# Effects of confinement on crystal growth

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The force of crystallization causes deformation of solids such as porous building materials and is fundamental for geological processes such as replacement and weathering [1]. However, details of the growth and the dissolution process in close contact are still a matter of investigation.

We use $NaClO_3$ crystals growing against a glass surface as a precisely controllable model system for confined crystal growth. The usage of reflective interference contrast microscopy (RICM) allows us to observe the growth of the confined interface *in situ* with a resolution of single molecular layers. The high temporal resolution of the method enables us to follow the step flow of individual crystal layers which are strongly influenced by the limited transport in the confined water film (FIG.1).

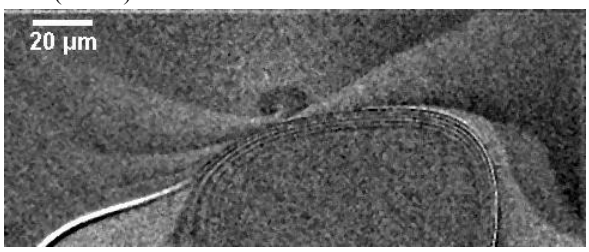


**Fig 1** Average subtracted RICM image of confined crystal interface showing single crystal layers and steps around a screw dislocation

Our observations show that, like, e.g., garnet or posh alum [2], $NaClO_3$ can grow in an interlaced step flow process. The presented result will show various effects that have to be considered for the description of confined crystal growth and the force of crystallization and thus help to understand processes, which are apparent in many different geological systems.

[1] Maliva, *Geology* **16** (1988)
[2] Bennema et al, crystal growth (1983)