

# The Increasing Importance of the Space Domain in Strengthening NATO's Deterrence Posture

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Dr. Donald A. Lewis  
The Aerospace Corporation  
Member-at-Large for Space  
NATO STO Systems Concepts and Integration Panel

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# The Space Domain and NATO

*All conditions, areas, activities and things in and terrestrially relating to outer space, including space-related activities, missions, infrastructure, people, cargo, means of communication and spacecraft and other conveyances to, in, through and from outer space and the Earth.*

- Increasingly recognized as a domain of operations
  - NATO moving in that direction
  - July 2018 Brussels Summit Declaration:
    - “We have agreed to strengthen the Alliance's deterrence and defence posture in all domains.”
    - “Recognising that space is a highly dynamic and rapidly evolving area, which is essential to a coherent Alliance deterrence and defence posture, we have agreed to develop an overarching NATO Space Policy.”

*Space will become part of the larger deterrence and defense dialog as NATO officially recognizes it as a domain of operations*

# Space and Deterrence: Two Principal Objectives

- **At the Alliance level:** Deterring inimical behaviors and actions through perceptions that space contributes significantly to:
  - Information dominance and comprehensive strategic awareness
  - Enhanced military strength and force effectiveness
  - Strength and resilience of civil governance and infrastructure
  - Industrial base strength
- **At the Domain Level:** Deterring inimical actions against Alliance capabilities within the space domain
  - Mitigating the degradation or loss of space capabilities
  - Confident attribution of any and all attacks
  - Capacity for inflicting consequences

# Space is Essential to NATO Operations and Civilian Governance

- Enhances warfighter capabilities
  - ISR and attack warning
  - Communications, command and control
  - Navigation and timing
  - Environmental awareness
  
- Enables critical civilian governance and commerce functions
  - Civilian leadership
  - First responders
  - Civilian communications and awareness
  - Critical economic / infrastructure functions



***Space Contributes to both Military and Civilian Strength / Deterrence***

# Space Contributions to NATO Strength

## Information Dominance

### Enabling:

- Domain awareness
  - Air, Land, Maritime, Cyber
- Indications and Warning
- Pervasive C4ISR
- Defeat denial and deception
- Net-centric warfare
- High velocity ops tempos
- Autonomous operations

## Force Enhancement

### Supporting effects:

- Joint fires
- Personnel recovery
- Battlefield awareness
- Navigation and targeting

