

2021 年度 物理学科大輪講 第 1 回

日時：10 月 20 日 (水) 13 時 30 分から

場所：オンライン (zoom)

時間：25 分 (発表 20 分、討論 5 分)

前半 (13:30–15:15)

座長：田崎

1. 2018041033 (渡邊研究室) 13:35–14:00
High-Sensitivity Accelerometry with a Feedback-Cooled Magnetically Levitated Microsphere
Charles W. Lewandowski, Tyler D. Knowles, Zachariah B. Etienne, and Brian D'Urso
PHYSICAL REVIEW APPLIED **15**, 014050 (2021)
2. 2018041044 (渡邊研究室) 14:00–14:25
Axisymmetric scalable magneto-gravitational trap for diamagnetic particle levitation
J. P. Houlton, M. L. Chen, M. D. Brubaker, K. A. Bertness, and C.T. Rogers
SCIENTIFIC INSTRUMENTS **89**, 125107 (2018)
3. 2018041049 (町田研究室) 14:25–14:50
Seebeck Effect in Germanium
T.H.GEBALLE, G.W.HULL
PHYSICAL REVIEW, 94,1134–1140,1954
4. 2018041017 (西坂研究室) 14:50–15:15
Mechanisms of Gravitaxis in *Chlamydomonas*,
A. M. Roberts,
The Biological Bulletin **210**, 78–80 (2006).

後半 (15:25–16:40)

座長：西坂

5. 2018041004 (田中研究室) 15:25–15:50
Nanophotonic computational design
Jesse Lu, and Vučković
Optics Express, 21, 13351–13367 (2013)
6. 2018041016 (田中研究室) 15:50–16:15
Wide-Gamut Plasmonic Color Palettes with Constant Subwavelength Resolution,
Soroosh Daqiqeh Rezaei, Ray Jia Hong Ng, Zhaogang Dong, Jinfu Ho, Eileen H.
H. Koay, Seeram Ramakrishna, and Joel K. W. Yang,
ACS Nano 2019, **13**, 3580–3588 (2019).
7. 2018041030 (田中研究室) 16:15–16:40
An optical cloak made of dielectrics
Jason Valentine, Jensen Li, Thomas Zentgraf, Guy Bartal, and Xiang Zhang,
nature materials, 8, 568–571 (2009)
8. 2018041038 (田中研究室) 16:40–17:05
Structural color printing based on plasmonic metasurfaces of perfect light absorption
Fei Cheng , Jie Gao , Ting S. Luk and XiaodongYang
Nature, Scientific Reports 5, Article number: 11045 (2015)

2021年度 物理学科大輪講 第2回

日時：10月27日(水) 13時30分から

場所：オンライン (zoom)

時間：25分(発表20分、討論5分)

前半 (13:30–15:10)

座長：荒川

1. 2018041010 (理論研究室) 13:30–13:55
Must time-machine construction violate the weak energy condition?
Amos Ori
Phys.Rev.Lett.71,2517-2524(1993)
2. 2016041065 (理論研究室) 13:55–14:20
Quantum Teleportation,
Michael A. Nielsen and Isaac L. Chung,
Quantum Computation and Quantum Information (Cambridge University Press,
2010) Chapter 1.3.7, p.26–p.28 and 2.4, p.98–p.105.
3. 2018041040 (平野研究室) 14:20–14:45
Entanglement on an optical atomic-clock,
Edwin Pedrozo-Penafiel, Simone Colombo, Chi Shu, Albert F.Adiyatsullin, Zeyang
Li, Enrique Mendez, Boris Braverman, Akio Kawasaki, Daisuke Akamatsu, Yan-
hong Xiao and Vladan Vuletic,
Nature **588**, 414-418 (2020).
4. 2018041059 (平野研究室) 14:45–15:10
Full daylight quantum-key-distribution at 1550 nm enabled by integrated silicon
photonics,
M. Avesani, L. Calderaro, M. Schiavon, A. Stanco, C. Agnesi, A. Santamato, M.
Zahidy, Scriminich, G. Foletto, G. Contestabile, M. Chiesa D. Rotta, M. Artiglia, A.
Montanaro, M. Romagnoli, V. Sorianello, F. Vedovato, G. Vallone, and P. Villoresi,
npj Quantum Information. **7**, 93 (2021).

