

Lim, Dong Gyu

Website: limathub.github.io

Email: limath@math.berkeley.edu

Curriculum Vitae

EDUCATION	University of California at Berkeley , Berkeley, CA Ph.D in Mathematics <i>On leave for 3 years (Military Service in South Korea)</i> Master of Arts in Mathematics Rutgers, the State University of New Jersey , New Brunswick, NJ Exchange Student Program Seoul National University , Seoul, South Korea Bachelor of Science in Mathematics, <i>Summa Cum Laude</i> Bachelor of Arts in Economics	Aug 2018 ~ May 2023 Aug 2013 ~ Aug 2015 Jan 2013 ~ May 2013 Mar 2009 ~ Aug 2013
RESEARCH INTERESTS	p -adic geometry, moduli of shtukas, affine Deligne-Lusztig varieties, Shimura varieties, Langlands Program	
RESEARCH PAPERS	<i>Nonemptiness of single affine Deligne-Lusztig varieties</i> , preprint (2022) <i>The connected components of affine Deligne-Lusztig varieties</i> , with I.Gleason and Y.Xu, preprint (2022) available at arxiv.org/abs/2208.07195 .	available upon request
OTHER PUBLICATIONS	Moments in Life When You Need Your Math Brain , Tornado Press, Korea, 344 pages Written for the general public, about approachable ways to discover math in our everyday lives	July 2019
INVITED TALKS	The 10th NCTS-POSTECH-PMI Joint Workshop on Number Theory, Online Conference Title: <i>Nonemptiness of single affine Deligne-Lusztig varieties</i> Johns Hopkins Junior Number Theory Days 2022, Johns Hopkins University, Baltimore, MD Title: <i>p-adic geometry and affine Deligne-Lusztig varieties Lie Groups and Representation Theory Seminar, University of Maryland, College Park, MD Title: <i>Nonemptiness of single affine Deligne-Lusztig varieties</i> <i>Connected components of affine Deligne-Lusztig varieties</i> CAS AMSS Seminar, Chinese Academy of Sciences, Beijing, China (online) Title: <i>Some geometry of affine Deligne-Lusztig varieties</i> Berkeley-Tokyo Workshop, University of California, Berkeley, CA (online) Title: <i>Nonemptiness of (single) affine Deligne-Lusztig varieties</i> CUHK RANT Seminar, Chinese University of Hong Kong, Hong Kong (online) Title: <i>Nonemptiness of affine Deligne-Lusztig varieties</i> SNU Number Theory Group Seminar, Seoul National University, Seoul, South Korea Title: <i>Nonemptiness of affine Deligne-Lusztig varieties</i></i>	Dec 2022 Dec 2022 Nov 2022 Nov 2022 Mar 2022 Feb 2022 Jan 2022

TEACHING
EXPERIENCE

Graduate Student Instructor (GSI), Department of Mathematics, UC Berkeley
with **Outstanding GSI Award** (2014-15)

- | | | | |
|---|--|---|-------------------|
| • Math 1B
<i>Calculus</i> | Spring 2015 | • Math 110
<i>Linear Algebra</i> | Fall 2020 |
| • Math 53
<i>Multivariable Calculus</i> | Spring 2014 | • Math 113
<i>Introduction to Abstract Algebra</i> | Fall 2022 |
| • Math W53
<i>Web-based Multivariable Calculus</i> | Summer 2019, 2020, 2021 | • Math 126
<i>Introduction to Partial Differential Equations</i> | Spring 2020, 2023 |
| • Math 54 (Full-time lecturer) | Summer 2014 | • Math 185
<i>Introduction to Complex Analysis</i> | Fall 2021 |
| • Math 54 | Fall 2014, Fall 2018
Spring 2019, Fall 2019 | • Math 250B
<i>Commutative Algebra</i> | Spring 2023 |
| <i>Linear Algebra and Differential Equations</i> | | | |

Directed Reading Program (DRP), Department of Mathematics, UC Berkeley
Mentored undergraduate students for independent reading projects

- *Introduction to Model Theory* (Mentee: Erika Lin) Spring 2015
- *Arithmetic of Elliptic Curves* (Mentee: Kai Shaikh) Spring 2020

Preparation Class for IMO, Private tutoring 2009 ~ 2012
Taught six representatives (all won **Gold Medals** in IMO)
• Each ranked 37th('09), 27th('10), 13th('11), 9th, 24th, 27th('12).