## Counterspace

- Denial of access / use of space
- Space domain awareness

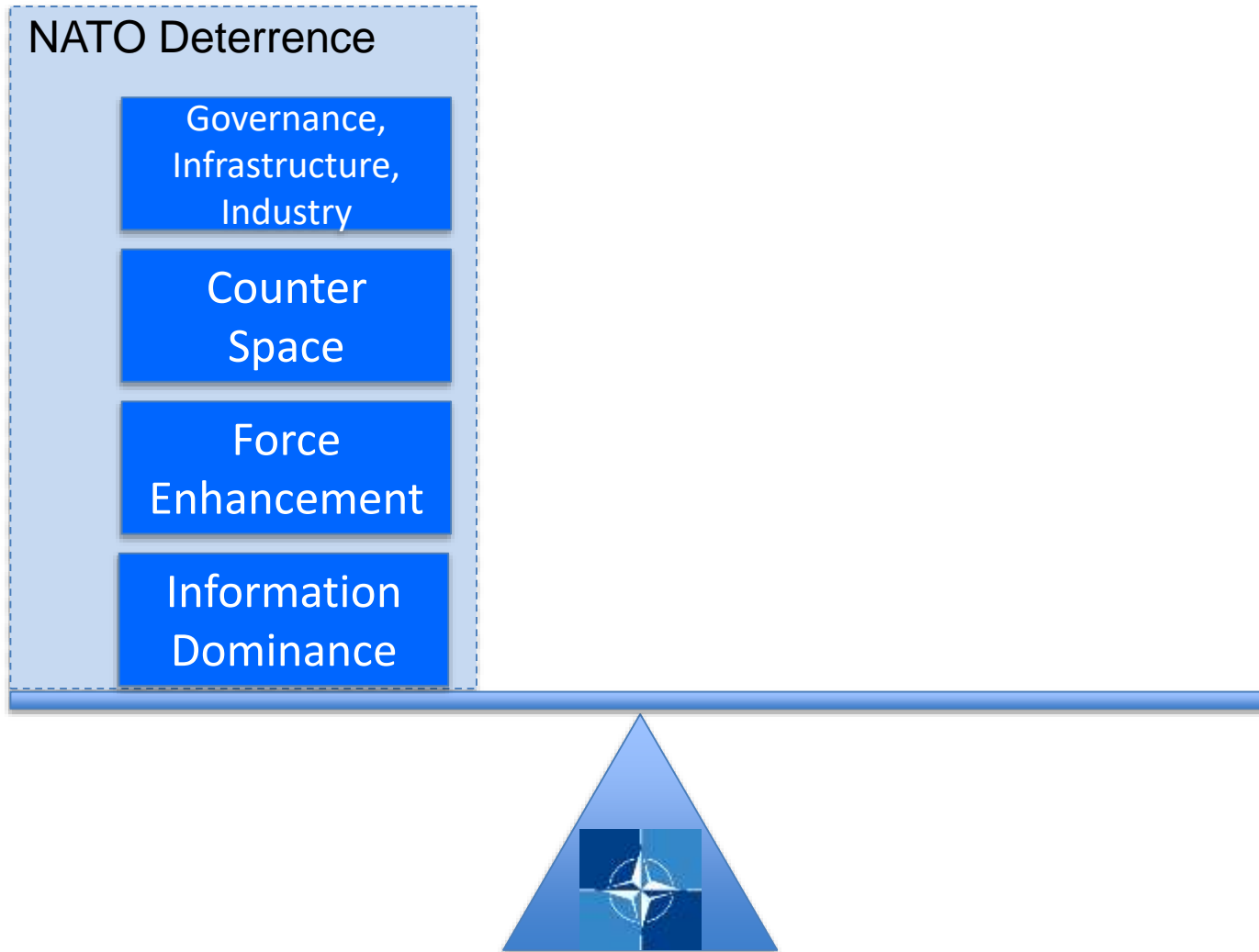
## Industrial Base

- Advanced technology and manufacturing capacity
- Innovative and intellectually competitive workforce

