Dongho Lee

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Research Interests

Symplectic Geometry, Symplectic Dynamics, Reeb Dynamics, Three-body Problem

Education

Ph.D. in Mathematics
Department of Mathematics, Seoul National University, Seoul, Korea Mar 2018 – Feb 2025

Bachelor of Science in Mathematics
Bachelor of Economics in Economics, Minor in Physics
College of Liberal Studies, SNU Mar 2013 – Feb 2018
Graduated with Honors

Research Experience

Postdoctoral Researcher
Center for Quantum Structures in Modules and Spaces (QSMS), SNU May 2025 – Present
Postdoctoral Supervisor:

– Research on three-body problem.

Research Institute of Mathematics, SNU Mar 2025 – Apr 2025
Postdoctoral Supervisor: Prof. Cheol-hyun Cho

– Research on periodic orbits in the three-body problem via symplectic geometry.

Graduate Student Researcher
Department of Mathematics, SNU Mar 2018 – Feb 2025
Ph.D Advisor: Prof. Otto van Koert

– Focus on global hypersurfaces of section and the three-body problem in symplectic and contact geometry.

Manuscripts and Publications

1. **Conley-Zehnder Indices of Spatial Rotating Kepler Problem** (Manuscript)
with Beomjun Sohn In preparation

– Description of the moduli space and computing the Conley-Zehnder indices of periodic orbits of spatial rotating Kepler problem.

2. **Fiberwise Convexity of Restricted Three-body Problem** (Manuscript)
with Sunghae Cho and Beomjun Sohn In preparation

– Investigating fiberwise convexity in the restricted three-body problem, relating it to spatial periodic orbits.

3. **Global Hypersurfaces of Section and the Spatial Kepler Problem**
   Advisor: Prof. Otto van Koert Ph.D. Thesis, Dec 2024
   – Demonstrated existence of global hypersurfaces of section for certain Hamiltonian systems.
   – Provided simplified descriptions of the moduli space of periodic orbits in the rotating Kepler problem and computed Conley-Zehnder indices.
4. **Global Hypersurfaces of Section for Geodesic Flows on Convex Hypersurfaces**
   with Sunghae Cho *Archiv der Mathematik*, 31 Jul 2024
   – Constructed a global hypersurface of section for geodesic flows on convex hypersurfaces with isometric involution, generalizing Birkhoff annuli to higher dimensions.

Presentations

1. **Closed orbits of the spatial rotating Kepler problem** (Scheduled)
   2025 Korean Mathematical Society Spring Meeting, Daejeon, Korea 24 – 26 Apr 2025

Personal Affiliations

Korean Mathematical Society, Korea 2025 – Present

QSMS-BK21 Symplectic Seminar, Korea 2021 – Present

Conference Participation

2025 Symplectic Retreat 23 – 26 Jan 2025
Stanford Hotel, Tongyeong, Korea

From Hamiltonian Dynamics to Symplectic Topology and Beyond 3 – 7 Jun 2024
A 2024 celebration of Claude Viterbo and his mathematics
Institut Henri Poincaré, Paris, France

Topology of 4-manifolds and Related Topics 21 – 27 Jan 2024
A conference in honor of Jongil Park's 60th birthday
Ocean Suites Hotel, Jeju, Korea

East Asian Symplectic Conference 2023 29 Oct – 4 Nov 2023
Ocean Suites Hotel, Jeju, Korea

QSMS Workshop on Symplectic Geometry and Related Topics 5 – 10 Feb 2023
Ocean Suites Hotel, Jeju, Korea

Workshop on Symplectic Dynamics 27 Jun – 1 Jul 2022
Instituto Superior Técnico, Lisboa, Portugal

Symplectic Geometry and Beyond (Part I) 7 – 10 Feb 2022
Conference on the occasion of Yong-Geun Oh's 61st birthday
Ocean Suite Hotel, Jeju, Korea

Fukaya 60 Geometry and Everything 17 – 22 Feb 2019
A conference in honor of Kenji Fukaya's 60th birthday
Kyoto University, Kyoto, Japan

Teaching Experience

Teaching and Course Assistant, Seoul National University Mar 2018 – Feb 2025

Major Courses

Algebraic Topology (Graduate Course) Fall 2019

Introduction to Topology Spring 2023, Spring 2020

Introduction to Differential Geometry Spring, Fall 2021

Selected Topics Seminar (College of Liberal Studies) Spring 2023
Probability in mathematical and philosophical viewpoints

General Education Courses

Head Teaching Assistant for Introductory Mathematics Courses Spring 2020
Assisted in course planning and exam preparation

Engineering Mathematics Fall 2024, Fall, Summer, Spring 2023, Fall 2020

Calculus for Life Science Fall 2022, Spring 2021

Fundamentals and Applications of Mathematics Spring 2022
Calculus course for liberal arts students

Calculus Practice Fall, Spring 2018

Calculus Fall, Spring 2018

Awards and Honors

Merit-based Scholarship, Department of Mathematics, Seoul National University 2018

National Scholarship, Korean Student Aid Foundation 2015

Merit-based Scholarship, College of Liberal Studies, Seoul National University 2013

References

Prof. Otto van Koert
Department of Mathematics, Seoul National University
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Relationship: Ph.D. Advisor

Prof. Cheol-hyun Cho
Department of Mathematics, Seoul National University
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Relationship: Postdoctoral Supervisor