

Unit Name

Analysis on Metric Spaces Unit

Scholarly Contributions and Creative Productions (by Faculty)

Journal Article

1. Liu, Qing, Nageswari Shanmugalingam, and Xiaodan Zhou. 2025. "Discontinuous Eikonal Equations in Metric Measure Spaces." *Transactions of the American Mathematical Society* 378.
2. Lahti, Panu, and Xiaodan Zhou. 2024. "Metric Quasiconformality and Sobolev Regularity in Non-Ahlfors Regular Spaces." *Analysis and Geometry in Metric Spaces* 12.
3. Pinamonti, Andrea, Panu Lahti, and Xiaodan Zhou. 2024. "A Characterization of BV and Sobolev Functions via Nonlocal Functionals in Metric Spaces." *Nonlinear Analysis*.
4. Lahti, Panu, Andrea Pinamonti, and Xiaodan Zhou. 2024. "BV Functions and Nonlocal Functionals in Metric Measure Spaces." *Journal of Geometric Analysis* 34.
5. Kijowski, Antoni, Qing Liu, and Xiaodan Zhou. 2024. "Horizontally Quasiconvex Envelope in the Heisenberg Group." *Revista Matematica Iberoamericana* 40.

Presentation at Conference

1. Zhou, Xiaodan. 2024. "Uniqueness of Green Functions in Metric Spaces, Yes and No." Mini-Workshop on Geometric Variational Problems, Geometric Measure Theory, and Related Topics, September.
2. Zhou, Xiaodan. 2024. "Non-Uniqueness of Green Functions on Metric Spaces ." The Mathematical Society of Japan Autumn Meeting, September.
https://www.mathsoc.jp/en/assets/file/meeting/osaka24sept/talklist/talklist24sept_en_20240709.pdf
3. Zhou, Xiaodan. 2024. "Superposition of Subsolutions to Infinite Laplace Equation in Disjoint Variables." AMS-UMI International Joint Meeting 2024, Special Session "Nonlinear Problems with Nonstandard Growth Conditions and Analysis on Metric Spaces", July.
https://umi.dm.unibo.it/jm-umi-ams/wp-content/uploads/gravity_forms/4-d0932360595218ee3f04f5bfdd3fc5c8/2024/05/FILE_B_Nonlinear_Problems_with_Nonstandard_Growth_Conditions_and_Analysis_on_Metric_Spaces_Special_Session_A18.pdf
4. Zhou, Xiaodan. 2024. "Uniqueness of Green Functions in Metric Spaces, Yes and No." RIMS Workshop "Harmonic Analysis and Nonlinear Partial Differential Equations", June.
https://www.rimath.saitama-u.ac.jp/lab.jp/nealbez/RIMS2024_E.pdf
5. Zhou, Xiaodan. 2024. "Uniqueness of Green Functions in Metric Spaces, Yes and No." Keio University Nonlinear Analysis Seminar, May.
https://naseminar.math.keio.ac.jp/NA-seminar_2024.html
6. Zhou, Xiaodan. 2024. "Discontinuous Eikonal Equations in Metric Measure Spaces." American Mathematical Society Spring Eastern Sectional Meeting Special Session on Interactions Between Analysis, Geometric Measure Theory, and Probability in Non-Smooth Spaces, April.
<https://meetings.ams.org/math/spring2024e/meetingapp.cgi/Paper/34906>
7. Zhou, Xiaodan. 2024. "Discontinuous Eikonal Equations in Metric Measure Spaces." OIST Workshop "Geometric Aspects of Partial Differential Equations", January.
<https://groups.oist.jp/gpde/2024-oist-workshop>

8. Zhou, Xiaodan. 2024. "Uniqueness of Green Functions on Metric Spaces, Yes and No ." University of Cincinnati Analysis Seminar, April.
9. Zhou, Xiaodan. 2024. "Solving an Equation in a Space without Directions." Smith College Thursday Lunch Talk, April.

Scholarly Contributions (by Unit Members)