後半 (15:20–17:25)

座長：宇田川

5. 2018041045 (荒川研究室) 15:20–15:45
Infrared Spectra and Intensities of Ar-H₂O and O₂-H₂O Complexes in the Range of the ν_3 Band of H₂O
Susumu Kuma, Mikhail N. Slipchenko, Takamasa Momose, Andrey F. Vilesov
J. Phys. Chem. A, **114**, 9022-9027(2010)
6. 2018041042 (町田研究室) 15:45–16:10
A HELIUM-3 DILUTION REFRIGERATOR
H.E.HALL, P.J.FORD, and K.THOMPSON
CRYOGENICS, 6, 80-88 (1966)
7. 2018041037 (渡邊研究室) 16:10–16:35
Wetting transition in liquid Ga-Bi alloys: light scattering study of surface energy and entropy,
A.H. Ayyad, W. Freyland,
Surface Science, 506, 1–11 (2002).
8. 2018041019 (渡邊研究室) 16:35–17:00
Thermal Expansion Coefficient and Spontaneous Volume Magnetostriction of Fe-Ni (fcc) Alloys,
Yasunori Tanji,
Journal of the Physical Society of Japan **31**, 1366–1373 (1971).

2021年度 物理学科大輪講 第3回

日時：11月10日(水) 13時30分から

場所：オンライン (zoom)

時間：25分(発表20分、討論5分)

前半 (13:30–15:10)

座長：渡辺

1. 2018041014 (理論研究室) 13:30–13:55
Strong coupling theory of the spinless charges on triangular lattices: Possible formation of a gapless charge-ordered liquid
Chisa Hotta and Nobuo Furukawa
PHYSICAL REVIEW B **74**, 193107 (2006)
2. 2018041025 (理論研究室) 13:55–14:20
Chiral tunnelling and the Klein paradox in graphene
M. I. KATSNELSON, K. S. NOVOSELOV, and A. K. GEIM
nature physics VOL 2 SEPTEMBER 2006 p620–p625
3. 2017041027 (荒川研究室) 14:20–14:45
Direct measurement of fast ortho-para conversion of molecularly chemisorbed H₂ on Pd(210)
H. Ueta, Y. Sasakawa, D. Ivanov, S. Ohno, S. Ogura, and K. Fukutani
Phys. Rev. B **102**, 121407(R), (2020)
4. 2018041002 (松本研究室) 14:45–15:10
Measurement of gravitational coupling between millimetre-sized masses
T. Westphal, H. Hepach, J. Pfaff, M. Aspelmeyer
Nature 591,225-228 (2021)

後半 (15:20–17:25)

座長：松本

5. 2018041022 (西坂研究室) 15:20–15:45
Flagellar synchronization through direct hydrodynamic interactions
Douglas R Brumley, Kirsty Y Wan, Marco Polin, Raymond E Goldstein
e.life, 2014, e02750
6. 2018041001 (平野研究室) 15:45–16:10
Detection of low-conductivity objects using eddy current measurements with an optical magnetometer,
Kasper Jensen, Michael Zugenmaier, Jens Arnbak, Hans Stærkind, Mikhail V. Balabas, and Eugene S. Polzik,
PHYSICAL REVIEW RESEARCH **1**, 033087 (2019).
7. 2018041023 (町田研究室) 16:10–16:35
Effect of Pressure on emf of Thermocouples
F. P. Bundy
Journal of Applied Physics, **32**, 483-488 (1961).
8. 2017041018 (町田研究室) 16:35–17:00
Sample shape and boundary dependence of measured transverse thermal properties
Samuel Mumford, Tiffany Paul, Erik Kountz, and Aharon Kapitulnik
J. Appl. Phys. 128, 175105 (2020) ; doi: 10.1063/5.0024253

2021 年度 物理学科大輪講 第 4 回

日時：11 月 17 日 (水) 13 時 30 分から

場所：オンライン (zoom)

時間：25 分 (発表 20 分、討論 5 分)

前半 (13:30–15:10)

