

# Crystallize in CAS-MPG Chemistry

Supported by the **CAS-MPG Doctoral Promotion Programme**, FENG Xianjuan and FAN Jing, both Ph.D. students from the CAS Shanghai Institute of Ceramics, studied for some years at the Max Planck Institute for Chemical Physics of Solids (MPI-CPfS) in Dresden. FENG, now a postdoctoral researcher at the MPI-CPfS, defended her thesis last September and received her Ph.D. Degree in last Jan; FAN just defended her thesis in April and will be granted with the Degree in the upcoming June. Let's hear in this interview (given in Feb 2014) what they would say about their study and life in Germany and envision how this experience will impact their future.

## FAN Jing: Confident and Independent

“My Ph.D. study, especially my experience with two different cultures, has already influenced my way of thinking significantly. I am now more confident when working independently on a project in an international team,” FAN Jing told BCAS reporter SONG Jianlan. She returned to Shanghai about 10 months ago and has found a job in the industrial sector.



**BCAS: How did you first get to know and become interested in the CAS-MaxPlanck Joint Ph.D. Training Programme/Doctoral Promotion Programme?**

**FAN:** Firstly I got to know the exchange programme on the website of our institute. Since I had always been hoping to have a look at the outside world, I went directly to my supervisor and asked if I could grab the opportunity to study in Germany for a while. He not only agreed but also recommended Prof. Yuri Grin to me for consideration as my future supervisor, sin-

ce their expertise is quite complementary to our strengths in Shanghai.

**BCAS: What is the role of the Shanghai Institute of Ceramics (SIC) in your Ph.D. study? What specifically did you learn at SIC before going to Germany?**

**FAN:** At SIC I spent one and a half year learning the basic experimental techniques and theoretical knowledge of thermoelectric materials, especially measurement of some physical properties and data analysis. This training is quite helpful because it helps me to get a moderately

complete knowledge system together with my later focus on solid chemistry.

**BCAS: What is the topic of your thesis work?**

**FAN:** I mainly investigate new thermoelectric materials with high performance. It is quite important to learn the structure-property relationship regarding my topic. I am quite glad that I have the access to the most advanced techniques for crystal structural measurement and analysis, which equipped me with necessary tools for more profound and comprehensive studies in this field.

**BCAS: What is the role of your host institute at MPG in terms of your Ph.D. training? What do you mainly study there?**

**FAN:** I investigated the same topic at MPI-CPfS as in SIC, but from a different view. In Germany I learned crystal growth technique and crystallographic structure analysis including single crystal X-ray diffraction, powder synchrotron X-ray diffraction and electron diffraction techniques. For my thesis my research in Germany contributes the majority part, because I have a more mature and clearer mind on my topic during the second half of my Ph.D. study.

**BCAS: You have supervisors both in Germany and SIC right? How different do you think they are in terms of teaching?**

**FAN:** Yes. They both have quite important impacts on me, and to be honest, they are quite alike in terms of teaching. They both encouraged me to think independently, read classical books, and take initiative; and they both recommend the right people to help me when necessary. The only difference is that my German supervisor will teach me specific techniques himself, while my Chinese supervisor is more likely to share his experience on how to do research.

**BCAS: Do you need to travel between Shanghai and Dresden to work on your thesis?**

**FAN:** Since in either group a complete set of equipment is available, it is not necessary for me to travel between the two countries. But my supervisors are generous and willing to promote the networking between the two groups, therefore they paid for my visits back to China once a year, so that I could exchange with my group what I have done and learned in Germany. I will defend my thesis in April 2014 in Shanghai with the appearance of both of them.

**BCAS: What were your expectations in the very beginning of your study in Germany? What about now? Are you satisfied with what you have experienced there?**

**FAN:** Perhaps in the beginning I was a little bit confused and tended to wait for my supervisor to point out the direction for me. While later, I realized that I must be wholly responsible for my own research, hold the big picture, and find the right colleagues to cooperate. I was quite satisfied with this experience,

and I think I have just learned a quite valuable lesson on how to work in a team and remain independent at the same time.

**BCAS: Do you remember your first day in Germany? What impressed you the most in Germany and your host institute?**

**FAN:** Yes, of Course. I remember taking the train from the airport to where I live, and the view alongside was so beautiful, in particular that of the Elbe river, which astonished me when I passed by. Soon after I dropped my baggage I went to the institute. I was thrilled to see quite nice an office building, with clean labs and nice colleagues; I even saw a garden inside the institute! "High quality" is always the term popping in my mind when I think of Germany, since I feel that Germans pursue high quality in every aspect of their life, work and research. They have high standards for everything.

