

国際セミナー道場実施報告

International Seminar Dojo 2020 Program

Date: September 25, 2020
Method: Online Zoom meeting

Friday, September 25

- | | |
|---------------|---|
| 13:00 – 13:15 | Opening |
| 13:20 – 15:20 | Research discussions (oral presentation) |
| 15:40 – 16:40 | Group work |
| 17:00 – 18:00 | Special lecture
“Nanodiamonds containing Nitrogen-Vacancy centers
– on the road towards quantum sensing”
Dr. Takuya F. Segawa, ETH Zürich, Switzerland |
| 18:20 – 19:20 | Rump session
“Looking back on graduate school life”
Ryoichi Sakata, Electronic Science and Engineering, Noda Lab.
Kazuki Hashimoto, Electrical Engineering, Hikihara Lab.
“Differences Between Company/National Institute and University”
Masataka Imura, National Institute for Materials Science
“Differences between research institutes and universities”
Koichi Murata, Central Research Institute of Electric Power Industry |
| 19:20 – 19:30 | Closing |
| 19:30 – | Reception (online exchange meeting) |

Instructions

- All events are held online through Zoom. The meeting URL will be sent to the participants by email. Research discussions, group work, and the reception are held by using “Breakout Rooms” in the Zoom meeting. Students are required to set his/her name in the Zoom meeting to “the presentation number, his/her name” such as “X-1, Taro Kyodai”.
- **Research discussions:** Each student gives an oral presentation on his/her research to the other members in the group (from A to J). The presentation time for each student is limited to 10 minutes. After each presentation, questions and answers are exchanged within the same group for another 5 to 10 minutes.
- **Group work:** Students propose a collaborative research plan through group discussion. The research plan must be interdisciplinary, spanning multiple (at least two) research fields. Students discuss the objective, methods, expected results, and social impacts of the proposed research. Students summarize their research plan in a short PowerPoint presentation (1 to 3 slides) during the group work, and the group leader submits these slides by email.
- During the rump session and the succeeding reception, participants may freely eat and drink.
- Presentation titles and presenter names are listed below in groups for the research discussions and group work.

Presentation Titles and Group Members

Group A

A-1: “Demonstration of high power, high beam quality beam scanning lasers with dually modulated photonic crystals”

Ryoichi Sakata (Electronic Science and Engineering, Noda Lab., D3)

A-2: “Decentralized Control for Consensus-Based Power Packet Distribution”

Seongcheol Baek (Electrical Engineering, Hikihara Lab., D3)

A-3: “Photo-carrier doping effect on high-order harmonic generation in solids”

Kohei Nagai (Physics, Solid State Spectroscopy Group, D2)

A-4: “Efficient Eddy-Current Analysis of Laminated Iron Cores Using Multi-Scale Model Order Reduction”

Hamed Eskandari (Electrical Engineering, Matsuo Lab., D2)

A-5: “Improvement of Optical Gain Properties in CsPbI₃ Nanocrystals”

Etsuki Kobiyama (Physics, Nanophotonics Group (ICR), M2)

A-6: “Spin waves transport and estimation in a paramagnetic organic chemical compound”

Haneol Jang (Electronic Science and Engineering, Shiraishi Lab., M2)

A-7: “Calculation of electric quadrupole moments in iron-based superconductor LaFeAsO from a first-principles calculation”

Taisei Kitamura (Physics, Condensed Matter Theory Group, M1)

Group B

B-1: “Liouvillianity breaking in Floquet-Lindblad systems under high-frequency regimes”

Kaoru Mizuta (Physics, Condensed Matter Theory Group, D2)

B-2: “Extended Nielsen-Ninomiya Theorem for Floquet and non-Hermitian systems”

Takumi Bessho (Physics, Physics of Matter: Condensed Matter Physics (YITP), D2)

B-3: “Quick measurement technique for carbon related defect in Gallium Nitride”

Kazutaka Kanegae (Electronic Science and Engineering, Kimoto Lab., D2)

B-4: “Enhancement of spin signals by thermal annealing in silicon-based lateral spin-valves”

Naoto Yamashita (Electronic Science and Engineering, Shiraishi Lab., D1)

B-5: “Vector measurement of tiny magnetic fields using Optically Pumped Magnetometer”

Kazuki Namita (Electrical Engineering, Kobayashi Lab., D1)

B-6: “Two Dimensional Swarm Formation in Time-invariant External Potential: Modelling, Analysis, and Control”

