

業績リスト / Publication List

協奏分子システム研究センター
階層分子システム研究解析部門
鹿野グループ

Research Center of Integrative Molecular Systems (CIMoS)
Division of Trans-Hierarchical Molecular Systems
Shikano Group

March 17, 2017

“二重下線 / double underline” グループリーダー: 鹿野 豊 / Group Leader:
Yutaka Shikano

“下線 / underline” グループメンバー (インターンシップ含) 分子研の所
属があるもの / Group member included the internship students and
visitors

1 グループメンバー / Group Members

1. 杉尾 一 / Hajime Sugio (日本学術振興会特別研究員, JSPS Young Researcher Fellow) 1 April 2014 – 31 March 2015
2. 後藤 振一郎 / Shin-itiro Goto (特別協力研究員, 技術支援員 / Research Fellow and Technical Staff) 1 October 2014 – 15 December 2015
3. 中根 淳子 / Junko Nakane (秘書 / Secretary) 16 February 2012 – 31 March 2014
4. 近藤 直子 / Naoko Kondo (秘書 / Secretary) 1 April 2014 – 31 March 2016
5. 加茂 恭子 / Kyoko Kamo (技術支援員, Technical Staff) 1 April 2014 – 31 March 2017
6. 加藤 真悠子 / Mayuko Kato (技術支援員, 事務支援員 / Technical Staff, Administrative Staff) 16 May 2014 – 31 March 2017

7. 鈴木 小百合 / Sayuri Suzuki (秘書 / Secretary) 1 April 2016 – 31 March 2017

2 査読付学術論文 / Refereed academic journals

1. Hirokazu Kobayashi, Graciana Puentes, and Yutaka Shikano,
Extracting joint weak values from two-dimensional spatial displacements
Physical Review A **86**, 053805 (2012) [4 pages].
2. Yutaka Shikano,
The counterfactual process in weak values
Physica Scripta **T151**, 014015 (2012) [3 pages].
3. Yutaka Shikano, Junsei Horikawa, and Tatsuaki Wada,
The discrete-time quantum walk as a stochastic process in quantum mechanics
Physica Scripta **T151**, 014016 (2012) [5 pages].
4. Tomoyuki Horikiri, Yasuhiro Matsuo, Yutaka Shikano, Andreas Löffler, Sven Höfling, Alfred Forchel, and Yoshihisa Yamamoto,
Temperature Dependence of Highly Excited Exciton Polaritons in Semiconductor Microcavities
Journal of the Physical Society of Japan **82**, 084709 (2013) [10 pages].
5. Ali Ü. C. Hardal, Peng Xue, Yutaka Shikano, Özgür E. Müstecaplıoğlu, and Barry C. Sanders,
Discrete time quantum walk with nitrogen-vacancy centers in diamond coupled to a superconducting flux qubit
Physical Review A **88**, 022303 (2013) [11 pages].
6. Yuki Susa, Yutaka Shikano, and Akio Hosoya,
Reply to “Comment on ‘Optimal Probe Wavefunction of Weak-Value Amplification’”
Physical Review A **87**, 046102 (2013) [2 pages].
7. 杉尾 一,
自然哲学における数量概念の歴史
比較文化研究 **111**, 281 - 288 (2014).
8. 杉尾 一,
時空に依存する物理量概念
時間学研究 **7**, 9 - 21 (2014).

9. Meltem Gönülol, Ekrem Aydiner, Yutaka Shikano, and Özgür E. Müstecaplıoğlu, Survival Probability in a Quantum Walk on a One-Dimensional Lattice with Partially Absorbing Traps
Journal of Computational and Theoretical Nanoscience **10**, 1596–1600 (2013).
10. Yutaka Shikano, Tatsaki Wada, and Junsei Horikawa, Discrete-time quantum walk with feed-forward quantum coin
Scientific Reports **4**, 4427 (2014) [7 pages].
11. Atsushi Noguchi, Yutaka Shikano, Kenji Toyoda, and Shinji Urabe, Aharonov-Bohm effect in the tunnelling of a quantum rotor in a linear Paul trap
Nature Communications **5**, 3868 (2014) [6 pages].
12. Hirokazu Kobayashi, Koji Nonaka, and Yutaka Shikano, Stereographical visualization of a polarization state using weak measurements with an optical-vortex beam
Physical Review A **89**, 053816 (2014) [5 pages]. Editor's Suggestion
13. Shin-itiro Goto, Legendre submanifolds in contact manifolds as attractors and geometric nonequilibrium thermodynamics
Journal of Mathematical Physics **56**, 073301 (2015) [30 pages].
14. Yusuf Turek, Wulayimu Maimaiti, Yutaka Shikano, Chang-Pu Sun, and Mohammad Al-Amri, Advantages of nonclassical pointer states in postselected weak measurements
Physical Review A **92**, 022109 (2015) [8 pages].
15. Yusuf Turek, Hirokazu Kobayashi, Tomotada Akutsu, Chang-Pu Sun, and Yutaka Shikano, Post-selected von Neumann measurement with Hermite-Gaussian and Laguerre-Gaussian pointer states
New Journal of Physics **17**, 083029 (2015) [17 pages].
16. Giuseppe Di Molfetta, Lauchlan Honer, Ben B. Luo, Tatsuaki Wada, and Yutaka Shikano, Massless Dirac Equation from Fibonacci Discrete-Time Quantum Walk
Quantum Studies: Mathematics and Foundations **2**, 243–252 (2015).
Erratum: Quantum Studies: Mathematics and Foundations **2**, 253–254 (2015).
17. Kazutaka G. Nakamura, Yutaka Shikano, and Yosuke Kayanuma,

