# 臺灣北部雪山山脈造山機制之研究

# Study of Mountain Building Processes of the Northern Hsuehshan Range, Taiwan

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**Project description:**

The relationship between deformational strain pattern and temperature distribution across the Hsuehshan Range is not clearly evaluated yet. It leads that mountain building and exhumation processes of Hsuehshan Range have been proposed by two different models as front offscrap and basal accretion. In this project these hypotheses will be tested by using the anisotropy of magnetic susceptibility (AMS) as fabric indicator and finite strain marker to elucidate the tectonic deformation and finite strain pattern. At the same time, the reconstruction of paleotemperature profile and structural cross-section will be conducted by published data. In the end, the validation of mountain building hypotheses of the northern Hsuehshan Range will be discussed.

In the study, oriented samples will be collected across the northern Hsuehshan Range via Highway 9 in the field. In the lab, principal directions and values of magnetic susceptibility ellipsoid will be measured. The relationship between magnetic foliation/lineation inferred from AMS, and petrofabric foliation/lineation of mesostructures will be inspected. And the magnitude parameters of magnetic susceptibility ellipsoids will be used to illustrate the mean magnetic susceptibility, the degree of anisotropy, foliation, lineation, ellipsoid type and strain pattern, and also explore the relationships among these parameters. Besides, various experiments and methods, such as magnetic susceptibility, hysteresis loop, isothermal remnant magnetism, and thermal demagnetization can be used to evaluate the magnetic source carrier(s) of AMS.

The paleotemperature profile can be reconstructed by using published vitrinite data. The structural cross-section will be synthesized through published reports and papers. The essential information inferred from profiles of strain pattern, temperature distribution and structural cross-section can be used to evaluate the inter-relationship among deformation, structural evolution and metamorphic temperature. Furthermore the mountain building processes of the northern Hsuehshan Range should be able to be revealed. The results can provide insights into understanding the kinematic history and structural evolution of Taiwan orogen.

**Project Schedule:**

**1 week: field trip; 2 weeks: conducting AMS measurement and reading selected papers; 1 week: plotting and interpreting the AMS results; 2 weeks: reconstructing the temperature and structure profiles. 1-2 weeks: magnetic mineral determination; 1 week: synthetic interpretation and complete the presentation / report.**

**Preferred background:**

Students with field work experience are highly welcomed.

Paleomagnetic knowledge and ArcGIS skills are not necessary.

Knowledge of Excel and stereonet plotting is required.