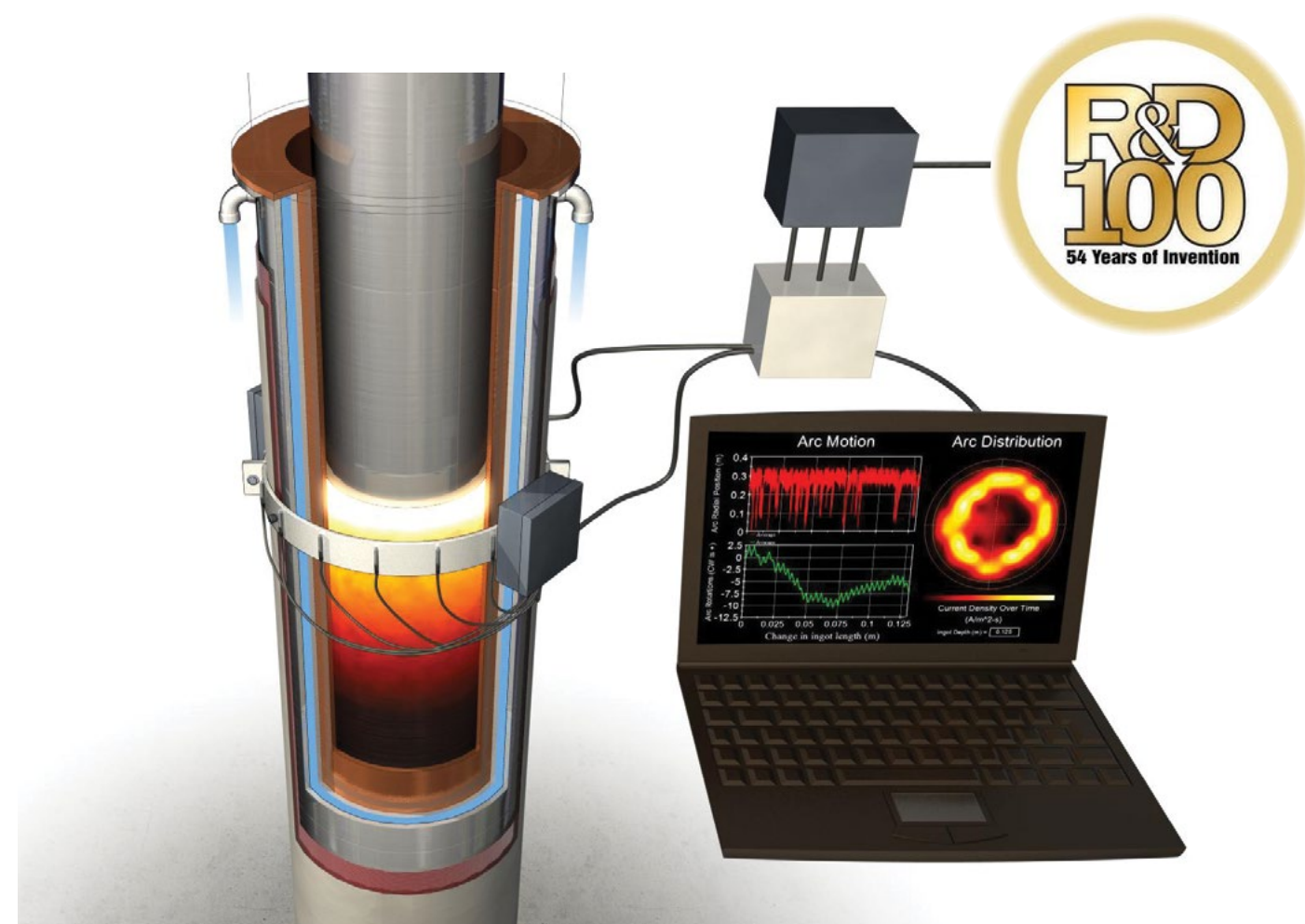


# Impact & Innovation: NETL Structural Materials Development

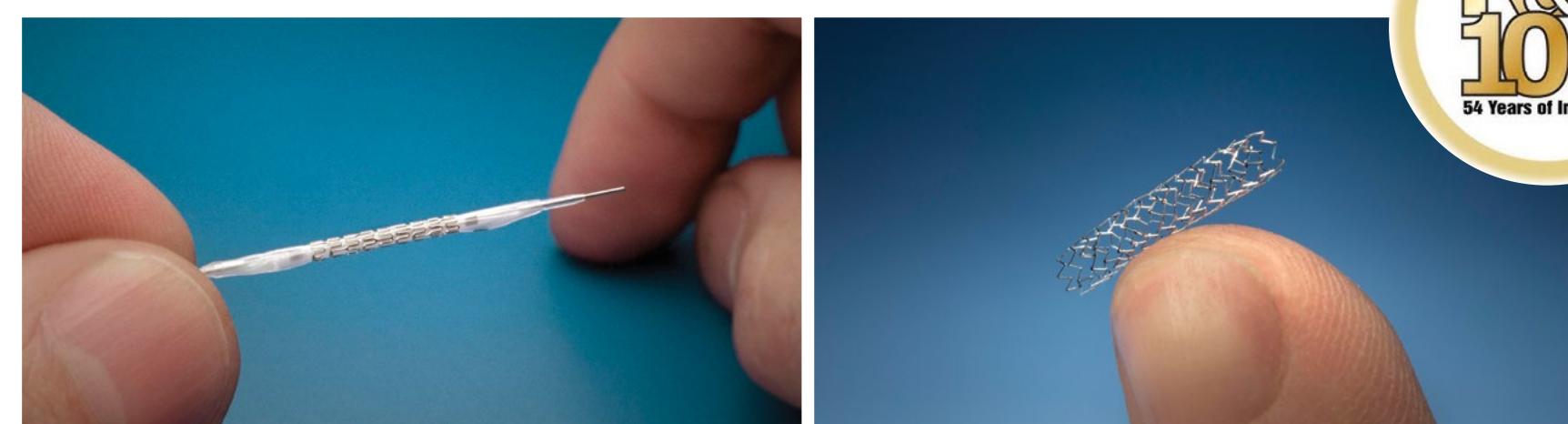
Enabling advanced technology, creating jobs and saving lives.

## Improving Alloy Manufacturing



