Program

(Monday, February 9)

10:00 - 10:10 "Introductory Talk"
Hideki Hasegawa, Hokkaido University

- Plenary -

10:10 - 10:50 "Meme Media for the Dynamic Federation of Web Applications and Ubiquitous Knowledge Resources"
Yuzuru Tanaka, Kimihito Ito, and Jun Fujima, Hokkaido University ................ p.1

10:50 - 11:10 Break

11:10 - 11:50 "Toward Realization of Intelligent Quantum Chips Utilizing III-V Nanoelectronics"
Hideki Hasegawa, Hokkaido University .............................................................. p.39

11:50 - 12:40 "Self-Assembled Quantum Dots for Optoelectronic Devices: Progress and Challenges"
Mohamed Henini, Nottingham University ......................................................... p.46

12:40 - 13:40 Lunch Break

- Spintronics -

13:40 - 14:30 "Growth and Characterization of Ferromagnetic Metal/Compound Semiconductor Heterostructures for Spin Electronics"
Chris Palmstrøm, University of Minnesota ....................................................... p.60

14:30 - 15:10 "High Efficiency Spin Injection from a Ferromagnetic Metal into a Semiconductor through an Fe/InAs Junction"
Kanji Yoh, Hokkaido University and CREST-JST ............................................ p.62

15:10 - 15:30 Break

15:30 - 16:20 "Hybrid Ferromagnetic (MnGa)As / GaAs-Structures: Metal Organic Vapor Phase Epitaxy, Structure Analysis and Magnetic Properties"
Wolfgang Stolz, Philipps University Marburg .................................................... p.66

16:20 - 17:00 "Magnetoresistance and Magnetometry Phenomena in AlGaN/GaN Two-Dimensional Electron Gas"
Kotaro Tsubaki, N. Maeda, T. Saitoh, and N. Kobayashi, 1Toyo University, 2NTT Photonics Laboratory, 3NTT Basic Research Laboratory, 4University of Electro-Communications .................................................. p.67

17:00 - 18:00 Lab Tour to RCIQE
(Tuesday, February 10)

- Devices and Circuit Applications -

9:30 - 10:10 "Room Temperature Operation of Highly Functional Single-Electron Transistors and Silicon Nanocrystal Memories"
Toshiro Hiramoto, M. Saitoh, and I. Kim, University of Tokyo ................................p.73

10:10 - 10:50 "MOVPE Growth of Nanostructures and Their Applications"
Takashi Fukui and Junichi Motohisa, Hokkaido University .........................p.78

10:50 - 11:10 Break

Yoshikazu Miyanaga, Kentarou Yoshikawa and Yasuyuki Hatakawa, Hokkaido University ..........................................................p.83

11:50 - 13:30 Lunch Break

- Photonic Technologies -

13:30 - 14:10 "Photonics Nanodevice Integration Engineering in Tokyo Tech"
Shigehisa Arai, Tokyo Institute of Technology .............................................. p.89

14:10 - 14:50 "Challenges for Terahertz Integrated Circuits"
Eiichi Sano, Hokkaido University .....................................................................p. 95

14:50 - 15:10 Break

- GaN-Based Technologies -

15:10 - 15:50 "Surface Characterization and Passivation for GaN-based Electron Devices"
Tamotsu Hashizume and Hideki Hasegawa, Hokkaido University ............p.101

15:50 - 16:30 "AlGaN/GaN Heterojunction FET for High Frequency Power Applications"
Masaaki Kuzuhara, R&D Association for Future Electron Devices .......... p.112

16:30 - 18:00 Poster Sessions (see page iv)

18:30 - 20:30 Reception (Centennial Hall, Hokkaido University)
(Wednesday, February 11)

- GaN-Based Technologies (continued) -

9:30 - 10:10 "Critical Issues for the Development of GaN-Based UV Devices"
Hiroshi Amano, M. Iwaya, S. Kamiyama and I. Akasaki, Meijo University ....p.118

10:10 - 10:30 Break

- Quantum Dots -

10:30 - 11:20 "In-rich InGaN/GaN Self-Assembled Quantum Dots by MOCVD"
Euijoon Yoon, Seoul National University .................................................... p. 112

11:20 - 12:00 "Scanning Probe Microscopy Observations of Electronic States and Work Functions in InAs Quantum Dots"
Arao Nakamura¹², T. Yamauchi and M. Tabuchi, †Nagoya University, ‡CREST-JST, ‡Nagoya University-VBL .................................................................p.127
Poster Sessions

P-1 "Air-Core Photonic Band-Gap Fibers: the Impact of Surface Modes"
Kunimasa Saioth1, Niels Asger Mortensen2, and Masanori Koshiba3, 'Graduate School of Electronics and Information Engineering, Hokkaido University, 4Crystal Fiber A/S p135

P-2 "Growth Kinetics and Modeling of Selective Molecular Beam Epitaxial Growth of GaAs Ridge Quantum Wires on Pre-Patterned Substrates"
Taketomo Sato, Isao Tamai and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ..............................................................p.136

