ISNTT2021 Symposium Oral Program

December 14, 2021 (Tuesday)

09:40 - 10:00	**Opening Remarks**

Session 1 : Spin-dependent Transport in Two-dimensional Systems

10:00 - 10:50

S01-1 : **Hyperfine Mediated Transport in Semiconductor Quantum Structures**
(Plenary) Y. Hirayama
Tohoku University

10:55 - 11:15

S01-2 : **Electrical Evaluation of Spin-orbit Interaction Coefficients Near the Persistent Helix State in InGaAs Quantum Well**
C. Zhang, Z. Fan, Q. Liao, K. Hashimoto, S. Karube, Y. Hirayama, J. Nitta, M. Kohda
Tohoku University

11:15 - 11:35

S01-3 : **An Electronic Half-mirror on Quantum Hall Copropagating Spin-split Edge Channels**
T. Shimizu, T. Nakamura, A. Endo, J. Ohe, S. Katsumoto
The University of Tokyo

11:35 - 11:55

S01-4 : **Quantum Limit Transport and Two-dimensional Weyl Fermions in Epitaxial Ferromagnetic Oxide $SrRuO_3$ Thin Films**
S. Kaneta-Takada, Y. K. Wakabayashi, Y. Krockenberger, T. Nomura, Y. Kohama, H. Irie, K. Takiguchi, S. Ohya, M. Tanaka, Y. Taniyasu, H. Yamamoto
NTT Basic Research Laboratories

December 14, 2021 (Tuesday)

Session 2 : High-frequency Dynamics in 2D Materials

17:00 - 17:30

S02-1 : **Terahertz Physics of Graphene, Possibly the Most Nonlinear Material We Know**
(Invited) D. Turchinovich
Bielefeld University

17:30 - 18:00

S02-2 : **Valley Dynamics in Transition Metal Dichalcogenide Monolayers and Heterostructures**

(Invited) T. Korn

Institut für Physik Universität Rostock

18:00 - 18:20

S02-3 : **Ultrafast Time-resolved Electrical Readout of Photocurrent in Graphene Photodetector Using On-chip THz Spectroscopy**

K. Yoshioka, T. Wakamura, M. Hashisaka, K. Watanabe, T. Taniguchi, N. Kumada

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18:20 - 18:40

S02-4 : **Electron-Spin-Resonance in a Proximity-coupled MoS_2/Graphene Van-der-Waals Heterostructure**

C. H. Sharma, P. Zhao, L. Tiemann, M. Prada, R. H. Blick

Universitt Hamburg

18:40 - 19:00

S02-5 : **Coherent Zone-Corner Acoustic Phonons in Transition Metal Dichalcogenide $MoSe_2$**

I. Katayama, S. Bae, K. Matsumoto, M. Kitajima, K. Shudo, H. Raebiger, J. Takeda

Yokohama National University

19:00 - 19:20 ***Short Break***

December 14, 2021 (Tuesday)

Session 3 : Applications of Superconducting Quantum Circuits

19:20 - 19:50

S03-1 : **Detecting Spin Fluorescence with a Microwave Photon Counter**

(Invited) P. Bertet

CEA-Saclay

19:50 - 20:20

S03-2 : **A Ring Resonator-Based Coupler for Enhanced Connectivity in Superconducting Multi-Qubit Networks**

(Invited) R. Vijayaraghavan

Tata Institute of Fundamental Research

20:20 - 20:40

S03-3 : **Josephson Traveling-wave Parametric Amplifiers with Reduced Transmission Loss and Fabrication Complexity**

C. W. S. Chang, H. Kutsuma, Y. Nakamura

The University of Tokyo

20:40 - 21:00

S03-4 : **Detection of Solid-state Defects Coupled to a Superconducting Qubit via Critical Current Fluctuations**

L. V. Abdurakhimov, I. Mahboob, H. Toida , K. Kakuyanagi, Y. Matsuzaki, S. Saito
NTT Basic Research Laboratories

December 15, 2021 (Wednesday)

Session 4 : Quantum Communication

08:30 - 09:00

S04-1 : **Quantum communications: Overcoming Practical Challenges**

(Invited)

H.-K. Lo
University of Toronto / University of Hong Kong

09:00 - 09:20

S04-2 : **Securing the Source in Quantum Key Distribution**

K. Tamaki
University of Toyama / NTT Basic Research Laboratories

09:20 - 09:40

S04-3 : **Hong-Ou-Mandel Interference Between Independent Light Sources for Three-photon Time-bin Entanglement**

H. P. Lo, T. Ikuta, T. Honjo, W. J. Munro, H. Takesue
NTT Basic Research Laboratories

10:00 - 12:00 Poster Session I

December 15, 2021 (Wednesday)

