

## MERIT errantry report

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I joined the research facilities and conference described below through MERIT program.

This is the first time for me to go abroad on business. I do not have the enough experiences for going abroad, so I was anxious and stressed before departure. However, everything including presentation, scenery, and meals in this official trip for about two weeks was new and enjoyable for me.

I describe the contents of my official trip below. All the contents of my presentation are about the control of structural phase transitions and development of novel superconductors in layered transition metal dichalcogenides.

### 1 : EPFL

In EPFL, I visited the laboratory of Professor H. Ronnow, who is the expert of magnetism and magnetic materials. The contents were the laboratory tour, discussion with students of laboratory, discussion of future prospects of my study, and seminar presentation. Main questions and comments were based on physics including the origin of structural phase transition and the emergence of superconductivity. In the seminar, I could not answer exactly for one nice question, but the understanding of the materials becomes deeper. I was so impressed by the stance of members discussing actively with each other. Of course, I cannot deny the possibility that I saw only the good part, but I had a positive impression. I could also get some propositions of collaborating research.

### 2 : ETH

In ETH, I visited Dr. Viciu, who is an expert of synthesis of inorganic chemistry, and had a one-to-one discussion of the data of my research for about 2 hours. I explained mainly on the aspects of materials themselves, because she is a professional of chemistry. Main questions were on the

synthesis processes, doping method, and lattice constants variations by doping. She advised me fruitfully about how to develop novel material system starting from my materials based on her experiences. I was impressed by her intuition as a chemist, which cannot be cultivated in department of applied physics.

### 3 : Materials & Mechanisms of Superconductivity

I gave a poster presentation in the most popular conference (M2S) on superconductivity, which is held once in three years. It seemed that the researches focusing on development of novel superconductors are minorities. The main topics of this conference were about cuprate superconductors (including charge density wave order and pseudogap) and iron-based superconductors. However, several researchers including young ones came to my poster presentation and discussed my research results. I could explain my poster for three hours, which is almost all the time of presentation.

The poster presentation was satisfactory for me, but the conference was not, because it seemed to me that only FeSe/STO and high-pressure experiment of H<sub>2</sub>S are novel and interesting results. This thought might come from the fact that I had read the articles presented in the conference, but the big stream for superconductivity must be necessary. I am also the young researcher aiming the big discovery, so such a jeering opinion means that I am so immature as a researcher.

I would like to thank MERIT program, Prof. Ronnow, Dr. Viciu, and members of accepted laboratories to give me such a wonderful opportunity.