

# Historic Cosmology, Identity, and Exploration

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# Summary

- ▶ What Does DARPA Want with a Starship?
- ▶ Goal: Human Exploration & Settlement of the Heavens
  - What does Human Mean?  
What does Heaven Mean?  
What is Exploration and Settlement?
  - What Holds Us Back?
  - What Drives Us Forward?
- ▶ Context: Western Civilization, 2500 Years
  - Judeo-Christian Cosmology
  - Greco-Roman (Hellenistic) Cosmology
  - Impacts of Paradigms on the Past, Present, and Future

# What does DARPA want with a Starship?

- ▶ Creating an alternative to cultural atrophy

# Short Term Society Reinforced

| Sphere        | Principle           | Time Horizon              |
|---------------|---------------------|---------------------------|
| Communication | Internet/Cable/etc. | 1–5 seconds               |
| Travel        | Jet Airline Flight  | NJ to Singapore: 19 hours |
| Technology    | Moore's Law         | 2–3 Year Investment       |
| Business      | Rule of 72          | 7 Year Investment         |
| Politics      | Election Cycles     | 2–8 Year Planning Frame   |

**RESULT:** Almost nothing positive is planned past an eight year horizon.

Medieval Society: Cathedrals took over a century to build and were designed to last many centuries.

# Long Term Society Undermined

| Motive  | Concept                     | Time Horizon                           |
|---------|-----------------------------|----------------------------------------|
| Promise | Space Settlement            | 5 Years – End of Universe              |
| Threat  | Nuclear Waste Disposal      | Now – 1 Million Years                  |
| Threat  | Gene/Seed Banks             | Contingency against species extinction |
| Threat  | Economic/Ecological Hazards | 5–100 Years                            |

**Every Long Term Concept is Based on Threats Except Space Settlement.**

Threat mitigation means the best you can hope for is a more expensive status quo, not advancement.

Focus on threats only leads to avoidance or negativity.



# Tactics without Strategy = Flailing

**RESULT:** Psychology provides...

- ▶ Positive reinforcement of tactical thinking
- ▶ Negative reinforcement of strategic thinking
  
- ▶ **Collapse: Apathy – Atrophy – Anarchy**
  - We assume we've done everything, so we do nothing.
  - We assume we know everything, so we forget everything.
  - We assume there is no hope, so we plan nothing.
  
- ▶ *“Where there is no vision, the people perish.”*  
–Proverbs 29:18

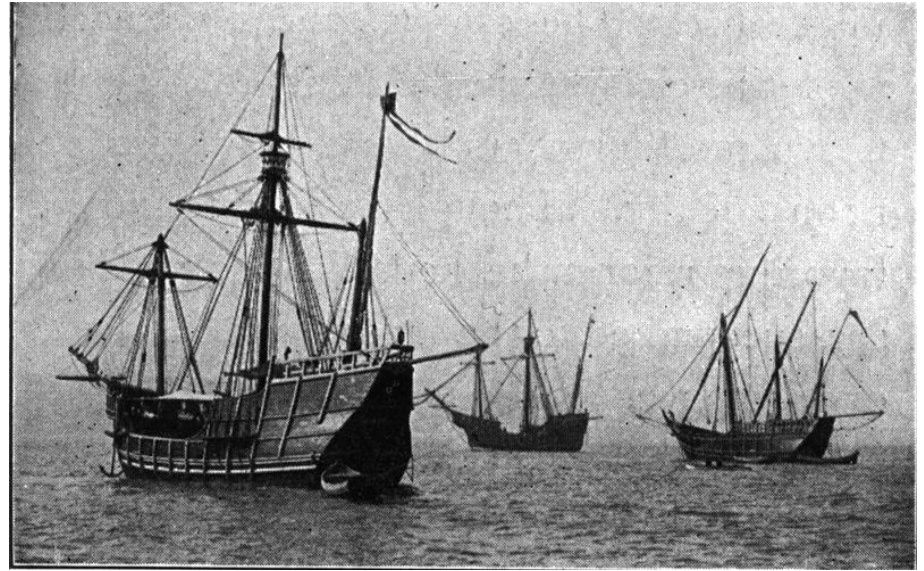
# Conclusion

Exhausted Societies face one of two futures:

Cultures that Exhaust  
Themselves in Place  
Experience Collapse.