Session 5 : Topological Phenomena and Quantum Hall physics

17:00 - 17:50

S05-1 : **Dilute Magnetic Topological Insulators**

(Plenary)

L. W. Molenkamp
Würzburg University

17:55 - 18:25

S05-2 : **Excitonic Nature of Magnons in a Quantum Hall Ferromagnet**

(Invited) P. Roulleau

CEA Saclay

18:25 - 18:45

S05-3 : **Andreev Reflection of Fractional Quantum Hall Quasiparticles**

M. Hashisaka, T. Jonckheere, T. Akiho, S. Sasaki, J. Rech, T. Martin, K. Muraki

NTT Basic Research Laboratories / JST, PRESTO

18:45 - 19:05

S05-4 : **Transport Study of Topological Bands: Remarkable Feature in a Thermoelectric Material**

G. Eguchi , M. Taupin, M. Budnowski, A. Steiger-Thirsfeld, Y. Ishida, K. Kuroda, S. Shin, A. Kimura, S. Paschen

TU Wien

19:05 - 19:20	***Short Break***

December 15, 2021 (Wednesday)

Session 6 : Novel Qubits and Manipulations in Superconducting Circuits

19:20 - 19:50

S06-1 : **Quantum Error Correction and Error-Transparent Gates on a Binomial Bosonic Code**

(Invited) L. Sun

Tsinghua University

19:50 - 20:20

S06-2 : **Quantum Error Correction of a Qubit Encoded in Grid States of an Oscillator**

(Invited) P. Campagne-Ibarcq

National Institute for Research in Digital Science and Technology

20:20 - 20:40

S06-3 : **Speed Limits for Quantum Gates with Weakly Anharmonic Qubits**

S. Ashhab, F. Yoshihara, T. Fuse, N. Yamamoto, A. Lupascu, K. Semba

NICT

20:40 - 21:00

S06-4 : **Enhanced Coherence of All-nitride Superconducting Qubits on a Silicon Substrate**

S. Kim, H. Terai, T. Yamashita, W. Qiu, T. Fuse, F. Yoshihara, S. Ashhab, K. Inomata, K. Semba

NICT

December 16, 2021 (Thursday)

Session 7 : Quantum Information Processing

08:30 - 09:00

S07-1 : **Programmable Photonics for Quantum Information and Machine Learning**
(Invited) D. Englund
MIT

09:00 - 09:20

S07-2 : **Higher-order Randomized Benchmarking**
Y. Nakata, D. Zhao, T. Okuda, E. Bannai, Y. Suzuki, S. Tamiya, K. Heya, Z. Yan, K. Zuo, S. Tamate, Y. Tabuchi, Y. Nakamura
The University of Tokyo / JST, PRESTO

09:20 - 09:40

S07-3 : **Efficient Tomography of Microwave Photonic Cluster States**
Y. Sunada, S. Kono, J. Ilves, T. Sugiyama, Y. Suzuki, T. Okubo, S. Tamate, Y. Tabuchi, Y. Nakamura
The University of Tokyo

09:40 - 10:00 ***Short Break***

December 16, 2021 (Thursday)

Session 8 : Quantum Optics and Optical Frequency Combs

10:00 - 10:30

S08-1 : **Scalable Semiconductor Quantum and Classical Photonics**
(Invited) J. Vučković
Stanford University

10:30 - 11:00

S08-2 : **Towards a Quantum Optical Sampling Oscilloscope**
(Invited) S. A. Diddams
NIST and University of Colorado, Boulder

11:00 - 11:20

S08-3 : **Thermal Control of a Kerr Microresonator Soliton Comb via an Optical Sideband**
K. Nishimoto, K. Minoshima, T. Yasui, N. Kuse
Tokushima University

11:20 - 11:40

S08-4 : **Optical Transmission Using Stokes Light**

S. Sugawara, S. Tanaka, S. Fujii, H. Kumazaki, S. Tasaka, S. Kawanishi, T. Tanabe

Keio University

11:40 - 12:00

S08-5 : **Frequency and Time Domain Measurements of $^{167}Er^{3+}$:Y_2SiO_5 by Stabilizing the Optical Frequency Using a Fiber Laser Comb**

S. Yasui, M. Hiraishi, A. Ishizawa, H. Omi, R. Kaji, S. Adachi, T. Tawara

NTT Basic Research Laboratories / Hokkaido University

December 16, 2021 (Thursday)

Session 9 : Optical Lattice Clocks and Precision Measurements

17:00 - 17:50

S09-1 : **Transportable Optical Lattice Clocks to Test and Use Gravitational Redshift**

