Corporation awards tenure to 23 faculty members

October 17, 2001

The Executive Committee of the MIT Corporation has approved the awarding of tenure to the following faculty members, effective July 1, 2001 unless otherwise noted.

Dr. Paul I. Barton, associate professor in the Department of Chemical Engineering has been promoted to associate professor with tenure. Barton's expertise is in analysis, synthesis, design and optimization of chemical and biological manufacturing processes as whole systems. His research program is widely recognized for its fundamental advances and applications. One such application is the plantwide dynamic simulation tool ABACUSS II. This software enables the formulation and solution of the equations governing flow, chemical reaction and transport in complex networks of unit operations, including detailed descriptions of discontinuities arising from both the physics and control actions, such as the action of an emergency shutdown system. Barton has played a pioneering role in the teaching of process design and the use of computers in the chemical engineering curriculum at MIT. He received the M.Eng. in 1988 and the Ph.D. in 1992, both from the University of London. He was appointed assistant professor at MIT in 1992 and associate professor in 1999.

Dr. Jianzhu Chen, associate professor in the Department of Biology, has been promoted to associate professor with tenure. Chen has made significant and novel contributions in three distinct areas of immunology, each involving molecular mechanisms of lymphocyte development and function. Among other things, he and his colleagues have developed a mouse system that allows memory T-cells to be studied to determine how they respond to antigen and how they arise by differentiation. Their results show that the critical event for na������ve-to-memory T-cell differentiation is cell proliferation mediated by the T-cell antigen receptor. These findings may help develop potent vaccines against cancer and infectious pathogens such as HIV. Chen teaches a graduate course in immunology and co-teaches an upper-level course for biology undergraduates and premedical students. A 1990 recipient of a Ph.D. in genetics from Stanford University, Chen joined MIT as an assistant professor in 1994.

Dr. Pavel I. Etingof, assistant professor in the Department of Mathematics, has been promoted to associate professor with tenure. Etingof is widely recognized for his work in theory of quantum groups, a branch of representation theory that intersects mathematical physics. He is co-editor

of the book "Quantum Field Theory for Mathematicians." After receiving a Ph.D. in mathematics from Yale University in 1994, he spent four years as an assistant professor at Harvard before coming to MIT as an assistant professor in 1998.

Dr. Eric Marie Jacques Feron of the Department of Aeronautics and Astronautics has been promoted to associate professor with tenure. Feron works simultaneously in the highly theoretical domain and on practical applications. The main societal need he addresses is for safety, performance and efficiency in air vehicles and air transportation networks. As a theoretician, he was one of the founders of the modern school of computational control--the use of linear matrix inequalities to frame and solve control problems. He has built on this work to make contributions to the control of unmanned air vehicles and air traffic control and airport congestion alleviation. Feron received the B.S. from ������cole Polytechnique in 1989, the D.E.A. from ������cole Normale Superieure in 1990 and the Ph.D. from Stanford University in 1994. Before coming to MIT as an assistant professor in 1993, he worked in the French Ministry of Defense and holds the title of advisor to the Academy of Technologies of France. He was promoted to associate professor in July 1999.

Dr. Peter H. Fisher, associate professor in the Department of Physics, has been promoted to full professor with tenure. Fisher is an experimentalist working in high-energy physics. His primary research involves the Alpha Magnetic Spectrometer (AMS) project, which aims to detect or constrain the abundance of antimatter in the universe. He also works on data from the LEP Collider at CERN and on neutrino physics. A recipient of the department's Buechner prize for outstanding teaching, he is chair of the Physics Colloquium Committee and has served as chair of the Laboratory for Nuclear Science Colloquium Committee. He received a Ph.D. in physics from the University of California at Berkeley in 1988 and joined MIT as an associate professor in 1994.

Dr. Hiroshi Ishii of the Program in Media Arts and Sciences has been promoted to associate professor with tenure. Ishii is founder of the Media Lab's Tangible Media group, which explores innovative ways to give physical form to digital information, focusing on the design of seamless interfaces between humans, digital information and the physical world. He came to the Media Lab in 1995 as an associate professor after 15 years as a research engineer at NTT at Nippon Telegraph and Telephone in Yokosuka, Japan. At NTT, his research team designed TeamWorkStation and ClearBoard--collaboration media that provide seamless, shared workspace across distances. Ishii received the B.S. (1978), the M.S. (1980) and the Ph.D. (1992) degrees from Hokkaido University. Ishii was also a visiting assistant professor at the University of Toronto from 1993-94. His awards include MIT's Perkins Award for Excellence in Graduate Student Advising, presented to faculty members who have demonstrated compassion and dedication to students.