Teaching Assistant, Summer & Winter Schools, Korean Mathematical Society (KMS) 2009 ~ 2012
Taught students (selected based on their performance in the Korean Mathematical Olympiad)
at the official math bootcamps of the KMS

AWARDS &
CERTIFICATES

Undergraduate Mathematical Competition, Korean Mathematical Society
2 Gold Awards Nov 2010 and Nov 2011

Korean Injae Award, Presidential Award
awarded by Lee MyungBak, President of Republic of Korea Dec 2008

49th International Mathematical Olympiad (IMO), Madrid, Spain
Gold Medal (12th out of 535 students) Jul 2008

SCHOLARSHIPS
& FELLOWSHIPS

Lehmer Fellowship in Number Theory, Department of Mathematics, UC Berkeley Spring 2022

Presidential Scholarship of Science, Korea Foundation for the Advancement of Science & Creativity
Mar 2009 ~ Feb 2013

Scholarship for Studying Abroad Students, Korea Foundation for Advanced Studies
2013-14, 14-15, 18-19, 19-20, 20-21

MATHEMATICS
OUTREACH

Door-to-Door Math Talk Concerts, almost everywhere in Korea Sep 2015 ~ Aug 2018
Short, enjoyable math talks on miscellaneous everyday thoughts as a math person
for students and adults (>50 times, >5000 people)

Science Night Live, University of California, Berkeley, CA Sep 2022
 Delivered a talk about the beauty of number theory to non-math graduate students and postdocs
 Title: *What is ANT? with interesting coincidences around Heegner Numbers*

INTERNAL
SEMINAR TALKS

Berkeley Number Theory Learning Seminar

Hodge Cycles on Abelian Varieties Spring 2019
Stabilizers of Hodge cycles and of absolute Hodge cycles in the Mumford-Tate group
 Arithmetic Statistics of Function Fields via Hurwitz space Fall 2019
On a homological spectral sequence converging to the homology group of Hurwitz space
 Eichler-Shimura Relation Spring 2021
Description of $X_0(Np)$ as two copies of $X_0(N)$ intersecting transversally at supersingular points
 p -adic Modular Forms Fall 2021
The proof of Coleman Classicality Theorem
 Arithmetic of Algebraic Differential Equations Fall 2022
Global nilpotence and some bound via the conjugate spectral sequence and Hodge cohomology

Berkeley-Stanford Learning Seminar

Bruhat-Tits Theory Spring 2020
Explicit descriptions of buildings for SL_n and SP_{2g}
 p -divisible Groups Fall 2020
Adic generic fiber of Rapoport-Zink space, Fargues-Fontaine curve, and p -divisible group over O_C
 Perverse Sheaves Fall 2021
Sheaf-function dictionary via the trace map
 Emerton-Gee Stacks Fall 2022
Crystalline representations and the structure theorem of Breuil-Kisin modules

Student Number Theory Seminar

The Kottwitz conjecture for local shtuka spaces Fall 2019
Dualizing complex and trace distribution on Artin v -stacks
 The cohomology of compact unitary Shimura varieties Spring 2020
Vector bundles on the Fargues-Fontaine curve
Rapoport-Zink spaces and the dimension of strata in the flag varieties

WORK
EXPERIENCE
AND SOCIAL
SERVICE

Chief Olympiad Assistant, Korean Mathematical Society 2010-11
 Led official KMS Olympiad events for the 2010-11 season up to the team selection and participated in IMO 2011 as an Observer C
 Researcher, Education & Culture, **National Institute for Mathematical Sciences**, South Korea
 • General focus: Studied and developed mathematical culture in South Korea
 • Personal focus: Created math outreach activities for students with underrepresented backgrounds
 Sep 2015 ~ Aug 2018
 President, Korean Graduate Student Association, UC Berkeley Jul 2014 ~ Jun 2015
 Organized social events, friendly sports matches (with Stanford), and job recruiting events
 Co-founder and Vice President, Easy Bay Korean Tennis Club, Berkeley and SF Area
 Contributed to integration of the Korean community in Bay Area through tennis
 Jun 2021 ~ May 2022

PROGRAMMING
SKILLS

SageMath (intermediate)