

# 外国人客

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Measurements under extreme conditions - high pressure, low temperature, intense magnetic fields - often give rise to new discoveries in solid state physics and other scientific domains. Research infrastructures all over the world therefore make substantial efforts to push these conditions to unprecedented limits, while trying to cope with the inevitable side-effect of an increasingly harsh experimental environment. With its outstanding facilities, the Institute for Solid State Physics is an international reference for measurements under extreme conditions. This notably includes the highest indoor magnetic fields in the world, produced by Prof. Matsuda's group in the International Megagauss Science Laboratory (IMGSL)

Research in high magnetic fields is also the principal activity of my home institution, the Laboratoire National des Champs Magnétiques Intenses (LNCMI) in Toulouse, France, and its partners of the European Magnetic Field Laboratory (EMFL). Apart from Kashiwa, Toulouse is currently the only other place in the world where magnetic fields above 100 T are routinely used for scientific experiments. As such fields can only be produced on a microsecond timescale using high-voltage pulsed-power equipment, researchers in either facility are facing a common problem: to conceive measurement techniques with adequate acquisition speed and sufficient protection against transient electromagnetic disturbances. Given the number of potentially interesting techniques this represents a vast and ambitious endeavor.

Experimental development is often exciting, sometimes frustrating and always very time-consuming. It often depends on the right inspiration, and what could be more

inspiring than to discuss and work side-by-side with colleagues interested in the same domain? I have therefore been extremely elated when, several years back, Prof. Matsuda proposed me to visit his lab more regularly in order to intensify our existing collaboration and jointly promote the technical progress and use of Megagauss fields. After a first 6-month stay in 2022 I thus found myself again in Kashiwa for two 1-month stays in mid-November 2023 and mid-February 2024. The stifling heat and mistiness of the 2022 summer months was this time replaced by Koyo, my favorite season in Japan, and a cold winter month with clear views of Fuji-san. By comparison, the atmosphere in the lab was as always: companionable and most inspiring!

My work was this time dominated by a scientific project, optical measurements on 2-dimensional organic-inorganic perovskites, and I am grateful for the additional machine time I was given at the end of my stay in order to be able to finish the experiments. Of course, this would still not have been possible without Dr. Zhou's help and that of 2 old acquaintances, Prof. Miyata and Dr. Yang, who respectively stayed in Toulouse for their postdoc and PhD roughly 10 years ago. Working with them was an immense pleasure and I apologize for breaking their replaceable cryostats rather than building (and breaking) my own.

Apart from scientific-technical work, my stay also provided a good occasion to plan ahead as far as our collaboration is concerned. As of 2024 the project will dispose of a yearly travel budget provided by Centre National de la Recherche Scientifique (CNRS) in the framework of an International Research Project (IRP). The decision how to spend this budget in the first year

was quickly taken: a small bilateral workshop on Science and Instrumentation for Extreme Magnetic Fields (6MaF) organized by Prof. Matsuda and myself in Toulouse will permit other members of the 2 groups to get acquainted. It will put the collaboration on a broader basis and notably motivate students and younger staff to interact and play a more active role.

In view of the scientific-technical results I could obtain at IMGSL, the deepening of our collaboration and the good time I had in the Tokyo area, I consider my stay as extremely fruitful and enjoyable. This would not have been possible without the ISSP's generous and perfectly well organized international visiting professors program and the help of local staff for which I am sincerely grateful. My thanks go of course first of all to Prof. Matsuda for inviting me and taking care of me during my