(Plenary) H. Katori

The *University of Tokyo / RIKEN*

17:55 - 18:15

S09-2 : **Frequency Stability of a Cryogenic Silicon Optical Resonator with Crystalline Mirror Coatings**

J. Yu, T. Legero, F. Riehle, D. Nicolodi, D. Kedar, J. Robinson, E. Oelker,

J. Ye, U. Sterr

PTB

18:15 - 18:35

S09-3 : **Calibrating International Time and Tracing the Frequency of NICT-Sr1 to Remote Primary Frequency Standards**

N. Nemitz, T. Gotoh, H. Ito, Y. Hanado, T. Ido, H. Hachisu

NICT

19:00 - 21:00 Poster Session II

December 17, 2021 (Friday)

Session 10 : Advanced Physics in Atomic-layer-engineered Graphene

08:30 - 09:20

S10-1 : **The Magic of Moiré Quantum Matter**
(Plenary) P. Jarillo-Herrero
MIT

09:25 - 09:45

S10-2 : **Towards Scalable Growth of Hexagonal Boron Nitride/Graphene Vertical Heterostructure**
S. Wang, J. Crowther, H. Kageshima, H. Hibino, Y. Taniyasu
NTT Basic Research Laboratories

09:45 - 10:05

S10-3 : **Observation of Flat Band in Millimeter-scale Magic-angle Twisted Bilayer Graphene**
W. Norimatsu, K. Sato, T. Ito, K. Nakagahara, K. Wakabayashi, H. Hibino
Nagoya University

10:05 - 10:20 ***Short Break***

December 17, 2021 (Friday)

Session 11 : Superconductivity and Novel Materials

10:20 - 10:50

S11-1 : **Towards Ambient Superconductivity: Novel Hydrogen-Rich Materials**
(Invited) R. Dias
University of Rochester

10:50 - 11:20

S11-2 : **Molecular Beam Epitaxy of Novel Materials**
(Invited) S. Stemmer
University of California

11:20 - 11:40

S11-3 : **Growth of $Ba_{1-x}K_xFe_2As_2$ Epitaxial Thin Films by MBE**
D. Qin, K. Iida, C. Tarantini, T. Hatano, C. Wang, Z. Guo, H. Gao, H. Saito, S. Hata, A. Yamamoto, M. Naito
Tokyo University of Agriculture and Technology / JST CREST

11:40 - 12:00

S11-4 : **Tunnel Spectroscopy of Atomically Thin $NbSe_2$ Superconducting Films Carrying a Supercurrent**

A. Kanda, H. Tomori, R. Yanai, L. Haoyun, M. Ishikawa, T. Taniguchi, K. Watanabe, M. Hayashi

University of Tsukuba

December 17, 2021 (Friday)

Session 12 : Thermodynamics and Optics in Low-dimensional Systems

17:00 - 17:30

S12-1 : **Extrinsic Thermoelectric Response of Quantum Conductors**

(Invited)

R. Sánchez

Universidad Autónoma de Madrid

17:30 - 17:50

S12-2 : **Observation of Seebeck Effect in a Silicon Electron Box by Electron Counting Statistics**

K. Chida, A. Fujiwara, K. Nishiguchi

NTT Basic Research Laboratories

17:50 - 18:20

S12-3 : **Single-Photon Emission from Moving Quantum Dots Driven by a Surface Acoustic Wave**

(Invited)

C. J. B. Ford

University of Cambridge

18:20 - 18:40

S12-4 : **Resonance Fluorescence Dynamics of an Acoustically Modulated Quantum Dot**

M. Weiß, D. Wigger, M. Lienhart, M. Nägele, J. Finley, T. Kuhn,P. Machnikowski, H. Krenner

Augsburg University / University of Münster

18:40 - 19:00 ***Short Break***

December 17, 2021 (Friday)

Session 13 : Optomechanics and Spinmechanics

19:00 - 19:30

S13-1 : **Hybrid Optomechanical Systems : Coupling a Single Two-Level System with a Mechanical Oscillator**

(Invited) J.-P. Poizat

Univ. Grenoble Alpes, CNRS

19:30 - 20:00

S13-2 : **GHz Optomechanics with Microcavity Polaritons**

(Invited) Paulo V. Santos

Paul-Drude-Institut für Festkörperelektronik

20:00 - 20:20

S13-3 : **Cavity-enhanced Coherent Magnon-phonon Transduction with Surface Acoustic Waves**

D. Hatanaka, M. Asano, H. Okamoto, Y. Kunihashi, H. Sanada, H. Yamaguchi

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20:20 - 20:30	**Closing**