

Peer-Reviewed Papers

- (1) Birchite $\text{Cd}_2\text{Cu}_2(\text{PO}_4)_2\text{SO}_4 \cdot 5\text{H}_2\text{O}$ as a model antiferromagnetic spin-1/2 Heisenberg J_1 - J_2 chain
Masayoshi Fujihala, Harald O. Jeschke, Katsuhiko Morita, Tomohiko Kuwai, and Akihiro Koda
Phys. Rev. Materials **6**, 114408 (2022).
- (2) Direct measurement of the evolution of magnetism and superconductivity toward the quantum critical point
Wataru Higemoto, Makoto Yokoyama, Takashi U. Ito, Taiga Suzuki, Stéphane Raymond, and Youichi Yanase
Proc. Natl. Acad. Sci. U.S.A. **119**, e2209549119 (2022).
- (3) Selective Epitaxial Growth of Ca_2NH and CaNH Thin Films by Reactive Magnetron Sputtering under Hydrogen Partial Pressure Control
Seoungmin Chon, Yuki Sugisawa, Shigeru Kobayashi, Kazunori Nishio, Markus Wilde, Natsuko Kishi, Daiichiro Sekiba, Katsuyuki Fukutani, Taro Hitosugi, and Ryota Shimizu
J. Phys. Chem. Lett. **13**, 10169 (2022).
- (4) Temperature dependence of the hyperfine parameters on $\text{Fe}_3\text{O}_4(111)$ surfaces
Kanta Asakawa, Taizo Kawauchi, and Katsuyuki Fukutani
J. Phys. Commun. **6**, 105004 (2022).
- (5) Finding RHEED conditions sensitive to hydrogen position on $\text{Pd}(100)$
T. Kawamura, Y. Fukaya, and Katsuyuki Fukutani
Surf. Sci. **722**, 122098 (2022).
- (6) Repeatable Photoinduced Insulator-to-Metal Transition in Yttrium Oxyhydride Epitaxial Thin Films
Yuya Komatsu, Ryota Shimizu, Ryuhei Sato, Markus Wilde, Kazunori Nishio, Takayoshi Katase, Daiju Matsumura, Hiroyuki Saitoh, Masahiro Miyauchi, Jonah R. Adelman, Ryan M. L. McFadden, Derek Fujimoto, John O. Ticknor, Monika Stachura, Iain McKenzie, Gerald D. Morris, W. Andrew MacFarlane, Jun Sugiyama, Katsuyuki Fukutani, Shinji Tsuneyuki, and Taro Hitosugi
Chem. Mater. **34**, 3616 (2022).
- (7) Hydrogen- Ti^{3+} Complex as a Possible Origin of Localized Electron Behavior in Hydrogen-Irradiated SrTiO_3
Takashi U. Ito
e-J. Surf. Sci. Nanotechnol. **20**, 128 (2022).
- (8) Development of Ultraslow, Monochromatic, and Mass-selected Ion Source Toward Measurement of Hydrogen Ion Permeability of Graphene
Tomo-o Terasawa, Katsuyuki Fukutani, Satoshi Yasuda, and Hidehito Asaoka
e-J. Surf. Sci. Nanotechnol. **20**, 196 (2022).
- (9) Probing Copper and Copper-Gold Alloy Surfaces with Space-Quantized Oxygen Molecular Beam
Yasutaka Tsuda, Jessiel Saron Gueriba, Hirokazu Ueta, Wilson Agerico Diño, Mitsunori Kurahashi, and Michio Okada

JACS Au, **2**, 1839 (2022).

