Peer-Reviewed Papers

(1) Formation of α clusters in dilute neutron-rich matter
J. Tanaka, Z. H. Yang, S. Typel, S. Adachi, S. Bai, P. van Beek, D. Beaumel, Y. Fujikawa, J. Han, S. Heil, S. Huang, A. Inoue, Y. Jiang, M. Knösel, N. Kobayashi, Y. Kubota, W. Liu, J. L. Lou, Y. Maeda, Y. Matsuda, K. Miki, S. Nakamura, K. Ogata, V. Panin, H. Scheit, F. Schindler, P. Schrock, D. Symochko, A. Tamii, T. Uesaka, V. Wagner, K. Yoshida, J. Zenihiro, and T. Aumann
Science **371**, 260 (2021).

(2) Quasifree Neutron Knockout Reaction Reveals a Small s-Orbital Component in the Borromean Nucleus ^{17}B
Z. H. Yang, Y. Kubota, A. Corsi, K. Yoshida, X.-X. Sun, J. G. Li, M. Kimura, N. Michel, K. Ogata, C. X. Yuan, Q. Yuan, G. Authelet, H. Baba, C. Caesar, D. Calvet, A. Delbart, M. Dozono, J. Feng, F. Flavigny, J.-M. Gheller, J. Gibelin, A. Giganon, A. Gillibert, K. Hasegawa, T. Isobe, Y. Kanaya, S. Kawakami, D. Kim, Y. Kiyokawa, M. Kobayashi, N. Kobayashi, T. Kobayashi, Y. Kondo, Z. Korkulu, S. Koyama, V. Lapoux, Y. Maeda, F. M. Marqués, T. Motobayashi, T. Miyazaki, T. Nakamura, N. Nakatsuka, Y. Nishio, A. Obertelli, A. Ohkura, N. A. Orr, S. Ota, H. Otsu, T. Ozaki, V. Panin, S. Paschalis, E. C. Pollacco, S. Reichert, J.-Y. Roussé, A. T. Saito, S. Sakaguchi, M. Sako, C. Santamaria, M. Sasano, H. Sato, M. Shikata, Y. Shimizu, Y. Shindo, L. Stuhl, T. Sumikama, Y. L. Sun, M. Tabata, Y. Togano, J. Tsubota, F. R. Xu, J. Yasuda, K. Yoneda, J. Zenihiro, S.-G. Zhou, W. Zuo, and T. Uesaka
Phys. Rev. Lett. **126**, 082501 (2021).

(3) Stable double-heavy tetraquarks: spectrum and structure
Q. Meng, E. Hiyama, A. Hosaka, M. Oka, P. Gubler, K.U. Can, T.T. Takahashi, and H.S. Zong
Phys. Lett. B **814**, 136095 (2021).

(4) First spectroscopic study of ^{51}Ar by the (p, 2p) reaction
M.M. Juhász, Z. Elekes, D. Sohler, Y. Utsuno, K. Yoshida, T. Otsuka, K. Ogata, P. Doornenbal, A. Obertelli, H. Baba, F. Browne, D. Calvet, F. Château, S. Chen, N. Chiga, A. Corsi, M.L. Cortés, A. Delbart, J.-M. Gheller, A. Giganon, A. Gillibert, C. Hilaire, T. Isobe, T. Kobayashi, Y. Kubota, V. Lapoux, T. Motobayashi, I. Murray, H. Otsu, V. Panin, N. Paul, W. Rodriguez, H. Sakurai, M. Sasano, D. Steppenbeck, L. Stuhl, Y.L. Sun, Y. Togano, T. Uesaka, K. Wimmer, K. Yoneda, N.L. Achouri, O. Aktas, T. Aumann, L.X. Chung, Zs. Dombrádi, F. Flavigny, S. Franchoo, I. Gašparić, R.-B. Gerst, J. Gibelin, K.I. Hahn, D. Kim, T. Koiwai, Y. Kondo, P. Koseoglou, J. Lee, C. Lehr, B.D. Linh, H.N. Liu, T. Lokotko, M. MacCormick, K. Moschner, T. Nakamura, S.Y. Park, D. Rossi, E. Sahin, P.-A. Söderström, S. Takeuchi, H. Törnqvist, V. Vaquero, V. Wagner, S. Wang, V. Werner, X. Xu, H. Yamada, D. Yan, Z. Yang, M. Yasuda, and L. Zanetti
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(5) J/ψ near T_c
T. Song, P. Gubler, J. Hong, S.H. Lee, and K. Morita
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(6) Unexpectedly enhanced α-particle preformation in ^{48}Ti probed by the (p, $p\alpha$) reaction
Y. Taniguchi, K. Yoshida, Y. Chiba, Y. Kanada-En'yo, M. Kimura, and K. Ogata
Phys. Rev. C **103**, L031305 (2021).

