Division of Mathematical and Physical Sciences	Research field	Elementary Particle, Cosmology, Theoretical Physics	Lab. ID MP14

Laboratory web site	http://hep.s.kanazawa-u.ac.jp/index-eg.html

Research subjects

After the discovery of the Higgs particle at LHC (world wide collaborative research), the standard model of the elementary particle has been finally established. Now our next targets are what has been established by experiments but are not explained by the standard model, that is, neutrino masses and lepton mixings, dark matter, etc. We are working for creating new models and unified models beyond the standard model, and analyze them phenomenologically focusing on the feasibility of experimental verification in the near future.
Also our laboratory has active groups working for QCD world by Monte Carlo simulation technique and Tensor networks using super computers, and for fundamental investigation of the field theory, quantum systems and statistical systems using the renormalization group method, path integral method, etc.

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

Master course: The first grade students take two seminars, elementary particle physics and field theory, using English textbooks. At the end of the first grade, the students decide their practical subject for the Master thesis and belong to one of the research groups, after consultation with staffs.
Doctor course: Students select the primary staff or research group to work with, and collaborative research works are started. Doctor students are encouraged to go for outer activities, participating research workshops/meetings, international conferences, even foreign country institutes for months. Financial supports are usually available and determined by the laboratory meeting.
As for foreign students, we have a couple of foreign students, and all activities or correspondences in the laboratory are done in English.
The laboratory is managed by a weekly labo-meeting which must be attended by staffs and DC students, where all policies and practical financial supports for research are discussed and determined.

Daily life in the laboratory, etc.

Personal working desk with a personal computer is available for every student. Also the PC cluster machine can be used for parallel processing numerical calculations.
All relevant students of undergraduate, Master, Doctor and post Doc researchers share the laboratory rooms, and everyday free discussion on physics or related topics are strongly encouraged.
Many laboratory activities are organized like, welcome party for new comers, excursion, summer workshop, etc.

Message or comments by the laboratory faculty staffs

Theoretical physics is very robust and will be a basic literacy or skill for any careers after graduation. About a half of the Master graduates take occupation as high school teachers, ICT enterprise laboratory staffs, public servants, etc. The rest half will enter the Doctor course. After taking the doctoral degree, graduates will be post doc researchers at domestic or foreign institutes, research or educational staffs at higher education organization, research laboratory staffs at ICT related large or venture companies, etc.

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