座長：町田

1. 2018041035 (理論研究室) 13:30–13:55
Collective Power: Minimal Model for Thermodynamics of Nonequilibrium Phase Transitions,
Tim Herpich, Juzar Thingna, and Massimiliano Esposito,
PHYSICAL REVIEW X **8**, 031056 (2018).
2. 2018041050 (理論研究室) 13:55–14:20
On a Relativistically Invariant Formulation of the Quantum Theory of Wave Fields.
Shinichiro Tomonaga
Progress of Theoretical Physics Vol. I, No.2, Aug.-Sept., 1946.
3. 2015041070 (渡邊研究室) 14:20–14:45
Tetragonal magnetostriction and magnetoelastic coupling in Fe-Al, Fe-Ga, Fe-Ge, Fe-Si, Fe-Ga-Al, and Fe-Ga-Ge alloys.
J. B. Restorff , M. Wun-Fogle , K. B. Hathaway , A. E. Clark , T. A. Lograsso , and G. Petculescu
J. Appl. Phys. **111**, 023905 (2012)
4. 2018041007 (渡邊研究室) 14:45–15:10
Nanocrystalline $\text{Fe}_{88-2x}\text{Co}_x\text{Ni}_x\text{Zr}_7\text{B}_4\text{Cu}_1$ alloys: Soft magnets for vehicle electrification technologies
K. E. Knipling, M. Daniil, and M. A. Willard
J. Appl. Phys. **117**, 172611 (2015)

後半 (15:20–17:25)

座長：宇田川

5. 2018041013 (松本研究室) 15:20–15:45
The Shape of Fiber Tapers
Timothy A. Birks and Youwei W. Li
JOURNAL OF LIGHTWAVE TECHNOLOGY, VOL. 10, NO. 4, APRIL 1992
6. 2018041041 (西坂研究室) 15:45–16:10
Gliding Direction of Mycoplasma mobile
Hanako Morio, Taishi Kasai, Makoto Miyata
Journal of Bacteriology 198, 283–290, 2016
7. 2018041047 (平野研究室) 16:10–16:35
Gigahertz measurement-device-independent quantum key distribution using directly modulated lasers
R. I. Woodward, Y. S. Lo, M. Pittaluga, M. Minder, T. K. Paraïso, M. Lucamarini, Z. L. Yuan, and A. J. Shields,
npj Quantum Information , **7** , 58 , (2021)
8. 2018041029 (町田研究室) 16:35–17:00
Quadratic Fermi node in a 3D strongly correlated semimetal
Takeshi Kondo, M. Nakayama, R. Chen, J.J. Ishikawa, E.-G. Moon T. Yamamoto, Y. Ota, W. Malaeb, H. Kanai, Y. Nakashima, Y. Ishida, R. Yoshida, H. Yamamoto, M. Matsunami, S. Kimura, N. Inami, K.Ono,H.Kumigashira, S. Nakatsuji,L. Balents, and S. Shin
Nature Communications, 6, 1–8 (2015).

2021 年度 物理学科大輪講 第 5 回

日時：11 月 24 日 (水) 13 時 30 分から

場所：オンライン (zoom)

時間：25 分 (発表 20 分、討論 5 分)

前半 (13:30–15:10)

座長：松本

1. 2017041002 (理論研究室) 13:30–13:55
On stability and turbulence of fluid flows
Werner Heisenberg
Translation of "Über Stabilität und Turbulenz von Flüssigkeitsströmen.", Annalen der Physik, Band 74, No. 15, 1924.
2. 2017041042 (理論研究室) 13:55–14:20
Phase-field modeling of dry snow metamorphism,
Thomas U.Kaempfer, and Mathis Plapp,
PHYSICAL REVIEW, E **79**, 031502-17,(2009).
3. 2017041033 (荒川研究室) 14:20–14:45
Cryopumping of hydrogen on stainless steel in the temperature range between 7 and 18 K
Frederic Chill, Stefan Wilfert, and Lars Bozyk
J. Vac. Sci. Technol. A **37**, 031601 (2019)
4. 2018041039 (町田研究室) 14:45–15:10
Deviations from the Wiedemann-Franz law in dilute CuCr alloys,
G.Pitsi, and A.Dupré,
Physica B+C, vol.86–88, pp.457–458 (1977).