(7) High-spin states in ^{35}S
S. Go, E. Ideguchi, R. Yokoyama, N. Aoi, F. Azaiez, K. Furutaka, Y. Hatsukawa, A. Kimura, K. Kisamori, M. Kobayashi, F. Kitatani, M. Koizumi, H. Harada, I. Matea, S. Michimasa, H. Miya, S. Nakamura, M. Niikura, H. Nishibata, N. Shimizu, S. Shimoura, T. Shizuma, M. Sugawara, D. Suzuki, M. Takaki, Y. Toh, Y. Utsuno, D. Verney, and A. Yagi
Phys. Rev. C **103**, 034327 (2021).

(8) Proton induced deuteron knockout reaction as a probe of an isoscalar proton-neutron pair in nuclei
Y. Chazono, K. Yoshida, K. Yoshida, and K. Ogata
Phys. Rev. C **103**, 024609 (2021).

(9) Variational approach with the superposition of the symmetry-restored quasiparticle vacua for nuclear shell-model calculations
N. Shimizu, Y. Tsunoda, Y. Utsuno, and T. Otsuka
Phys. Rev. C **103**, 014312 (2021).

(10) Chiral separation effect catalyzed by heavy impurities
D. Suenaga, Y. Araki, K. Suzuki, and S. Yasui
Phys. Rev. D **103**, 054041 (2021).

(11) Decay properties of $N^*(1895)$
K. P. Khemchandani, A. Martínez Torres, H. Nagahiro, and A. Hosaka
Phys. Rev. D **103**, 016015 (2021).

(12) Quark level and hadronic contributions to the electric dipole moment of charged leptons in the standard model
Y. Yamaguchi and N. Yamanaka
Phys. Rev. D **103**, 013001 (2021).

(13) Two relativistic Kondo effects: Classification with particle and antiparticle impurities
Y. Araki, D. Suenaga, K. Suzuki, and S. Yasui
Phys. Rev. Research **3**, 013233 (2021).

(14) Gamow–Teller transitions of neutron-rich N=82, 81 nuclei by shell-model calculations
N. Shimizu, T. Togashi, and Y. Utsuno
Prog. Theor. Exp. Phys. **2021**, 033D01 (2021).

(15) Evolution of shell structure in exotic nuclei
T. Otsuka, A. Gade, O. Sorlin, T. Suzuki, and Y. Utsuno
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(16) The impact of nuclear shape on the emergence of the neutron dripline
N. Tsunoda, T. Otsuka, K. Takayanagi, N. Shimizu, T. Suzuki, Y. Utsuno, S. Yoshida, and H.

Ueno

Nature **587**, 66 (2020).

(17) Large electric dipole moment of charged leptons in the standard model,

Y. Yamaguchi, and N. Yamanaka

Phys. Rev. Lett. **125** (2020) 241802.

(18) How different is the core of ^{25}F from $^{24}O_{g.s.}$?

