Curriculum Vitae

Personal information

Name:	**Junichi Okamoto**
Date of birth:	January 30, 1986
Nationality:	Japanese
Marital status:	married, two children

Contact

Office:	Institute of Physics University of Freiburg Hermann-Herder-Str. 3 D-79104, Freiburg im Breisgau, Germany
E-mail:	junichi.okamoto@physik.uni-freiburg.de
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Employment

Since 01.2019	Georg H. Endress fellow and research associate (with Prof. M. Thoss), Institute of Physics, University of Freiburg
12.2017–12.2018	Postdoc (with Prof. M. Thoss), Institute of Physics, University of Freiburg
10.2014–11.2017	Postdoc (with Prof. L. Mathey), Institute of Laser Physics, University of Hamburg

Education

09.2008–10.2014	Ph.D. in Physics, Columbia University Thesis: Theoretical study of charge density waves in transition metal materials Adviser: Prof. A. J. Millis
04.2004–03.2008	B.Sc. in Physics, Kyoto University

Research focus

- Light-matter interaction: optically excited strongly correlated materials, photoinduced phase transitions, cavity-matter systems
- Low-dimensional systems: atomic nanowires, organic materials, carbon nanotubes, cold atoms
- Transport problems: charge-density wave materials, nano-structures

Grants/Awards

- G. H. Endress postdoctoral fellowship (2019–2021)
- Research grant from Research Foundation for Opto-Science and Technology, (500,000 JPY, 2018-2019)
- IOP trusted reviewer (2020)

Scientific community service

Referee:	Nat. Phys., Phys. Rev. Lett., Phys. Rev. B, Nanoscale, J. Stat. Mech., J. Phys. Commun., Phys. Rep., SciPost Phys., npj Quantum Mater., Commun. Phys., Sci. Rep., New J. Phys.
Guest editor:	Zeitschrift für Naturforschung A, vol. 71, 2016
Organizer:	PIER workshop in “Emergence in driven solid-state and cold-atom systems", 2015
Student council:	Gotham-Metro Condensed Matter Meeting, Spring 2012

Teaching experience

- Lecturing

WS 2020/2021	Advanced condensed matter theory (full course), University of Freiburg
WS 2019/2020	Advanced quantum mechanics (two lectures), University of Freiburg
SS 2018	Theoretical condensed matter physics (two lectures), University of Freiburg

- Organizer of tutorials (Oberassistenz)

SS 2021	Theoretical condensed matter physics, University of Freiburg
WS 2019/2020	Advanced quantum mechanics, University of Freiburg
WS 2018/2019	Term paper “Modern Topics in Condensed Matter Physics", University of Freiburg
SS 2018	Theoretical condensed matter physics, University of Freiburg

- Tutoring/Teaching assistant

SS 2022	Theoretische Physik I (Klassische Mechaniks), University of Freiburg
WS 2021/2022	Theoretische Physik IV (Statistische Physik), University of Freiburg
Fall 2013	Statistical mechanics, Columbia University
Spring 2013	Condensed matter physics I, Columbia University
Fall 2012	Statistical mechanics, Columbia University
Spring 2012	General physics laboratory II, Columbia University
Fall 2011	Statistical mechanics, Columbia University
Spring 2011	Quantum mechanics II, Columbia University
Fall 2010	Quantum mechanics I, Columbia University
Spring 2010	General physics laboratory II, Columbia University
Fall 2009	General physics laboratory I, Columbia University
Spring 2009	General physics laboratory II, Columbia University

Supervision of students and researchers

Since 2019	S. Stumper, Ph.D. thesis, University of Freiburg, (co-supervision)
2021	S. Mirmohammadi, Master thesis, University of Freiburg, (co-supervision)
2019	S. Stumper, Master thesis, University of Freiburg, (co-supervision)
2016	J. Hinrichsen, Bachelor thesis, University of Hamburg, (co-supervision)
2016	N. Heimann, Bachelor thesis, University of Hamburg, (co-supervision)

