**SUJET DE STAGE DE M2R 2018-2019:**

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| **Titre du sujet :** | **Kinetic behavior of sulfur in the Earth's mantle and magmas**. |
| **Responsables**: | Ken Koga |
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| **Exposé du sujet** | Sulfur compounds are the third most abundant oxide compound found in the volcanic gas, after hydrogen and carbon. Given its relatively high abundance in magmatic environment (up to thousands of ppm by weight in magma) compared to that of in the air (typically 1 to 10 ppb by volume), sulfur compound is thought to be good tracer of magmatic high-temperature degassing process. Naturally, there have been extensive number of research that describes the chemical reactions and thermodynamics of the sulfur in magma and high temperature gases.  In this research project, kinetic responses of sulfur compounds in magma and gas are investigated using a 1-atm furnace. Because magma ascent and degassing process are highly disequilibrium process, it is critical to identify processes that hinder an attainment of equlibrium. It would require detailed laboratory investigation simulating the degassing process, to understand the rates and mechanisms of sulfur exchange in such dynamic environment.  In this internship, the candidate is expected to explore parameters that impose dynamic chemical reactions, for example cooling rate and surrounding chemical environment. As the instrument is a part of on-going development, the project is suitable to those who would are interested in the challenges of instrument developments. Familiarity with device control scripts would be very much appreciated. Solid comprehension of diffusion and kinetic processes is needed to complete the project successfully, as the reduction of petrological data obtained dynamic environment require mathematical modeling based on such processes. Familiarity with scripting language (for example, Matlab, Python, R) is strongly desired. |
| **Méthodes utilisées** | *1-atm furnace, electron microprobe, SEM, LA-ICPMS* |