Takumi Kuwahara

Contact Information

Center for Theoretical Physics of the Universe
Institute for Basic Science
34126, IBS, Theory building, 4th Floor, 55, Expo-ro, Yuseong-gu, Daejeon, Korea
kuwahara@ibs.re.kr

Research Interests

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

Research Employment

Postdoctral fellow
CTPU-PTC group, IBS — Sep. 2017-current
University of Tokyo, High Energy Physics Theory Group — Apr. 2017-Aug. 2017

Education

Nagoya University, Nagoya, Japan

Ph.D., Physics, Mar 2017

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

M.S., Physics, Mar 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, Mar 2012

Research Fellowship

Research Fellow — April 2016 to Aug. 2018
Japan Society for the Promotion of Science (JSPS)
Research Assistant — July 2014 to March 2015
Department of Physics, Nagoya University
Supervisors: Junji Hisano, Ph.D

Teaching Experience

Co-instructor — Autumn 2013–2015
Basic Experiments on Physics,
Aichi Medical University
Teaching Assistant — Autumn 2013, 2015
Mathematics for Physics (G30: for students studying abroad), 2015
Department of Physics, Nagoya University
Mathematics for Physics, 2013
Department of Physics, Nagoya University

Awards

Travel Awards
- Overseas Dispatching for Young Scientists, Nagoya, Japan — Mar 2016

Student Awards — Nagoya University, Department of Physics
- Exemption from Refund of a Scholar Loan (JASSO) — Mar 2016
- Exemption from Refund of a Scholar Loan (JASSO) — Mar 2014

Refereed Journal 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 InteractingMassive 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

Submitted Journal Publications

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

Presentations

Talk Presentations (only international conferences)

- 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*",
China Oct., 2019
- 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*",
China Oct., 2019
- Summer Institute 2019,
"*UV Compeletions of Composite Asymmetric Dark Matter Model with Dark Photon Portal*",
Republic of Korea July, 2019
- Conference on Flavor Physics and CP violation (FPCP) 2019,
"*Renormalization Effects on Electric Dipole Moments in Electroweakly Interacting Massive Particle Models*",
Canada May, 2019
- KEK Theory Meeting (KEK-PH 2018 Winter),
"*Revisiting Flavor and CP Violation in Supersymmetric SU(5) with Right-Handed Neutrinos*",
Japan Dec., 2018
- SUSY 2018,
"*Revisiting Flavor and CP Violation in Supersymmetric SU(5) with Right-Handed Neutrinos*",
Spain July, 2018
- Dark Side of the Universe,
"*Two-loop Anomalous Dimensions for Four-Fermi Operators in Supersymmetric Theories*",
Republic of Korea July, 2017
- ECT* Baryon over antibaryon (*invited talk*),
"*Proton Decay in SUSY GUTs*",
ECT*, Italy July, 2016
- SUSY 2016,
"*GUT Scale Threshold Effects on Proton Decay*",
Melbourne, Australia July, 2016
- CETUP* Workshop on Neutrino Physics/Unification Session,
"*Threshold Corrections to Dimension-Six Proton Decay Operators in SUSY SU(5)*",
Lead-Deadwood South-Dakota, US June -July, 2016
- Flavors of New Physics,
"*GUT Scale Threshold Effect on Proton Decay*",
IQBRC/KEK Tokai Campus, Japan Mar 2015
- KEK Theory Meeting (KEK-PH2013 FALL),
"*Decoupling Can Revive Minimal Supersymmetric SU(5)*",
KEK, Japan Oct 2013

Poster Presentations (only international conferences)

- Gordon research Seminar/Conference (also *short talk selected*),
  "*Light Stop, Heavy Higgs, and Heavy Gluino in Supersymmetric Standard Models with Extra Matters* ",
  HKUST, Hong-Kong Jun 2017
- KEK Theory Meeting (KEK-PH 2016),
  "*GUT Scale Threshold Effect on Proton Decay*",
  KEK, Japan Feb 2016
- Flavor Physics and CP Violation (FPCP 2015),
  "*GUT Scale Threshold Effect on Proton Decay*",
  Nagoya, Japan Mar 2015
- 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
- Summer Institute 2014 – Phenomenology of Elementary Particles and Cosmology–,
  "*Grand Unified Theory in High-scale Supersymmetry*",
  Fuji-Yoshida, Japan Aug 2014
- 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
- International Workshop on Next generation Nucleon Decay and Neutrino Detectors (NNN 2013),
  "*Decoupling Can Revive Minimal Supersymmetric SU(5)*",
  Kavli IPMU, Japan Nov 2013

Seminar Talk

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