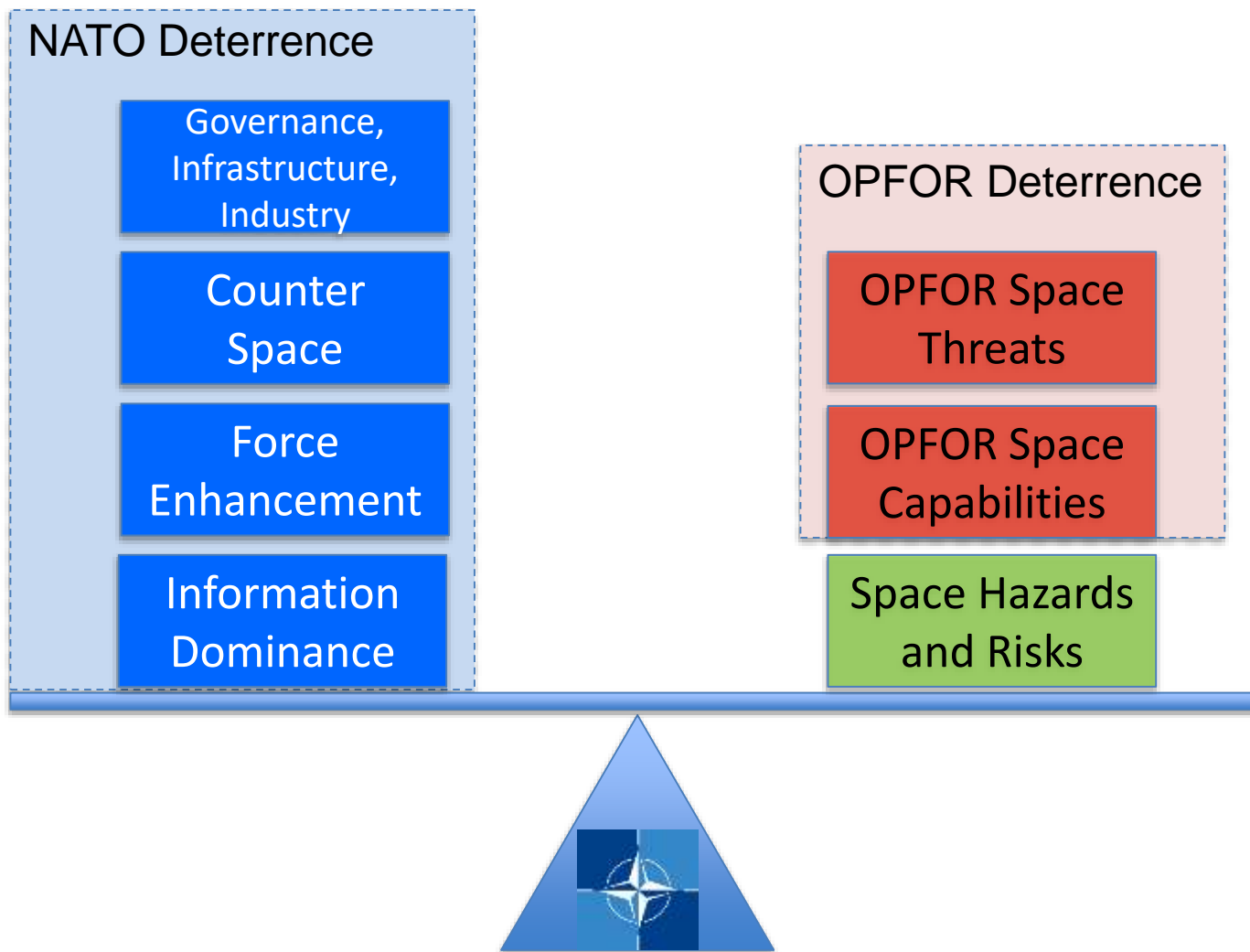
## Civil Governance

- Civilian authority C4ISR
- Critical civilian and economic infrastructures

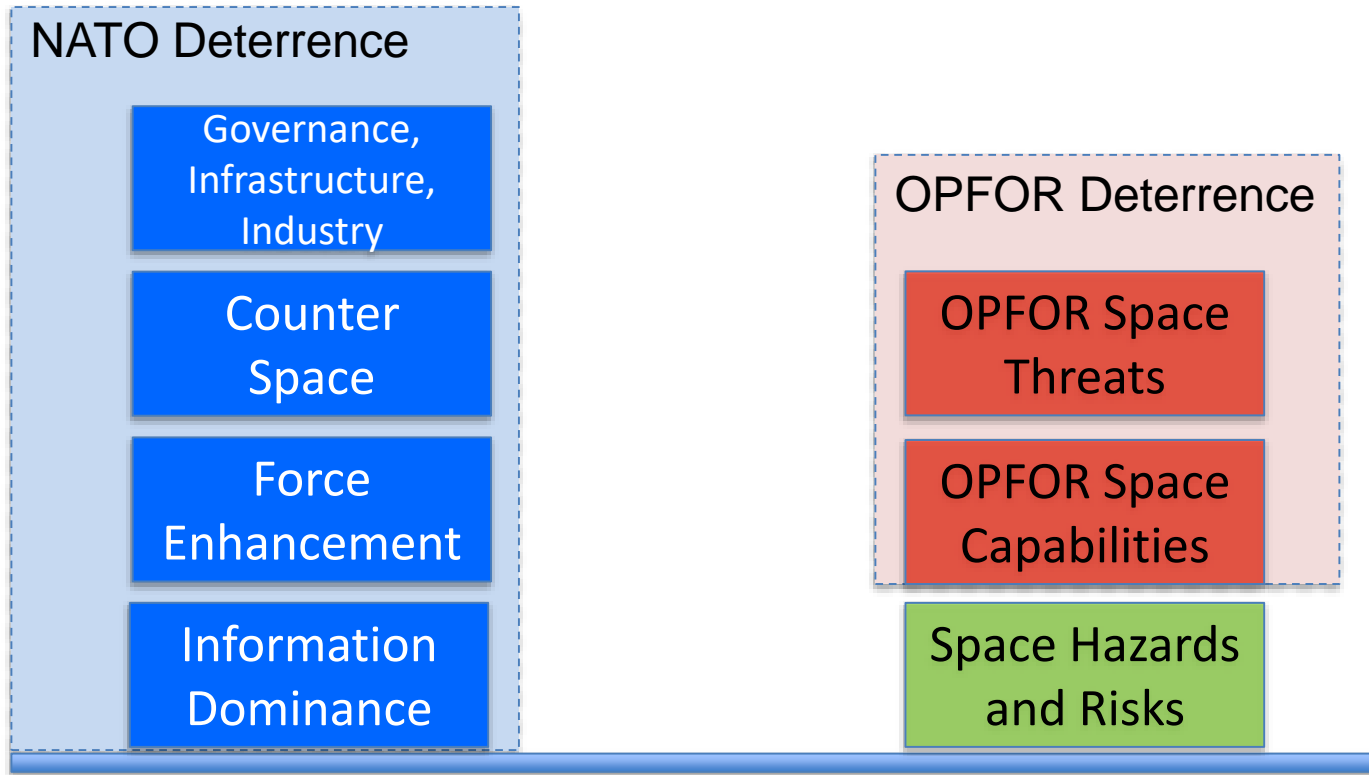
# Contributions to NATO Deterrence from Space



