

Unit Name

Analysis on Metric Spaces Unit
Assistant Professor Xiaodan Zhou

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Lahti, P.; Zhou, X.
Quasiconformal and Sobolev Mappings in Non-Ahlfors Regular Metric Spaces. *Tohoku Mathematical Journal* 2025, 77.
2. Kijowski, A.; Liu, Q.; Zhang, Y.; Zhou, X.
A Second-Order Operator for Horizontal Quasiconvexity in the Heisenberg Group and Application to Convexity Preserving for Horizontal Curvature Flow. *Discrete and Continuous Dynamical Systems-Series A* 2025, 45, 3483–3511.
3. Liu, Q.; Shanmugalingam, N.; Zhou, X.
Discontinuous Eikonal Equations in Metric Measure Spaces. *Transactions of the American Mathematical Society* 2025, 378.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Kenshiro Tashiro	Journal Article	Measure contraction property, curvature exponent and geodesic dimension of \mathbb{H}^p -sub-Finsler Heisenberg groups	Annales de l'Institut Fourier	Centre Mersenne	TBA
Nikita Evseev	Journal Article	Brownian path preserving mappings on the Heisenberg group	Journal of Mathematical Analysis and Applications	Elsevier	2025
Ye Zhang	Journal Article	On Gradient Estimates of the Heat Semigroups on Step-Two Carnot Groups	Potential Analysis	Springer Nature	2025
Kenshiro Tashiro	Journal Article	The curvature exponent for sub-Finsler Heisenberg groups	SIAM Journal on Mathematical Analysis	Society for Industrial and Applied Mathematics	2025
Kenshiro Tashiro	Journal Article	Curvature Exponent of Sub-Finsler Heisenberg Groups	SIAM Journal on Mathematical Analysis	SIAM	2025
Ye Zhang	Journal Article	Horizontal semiconcavity for the square of Carnot–Carathéodory distance on step 2 Carnot groups and applications to Hamilton–Jacobi equations	Nonlinearity	IOP Publishing	
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	MSJ 2025 Spring meeting, Waseda University		

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Ye Zhang	Presentation at Conference	The heat flow approach to the Prékopa--Leindler inequality	Sub-Riemannian Analysis and Geometry, 2025 OIST Conference		
Nikita Evseev	Presentation at Conference	Rellich-Kondrachov theorem for mappings in metric spaces	MSJ Spring Meeting 2025 at Waseda University		
Kenshiro Tashiro	Presentation at Conference	The weak Bochner inequality on the Dyson Brownian motion and Ricci curvature	Geodesics and related problems in Kumamoto University		
Nikita Evseev	Presentation at Conference	Weak derivatives and metric differentiability almost everywhere	Function Spaces and Applications XIII. 1–7 June 2025 Paseky nad Jizerou		
Nikita Evseev	Presentation at Conference	Weak weak* time derivatives	MSJ Spring Meeting 2026		
Nikita Evseev	Presentation at Conference	Zero-extension convergence and Sobolev spaces on changing domains	MSJ Autumn Meeting 2024 at Osaka University		
Kenshiro Tashiro	Presentation at Conference	Sub-Riemannian manifolds satisfying RCD	Geodesics and related problems, Kumamoto University		
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	2025 Geometry and Probability Conference, Yamagata City Health Center		
Kenshiro Tashiro	Presentation at Conference	Sub-Riemannian manifolds satisfying RCD	Contact structure, singular points, differential equations and related topics, Kanazawa station satellite		
Kenshiro Tashiro	Presentation at Conference	Sub-Riemannian geometry, Hausdorff dimension and RCD condition	Riemannian geometry and Geometric Analysis, Tsukuba University		
Nikita Evseev	Presentation at Conference	Rellich–Kondrachov theorem for mappings in metric spaces	MSJ Autumn Meeting 2025		
Nikita Evseev	Seminars	Sobolev spaces on variable domains and weak weak* derivative	Sobolev Institute of Mathematics		
Nikita Evseev	Seminars	Weak derivatives and metric differentiability almost everywhere	Seminar in Sobolev Institute of Mathematics. Novosibirsk Russia		
Kenshiro Tashiro	Seminars	The Bakry–Emery gradient estimate of Dyson Brownian motion and Ricci curvature	Osaka university probability seminar		
Nikita Evseev	Seminars	A metric approach to some compactness theorems for Sobolev spaces	Vienna Geometric Analysis Seminar		

Honors, Awards & Fellowships

Term 2 2025 - Term 2 2028

JSPS Grant-in-Aid for Scientific Research(C), 2028 [Fiscal Year: 2028-04-01]

Term 2 2022 - Term 2 2025 JSPS Grant-in-Aid for Early-Career Scientists, 2025 [Fiscal Year: 2025-04-01]

External Service

Term 2 2025 - Term 2 2025 Pre-examiner of the doctoral thesis of Timo Takala, Aalto University, Aalto University, Give a summation of the most important results and merits of the thesis along with discovered shortcomings. Evaluate whether the manuscript can be accepted for publication as a doctoral thesis as it is or after making some required necessary corrections. [Fiscal Year: 2025-02-19]

Outreach Activities [For Unit Members Only]

Term 2 2025 Ye Zhang, Dr., Shanghai Ganquan Foreign Language Middle School [Fiscal Year: 2025-01-23]

Workshops and Seminars [Organized and Hosted by Faculty/Units]

Speaker Name(s)	Title	Location	Co-Organizers	Date
Yohei Sakurai	Almost splitting and quantitative stratification for super Ricci flow	OIST		2026-11-06
Malte Kampschulte	Fluid structure interaction and Sobolev spaces on changing domains	OIST		2025-09-09
Tadashi Fujioka	Topological regularity of Busemann spaces	OIST		2025-06-04
Takashi Kumagai (Waseda University)	Periodic homogenization for non-local stable-like operators	OIST		2025-02-19
Bae Jun Park (Sungkyunkwan University)	Recent development in bilinear rough singular integrals	OIST		2025-01-22
Davide Barilari and others	Sub-Riemannian Analysis and Geometry Workshop	OIST	Qing Liu (OIST) and Ye Zhang (OIST)	2025-01-14