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Plasticity of crystals and interfaces: from discrete dislocations to size-dependent continuum theory. (English) [Zbl 1299.74002](#)

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From the text: We summarize the current advances in size-dependent continuum plasticity of crystals, specifically, the rate-independent (quasistatic) formulation, on the basis of dislocation mechanics. A particular emphasis is placed on relaxation of slip at interfaces. This unsolved problem is the current frontier of research in plasticity of crystalline materials. We outline a framework for further investigation, based on the developed theory for the bulk crystal.

MSC:

- [74-02](#) Research exposition (monographs, survey articles) pertaining to mechanics of deformable solids
- [74C15](#) Large-strain, rate-independent theories of plasticity (including nonlinear plasticity)
- [74E05](#) Inhomogeneity in solid mechanics
- [74E15](#) Crystalline structure

Keywords:

grain boundary dislocations; discrete to continuum; long-range interactions; short dislocation-dislocation correlation

Full Text: [DOI](#)