Yanran Wang (Electrical Engineering, Hikihara Lab., M2)

B-7: “Fabrication of silicon-vacancy centers in nanodiamonds by detonation”

Konosuke Shimazaki (Electronic Science and Engineering, Takeuchi Lab., M1)

Group C

C-1: “On-chip Memory Optimized Sparse Deep Neural Network Accelerator with Efficient Index Matching”

Hongjie Xu (Communications and Computer Engineering, Onodera Lab., D2)

C-2: “A Numerical Evaluation of MAC protocols for power transmission”

Shinji Katayama (Electrical Engineering, Hikihara Lab., D2)

- C-3: “Impacts of forming processes on resistive switching characteristics in TaO_x-based ReRAM cells”
Toshiki Miyatani (Electronic Science and Engineering, Kimoto Lab., D1)
- C-4: “Performance of routing and flexible spectrum slot allocation model for multipath provisioning in elastic optical networks”
Kenta Takeda (Communications and Computer Engineering, Oki Lab., M2)
- C-5: “ILU Preconditioner for Nonlinear Time-Harmonic Eddy-Current Analysis”
Hideaki Nagamine (Electrical Engineering, Matsuo Lab., M2)
- C-6: “Detection of current induced magnetization switching”
Motomi Aoki (Electronic Science and Engineering, Shiraishi Lab., M1)

Group D

- D-1: “A Design Framework for a Stand-alone Hybrid Dispersed Generation Network Unified by Passivity-based Control”
Rutvika Nandan Manohar (Electrical Engineering, Hikihara Lab., D3)
- D-2: “Nonlinear response in strongly-correlated electron systems”
Yoshihiro Michishita (Physics, Condensed Matter Theory Group, D2)
- D-3: “High-peak-power, short-pulse operation of photonic-crystal lasers”
Ryohei Morita (Electronic Science and Engineering, Noda Lab., D2)
- D-4: “Fabrication of semipolar AlGa_N Deep Ultraviolet LEDs on *r*-AlN”
Ryota Akaike (Electronic Science and Engineering, Kawakami Lab., D1)
- D-5: “Improvement of AC loss measurement system for measuring short coupling time constants of striated and copper-plated coated conductors”
Ning Wang (Electrical Engineering, Amemiya Lab., M2)
- D-6: “Developing an optical tweezers array system with alkaline-earth-like atom”
Yuma Nakamura (Physics, Quantum Optics Group, M1)

Group E

- E-1: “High-frequency equivalent circuit of interleaved air-core toroidal transformer”
Kazuki Hashimoto (Electrical Engineering, Hikihara Lab., D3)
- E-2: “Experimental Study on Quench Detection and Protection Conditions of High-temperature superconductor”
Xijie Luo (Electrical Engineering, Amemiya Lab., D2)
- E-3: “Theory of collective excitations in dissipative fermionic superfluids”
Kazuki Yamamoto (Physics, Condensed Matter Theory Group, D1)
- E-4: “Tunable broadband visible-infrared photon pair source using a LiNbO₃ crystal in the mid-infrared region”
Masaya Arahata (Electronic Science and Engineering, Takeuchi Lab., D1)
- E-5: “Quantum spectroscopy in monolayer transition metal dichalcogenide”
Shinya Takahashi (Physics, Solid State Spectroscopy Group, M1)
- E-6: “Self-consistent analysis of PCSEs under CW operation”
Shumpei Katsuno (Electronic Science and Engineering, Noda Lab., M1)

Group F

F-1: "AC loss of the layers of CORC cable"

Yang Li (Electrical Engineering, Amemiya Lab., D3)

F-2: "Shift Manipulation of Intrinsic Localized Mode in Driven Klein Gordon Lattice"

Hiroataka Araki (Electrical Engineering, Hikihara Lab., D1)

F-3: "Terahertz Non-Linear Spectroscopy of Landau-Levels in Graphene"

Kohei Eguchi (Physics, Solid State Spectroscopy Group, M2)

F-4: "Superconducting state in Rashba-Hubbard model"

Kosuke Nogaki (Physics, Condensed Matter Theory Group, M2)

F-5: "Enhancement of spin-orbit coupling in heavy metal doped silicon"

Taiki Nishijima (Electronic Science and Engineering, Shiraishi Lab., M2)

F-6: "Accurate characterization of barrier heights at Ti/ and Ni/heavily-doped SiC interfaces"

