

Nguyen Dinh Dang Khoa

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I am a graduated student in Mathematics. My current interests lie in many aspects of algebra including Algebraic Topology, Cohomology of Groups and Computational Algebraic Geometry.

Education

University of Science – VNUHCM

September 2020 – September 2024

Bachelor in Mathematics - Honor Program.

Ho Chi Minh city - Vietnam

GPA: 8.63/10.

Courseworks:

- Analysis: Functional Analysis, Real Analysis, Complex Variable Functions.
- Algebra: Modern Algebra, Galois Theory, Ring Theory, Commutative Algebra, Graded Algebra, Group Algebra, Homological Algebra, Representation Theory of Finite Groups.
- Topology: General Topology, Algebraic Topology, Differential Topology.

Thesis: On the cohomology of certain S -arithmetic groups.

Advisor: Dr. Tuan Anh Bui.

Research Projects

On the Cohomology Ring of Lagrangian Grassmannian and its Hilbert Series

August 2024

- **Mentor:** Assoc. Prof. Dang Tuan Hiep – Da Lat University.
Prof. Hoang Le Truong – Vietnam Institute of Mathematics.
- The goal of this project is to prove the conjecture proposed by Reiner and Tudose in 2003, on the formula of the Hilbert series for the cohomology ring of the Grassmannian and its analog for Lagrangian Grassmannian.
- **Funded by Vingroup Innovation Foundation (VINIF)** within sponsorship and cooperation program in 2024 between Institute of Mathematics and VINIF.

On the Cohomology of certain S -arithmetic groups

February 2024

- **Mentor:** Dr. Tuan Anh Bui – University of Science - VNUHCM
- This is a continuation of my undergraduate thesis. Our final goal is able to compute cohomology groups of $SL_2(\mathbb{Z}[1/m])$ completely. Based on Serre's theory on decomposing a group by acting it on trees, we can reduce the problem into computing $SL_2(\mathbb{Z}[1/m'])$ and its congruence subgroups, where $m = pm'$. My main contributions involved studying its finite subgroups using theory of Euler characteristic.

LOT groups and Whitehead Conjecture

October 2023

- **Mentor:** Prof. Thomas Koberda – University of Virginia.
- This project is part of the Vietnam Polymath REU program. We aim to disprove Whitehead's famous conjecture in Algebraic Topology by studying a class of objects called LOT groups, which could potentially serve as a counterexample to the conjecture. Major parts of our research include examining the Alexander polynomial of LOT groups, as well as analyzing spherical diagrams and their generations to compute potential counterexample.

Teaching Assistant

- **Linear Algebra** for Mathematics Program – University of Science, VNUHCM.
- **Discrete Mathematics** for Computer Science Program – University of Science, VNUHCM.
- **Discrete Structures I** for Advanced Program in Computer Science – University of Science, VNUHCM.

Programs Participated

Workshop on “Commutative Algebra and related Combinatoric structures”, Ha Noi City	Dec 2024
CIMPA School on Applied Number Theory	June 2024
Vietnam Polymath REU	October 2023
<ul style="list-style-type: none">Project acquired: LOT groups and the Whitehead Conjecture.Mentor: Prof. Thomas Koberda.	
VIASM Research Experiences for Undergraduates Summer School	August 2023
<ul style="list-style-type: none">Presented topic: Crystallographic group and classification method using cohomology.Mentor: Dr. Tuan Anh Bui.	
SEAMS School on Number Theory and Applications, Ho Chi Minh City	June 2023
IACR-VIASM, Summer School on Cryptography	August 2022
VIASM, Summer School on Quantum Computing	November 2020

Skills

Computer tools: GAP, Macaulay2, SageMath, Julia, Mathematica, Matlab.

Languages:

- Vietnamese:** Mother tongue.
- English:** Fluent (Band 6.5 in IELTS Academic).

Awards

Academic Encouragement Scholarship for Undegraduate, Univeristy of Science, VNUHCM.	2022
Academic Encouragement Scholarship for Undegraduate, Univeristy of Science, VNUHCM.	2021
Ranked Third at "HCMC Excellent Student Competition".	2019 – 2020
Bronze Medal at "HCMC April Olympic Competition".	2018 – 2019
Gold Medal at "HCMC April Olympic Competition".	2017 – 2018

Referees / References

Tuan Anh Bui

- Doctor of Mathematics, Ho Chi Minh University of Science, Vietnam.
- Research Gate: <https://researchgate.net/profile/Tuan-Bui-8>.
- Email: t.buif84@gmail.com.

Thomas Koberda

- Professor of Mathematics, University of Virginia, USA.
- Website: <https://sites.google.com/view/koberdat>.
- Email: tmk5a@virginia.edu.

Dang Tuan Hiep

- Associate Professor of Mathematics, Da Lat University, Vietnam.
- Website: <https://sites.google.com/site/hiepdangmath>.
- Email: hiepdt@dlu.edu.vn.

Hoang Le Truong

- Professor of Mathematics, Institute of Mathematics, Vietnam.
- Website: <http://math.ac.vn/en/component/staff/?task=getProfile&staffID=67>.
- Email: hltruong@math.ac.vn.

Mai Hoang Bien

- Dean of the Faculty of Mathematics and Computer Science, Ho Chi Minh University of Science, Vietnam.
- Website: <https://en.hcmus.edu.vn/profile/assoc-prof-mai-hoang-bien>.
- Email: mhbien@hcmus.edu.vn.