High-impact national security research and workforce development enabled by world-class research scientists and essential infrastructure

The Center for National Security Initiatives (NSI) has established core capability research areas across the University of Colorado Boulder campus, engaging with 60+ research faculty that align to research and development priorities of the Department of Defense (DoD) and the intelligence community, and providing advanced training for the next generation workforce.

As the sole Tier-1 research institution in Colorado, CU Boulder creates a prime opportunity for on-demand collaboration among technical experts in the aerospace and defense enterprise.

Applied and fundamental research supporting national security priorities
Workforce development including hiring, internships and student projects
Access to intellectual capital through world-class faculty, specialized academic programs and topical studies

Core Capabilities
- Geospatial Data Analytics
- Autonomous Systems
- Space Domain Awareness
- Positioning, Navigation & Timing
- Hypersonics
- RF Engineering
- Remote Sensing
- Quantum Technologies
- Space Weather
- SmallSat Technologies
- Materials Science
- Human Performance

A Powerful Convergence of Research & Technical Collaborators

Be Boulder.
Colorado’s Front Range: A World-Class Innovation Ecosystem

- Colorado is the 2nd largest aerospace economy in the nation
- Home to Space Command, NORTHCOM and 4 DoD installations
- Colorado’s aerospace industry generates $15.4B in total annual output

CU Boulder is the #1 public university recipient of NASA research awards (#2 overall)
- 900+ active duty, reserve, National Guard and veteran students
- 1,800+ patents filed and/or issued for CU Boulder inventions since 2006

Colorado Front Range is one of the top entrepreneurial ecosystems in the nation

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CU Boulder National Security Capabilities: Highlights

- Space Domain Awareness
  - Missions: Space ops, anomalies
  - Challenges: Info fusion, perception, human factors, space environment, activity interference
  - CU Strengths: Astrodynamics, sensor tasking, autonomy, estimation, GNC, space weather
  - NSI Research Leader: Marcus Holzinger

- Position, Navigation & Timing
  - Missions: Pervasive to land/sea/air/space ops
  - Challenges: GNSS limited/denied environment, high precision, resilient operation, low SWaP
  - CU Strengths: GNSS science, instrumentation, algorithms, vision & LIDAR, quantum sensing
  - NSI Research Leader: Dennis Akos

- Hypersonics
  - Missions: Strike, defense, ISR
  - Challenges: Strongly coupled physics, materials, testing, validation
  - CU Strengths: Aerothermodynamics, high-temperature materials, structures, GNC
  - NSI Research Leader: Iain Boyd

- Autonomous Systems
  - Missions: Swarm, Urban/Subterranean, Space
  - Challenges: Non-determinism, certification, test & evaluation
  - CU Strengths: Field robotics, assured algorithms, control theory
  - NSI Research Leader: Chris Heckman