外国人客員所員を経験して

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My scientific interest in physics of strongly correlated electronic systems of both organic and inorganic chemical origin results in a large overlap with a number of groups in ISSP. I know one of my hosts, Prof. Mori, since the time of my PhD, and even before coming to ISSP enjoyed great discussions on physics of organic conductors and Mott insulators with her when we met at conferences. The last year in my lab in the Johns Hopkins University we started to work on using Raman spectroscopy to get a deeper understanding of the spin-liquid candidate Cat-H_3(EDT-TTF)$_2$ synthesized in Prof. Mori's lab. More recently I have developed an active collaboration with Prof. Nakatsuji, when he was visiting the Johns Hopkins University. In my group in JHU we did studies of materials discovered in his group, such as proving dynamic Jahn-Teller distortion for $Ba_3CuSb_2O_9$. During the 6 months of my stay in ISSP we had many experimental works done in the groups of both of my hosts, Prof. Mori and Prof. Nakatsuji. In addition I have started many new collaborative projects with other groups in the University of Tokyo.

One of the main aims of my stay in ISSP was to understand magnetic properties of molecular-based quantum dipole liquid κ-(BEDT-TTF)$_2$Hg(SCN)$_2$Br and other molecular materials with a close structure and chemical composition. We performed measurements of magnetic properties in collaboration with Prof. Mori and Prof. Yamashita, and Prof. Uji's group at NIMS. In this half a year we made a lot of progress, discovering a possible spin liquid state in another molecular-based Mott insulator κ-(BEDT-TTF)$_2$Hg(SCN)$_2$Cl. We determined an unexpected ferromagnetic response in the quantum dipole liquid, which we now work on understanding.

Collaboration with Prof. Nakatsuji during my visit resulted in our thorough understanding a spin ferronematic state in $NiGa_2S_4$. Also, we started new work on Mn_3Sn synthesized and studied in Prof. Nakatsuji's group. We found a possible way to do an easy characterization of quality of the samples using Raman scattering spectroscopy system at the optical lab in ISSP. This is also a preparatory work for Raman studies of this material we will carry on in my lab in JHU.

As a whole, these 6 months were very productive. I enjoyed the atmosphere in ISSP, which provided many interesting seminars, and discussions with my hosts and members of their groups. It was great to be a part of ISSP community and to enjoy New Year Celebrations. I would like to thank both of my hosts, as well as many other members of ISSP, with whom I was working during this half a year.