T. L. Tang, T. Uesaka, S. Kawase, D. Beaumel, M. Dozono, T. Fujii, N. Fukuda, T. Fukunaga, A. Galindo-Uribarri, S. H. Hwang, N. Inabe, D. Kameda, T. Kawahara, W. Kim, K. Kisamori, M. Kobayashi, T. Kubo, Y. Kubota, K. Kusaka, C. S. Lee, Y. Maeda, H. Matsubara, S. Michimasa, H. Miya, T. Noro, A. Obertelli, K. Ogata, S. Ota, E. Padilla-Rodal, S. Sakaguchi, H. Sakai, M. Sasano, S. Shimoura, S. S. Stepanyan, H. Suzuki, M. Takaki, H. Takeda, H. Tokieda, T. Wakasa, T. Wakui, K. Yako, Y. Yanagisawa, J. Yasuda, R. Yokoyama, K. Yoshida, K. Yoshida, J. Zenihiro.

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(19) Casimir effect for lattice fermions

T. Ishikawa, K. Nakayama, and K. Suzuki

Phys. Lett. B **809**, 135713 (2020).

(20) The φ meson with finite momentum in a dense medium

H.J. Kim and P. Gubler

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(21) N=32 shell structure below calcium: Low-lying structure of ^{50}Ar

M. L. Cortés, W. Rodriguez, P. Doornenbal, A. Obertelli, J. D. Holt, J. Menéndez, K. Ogata, A. Schwenk, N. Shimizu, J. Simonis, Y. Utsuno, K. Yoshida, L. Achouri, H. Baba, F. Browne, D. Calvet, F. Château, S. Chen, N. Chiga, A. Corsi, A. Delbart, J.-M. Gheller, A. Giganon, A. Gillibert, C. Hilaire, T. Isobe, T. Kobayashi, Y. Kubota, V. Lapoux, H. N. Liu, T. Motobayashi, I. Murray, H. Otsu, V. Panin, N. Paul, H. Sakurai, M. Sasano, D. Steppenbeck, L. Stuhl, Y. L. Sun, Y. Togano, T. Uesaka, K. Wimmer, K. Yoneda, O. Aktas, T. Aumann, L. X. Chung, F. Flavigny, S. Franchoo, I. Gašparić, R.-B. Gerst, J. Gibelin, K. I. Hahn, D. Kim, T. Koiwai, Y. Kondo, P. Koseoglou, J. Lee, C. Lehr, B. D. Linh, T. Lokotko, M. MacCormick, K. Moschner, T. Nakamura, S. Y. Park, D. Rossi, E. Sahin, P.-A. Söderström, D. Sohler, S. Takeuchi, H. Toernqvist, V. Vaquero, V. Wagner, S. Wang, V. Werner, X. Xu, H. Yamada, D. Yan, Z. Yang, M. Yasuda, and L. Zanetti

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(22) Structure of ^{30}Mg explored via in-beam γ-ray spectroscopy

N. Kitamura, K. Wimmer, N. Shimizu, V. M. Bader, C. Bancroft, D. Barofsky, T. Baugher, D. Bazin, J. S. Berryman, V. Bildstein, A. Gade, N. Imai, T. Kröll, C. Langer, J. Lloyd, E. Lunderberg, G. Perdikakis, F. Recchia, T. Redpath, S. Saenz, D. Smalley, S. R. Stroberg, J. A. Tostevin, N. Tsunoda, Y. Utsuno, D. Weisshaar, and A. Westerberg

Phys. Rev. C **102**, 054318 (2020).

(23) Signatures of the vortical quark-gluon plasma in hadron yields
H. Taya, A. Park, S. Cho, P. Gubler, K. Hattori, J. Hong, X.G. Huang, S.H. Lee, A. Monnai, A. Ohnishi, M. Oka and D.L. Yang (ExHIC-P Collaboration)
Phys. Rev. C **102**, 021901(R) (2020).