Cultures that Spread  
to New Environments  
Experience Restoration.



# The Positive Goal: Human Exploration and Settlement of the Heavens

- ▶ Definitions
- ▶ Implications based on history

# What Does Human Mean?

| Component                                                | Definition                                                                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Body</b><br>(Health, Fitness)                         | Frame of information through which material passes <ul style="list-style-type: none"><li>• 98 percent of atoms change every 6 months.</li><li>• Mortal, physical manifestation of identity</li><li>• Greek: Form plus Substance</li></ul>                                                                                           |
| <b>Spirit</b><br>(Energy, Resolve)                       | Life force, associated with breath and blood. <ul style="list-style-type: none"><li>• Measure of life of person or group (Esprit de Corps)</li><li>• Greek: Spirits were vegetative, animal, or rational</li></ul>                                                                                                                  |
| <b>Soul</b><br>(Integrity, Independence, Accountability) | Eternal identity of sentient being. <ul style="list-style-type: none"><li>• In both Greek and Hebrew roots, element of permanent/divine/heavenly that is bonded temporally to mortal/earthly/material body</li><li>• Irreducible entity after logical reduction of attributes (Who are you? – answer cannot be attribute)</li></ul> |

# What Does Heaven Mean?

| Christian     | Definition                                                                                                                                                                                                                                                              |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| First Heaven  | <b>Atmosphere of Earth</b> <ul style="list-style-type: none"><li>• Greek: Considered dynamic environment like Earth</li></ul>                                                                                                                                           |
| Second Heaven | <b>Space</b> <ul style="list-style-type: none"><li>• Greek: End of transient and beginning of eternal.</li><li>• Dante: Started at Lunar Orbit</li></ul>                                                                                                                |
| Third Heaven  | <b>Heaven associated with God (Greek: Olympus)</b> <ul style="list-style-type: none"><li>• Both Systems: Material is incorruptible/eternal/perfect (Logos)</li><li>• Judeo-Christian: Exists outside physical universe as higher dimension (in modern terms).</li></ul> |

# Greek Universe: Settling Pond

| Greek  | Definition                                                                                                                               |
|--------|------------------------------------------------------------------------------------------------------------------------------------------|
| Ether  | Highest divine element, weightless, incorruptible, perfect forms and gods at this level.                                                 |
| Fire   | Next highest. Some on Earth, but still largely associated with heavens.                                                                  |
| Air    | Middle – atmosphere. Dynamic.                                                                                                            |
| Water  | Oceans primarily, but all waters, highly chaotic.                                                                                        |
| Earth  | Lowest element, heaviest, subject to change, earthquakes, etc.<br>Earth was not the center of the Ptolemaic universe, it was the bottom. |
| Humans | Created from mud, raindrops, and a little ether.<br>Created upright to look at the stars.                                                |

# What is Exploration/Settlement?

| Component                | Definition                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic Life Functions     | <ul style="list-style-type: none"><li>• <b>Reproduction and Locomotion</b></li><li>• Goal to spread genome to largest possible territory to prevent an event from destroying the genome.</li><li>• Plants/Spiders/Coral reproduce blindly using low energy formula of small offspring/winds/currents (R-selected species) or move in intelligently seeking new food sources (K-selected species)</li></ul> |
| Conscious Life Functions | <b>Adaptation, Response to Stimuli, Growth.</b>                                                                                                                                                                                                                                                                                                                                                            |
| Process of Exploration   | <ul style="list-style-type: none"><li>• <b>Develop Awareness of New Environment</b></li><li>• <b>Evaluate Threats and Opportunities</b></li><li>• <b>Move personally to new region, and/or</b></li><li>• <b>Move offspring to new location</b></li></ul>                                                                                                                                                   |