Dr. Daniel N. Jackson, the Douglas T. Ross Career Development Professor of Software Technology in the Department of Electrical

Engineering and Computer Science, has been promoted to associate professor with tenure. Jackson's work focuses on languages and tools for software design. With his research group, he has designed a new language for modeling structural aspects of software and a tool that automatically analyzes such models so that flaws can be detected before implementation. He was recipient of one of the first National Science Foundation information technology grants last year to investigate new software engineering techniques and tools that improve the reliability, safety and predictability of infrastructural software. He joined the MIT faculty as an associate professor in August 1997 after five years as an assistant professor at Carnegie Mellon. He earned the B.A. from Oxford University in 1984, and the S.M. (1988) and Ph.D. (1992) from MIT.

Dr. David Karger, the Esther and Harold E. Edgerton Career Development Associate Professor in the Department of Electrical Engineering and Computer Science, has been promoted to associate professor with tenure. Karger is an algorithm designer whose work on randomized graph algorithms offered solutions to important problems and contributed novel techniques to the field. His research activities include applied algorithm design in areas such as information retrieval, networking, scheduling and machine learning. He has received a Packard Foundation Fellowship and a Sloan Fellowship. He earned the A.B. from Harvard in 1989, a math certificate from Cambridge University in 1990 and the Ph.D. from Stanford University in 1994. His thesis won the Association of Computing Machinery doctoral dissertation award. He came to MIT as an assistant professor in 1995 after a stint at AT&T Bell Labs and was promoted to associate professor in 1999. He teaches in the undergraduate and graduate curriculum and has developed two new graduate courses in algorithms.

Dr. Jacqueline A. Lees, associate professor in the Department of Biology and associate director of the Center for Cancer Research (CCR), has been promoted to associate professor with tenure. Lees is a leader in determining the roles of transcription factors in regulating biological processes that affect cell proliferation, development, cell death and cancer. Using a combination of cell biology and mutant mouse models, she studies how the E2F family of mammalian transcription factors contributes to the regulation of cellular proliferation during normal development and tumorigenesis. Major advances have been made in understanding how both oncogenes and tumor suppressors act to control cellular proliferation. Lees' recent groundbreaking work shows that certain E2Fs, despite substantial biochemical similarities, play radically different biological roles. Lees received a Ph.D. in 1990 from University College of the University of London and joined MIT as an assistant professor in 1994. She co-designed a new advanced undergraduate course, "Principles of Human Disease" (7.27) and is a member of the biology department's graduate committee.

Dr. Seth Lloyd, associate professor in the Department of Mechanical Engineering, has been promoted to associate professor with tenure. Internationally renowned for his work in quantum computation, physics of information and complex systems, Lloyd is a leader in the emerging field

of quantum mechanical computers. A member of the d'Arbeloff Laboratory for Information Systems and Technology and of the Laboratory for Information and Decision Systems, he has done seminal work in quantum computation and quantum communications. He has proposed the first technologically feasible design for a quantum computer, demonstrated the viability of quantum analog computation, proved quantum analogs of Shannon's noisy channel theorem and designed novel methods for quantum error correction and noise reduction. Lloyd has organized and co-organized conferences including Complexity in Engineering in 1999, and Mechanical Engineering in the Information Age in 2000. A principal investigator at the Research Laboratory of Electronics, he received a Ph.D. in physics from Rockefeller University in 1988 and joined MIT as an assistant professor in 1994.

Dr. Alexandre Megretski, the Esther and Harold E. Edgerton Associate Professor in the Department of Electrical Engineering and Computer Science, has been promoted to associate professor with tenure. Megretski joined the MIT faculty in 1996 and was promoted to associate professor in 1999. Prior to that he was an assistant professor at Iowa State University from 1993-96. He received the M.S. (1985) and Ph.D. (1988) from Leningrad University. A leading theoretician in the field of control theory, Megretski's research interest is in the invention of new mathematical methods to solve problems associated with feedback control systems and decision making, particularly with the nonlinear phenomena in systems analysis and optimization. His best-known achievement is the dvelopment of the method of Integral Quadratic Constraints for robust nonlinear control. He also has solved long-standing open problems in operator theory, a branch of mathematical analysis that has had major impact on control theory, and has solved major theoretical questions puzzling the control community.

Dr. Takehiko Nagakura, associate professor in the Department of Architecture, has been promoted to associate professor with tenure. Nagakura is pioneering a new, digitally based paradigm for architectural practice. Working at the interface of information technology and architectural design, he develops computer graphics films of famous unbuilt or demolished architectural projects such as the Danteum of Terragni and Lingeri (1938), and develops digital representations for design and construction of his own projects. His work focuses on using digital media to enhance understanding of historical architectural projects and to explore possibilities for current and future designs. Nagakura received the B.Eng. and M.Eng. degrees from Tokyo University in 1985 and 1988, and the M.Arch and Ph.D. from Harvard University in 1987 and 1996, respectively. He came to MIT in 1993 as a lecturer, was promoted to assistant professor in 1994 and to associate professor in 1999. Previously he was an instructor at Harvard and an assistant designer at Fumihiko Maki & Associates.