# The NATO Deterrence Balance Relative to Space



# Managing the Deterrence Balance Relative to Space



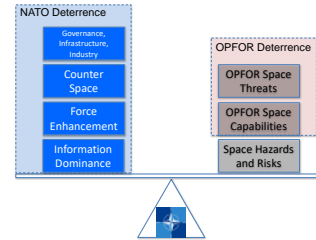
- Capability
- Resiliency
- Doctrine
- Messaging





# Threat and Risks to NATO Space Capabilities

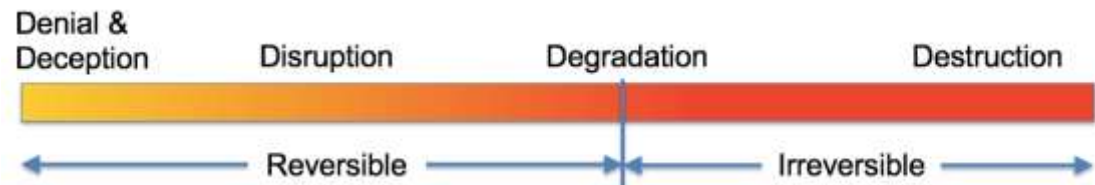
From Intentional, Unintentional and Natural Threats and Risks



- **Environmental**
  - Space environment
  - Terrestrial environment
- **Unintentional**
  - RF interference
  - Debris and collisions
- **Other risks**
  - Engineering
  - Operational
  - Programmatic
  - Institutional / diplomatic

- The critical need to minimize the fight in space
  - Loss of space capabilities needed for operations (*and deterrence*)
  - Temporary or permanent damage to the space environment
  - RF interference / space “traffic” congestion
  - Civilian collateral effects – degradation/loss of critical infrastructure

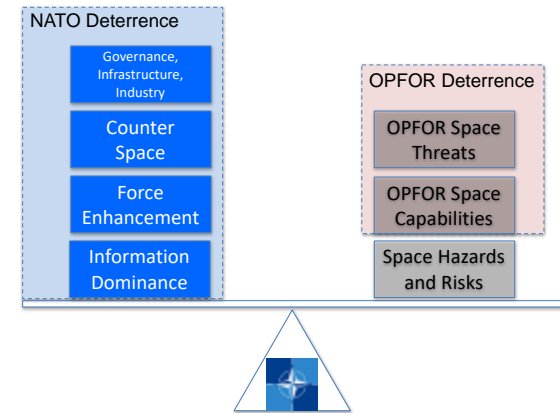
- **Intentional (Adversarial)**
  - Denial and deception
  - Electronic and cyber attack
  - Physical attack of satellites
  - Physical of infrastructure
  - Nuclear events



# Deterrence Considerations Relative to Space

## *Strengthening Deterrence via Space*

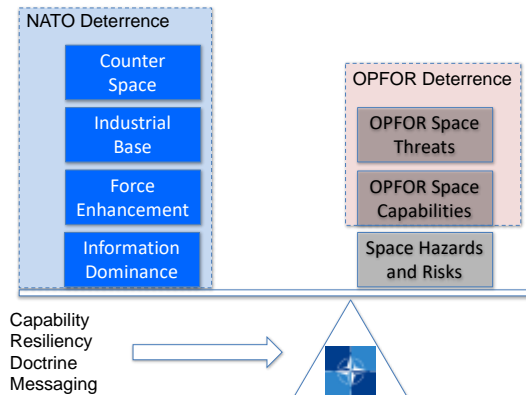
- Ensure NATO access to advanced space capabilities
  - Substantially better than OPFOR capabilities
  - Interoperable and integrated
- Comprehensive integration of space into NATO C3
  - Architectures and CONOPS
  - Advanced information dominance capabilities
- Space capabilities required for operations in
  - Extreme OPS tempos
  - New operational environments (mega-cities / Arctic)
- Common NATO space domain awareness capability
- Comprehensive space operations training
- Means to deny OPFOR space capabilities (counterspace)



