

November 13th, Monday

8th NTT-BRL School

10:00 - 10:30 Opening Remarks

10:30 - 10:45 Short Break

10:45 - 12:15 **Lecture 1**

The ABC's of Quantum Computation

Prof. Kae Nemoto

National Institute of Informatics (NII)

12:15 - 12:30 8th NTT-BRL School Photo

12:30 - 13:45 Lunch Time

13:45 - 15:15 **Lecture 2**

Hybrid Quantum Systems Using Collective Excitations in Solid

Prof. Yasunobu Nakamura

Research Center for Advanced Science and Technology (RCAST)

The University of Tokyo

15:15 - 15:45 Coffee Break

15:45 - 17:15 **Lecture 3**

Coherent Ising Machine for Solving Complex Optimization Problems

Dr. Hiroki Takesue

Optical Science Laboratories, NTT Basic Research Laboratories

17:30 - 19:30 Welcome Reception

November 14th, Tuesday

ISNTT2017 Symposium

9:40 - 10:00 Opening Remarks

Session 1

10:00 - 11:00

Tu-01 : **Quantum Metrology with Schrodinger Cats**

(Keynote) S. Haroche

Laboratoire Kastler Brossel, Collège de France

11:00 - 11:30 Coffee Break

Session 2: Optomechanics

11:30 - 12:00

Tu-02 : **Extremely High Frequency Cavity Optomechanics**

(Invited) A. Fainstein

Comisión Nacional de Energía Atómica (CNEA), Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET)

12:00 - 12:20

Tu-03 : **Toward a Phononic Crystal Nano-string with a Quality Factor of One Billion**

A. Ghadimi, S. Fedorov, N. J. Engelsen, M. Breyhi, R. Schilling, H. Shutz, D. J. Wilson, and T. J. Kippenberg

Ecole Polytechnique Federale de Lausanne (EPFL)

12:20 - 12:40

Tu-04 : **The Fully Quantized Dynamical Casimir Effect – Vacuum Casimir-rabi Oscillations in Optomechanical Systems**

V. Macrì, A. Ridolfo, O. Di Stefano, A. F. Kockum, F. Nori, and S. Savasta
RIKEN

12:40 - 12:50 ISNTT2017 Symposium Photo

12:50 - 14:00 Lunch Time

Session 3: Quantum State Manipulation in Superconducting Systems

14:00 - 14:30

Tu-05 : **Quantum Engineering of Superconducting Qubits**

(Invited) W. D. Oliver

Massachusetts Institute of Technology

14:30 - 15:00

Tu-06 : **Towards Fault-tolerant Quantum Computing Using Superconducting Qubits**

(Invited) M. Takita

IBM

15:00 - 15:20

Tu-07 : **Tunable Quantum Gate Between a Superconducting Atom and a Propagating Microwave Photon**

K. Koshino, K. Inomata, Z. R. Lin, Y. Tokunaga, T. Yamamoto, and Y. Nakamura

College of Liberal Arts and Sciences, Tokyo Medical and Dental University

15:20 - 15:40

Tu-08 : **Quantum Non-demolition Detection of an Itinerant Microwave Photon Using an Entangling Gate with a Superconducting Qubit**

S. Kono, Y. Tabuchi, A. Noguchi, R. Yamazaki, K. Koshino, and Y. Nakamura

Research Center for Advanced Science and Technology (RCAST),

The University of Tokyo

15:40 - 16:10

Coffee Break

Session 4: Unconventional Superconducting Junctions

16:10 - 16:40

Tu-09 : **Majorana Modes in InAs/Al Two-dimensional Heterostructures**

(Invited) F. Nichele

University of Copenhagen

16:40 - 17:00

Tu-10 : **Tunable Josephson Junctions and Superconducting Quantum Interference in an Interfacial Superconductor**

A. M. R. V. L. Monteiro, D. J. Groenendijk, N. Manca, E. Mulazimoglu, S. Goswami, R. Wölbing, D. Koelle, R. Kleiner, Y. Blanter, L. M. K. Vandersypen, and A. D. Caviglia

