Mechanistic study of bending creep behaviour of bicrystal nanobeam

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In this paper, bending creep deformation mechanism for nickel nanobeam has been investigated using molecular dynamics simulation. Low temperature creep deformation ($T < 0.3\ T_m$) is found to be guided by jog formation and glide motion of grain boundary whereas lattice diffusion, grain boundary migration and sliding are the controlling mechanism for high temperature deformation ($T > 0.5\ T_m$). The occurrence of tertiary creep regime is observed only at high temperature deformation due to creep instability caused by cavity formation. It is revealed through dislocation analysis that intrinsic Frank partial dislocations are the driving factor for cavity generation leading to intergranular fracture. More in Computational Materials Science (2017) Publisher: **Elsevier** DOI: **10.1016/j.commatsci.2017.04.028**