

## Thermal models of the Torres del Paine Contact aureole

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### **Context** *Description en 10 lignes au maximum*

The Torres del Paine intrusion is a composite intrusion emplaced into the upper-most crust over the period from 12.45Ma to 12.6Ma. It is composed of at least 3 large batches of granites, followed by a mafic sill complex. The intrusion of each magma batch occurred in pulses of intrusion rapid enough to maintain one batch partially molten, while individual batches have brittle contact with each other. High-precision dating, along with field evidence, has provided tight time constraints for the succession and duration of intrusions, and available phase petrology studies of the contact aureole all provide constraints for the thermal evolution of the igneous and contact metamorphic temperatures. The goal is to establish 2-D and potentially 3-D models of the Torres del Paine igneous and contact metamorphic system, exploring the effects of re-melting of igneous rocks, as well as the detailed geometry of the intrusion

### **Objectives and Methods**

- Collection of all available thermal constraints on the igneous and metamorphic rocks of the Torres del Paine intrusive system
- Critical evaluation of the thermal properties of the rocks involved, with establishment of latent heat content of the different igneous rocks
- Selection and improvement of thermal modeling codes to include the geometry and physical properties of the system
- Use of constrained stochastic models for intrusion timing to evaluate thermal effects

### **Literature**

Annen C (2009) From plutons to magma chambers: Thermal constraints on the accumulation of eruptible silicic magma in the upper crust. *Earth and Planetary Science Letters* 284:409–416. doi: 10.1016/j.epsl.2009.05.006  
 Bodner R (2013) *Metamorphism and Kinetics in the Torres del Paine contact aureole*. PhD Thesis Univ. Lausanne  
 Floess D, Baumgartner LP (2015) Constraining magmatic fluxes through thermal modelling of contact metamorphism. *Geological Society, London, Special Publications* 422:41–56

1 photo dimension H5.5cm x L8.5cm



### **WEB sites**

### **Choice of orientation :**

Geochemistry, Alpine tectonics, Ore Deposits