

Neutrons - 'Stretchier' Alloys

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Researchers at Oak Ridge National Laboratory have developed a method of adding nanostructures to high-entropy metal alloys, or HEAs, that enhance both strength and ductility, which is the ability to deform or stretch under tensile stress without failing.

The results, published in [Science](#), open a promising pathway for tailoring HEA properties using small gradient structures to produce improved high-performance metals for a wide range of applications.

Conventional metallic materials, including HEAs (metals composed of five or more elements), become less ductile or more brittle as their strength increases.

The scientists used neutron diffraction methods at ORNL's Spallation Neutron Source to confirm tiny defect features, called stacking faults, form easily in an HEA compared to conventional fine-grained alloys.

"The stacking faults enhanced the test alloy's plasticity while also contributing to increased strength and hardening," said ORNL's Ke An. "Industries that could greatly benefit include automotive, power distribution and aerospace."

Read the [original article](#) on Oak Ridge National Laboratory (ORNL).