- Influence of pulse width and detuning on coherent phonon generation
Physical Review B **92**, 144304 (2015) [7 pages].
18. Akio Hosoya, Koji Maruyama, and Yutaka Shikano,
Operational derivation of Boltzmann distribution with Maxwell's demon model
Scientific Reports **5**, 17011 (2015) [9 pages].
 19. Shin-itiro Goto, Robin W. Tucker, Timothy J. Walton,
Classical dynamics of free electromagnetic laser pulses
Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms **369**, 40 - 44 (2016).
 20. Shin-itiro Goto, Robin W. Tucker, Timothy J. Walton,
The dynamics of compact laser pulses
Journal of Physics A: Mathematical and Theoretical **49**, 265203 (2016) [11 pages].
 21. Tomoyuki Horikiri, Makoto Yamaguchi, Kenji Kamide, Yasuhiro Matsuo, Tim Byrnes, Natsuko Ishida, Andreas Löffler, Sven Höfling, Yutaka Shikano, Tetsuo Ogawa, Alfred Forchel, and Yoshihisa Yamamoto,
High-energy side-peak emission of exciton-polariton condensates in high density regime
Scientific Reports **6**, 25655 (2016) [11 pages].
 22. Kazutaka G. Nakamura, Kazuma Ohya, Hiroshi Takahashi, Tetsuya Tsuruta, Hiroya Sasaki, Shin-ichi Uozumi, Katsura Norimatsu, Masahiro Kitajima, Yutaka Shikano, and Yosuke Kayanuma,
Spectrally resolved detection in transient reflectivity measurements for coherent optical phonons in diamond
Physical Review B **94**, 024303 (2016) [7 pages].
 23. Yu-Xiang Zhang, Shengjun Wu, Zeng-Bing Chen, and Yutaka Shikano,
Ground-state cooling of dispersively coupled optomechanical system in unresolved sideband regime via dissipatively coupled oscillator
Physical Review A **94**, 023823 (2016) [11 pages].
 24. Shin-itiro Goto,
Contact geometric descriptions of vector fields on dually flat spaces and their applications in electric circuit models and nonequilibrium statistical mechanics
Journal of Mathematical Physics **57**, 102702 (2016) [41 pages].
 25. Tomoyuki Horikiri, Makoto Yamaguchi, Kenji Kamide, Yasuhiro Matsuo, Tim Byrnes, Natsuko Ishida, Andreas Löffler, Sven Höfling, Yutaka

- Shikano, Tetsuo Ogawa, Alfred Forchel, and Yoshihisa Yamamoto,
Erratum: High-energy side-peak emission of exciton-polariton condensates in high density regime
Scientific Reports **6**, 35094 (2016) [1 page].
26. Fumiaki Matsuoka, Akihisa Tomita, and Yutaka Shikano,
Generation of Phase-Squeezed Optical Pulses with Large Coherent Amplitudes by Post-Selection of Single Photons and Weak Cross-Kerr Nonlinearity
Quantum Studies: Mathematics and Foundations, accepted for the publication.
27. Yutaka Shikano,
How to realize one-dimensional discrete-time quantum walk by Dirac particle
Interdisciplinary Information Sciences, accepted for publication.

3 レビュー論文、著書 / Review articles and books

1. Yutaka Shikano,
Time in Weak Value and Discrete Time Quantum Walk: From Quantum Measurement to Quantum Dynamics
(LAP Lambert, Germany, 2012).
2. Yutaka Shikano,
Theory of “Weak Value” and Quantum Mechanical Measurements in “Measurements in Quantum Mechanics” edited by Mohammad Reza Pahlavani (InTech, Croatia, 2012) pp. 75 – 100.
arXiv:1110.5055.
3. Yutaka Shikano,
From Discrete Time Quantum Walk to Continuous Time Quantum Walk in Limit Distribution
Journal of Computational and Theoretical Nanoscience **10**, 1558-1570 (2013).