# Metaphor: Cats and Dogs

| Animal    | Exploring a New Room                                                                                                                                                                                                                                                                        |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dog       | <ul style="list-style-type: none"><li>• Charges into middle of room</li><li>• Evaluates by scent and sight for opportunities</li><li>• Higher in food chain (K-selected species)</li><li>• Pack animal</li></ul>                                                                            |
| Cat       | <ul style="list-style-type: none"><li>• Walks silently around edge of room</li><li>• Evaluates by sound and motion for threats</li><li>• Lower in food chain (still K, but more R-biased)</li><li>• Independent</li></ul>                                                                   |
| Blind Dog | <ul style="list-style-type: none"><li>• People don't usually realize the dog has gone blind until they rearrange the furniture.</li><li>• Dog is so used to the patterns of the room and depends on scent more than sight that it does not panic or show signs of loss of vision.</li></ul> |

# Greek Cosmology

| Element         | Result                                                                                                                                                                                                                                                                                                                       |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| View of Heavens | <ul style="list-style-type: none"><li>• Catlike avoidance</li><li>• Attempts to reach heaven were bold failures<ul style="list-style-type: none"><li>• Prometheus and Phaethon punished</li><li>• Icarus dies foolishly, Daedalus mourns</li></ul></li><li>• Exploration limited to mathematics and philosophy</li></ul>     |
| View of Seas    | <ul style="list-style-type: none"><li>• Doglike bravery</li><li>• Many successful heroes of the seas<ul style="list-style-type: none"><li>• Ulysses/Odysseus, Jason have great adventures</li><li>• Stories focused on imminent threats and opportunities to Greek civilization</li></ul></li></ul>                          |
| Result          | <ul style="list-style-type: none"><li>• Astronomy boosted initially by basic astronomy, but held back until observation logs and mathematics disproved Ptolemaic model.</li><li>• Age of Nautical Exploration launched by Europe.<ul style="list-style-type: none"><li>• 1450's to 1950's, or 500 years.</li></ul></li></ul> |

# Cosmology Compared

| Hellenist                                                                                                                                                                                                                                                  | Christian                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• “...man was given a towering head and commanded to stand erect, with his face uplifted to gaze on the stars of heaven”.<br/>Metamorphoses 80–89</li></ul>                                                          | <ul style="list-style-type: none"><li>• “The heavens declare the glory of God... Day after day they pour forth speech; night after night they reveal knowledge.”<br/>Psalm 19:1a, 2.</li></ul>                   |
| <ul style="list-style-type: none"><li>• Drive to explore Earth via the Seas</li></ul>                                                                                                                                                                      | <ul style="list-style-type: none"><li>• Great commission to spread good news to all lands/peoples.</li></ul>                                                                                                     |
| <ul style="list-style-type: none"><li>• Celestial Navigation Invented (Astrolabe, Antikythera)</li></ul>                                                                                                                                                   | <ul style="list-style-type: none"><li>• Celestial Navigation Refined (sextant, nautical almanac)</li></ul>                                                                                                       |
| <ul style="list-style-type: none"><li>• Alexander the Great</li><li>• Hellenistic homogeny</li><li>• Roman Republic</li><li>• Roman Empire</li><li>• Collapse</li></ul>  | <ul style="list-style-type: none"><li>• European Missionaries/Monks</li><li>• Christian homogeny: Europe</li><li>• Renaissance/Age of Exploration</li><li>• British Empire</li><li>• American Republic</li></ul> |