**BCAS: What do you think is the biggest difference between SIC and MPI-CPfS?**

**FAN:** I think in general SIC is more focused on applied science and engineering, while MPI-CPfS most famous for its basic science study, therefore they differ a lot in terms of working style. In SIC, each group focuses on one area or application and has a lot of staffs and equipment, hence there is usually no need for intense cooperation with other groups. Whereas in MPI-CPfS, the groups, generally led by one professor and smaller compared to those in SIC, are more diverse concerning research topics, and as a result more intense cooperation occurs among the groups. Actually MPI-CPfS was built in the first place to encourage the interdisciplinary explorations between physics and chemistry, so the two physical groups and the two chemical ones at the institute can collaborate a lot in materials synthesis and property measurement, sharing equipment and other resources.

**BCAS: Did you run into any difficulty there during your years in Germany? Are the "legendary" scientific courses in Germany very hard?**

**FAN:** Not speaking German made life a little bit difficult at first, therefore I bought a lot of wrong things in my early days there. Other difficulties originated from the cultural difference, for example I had to get used to making an appointment for almost every service. As for the scientific courses, I have not taken any German scientific courses by myself, but I heard from others that it is indeed quite hard.

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**BCAS: Did you find it easy to make friends with German and other international students?**

**FAN:** It is easier to make friends with international students from France, Spain and etc. Usually it takes longer time to get close to German fellows, but once you become real friends they will invite you to their life.

**BCAS: Is German a very complicated language?**

**FAN:** German language is difficult indeed, because there are too many transformations regarding the positive, negative and neutral words. From other foreigners' point of view, however, German is not so complicated as Chinese. At least it has quite strict rules and clear meaning. I think it is difficult just because there are too many transformations to remember.

**BCAS: What are you going to do after graduation? How do you think your Ph.D. study will benefit your future career?**

**FAN:** I have already come back to China for about 8 months and found a job in the industry, out of both personal interest and family consideration. My Ph.D. study, especially my experience with two different cultures, has already influenced my way of thinking significantly. I am now more confident when working independently on a project in an international team. The training of problem finding and solving will continually benefit my future career.

**BCAS: Would you give some advice to fellow Chinese students wanting to do their Ph.D. in Germany? Is there any advice you would give to the Chinese students who want to study in Germany with support from this joint training programme?**

**FAN:** I think they should firstly get support from their Chinese supervisors, find some common interests between the Chinese and German groups. If they can work on the same topic, it will save them a lot of trouble when writing doctoral theses. On the other hand due to the cultural difference, misunderstanding could happen from time to time; therefore good communication skills are quite important. I suggest they take some time to study German before going to Germany. This will make their life easier.◀



## FENG Xianjuan: Lead an Innovative Life

“At the Max Planck Institute for Chemical Physics of Solids, every new idea, however strange it seems to be, is welcomed and respected,” Dr. FENG, now a postdoctoral researcher at the Dresden institute, told BCAS reporter when asked about the biggest difference between her home institute in Shanghai and her host institute at MPG.

**BCAS: What is the topic of your thesis work?**

**FENG:** My thesis is titled with “Synthesis structure and properties of Zintl phase intermetallic compounds”. I have great interest in thermoelectric materials.

**BCAS: What are the roles of SIC and MPI-CPfS in your Ph.D. study, respectively?**

**FENG:** SIC is the starting place of my Ph.D. or pre-Ph.D. I learned there all the skills and methods for materials characterization, and conducted experiments for part of my Ph.D. thesis. CPfS also plays an important role, because in Germany I focused mainly on the experiments and achieved a lot of progress in my thesis work. At the same time I learned how to think about the problems I came to, independently.

**BCAS: You have supervisors both in Germany and SIC right? How different do you think they are in terms of teaching?**

**FENG:** Yes, I had two supervisors in both institutes. Both of them guided me step by step in my Ph.D. work. My German professor is always

strict to me; and my supervisor at SIC gives me lots of encouragement as well as knowledge. Both are good.

**BCAS: Do you need to travel between the two countries to work on your thesis?**

**FENG:** I traveled only once back to Shanghai but for personal vacation during my study. My two supervisors visit each other quite often because they have been cooperating for a long time.

**BCAS: Do you remember your first day in Germany? What impressed you the most in Germany and your host institute?**

**FENG:** Yes, of course. The weather was cold outside but the people inside the institute were warm and kind. What most impressive was, the management of visiting programme was very professional.

**BCAS: What do you think is the biggest difference between SIC and MPI-CPfS?**

**FENG:** The biggest difference between these institutes is the way they treat new ideas from

young scientists. At CPfS every new idea, however stupid it seems to be, is welcomed and respected. But in SIC the same case is treated differently, for whatever reason.

**BCAS: Did you run into any difficulty there during your years in Germany? Are the legendary scientific courses in Germany very hard?**

**FENG:** The main difficulty was the language, German. It would be better to learn some short German sentences or even some German culture before one comes to Germany. The courses did not seem very hard at first glance, but little by little, you realise that they are actually quite hard and exhausting.

**BCAS: Do you have any suggestion as to improving the Joint Ph.D. Training Programme (Doctoral Promotion Programme) for Ph.D. students?**

**FENG:** It would be much nicer if the application procedure is simplified – it took me several months if I remember correctly. ◀