4 総説、解説記事 / Social articles

1. Yutaka Shikano,
Special issue on quantum walks

- Quantum Information Processing **11**, 1013 (2012) [2 pages].
2. 鹿野 豊,
分子科学への船出 (New Lab 研究室紹介)
分子研レターズ **66**, 31 – 32 (2012).
 3. Yutaka Shikano, Etsuo Segawa, Armando Perez, and Jingbo Wang,
A Special Issue on Theoretical and Mathematical Aspects of Discrete
Time Quantum Walks
Journal of Computational and Theoretical Nanoscience **10**, 1555–1556
(2013).
 4. 鹿野 豊,
“光子は未来を知っている” interviewed to Yakir Aharonov (監修)
日経サイエンス 2014年1月号 published on 25 November 2013 (再掲:
日経サイエンス別冊「量子の逆説」(細谷暁夫 編) published on 18 June
2014).
 5. 鹿野 豊,
“Foundational Questions Institute 主催エッセイコンテスト” (ラ・トッ
カータ)
日本物理学会学会誌 **69**, 326 (2014).
 6. Yutaka Shikano,
“These from Bits.”
in “It From Bit or Bit From It?” (Springer, Switzerland, 2015), Chapter
10, pp 113 – 118.
 7. 鹿野 豊,
小型環境モニターの開発 (利用者報告)
分子科学研究所装置開発室 Annual Report 2015, 12 (2016).
 8. 鹿野 豊,
“今野紀雄, 量子ウォーク (森北出版, 2014)” (新著紹介)
日本物理学会学会誌 **71**, 711 (2016).
 9. 鹿野 豊, 野尻 美穂子, 高安 美佐子, 田中 忠芳,
“物理と社会シンポジウム「ダイバーシティの中での物理教育」報告”
大学の物理教育 **23**, 48 – 52 (2017).
 10. Etsuo Segawa, Masato Takei, Yutaka Shikano, Nobuaki Obata, and
Norio Konno,
Special Issue: Quantum Simulation and Quantum Walks
Interdisciplinary Information Sciences, accepted for publication.

5 Preprint

1. Masamitsu Bando, Tsubasa Ichikawa, Yasushi Kondo, Nobuaki Nemoto, Mikio Nakahara, and Yutaka Shikano, Applications of Concatenated Composite Pulses to NMR arXiv:1508.02983 submitted to Reviews of Scientific Instruments (in preparation).
2. Pablo Arnault and Fabrice Debbasch, Quantum walks and gravitational waves arXiv:1609.00722.
3. Mikko Tukiainen, Hirokazu Kobayashi, and Yutaka Shikano, Quantification of Concurrence via Weak Measurement arXiv:1611.00149 submitted to Physical Review A (under review).
4. Tomoyuki Horikiri, Tim Byrnes, Kenichiro Kusudo, Natsuko Ishida, Yasuhiro Matsuo, Yutaka Shikano, Andreas Löffler, Sven Höfling, Alfred Forchel, and Yoshihisa Yamamoto, Highly excited exciton-polariton condensates: An evidence of strong coupling in high density regime submitted to Physical Review B (under review).
5. Fumika Suzuki, Marina Litinskaya, and William G. Unruh, Scattering of a composite quasiparticle by an impurity on a lattice arXiv:1701.04899.
6. Hiroya Sasaki, Riho Tanaka, Fujio Minami, Yosuke Kayanuma, Yutaka Shikano, and Kazutaka G. Nakamura, Coherent control of 40 THz optical phonons in diamond submitted to Physical Review B (under review).

6 国際会議録 / Conference Proceedings

1. Yutaka Shikano, Counter-Factual Phenomenon in Quantum Mechanics in Quantum Bio-Informatics V-Proceedings of the Quantum Bio-Informatics 2011 edited by Accardi Luigi, Wolfgang Freudenberg, and Masanori Ohya (World Scientific Publishing, Singapore, 2013) pp 463 – 472.
2. Yutaka Shikano, On Signal Amplification from Weak-Value Amplification in Kinki University Series on Quantum Computing Volume 9 “Physics,

Mathematics, and All that Quantum Jazz” edited by Shu Tanaka, Masamitsu Bando, and Utkan Güngördü (World Scientific, Singapore, 2014) pp. 91 – 100.

3. Yutaka Shikano,
On signal amplification via weak measurement
AIP Conference Proceedings **1633**, 84 – 86 (2014).
QUANTUM COMMUNICATION, MEASUREMENT AND COMPUTING (QCMC): Eleventh International Conference on QCMC
edited by Hannes-Jörg Schmiedmayer and Philip Walther.

7 招待講演 / Invited talks

1. 鹿野 豊,
2012 年度科学基礎論学会研究例会 at 首都大学東京, 17 June 2012,
“量子力学と測定に関する縦糸と横糸”.
2. 鹿野 豊,
AMO 討論会 at 理化学研究所, 15 June 2012,
“On the usefulness of Weak-Value amplification”.
3. Yutaka Shikano,
The 72nd Okazaki Conference on “Ultimate Control of Coherence” at
Okazaki Conference Center, 9 January 2013,
“Exciton-polariton condensation in high excitation density regime”.
4. Yutaka Shikano,
Joint Mathematics Meeting 2013 at San Diego Convention Center,
USA, 10 January 2013,
“On Inhomogeneous Quantum Walks”.
5. Yutaka Shikano,
2013 Asian Core Winter School “Advances in Nanomaterials Chemistry
- Theory and Experiment” at Hanwha Resort Haeundae, South Korea,
28 January 2013,
“Introduction to Quantum Optics – Toward well understanding the
nano-scale science (chemistry) –”.
6. Yutaka Shikano,
RCPAM-CMRU 勉強会 “Quantum Walks and Dynamics on Metric
Graphs” at Tohoku University, 7 March 2013,
“Nonlinear (Discrete Time) Quantum Walk and Porous Medium Equa-
tion”.