Masahiro Hara (Electronic Science and Engineering, Kimoto Lab., M2)

Group G

G-1: "Spin-lock techniques for brain function measurement in the low-field MRI"

Hiroyuki Ueda (Electrical Engineering, Kobayashi Lab., D2)

G-2: "Giant surface magnetoelectric effect in d-wave superconductors"

Yuhei Ikeda (Physics, Condensed Matter Theory Group, D1)

G-3: "Development of ytterbium quantum gas microscope toward the direct measurement of SU(N) magnetism"

Yoshihiro Takata (Physics, Quantum Optics Group, D1)

G-4: "Model Order Reduction of Nonlinear Eddy-current Field Using Parameterized CLN"

Miwa Tobita (Electrical Engineering, Matsuo Lab., M2)

G-5: "Realization of Ferromagnetic Resonance in 1 nm Co ultrathin film"

Shugo Yoshii (Electronic Science and Engineering, Shiraishi Lab., M1)

G-6: "Lateral spread of implanted atoms into a SiC substrate"

Qimin Jin (Electronic Science and Engineering, Kimoto Lab., M1)

Group H

H-1: "Ultra high-Q photonic crystal coupled nanocavities"

Masahiro Nakadai (Electronic Science and Engineering, Noda Lab., D3)

H-2: "Broadband photon-pair generation using a silicon nitride ring resonator"

Kenta Sugiura (Electronic Science and Engineering, Takeuchi Lab., D2)

H-3: "Direct generation of infrared light source by spontaneous parametric down-conversion in PPSLT"

Masayuki Hojo (Physics, Solid State Spectroscopy Group, M2)

H-4: "Hydrodynamics in electron fluid"

Ryotaro Sano (Physics, Condensed Matter Theory Group, M1)

H-5: "Phonon-photon strong coupling in a microcavity"

Zhenya Zhang (Physics, Nanophotonics Group (ICR), M1)

H-6: "Contraction of stacking faults in SiC epitaxial layers in thermal equilibrium"

Euihyeon Do (Electronic Science and Engineering, Kimoto Lab., M1)

Group I

- I-1: "Adaptive quantum state estimation for dynamic quantum states"
Saki Nohara (Electronic Science and Engineering, Takeuchi Lab., D3)
- I-2: "Progress towards realization of an optical frequency standard using Ba⁺"
Hiroto Fujisaki (Electronic Science and Engineering, Quantum Optical Engineering Lab., D3)
- I-3: "Exceptional-torus in strongly correlated nodal-line semimetals"
Kazuhiro Kimura (Physics, Condensed Matter Theory Group, D2)
- I-4: "Developing a Programmable Quantum System Using Ytterbium Atoms"
Daichi Okuno (Physics, Quantum Optics Group, D2)
- I-5: "Large spin Hall angle in Heusler alloy Weyl semimetal Co₂MnGa"
Livio Leiva (Electronic Science and Engineering, Shiraishi Lab., D2)
- I-6: "Measurement of spatial resolution of fluctuation microscope using samples with slow relaxation time"
Akinori Ooka (Physics, Soft Matter Physics Group, M2)

Group J

- J-1: "Gate voltage dependence of spin-dependent signal in Si spin MOSFET"
Soobeom Lee (Electronic Science and Engineering, Shiraishi Lab., D3)
- J-2: "Influence of Molecular Fluctuation of Biomolecule Bound to DNA origami"
Yuki Yamamoto (Electronic Science and Engineering, Yamada Lab., D3)
- J-3: "Impact of excluding oxidation process on the interface states density at SiC/SiO₂ structure"
Keita Tachiki (Electronic Science and Engineering, Kimoto Lab., D2)
- J-4: "Electron Hydrodynamics in Noncentrosymmetric Crystals"
Riki Toshio (Physics, Condensed Matter Theory Group, D1)
- J-5: "Towards experiments with multi-species quantum gas"
Naoto Mizukami (Physics, Quantum Optics Group, M2)
- J-6: "Dynamic Coupling in Surfactant Lamellar and Colloid Particles Mixtures"
Shingo Yoshioka (Physics, Soft Matter Physics Group, M2)



