PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering

Approved by the Regents
May 19, 2011

L. Jay Guo, associate professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, and associate professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering, is recommended for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, and professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program, College of Engineering.

Academic Degrees:

Ph.D.	1997	University of Minnesota, Electrical Engineering
M.S.	1995	University of Minnesota, Electrical Engineering
B.S.	1990	Nankai University, China, Physics

Professional Record:

2005-present	Associate Professor (with tenure), Department of Electrical Engineering and Computer Science, and Associate Professor (without tenure) Macromolecular Science and Engineering Program, University of Michigan
2001-2005	Assistant Professor, Macromolecular Science and Engineering Program, University of Michigan
1999-2005	Assistant Professor, Department of Electrical Engineering and Computer Science, University of Michigan
1997-1999	Research Associate, Department of Electrical Engineering, Princeton University, Princeton, NJ

Summary of Evaluation:

Teaching: Professor Guo has established a solid teaching record as an associate professor at the University of Michigan. Professor Guo developed a new course, "Nanoelectronics and Nanofabrication Technologies." He has also taught five existing courses, EECS 215, "Introduction to Electronic Circuits," EECS 320, "Introduction to Semiconductor Devices," EECS 421, "Properties of Transistors," EECS 423, "Solid-State Device Laboratory," and EECS 528, "Properties of Microelectronics Process Technology." EECS 215 and 320 are required courses for electrical engineering students. The courses taught by Professor Guo have been well received by the students. His teaching evaluations have average values Q1=3.95 and Q2=3.91. To continue to improve his teaching, Professor Guo has visited lectures of colleagues, and attended CRLT workshops on learning and teaching.

Beyond his instructional contributions, Professor Guo has distinguished himself in graduate education. He is currently supervising 11 Ph.D. students and two post-doctoral fellows. During his ten years at Michigan, he has graduated 10 Ph.D. students and two M.S. students. In addition, he has supervised 14 undergraduate and high school students in research. Both undergraduate and graduate students are uniformly complimentary about his energy and enthusiasm for research, teaching, and mentoring.

Professor Guo has also provided academic advising to both undergraduate and graduate students in EECS. From 2001 to 2005, he served as the academic advisor for graduate students majoring in the solid-state electronics area. In addition, from 2008 to 2009, he served as an EE undergraduate advisor. In this position, Professor Guo advised EE and undeclared undergraduate students with course and career planning.

Research: Professor Guo's research and scholarly output are truly outstanding. In the last decade he has emerged as a major figure in the crowded fields of *nanotechnology* and *nanolithography*. He has established a research program that makes Michigan one of the world leaders in these fields. Out of a career total of 94 publications in archival journals having high impact factors, 74 have resulted from his research at the University of Michigan with his students and collaborators. The mainstay of Professor Guo's research has been the evolution and application of novel and unusual microfabrication and nanofabrication techniques in microelectronics, photonics, fluidics, bioelectronics, and photovoltaics. He has invented the *reverse NIL technique*, which can be applied to 3-dimensional nanostructure fabrication, and the high throughput *roll-to-roll NIL*, which can be applied to mass production of optical devices and in photovoltaics. Professor Guo was also the first to combine the techniques of NIL and photolithography for device fabrication. His contributions in these areas establish him as a major intellectual contributor and innovator.

Professor Guo has published his research in 23 different archival journals. The large number of journals with very diverse specialties and focus is an indication of the breadth and multidisciplinary nature of his research. Professor Guo has contributed substantially to technology transfer. Eight U.S. and international patents have been granted from his research at the University of Michigan. His group collaborates with several companies and most notably he helped to establish the nanoimprint lithography capability at Hewlett-Packard laboratories. The University has approved a Small Company Innovation Program for his group to collaborate with industry. Professor Guo has participated in outreach activities related to his research. He has participated in the NASA Sharp-Plus program for high school students where students selected from a national pool conduct summer research under a university faculty member. He has also worked with female and minority high school students and has provided motivation for them to pursue a degree in engineering.

Recent and Significant Publications:

"Facile route to polymer solar cells with optimum morphology applicable to roll-to-roll process," H.J. Park, M.G. Kang, S.-H. Ahn and L.J. Guo, *Adv Mater*, 22, E247-E253, 2010.

