Division of Mathematical and Physical Sciences	Research field	Differential Geometry	Lab. ID MP02

Laboratory web site

Research subjects

Research on geometric analysis: Topics of current research include harmonic functions and the heat equation on complete manifolds, harmonic mappings of finite enegy, and potential theory on trancient networks.
Research on hyperbolic geometry: For hyperbolic geometry, we study geometries in the two- and three-dimensional hyperbolic spaces. The main subjects of the research are Riemannian surfaces and the Teichmuller spaces that are related to the two-dimensional hyperbolic spaces, and volume formulae of polyhedra in the three-dimensional hyperbolic space.

Master/Doctor course: Education policy, curriculum, typical activity in the laboratory

Based on their interests and abilities, the faculty staff responsible to the student decide what he/she learns in the laboratory. In general, the first year students learn about differential geometry from standard books. Once they learned enough about geometry, which may take more than a year, the students choose their research field. Reading research papers related to the field, they do their own research and write their master's theses. For a Doctor course students, their researches start with expanding their master's theses. Getting latest research results, they prepare their Ph. D. theses.

Daily life in the laboratory, etc.

The students have seminar once a week in general. The rest of the time in the week they study their own research subject by themselves and prepare the next seminar. Some students do their study in the laboratory room, some do in the library and some do in their home.

Message or comments by the laboratory faculty staffs

Studying mathematics is a hard work. Spending much time for understanding mathematics does not guarantee that you can understand mathematics: for example, even if you spent all the day to understand a theorem, it does not guarantee that you can understand it at the end of the day. But, this difficulty for understanding mathematics gives you a delightful time for understanding mathematics. We hope that the students get this wonderful experience.

Recent Master theses in these 3 years (+ more if appropriate)

year.month	Thesis title (including English translation of Japanese thesis title)
2016.3	Harmonic functions on planar graphs and square tilings
2014.9	A potential theory on nonlinear networks
2014.3	Morse functions, handle bodies, and low dimensional manifolds
2013.3	Thomson's principle and Rayleigh's monotonicity law in infinite networks
2013.3	On the mean curvatures of rotationally symmetric hypersurfaces

Recent Doctoral theses in these 3 years (+ more if appropriate)

year.month	Thesis title (including English translation of Japanese thesis title)

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