- (10) Revealing the Role of Hydrogen in Electron-Doping Mottronics for Strongly Correlated Vanadium Dioxide
Xuanchi Zhou, Haifan Li, Fanqi Meng, Wei Mao, Jiaou Wang, Yong Jiang, Katsuyuki Fukutani, Markus Wilde, Bunshi Fugetsu, Ichiro Sakata, Nuofu Chen, and Jikun Chen
J. Phys. Chem. Lett. **13**, 8078 (2022).
- (11) Quantum critical spin-liquid-like behavior in the $S=1/2$ quasikagome-lattice compound $\text{CeRh}_{1-x}\text{Pd}_x\text{Sn}$ investigated using muon spin relaxation and neutron scattering
Rajesh Tripathi, D. T. Adroja, C. Ritter, Shivani Sharma, Chongli Yang, A. D. Hillier, M. M. Koza, F. Demmel, A. Sundaresan, S. Langridge, Wataru Higemoto, Takashi U. Ito, A. M. Strydom, G. B. G. Stenning, A. Bhattacharyya, David Keen, H. C. Walker, R. S. Perry, Francis Pratt, Qimiao Si, and T. Takabatake
Phys. Rev. B **106**, 064436 (2022).
- (12) Efficient Hydrogen Isotope Separation by Tunneling Effect Using Graphene-Based Heterogeneous Electrocatalysts in Electrochemical Hydrogen Isotope Pumping
Satoshi Yasuda, Hisayoshi Matsushima, Kenji Harada, Risako Tanii, Tomo-o Terasawa, Masahiro Yano, Hidehito Asaoka, Jessiel Siaron Gueriba, Wilson Agerico Diño, and Katsuyuki Fukutani
ACS NANO **16**, 14362 (2022).
- (13) Two-step Mott transition in $\text{Ni}(\text{S},\text{Se})_2$: μSR studies and charge-spin percolation model
Qi Sheng, Tatsuya Kaneko, Kohtaro Yamakawa, Zurab Guguchia, Zizhou Gong, Guoqiang Zhao, Guangyang Dai, Changqing Jin, Shengli Guo, Licheng Fu, Yilun Gu, Fanlong Ning, Yipeng Cai, Kenji M. Kojima, James Beare, Graeme M. Luke, Shigeki Miyasaka, Masato Matsuura, Shin-ichi Shamoto, Takashi Ito, Wataru Higemoto, Andrea Gauzzi, Yannik Klein, and Yasutomo J. Uemura
Phys. Rev. Res. **4**, 033172 (2022).
- (14) Relief of spin frustration through magnetic anisotropy in the quasi-one-dimensional $S=1/2$ antiferromagnet $\text{Na}_2\text{CuSO}_4\text{Cl}_2$
M. Fujihala, Y. Sakuma, S. Mitsuda, A. Nakao, K. Munakata, R. A. Mole, S. Yano, D. H. Yu, K. Takehana, Y. Imanaka, M. Akaki, S. Okubo, and H. Ohta
Phys. Rev. B **105**, 144410 (2022).
- (15) Magnetic ground state of $\text{YbCo}_2\text{Zn}_{20}$ probed by muon spin relaxation
Wataru Higemoto, Kazuhiko Satoh, Takashi U Ito, Kazuki Ohishi, Yuta Saiga, Masashi Kosaka, Kazuyuki Matsubayashi, and Yoshiya Uwatoko
J. Phys.: Conf. Ser. **2462**, 012039 (2023).
- (16) Present status of J-PARC MUSE
K. Shimomura, A. Koda, A. D. Pant, H. Natori, H. Fujimori, I. Umegaki, J. Nakamura, M. Tampo, N. Kawamura, N. Teshima, P. Strasser, R. Kadono, R. Iwai, S. Matoba, S. Nishimura, S. Kanda, S. Takeshita, T. Yuasa, T. Yamazaki, Y. Miyake, Y. Kobayashi, Y. Oishi, Y. Nagatani, Y. Ikedo, W. Higemoto, and T. Ito

J. Phys.: Conf. Ser. **2462**, 012033 (2023).

(17) Spin gap in the weakly interacting quantum spin chain antiferromagnet $\text{KCuPO}_4 \cdot \text{H}_2\text{O}$

M. Fujihala, M. Hagihala, K. Morita, N. Murai, A. Koda, H. Okabe, and S. Mitsuda

Phys. Rev. B **107**, 054435 (2023).

(18) Probing Strain and Doping along a Graphene Wrinkle Using Tip-Enhanced Raman Spectroscopy

Maria Vanessa Balois-Oguchi, Norihiko Hayazawa, Satoshi Yasuda, Katsuyoshi Ikeda, Tien Quang Nguyen, Mary Clare Escaño, and Takuo Tanaka

J. Phys. Chem. C **127**, 5982 (2023).

(19) Protons Inside the LiCoO_2 Electrode Largely Increase Electrolyte–Electrode Interface Resistance in All-Solid-State Li Batteries

Shigeru Kobayashi, Kazunori Nishio, Markus Wilde, Katsuyuki Fukutani, Ryota Shimizu, and Taro Hitosugi

J. Phys. Chem. C **127**, 4684 (2023).

(20) Band gap opening in graphene by hybridization with Au(001) reconstructed surfaces

Tomo-o Terasawa, Kazuya Matsunaga, Naoki Hayashi, Takahiro Ito, Shin-ichiro Tanaka, Satoshi Yasuda, and Hidehito Asaoka

Phys. Rev. Materials **7**, 014002 (2023).

Invited Talks at International Conferences

(1) Structure analysis of 2D materials by total-reflection high-energy positron diffraction (TRHEPD)

Y. Fukaya

14th International Symposium on Atomic Level Characterizations for New Materials and Devices '22 (ALC '22), Oct. 16-21, 2022, Okinawa, Japan

Books and Scientific Articles

None

Patents

None

Awards

(1) 2022 年度 日本分光学会 奨励賞, 日本分光学会(2022)

山川紘一郎 「分子の核スピン異性化とクラスター化に関するテラヘルツ・赤外分光研究」

(2) 令和4年度 理事長ファンド「萌芽研究開発制度」 成果報告会 優秀発表賞, 深谷有喜

Press Release

(1) 原子一個の厚みのカーボン膜で水素と重水素を分ける ―幅広い分野でのキーマテリアル「重水素」を安価に精製する新技術を実証― 2022 年 8 月 31 日 (JAEA、東大、北大、阪大)

- (2) 素粒子ミュオンで捉えた！超伝導に埋もれた微弱な磁気の発見 —超伝導発現機構の解明に向けて前進— 2022年11月25日(JAEA、茨大、京大、東工大、J-PARC)
- (3) スピンの揺らぎの直接観測に世界で初めて成功 —ナノメートルサイズの磁性を解明し、超小型磁気素子の機能向上へ— 2022年12月7日(JAEA、CROSS、J-PARC)
- (4) 炭素膜グラフェンと金はどのように電子の手をつなぐか？ —金原子の配置でグラフェンとの化学結合を操作して省エネ集積回路の実現へ— 2023年1月30日(JAEA、名大、阪大)