Dr. Krishna Rajagopal, the Class of '58 Assistant Professor in the Department of Physics, has been promoted to associate professor with tenure. Rajagopal, a theoretical physicist, is an expert in quantum field theory and statistical physics with a fundamental interest in the behavior of

matter under extreme conditions such as in supernovae, neutron stars and the early universe. He has made several important discoveries and proposals concerning the properties of quark matter and its role in the universe. His theoretical work is helping experimenters who collide heavy nuclei at high energies to explore the properties of hot quark matter, last seen in the first microseconds after the Big Bang. His discoveries have revolutionized understanding of cold quark matter deep within neutron stars. Rajagopal received a Ph.D. in physics from Princeton University in 1993 and joined MIT as an assistant professor in 1997. He received the Buechner Prize in 1999 for outstanding teaching for his work in the undergraduate quantum mechanics sequence. He is an Alfred P. Sloan Fellow and a Department of Energy Outstanding Junior Investigator.

Dr. Caroline Ross of the Department of Materials Science and Engineering has been promoted to associate professor with tenure. Ross conducts research in the area of thin films used in magnetic data storage applications such as hard disks, magnetic random-access memories and other magnetoelectronic and magnetooptical devices. She studies the deposition of thin films and fabrication of small magnetic structures for these devices, and investigates how their magnetic and magnetoresistive properties can be controlled. Ross received the B.A. (1985) and the Ph.D. (1988) from Cambridge University. She spent two years as a postdoctoral fellow at Harvard University, and in 1991 became a research scientist at Komag, Inc., a manufacturer of memory disks for magnetic storage devices. She was appointed assistant professor at MIT in 1997 and promoted to associate professor in 2000.

Dr. Ram Sasisekharan of the Division of Bioengineering and Environmental Health has been promoted to associate professor with tenure. Sasisekharan has radically changed the way polysaccharides can be studied. The study of these complex sugars, which are far more complicated than either DNA or proteins, has been moved forward by his development of a way to sequence sugars, or determine the order of their building blocks, and use that information to make advances in drug development and other areas of biotechnology. Sasisekharan received the 1999 Burroughs Wellcome Fund New Investigator Award, the 1999 Beckman Foundation Young Investigator Award, the Edgerly Science Partnership Award, and the 1998, 1999 and 2000 Research Awards from the CaPCURE Foundation. He earned the B.S. from Bangalore University (1985), the M.A. from Harvard University (1987) and the Ph.D. from Harvard Medical School (1992). He joined the MIT faculty in 1996 and was promoted to associate professor in 2000. He is the graduate officer for the Division of Bioengineering.

Dr. Duncan Simester of the Sloan School of Management has been promoted to associate professor with tenure. Simester's research in theoretical and empirical marketing falls into three main areas: pricing with relatively uninformed consumers, customer satisfaction and employee incentives and methodologies related to the Internet. He was named a finalist for the John D.C. Little Award in 1994, 1995 and 1997 for best paper in marketing science. Simester received the Bachelor of Commerce, the Master of Commerce and the L.L.B. degrees from the University of

Auckland (1985-90). He received the Ph.D. in management science from MIT in 1993. Simester taught at the University of Chicago from 1993-97 before coming to MIT in 1997 as an assistant professor.

Dr. Peter T.C. So, the Esther and Harold E. Edgerton Associate Professor in the Department of Mechanical Engineering, has been promoted to associate professor with tenure. So works in the field of bioinstrumentation at the interface between engineering and biology. He has developed a number of technologies that have led to novel instrumentation in optical microscopy and micromanipulation, which in turn has led to advances in biology and medicine. In medicine, he is developing two-photon endoscopes for the noninvasive diagnosis of disease such as skin cancer; in biology, new micromanipulation and imaging techniques that allow the study of the mechanical properties of proteins and cells with applications in areas such as cardiology. So received the B.S. from Harvey Mudd College in 1986 and the Ph.D. from Princeton in 1992. He served as a postdoctoral associate at the University of Illinois from 1992-96, when he joined MIT as an assistant professor. He has developed several new courses and is a popular supervisor for UROP students.

Dr. Peter K. Sorger, associate professor in the Department of Biology, has been promoted to associate professor with tenure. Sorger is a world leader in molecular studies of chromosome segregation, the process by which DNA is divided among daughter cells during cell division. The process is mediated by specialized chromosome structures called kinetochores that attach to the fibers of the mitotic spindle. Accurate segregation is essential for the propagation of genetic information and errors are thought to promote cancer. To elucidate the structure and function of kinetochores in living cells, Sorger and his group have developed methods to link quantitative three-dimensional microscopy and molecular genetics. He has designed and taught a new undergraduate project lab, "Experimental Molecular Biology," and more recently, the undergraduate subject "Cell Biology" and "Methods and Logic in Molecular Biology." He received a Ph.D. in biochemistry from Cambridge University in 1988 and joined MIT as an assistant professor in 1994.