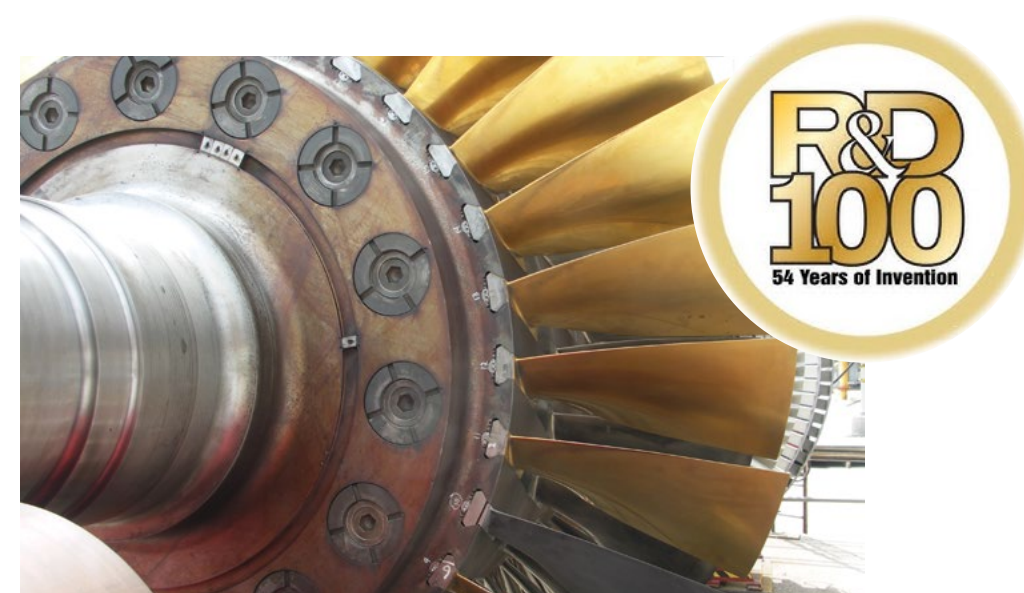
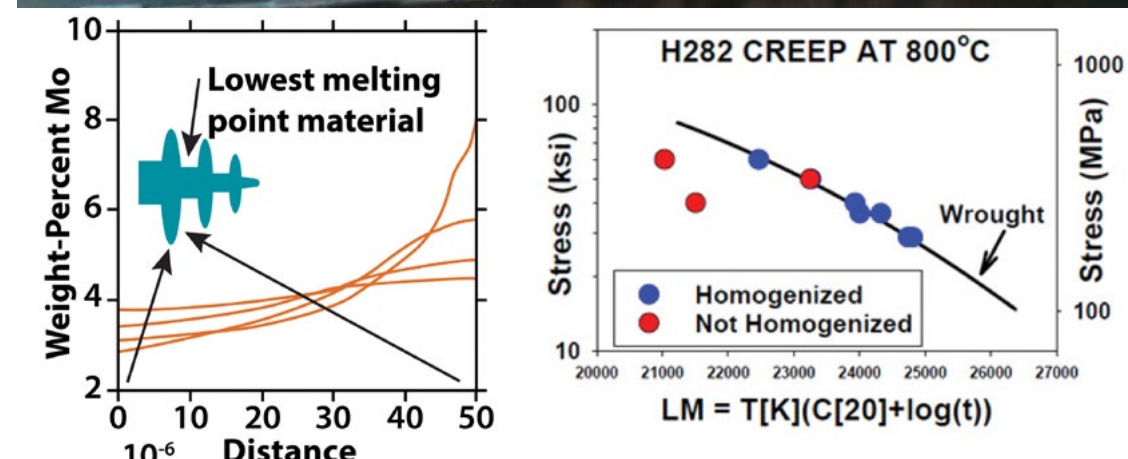
Arc Position Sensing Technology. Improved ingot quality during vacuum arc remelting. Startup Ampere Scientific founded as spin-off from NETL intellectual property.