Conference and seminar talks

1. University of Freiburg, Physics Department Colloquium, 7/25, 2022
   “Light-induced dynamics and control of strongly correlated materials"
2. APS March Meeting, online, 3/15–3/19, 2021
   “Floquet prethermalization and Rabi oscillations in optically excited Hubbard clusters"
3. Charles University in Prague, Condensed Matter Theory Seminar, online, 1/7, 2021
   “Numerical time-dependent spectroscopy on the optically excited Mott-Hubbard cluster"
4. Georg H. Endress Research Seminar, online, 11/26, 2020
   “Numerical time-dependent spectroscopy on the optically excited Mott-Hubbard cluster"
5. DPG Fall meeting, Freiburg, Germany, 9/23–9/27, 2019
   “Spectral properties of optically driven one-dimensional extended Hubbard model: An exact diagonalization study"
6. DPG Spring meeting (SAMOP), Rostock, Germany, 3/10–3/15, 2019
   “Exact numerical simulations of periodically driven one-dimensional extended Hubbard model"
7. Plasma 2019 Workshop, Orlando, FL, 1/18–1/21, 2019
   “Enhanced Josephson coupling in parametrically driven high-T_c superconductors"
8. DPG Spring meeting, Berlin, Germany, 3/11–3/16, 2018
   “Renormalization group study of competing low-temperature phases in single-wall carbon nanotubes"
9. NGSCES, Barcelona, Spain, 9/4–9/8, 2017
   “Theory of enhanced interlayer tunneling in optically driven high-T_c superconductors"
10. University of Erlangen-Nürnberg, Group Seminar (Thoss group), 7/6, 2017
    “Theory of enhanced interlayer tunneling in optically driven high-T_c superconductors"
11. DPG Spring meeting, Dresden, Germany, 3/19–3/24, 2017
    “Theory of enhanced interlayer tunneling in optically driven high-T_c superconductors"
12. DPG Spring meeting, Regensburg, Germany, 3/6–3/11, 2016
    “Stabilized superconductivity in periodically driven Josephson junction chains"
13. DPG Spring meeting, Berlin, Germany, 3/16–3/20, 2015
    “Dynamics of competing orders in YBCO triggered by ultrafast light pulses"
14. APS March meeting, Denver, CO, 3/5–3/7, 2014
    “Experimental evidence for a Bragg glass density wave phase in a transition-metal dichalcogenide"
15. APS March meeting, Baltimore, MD, 3/18–3/22, 2013
    “Role of impurities in the charge density wave state of transition metal dichalcogenides"
16. APS March meeting, Boston, MA, 2/27–3/2, 2012
    “One-dimensional physics in transition-metal nanowires"

In addition to that, I have presented 10 posters at scientific conferences (contributed as a presenting author).

List of publications

1. “Photoinduced intra-domain dynamics and nonthermal switching of metastable states in the one-dimensional extended Peierls-Hubbard model"
   Phys. Rev. B 105, 094302 (2022)
   J. Okamoto, S. Mirmohammadi
2. “Observation and manipulation of a phase separated state in a charge density wave material"
   Nano Lett. 22, 1929 (2022)
   S. M. Walker, T. Patel, J. Okamoto, D. Langenberg, E. Bergeron, J. Gao, X. Luo, W. Lu, Y. Sun, A. W. Tsen, and J. Baugh

3. “Interaction-driven dynamical quantum phase transitions in a strongly correlated bosonic system"
   Phys. Rev. Research 4, 013002 (2022)
   S. Stumper, M. Thoss, J. Okamoto

4. “Higgs mode mediated enhancement of interlayer transport in high-T_c superconductors"
   Phys. Rev. B 103, 224503 (2021)
   G. Homann, J.G. Cosme, J. Okamoto, L. Mathey

5. “Floquet prethermalization and Rabi oscillations in optically excited Hubbard clusters"
   Sci. Rep. 11, 17994 (2021)
   J. Okamoto, F. Peronaci

6. “Dynamical control of the conductivity of an atomic Josephson junction"
   Phys. Rev. Research 3, 013111 (2021)
   B. Zhu, V. P. Singh, J. Okamoto, and L. Mathey

7. “Photocurrent Imaging of Multi-Memristive Charge Density Wave Switching in Two-Dimensional 1T-TaS_2"
   Nano Lett. 20, 7200 (2020)
   T. Patel, J. Okamoto, T. Dekker, B. Yang, J. Gao, X. Luo, W. Lu, Y. Sun, and A. W. Tsen

8. “Effect of mediated interactions on a Hubbard chain in mixed-dimensional fermionic cold atoms"
   Phys. Rev. Research 2, 033054 (2020)
   J. Okamoto, W.-M. Huang, K. Irwin, D. K. Campbell, S.-W. Tsai

9. “Macroscopic boundary effects in the one-dimensional extended Bose-Hubbard model"
   Phys. Rev. A 101, 063626 (2020)
   S. Stumper, J. Okamoto