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
Ye Zhang	Journal Article	Curvature exponent and geodesic dimension on Sard-regular Carnot groups	Analysis and Geometry in Metric Spaces	De Gruyter	2024
Nikita Evseev	Journal Article	Brownian path preserving mappings on the Heisenberg group	Journal of Mathematical Analysis and Applications	Elsevier	2025
Kenshiro Tashiro	Journal Article	The curvature exponent for sub-Finsler Heisenberg groups	SIAM Journal on Mathematical Analysis	Society for Industrial and Applied Mathematics	
Ye Zhang	Journal Article	Centered Hardy-Littlewood maximal functions on H-Type groups revisited	Mathematische Annalen	Springer	2024
Kenshiro Tashiro	Journal Article	Measure contraction property, curvature exponent and geodesic dimension of ℓ^p -sub-Finsler Heisenberg groups	Annales de l'Institut Fourier	Centre Mersenne	TBA
Ye Zhang	Journal Article	Loomis-Whitney inequalities on corank 1 Carnot groups	Annales Fennici Mathematici	Annales Fennici Mathematici	2024
Kenshiro Tashiro	Other Teaching Materials	Machine Learning course for high school students		Miyazaki Software Center	2025
Kenshiro Tashiro	Presentation at Conference	Sub-Riemannian manifolds satisfying RCD	Contact structure, singular points, differential equations and related topics, Kanazawa station satellite	NA	
Kenshiro Tashiro	Presentation at Conference	Sub-Riemannian geometry, Hausdorff dimension and RCD condition	Riemannian geometry and Geometric Analysis, Tsukuba University	NA	
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	MSJ spring meeting, Waseda University	NA	
Ye Zhang	Presentation at Conference	On the Centered Hardy–Littlewood Maximal Functions on H-Type Groups	The 3rd Global Youth Forum, University of Science and Technology of China	NA	
Ye Zhang	Presentation at Conference	Semiconcavity results of squared sub-Riemannian distance on ideal Carnot groups	MSJ Spring Meeting 2024, Osaka University	NA	
Ye Zhang	Presentation at Conference	Semiconcavity results of squared sub-Riemannian distance on	RIMS Symposium: Harmonic Analysis and	NA	

Name of Unit Member	Type	Title	Outlet	Publisher	Year Pub
		Heisenberg group and applications to PDEs	Nonlinear Partial Differential Equations, Kyoto University		
Ye Zhang	Presentation at Conference	Horizontal semiconcavity for the square of Carnot-Carathéodory distance on step 2 Carnot groups and applications to Hamilton-Jacobi equations	Swansea Summer School in Nonlinear PDEs, Swansea University	NA	
Ye Zhang	Presentation at Conference	The heat flow approach to the Prékopa--Leindler inequality	Sub-Riemannian Analysis and Geometry, 2025 OIST Conference	NA	
Nikita Evseev	Presentation at Conference	Rellich-Kondrachov theorem for mappings in metric spaces	MSJ Spring Meeting 2025 at Waseda University	NA	
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	Curvature and related topics, Tokushima University	NA	
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	Osaka University Geometry Seminar	NA	
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	Geometry Symposium, Kansai University	NA	
Kenshiro Tashiro	Presentation at Conference	The Horoboundary of virtually nilpotent groups"	Tokyo metropolytan University geometry seminar, Tokyo metropolytan University	NA	
Kenshiro Tashiro	Presentation at Conference	Sub-Riemannian manifolds satisfying RCD	Geodesics and related problems, Kumamoto University	NA	
Kenshiro Tashiro	Presentation at Conference	MCP for sub-Finsler Heisenberg groups	Geometry and Probability, Yamagata City Health Center	NA	
Nikita Evseev	Seminars	Weak weak* derivative	Vienna Geometric Analysis Seminar	NA	
Nikita Evseev	Seminars	Weakly weakly* differentiable functions	International Prague seminar on function spaces	NA	
Nikita Evseev	Seminars	Weak derivatives and metric differentiability almost everywhere	Seminar in Sobolev Institute of Mathematics. Novosibirsk Russia	NA	
Nikita Evseev	Seminars	About the article by Yu. G. Reshetnyak from 1997.	Seminar in Sobolev Institute of Mathematics. Novosibirsk Russia	NA	

External Service

2025-02-19

Pre-examiner of the doctoral thesis of Timo Takala, Aalto University, Aalto Univeristy, 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.

Outreach Activities (For Unit Members Only)

2025-01-23 Ye Zhang, Dr., Shanghai Ganquan Foreign Language Middle School

2024-12-01 Kenshiro Tashiro, Dr., Miyazaki Software Center

Workshops and Seminars (Organized and Hosted by Faculty/Units)

Speaker Name(s)	Title	Location	Co-Organizers	Date
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
Neal Bez (Saitama University)	The Brascamp-Lieb inequality	OIST		2024-05-29
Jana Bjorn (Linkoping University)	Growth estimates for p-harmonic Green functions on weighted \mathbb{R}^n and metric spaces	OIST		2024-05-15
Anders Bjorn (Linkoping University)	The Dirichlet problem and boundary regularity for nonlinear parabolic equations	OIST		2024-05-08
Sylvester Eriksson-Bique	Different definitions of conformal dimension are (essentially) equal!	OIST		2024-01-22