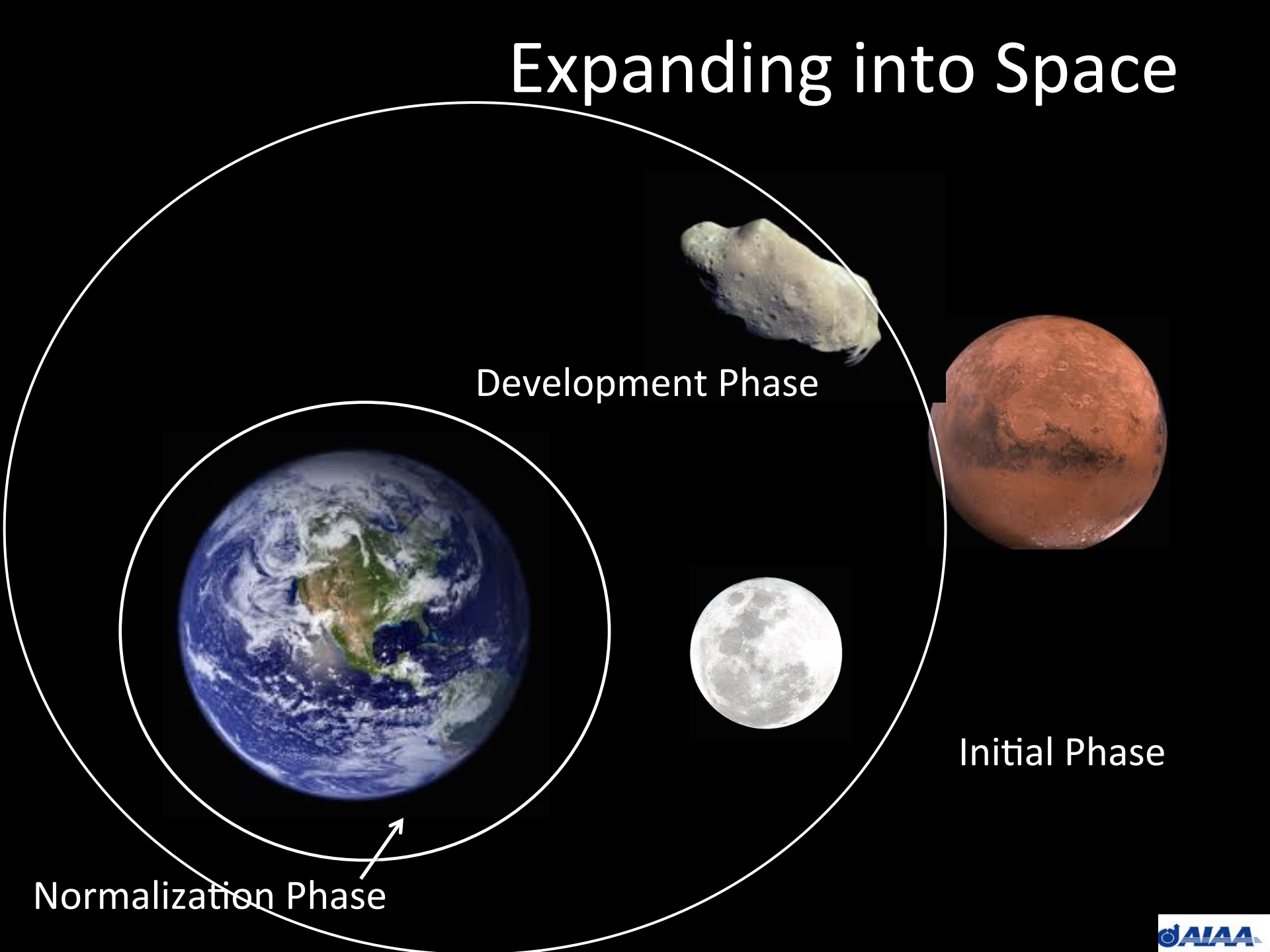
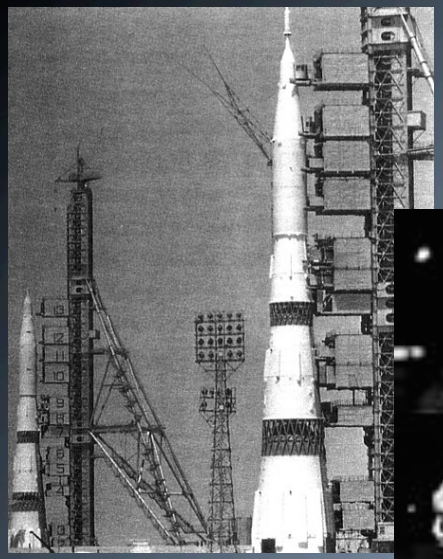
The Role of Industry in Space: A Shifting Paradigm

