

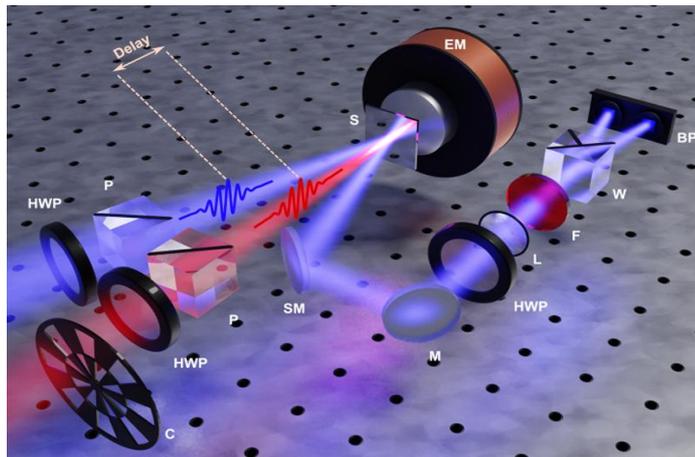
## 滞在報告

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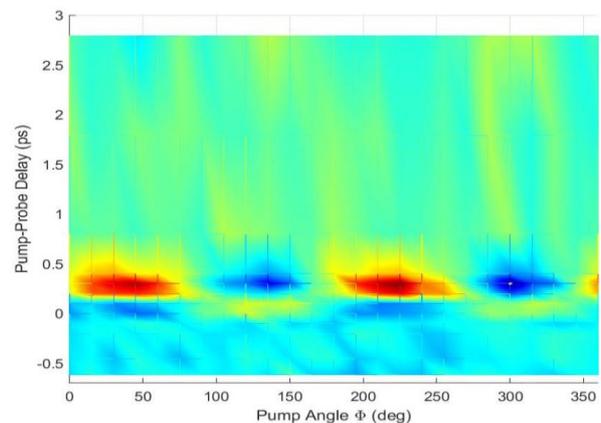
During 2025/9/18-11/22, I stayed in Nancy for research. Nancy is located on the east side of France, which can be reached from Paris in two hours by direct train.

My research was mainly conducted in the Institut Jean Lamour, which is a broad-scope research laboratory combining several different topics in material science and physics.



My research topic is utilizing a femtosecond laser to excite the spin-polarization in antiferromagnetic RuO<sub>2</sub>. We use the pump-probe technique, in which two beams are separated with a time delay. The pump beam with strong fluence can excite electrons from the valence band to the conduction band, and the probe beam can capture the tiny change in optical properties, such as reflectivity.

For my research, we successfully measured the optical-induced spin-polarization of RuO<sub>2</sub>, which shows clear crystal orientation dependence. When the pump angle changes, we can excite the opposite sign of the spin polarization, which is expected based on the band structure of this material. In addition, the magnetization response is ultrafast, which has maximum spin polarization at a 300-fs scale.



Overall, it was a wonderful experience from both a scientific and an experiential perspective. Due to a variety of ethnicities in the institute, I have chance to communicate with researchers from several different countries and exchange different perspectives. It has a great impact on my future, and I hope to visit this city again.