(24) ω*N* scattering length from ω photoproduction on the proton near the reaction threshold
T. Ishikawa, H. Fujimura, H. Fukasawa, R. Hashimoto, Q. He, Y. Honda, A. Hosaka, T. Iwata, S. Kaida, J. Kasagi, A. Kawano, S. Kuwasaki, K. Maeda, S. Masumoto, M. Miyabe, F. Miyahara, K. Mochizuki, N. Muramatsu, A. Nakamura, S. X. Nakamura, K. Nawa, S. Ogushi, Y. Okada, K. Okamura, Y. Onodera, K. Ozawa, Y. Sakamoto M. Sato1, T. Sato, H. Shimizu, H. Sugai, K. Suzuki, Y. Tajima, S. Takahashi, Y. Taniguchi, Y. Tsuchikawa, H. Yamazaki, R. Yamazaki, and H. Y. Yoshida
Phys. Rev. C **101**, 052201 (2020).

(25) Suppression of decay widths in singly heavy baryons induced by the $U_A(1)$ anomaly
Y. Kawakami, M. Harada, M. Oka, and K. Suzuki
Phys. Rev. D **102**, 114004 (2020).

(26) Photoproduction of $\bar{D}^0\Lambda_c^+$ within the Regge-plus-resonance model
D. Skoupil, and Y. Yamaguchi
Phys. Rev. D **102** (2020) 074009.

(27) Charmed baryon spectrum from lattice QCD near the physical point
H. Bahtiyar, K.U. Can, G. Erkol, P. Gubler, M. Oka, T.T. Takahashi
Phys. Rev. D **102**, 054513 (2020).

(28) Use of the canonical approach in effective models of QCD
M. Wakayama, S.-I. Nam, and A. Hosaka
Phys. Rev. D **102**, 034035 (2020).

(29) Systematic study on the quark-hadron mixed phase in compact stars
C.J. Xia, T. Maruyama, N. Yasutake, T. Tatsumi, H. Togashi, and H. Shen
Phys. Rev. D **102**, 023031 (2020).

(30) $\Lambda(1405)$ as a $\bar{K}N$ Feshbach resonance in the Skyrme model
T. Ezoe and A. Hosaka
Phys. Rev. D **102**, 014046 (2020).

(31) Spectrum of singly heavy baryons from a chiral effective theory of diquarks
Y. Kim, E. Hiyama, M. Oka, and K. Suzuki
Phys. Rev. D **102**, 014004 (2020).

(32) Classifying the pole of an amplitude using a deep neural network
D. L. B. Sombillo, Y. Ikeda, T. Sato and A. Hosaka
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(33) Roper-like resonances with various flavor contents and their two-pion emission decays
A.J. Arifi, H. Nagahiro, A. Hosaka and K. Tanida

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(34) Heavy baryons in holographic QCD with higher dimensional degrees of freedom
D. Fujii and A. Hosaka
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(35) *D* meson mass and heavy quark potential at finite temperature
P. Gubler, T. Song, S.H. Lee
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(36) Three-body decay of $\Lambda_c^*(2765)$ and determination of its spin-parity
A.J. Arifi, H. Nagahiro, A. Hosaka and K. Tanida
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(37) P_c pentaquarks with chiral tensor and quark dynamics
Y. Yamaguchi, H. Garca-Tecocoatzi, A. Giachino, A. Hosaka, E. Santopinto, S. Takeuchi and M. Takizawa
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(38) Kondo effect driven by chirality imbalance
D. Suenaga, K. Suzuki, Y. Araki, and S. Yasui
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(39) QCD Kondo excitons
D. Suenaga, K. Suzuki, and S. Yasui
Phys. Rev. Research **2**, 023066 (2020).

(40) Neutron star equation of state: Exemplary modeling and applications
A. Li, Z.-Y. Zhu, E.-P. Zhou, J.-M. Dong, J.-N. Hu, and C.-J. Xia
J. High Energy Astrophysics **28**, 19 (2020).

(41) Heavy hadronic molecules with pion exchange and quark core couplings: a guide for practitioners
Y. Yamaguchi, A. Hosaka, S. Takeuchi, M. Takizawa
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(42) Low-energy super Gamow-Teller (LeSGT) and anti-LeSGT transitions: Hindered "allowed decay" of ^{14}C as an anti-LeSGT transition
Y. Fujita, Y. Utsuno, and H. Fujita
Eur. Phys. J. A **56**, 138 (2020).

