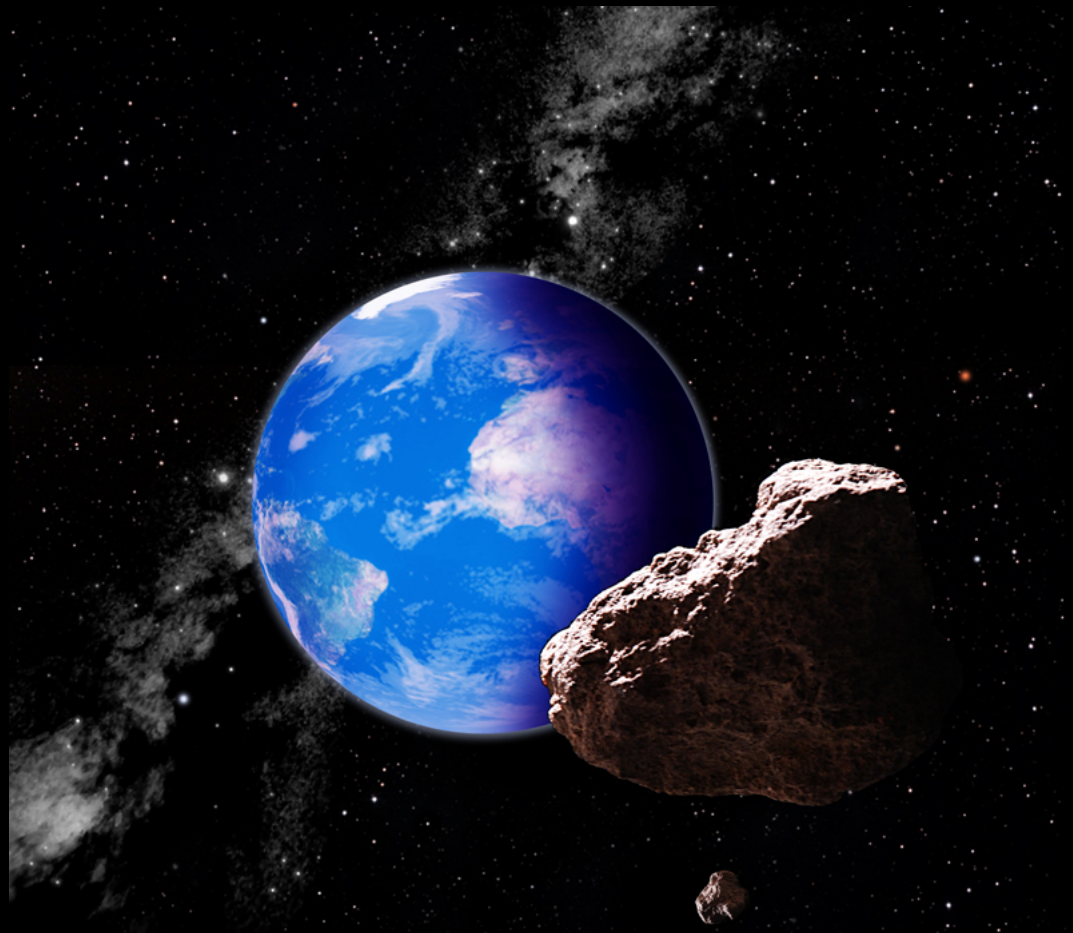
Human NEO Exploration



KISS NEO Study

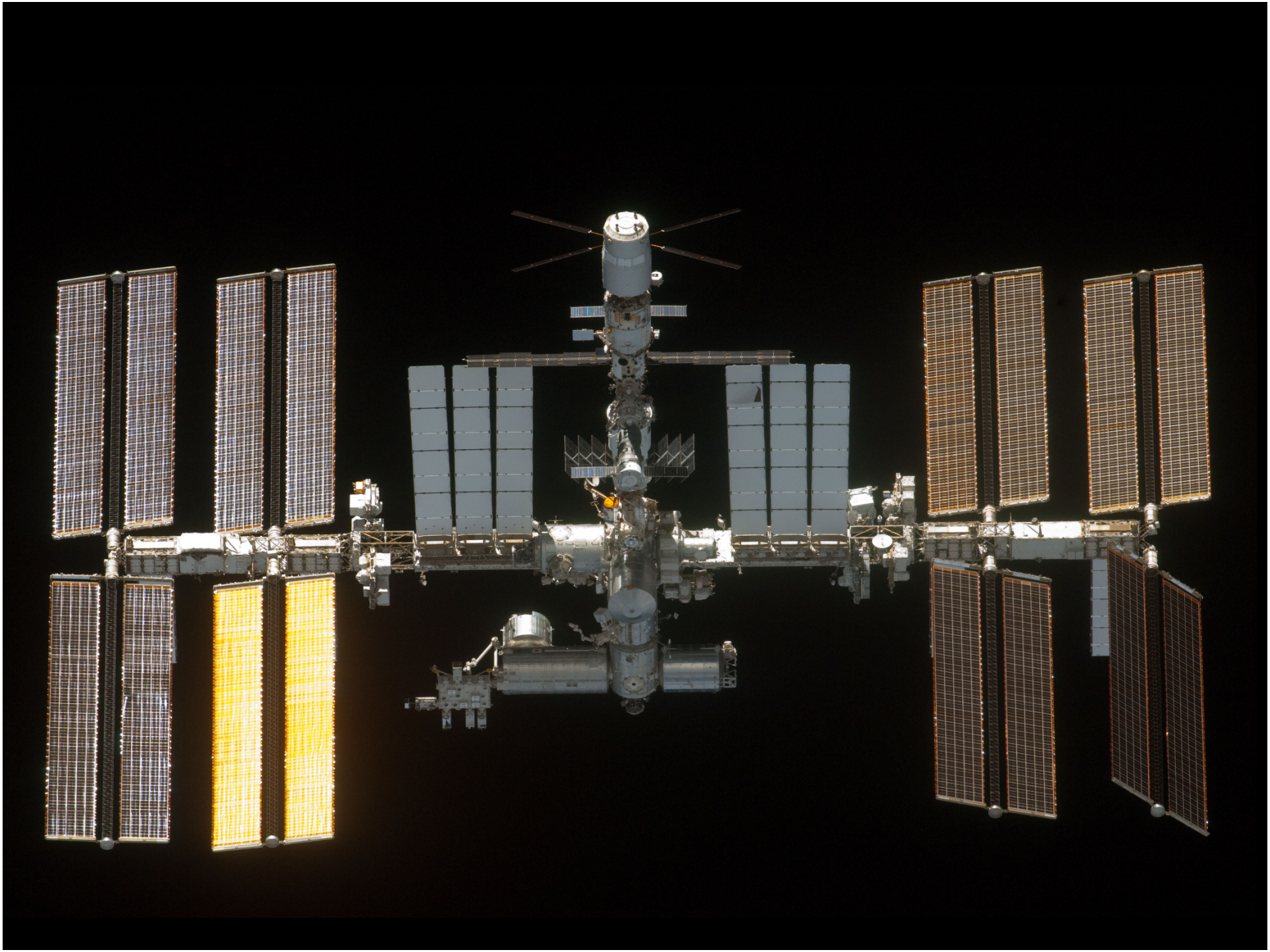
Tom Jones

skywalking1@gmail.com

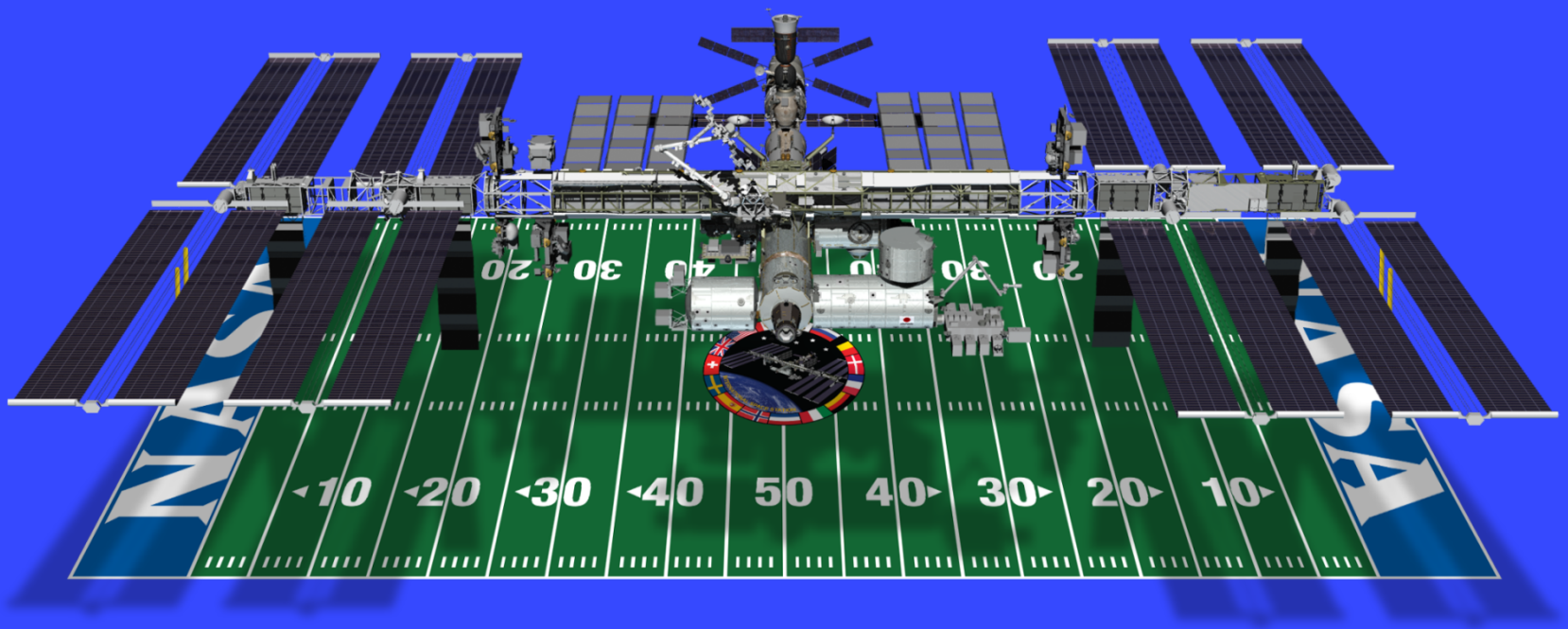
Sept. 27, 2011







ISS FACTS



Spacecraft Mass: 816,349 lb (370,290 kg)
Velocity: 17,500 mph (28,200 kph)
Altitude: 220 miles above Earth
Science Laboratories from
US, Europe, Japan, and Russia