Kavli Institute of Nanoscience

17:00 - 17:20

Tu-11 : **Finite Supercurrent in Nb/(In, Fe)As/Nb Junctions**

T. Nakamura, L. D. Anh, Y. Hashimoto, S. Ohya, M. Tanaka, and S. Katsumoto

The University of Tokyo

17:20 - 17:40

Tu-12 : **Charge Quantum Interference Device**

R. Shaikhaidarov, S. E. de Graaf, S. T. Scacel, T. Hönenigl-Decrinis, V. A. Antonov,

E. V. Il'ichev, and O. V. Astafiev

Royal Holloway University of London

17:40 - 19:30

Poster Session I

November 15th, Wednesday

Session 5: Strongly Coupled Systems

9:00 - 9:30

We-01 : Cavity QED of Condensed Matter in the Ultrastrong Coupling Regime

(Invited) J. Kono
Rice University

9:30 - 9:50

We-02 : Probing the Dressed Structure of the Light-matter Ground State in the Ultra-strong Coupling Regime

M. Cirio, N. Lambert, S. De Liberato, K. Debnath, and F. Nori
Riken

9:50 - 10:10

We-03 : Twists of Qubit Energies in Deep-strongly-coupled Qubit-oscillator Circuits

F. Yoshihara, T. Fuse, Z. Ao, S. Ashhab, K. Kakuyanagi, S. Saito, T. Aoki, and K. Semba
National Institute of Information and Communications Technology

10:10 - 10:30

We-04 : A Coupling Between a Lamped Element Resonator and 4300 Superconducting Flux Qubits Ensemble

K. Kakuyanagi, Y. Matsuzaki, C. Déprez, H. Toida, K. Semba, H. Yamaguchi, W. J. Munro, and S. Saito
NTT Basic Research Laboratories

10:30 - 11:00 Coffee Break

Session 6: Semiconductor-based Quantum Devices and Technologies

11:00 - 11:30

We-05 : Circuit Quantum Electrodynamics with Gate-defined Silicon Quantum Dots

(Invited) X. Mi
Princeton University

11:30 - 11:50

We-06 : Long Spin Coherence of Acceptor Atoms in Mechanically Strained Silicon

T. Kobayashi, J. van der Heijden, J. Salfi, C. Chua, M. G. House, B. C. Johnson, J. C. McCallum, H. Riemann, N. Abrosimov, P. Becker, H.-J. Pohl, M. Y. Simmons, and S. Rogge
University of New South Wales and Tohoku University

11:50 - 12:10

We-07 : Multi-level Landau-Zener-Stückelberg-Majorana Transitions in a Silicon-based Single-electron Interferometer

S. N. Shevchenko, A. Chatterjee, S. Barraud, R. Otxoa, F. Nori, J. J. L. Morton, and M. F. Gonzalez-Zalba
B. Verkin Institute for Low Temperature Physics and Engineering

12:10 - 12:30

We-08 : Quantum Hall Stripes in Tilted Magnetic Fields

M. A. Zudov, Q. Shi, Q. Qian, G. C. Gardner, J. D. Watson, and M. J. Manfra
University of Minnesota

12:30 - 14:00 Lunch Time

Session 7: Nanophotonics and Nano Structures

14:00 - 14:30

We-09 : **Quantum Processing with Phonons**

(Invited) [B. Sussman](#)

National Research Council Canada

14:30 - 14:50

We-10 : **Spontaneous Emission Enhanced by Purcell Effect in a Set of Optomechanical Cavities**

[F. Tian](#), H. Sumikura, E. Kuramochi, M. Takiguchi, M. Ono, H. Taniyama, A. Shinya, and M. Notomi

NTT Basic Research Laboratories

14:50 - 15:10

We-11 : **Optoplasmonic Rolled-up-microtube Cavities**

[Y. Yin](#), and O. G. Schmidt

Leibniz Institute for Solid State and Materials Research Dresden (IFW Dresden)

15:10 - 15:40

We-12 : **Towards Nano Topological Photonics**

(Invited) [X. Hu](#)

National Institute for Materials Science

15:40 - 16:10 Coffee Break

16:10 - 16:30

We-13 : **Electric-field Switchable Second-harmonic Generation in Bilayer MoS₂ by Inversion Symmetry Breaking**