American Institute for Aeronautics and Astronautics

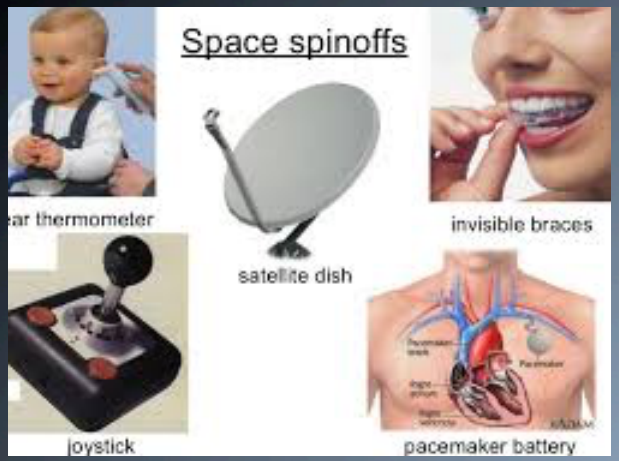
Expanding into Space



Initial Phase: Government



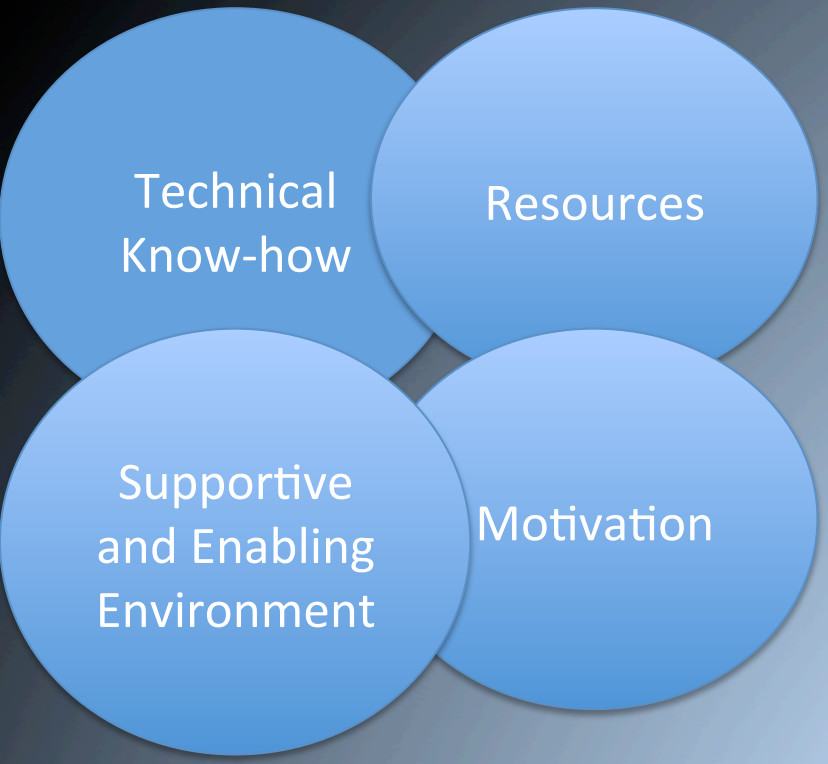
- Strategic Motivation
- Profit not important
- Huge initial investment
- Unknown risk/reward situation
- No business case
- No rules in place