7. 鹿野 豊,
第2回つくば量子情報サロン at 産業技術総合研究所, 11 May 2013,
“弱値を巡る量子測定理論と量子論の解釈”.
8. Yutaka Shikano,
1st Awaji International Workshop on “Electron Spin Science and Technology: Biological and Materials Science Oriented Applications” at Awaji Yumebutai International Conference Center, Japan, 17 June 2013,
“Quasi-Magnon Dynamics on Hybrid Superconducting Qubit and Nitrogen Vacancy Centers in Diamond”.
9. Yutaka Shikano,
九州大学 Math-for-Industry 研究所共同利用研究会「量子ウォーク数理の新展開：物質制御への応用」 at 九州大学, 21 June 2013,
“How to implement the discrete time quantum walk in the hybrid quantum system?”.
10. 鹿野 豊,
NAIST グリーンフォトンクス研究会「有機レーザーを目指して」 at 奈良先端科学技術大学院大学, 2 August 2013,
“反転分布のないレーザー発振に向けて”.
11. Yutaka Shikano,
Summer Workshop on “Physics, Mathematics, And All That Quantum Jazz” at Kinki University, Japan, 7 August 2013,
“On the Signal Amplification –From Weak-Value Amplification–”.
12. Yutaka Shikano,
ELiTES thermal noise workshop 2 at Jena University, Germany, 30 August 2013,
“On Fluctuation-Dissipation Theorem in Non-equilibrium Steady State”.
13. Yutaka Shikano
Symposium on New Frontiers of Quantum Photonic Network at 電気通信大学, 6 November 2013,
“光渦を使った量子トモグラフィ”.
14. 鹿野 豊,
第2回 NINS Colloquium セッション2：ビックデータと仮説形成：複雑系の理解に向けて at ヤマハリゾート「つま恋」, 17 December 2013,
“データ駆動型科学研究の将来像”.
15. Yutaka Shikano,
Fifth Nagoya Winter Workshop on Quantum Information, Measure-

- ment, and Foundations at Nagoya University, 3 March 2014,
“Observation of Aharonov-Bohm effect with quantum tunneling”.
16. Yutaka Shikano,
Interdisciplinary Workshop on Quantum Device –towards operation of
the quantum information and the quantum computer– 2014 at National
Institute of Informatics, Tokyo, Japan, 27 March 2014,
“Stereographical Visualization of Polarization State using Weak Mea-
surement with Optical Vortex Beam”.
 17. Yutaka Shikano,
BIT’s 3rd Annual World Congress and EXPO of Advanced Materials-
2014 at Chongqing Yuelai International Conference and EXPO Center,
Chongqing, China, 7 June 2014,
“Toward the Polariton Lasing”.
 18. Yutaka Shikano,
2014 edition of the International Conference in Statistical Physics (Sigma
Phi 2014) at Sheraton Rhodes Hotel, Greece, 10 July 2014,
“Discrete Time Quantum Walk Is Quantum Dynamical Simulator”.
 19. 鹿野 豊,
プラズマ科学のフロンティア 2014 at 核融合科学研究所, 7 August 2014,
“波動関数を可視化する方法 ~ 光を用いた実験を例として ~”.
 20. 鹿野 豊,
量子系の数理解と物質制御への展開：量子ウォークを架け橋に at 東北大
学情報科学研究科, 18 September 2014,
“量子ウォークによる量子シミュレーション”.
 21. Yutaka Shikano,
Quantum Technologies Based On Hybrid Emitter - Solid State Systems
at University of Strasbourg, France, 24 September 2014,
“Optomechanics of Quantum Rotor”.
 22. 鹿野 豊,
RIMS 研究集会「量子場数理解とその周辺」at 京都大学数理解析研究所,
8 October 2014,
“Massless Dirac Equation from Fibonacci Quantum Walk”.
 23. 後藤 振一郎,
Mini Workshop on Information Geometry and Statistical Physics at 分
子科学研究所, 18 October 2014,
“緩和過程の接触多様体上での幾何学的記述—幾何学的非平衡統計力学
構築の試み—”.

24. 鹿野 豊,
Nagahama Workshop “From Quantum to Life” at 長浜バイオ大学, 15
November 2014,
“情報理論的アプローチの理論再構築の限界”.
25. 鹿野 豊,
第 31 回量子情報技術研究会 (QIT31) at 東北大学片平キャンパス, 17
November 2014,
“量子ウォークの数理と応用”.
26. 鹿野 豊,
3rd Yokohama Quantum Walk Workshop at 横浜国立大学, 19 Novem-
ber 2014,
“Seeking the SIC POVM”.
27. 鹿野 豊,
学融合研究 Kick Off Meeting “新たな量子物理量の基礎の探求と精密
測定への応用” at 東北大学東京分室, 21 November 2014,
“Introduction to Weak Value and Weak Measurement from Historical
Viewpoint”.
28. 鹿野 豊,
第 3 回 NINS Colloquium 分科会 2 “光でひも解く自然科学” at プリン
ス箱根, 2 December 2014,
“Summary Talk of Our Session”.
29. 鹿野 豊,
第 3 回 NINS Colloquium at プリンス箱根, 3 December 2014,
“Summary Talk of Our Session”.
30. Yutaka Shikano,
Tensor Network States: Algorithms and Applications 2014 at Institute
of Physics, Chinese Academy of Sciences, Beijing, China, 5 December
2014,
“Discrete-time quantum walk and Quantum dynamical simulation”.
31. Yutaka Shikano,
Deep dive into the Aharonov-Albert-Vaidman amplification effect at
Chapman University, Orange, CA, USA, 10 December 2014,
“Weak measurement with higher-order Gaussian modes”.
32. 鹿野 豊,
マイクロイオントラップ講演会 at 大阪大学基礎工学部国際棟, 25 De-
cember 2014,
“イオントラップを用いたフォノン干渉と量子基礎実験 — 量子基礎論

から見たマイクロイオントラップへの期待 —”.