[J. Klein](#), J. Wierzbowski, A. Steinhoff, M. Florian, M. Rösner, F. Heimbach, K. Müller, F. Jahnke, T. O. Wehling, J. J. Finley, and M. Kaniber

Walter Schottky Institut und Physik Department

16:30 - 16:50

We-14 : **Spatio-temporal Coherent Control of Light Transport in Disordered Materials**

[M. Mounaix](#), S. Gigan

Laboratoire Kastler Brossel, ENS, CNRS, UPMC

16:50 - 17:10

We-15 : **Estimation of Pi-Pi Electronic Couplings from Current Measurements**

J. Trasobares, J. Rech, T. Jonckheere, T. Martin, O. Alevéque, E. Levillain, V. Diez-Cabanes, Y. Olivier, J. Cornil, J.P. Nys, R. Sivakumarasamy, K. Smaali, P. Leclere, A. Fujiwara, D. Theron, D. Vuillaume, and [N. Clement](#)

NTT Basic Research Laboratories

17:10 - 17:40

We-16 : **Challenges for Nanocar and Molecular Machine by nm-size Tip Approach and cm-level Hand Motion**

(Invited)

[K. Ariga](#)

National Institute for Materials Science

17:40 - 19:30 Poster Session II

November 16th, Thursday

Session 8: Single-electron Devices and Physics

9:00 - 9:30

Th-01 : Stochastic Thermodynamics in Superconducting and Hybrid Circuits

(Invited) [J. P. Pekola](#)

Aalto University School of Science

9:30 - 10:00

Th-02 : Shot Noise and Feedback in Single-electron Tunneling through Quantum Dots

(Invited) [R. J. Haug](#)

University of Hannover

10:00 - 10:20

Th-03 : Power Generation with Maxwell's Demon in a Silicon Nanodevice

[K. Chida](#), K. Nishiguchi, and A. Fujiwara

NTT Basic Research Laboratories

10:20 - 10:40

Th-04 : Quench Dynamics in Superconducting Nanojunctions: Metastability and Dynamical Phase Transitions

[R. Souto](#), A. Martín-Rodero, and A. L. Yeyati

Autonomous university of Madrid

10:40 - 11:10

Coffee Break

Session 9: Spin-orbit Interactions and Spin Transport

11:10 - 11:30

Th-05 : Drift-induced Enhancement of Cubic Dresselhaus Spin-orbit Interaction in Two-dimensional Electron Gas

[Y. Kunihashi](#), H. Sanada, Y. Tanaka, H. Gotoh, K. Onomitsu, K. Nakagawara, M. Kohda, J. Nitta, and T. Sogawa

NTT Basic Research Laboratories

11:30 - 11:50

Th-06 : Anisotropy and Suppression of Spin-orbit Interaction in GaAs Double Quantum Dots

[A. Hofmann](#), V. F. Maisi, T. Krähenmann, C. Reichl, W. Wegscheider, K. Ensslin, and T. Ihn

ETH Zürich

11:50 - 12:10

Th-07 : Detecting Non-local Spin Signal through Electron Interaction

[T. Shimizu](#), Y. Hashimoto, S. Sugumaran, A. Endo, T. Nakamura, and S. Katsumoto

University of Tokyo

12:10 - 12:30

Th-08 : Spin Hall Photoconductance and Ultrafast Helicity-dependent Currents in Topological Insulators

[P. Seifert](#), C. Kastl, K. Vaklinova, S. Ganichev, K. Kern, M. Burghard, and A. W. Holleitner

Walter Schottky Institut, TU Munich

12:30 - 12:50

Th-09 : Observation of Full Spin-Orbit Polarization in a Band-Inverted InAs/InGaSb Composite Quantum Well at Zero Magnetic Field

[Y. Takahashi](#), H. Irie, T. Akiho, K. Onomitsu, and K. Muraki

NTT Basic Research Laboratories

12:50 - 14:00 Lunch Time

Session 10: Nanomechanics and Phononics

14:00 - 14:30

Th-10 : Graphene Electro-mechanical Resonators

(Invited) A. Bachtold

The Institute of Photonic Sciences

14:30 - 15:00

Th-11 : Broadband Optomechanical Torque Magnetometry and Resonance Spectroscopy

(Invited) J. Losby

University of Alberta

15:00 - 15:20

Th-12 : Reorientation of Quantization Axis for Quantum Dot through High Variable Uniaxial Stress