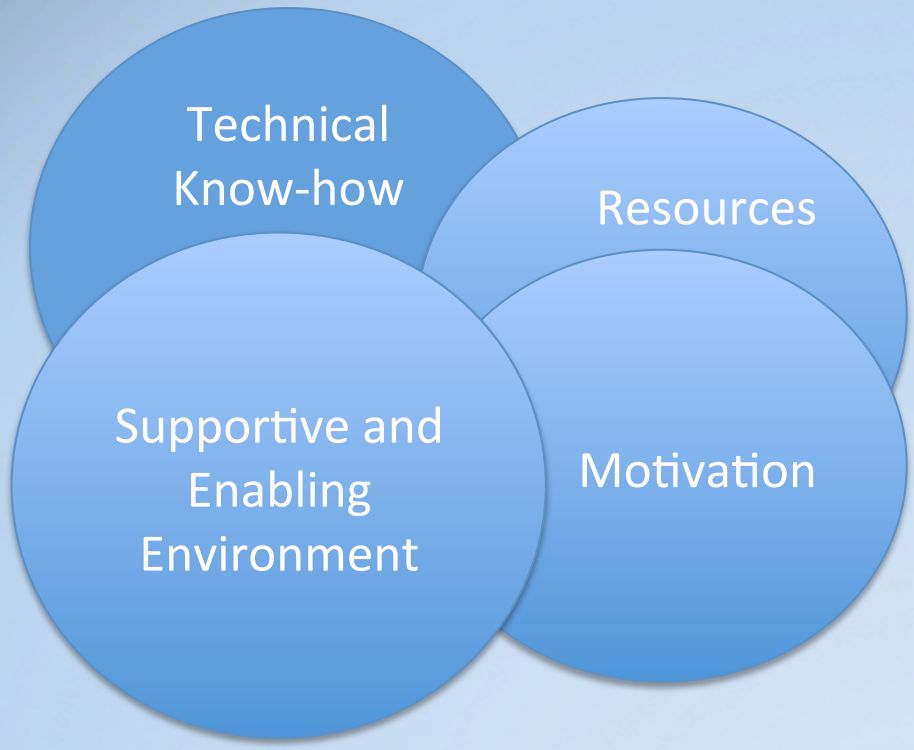


Initial Phase: Industry

- Work under Government supervision
- Followed Government lead
- Dependent on Government funding
- Developing capability
  - Technical skill sets
  - Programmatic skill sets
  - Corporate knowledge creation
- Licensed technologies for spin offs