Dr. Simon Mark Spearing, associate professor in the Department of Aeronautics and Astronautics, has been promoted to associate professor with tenure. Spearing is a materials systems engineer who bridges the intellectual gap between material science and structural engineering. He has created mechanism-based models for several important advanced material systems, including the durability of graphite/titanium hybrid laminates and the durability of layered materials used in electronics packaging. Recently he pioneered the structural design of the MIT Micro-Engine and other MEMS devices. Spearing received the B.A. (1986), M.A. (1990) and Ph.D. (1990) from Cambridge University. He came to MIT in 1994 as the Boeing Assistant Professor of Aeronautics and Astronautics. He became the Esther and Harold Edgerton Assistant Professor in 1998 and the Esther and Harold Edgerton Associate Professor in 1999. Previously, Spearing worked at the University of California at Santa Barbara and British Petroleum (Carborundum). He has twice won both the departmental undergraduate teaching award and the departmental

undergraduate advising award.

Dr. Bruce Tidor, associate professor in the Division of Bioengineering and Environmental Health and the Department of Electrical Engineering and Computer Science, has been promoted to associate professor with tenure. Tidor's research uses theory and modeling to study recognition and binding by biological molecules. He has developed a novel understanding of the way that proteins use patterns of polar and charged chemical groups to guide tight and specific association. Using this understanding, his group has been successful in designing and modulating inter actions among proteins. Tidor has served on the MIT Council on Educational Technology. He received a Sloan Fellowship in 1999 and other support to incorporate computer animation, simulation and display into undergraduate subjects. He is a popular lecturer who developed an IAP subject emphasizing hands-on computational molecular modeling. He received the A.B. from Harvard University (1983), the M.Sc. from Oxford University (1985) and the Ph.D. from Harvard (1990). He was a Whitehead Fellow from 1990-94, when he joined the MIT faculty.

Dr. Kai von Fintel of the Department of Linguistics and Philosophy has been promoted to associate professor with tenure. Von Fintel's main research specialty is the interaction of semantics and pragmatics. In his publications on conditionals, quantification, negative polarity, presupposition and other notoriously difficult linguistic phenomena, he focuses on the division of labor between the semantics proper and the pragmatic mechanisms that are responsible for the enhancement or masking of purely semantic meaning. He has also provided precise new insights about the nature of these pragmatic mechanisms. Von Fintel came to MIT as an instructor in 1993, was promoted to assistant professor in 1994 and associate professor in 1998. He received undergraduate degrees in English (1983) from the University of M��nster in Germany and linguistics (1986) from the University of K��ln in Germany. He received the M.A. (1992) and the Ph.D. (1994) in linguistics from the University of Massachusetts at Amherst.

Dr. Uwe-Jens Wiese, associate professor in the Department of Physics, has been promoted to associate professor with tenure. A theoretical physicist whose major work is on the lattice formation of quantum chromodynamics (QCD), he has made major contributions to the solution of lattice QCD and other strongly interacting systems with many degrees of freedom. He uses a combination of formal theoretical analysis and numerical computation to solve problems that were previously intractable by either approach alone. Among other things, Wiese invented a new formulation of QCD, the quantum link theory, that provides insight into the mechanism of confinement and provides for the first time the possibility of using powerful cluster algorithms to prevent critical slowing down in numerical simulations. He received a Ph.D. in physics in 1986 from the Institute for Theoretical Physics at Hannover University in Germany and joined MIT as an assistant professor in 1994. Wiese has served on the Computer User Committees in the Laboratory for Nuclear Science and the Center for Theoretical Physics.

Dr. Matthew Wilson, associate professor of the Department of Brain and Cognitive Sciences, has been promoted to associate professor with tenure. Wilson studies mechanisms of learning and memory in the brain; his research contributions include GENESIS, a software package for large-scale simulation of biological neural networks, and the "tetrode" technology for recording simultaneously from large numbers of neurons in freely moving animals. He has used his new techniques to make major discoveries in the way mammalian (rat) brains explore, organize, recall and use spatial memories. He has gone on to explore the role of the hippocampus in memory; the relationship between activities in the hippocampus and the cortex for preserving and ordering memory; and the role of REM sleep as a mechanism for reevaluation and reorganization of existing memories. Wilson received the B.S. in electrical engineering from Rensselaer Polytechnic Institute in 1983, the M.S. in electrical engineering from the University of Wisconsin in 1986, and the Ph.D. in computational and neural systems from the California Institute of Technology in 1990.

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