

ARL 6.1 - Concept and Rapid Assessment Research Laboratory

ARL 6.2 – Large-Scale Prototype Development Laboratory



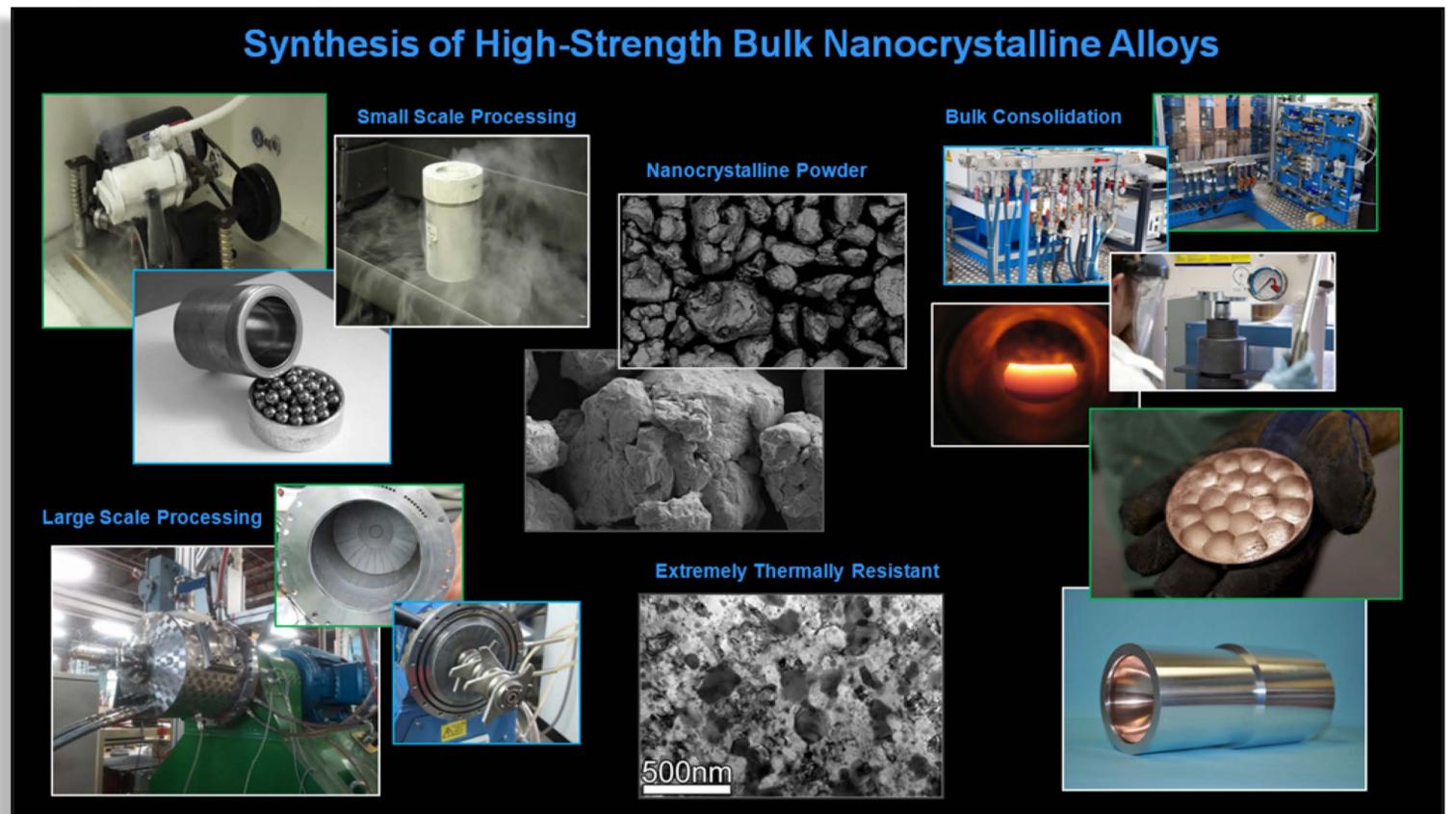
S&T Campaign: Materials Research
Unique ARL Facilities (APG)

Kris Darling, (410) 306-0862
 Kristopher.darling.civ@mail.mil

Laboratory Vision: cooperate by design for the purpose of rapid assessment and transition of proof-of-concept ideas to pilot-scale and pre-manufacturing levels

Goals

1. Develop the under-pinning science of grain boundary solute engineering
2. Delineate and engineer mechanisms controlling deformation at the nanoscale
3. Advance processing technologies to explore and develop nanostructured alloys and other far-from-equilibrium states with advantageous properties
4. Design and develop bulk nanocrystalline components for future force applications



Unique ARL Facilities

- Open access to all processing and characterization equipment across ARL
- Rapid assessment of structural, physical, and mechanical properties
- Expertise in Transmission Electron Microscopy and Atom Probe Tomography
- Expertise in small-scale, site-specific mechanical testing
- Expertise in synthesizing a large array of distinct material types including: nano-composites, amorphous alloys, intermetallics, reactive compounds, thermoelectrics, magnetic and high entropy alloys
- Scalable in-house production of specialty powders for additive manufacturing technologies

Complementary Expertise Sought

- Expertise in computational thermodynamics and kinetics (ThermoCalc–DICTRA) for phase equilibrium prediction and evolution
- Aberration corrected TEM
- Large-scale process consolidation: HIPing, extrusion, high temperature forging and swaging techniques
- Melt-spinning, splat quenching, and spray atomization for metastable powder synthesis and feedstock generation