## Radiopaque Stent Alloy with Boston Scientific



PROMUS® Element™ Stent. Winner of ASM-International Engineered Materials Award, 2015; Secretary of Energy Award for Excellence, 2012.

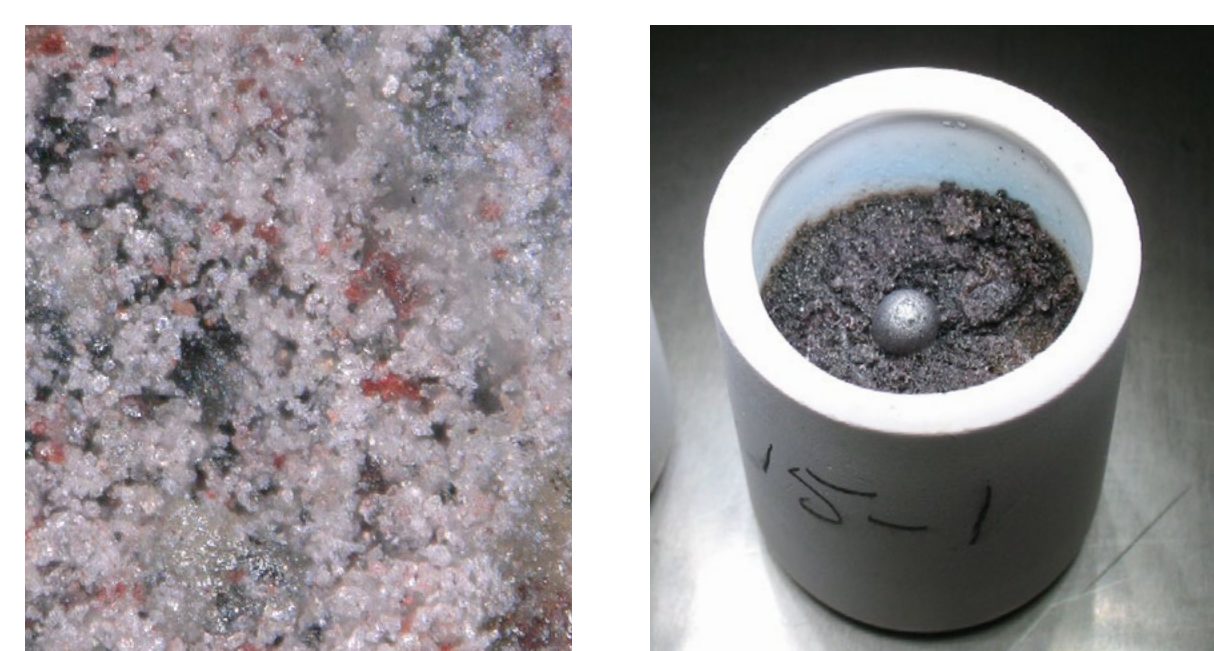
## Energy & Aerospace Materials Development



**BlackGold®**, an erosion-resistant nanocoating for gas turbines, developed with MDS Coatings and partners Delta and Calpine.

**Computational Tool To Design Alloy Heat Treatments**  
Demonstrated thick-walled castings from nickel superalloys, an enabler for advanced ultra-supercritical steam turbines.

## Metallurgical Processes for Materials Recovery & Recycling



Additive Fusion Technology to concentrate rare earth elements in coal waste streams. Nickel and vanadium recovery through carbothermal reduction of gasification slags.

## Alloys for Defense Applications



Prototype armor manufacture for the U.S. Army resulting in effective armor still in use today.

## NETL-Developed Refractory Brick



NETL developed refractory brick doubled refractory service life. Licensed to Harbison-Walker and commercially produced as Aurex 95P. Used in nearly every slagging gasifier worldwide.

### NETL PARTNERS

