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Center for Theoretical Physics of the Universe, Institute for Basic Science
Daejeon, Republic of Korea

RESEARCH INTERESTS

Particle Phenomenology, Supersymmetry, Grand Unified Theories, CP Violation, Flavor Physics, Quantum Corrections

SELECTED PUBLICATIONS

- [1] Masahiro Ibe, Ayuki Kamada, Shin Kobayashi, **Takumi Kuwahara**, and Wakutaka Nakano.
“*Ultraviolet Completion of a Composite Asymmetric Dark Matter Model with a Dark Photon Portal*”
arXiv:1811.10232, doi:10.1007/JHEP03(2019)173, JHEP 1903 (2019) 173
- [2] Jason L. Evans, Kenji Kadota, and **Takumi Kuwahara**.
“*Revisiting Flavor and CP Violation in Supersymmetric $SU(5)$ with Right-Handed Neutrinos*”
arXiv:1807.08234, doi:10.1103/PhysRevD.98.075030, Phys.Rev. D98 (2018) no.7, 075030
- [3] Junji Hisano, **Takumi Kuwahara**, and Yuji Omura.
“*Threshold Corrections to Baryon Number Violating Operators in Supersymmetric $SU(5)$ GUTs.*”
arXiv:1503.08561, doi:10.1016/j.nuclphysb.2015.06.022, Nucl.Phys. B898 (2015) 1-29

RESEARCH EMPLOYMENT

Postdoctoral fellow

CTPU-PTC group, IBS

University of Tokyo, High Energy Physics Theory Group

Sep. 2017-current

Apr. 2017 - Aug. 2017

EDUCATION

Nagoya University, Nagoya, Japan

Ph.D., Physics, March 2017

- Thesis Title: *Next-Leading Order Corrections for Proton Decay in Supersymmetric Unification*
- Supervisor: Junji Hisano, Ph.D

M.S., Physics, March 2014

- Thesis Title: *Proton Decay in SUSY $SU(5)$ GUTs Revisited after Discovery of the Higgs Boson*
- Supervisor: Junji Hisano, Ph.D

Tokyo University of Science, Kagurazaka, Tokyo, Japan

B.S., Physics, March 2012

RESEARCH FELLOWSHIP

Research Fellow

Apr. 2016 - Aug. 2018

Japan Society for the Promotion of Science (JSPS)

Research Assistant

Jul. 2014 - Mar. 2015

Department of Physics, Nagoya University
Supervisors: Junji Hisano, Ph.D

TEACHING EXPERIENCE

Co-instructor

- Basic Experiments on Physics fall semester 2013–2015
Aichi Medical University

Teaching Assistant

- Mathematics for Physics (G30: for students studying abroad) fall semester 2015
Department of Physics, Nagoya University
- Mathematics for Physics fall semester 2013
Department of Physics, Nagoya University

AWARDS

Travel Awards

- Overseas Dispatching for Young Scientists, Nagoya, Japan March 2016

Student Awards

- Exemption from Refund of a Scholar Loan (JASSO) March 2016
- Exemption from Refund of a Scholar Loan (JASSO) March 2014

PUBLICATIONS

According to the custom in the particle physics community, the alphabetical author ship is used.

Under-Reviewed Manuscripts

- [1] Ayuki Kamada, and **Takumi Kuwahara**.
“*Lessons from T^μ_μ on inflation models II: scalar QED and QCD*”
arXiv:1909.04229
- [2] Ayuki Kamada, and **Takumi Kuwahara**.
“*Lessons from T^μ_μ on inflation models I: two-scalar theory and Yukawa theory*”
arXiv:1909.04228