33. 鹿野 豊,
第 6 回暗号及び情報セキュリティと数学の関連ワークショップ (CRISMATH 2014) at 産業技術総合研究所臨海副都心センター, 26 December 2014,
“量子計算機の基礎と実状”.
34. 鹿野 豊,
Small-workshop on Communications between Academia and Industry for Security (SCAIS) at 九州大学西新プラザ, 19 January 2015,
“量子計算機の現状と展望”.
35. 鹿野 豊,
Symposium on Quantum Fields in Dynamical Nature, on the occasion of Professor Izumi Ojima’s retirement at 京都大学北部キャンパス北部総合教育研究棟内益川ホール, 6 March 2015,
“Visualizing Quantum Nature”.
36. 鹿野 豊,
第 9 回日本統計学会春季集会 at 明治大学中野キャンパス, 8 March 2015,
“実験家の協働で見えてきた統計的考え方の重要性と期待”.
37. 鹿野 豊,
第 70 回日本物理学会年次大会「スピン分光法の最近の現状と展望」(領域 3, 領域 7, 領域 5) at 早稲田大学早稲田キャンパス, 22 March 2015,
“ダイヤモンド窒素格子欠陥中の電子スピンをを用いた計測手法”.
38. Yutaka Shikano,
Tropical School and Workshop on Analytic and Computational Methods for Complex Systems: The Case of Polymer Conformations at Research Center for Theoretical Physics, Central Visayan Institute Foundation, Philippine, 12 May 2015,
“Deformed Statistical Mechanics”.
39. Yutaka Shikano,
Tropical School and Workshop on Analytic and Computational Methods for Complex Systems: The Case of Polymer Conformations at Research Center for Theoretical Physics, Central Visayan Institute Foundation, Philippine, 14 – 15 May 2015,
“Statistical analysis on Complex systems”. (Lectures)
40. Yutaka Shikano,
Symposium on Computing Science at Mindanao State University, Iligan Institute of Technology (MSU-IIT), Philippine, 20 May 2015,
“Introduction to Discrete-Time Quantum Walk”.

41. Yutaka Shikano,
The 3rd Awaji International Workshop on Electron Spin Science & Technology: Biological and Materials Science Oriented Applications (AWEST 2015) at Awaji Yumebutai International Conference Center, Japan, 16 June, 2015,
“Toward Quantum Phononics – As an example of coherent phonon in diamond –”.
42. 鹿野 豊,
科学における確率 at 統計数理研究所, 7 July 2015,
“量子ウォークにおける確率”.
43. 鹿野 豊,
東北大学電気通信研究所共同プロジェクト研究 「量子測定の物理と情報通信」 第1回研究会 at 東北大学電気通信研究所, 2 September 2015,
“弱測定による量子現象の可視化”.
44. 鹿野 豊,
2015年度日本数学会秋季総合分科会「量子ウォークと関連する話題」(応用数学分科会スペシャルセッション) at 京都産業大学, 15 September 2015,
“量子動力学シミュレーション”.
45. Yutaka Shikano,
3rd International Complex Systems Meeting in 17th SPVM National Physics Conference at Cavite State University, Philippines, 22 October 2015,
“Visualizing a quantum state”.
46. Yutaka Shikano,
1st International Conference on Quantum Foundations at National Institute of Technology, Patna, India, 4 December 2015,
“Visualizing a quantum state” (canceled due to VISA problem).
47. Yutaka Shikano,
PacifiChem 2015 symposium on “Machine Learning Meets First-Principles Simulation for Materials Discovery” at Honolulu, Hawaii, USA, 15 December 2015,
“On Lesson from Material Databases”.
48. Yutaka Shikano,
2016 Joint Mathematics Meetings “AMS Special Session on Quantum Walks, Quantum Markov Chains, Quantum Computation and Related Topics” at Washington State Convention Center, Seattle, USA, 7 Jan-