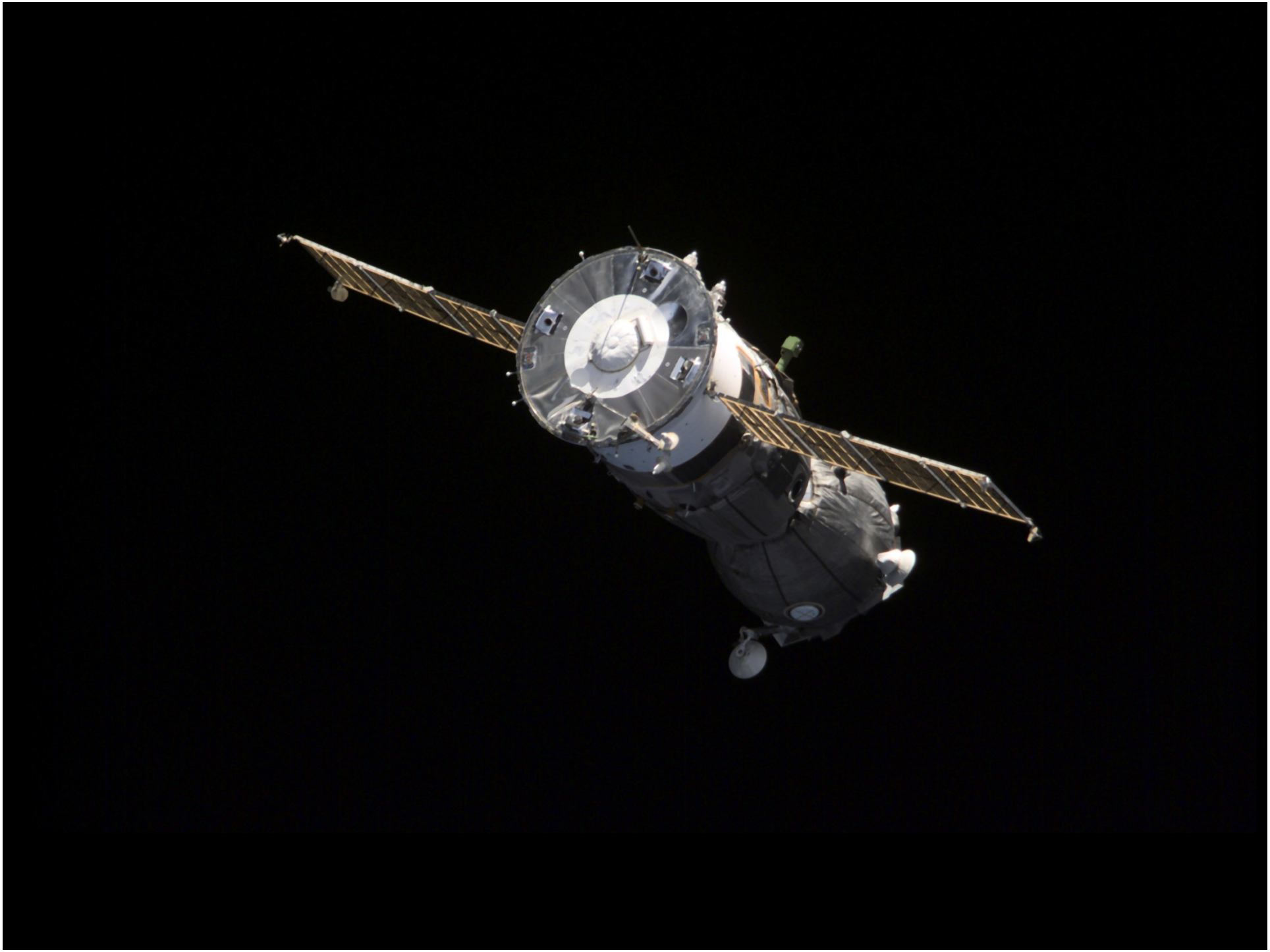




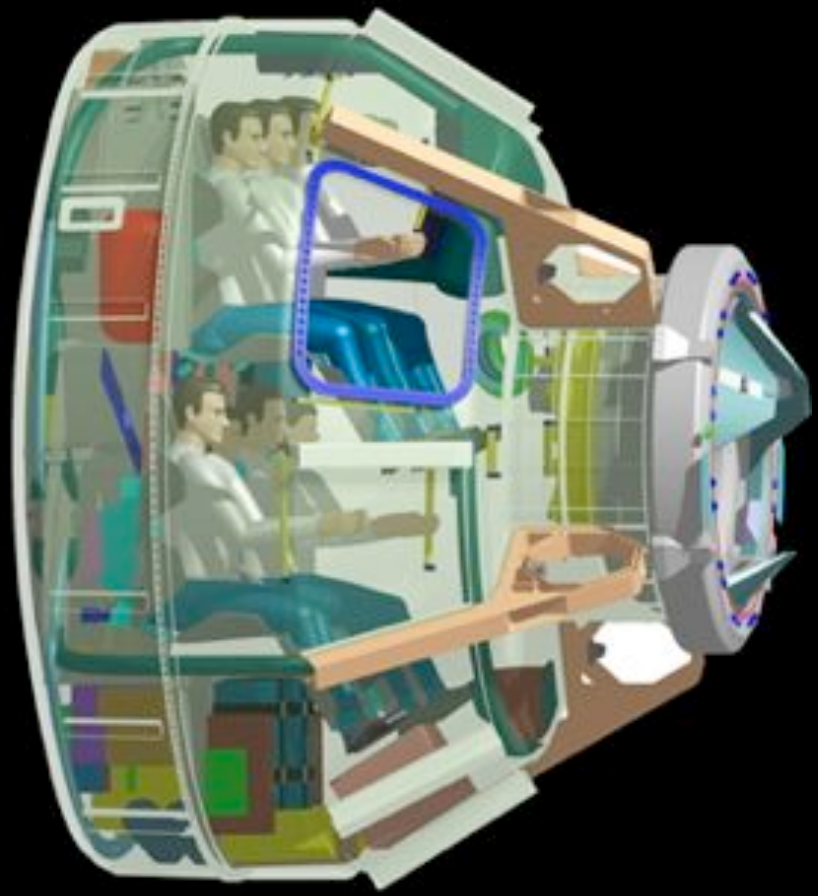