Peer-Reviewed Publications

- [1] Masahiro Ibe, Ayuki Kamada, Shin Kobayashi, **Takumi Kuwahara**, and Wakutaka Nakano.
“*Baryon-Dark Matter Coincidence in Mirrored Unification*”
arXiv:1907.03404, doi:10.1103/PhysRevD.100.075022, Phys.Rev. D 100 (2019) no.7, 075022.
- [2] Wataru Kuramoto, **Takumi Kuwahara**, and Ryo Nagai.
“*Renormalization Effects on Electric Dipole Moments in Electroweakly Interacting Massive Particle Models*”
arXiv:1902.05360, doi:10.1103/PhysRevD.99.095024, Phys.Rev. D99 (2019) no.9, 095024
- [3] Masahiro Ibe, Ayuki Kamada, Shin Kobayashi, **Takumi Kuwahara**, and Wakutaka Nakano.
“*Ultraviolet Completion of a Composite Asymmetric Dark Matter Model with a Dark Photon Portal*”
arXiv:1811.10232, doi:10.1007/JHEP03(2019)173, JHEP 1903 (2019) 173
- [4] Jason L. Evans, Kenji Kadota, and **Takumi Kuwahara**.
“*Revisiting Flavor and CP Violation in Supersymmetric $SU(5)$ with Right-Handed Neutrinos*”
arXiv:1807.08234, doi:doi:10.1103/PhysRevD.98.075030, Phys.Rev. D98 (2018) no.7, 075030
- [5] Junji Hisano, **Takumi Kuwahara**, Yuji Omura, and Takeki Sato.
“*Two-loop Anomalous Dimensions for Four-Fermi Operators in Supersymmetric Theories.*”
arXiv:1703.08329, doi:10.1016/j.nuclphysb.2017.06.021, Nucl.Phys. B922 (2017) 77-93
- [6] Junji Hisano, Wataru Kuramoto, and **Takumi Kuwahara**.
“*Light Stop, Heavy Higgs, and Heavy Gluino in Supersymmetric Standard Models with Extra Matters.*”
arXiv:1611.07670, doi:10.1093/ptep/ptx031, PTEP 2017 (0) 033
- [7] Borut Bajc, Junji Hisano, **Takumi Kuwahara**, and Yuji Omura.
“*Threshold Corrections to Dimension-six Proton Decay Operators in Non-minimal SUSY $SU(5)$ GUTs.*”
arXiv:1603.03568, doi:10.1016/j.nuclphysb.2016.06.017, Nucl.Phys. B910 (2016) 1
- [8] Junji Hisano, Daiki Kobayashi, Wataru Kuramoto, and **Takumi Kuwahara**.
“*Nucleon Electric Dipole Moments in High-Scale Supersymmetric Models.*”
arXiv:1507.05836, doi:10.1007/JHEP11(2015)085, JHEP 1511 (2015) 085
- [9] Junji Hisano, **Takumi Kuwahara**, and Yuji Omura.
“*Threshold Corrections to Baryon Number Violating Operators in Supersymmetric $SU(5)$ GUTs.*”
arXiv:1503.08561, doi:10.1016/j.nuclphysb.2015.06.022, Nucl.Phys. B898 (2015) 1-29
- [10] Junji Hisano, Daiki Kobayashi, **Takumi Kuwahara**, and Natsumi Nagata.
“*Decoupling Can Revive Minimal Supersymmetric $SU(5)$.*”
arXiv:1304.3651, doi:10.1007/JHEP07(2013)038, JHEP 1307 (2013) 038

- [11] Junji Hisano, **Takumi Kuwahara**, and Natsumi Nagata.
“Grand Unification in High-scale Supersymmetry.”
 arXiv:1304.0343, doi:10.1016/j.physletb.2013.05.017, Phys.Lett. B723 (2013) 324-329

Conference Papers

- [1] **Takumi Kuwahara**, “*Renormalization Effects on Electric Dipole Moments in Electroweakly Interacting Massive Particle Models*”, arXiv:1906.08721. (Proceedings of FPCP 2019 Conference)
- [2] **Takumi Kuwahara**, “*Threshold corrections to dimension-six proton decay operators in SUSY $SU(5)$* ”, doi:10.1063/1.5010111. (Proceedings of Workshop on Neutrino Physics: Session of CETUP* 2016)
- [3] **Takumi Kuwahara**, “*GUT Scale Threshold Effect on Proton Decay*”, doi:10.22323/1.248.0085. (Proceedings of FPCP 2015 Conference)
- [4] **Takumi Kuwahara**, “*Decoupling can revive minimal supersymmetric $SU(5)$* ”, doi:10.22323/1.208.0034. (Proceedings of KMI2013)