- uary 2016,
“On Nonlinear Quantum Walk”.
49. Yutaka Shikano,
EMN Quantum Meeting 2016 at Holiday Inn Resort Phuket, Thailand,
9 April 2016,
“Visualizing Quantum State”.
 50. Yutaka Shikano,
Conference on Concepts and Paradoxes in a Quantum Universe at
Perimeter Institute for Theoretical Physics, Canada, 20 June 2016,
“Observation of Aharonov-Bohm effect with quantum tunneling”.
 51. 鹿野 豊,
2016 年 第 41 回 光学シンポジウム at 東京大学生産研究所, 24 June
2016,
“光渦ビームを用いた量子状態の可視化”.
 52. 鹿野 豊,
第 61 回物性若手夏の学校 (集中ゼミ) at ホテルシャレードイン志賀, 30
July 2016,
“量子動力学シミュレーション入門 ~量子ウォークを例にして~”.
 53. 鹿野 豊,
2016 年日本物理学会秋季大会 (物性領域)「量子測定・弱測定の理論・
実験の深化 ~量子情報・量子基礎論・量子統計への展開~」(領域 1,
領域 11) at 金沢大学 (角間キャンパス), 14 September, 2016
“全体総括と弱測定の未来”.
 54. Yutaka Shikano,
International Symposium on Ultrafast Intense Laser Science 15 (ISUIL15)
at Convention Center of Cassis, France, 3 October 2016,
“Phononic interference in bulk solid diamond”.
 55. Yutaka Shikano,
2nd International Conference on Quantum Foundations at Panache Ho-
tel, Patna, India, 18 October 2016,
“Visualizing Quantum State by Weak Measurement”.
 56. Yutaka Shikano,
4th Yokohama Workshop on Quantum Walks at Yokohama National
University, Minatomirai Campus, 20 October 2016,
“Discrete-time quantum walk with feed-forward quantum coin”.
 57. Yutaka Shikano,
8th Jagna International Workshop: “Structure, Function, and Dy-

namics: from nm to Gm” at Research Center for Theoretical Physics (RCTP) in Jagna, Bohol, Philippines, 5 January 2017, “Introduction to discrete-time quantum walk”.

58. 鹿野 豊, 東北大学電気通信研究所共同プロジェクト研究「量子測定の物理と情報通信」 at 東北大学電気通信研究所, 9 March 2017 “弱測定を用いた量子状態推定”.
59. 鹿野 豊, 第72回日本物理学会年次大会「量子ウォークの深化とその周辺」(領域11, 領域1) at 大阪大学(豊中キャンパス), 17 March 2017 “自己双対性のあるコインを用いた離散時間量子ウォーク”.

8 受賞 / Awards

1. Yutaka Shikano, 2013 FQXi (Foundational Questions Institute) Essay Contest “It from Bit or Bit from It” Fourth Prize.
2. Yutaka Shikano, 2013 Quantum Information Processing Top Reviewers.
3. 鹿野 豊, 平成25年度公益財団法人光科学技術研究振興財団研究表彰.
4. Yutaka Shikano, Outstanding Referee of Physica A (June 2015).
5. Yutaka Shikano, Outstanding Referee of Physics Letters A (November 2015).
6. Yutaka Shikano, Reviewer Rewards for International Journal of Modern Physics B (January 2017).

9 競争的資金獲得状況 / Grants

9.1 科研費

1. 鹿野 豊, 若手研究(B)(代表)(代表者: 鹿野 豊)
2013年度-2014年度 3900千円
“微小共振器ポラリトン凝縮体生成過程の量子ダイナミクスの解析”.
2. 杉尾 一, 特別研究員奨励費(代表)(代表者: 杉尾 一)
2014年度 600千円
“時間対称化された量子力学における弱値と文脈解釈による真値についての認識論的研究”.
3. 鹿野 豊, 基盤研究(C)(一般)(代表)(代表者: 鹿野 豊)

- 2016年度-2018年度 3600千円
“量子トンネル効果中の測定理論の構築”.
4. 鹿野 豊, 基盤研究(C)(一般)(分担) (代表者: 岡野 泰彬)
2016年度-2018年度 450千円
“複素誘電率の直接測定によるコヒーレントフォノン生成機構の解明”.

9.2 民間財団助成

1. 鹿野 豊, 大幸財団 平成26年度自然科学系学術研究助成 (代表者: 鹿野 豊)
2014年度-2015年度 2000千円
“量子動力学シミュレータの原理の理論的探究”.

9.3 その他

1. 鹿野 豊, 大幸財団 平成27年度海外学術交流研究助成 (代表者: 鹿野 豊)
2015年度 235千円
“Tropical School and Workshop on Analytic and Computational Methods for Complex Systems: The Case of Polymer Conformations 出席のための海外渡航助成”
2. 鹿野 豊, 大幸財団 平成27年度研究会開催助成 (代表者: 鹿野 豊)
2015年度 100千円
“Tensor Network States: Algorithms and Applications 2016 会議開催のための助成”

10 教育活動 / Educational activities

10.1 インターンシップ学生受入歴 / Internship students

1. Ali Umit Cemal Hardal, Koc University, Turkey, 1 July 2013 – 30 September 2013 (IMS Internship).
2. Ben Bin-Bin Luo, The University of Western Australia, Australia, 25 June 2014 – 25 July 2014 (AsiaBound Program Internship).
3. Lauchlan Thomas Honter, The University of Western Australia, Australia, 25 June 2014 – 25 July 2014 (AsiaBound Program Internship).