10. “Time-dependent spectral properties of photoexcited one-dimensional ionic Hubbard model: an exact diagonalization study"
    New J. Phys. 21, 123040 (2019)
    J. Okamoto

11. “Gapless regime in charge-density-wave phase of the finite dimensional Falicov-Kimball model"
    Phys. Rev. B 100, 075124 (2019)
    M. Žonda, J. Okamoto, M. Thoss

12. “Absence of Coulomb Blockade in the Anderson Impurity Model at the Symmetric Point"
    J. Phys. Chem. C 123, 13538 (2019)
    A. Levy, L. Kidon, J. Bätge, J. Okamoto, M. Thoss, D. T. Limmer, E. Rabani

13. “Influence of electron-phonon coupling on the low-temperature phases of metallic single-wall carbon nanotubes"
    Phys. Rev. B 98, 205122 (2018)
    J. Okamoto, L. Mathey, W.-M. Huang

14. “Probing optically silent superfluid stripes in cuprates"
    Science 359, 575 (2018)
    S. Rajasekaran, J. Okamoto, L. Mathey, M. Fechner, V. Thampy, G. D. Gu, A. Cavalleri

15. “Critical behavior of a chiral superfluid in a bipartite square lattice"
    New J. Phys. 20, 015012 (2018)
    J. Okamoto, W.-M. Huang, R. Höppner, L. Mathey

16. “Transiently enhanced interlayer tunneling in optically driven high T_c superconductors"
    Phys. Rev. B 96, 144505 (2017)
    J. Okamoto, W. Hu, A. Cavalleri, L. Mathey

17. “Fermion pairing in mixed-dimensional atomic mixtures"
    Phys. Rev. A 95, 053633 (2017)
    J. Okamoto, L. Mathey, W.-M. Huang

18. “Hierarchical equations of motion approach to transport through an Anderson impurity coupled to interacting Luttinger liquid leads"
Phys. Rev. B 94, 235411 (2016)
J. Okamoto, L. Mathey, R. Härtle

19. “Theory of enhanced interlayer tunneling in optically driven high T_c superconductors"
Phys. Rev. Lett. 117, 227001 (2016)
J. Okamoto, A. Cavalleri, L. Mathey
(Featured in Journal Club for Condensed Matter Physics, March 2017)

20. “Distinct surface and bulk charge density waves in ultrathin 1T-TaS_2"
Phys. Rev. B 94, 201108(R) (2016)
R. He, J. Okamoto, Z. Ye, G. Ye, H. Anderson, X. Dai, X. Wu, J. Hu, Y. Liu, W. Lu, Y. Sun, A. N. Pasupathy, A. W. Tsen

21. “Editorial: Emergence in driven solid-state and cold-atom systems"
Z. Naturforsch. A 71, 873 (2016)
L. Mathey, J. Okamoto

22. “Structure and Control of Charge Density Waves in Two-Dimensional 1T-TaS_2"
PNAS 112, 15054 (2015)
A. W. Tsen, R. Hovden, D. Z. Wang, Y. D. Kim, J. Okamoto, K. A. Spoth, Y. Liu, W. J. Lu, Y. P. Sun, J. Hone, L. F. Kourkoutis, P. Kim, A. N. Pasupathy

23. “Effects of strong impurities on a charge density wave in a transition metal dichalcogenide"
Phys. Rev. B 91, 184204 (2015)
J. Okamoto, A. J. Millis

24. “Experimental evidence for a Bragg glass density wave phase in a transition-metal dichalcogenide"
Phys. Rev. Lett. 114, 026802 (2015)
J. Okamoto, C. J. Arguello, E. Rosenthal, A. Pasupathy, A. J. Millis

25. “Experimental observation of spin-exchange-induced dimerization of an atomic one-dimensional system"
Phys. Rev. B 87, 161406(R) (2013)
N. Zaki, C. A. Marianetti, D. P. Acharya, P. Zahl, P. Sutter, J. Okamoto, P. D. Johnson, A. J. Millis, R. M. Osgood

26. “One-dimensional physics in transition-metal nanowires: Renormalization group and bosonization analysis"
Phys. Rev. B 85, 115406 (2012)
J. Okamoto, A. J. Millis

27. “One-dimensional physics in transition metal nanowires: Phases and elementary excitations"
Phys. Rev. B 84, 205433 (2011)
J. Okamoto, A. J. Millis

References

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Junichi Okamoto Freiburg, January 20, 2023