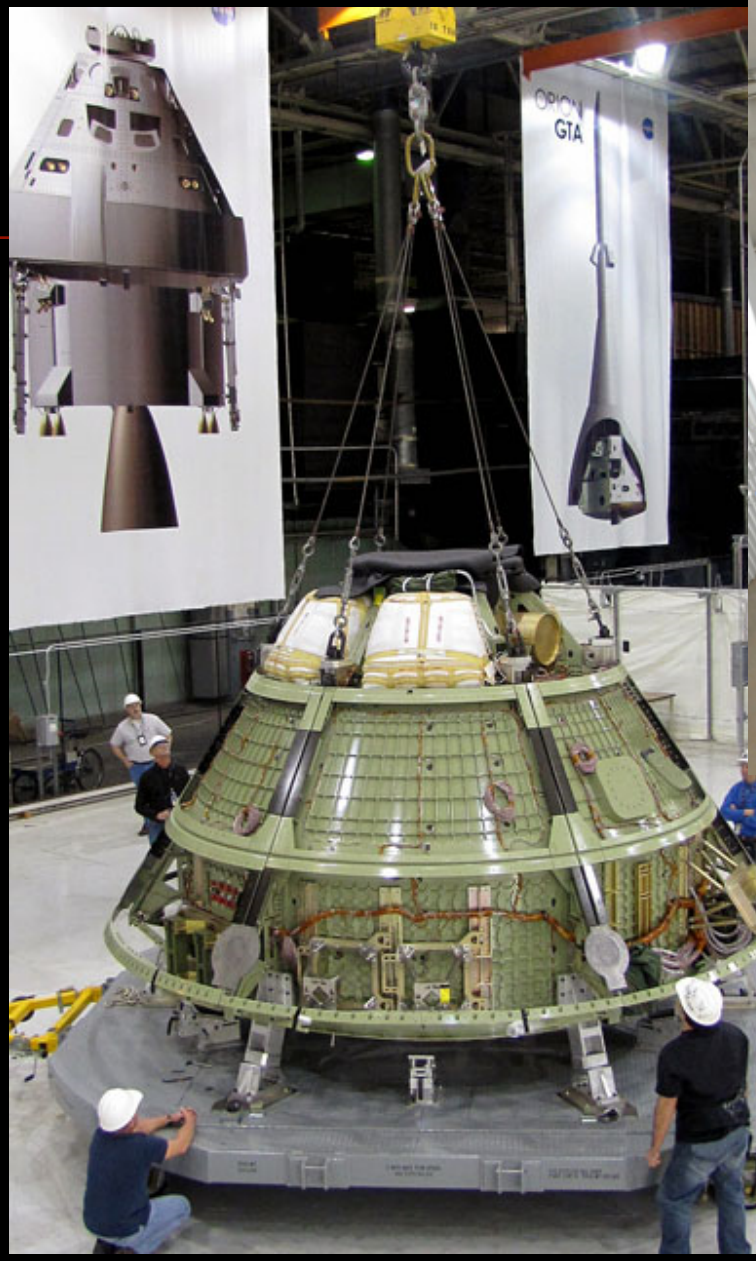






Photo: SpaceX / Mike