4. Yu-Xiang Zhang, University of Science and Technology of China (USTC), China, 7 May 2014 – 25 July 2014 (Visiting Student) and 16 June 2015 – 1 November 2015 (IMS Internship).
5. Giuseppe Di Molefetta, Sorbonne Universities, UPMC University of Paris VI, France, 17 June 2014 – 19 August 2014 (JSPS Summer Internship).
6. Yusuf Turek, Institute of Theoretical Physics, Chinese Academy of Sciences, China, 1 July 2014 – 17 September 2014 (IMS Internship).
7. Ben McAllister, The University of Western Australia, Australia, 7 December 2014 – 8 January 2015 (AsiaBound Program Internship).
8. Blake Segler, The University of Western Australia, Australia, 7 December 2014 – 8 January 2015 (AsiaBound Program Internship).
9. Julian Rodino, The University of Western Australia, Australia, 10 December 2014 – 8 January 2015 (AsiaBound Program Internship).
10. Fumika Suzuki, University of British Columbia, Canada, 9 February 2015 – 9 March 2015 and 11 December 2015 – 13 January 2016 (Visiting Student).
11. Mikko Tukiainen, University of Turku, Finland, 15 January 2015 – 28 March 2015 and 7 October 2015 – 8 November 2015 (Visiting Student).
12. Thomas Vickers, The University of Western Australia, Australia, 21 June 2015 – 23 July 2015 (AsiaBound Program Internship).
13. Junho Jung, The University of Western Australia, Australia, 21 June 2015 – 23 July 2015 (AsiaBound Program Internship).
14. Devid Ferri, The University of Western Australia, Australia, 21 June 2015 – 26 July 2015 (AsiaBound Program Internship).
15. Tom Milan, The University of Western Australia, Australia, 21 June 2015 – 26 July 2015 (AsiaBound Program Internship).
16. Sristy Agrawal, Indian Institute of Science Education and Research, Kolkata, 5 December 2015 – 26 December 2015 and 17 June 2016 – 31 July 2016 (Visiting Student).
17. Pablo Arnault, Sorbonne Universities, UPMC University of Paris VI, France, 21 June 2016 – 23 August 2016 (JSPS Summer Internship).

10.2 学位審査委員 / Ph.D thesis committees

1. Yutaka Shikano, Giuseppe Di Molefetta, University of Paris VI, France, 28 July 2015.

2. Yutaka Shikano, Debmalya Das, Indian Institute of Science Education and Research Mohali, January 2016 (examinator).
3. Yutaka Shikano, M K A C Mahasinghe, University of Colombo, February 2016 (examinator).
4. Yutaka Shikano, Yuki Susa, Tokyo Institute of Technology, Japan, 4 January 2016 and 18 February 2016.

11 学術雑誌編集委員 / Editorial activities

1. Yutaka Shikano, Guest Editor of Quantum Information Processing, Special Issue on Quantum Walk (2012).
2. Yutaka Shikano, Guest Chief-Editor of Journal of Computational and Theoretical Nanoscience, Special Issue “Theoretical and Mathematical Aspects of the Discrete Time Quantum Walk” (2013).
3. Yutaka Shikano, Review Editor of Frontier in Mathematical Physics (2013 – present).
4. Yutaka Shikano, Guest Editor of Advances in Mathematical Physics, Special Issue “The Theory of Quantum Simulation, Quantum Dynamics, and Quantum Walks” (2014).
5. Yutaka Shikano, Editorial Board Member of Scientific Reports (2015 – present).
6. Yutaka Shikano, Guest Editor of Interdisciplinary Information Sciences, Special Issue “Quantum walk and quantum simulation” (2016 – 2017).
7. Yutaka Shikano, Guest Editor of Complexity, Special Issue “Advanced Topics in Theory, Practice, and Applications of Geometry and Topology of Complex Quantum Networks and Quantum Walks” (2017).

12 会議世話人 / Organizing activities

1. Yutaka Shikano, Organizer, Mini-Workshop on Development of Weak Measurement and Weak Value at Tokyo Institute of Technology, 8 May 2012.
2. Yutaka Shikano, Organizer, International Workshop : Physics of information, information in physics, and the demon at Institute for Molecular Science, Japan, 27 – 29 June, 2012.

3. Yutaka Shikano, Chief-Organizer, IMS Workshop “Quantum Dynamics and Quantum Walks” at Okazaki Conference Center, 24 – 26 November 2012.
4. 鹿野 豊, 世話人, 発起人, 計算材料科学と数学の協働によるスマート材料デザイン手法の探索 – 階層構造を解析する – at WPI-Advanced Institute for Materials Research, Tohoku University, Japan, 13 – 15 January 2013.
5. 鹿野 豊, 世話人, KEK-IMS Joint Workshop 「量子論の深化と発展」 at Okazaki Conference Center, 18 – 19 March 2013.
6. Yutaka Shikano, Chief-Organizer, Workshop of Quantum simulations and quantum walks at Scuola Normale Superiore, Pisa, Italy, 11 – 15 November 2013.
7. Yutaka Shikano, Organizer, Mini Workshop “Philosophies and Concepts of Weak Values” at Institute for Molecular Science, 10 October 2014.
8. 鹿野 豊, 世話人代表, Mini Workshop on Information Geometry and Statistical Physics at 分子科学研究所, 18 October 2014.
9. Yutaka Shikano, Organizer, Nagahama Workshop “From Quantum to Life” at Nagahama Bio University, 14 – 16 November 2014.
10. Yutaka Shikano, Chief-Organizer, Workshop of Quantum Simulation and Quantum Walks 2014 at Pumula Beach Hotel, Hibberdene, KwaZulu-Natal, South Africa, 24 – 28 November 2014.
11. Yutaka Shikano, Chief-Organizer, Workshop on Hierarchy of Quantum Mechanics at Okazaki Conference Center, Japan, 21 – 23 February 2015.
12. Yutaka Shikano, Organizer, International Workshop on Weak Measurement and Weak Value at Tokyo Institute of Technology, Japan, 19 – 20 March 2015.
13. Yutaka Shikano, Organizer, Mini Workshop on Diffusion Process in Physical Chemistry at Institute for Molecular Science, Japan, 9 November 2015.
14. Yutaka Shikano, Chief-Organizer, Workshop of Quantum Simulation and Quantum Walks 2015 at Yokohama National University, Japan, 16 – 18 November 2015.
15. 鹿野 豊, 世話人, 分子研研究会 「計測データに潜む階層性の創発」 at 分子科学研究所, 27 November 2015.
16. 鹿野 豊, 世話人, NINS / IURIC Colloquium 2015 分科会 “数理モデ

