

## Superconductivity research advanced by new materials and spectroscopies

In this workshop, novel physics brought through new materials and the quantum beams at large facility were intensively discussed. Many progresses in the research of unconventional superconductivity and their related phenomena emerging from the charge, spin and orbital degrees of freedom were reported. The strategic and educational use of quantum beam facility such as J-PARC and Spring-8 for the research of material science was also addressed.

The international workshop "Superconductivity research advanced by new materials and spectroscopies" was held on July 23<sup>rd</sup>-25<sup>th</sup>, 2013 in the lecture Hall of Institute for Materials Research, Tohoku University. This workshop aimed to discuss recent experimental and theoretical development in the research of unconventional superconductivity

Searching for high-T<sub>c</sub> superconducting materials and understanding the electronic states are exciting and challenging field in physics of strongly correlated electron system as well as materials science. On the other hand, various spectroscopy techniques with quantum beams such as neutron, muon and synchrotron X-ray, are indispensable for the study of dynamical properties of charge, spin and orbital degrees of freedom. Therefore, the discussion about new researches on novel physics potentially brought through new materials and the world highest intensity

quantum beams are quite important. We selected following topics as the main target and exchanged ideas.

- 1: High-T<sub>c</sub> superconductivity in cuprate oxides and related phenomena
- 2: Superconductivity in Fe-based compound and the mechanism
- 3: New superconducting materials and exotic phenomena

The advanced spectroscopic technique and its strategic use were also discussed. This workshop provided a unique opportunity to discuss and exchange the finding and ideas on recent and long-standing researches. The young scientists interacted with senior researches through various informal discussions. We would like to thank all participants and the support from ICC-IMR for the success of the workshop.



Fig. 1 A picture of workshop. More than 100 researchers including many young scientists participated in the workshop.

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Keywords: high-tc iron-based pnictide superconductivity, electronic material, neutron scattering

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