Altenhofen

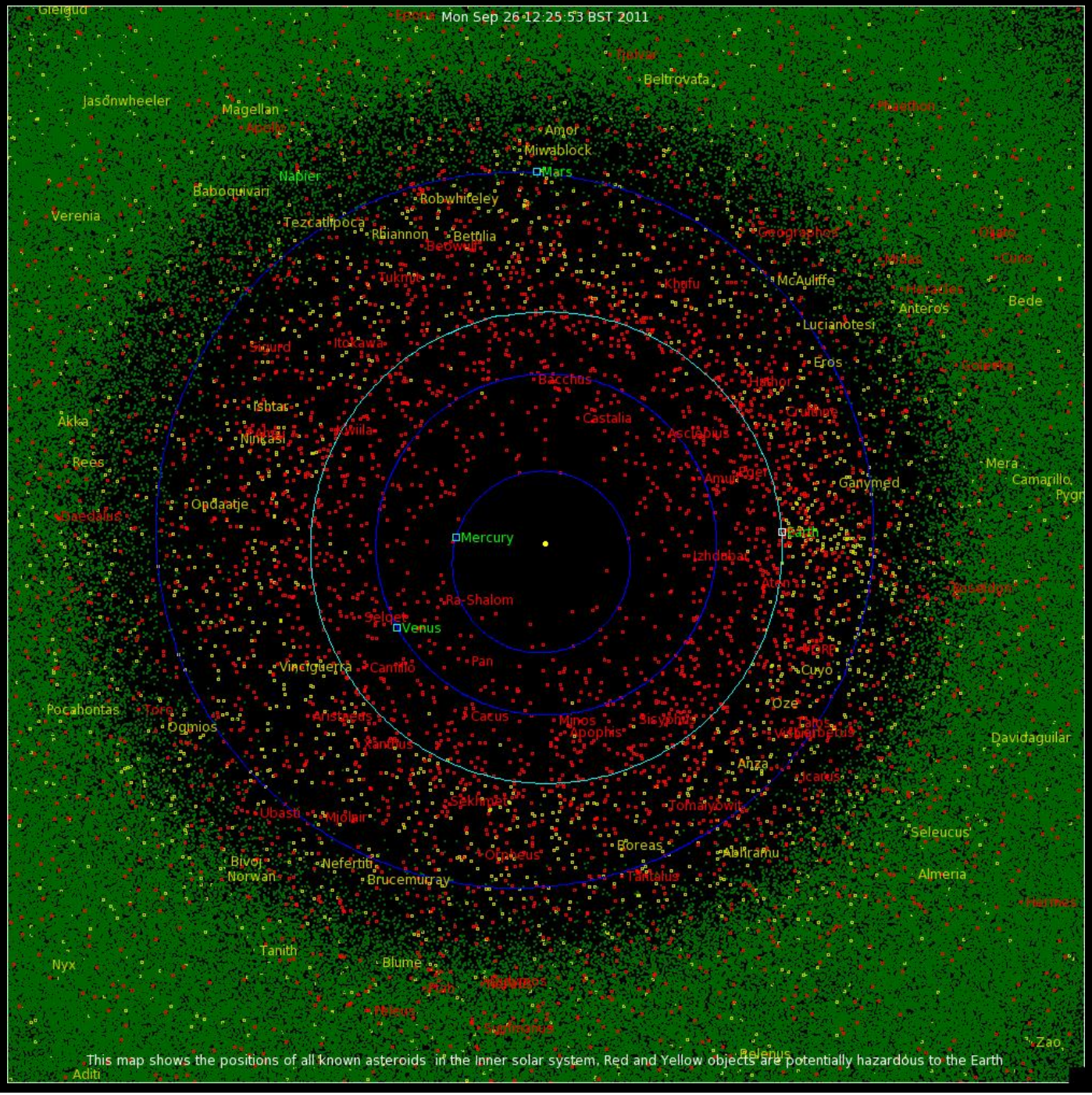


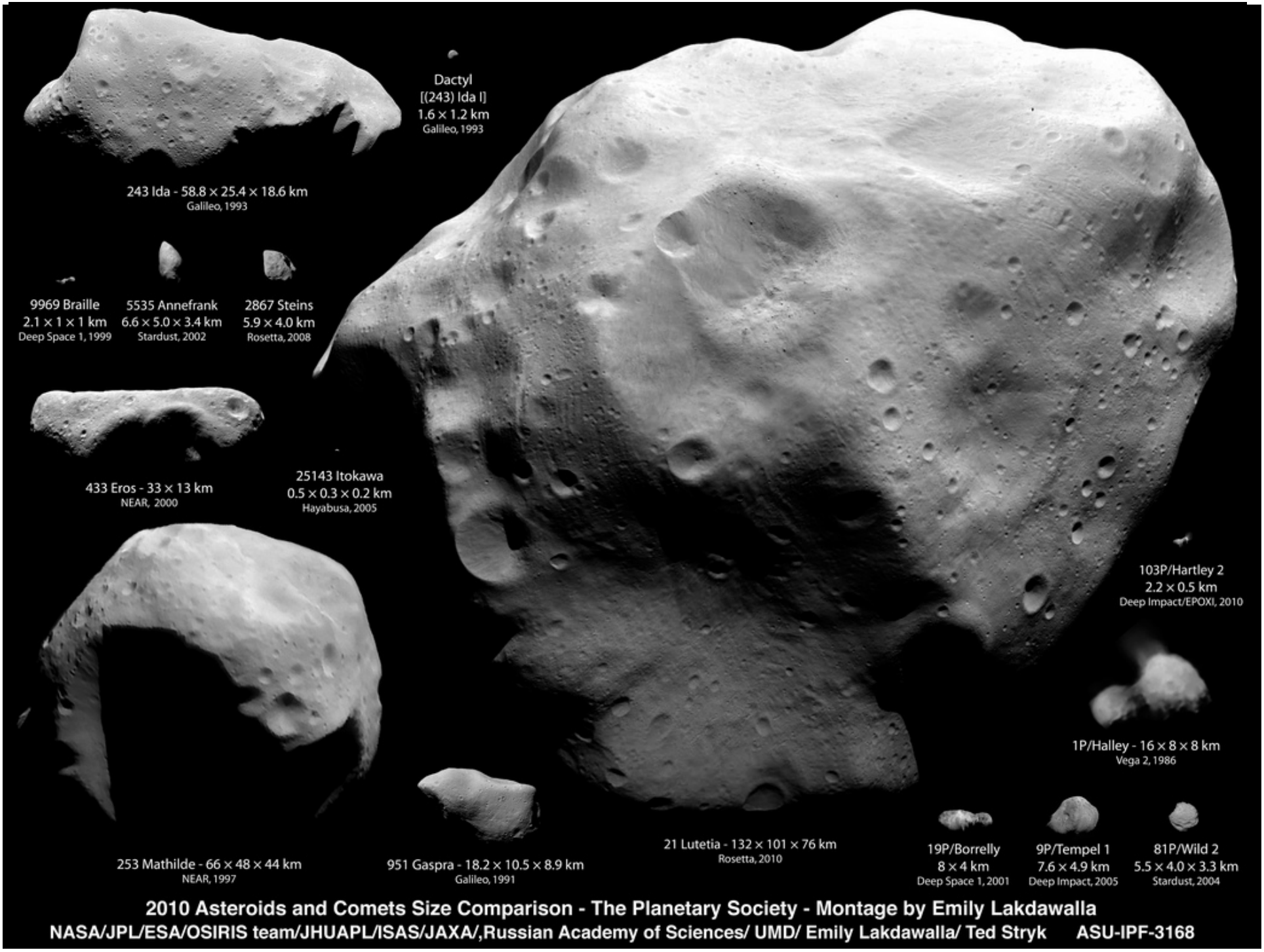




Multi-Purpose Crew Vehicle (also known as “Orion”)