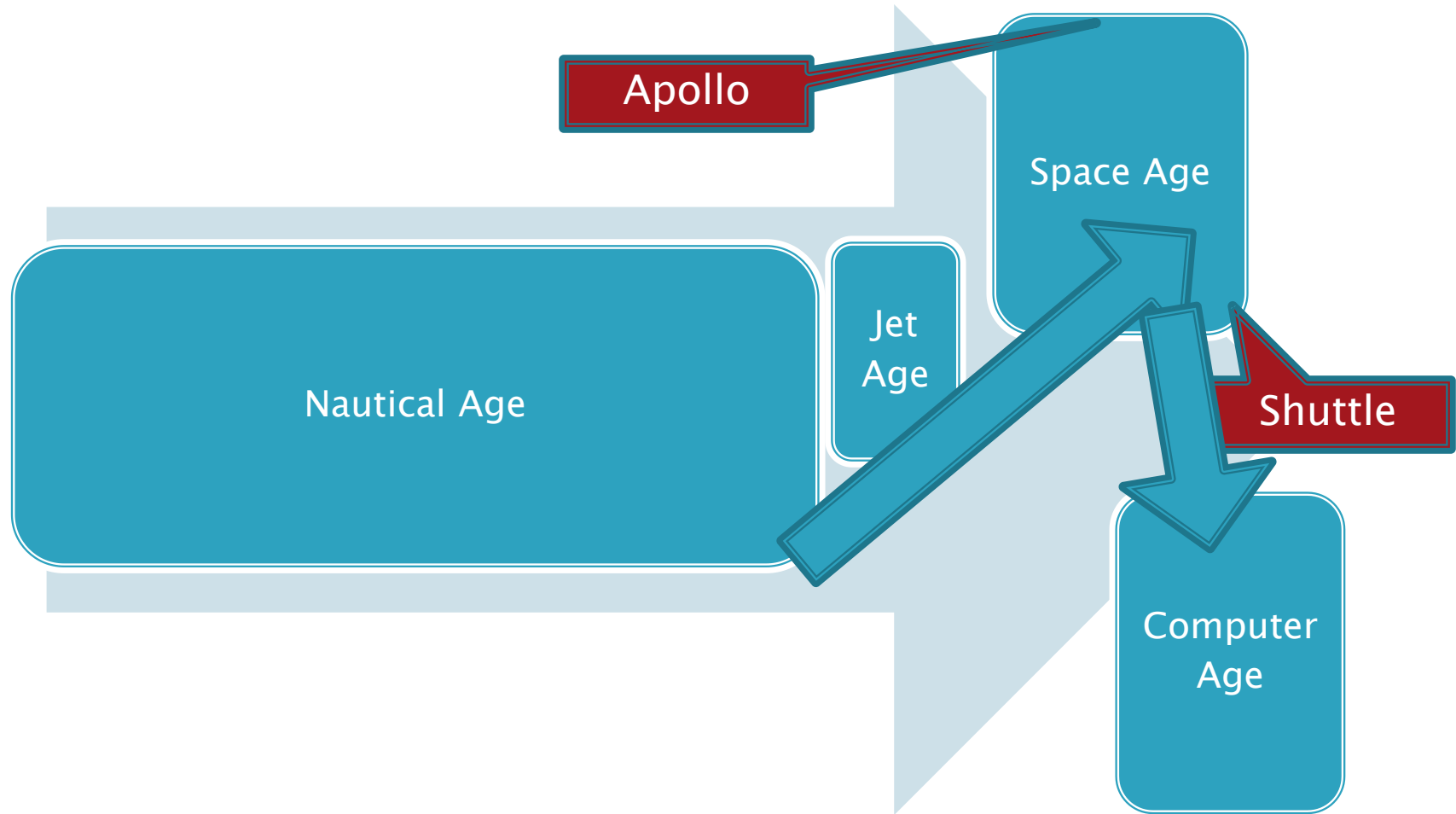
# Cosmology Contrasted

| Hellenist                                                                                                                                               | Christian                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• High heavens are pure and for gods alone.</li><li>• Flesh is permanently corrupt and limited to Earth</li></ul> | <ul style="list-style-type: none"><li>• Incarnation of Christ – pure form of Heaven became flesh and lived/ died/ resurrected / ascended</li></ul>                                                                                            |
| <ul style="list-style-type: none"><li>• Human souls at death go deeper into Earth (Hades), there to be punished or rewarded</li></ul>                   | <ul style="list-style-type: none"><li>• Human souls at death ascend to third Heaven.</li><li>• Descent is punishment only.</li></ul>                                                                                                          |
| <ul style="list-style-type: none"><li>• Stories warn that those who attempt to ascend sky or heavens are punished</li></ul>                             | <ul style="list-style-type: none"><li>• Humans promised to ascend sky physically at Second Coming.</li><li>• Prophecy that elect would be gathered “from the ends of the Earth to the ends of the Heavens”. (Matt 24:31/Mark 13:27)</li></ul> |