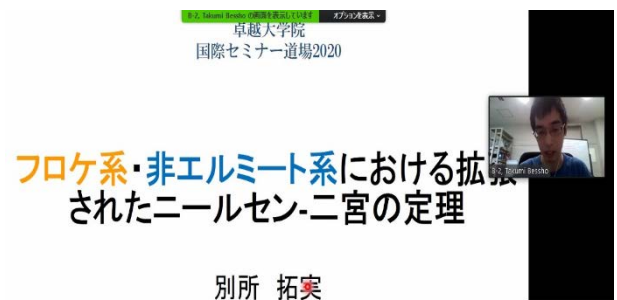
【野田教授による開催挨拶】



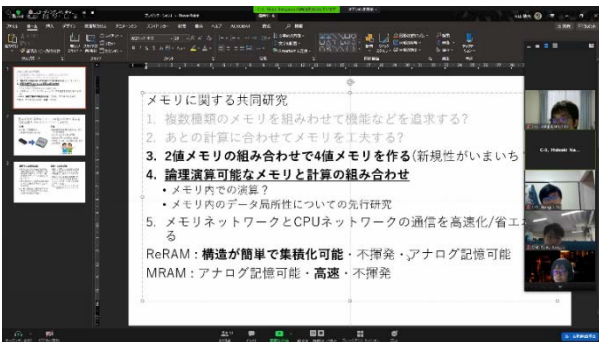
【参加者（一部）】



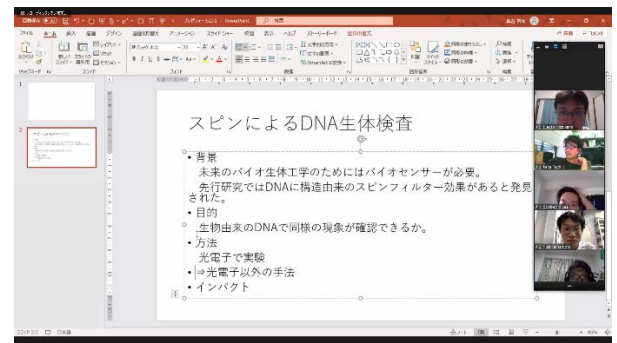
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【研究ディスカッション（Bグループ）】



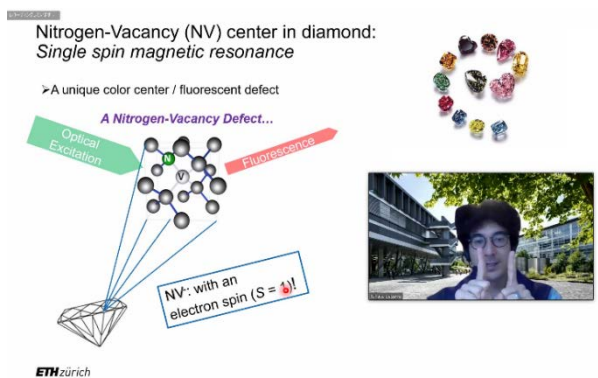
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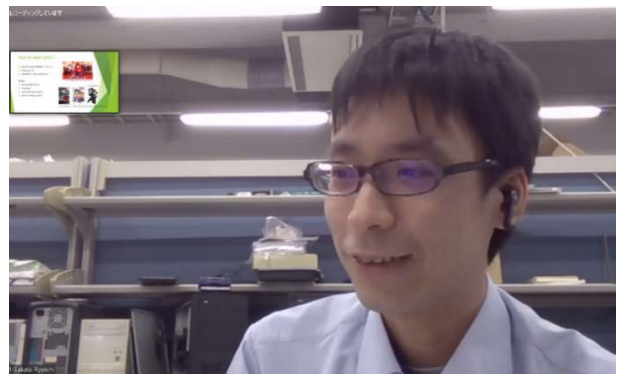
【Segawa 博士 特別講演】



【Segawa 博士 特別講演】



【竹内教授による Segawa 博士への謝辞】



【ランプセッション：D3 学生】

Summary 15

Category	Salary	Flexibility	Product	Publication	Education	Budget	Human Power
Company	◎	△	◎	△	△	◎	○
National institute	○	◎	△	○	△	○	△
University	○	○	△	○	◎	△	◎

科学技術・学術政策研究所
 National Institute of Science and Technology Policy

大学 公的研究機関
 企業 ベンチャー
 学産 イノベーションの創出
 官 官

産 財・地方自治体

<https://www.nistep.go.jp/research/science-and-technology-system>

【ランプセッション：物材研 井村氏】



【ランプセッション：電中研 村田氏】



【木本教授による閉会挨拶】



【田中教授による懇親会・乾杯】



【懇親会】



【懇親会】