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***Project:* Clues from the Ferrar Province: dikes and sills in the Transantarctic Mountains record interaction of flood-basalt magmas with tectonics at the time of Gondwana break-up.**

Contribution: to consult on dyke emplacement in Large Igneous Provinces, and present early results at IAVCEI in Iceland

The Jurassic Ferrar Large Igneous Province (FLIP) of Antarctica represents massive amounts of magma, emplaced both beneath the Transantarctic Mountains (TAM) and at the surface, related to early break-up of Gondwanaland. Remnants of magmatic systems now exist as volcanoclastic deposits, lava flows and intrusive complexes. Ferrar Dolerite intrusions, exposed over ~3500 km² from the TAM up to southern Australasia, represent most of the FLIP rocks. Previous studies show that large sills prevail over dikes and that the latter do not form the regional swarms normally encountered along extensional boundaries. The existence of vertical feeders or magma chambers is debated.

My project models a representative part of the FLIP plumbing system, by describing overall geological features and characteristics of the rocks from selected intrusive complexes along the TAM. Photogeology and structural field observations for three localities between South Victoria Land (SVL) and the Dry Valleys are being combined with study of dolerite petro-fabrics, investigated using petrography and rock-magnetism (anisotropy of magnetic susceptibility, AMS). My results show that localized arrays of Ferrar dikes either interconnect sill-fronts at distinct stratigraphic levels, or were fed into and away from ancient volcanic edifices. Intrusion geometry and AMS directions obtained for most dikes so far record: i) variations in magma-flow in distinct generations of cracks and ii) major control by the magmatic stress-field over the tectonic conditions on both the magma-flow within the dikes and the propagation of individual cracks and dike sets.

The Antarctic Science Bursary supported presentation of field and initial laboratory results at the XXVIII IAVCEI Assembly (Iceland, August 2008). Discussions with other scientists attending the conference provided a unique opportunity to place my Antarctic work on LIP magmatic systems in the context of a great range of work on Icelandic magmatism, as well as work globally on analogous magmatic processes. The setting of the meeting in Iceland is sparsely settled, but highly modified high-latitude landscape increased my appreciation of the importance for Antarctica of continued strong environmental protection.