

Can mathematics save our planet?

Ash clouds cause major air traffic interruptions

Melting glaciers threaten many territories

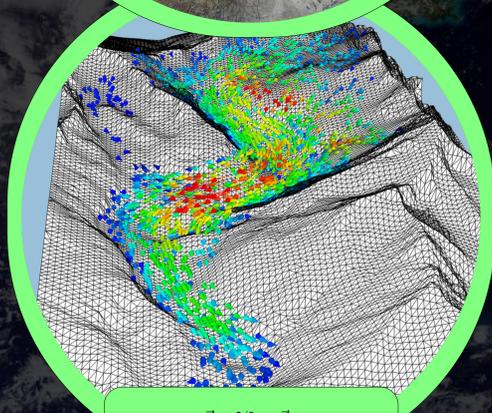
250'000 people were killed in the 2004 tsunami

How can we anticipate catastrophes?

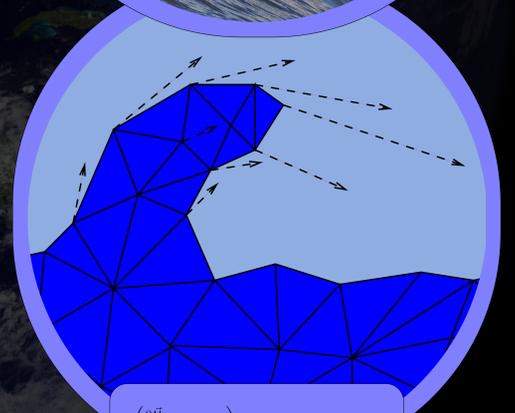
Mathematical equations are hidden behind all of these phenomena!



$$\frac{\partial \vec{U}}{\partial t} + \nabla \cdot (H\vec{U}) - \epsilon \Delta \vec{U} = f$$



$$\begin{aligned} -\gamma \nabla \cdot (|\varepsilon(\vec{U})|^{-2/3} \varepsilon(\vec{U})) + \nabla p &= \rho \vec{g} \\ \nabla \cdot \vec{U} &= 0 \end{aligned}$$



$$\begin{aligned} \rho \left(\frac{\partial \vec{U}}{\partial t} + (\vec{U} \cdot \nabla) \vec{U} \right) - 2\nabla \cdot (\mu \varepsilon(\vec{U})) + \nabla p &= \rho \vec{g} \\ \nabla \cdot \vec{U} &= 0 \end{aligned}$$

To accurately model and predict them, we need to solve mathematical equations!

Learn how maths describe such events and make your own predictions about ...

... the dispersion of an ash cloud

... the future evolution of a glacier

... the propagation of a tsunami