"Plasmonic nano-resonators for color filtering and spectral imaging," T. Xu, Y.-K Wu, X.-G. Luo and L.J. Guo, *Nat. Comm.*, Vol. 1, article 59. Doi:10.1038/ncomms1058, 2010.

"Nanofluidic diodes," L.J. Cheng, and L.J. Guo, Chem. Soc. Rev., 39, 923-938, 2010. Doi:10.1039/b822554k.

"High Speed Roll-to-Roll Nanoimprint Lithography on Flexible Plastic Substrate," S.H. Ahn and L.J. Guo, *Adv. Mater*, 20, 2044-2049, 2008.

"Polymer Microring Resonators for High-Frequency Ultrasound Detection and Imaging," A. Maxwell, S.-W. Huang, T. Ling, J.-S. Kim, S. Ashkenazi, and L.J. Guo, *IEEE J. Special Topics in Quantum Electronics* (on biophotonics), 14, 191-197, 2008.

"Nanoimprinted Semi-Transparent Metal Electrode and its Application in OLED," M.-G. Kang and L.J. Guo, *Adv. Mater.*, 19, 1391-1396, 2007.

Service: Professor Guo has compiled an excellent service record. This includes both internal service activities and service to the electrical engineering profession and his professional societies. In the department, Professor Guo has served in various important roles. In some of these positions he has directly engaged students, ranging from EE undergraduate advisor to financial aid chair to academic advisor for graduate students. At the university level, Professor Guo has been an executive committee member for an NIH training grant.

On the national and international stage, Professor Guo's research work on nanoimprint and nanotechnology has allowed him to contribute in many arenas. These range from being an associate editor for the *Journal of Nano Systems and Technology* (current) to serving as a panelist and in various capacities in important conferences. Among some of the most visible services contributed to the community, Professor Guo was the technical program chair for the IEEE SEM Fall Nano-Conference,

November 2009, and symposium chair for the MRS 2007 Spring and Fall Meeting on Flexible and Printed Electronic, Photonics, and Biomaterials.

Professor Guo is also committed to contributing to diversity and climate at Michigan. He has made particular efforts to attract underrepresented minority and female students to the graduate program in Electrical Engineering, as well to his own research group. He has participated in K-12 instructional activities and outreach activities in the community.

External Reviewers:
Reviewer A: "I feel that most in the community, in fact, believe that Dr. Guo is now the leader in nanoimprint techniques and their device application, surpassing even his advisor Chou and the next closest competitor, Willson."

Reviewer B: "I feel strongly that the activities of Dr. Guo stand at the forefront of NIL field. ... The impact of his work is truly amazing..."

Reviewer C: "I confess to have been positively surprised to see the magnificent scope of the applications of nanofabrication to nanoplasmonics, targeting with success biomedical applications."

Reviewer D: "...Professor Guo conducted research on excellent ideas and carried out significant research, which made impact on science and technologies of nanoelectronics, photonics, and sensors."

Reviewer E: "He stands out in terms of creativity, use of fabrication and experimental methods of testing such micro and nano-devices. His research is visible, well regarded by the scientific community in the field, and in my opinion, he ranks at the top within his peer group."

Reviewer F: "...he has made major contributions not only to the understanding of NIL as a technology tool but also an employable tool to carry out nanoscience related research projects. His different [projects reflect] a great ability to address important new areas of science employing NIL as an important tool. It is fair to say that his productivity over the years has been very high, especially when comparing to other people in the field."

Summary of Recommendation: Professor L. Jay Guo is an internationally recognized leader in the fields of nanotechnology and nanolithography, and has established a vigorous and productive research effort at Michigan. He has made significant contributions to both undergraduate and graduate education, and has contributed to both internal and external service. It is with the support of the College of Engineering Executive Committee that I recommend L. Jay Guo for promotion to professor of electrical engineering and computer science, with tenure, Department of Electrical Engineering and Computer Science, and professor of macromolecular science and engineering, without tenure, Macromolecular Science and Engineering Program College of Engineering.

David C. Munson Jr.

David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering
May 2011