

Dongmin Gang

Seoul National University

PERSONAL DETAILS

Birth March 30, 1982
Phone +82 10-6609-9402
Mail arima275@snu.ac.kr

EDUCATION

PhD in Physics

Seoul National University

Thesis : Studies on States/Operators in AdS/CFT

2005.3
~ 2011.2

B.A. in Physics

Postech

Thesis : Mathematical construction of gauge theory

2001.3
~ 2005.2

RESEARCH INTERESTS

- Quantum Field theory and String/M-theory
- Knot theory and low dimensional topology

PROFESSIONAL EXPERIENCE

Assistant Professor

Department of Physics and Astronomy, Seoul National University

2021.3
~ present

JRG Leader

APCTP, POSTECH

2019.10
~ 2021.2

QUC Fellow

Quantum Universe Center, Korea Institute for Advanced Study

2019.3
~ 2019.09

Senior Researcher

Center of Theoretical Physics, Seoul National University

2017.4
~ 2019.3

Project Researcher

Kavli IPMU, University of Tokyo

2014.10
~ 2017.3

PUBLICATION LIST

[1] **Precision Microstate Counting for the Entropy of Wrapped M5-branes**
By Dongmin Gang, Nakwoo Kim, Leopoldo A. Pando Zayas.
JHEP 03 (2020) 164

[2] **Rotating Black Hole Entropy from M5 Branes** By Francesco Benini, Dongmin Gang, Leopoldo A. Pando Zayas.
JHEP 03 (2020) 057

[3] **Magnetically charged AdS5 black holes from class S theories on hyperbolic 3-manifolds** By Jin-beom Bae, Dongmin Gang, Kimyeong Lee.
JHEP 02 (2020) 158

[4] **Expanding 3d $\mathcal{N} = 2$ theories around the round sphere** By Dongmin Gang, Masahito Yamazaki.
JHEP 02 (2020) 102

[5] **S duality and framed BPS states via BPS graphs** By Dongmin Gang, Pietro Longhi, Masahito Yamazaki.
Adv.Theor.Math.Phys. 23 (2019) 5, 1361-1410

[6] **Chern-Simons theory on $L(p,q)$ lens spaces and Localization** By Dongmin Gang.
J.Korean Phys.Soc. 74 (2019) no.12, 1119-1128

[7] **Large N twisted partition functions in 3d-3d correspondence and Holography** By Dongmin Gang, Nakwoo Kim.
Phys.Rev. D99 (2019) no.2, 021901.

[8] **Symmetry enhancement and closing of knots in 3d/3d correspondence**
By Dongmin Gang, Kazuya Yonekura.
JHEP 1807 (2018) 145.

[9] **Three-dimensional gauge theories with supersymmetry enhancement** By Dongmin Gang, Masahito Yamazaki.
Phys.Rev. D98 (2018) no.12, 121701.

[10] **S-duality resurgence in $SL(2)$ Chern-Simons theory** By Dongmin Gang, Yasuyuki Hatsuda.
JHEP 1807 (2018) 053.

[11] **All-Order Volume Conjecture for Closed 3-Manifolds from Complex Chern–Simons Theory** By Dongmin Gang, Mauricio Romo, Masahito Yamazaki.
Commun.Math.Phys. 359 (2018) no.3, 915-936.

- [12] **Smallest 3d hyperbolic manifolds via simple 3d theories** By Dongmin Gang, Yuji Tachikawa, Kazuya Yonekura.
Phys.Rev. D96 (2017) no.6, 061701.
- [13] **3d $\mathcal{N} = 2$ minimal SCFTs from Wrapped M5-branes** By Jin-Beom Bae, Dongmin Gang, Jaehoon Lee.
JHEP 1708 (2017) 118.
- [14] **Aspects of Defects in 3d-3d Correspondence** By Dongmin Gang, Nakwoo Kim, Mauricio Romo, Masahito Yamazaki.
JHEP 1610 (2016) 062.
- [15] **Taming supersymmetric defects in 3d-3d correspondence** By Dongmin Gang, Nakwoo Kim, Mauricio Romo, Masahito Yamazaki.
J.Phys. A49 (2016) no.30, 30LT02.
- [16] **Holography of 3d-3d correspondence at Large N** By Dongmin Gang, Nakwoo Kim, Sangmin Lee.
JHEP 1504 (2015) 091.
- [17] **Holography of wrapped M5-branes and Chern-Simons theory** By Dongmin Gang, Nakwoo Kim, Sangmin Lee.
Phys.Lett. B733 (2014) 316-319.
- [18] **Superconformal Index and 3d-3d Correspondence for Mapping Cylinder/Torus** By Dongmin Gang, Eunkyung Koh, Sangmin Lee, Jaemo Park.
JHEP 1401 (2014) 063.
- [19] **Duality between N=5 and N=6 Chern-Simons matter theory** By Sangmo Cheon, Dongmin Gang, Chiung Hwang, Satoshi Nagaoka, Jaemo Park.
JHEP 1211 (2012) 009.
- [20] **Superconformal Index with Duality Domain Wall** By Dongmin Gang, Eunkyung Koh, Kimyeong Lee.
JHEP 1210 (2012) 187.
- [21] **Line Operator Index on $S^1 \times S^3$** By Dongmin Gang, Eunkyung Koh, Kimyeong Lee.
JHEP 1205 (2012) 007.
- [22] **Tests of $\text{AdS}_4/\text{CFT}_3$ correspondence for $\mathcal{N} = 2$ chiral-like theory** By Dongmin Gang, Chiung Hwang, Seok Kim, Jaemo Park.
JHEP 1202 (2012) 079.
- [23] **Refined test of $\text{AdS}_4/\text{CFT}_3$ correspondence for N=2,3 theories** By Sangmo Cheon, Dongmin Gang, Seok Kim, Jaemo Park.
JHEP 1105 (2011) 027.
- [24] **Tree-level Recursion Relation and Dual Superconformal Symmetry of the ABJM Theory** By Dongmin Gang, Yu-tin Huang, Eunkyung Koh, Sangmin Lee, Arthur E. Lipstein.