Development Phase

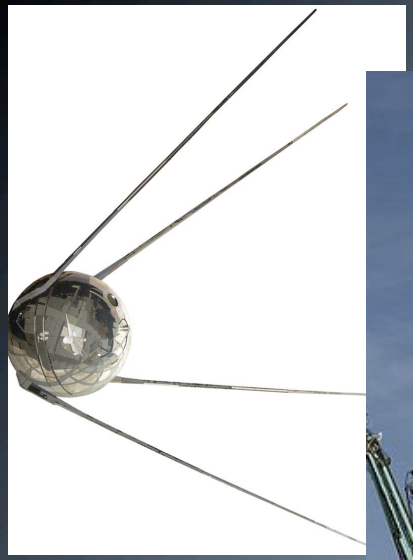


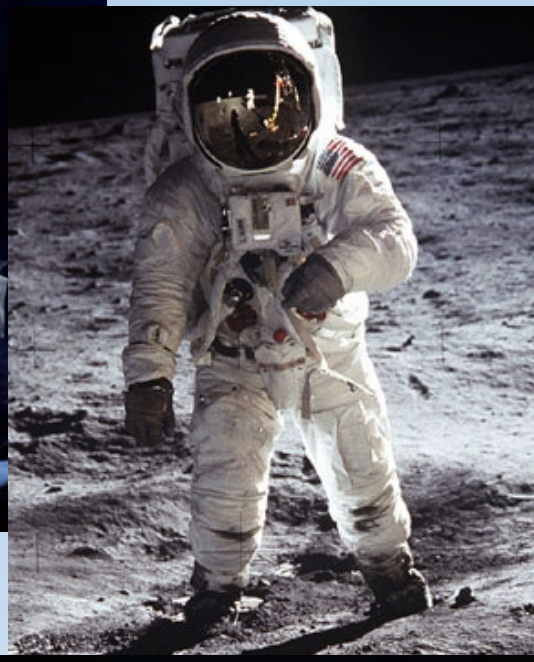


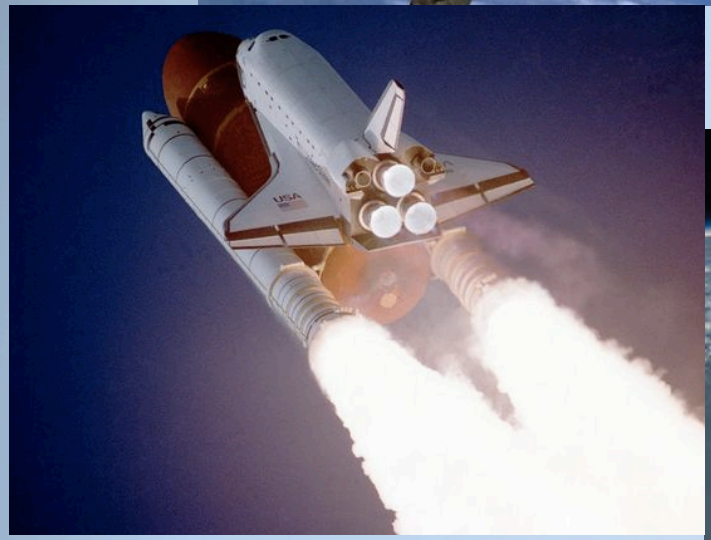
After 50 years of slowly accumulating experience in Low Earth Orbit…

….we live in interesting times!