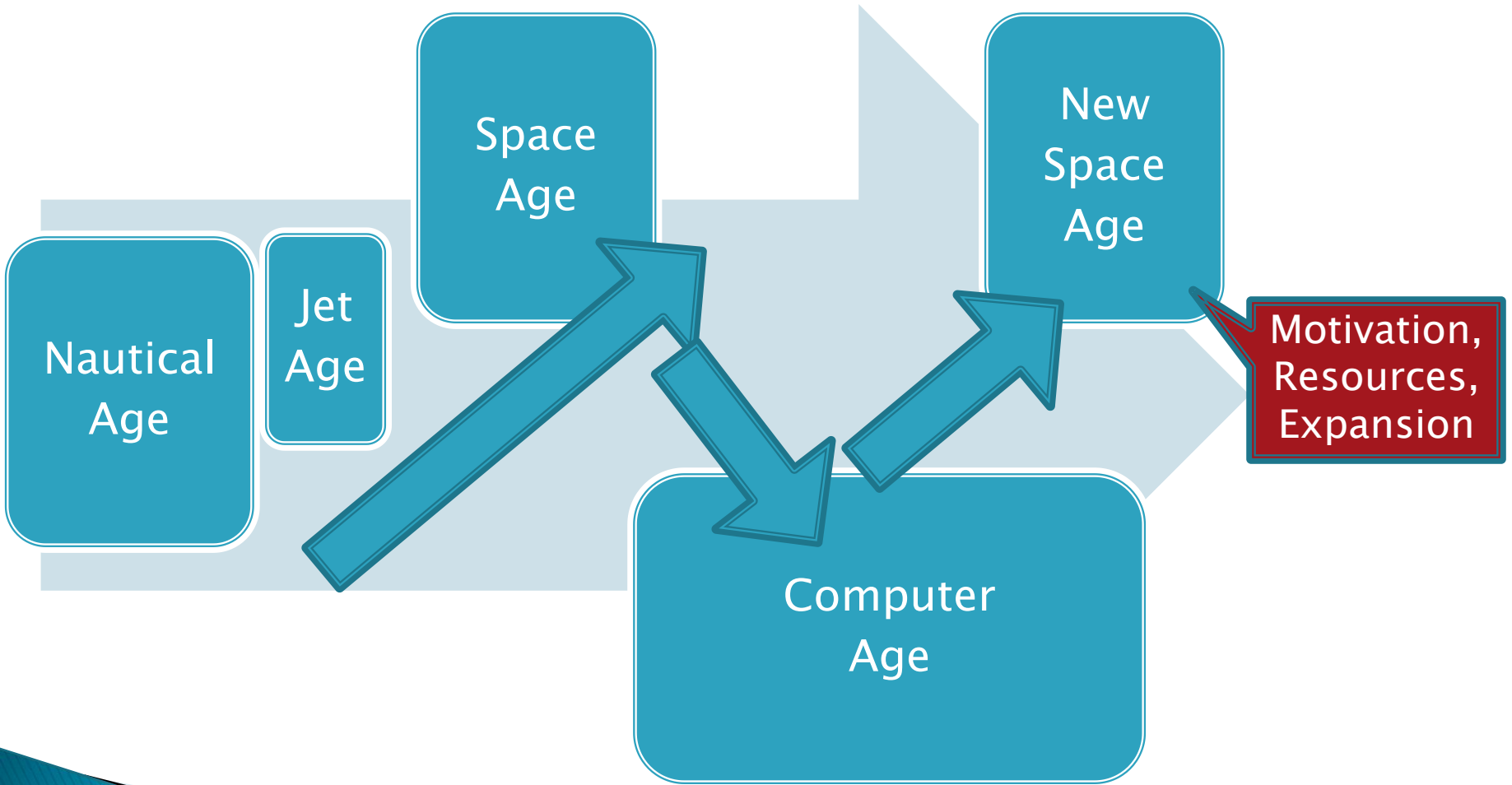
# Grexit? ...If Only!