(43) Feasibility study of the $K^+d \rightarrow K^0pp$ reaction for the Θ^+ pentaquark
T. Sekihara, H. C. Kim and A. Hosaka
Prog. Theor. Exp. Phys. **2020**, 063D03 (2020).

(44) Heavy baryon production with an instanton interaction
S.I. Shim, A. Hosaka and H. C. Kim
Prog. Theor. Exp. Phys. **2020**, 053D01 (2020).

(45) Studying the φ meson in nuclear matter from simulated *pA* reactions
P. Gubler

Proceedings of the XVIII International Conference on Hadron Spectroscopy and Structure (HADRON2019), 694 (2020).

(46) The φ meson in nuclear matter with zero and non-zero momentum - recent results
P. Gubler
J. Phys. Conf. Ser. **1643**, 012009 (2020).

(47) Simulating *pA* reactions to study the φ meson in nuclear matter at J-PARC
P. Gubler
AIP Conf. Proc. **2249**, 030002 (2020).

(48) Axial U(1) symmetry and mesonic correlators at high temperature in $N_f = 2$ lattice QCD
K. Suzuki, S. Aoki, Y. Aoki, G. Cossu, H. Fukaya, S. Hashimoto, and C. Rohrhofer (JLQCD Collaboration)
PoS LATTICE2019, 178 (2020).

(49) Symmetries of the light hadron spectrum in high temperature QCD
C. Rohrhofer, Y. Aoki, G. Cossu, H. Fukaya, C. Gattringer, L. Ya Glozman, S. Hashimoto, C. B. Lang, and K. Suzuki
PoS LATTICE2019, 227 (2020).

Invited Talks at International Conferences

(1) Heavy hadronic molecules with pion exchange and coupling to multiquarks
Y. Yamaguchi
Hadron in Nucleus 2020 (HIN20), Kyoto, Japan (March 8-10, 2021).

(2) Heavy hadronic molecules coupled with multiquark states
Y. Yamaguchi
Yamada Conference LXXII: The 8th Asia-Pacific Conference on Few-Body Problems in Physics (APFB2020), Kanazawa, Japan (March 1-5, 2021).

(3) Nuclear and Hadron Physics using Supercomputers
A. Hosaka
The 2020 Asian Nuclear Physics Association (ANPhA) meeting & the ANPhA symposium on nuclear physics facilities in Asia Online (Dec. 10-11, 2020).

(4) Heavy baryon Spectroscopy
A. Hosaka
APCTP-KPS-JPS meeting (Invited session), Online On-line (Nov. 6, 2020)

(5) Heavy baryons (conventional resonances)
A. Hosaka
SnowMass21 — Heavy-Quarks Conventional Hadrons2020 Online (Sept. 23, 2020).

Books and Scientific Articles

(1) ハドロン動力学による Pc ペンタクォークの質量スペクトル

山口康宏
原子核研究 第 65 巻 2 号 (2021 年 3 月).

(2) Ten Years of the Asian Nuclear Physics Association (ANPhA) and Major Accelerator Facilities for Nuclear Physics in the Asia Pacific Region
A.W. Thomas, A.E. Stuchbery, W. Liu, G. Xiao, Y. Ma, J. Cao, A.C. Pandey, B.K. Nayak, S. Som, K. Tanaka, .T. Motobayashi, H. Tamura, A. Hosaka, and B. Hong
Nuclear Physics News Vol. **30**, Issue 3, p. 3 (2020).

Patents

None

Awards

(1) 山口康宏
第 15 回(2021 年)日本物理学会若手奨励賞(第 22 回核理論新人論文賞)、対象研究：ハドロン動力学による Pc ペンタクォークの質量スペクトル、2020 年 10 月.

Press Release

(1) スズ原子核の表面でアルファ粒子を発見 －中性子星の構造とアルファ崩壊の謎に迫る－ (2021 年 1 月).

(2) 原子核の存在限界（中性子ドリップライン）の新たなメカニズム―中性子は原子核にいくつ入るか―（2020 年 11 月）.