P-3 "High-Density GaAs Hexagonal Nanowire Networks on Patterned (001) Substrates Using Selective MBE Growth"
Isao Tamai, Souichi Yoshida, Taketomo Sato and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ..............................................................p.137

P-4 "GaAs Based Two-Dimensional Photonic Crystals Using Selective Area MOVPE"
Junichiro Takeda, Masaru Inari, Akihiro Tarumi, Junichi Motohisa and Takashi Fukui, Research Center for Integrated Quantum Electronics, Hokkaido University . p.138

P-5 "Growth of III-V Semiconductor Nanowires by Selective Area Metalorganic Vapor Phase Epitaxy"

P-6 "Carbon Nanotube Growth on Substrates by Plasma CVD -Observation of Emission Spectra from Plasma-
A. Okita, Y. Suda, Y. Hayakawa, A. Tanaka, M. A. Bratescu and Y. Sakai, Graduate School of Electronics and Information Engineering, Hokkaido University .................p.140

P-7 "Fabrication of Two-Dimensional Kagome Lattice Structure by Selective Area Metalorganic Vapor Phase Epitaxy"
Premila Mohan, Junichi Motohisa and Takashi Fukui, Research Center for Integrated Quantum Electronics, Hokkaido University ..............................................................p.141

P-8 "Low-Damage RIBE Process of GaN-based Materials and Its Application to Nanostructures Fabrication"
Tsuottmu Muranaka, Tamotsu Hashizume and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University..............................................................p.142

P-9 "Nano Structure Emergence Projected by Localized Surface States on Fe(001) Thin Film Surfaces"
Kazuhisa Sueoka1, Hirofumi Oka1, Agus Subagyo2 and Koichi Mukasa3, 'Graduate School of Electronics and Information Engineering, Hokkaido University, 2CREST-JST ..............................................................p.143

P-10 "Preparation and Characterization of Co3Cr2O4Fe0.5Al Heusler Alloy Thin Films Grown on MgO Substrate by Magnetron Sputtering"
T. Kasahara, K. Matsuda, T. Marukame, T. Uemura, and M. Yamamoto, Graduate School of Electronics and Information Engineering, Hokkaido University ...............p.144

P-11 "Surface Reconstruction of Epitaxial Fe3O4(001) Films on MgO"
Agus Subagyo1, Kazuhisa Sueoka1,2, and Koichi Mukasa1,2, ’CREST-JST, ’Graduate School of Electronics and Information Engineering, Hokkaido University .............p.145
P-12 "(001) GaAs Surface Passivation by Forming Si and GaN Interface Control Layers on Ga-rich (4[6]) Surface"
Sanguan Anantathanasarn and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ................................................................. p.146

P-13 "Simultaneous Imaging of Ga and As Atoms by Means of Non-Contact Atomic Force Microscopy"
Nobutomo Uehara¹, Hirotaka Hosoii, Kazuhisa Sueoka¹, and Koichi Mukasa¹,
¹Graduate School of Electronics and Information Engineering, Hokkaido University,
²Innovation Plaza Hokkaido-JST ................................................................. p.147

P-14 "Effects of Si Deposition on Ga-Stabilized (4x6) and As-Stabilized (2x4) GaAs (001) surfaces"
Noboru Negoro and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ................................................................. p.148

P-15 "In-depth Cathodoluminescence Characterization of Heterostructures for III-V Nanoelectronics"
Fumitaro Ishikawa and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ................................................................. p.149

P-16 "Demonstration of Functional Magnetic Tunneling Junction with Negative Differential Resistance"
T. Uemura, S. Honma, T. Marukame, and M. Yamamoto, Graduate School of Electronics and Information Engineering, Hokkaido University ............................ p.150

P-17 "Characterization of (La, Sr)MnO₃ Films Deposited by Magnetron Sputtering on Si Substrate"
T. Uemura, Y. Takagi, K. Sekine, K. Matsuda, and M. Yamamoto, Graduate School of Electronics and Information Engineering, Hokkaido University ............................ p.151

P-18 "Switching Properties of GaAs-Based Quantum Wire Branch Switches Controlled by Nanometer-Scale Schottky Wrap Gate for Hexagonal BDD Quantum Circuits"
Miki Yumoto, Seiya Kasai, and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ............................ p.152

P-19 "Design and Implementation of a Digital Nano-Architecture Utilizing GaAs-Based Hexagonal Nanowire Networks Controlled by Schottky Wrap Gates"
Seiya Kasai, Miki Yumoto, Takahiro Tamura and Hideki Hasegawa, Research Center for Integrated Quantum Electronics and Graduate School of Electronics and Information Engineering, Hokkaido University ............................ p.153

P-20 "An Experimental Chip for Bio-Inspired Locomotion Controller based on the Wilson-Cowan Neural Oscillator"
Kazuki Nakada, Tetsuya Asai, and Yoshihito Amemiya, Graduate School of Electronics and Information Engineering, Hokkaido University ............................ p.154

P-21 "Single-Electron Device for Nonlinear Analog Computation"
Takahide Oya, Tetsuya Asai, and Yoshihito Amemiya, Graduate School of Electronics and Information Engineering, Hokkaido University ............................ p.154