

COMPUTATIONAL TECTONICS

Patrice Rey
 Earthbyte Research Group
 The University of Sydney

Through Tectonic and Geodynamic processes the Earth has evolved into a self-organized system of endogenic and exogenic envelopes exchanging energy and matter. Recent advances in numerical methods, numerical codes, and high performance computers provide geoscientists with the ability to model these processes.

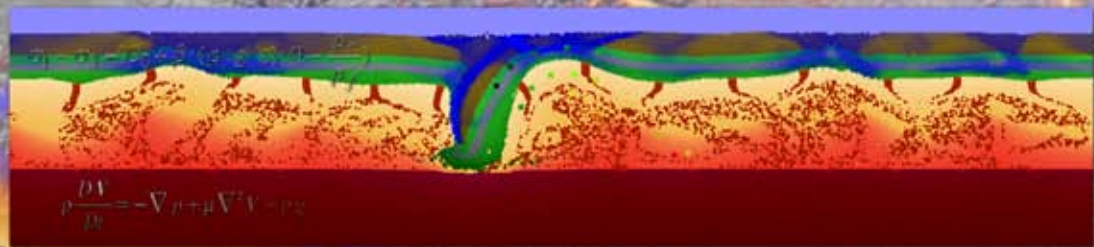
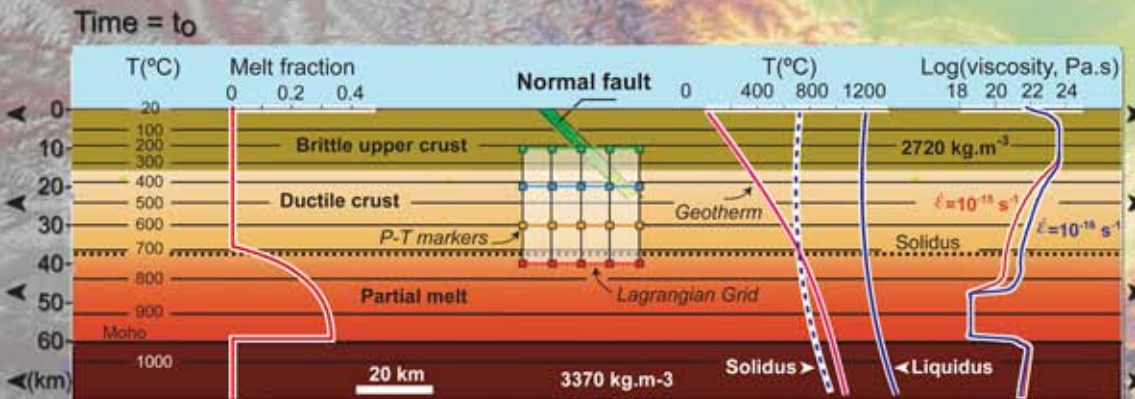
Computational Tectonics is a 5-day International Course dedicated to an audience of geoscientists keen to develop a practical expertise in Computational Tectonics.

$$\rho \frac{d\mathbf{V}}{dt} = -\nabla p + \mu \nabla^2 \mathbf{V} + \rho \mathbf{g}$$

$$\dot{\gamma}_x = \frac{1}{2} \left(\frac{\partial u}{\partial y} + \frac{\partial v}{\partial x} \right)$$

$$\dot{\gamma}_y = \frac{1}{2} \left(\frac{\partial v}{\partial z} + \frac{\partial w}{\partial y} \right)$$

$$\dot{\gamma}_z = \frac{1}{2} \left(\frac{\partial w}{\partial x} + \frac{\partial u}{\partial z} \right)$$



$$0 = \frac{\partial p_x}{\partial x} + \mu \left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} + \frac{\partial^2 u}{\partial z^2} \right) + f_x$$

$$0 = -\frac{\partial p_y}{\partial y} + \mu \left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} + \frac{\partial^2 v}{\partial z^2} \right) + f_y$$

$$0 = -\frac{\partial p_z}{\partial z} + \mu \left(\frac{\partial^2 w}{\partial x^2} + \frac{\partial^2 w}{\partial y^2} + \frac{\partial^2 w}{\partial z^2} \right) + f_z$$

$$\rho \frac{D\mathbf{V}}{Dt} = -\nabla p + \mu \nabla^2 \mathbf{V} + \rho \mathbf{g}$$

$$Ra_{mb} = \frac{\rho_0 g \alpha z_m^3 (Q_{con} - H)}{\mu \kappa}$$