| First Century Hellenist                                                                                                                                 | 21 <sup>st</sup> Century College Student                                                                                                        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"><li>• High heavens are pure and for gods alone.</li><li>• Flesh is permanently corrupt and limited to Earth</li></ul> | <p>When we send space probes to Mars, we are creating “junk” for future generations to clean up. (Not monuments for future historic sites.)</p> |
| <ul style="list-style-type: none"><li>• Human souls at death go deeper into Earth (Hades), there to be punished or rewarded”</li></ul>                  | <p>Believe we have to solve all problems on Earth before having a space program.</p>                                                            |
| <ul style="list-style-type: none"><li>• Stories warn that those who attempt to ascend sky or heavens are punished</li></ul>                             | <p>Think radiation belts and cosmic rays will kill any who attempt deep space. (Cultural bias to believe this lie)</p>                          |

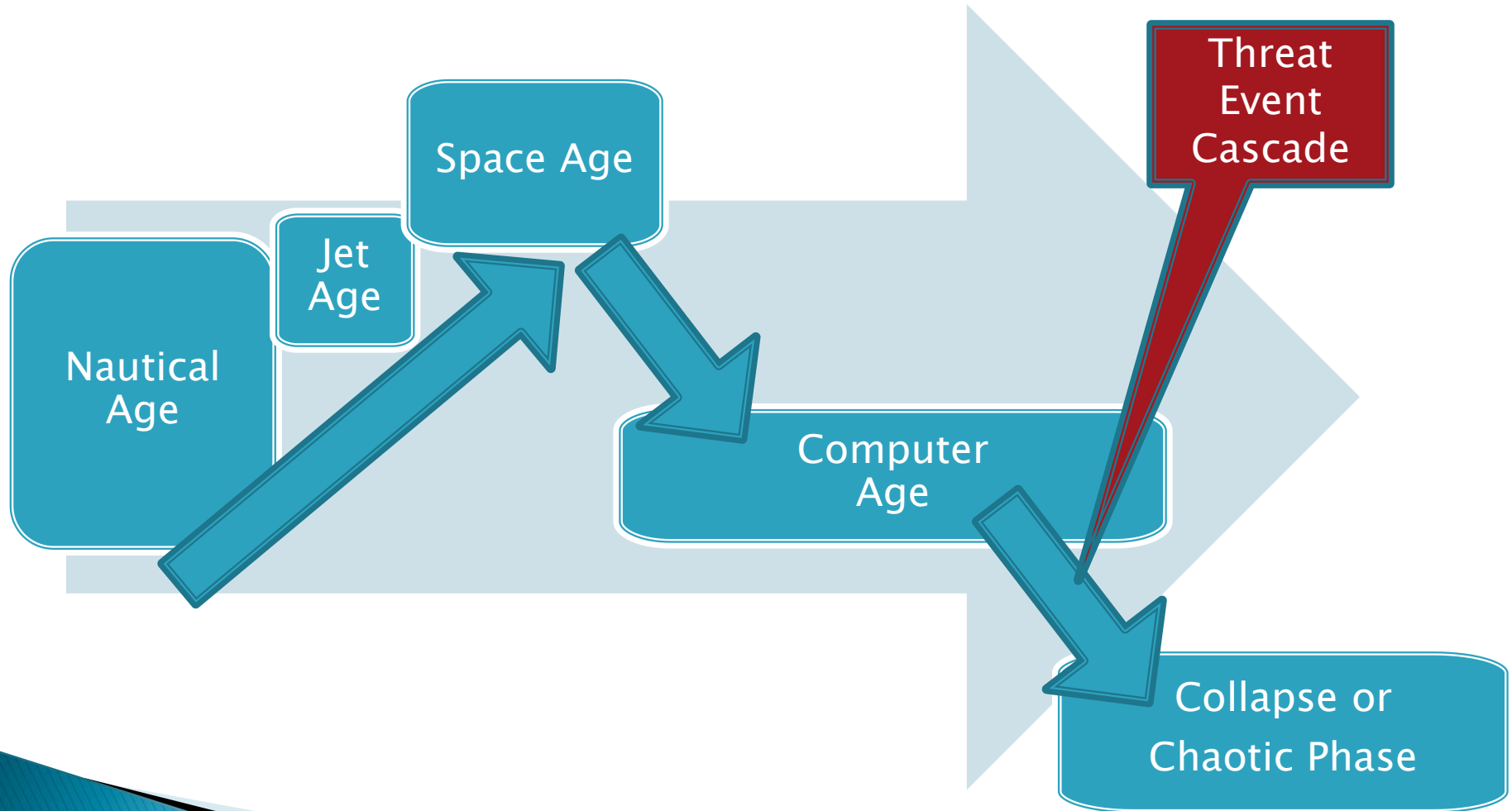
# Current State: Paradigm Shift from Exploration to Introversion