X. Yuan, F. Weihausen-Brinkmann, J. Martín-Sánchez, G. Piredda, V. Krapek, Y. Huo,

H. Huang, O. G. Schmidt, J. Edlinger, G. Bester, R. Trotta, and A. Rastelli

Johannes Kepler University Linz, Institute of Semiconductor and Solid State Physics

15:20 - 15:40

Th-13 : Coherent Coupling of Dark and Bright Excitons in a Mechanical Resonator

R. Ohta, H. Okamoto, T. Tawara, H. Gotoh, and H. Yamaguchi

NTT Basic Research Laboratories

15:40 - 16:10 Coffee Break

16:10 - 16:30

Th-14 : Spins and Mechanics in Diamond Quantum Systems

D. Lee, K. Lee, J. Cady, and A. Jayich

Korea University

16:30 - 16:50

Th-15 : Dissipation as a Resource for Quantum-limited Amplification and Nonreciprocal Devices in Superconducting Circuit Optomechanics

L. D. Toth, N. R. Bernier, A. Nunnenkamp, A. K. Feofanov, and T. J. Kippenberg

Ecole Polytechnique Federale de Lausanne (EPFL)

16:50 - 17:20

Th-16 : A Double Quantum Dot Coupled with a Phonon Resonator

(Invited) T. Fujisawa

Tokyo Institute of Technology

17:20 - 17:50

Th-17 : Acoustic Control of Light and Matter on a Chip

(Invited) H. J. Krenner

University of Augsburg

17:50 - 18:40 Bus Transfer

18:40 - 20:40 Banquet

November 17th, Friday

Session 11: Topological Phases and Phase Transitions in 2D Systems

9:00 - 9:30

Fr-01 : Edge Conduction in Monolayer WTe_2

(Invited) [T. Palomaki](#)
University of Washington

9:30 - 9:50

Fr-02 : Electric-field Driven Topological Phase Transition in $\text{InAs}/\text{In}_x\text{Ga}_{1-x}\text{Sb}$ Composite Quantum Wells

[H. Irie](#), T. Akiho, K. Suzuki, F. Couëdo, K. Onomitsu, and K. Muraki
NTT Basic Research Laboratories

9:50 - 10:10

Fr-03 : First-order Phase Transition of Quantum Hall Skyrmions Observed by Photoluminescence Microscopy

[J. N. Moore](#), J. Hayakawa, H. Iwata, T. Mano, T. Noda, and G. Yusa
Tohoku University

10:10 - 10:40 Coffee Break

Session 12: Superconducting Hybrid Systems

10:40 - 11:10

Fr-04 : Qubit-assisted Transduction for a Detection of Surface Acoustic Waves Near the Quantum Limit

(Invited) [A. Noguchi](#)
The University of Tokyo

11:10 - 11:30

Fr-05 : Efficient Unidirectional Transduction Between Electrical Microwaves and Surface Acoustic Waves and Routing of Propagating Microwave Phonons at the Quantum Level

[M. K. Ekström](#), T. Aref, J. Runeson, J. Björck, I. Boström, H. Sanada, G. Andersson, B. Suri, and P. Delsing
Chalmers University of Technology

11:30 - 11:50

Fr-06 : Reducing $1/f$ Noise in Quantum Devices by Surface Spin Desorption

[S. E. de Graaf](#), L. Faoro, J. Burnett, A. Adamyan, A. Y. Tzalenchuk, S. E. Kubatkin, T. Lindstrom, and A. V. Danilov
National Physical Laboratory

11:50 - 12:10

Fr-07 : Effects of Phonon-Bottleneck in Spin Relaxation of Er:YSO

[R. P. Budoyo](#), K. Kakuyanagi, H. Toida, Y. Matsuzaki, I. Mahboob, W. J. Munro, H. Yamaguchi, and S. Saito
NTT Basic Research Laboratories

12:10 - 12:40

Fr-08 : Progress on Superconducting Multi-qubits System

(Invited) [X. Zhu](#)
University of Science and Technology of China

12:40 - 12:50 Closing