後半 (15:20–17:25)

座長：井田

5. 2018041011 (町田研究室) 15:20–15:45
Universal Bound to the Amplitude of the Vortex Nernst Signal in Superconductors
Carl Willem Rischau , Yuke Li, Benoît Fauque, Hisashi Inoue, Minu Kim,
Christopher Bell , Harold Y. Hwang, Aharon Kapitulnik, and Kamran Behnia
PHYSICAL REVIEW LETTERS 126, 077001 (2021)
6. 2018041024 (松本研究室) 15:45–16:10
Shot-noise-limited laser stabilization with a high-power photodiode array,
Patrick Kwee, Benno Willke, Karsten Danzmann
OPTICS LETTERS/Vol.34, No.19/October 1, 2009
7. 2018041027 (平野研究室) 16:10–16:35
600-km repeater-like quantum communications with dual-band stabilization
Mirko Pittaluga, Mariella Minder, Marco Lucamarini, Mirko Sanzaro, Robert I.
Woodward, Ming-Jun Li, Zhiliang Yuan and Andrew J. Shields
Nature Photonics 15, 530 – 535 (2021)
8. 2018041015 (平野研究室) 16:35–17:00
Quantum-enhanced magnetometer with low-frequency squeezing
Travis Horrom, Robinjeet Singh, Jonathan P. Dowling, and Eugeny E. Mikhailov,
Physical Review A **86**, 023803 (2012).

2021年度 物理学科大輪講 第6回

日時：12月1日(水) 13時30分から

場所：オンライン (zoom)

時間：25分(発表20分、討論5分)

前半 (13:30–15:10)

座長：平野

1. 2017041048 (理論研究室) 13:30–13:55
Friedman 方程式,
David McMahon,
相対性理論 (プレデラス出版, 2016) Chapter 12, p.293 – 317.
2. 2015041073 (理論研究室) 13:55–14:20
Magnetism of Tsai-Type Quasicrystal Approximants
Shintaro Suzuki, Asuka Ishikawa, Tsunetomo Yamada, Takanori Sugimoto, Akira Sakurai and Ryuji Tamura
Materials Transactions, Vol. 62, No. 3 (2021) pp. 298 to 306
3. 2018041054 (渡邊研究室) 14:20–14:45
Thermodynamic analysis of the $\text{SiO}_2 - \text{NiO} - \text{FeO}$ system
R. Alejandro Cruz, S. Antonio Romero, R. Marissa Vargas, L. Manuel Hallen
Journal of Non-Crystalline Solids, 351, 1359 – 1365 (2005)
4. 2018041043 (松本研究室) 14:45–15:10
Wide-Band Direct Measurement of Thermal Fluctuations in an Interferometer
Kenji Numata, Masaki Ando, Kazuhiro Yamamoto, Shigemi Otsuka, and Kimio Tsubono
Phys. Rev. Lett. 91, 260602 – Published 29 December 2003

後半 (15:20–17:25)

座長：田崎

5. 2016041027 (西坂研究室) 15:20–15:45

The condensin complex is a mechanochemical motor that translocates along DNA
Tsuyoshi Terakawa, Shveta Bisht, Jorine M. Eeftens, Cees Dekker, Christian H.
Haering, Eric C. Greene,

Science **358**, 672-676 (2017)

Nanofabricated Racks of Aligned and Anchored DNA Substrates for Single-Molecule
Imaging

Jason Gorman, Teresa Fazio, Feng Wang, Shalom Wind, and Eric C. Greene,
Langmuir, 26(2), 1372 – 1379, **2010**

6. 2018041026 (平野研究室) 15:45–16:10

An integrated space-to-ground quantum communication network over 4,600 kilo-
metres

Yu-Ao Chen, Qiang Zhang, Teng-Yun Chen, Wen-Qi Cai

Nature, Vol589, 214—222 (2021)

7. 2018041006 (平野研究室) 16:10–16:35

Quantum repeaters in space

Carlo Liorni, Hermann Kampermann and Dagmar Bruß Heinrich-Heine-Universit

New J. Phys. 23 053021(2021)