JHEP 1103 (2011) 116.

[25] **Operator with large spin and spinning D3-brane** By Dongmin Gang, Jae-Sung Park, Satoshi Yamaguchi.
JHEP 0911 (2009) 024.

[26] **Superconformal defects in the tricritical Ising model** By Dongmin Gang, Satoshi Yamaguchi.
JHEP 0812 (2008) 076.

[27] **Integrable Spin Chain of Superconformal $U(M) \times \text{anti-}U(N)$ Chern-Simons Theory** By Dongsu Bak, Dongmin Gang, Soo-Jong Rey.
JHEP 0810 (2008) 038.

INVITED TALKS/LECTURES (LAST 3 YEARS, SELECTED)

- **M-theoretic genesis of topological phases**, Autumn Symposium on String Theory, KIAS, Korea (2020.9.25)

- **M-theoretic genesis of topological phases**, Webinar, Joint Seminar organized by Richard Ng (Louisiana State U), Eric C. Rowell (Texas and A&M), Zhenghan Wang (UCSB) and Xiao-Gang Wen (MIT), (2020.9.11)

- **Wrapped M5-branes : from topological phases to blackhole**, Webinar, IBS Daejeon, Korea (2020.9.9)

- **Wrapped M5-branes : from topological phases to blackhole**, Quantum Matter and Quantum Information with Holography, APCTP, Korea (2020.8.25)

- **M-theoretic genesis of topological phases**, Webinar, Harvard U, USA (2020.8.18)

- **M-theoretic genesis of topological phases**, Webinar, Fudan U, China (2020.8.12)

- **M-theoretic genesis of topological phases**, Webinar, Yale U, USA (2020.8.5)

- **M-theoretic genesis of topological phases**, Webinar, CALTECH, USA (2020.7.31)

- **M-theoretic genesis of topological phases**, Quantum Geometry and Duality 2020 I, APCTP, Korea (2020.7.31)

- **M-theoretic genesis of topological phases**, Webinar, Technion, Israel (2020.7.28)

- **Twisted indices in 3d-3d correspondence**, Webinar, KIAS, Korea (2020.4.20)

- **4 Lectures on “3d superconformal field theory”**, 24th APCTP Winter School on Fundamental Physics, APCTP, Korea (2020.1.30~2.5)

- **Quantum loop on hyperbolic 3-manifolds**, Strings, Branes and Gauge Theories, APCTP, Korea (2019.7.26)

- **3 Lectures on “Vacua counting of 3d gauge theories”**, Strings, Branes and

Gauge Theories, APCTP, Korea (2019.7.18~20)

- **Ads4 black hole, hyperbolic 3-manifold and analytic torsion**, New Pathways in Explorations of Quantum Field Theory and Quantum Gravity Beyond Supersymmetry, ICTP, Italy (2019.6.25)

- **Magnetically Charged AdS4 Black holes from wrapped M5-branes**, Osaka U, Japan (2019.6.4)

- **Magnetically charged Ads4 (Ads5) black hole from class R (class S) theories**, Yau Mathematical Sciences Center, Tsinghua U, China (2019.5.16)

- **Magnetically charged AdS4 Blackholes made of M5-branes**, String Theory and Quantum Field theory, Fudan University, China (2019. 3. 12)

- **Black hole entropy, hyperboilc 3-manifoldand analytic torsion**, IPMU, Japan (2019. 3. 5)

- **3 Lectures on “Introduction to D=3 Conformal Field Theory”**, Kyung Hee U, Korea (2018.12.26 ~ 27)

- **Applications of 3d-3d correspondence**, Research Summary 2018 : Fields, Gravity and String Theory, APCTP, Korea (2018.11.25)

- **Microstates counting of AdS4 black hole made of wrapped M5-branes**, East Asia Joint Workshop on Fields ans Strings 2016, KIAS, Korea (2018.11.8)

- **4 Lectures on “Conformal Field Theory”**, APCTP K-HEP Workshop, APCTP, Korea (2018.10.8 ~ 9)

- **3D Index as an order parameter for 3d N=2 gauge theories and 3-manifolds**, Strings, Branes and Gauge Theories, APCTP, Korea (2018.7.25)

- **The Simplest 3d N=4 SCFT**, Strings, Branes and Gauge Theories, APCTP, Korea (2018.7.20)

- **IR symmetry enhancement for 3d N=2 maxwell theories**, Workshop on Fields, Strings and Gravity, KIAS, Korea (2018.5.18)

- **3d gauge theories labelled by compact 3-manifolds**, Quantum Geometry and Duality, APCTP (Seoul), Korea (2018.4.14)

- **Quantum Approach to Dehn Surgery Problem**, KIAS, Korea (2018.4.10)

- **The 3D Index and Compact 3-manifolds**, UC Davis, USA (2018.3.16)

- **Qauntum invariants of closed hyperbolic 3-manifolds and resurgence**, CAL-TECH, USA (2018.2.28)

- **Symmetry enhancement and closing of knots in 3d/3d correspondence**, IPMU, Japan (2017.12.12)

- **Volume Conjecture, resurgence and 3d/3d correspondence**,IPMU-KIAS-Kyunghee Univ. joint workshop, KIAS, Korea (2017.12.7)

- **Resurgence of S-duality in $SL(2)$ Chern-Simons Theory**, International Workshop on Superconformal Theories 2017, Sichun U, China (2017.10.19)