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## **The Effect of elastic Strain on the Microstructure of free Surfaces of stressed Minerals in contact with an aqueous Solution**

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The influence of gradients in bulk elastic strain energy on the dissolution and growth behaviour of minerals in rocks is commonly considered negligible. We experimentally observed, however, that regular arrays of macroscopically visible etch grooves may develop on the originally smooth free surfaces of soluble crystals held in an undersaturated aqueous solution if the crystals are only *elastically* stressed. These grooves are oriented perpendicular to the compressive stress. They disappear soon after the stress is taken off. The formation of the grooves is well explained by recent theories on the instability of the surface of stressed solids. Development of such instabilities could significantly affect the grain boundary structure in rocks, and have a major effect on dissolution and growth processes.