

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

Approved by the Regents  
May 20, 2010

Luming Duan, 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.	1998	University of Science and Technology of China
B.S.	1994	University of Science and Technology of China

Professional Record:

2007 – present	Associate Professor, Department of Physics, University of Michigan
2003 – 2007	Assistant Professor, Department of Physics, University of Michigan
2001 – 2003	Senior Postdoctoral Scholar, California Institute of Technology
1999 – 2001	Postdoctoral Scholar, University of Innsbruck
1999	Associate Professor, University of Science and Technology of China
1998 – 1998	Lecturer, University of Science and Technology of China

Summary of Evaluations:

Teaching – Professor Duan is a highly effective teacher whose focus has been on quantum mechanics and atomic physics. Because these are closely related to his research area, this allows him to introduce examples and topics at the forefront of research as a means of energizing and motivating his students. Moreover, he is continuously seeking to improve his teaching through consultations and feedback. As a result, students praise his teaching, especially his clear explanations and excellent organization. In addition to classroom teaching, Professor Duan was the principle organizer of the 2008 Michigan Quantum Summer School. Since promotion to associate professor, he has graduated two doctoral students and is working with five more.

Research – Professor Duan is a theoretical atomic/condensed matter physicist whose research is focused on the physics of quantum information and ultra-cold atoms. He is considered to be a world leader in both areas. He has an extraordinary publication record and many of his papers appear in prestigious journals and receive international recognition. Citations to his work already exceed those achieved by good physicists over their entire careers. He is highly sought out by his peers, who have asked him to be part of many collaborative efforts. As a result, Professor Duan has been able to secure an exceptional amount of funding, enabling him to build an unusually large group of graduate and postdoctoral students. He is a Henry Russell Award recipient and was recently elected as a fellow of the American Physical Society.

Recent and Significant Publications:

“Quantum teleportation between distant matter qubits,” with S. Olmschenk, et al., *Science*, 323, 2009, pp. 486 – 489.

“General Hubbard model for strongly interacting fermions in an optical lattice and its phase detection,” *Europhysics Letters*, 81, 2008, p. 20001.

“Entanglement of single-atom quantum bits at a distance,” with D. L. Moehring, et al., *Nature*, 449, 2007, pp. 68 – 71.

“Scheme for demonstration of fractional statistics of anyons in an exactly solvable model,” with Y.-J. Han and R. Raussendorf, *Physical Review Letters*, 98, 2007, p. 150404 (quant-ph/0702031).

Service – Professor Duan is an effective and willing contributor to the greater physics and university communities. He initiated the creation of the Quantum Information and Quantum Foundations summer school series and they are an outstanding example of activity that not only supports the greater scientific community, but also brings recognition to Michigan. Furthermore, while he has only been in rank for two years, he has already served on the Executive Committee of the Michigan Center for Theoretical Physics and several other department committees. He has taken an active role in mentoring junior faculty and he works to include them in a variety of activities that broaden their exposure to physicists outside of the department.

External Reviews:

Reviewer (A)

“The candidate is one of the top scientists in the field of Theoretical Quantum Optics. I would rank him among the first five in the world and...[and one of] the youngest in the list.”

Reviewer (B)

“It should be clear to anybody perusing his publication list that his rate of output, the impact of his output, the range of experimental and theoretical collaborators, is mind-boggling. Many professors require a full career to assemble a publication record that is this impressive. ... I think that there should be no question that he is fully deserving of promotion to full professor.”

Reviewer (C)

“... Duan is very well known and considered a leader. His work regularly appears in the most selective journals and is very highly cited. ... I would certainly be delighted to have him as a colleague...and believe his case for promotion would be considered strong if he were here.”

Reviewer (D)

“Dr. Duan has a very impressive publication list, which covers a wide range of important subjects in quantum information and cold atom physics. He has been involved during the past ten years in many very fruitful collaborations with world-class theorists... I am impressed by the fact that...Duan has developed an independent program of research on cold atom gases with very significant contributions to the theory of strongly interacting systems. In this domain, I think that Dr. Duan stands now at the forefront of research.”

Reviewer (E)

“...Duan is a bright and versatile physicist... Professor Duan has been very prolific. He has published more than most of his peers.”

Reviewer (F)

“Stated succinctly, I consider Luming to be one the top few scientists of his generation... ...I offer my strongest recommendation of Professor Luming Duan for promotion to Professor with tenure. He is an absolutely sparkling well of scientific creativity whose achievements over the past decade have had a landmark impact on the course of Quantum Optics, Quantum Information

Science, and most recently, quantum many-body physics. He is a spectacularly talented and productive scientist on a rocket's trajectory to an even more wonderful future."

Reviewer (G)

"Luming Duan is without doubt one of the finest theorists in the field of quantum information and computation in the world today. ... Dr. Duan's work is characterized by elegance, insight into basic principles, and all-around brilliance. He combines a deep knowledge of theory at its most fundamental level, with the ability to design physical implementations of his theoretical discoveries."

Reviewer (H)


"Let me say at the outset that Duan is an exceptional physicist whom I strongly recommend for promotion. He is the sort of person that any top-ranked research university physics department would be proud to have as a senior faculty member. ... Duan has an impressive list of influential publications to his name. The impact of his work extends well beyond his sub-field of quantum optics. ... Of the considerable number of theorists working in quantum optics in the world, Duan is one of the very best."

Reviewer (I)

"Dr. Duan is widely regarded as one of the best theoretical physicists [of his generation] in atomic and optical physics and in quantum information. ... There are very few of his peers who can match his record of research achievements."

Summary of Recommendation:

Professor Duan has shown the highest intellectual quality, productivity, and leadership in creating and disseminating knowledge in physics. Through his outstanding research he has gained a reputation as a world leader in theoretical physics. He is an excellent teacher and a very generous citizen. The Executive Committee of the College of Literature, Science, and the Arts and I recommend that Associate Professor Luming Duan be promoted to the rank of professor of physics, with tenure, in the College of Literature, Science, and the Arts.



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Terrence J. McDonald  
Arthur F. Thurnau Professor,  
Professor of History and Dean  
College of Literature, Science, and the Arts

May 2010