



新学術領域研究 令和元年度～5年度

量子液晶の物性科学

Quantum Liquid Crystals

Recruitment of Postdoctoral Researchers

We are seeking to recruit four Postdoctoral Researchers in Condensed Matter Theory, as part of the project “Quantum Liquid Crystals”, lead by T. Shibauchi, and funded through the Kahkenhi program for Scientific Research on Innovative Areas.

Candidates will have the opportunity to work in one of four different projects, as described below.

○Occupation

Postdoctoral Researches

○Projects

Project 1 “Analysis and Design of quantum liquid crystal based on the first-principles approach”

(Supervised by: Hiroaki Ikeda)

Mission: On the basis of the first-principles approach, we study the electronic state in quantum liquid crystal, such as nematic order, and clarify the universality and diversity. We also elucidate and predict the emergent phenomena like unconventional superconductivity.

Project 2 “Mechanism of quantum liquid crystal and emergent phenomena in correlated metals”

(Supervised by: H. Kontani)

Mission : We study the mechanism of rich electronic liquid crystal orders, such as nematic order, that emerge in various strongly correlated electron systems. We also study the emergent phenomena related to liquid crystal, such as unconventional pairing mechanism.

Project 3 “ Non-equilibrium phenomena, control of orders, and functions in quantum liquid crystals and related systems”

(Supervised by: Masahiro Sato)

Mission : The main research subject is to theoretically find novel non-equilibrium phenomena, effective ways of controlling observables, and new functions in quantum liquid crystals and related systems. To this end, for instance, we focus on laser- or heat-driven phenomena in quantum liquid crystals with modern analytical or numerical techniques.

Project 4: “Dynamics, thermodynamics and transport in quantum liquid crystals and related systems”

(Supervised by: Nic Shannon)

Mission : This project will use numerical simulation techniques to explore the nature of the excitations of quantum liquid crystals, how these can transport heat, and how this relates to unconventional magnetic phases found in experiment.

○Employment status

Project 1,2,4: full time, non-tenured
Project 4: full time or part time, non-tenured

○Period and Salary

Period: three or four years depending on the project. Salary and benefits depend on the project. Please contact the supervisor of the project you are interested in for detail.

○Starting date:

After April 1st, 2020.

○Application period

Applications will be accepted until the positions are filled.

○Documents

Candidates for Project 1 (Ikeda), Project 2 (Kontani) and Project 3 (Sato) should submit the following documents, by email, to the supervisor of their preferred project. Documents should be combined in a single pdf file. Receipt of the application will usually be acknowledged within a few days.

- (1) Curriculum vitae,
- (2) Research Statement, addressing both past research, and interest in the present project.
- (3) List of publications
- (4) Copies of 1-3 significant publications/preprints
- (5) A list of projects of interest, in order of preference. (Only necessary for candidates who wish to apply for more than one project).

In addition to this, candidates should arrange for at least 2 referees to send letters of recommendation, by email, directly to the supervisor of their preferred project.

Candidates for Project 4 (Shannon) should upload all of their application materials through AcademicJobsOnline, following the instructions at this site:

<https://academicjobsonline.org/ajo/program/15184>

○Selection process (selection method and hiring decision), notification of result]

Initial short-list selection will be based on application documents. Subsequent selection may require an interview.

○Contact person of each project

project 1 : Hiroaki Ikeda, Department of Physics, Ritsumeikan University

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project 2 : Hiroshi Kontani, Department of Physics, Faculty of Science, Nagoya University

kon@slab.phys.nagoya-u.ac.jp

project 3 : Masahiro Sato, Department of Physics, Ibaraki University

masahiro.sato.phys@vc.ibaraki.ac.jp

project 4 : Nic Shannon, Theory of Quantum Matter Unit, OIST

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