NDU Spacepower Theory Project Update

National Defense Industrial Association

2007 National Security Space Policy & Architecture Symposium

2 February 2007

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Project Genesis, TOR, and Study Design

- 2005 QDR
- Feb 06 OSD Letter with TOR to NDU
- Study Design
  - *Yearlong effort: due Jun 07*
  - *Seminars, Workshops, Conferences*
  - *Product: Two Books*
    - *Volume I: Concise Spacepower Theory*
    - *Volume II: Comprehensive Spacepower Theory*

Seminars During Summer 2006

- Dennis Wingo*: Innovative Commercial Approaches to Space*
- Klaus Heiss: Strategic Importance of the Moon
- Joanne Gabrynowicz: *Space Law and Spacepower*
- Peter Teets: *National Security Space in the 21st Century*
- Roger Launius: *Exploration, Leadership, and Spacepower*
- Jon Sumida: *Mahan on Spacepower*
- Colin Gray: *Strategy and Spacepower Theory*
- Scott Pace: *Thoughts on Spacepower*
- Alex Roland: *Strategy, Spaceflight, and Spacepower*
- Karl Mueller: *Depolarizing the Space Weaponization Debate*
- John Logsdon: *Human Spaceflight and Spacepower*
- Theresa Hitchens: *International Perspectives of Spacepower*
- Phillip Baines: *Non-offensive Defenses in Space*
- Everett Dolman: *Astropolitik: Classical Geopolitics in the Space Age*
- Hal Winton: *On the Nature of Theory*
- Michael O'Hanlon: *Hedging Strategies: Neither Star Wars nor Sanctuary*
- Hank Cooper: *Missile Defense, the Space Connection and the 21st Century*

1st Workshop: *Merchants and Guardians*

Government's Role in Regulating, Licensing and Incentivizing Space Activity

- **NDU; 31 October 2006**
- **Approximately 40-50 attendees consisting of government and non-government experts**
- **Roundtable discussion**
- **Agenda included four panels:**
  - ***Panel 1*** **- Space Exploration: The Case for Public and Private Ventures**
  - ***Panel 2*** **- Current Commercial Space Activity: Incentives and Impediments**
  - ***Panel 3*** **- Crafting Laws and Policy to Facilitate Space Commerce and Exploration**
  - ***Panel 4*** **- Government as Regulator: The Good, the Bad, and the Ugly**

2nd Workshop: *International Perspectives*

- **NDU; 4-5 December 2006**
- **Approximately 50-60 attendees with a strong international presence**
- **Roundtable discussion**
- **Agenda Included**
  - **Panel 1 - Major Space Actors**
  - **Panel 2 - Emerging Space Powers**
  - **Panel 3 - Non-State Actors**
  - **Panel 4 - Synthesis: Spacepower and the Interrelation of US, International and Non-State Actors in Space**

Spacepower Theory: Volume II

VOLUME II CHAPTERS AND AUTHORS

Foreword: Implications of Spacepower for Geopolitics and Grand Strategy

Section I: Introduction to Spacepower Theory

Chapter 1: On the Nature of Theory: **Harold R. Winton**
Chapter 2: International Relations Theory and Spacepower: **Robert L. Pfaltzgraff, Jr.**
Chapter 3: Landpower, Seapower, and Spacepower: **John M. Collins**
Chapter 4: Airpower, Cyberpower, and Spacepower: **Benjamin S. Lambeth**

Section II: Spacepower and Geopolitics

Chapter 5: Orbital Terrain and Space Physics: **Martin E.B. France & Jerry Jon Sellers**
Chapter 6: Space Law and Governance Structures: **Joanne Irene Gabrynowicz**
Chapter 7: Building on Previous Spacepower Theory: **Colin S. Gray & John B. Sheldon**

Section III: Commercial Space Perspectives

Chapter 8: History of Commercial Space Activity and Spacepower: **Henry R. Hertzfeld**
Chapter 9: Commercial Space Industry and Markets: **Joseph Fuller, Jr.**
Chapter 10: Merchants and Guardians: **Scott Pace**
Chapter 11: Innovative Approaches to Commercial Space: **Ivan Bekey**

Section IV: Civil Space Perspectives

Chapter 12: History of Civil Space Activity and Spacepower: **Roger D. Launius**
Chapter 13: Affordable and Responsive Space Systems: **Sir Martin Sweeting**
Chapter 14: Human and Robotic Exploration: **Howard E. McCurdy**
Chapter 15: Competing Visions for Exploration: **Klaus P. Heiss & Dennis R. Wingo; Robert Zubrin**

Volume II (cont.)

Section V: Security Space Perspectives

- Chapter 16: History of Security Space Activity and Spacepower: **James Lewis**
- Chapter 17: Increasing the Military Uses of Space: **Henry F. Cooper, Jr. & Everett C. Dolman**
- Chapter 18: Preserving Freedom of Action in Space: **Michael Krepon, Theresa Hitchens & Michael Katz-Hyman**
- Chapter 19: Balancing Security Interests: **Michael E. O'Hanlon**

Section VI: International Perspectives

- Chapter 20: Russia: **James E. Oberg**
- Chapter 21: China: **Dean Cheng**
- Chapter 22: Europe: **Xavier Pasco**
- Chapter 23: Emerging Actors: **Randall R. Correll**

Section VII: Evolving Futures for Spacepower

- Chapter 24: Evolving U.S. Structures: **John M. Logsdon**
- Chapter 25: Evolving International Structures: **Dana J. Johnson**
- Chapter 26: Technological and Bureaucratic Drivers for Spacepower: **Taylor Dinerman**
- Chapter 27: Building Human Capital for Spacepower: **S. Peter Worden**

Afterword: The Future of Spacepower:

Appendixes

- Space Law: Outer Space Treaty, Registration Convention, Rescue and Return Agreement, Liability Convention, Moon Treaty, PAROS Proposals, IADC
- Orbits and Orbital Mechanics
- Basics of Space System Design
- Possibly Bibliographic Essay, Annotated Bibliography (assembled from COP), and Comprehensive Bibliography

Requirements for Concise Spacepower Theory

- **Volume I should:**
  - Account for the structure of the field:
    - the divergent world views of each sector and
    - the dynamics of their interactions.
  - Define the boundary conditions of the theory:
    - Cis-Lunar space as opposed to all of space
    - International perceptions of spacepower and their effect on US policy
  - Ask the key, fundamental questions regarding the uses and purposes of space to extract underlying principles.
    - Question hypotheses and present conditions.
    - Test counterfactuals.
  - Construct a framework that integrates divergent points of view and takes into account potential future scenarios.

- ***Roles of Theory: Define – Construct – Explain – Connect – Anticipate***

Upcoming Activities

- **NDU Capstone Symposium: *25-26 April 07***
  - Initial presentation of Volume I Spacepower Theory findings.
- **Community of Practice Website**
  - http://groups-beta.google.com/group/spacepower-theory
- **HAYSP@NDU.EDU**