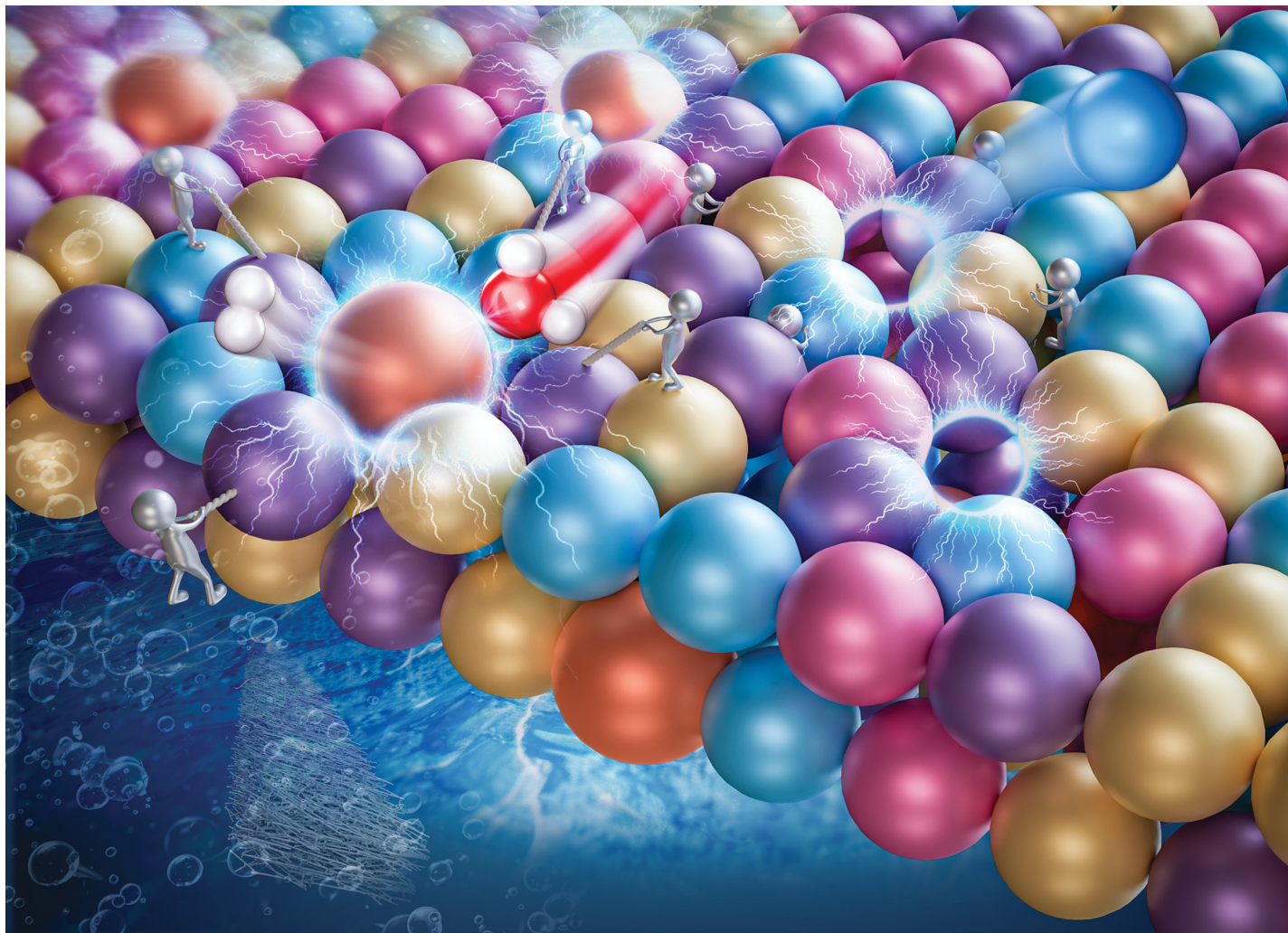




Showcasing research from Professor Baolong Shen's laboratory, Southeast University, Nanjing, China.

Vacancy induced microstrain in high-entropy alloy film for sustainable hydrogen production under universal pH conditions

We propose a novel strain-engineering approach to improve the electrocatalytic efficiency of high-entropy alloy (HEA) by introducing vacancy-induced microstrain into the HEA films. The engineered HEA film exhibits economically feasible industrial water electrolysis capabilities under pH universal conditions, achieving overpotentials of 104 mV (alkaline) and 106 mV (acidic) at 1 A cm^{-2} . Multi-element active sites with low coordination environments enhance charge transferability, thereby improving water adsorption and dissociation capacity. Additionally, the microstrain effect shifts the d-band center of Pt to an optimal position, enhancing hydrogen evolution reaction activity.

As featured in:



See Zhe Jia, Ligang Sun,
Baolong Shen *et al.*,
Energy Environ. Sci., 2024, **17**, 5854.