# Perception Management Relative to Space

## *Considerations for Effective Deterrence*

- Purposeful reveal of NATO's space strength
  - Too little – ineffective contribution to deterrence
  - Too much – may be escalatory (space "arms race")
  - Sensitive capabilities and doctrine
- Degree and nature of NATO space strength
  - Forces, leadership, policy and doctrine
  - Integration and interoperability
  - Civil governance and infrastructure
  - Industrial base contributions
- NATO offensive counterspace doctrine
- Enhanced conventional and asymmetric force capabilities enabled via space
- Messaging consequences of space included in exercises and peace-keeping missions



# NATO Training and Exercises

*Strength through practice and exploration*

- Contributes to deterrence strength as well as messaging
- NATO exercises offer opportunities to:
  - Explore complex dependencies on space in operations planning / execution
  - Assessment of OPFOR use of space and counterspace against NATO
  - Exploit scenarios for modeling and simulation of deterrence options
- Space played as a transformational capability since 2016
  - Once an official domain; full, unmitigated play and effects will be possible

## Trident CPX Series

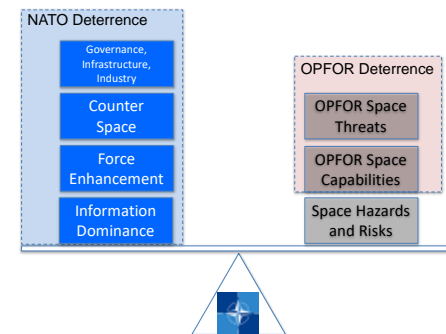
- TRJE 16
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- LOLE 20



# Considerations for Preserving NATO Space Strength

## *Minimizing the Erosion of Space Capabilities*

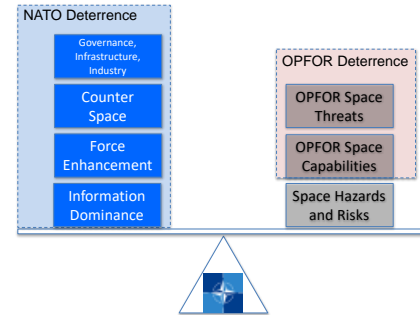
- Strategy, policy and doctrine
  - Support global norms for space activities / behaviors
  - Declared response doctrine for space threats / attacks
  - Entanglement of space equities / capabilities
- Process and procedures
  - CONOPS and TTPs to mitigate degraded or lost space capabilities
  - Rapid diagnosis of space anomalies and attribution of attack
  - Training / education on space threats and risk mitigation
- Capability solutions
  - Threat and risk resilient space capabilities
  - Cross-domain interoperability of NATO C3 architectures
  - Comprehensive NATO common space domain awareness
  - Counter-counterspace capabilities
  - Alternatives to space-supplied services



# Perception Management for Space Capability Preservation

## *Some Perception Messaging Challenges*

- NATO's likely response to space capability attacks
  - Doctrinal basis expressed in NATO Joint Publications
  - As observed in training and exercises
  - Alignment with national sovereign space doctrines
  - In-kind retaliation vs. asymmetric response
- NATO's (eventual) defensive counterspace doctrine
- Resiliency of NATO's space capabilities
  - Sovereign space resiliency measures often classified
- Minimizing reactive counterspace development
- Inherent ambiguities within the space domain
  - Satellites - ground assets - space data and networks



## Some Closing Thoughts

- NATO is more dependent upon space than current potential adversaries
- Space is complex – few understand all opportunities and risks
- The space domain will inevitably be integrated across all operational domains
- To substantively contribute to NATO's deterrence, space capabilities require:
  - The most advanced technology and applications
  - Integration and interoperability throughout NATO
  - Appropriately trained personnel and leadership
  - Resiliency to space threats, risks and hazards
  - Ability and will to inflict consequences if attacked
- By itself, NATO's presence in and use of the space domain is not sufficient to deter aggression against the Alliance but it is an essential element. There is still much to do ...

Thank You