PRESENTATIONS

(P): Poster presentation

International Conference Talks

- [1] International joint workshop on the Standard Model and beyond (KEK-KIAS-NCTS-ITP CAS joint workshop), “*Electric Dipole Moments in Electroweakly Interacting Massive Particle Models*”, Beijing, China, Oct. 2019
- [2] New physics beyond the Standard Model (research program by Peng Huanwu Innovation Research Center for Theoretical Physics), “*Baryon-Dark Matter Coincidence and Composite Asymmetric Dark Matter*”, Beijing, China, Oct. 2019
- [3] Summer Institute 2019, “*UV Completions of Composite Asymmetric Dark Matter Model with Dark Photon Portal*”, Gangneung, Republic of Korea, July 2019
- [4] Conference on Flavor Physics and CP violation (FPCP) 2019, “*Renormalization Effects on Electric Dipole Moments in Electroweakly Interacting Massive Particle Models*”, Victoria, Canada, May 2019
- [5] KEK Theory Meeting (KEK-PH 2018 Winter), “*Revisiting Flavor and CP Violation in Supersymmetric $SU(5)$ with Right-Handed Neutrinos*”, KEK, Japan, Dec. 2018
- [6] SUSY 2018, “*Revisiting Flavor and CP Violation in Supersymmetric $SU(5)$ with Right-Handed Neutrinos*”, Barcelona, Spain, July 2018
- [7] Dark Side of the Universe, “*Two-loop Anomalous Dimensions for Four-Fermi Operators in Supersymmetric Theories*”, Daejeon, Republic of Korea, July 2017
- [8] (P) Gordon research Seminar/Conference (**short talk selected**), “*Light Stop, Heavy Higgs, and Heavy Gluino in Supersymmetric Standard Models with Extra Matters*”, HKUST, Hong-Kong, Jun. 2017
- [9] ECT* Baryon over antibaryon (**invited talk**), “*Proton Decay in SUSY GUTs*”, ECT*, Italy, July 2016
- [10] SUSY 2016, “*GUT Scale Threshold Effects on Proton Decay*”, Melbourne, Australia, July 2016
- [11] CETUP* Workshop on Neutrino Physics/Unification Session, “*Threshold Corrections to Dimension-Six Proton Decay Operators in SUSY $SU(5)$* ”, Lead-Deadwood South-Dakota, USA, June -July 2016

- [12] (P) KEK Theory Meeting (KEK-PH 2016), “*GUT Scale Threshold Effect on Proton Decay*”, KEK, Japan, Feb. 2016
- [13] Flavors of New Physics, “*GUT Scale Threshold Effect on Proton Decay*”, IQBRC/KEK Tokai Campus, Japan, Mar. 2015
- [14] (P) Flavor Physics and CP Violation (FPCP 2015), “*GUT Scale Threshold Effect on Proton Decay*”, Nagoya, Japan, Mar. 2015
- [15] (P) Sakata Memorial KMI Workshop on “Origin of Mass and Strong Coupling Gauge Theories” (SCGT15), “*GUT Scale Threshold Effect on Proton Decay*”, Nagoya, Japan, Mar. 2015
- [16] (P) Summer Institute 2014, “*Grand Unified Theory in High-scale Supersymmetry*”, Fuji-Yoshida, Japan, Aug. 2014
- [17] (P) KMI International Symposium 2013 on “Quest for the Origin of Particles and the Universe”, “*Decoupling Can Revive Minimal Supersymmetric $SU(5)$* ”, Nagoya, Japan, Dec. 2013
- [18] (P) International Workshop on Next generation Nucleon Decay and Neutrino Detectors (NNN 2013), “*Decoupling Can Revive Minimal Supersymmetric $SU(5)$* ”, Kavli IPMU, Japan, Nov. 2013
- [19] KEK Theory Meeting (KEK-PH2013 FALL), “*Decoupling Can Revive Minimal Supersymmetric $SU(5)$* ”, KEK, Japan, Oct. 2013

SEMINAR TALKS

- [1] “*Supersymmetric Standard Models with Extra Matters*”, IBS, Oct. 2017
- [2] “*Next-Leading Order Corrections to Four-Fermi Operators in Supersymmetric Theories*”, University of Tokyo, Mar. 2017
- [3] “*Threshold Corrections to Dimension-Six Proton Decay Operators in SUSY $SU(5)$ GUTs.*”, **invited talk**, Osaka University, Nov. 2016
- [4] “*Nucleon Electric Dipole Moments in High-Scale Supersymmetric Models.*”, Jožef Stefan Institute, Mar. 2016
- [5] “*Threshold Corrections to Baryon Number Violating Operators in Supersymmetric $SU(5)$ GUTs.*”, **invited talk**, Tohoku University, Nov. 2015