure, in the College of Literature, Science, and the Arts.

Anne Curzan, Dean
Geneva Smitherman Collegiate Professor of
English Language and Literature, Linguistics,
and Education
Arthur F. Thurnau Professor
College of Literature, Science, and the Arts

May 2023