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Sommario/riassunto	<p>In this Special Issue, we have gathered work on simulations of polycrystalline metals and alloys at various length scales to model multiscale localization phenomena such as slip bands, cracks, and twins. The series highlights innovative techniques that combine simulation and experiments to capture material production and guide the development of forming theories. The published work helps to understand the effect of microstructure characteristics on deformation and damage behavior under multiaxial load conditions. Furthermore, these models and the studies can be used with machine learning technologies to optimize microstructure functions for materials application and process paths.</p>