Research Objective
- The objective of this research is the quantitatively examine penetrator and target interactions during a penetration event using advanced in-situ diagnostics.
- We work directly with material model developers to incorporate the critical deformation and failure mechanisms into large scale computational codes.

Challenges
Fracture and failure dominate the response in the ballistic environment and it is difficult to capture using continuum methods.

ARL Facilities and Capabilities Available to Support Collaborative Research
- EF309A:
  - Laboratory guns from 5.56 to 50 mm.
  - 100 to 2500 m/s
  - High-voltage In-Situ Diagnostic Radiography Apparatus (HIDRA)
  - Photonic Doppler Velocimetry (PDV)
  - High speed imaging >5Mfps
- Post-mortem characterization
  - SEM, EDS, EBSD,
  - XCT options at multiple length scales (w/B. Love, MMSD)

Complementary Expertise/ Facilities/ Capabilities Sought in Collaboration
- We are interested in a wide range of different material systems including metals and ceramics for Lethality and Protection System applications.
- We would like to incorporate new diagnostic equipment to our experimental facilities.
- We are seeking collaborators that are interested in new methodologies for representing fracture and failure in computational codes at relevant strain rates and length scales.