

Quantum Hadron Physics Laboratory

T. Hatsuda^{*1,*2}

The Quantum Hadron Physics (QHP) Laboratory¹⁾ in RIKEN Nishina Center was established on April 1, 2011 with Tetsuo Hatsuda (Professor, Univ. Tokyo, at the time) as a concurrent Chief Scientist. On April 1, 2012, Hatsuda moved to RIKEN as a full-time Chief Scientist. He is currently a Director of RIKEN iTHES²⁾ (interdisciplinary Theoretical Science Research Group, FY2013–FY2017), and a Program Director of RIKEN iTHEMS³⁾ (interdisciplinary Theoretical and Mathematical Sciences Program, FY2016–present).

One of the most important goals of the QHP Laboratory is to attract young bright theorists to RIKEN Nishina Center and create a good atmosphere for them to interact with each other and to produce original ideas. This is exactly what Dr. Yoshio Nishina has provided to Dr. S. Tomonaga, Dr. H. Yukawa, and others at RIKEN. Here, we recapitulate an English translation of the famous saying by Nishina, “Researchers’ growth depends on their environment, and a good environment depends on the researchers.” To accomplish the above goal, nine core members (including T. Hatsuda) from inside and outside of RIKEN working on diverse topics in theoretical physics have been appointed, as listed below.

Particle Physics:

Dr. Tsukasa Tada (2013–) Deputy Chief Scientist
 Dr. Hiroshi Suzuki (2011–2013) Senior Research Scientist
 Dr. Makiko Nio (2011–) Nishina Center Researcher

Hadron Physics:

Dr. Tetsuo Hatsuda (2011–) Chief Scientist
 Dr. Takumi Doi (2011–) Senior Research Scientist
 Dr. Yoshimasa Hidaka (2012–) Senior Research Scientist

Nuclear Physics:

Dr. Haozhao Liang (2015–) Research Scientist
 Dr. Nguyen Dinh Dang (2016–) Nishina Center Researcher

Atomic Physics:

Dr. Pascal Naidon (2012–) Senior Research Scientist

The QHP Laboratory has also accepted a number of post-doctoral researchers and graduate students from Japan and overseas to create an active research environment. Figure 1 shows the number of QHP Laboratory members in FY2011–FY2016. The QHP Laboratory has theoreticians in particle physics, hadron physics, nuclear physics, and atomic physics (as well as broader range of researchers from iTHES/iTHEMS) in a single lab. This varied mix has generated fruitful mutual interactions among the members to venture into new directions. Furthermore, this became a source of high productivity of the QHP Laboratory, as shown in Fig. 2.

The scientific activities of the QHP Laboratory are highly acclaimed in the community: 7 members received 10 awards (either domestic or international) as of March, 2017. Moreover, 5 invited review articles by the QHP Laboratory members were published, and 5 highlighted works have been released in press. Outreach activities are also taken seriously in the QHP Laboratory; 11 YouTube videos have been released to explain fascinating fundamental physics to the public. Owing to the interactions with iTHES and iTHEMS, the activities of the QHP Laboratory became even broader, and collaborations among theoretical physicists, theoretical biologists, engineers, and mathematicians have started. We hope that these collaborations would spur new breakthroughs in the coming 30 years.

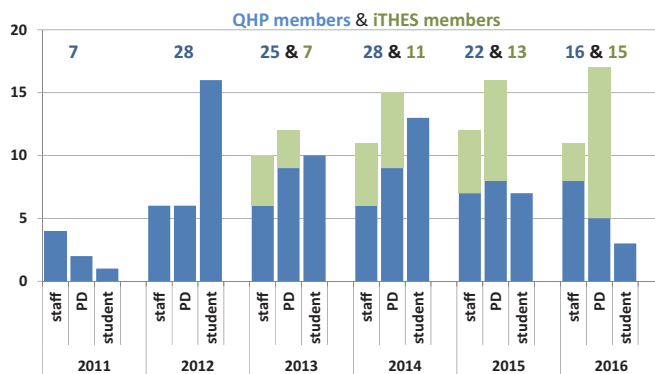


Fig. 1. Number of QHP Laboratory staff, post-doctoral researchers, students, and iTHES members in FY2011–FY2016.

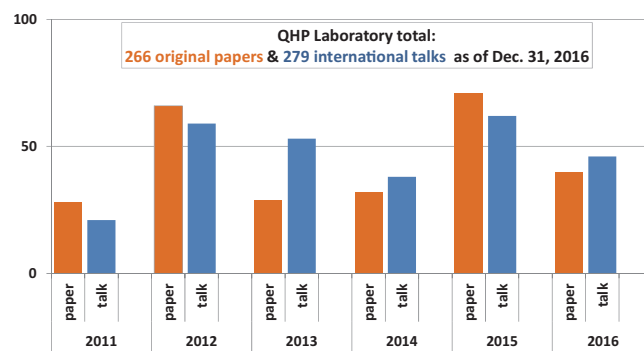


Fig. 2. Original papers and international conference talks by QHP members (as of Dec. 31, 2016).

References

- 1) QHP Laboratory in Nishina Center, <http://ribf.riken.jp/QHP/>.
- 2) iTHES Research Group, <http://ithes.science-server.com/>.
- 3) RIKEN iTHEMS Program, <https://ithems.riken.jp/>.

^{*1} Chief Scientist of Quantum Hadron Physics Laboratory (2011–present)

^{*2} Program Director of RIKEN iTHEMS (interdisciplinary Theoretical and Mathematical Sciences) Program (2016–present)