USA


Mon Sep 26 12:25:53 BST 2011
Gielgud
Jasonwheeler
Magellan
Apollo
Beltrovata
Amor
Miwablock
Mars
Napier
Baboquivari
Robwhiteley
Verenia
Tezcatlipoca
Rhiannon
Bettilia
Beowulf
Tukmit
Khufu
McAuliffe
Anteros
Lucianotesi
Bede
Sigurd
Itokawa
Eros
Bacchus
Hathor
Ishtar
Castalia
Asclepius
Akka
Nunki
Wilda
Rees
Anubis
Ganymed
Mera
Camarillo
Pygr
Daedalus
Mercury
Earth
Izhdehar
Ra-Shalom
Selqet
Venus
Pan
Vincilguerra
Camillo
Cuyo
Pocahontas
Toro
Ogmios
Aristaeus
Cacus
Minos
Apophis
Oze
Davidaguilar
Anza
Icarus
Tomanyowit
Ubasti
Midlan
Seleucus
Boreas
Nefertiti
Bivoj
Norwan
Brucemuray
Almeria
Hermes
Tanith
Nyx
Blume
Zao
This map shows the positions of all known asteroids in the inner solar system. Red and Yellow objects are potentially hazardous to the Earth
Aditi



2010 Asteroids and Comets Size Comparison - The Planetary Society - Montage by Emily Lakdawalla

NASA/JPL/ESA/OSIRIS team/JHUAPL/ISAS/JAXA/,Russian Academy of Sciences/ UMD/ Emily Lakdawalla/ Ted Stryk ASU-IPF-3168







“All I’m saying is now is the time to develop the technology to deflect an asteroid.”


