Announcement of the 13th TOYOTA RIKEN International Workshop

"Integrated Spectroscopy for Strong Electron Correlation

-Theory, Computation and Experiment (ISSEC2022)"

We plan to organize a workshop

"Integrated Spectroscopy for Strong Electron Correlation -Theory, Computation and Experiment (ISSEC2022)"

in person at University of Tokyo (Tokyo, Japan). The workshop will take place from Monday to Thursday, 5-8th of December, 2022.

The workshop will focus on efforts and achievements in the fields of momentum-energy resolved spectroscopic experiments and their analyses to understand strongly correlated electron systems including high-temperature superconductivity and topological matter/quantum spin liquids. In particular, we encourage exchange of idea and information among rapidly developing fields such as photoemission, scanning tunneling microscope, X ray and optics across disciplines. We also plan to discuss routes to combine with theoretical/computational tools such as data science/machine learning analyses and first-principles calculation together with theoretical modelling and solutions by quantum many-body solvers to understand the spectroscopic data. We believe that these interdisciplinary discussions greatly help challenges to quantum matter subjects that are not fully understood by a single spectroscopy measurement. See also our tentative home page:
http://fpmrt.riken.jp/public_html/issec2022/index.html

You are welcome to apply for the participation of the workshop and apply for the contributed presentation mainly at the poster session. The registration site will be open from September 5th, 2022 at the above web page.
Because of the covid19, we are forced to limit the number of participants to 80 and the registration site will close when the number reaches the limit. We appreciate your understanding.

In case of difficulty for travel and face-to-face meeting, we will accept a limited number of online participation, but the poster presentation will be only for the in-person participants.

The workshop is co-hosted by Toyota Physical and Chemical Research Institute, and Program for Promoting Researches on the Supercomputer Fugaku "Basic Science for Emergence and Functionality in Quantum Matter --- Innovative Strongly-Correlated Electron Science by Integration of "Fugaku" and Frontier Experiments ---"

Organizing Committee for ISSEC2022
Chair: Masatoshi Imada (Waseda Univ., Toyota Physical and Chemical Research Institute)
Atsushi Fujimori (Univ. Tokyo, National Tsinghua Univ.)
Tetsuo Hanaguri (RIKEN)
Takeshi Kondo (Univ. Tokyo)
Youhei Yamaji (NIMS)
Shiro Sakai (RIKEN)

issec2022-office@ml.riken.jp

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ISSEC2022
December 5-8, 2022
Koshiba Hall at University of Tokyo
http://fpmrt.riken.jp/public_html/issec2022/index.html

Scope

Remarkable progress has been made in recent energy and momentum resolved spectroscopies in terms of experimental methodologies and resolutions, while the analyses have essentially been performed individually in each spectroscopy (for example, photoemission, scanning tunneling microscope, X-ray scattering, optical measurement, neutron scattering and so on). In this circumstance, directly measurable physical properties desired for theoretical understanding are limited. When different spectroscopic measurements are all combined further with ab initio calculations and/or data science approaches, it would lead to synergetic outcomes. Integrated analyses of momentum-energy resolved spectroscopic data are particularly important.

In this workshop, we first discuss recent progress on each spectroscopic challenge to strongly correlated electron physics from experimental and theoretical (computational) sides. We then encourage exchanging ideas and recent attempts for "integrated spectroscopy", which can be reached, for instance, by the help of data science/machine

learning with further help of the first principles computational physics to analyze spectroscopic data. Applications of the integrated spectroscopy scheme should cover frontier quantum matter fields and may include studies on mechanisms of strong coupling high-temperature superconductors including the copper oxides, and iron pnictides and chalcogenides as well as on the nature of novel quantum fluids and topological matter such as quantum spin liquids characterized by particle fractionalization and/or breakdown of particle description itself.