# Can NewSpace Lead to a New Renaissance?



# Will Threats Lead to Repeat of 1910–1945 Chaos?



# Repeating the 20<sup>th</sup> Century

| Timeline                             | Status                                                                                                                                                                                                                                                                                                   |
|--------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2011<br>Looked<br>a LOT Like<br>1911 | <ul style="list-style-type: none"><li>• Apathetic civilizations and atrophied systems blindsided by technology explosion &amp; cultural shifts.</li><li>• No unclaimed land except poles, but resource demands skyrocket as industrial age expands.</li></ul>                                            |
| And then...                          | <ul style="list-style-type: none"><li>• Ideological despotism leading to genocides</li><li>• Societies of collective spirit attack societies that value individual soul</li><li>• Repeated economic collapse</li><li>• Imperial conflicts for resources to feed new industries and populations</li></ul> |
| But then...<br>(1945–70)             | <ul style="list-style-type: none"><li>• Space Age and Information Age born</li><li>• Improved food production and medicine</li></ul>                                                                                                                                                                     |
| However...                           | <ul style="list-style-type: none"><li>• Still no new resources for industrial engines or populations.</li></ul>                                                                                                                                                                                          |
| Result                               | <ul style="list-style-type: none"><li>• 2011 GOTO 1911; End Subroutine.<br/>Without a paradigm shift, the routine will repeat.</li></ul>                                                                                                                                                                 |

# Replacing the Paradigm

| Stagnation Paradigm                             | Exploration Paradigm                            |
|-------------------------------------------------|-------------------------------------------------|
| Closed system of Exploration                    | Open system of Exploration                      |
| Fast technology, but fragile systems            | Robust Technology                               |
| Fragile Personas, Corruption, Ignorance         | Robust Personas, Integrity and Intelligence     |
| Danger, even discomfort, minimized artificially | Danger levels commensurate with core physiology |
| Interdependence/Isolation                       | Independence/Community                          |
| Blind Dog                                       | Seeing Eye Dog                                  |

# Impact of Exploration Paradigm

| Phase                    | Impacts on Culture                                                                                                                                                                                                                                                  |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cultural Rebirth         | <ul style="list-style-type: none"><li>• Education in core sciences valued</li><li>• Realization by culture that it has a future</li></ul>                                                                                                                           |
| Technological Rebirth    | <ul style="list-style-type: none"><li>• Solutions to space-related problems force people to look at all problems stereoscopically, rather than myopically with Earth-only applications</li><li>• Problem solving for closed space systems minimizes waste</li></ul> |
| Open System of Resources | <ul style="list-style-type: none"><li>• Mining of resources for space use acts as force multiplier for expansion</li><li>• Eventual mining of space resources for earth applications opens systems without war or economic conflict</li></ul>                       |

# Conclusion

| Phase                 | Impacts on Culture                                                                                                                                                                                                   |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Collapse and Recovery | <ul style="list-style-type: none"><li>• A society that has faced adversity is brave enough to explore new worlds.</li></ul>                                                                                          |
| New Tall Ships        | <ul style="list-style-type: none"><li>• Create modular, bold fleets (“dog packs”) with maximum in-situ resource utilization, simple design, low cost, universality (pole to tropic), unlimited field life.</li></ul> |
| New Exodus            | <ul style="list-style-type: none"><li>• Break away from slavery and closed systems</li><li>• Face the challenges of the wilderness with a new “greatest generation”.</li></ul>                                       |