ルを用いた生命システムの理解” at ヤマハリゾートつま恋, 静岡県掛川市, 1 – 3 December 2015.

17. Yutaka Shikano, Chief-Organizer, The 75th Okazaki Conference: Tensor Network States: Algorithms and Applications 2016 at Okazaki Conference Center, Japan, 11 – 14 January 2016.
18. Yutaka Shikano, Founding Organizer, Workshop of Quantum Simulation and Quantum Walks 2016 at Czech Technical University in Prague, Czech Republic, 17 – 20 November 2016.

13 所外委員活動 / External committees

1. 鹿野 豊, 文部科学省科学技術政策研究所科学技術動向研究センター 専門調査員 (February 2014 – Present).
2. 鹿野 豊, 日本物理学会 男女共同参画推進委員会委員 (April 2014 – March 2017).
3. 鹿野 豊, 電子情報通信学会 量子情報技術時限研究専門委員会委員 (November 2014 – Present).
4. 鹿野 豊, 総合研究大学院大学先導的共同研究ワーキンググループ委員 (November 2015 – March 2017).
5. 鹿野 豊, 国立研究開発法人科学技術振興機構 ジェンダー・サミット 10 組織・運営委員会 部会委員 (September 2016 – Present).

14 サイエンスコミュニケーション活動 / Science communication activities

1. 鹿野 豊, 愛知県岡崎市立城北中学校, 12 February 2012 “観自然”.
2. 鹿野 豊, spcafé at 名古屋大学クレイグスカフェ, 29 November 2012 “物理学と情報科学の融和”.
3. 鹿野 豊, 早稲田大学本庄高校, 21 October 2013 “どうやって小さい現象を観るのか? –光で観える限界がある!?”.
4. 鹿野 豊, 橘学苑高等学校, 19 July 2014 進路懇談会.
5. 鹿野 豊, 青森県立三本木高等学校, 22 January 2015 “どうやって安全に通信しようか?”.
6. 鹿野 豊, 東京工業大学大学院理工学研究科基礎物理学専攻・物性物理学専攻, 29 February 2016 キャリアパス講演会.

7. 鹿野 豊, 岩手大学基礎自然科学系, 31 March 2016 公開講演会 “20歳からの海外放浪記～私の人生を変えた出来事～”.

15 メディア掲載歴 / Media

1. 鹿野 豊, AERA 2014年12月29日1月5日合併号「日本を突破する100人」.

16 その他 /Miscellanea

1. Yutaka Shikano, Selected participants from Japan Society for the Promotion of Science, 62nd Meeting of Nobel Laureates in Lindau, Germany (1 – 6 July 2012).
2. 鹿野 豊, 登壇者, パネリスト, 小布施 × Summer School by H-LAB (Harvard College Japan Initiative Lab) at 長野県小布施町 (17 August 2013).
3. Yutaka Shikano, Selected participants, 4th Heidelberg Laureate Forum in Heidelberg, Germany (18 – 23 September 2016).
4. Yutaka Shikano, Selected participants from Japan Society for the Promotion of Science, UK-Japan Frontiers of Science Symposium at Chicheley Hall, Milton Keynes, UK (7 – 9 November 2016).

17 外部評価 / External evaluations

1. David J. Wales, November 2015 (分子研リポート 2015).
Associate Professors Yutaka Shikano and Akihito Ishizaki both made enthusiastic presentations of their research, which involves interesting and ambitious projects that aim to address fundamental and practical issues in terms of molecular structure and measurement (Shikano) and light harvesting and coherence (Ishizaki).
2. Ian Walmsley, August 2013 (分子研リポート 2013).
Quantum Information Science: Research Assoc. Prof. Shikano
The appointment of Dr. Shikano as a new principal investigator in the area of many-body quantum correlations in larger systems from a bottom-up perspective opens important new territory for IMS, and could link very well to experimental activity both within the Photonics

Division and elsewhere, especially CIMoS. The international connections that Dr. Shikano has will also be helpful in bootstrapping the Institute 's profile in this area. His excellent work already has a high profile in that respect. The opportunity for stronger connections and applications in both experimental quantum information science (QIS) and in nanoscience could be further bolstered, perhaps by an additional appointment across these areas.