CURRICULUM VITAE December 3, 2010

NAME	Akihisa TOMITA	MALE	Nationality	Japan
BIRTH	Date: October 18, 1959 Place: Tokyo, Japan			
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EDUCATION

year	month	
1978	April-	Department of Physics, Faculty of Science, University of Tokyo
1982	March	
1982	April-	Department of Physics, Graduate School of Science, University of
1984	March	Tokyo

DEGREE

year	month	
1982	March	B. Sc. in Physics, University of Tokyo
1984	March	M. Sc. in Physics, University of Tokyo
1998	Sep.	D. Phil. in Electronics, University of Tokyo

EMPLOYMENT

year	month	
2010	April-	Professor, Graduate School of Information Science and Technology, Hokkaido University
2009	April-	Visiting Professor, Graduate School of Pure and Applied Sciences,
2010	March	Tsukuba University
2005	Nov.-	Senior Principal Researcher, Fundamental and Environmental Research
2010	March	Laboratories, NEC Corp.
2005	Oct.-	Quantum Information Experiment Group Leader, Quantum Computation and Information Project, ERATO-SORST, JST
2003	Oct.-	Visiting Associate Professor, Graduate School of Interdisciplinary Science
2008	March	and Engineering, Tokyo Institute of Technology
2000	Oct.-	Quantum Information Group Leader, Quantum Computation and
2005	Sep.	Information Project, ERATO, JST
1998	July-	Principal Researcher, Fundamental and Environmental Research
2005	Oct.	Laboratories, NEC Corp.
1991	Sep.-	Visiting Researcher, AT&T Bell Laboratories
1992	Aug.	
1987	Jan.-	Researcher, Opto-electronics Technology Research Laboratories
1989	March	
1984	April-	Researcher, Opto-electronics Research Laboratories, NEC Corp.
1998	June	

RESEARCH ACTIVITES (5-selected)		
Author(s), Title	Journal	Summary
(peer-reviewed articles) Mikio Fujiwara, Morio Toyoshima, Masahide Sasaki, Ken-ichiro Yoshino, Yoshihiro Nambu, and Akihisa Tomita, "Performance of hybrid entanglement photon pair source for quantum key distribution,"	Appl. Phys. Lett. **95**, 261103 (2009)	We have demonstrated a source of hybrid entanglement pairs between two different degrees of freedom, a 1550 nm time-bin qubit and an 810 nm polarization qubit. We obtained visibilities of 95.8% and 88%, well above the threshold of 70.7% needed to violate a Bell inequality and allow distilling a secure key in the quantum key distribution.
A. Tanaka, M. Fujiwara, S. W. Nam, Y. Nambu, S. Takahashi, W. Maeda, K. Yoshino, S. Miki, B. Baek, Z. Wang, A. Tajima, M. Sasaki, and A. Tomita: "Ultra fast quantum key distribution over a 97 km installed telecom fiber with wavelength division multiplexing clock synchronization,"	Optics Express **16 (15)**, pp. 11354-11360 (2008).	We have developed a high-speed QKD system operated on 625-MHz clock, and succeeded in key generation after transmission through a 97-km installed fiber cable. The synchronization pulses were transmitted through the same fiber-core with the quantum signals without degradation on the QBER.
Y. Okubo, X.-B. Wang, Y.-K. Jiang, S. Tani, and A. Tomita, "Experimental demonstration of quantum leader election in linear optics,"	Phys. Rev. **A 77**, 032343 (2008).	Anonymous leader election is one of the fundamental problems in distributed computing. We have implemented a quantum algorithm solving this problem deterministically with a linear optical circuit. It is interesting that in this implementation even failure results in linear-optic quantum gates can be utilized to determine a leader.
M. Shirane, S. Kono, J. Ushida, S. Ohkouchi, N. Ikeda, Y. Sugimoto, and A. Tomita, "Mode identification of high-quality-factor single-defect nanocavities in quantum dot-embedded photonic crystals,"	J. Appl. Phys. **101**, 073107 (2007).	We designed a high-Q cavity with a photonic crystal defect of highly symmetric H1 mode. This cavity is polarization independent and compatible to polarization encoded qubits. We characterized the cavity modes and verified the polarization independence.

A. Tomita, “Quantum Information Processing with Fiber Optics: Quantum Fourier Transform of 1024 Qubits,” More 69 articles were published	Optika i Spektroskopiya **99**, No. 2 pp. 219–225 (2005)	We have demonstrated a fiber-optic quantum circuit that performs Quantum Fourier Transform followed by measurement up to 1024 qubits. We showed that errors in phase gate propagate little to the further bits.
（Invited Talks） A. Tomita, A. Tajima, A. Tanaka, K. Yoshino, Y. Nambu, S. Takahashi, S. Yorozu, “High-speed Quantum Key Distribution System for Metropolitan Networks” A. Tomita, Interplay between Quantum Computation and Quantum Information A. Tomita, “Test and measurement on quantum key distribution systems” A. Tomita, “R&D and standardization of QKD in Japan,” A. Tanaka, M. Fujiwara, S. W. Nam, Y. Nambu, S. Takahashi, W. Maeda, K. Yoshino, S. Miki, B. Baek, Z. Wang, A. Tajima, M. Sasaki, and A. Tomita, “Quantum key distribution systems and field trials” A. Tomita, “Photonic systems for quantum information processing ” More 27 invited talks were given.	Updating Quantum Cryptography and Communications 2010 (UQCC 2010), Tokyo, Oct. 18-20, 2010 Tutorial Talk, 10th Asian Conference on Quantum Information Science (AQIS'10) , Tokyo, Japan Aug.27-31, 2010 Proc. SPIE, Vol. 7236, Quantum Communications Realized II, San Jose, CA, USA , Jan. 28 (2009). Plenary Talk (I), Updating Quantum Cryptography 2008, Tokyo, Japan, Dec. 1 (2008). 34th European Conf. Optical Communication (ECOC 2008), pp. 1-4, Brussels, Belgium, Sep. 21-25(2008) 8th Asian Conf. Quantum Information Science (AQIS), Seoul, Korea, Aug. 27-30 (2008)	

ACTIVITIES for ACADEMIC COMMUNITY	
year	
1982-	Member, The Physical Society of Japan
1984-	Member, The Japanese Society of Applied Physics
1991-	Member, The Optical Society of America
1995-	Member, The Institute of Electronics, Information and Communication Engineers (IEICE, Japan)
1996-1997	Chief Committee Member, Laser and Quantum-electronics, IEICE
2004-2005	Program Committee, ERATO Conference on Quantum Information Science
2006	Local Committee, International conference on quantum communication, measurement and computing
2006-2008	Committee, Quantum Information Technology, IEICE
2007	Guest Editor, IEEE J. Selected Topics in Quantum Electronics,
2007	Program Committee, Optics East 2007 “Quantum Communications Realized”
2007,2008,2010	Organizing Committee, Updating Quantum Cryptography
2009	Program Committee, Photonic West 2009 “Quantum Communications Realized II”
2009	Program Committee, Asian Conference on Quantum Information Science
2009-2010	Chief Guest Editor, IEICE Trans. Fundamentals “Leading-Edge Developments in Quantum Cryptographic Systems”