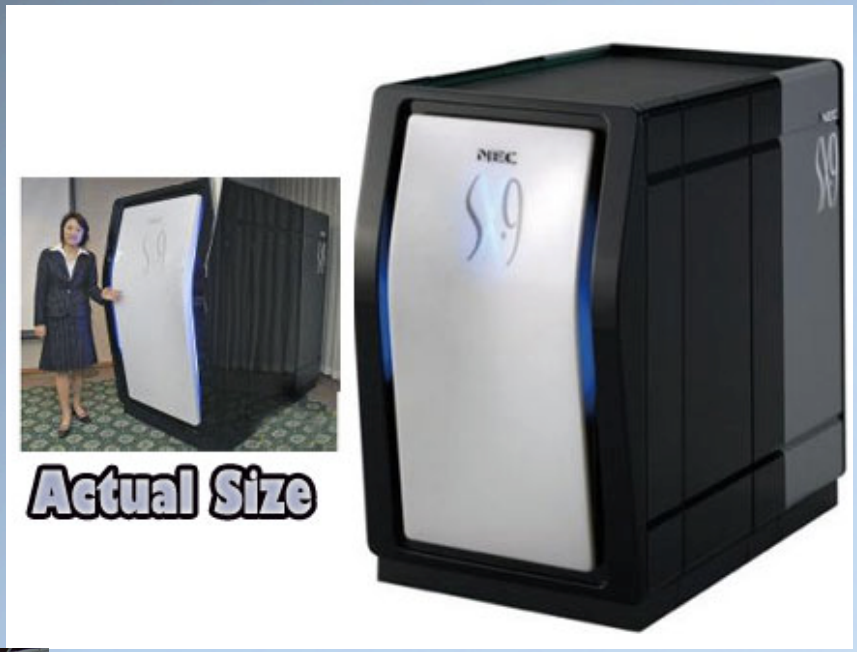
Technical Know-how

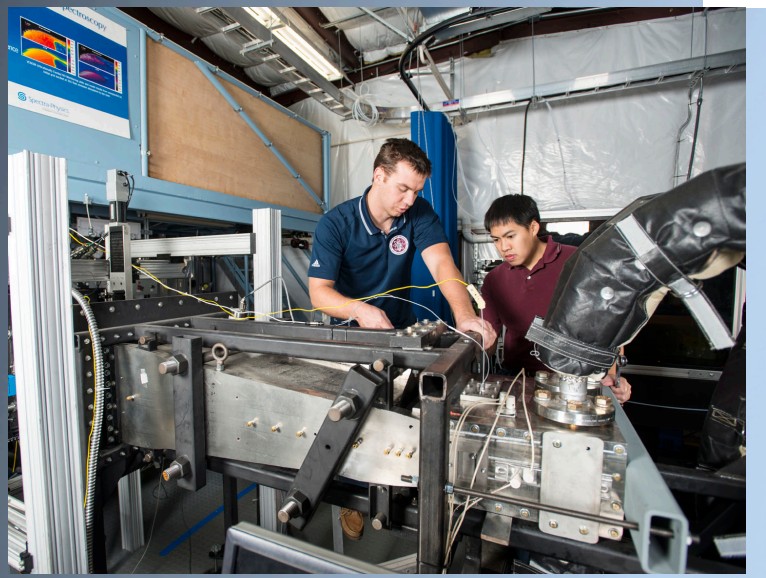






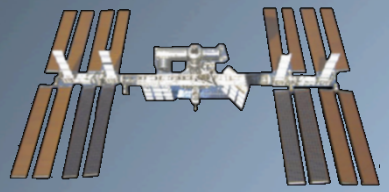
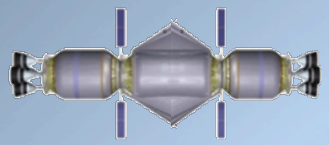
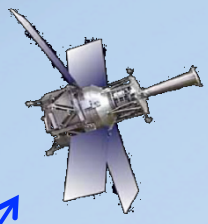
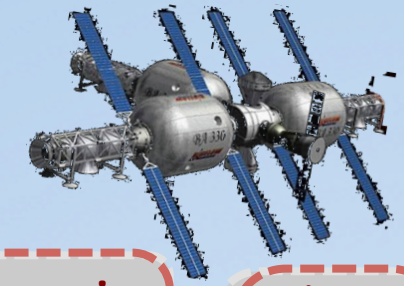
Resources





- People willing to invest
- Advanced communications
- Advanced connectivity
- Educated/Experienced Workforce

Motivation

Commercial Satellite Launches

ISS Cargo

Industrial Research

Fuel Launch to Depot

Tech Demo Launches

Sovereign Clients

Private Orbital Facilities

Government Satellites

ISS Space Tourism

Commercial Crew

Expanded Space Tourism

Expanded Spaceport Tourism

early 2010's
Proven Markets

late 2010's
Enabled Markets

early 2020's
Growth Markets

Slide Courtesy of the Commercial Spaceflight Federation

Supportive and enabling environment

NASA's Commercial Crew Program

"To facilitate the development of a U.S. commercial crew space transportation capability, with the goal of achieving safe, reliable and cost effective access to and from low-Earth orbit and the ISS"

Supportive and enabling environment …is still evolving

- International Level
- Country Level
- COMSTAC in the USA

Development Phase: Government

- Industry is Partner
- Government needs strategic approach
  - Capabilities and responsibilities
  - Long term vision for development goals
- Investment mechanisms need examination
- Should set up the framework for engagement

Development Phase: Industry

- Independent Interests (from Government)
- Business cases developed
- Still an entrepreneurial environment
- Needs structured framework in which to operate
- Can be self sustaining with strategic support

Normalization Phase

- Not yet achieved
- Satellite industry closest
- Model: Airline industry, manufacturing industry

Looking back at this decade we will mark this moment as the beginning of human expansion into space for purposes beyond exploration.

Satellite Timeline

1957 Launch of Sputnik

1962 Telestar 1 launched by US Govt but designed by AT&T marked the beginning of the commercial satellite industry.

1962 Communications Satellite Act passed
Which allowed companies to operate private satellites.

1980 satellites launched on vehicles
not wholly controlled by government.
ESA creates Arianespace.

1984 Regan signed Commercial Space Launch Act
Which created the Office of Commercial Space Transportation and enabled private operators of ELVs

1985 Soviet Union began marketing contracted satellite launches.

Since 1957 only 13 countries have their own launch capability. 13 more are working towards a space launch capability. 58 countries have sent satellites into orbit.

1993 International partnership between US/Russian companies formed to market Proton rocket. Energia Is evolved to non-governmental entity.