MINT
CENTS
$50



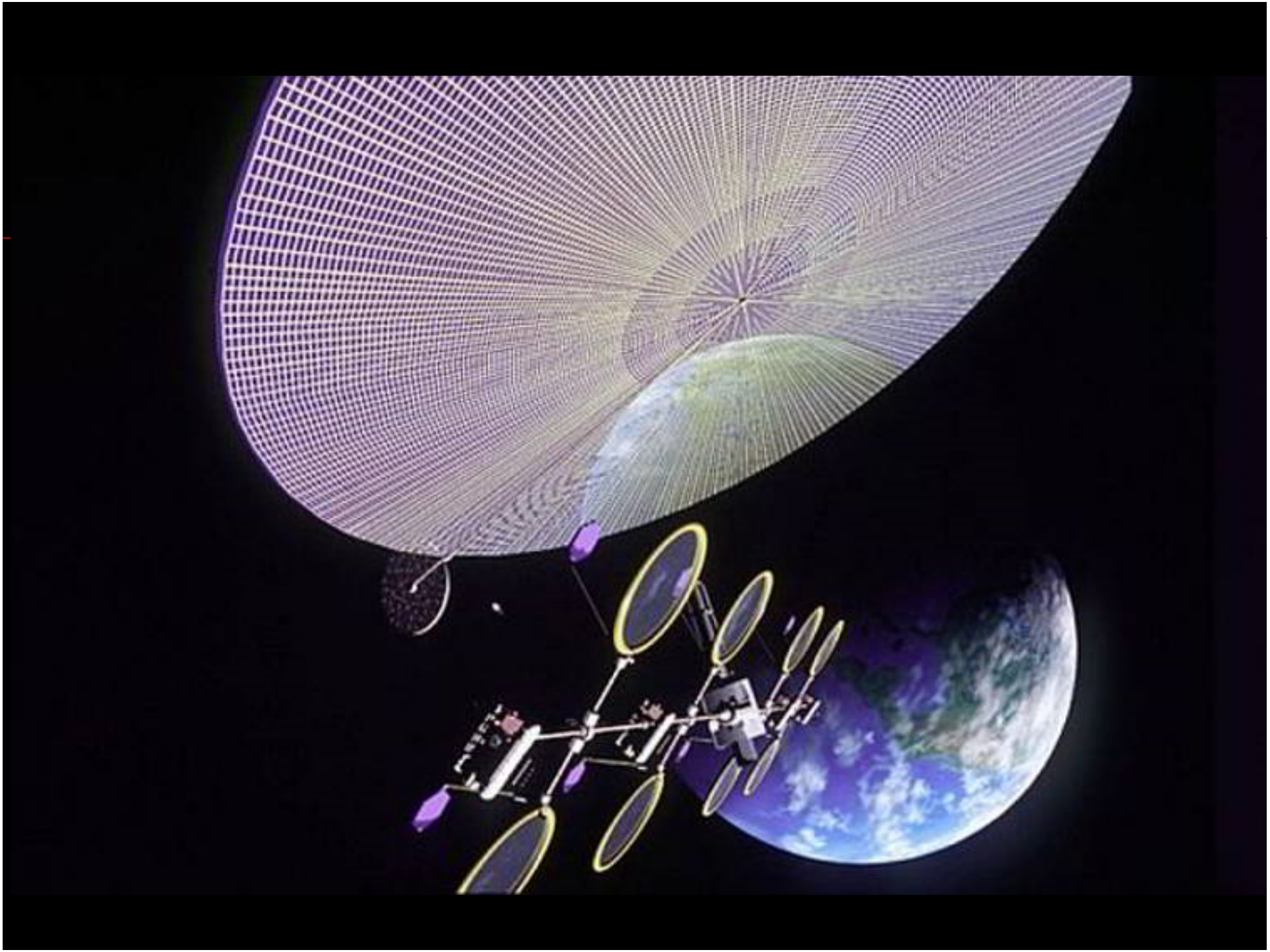
Murchison

Tagish Lake







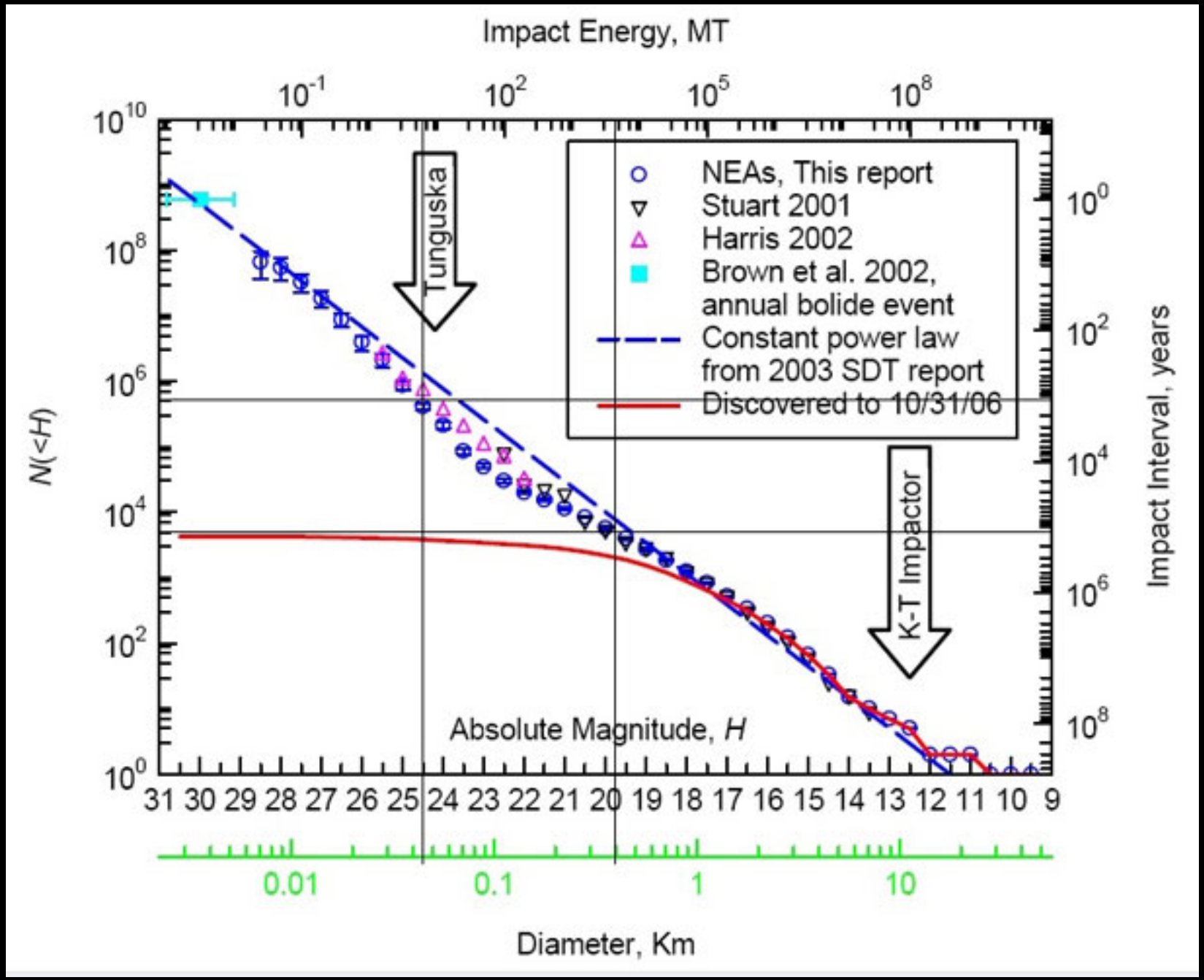




Participatory Exploration

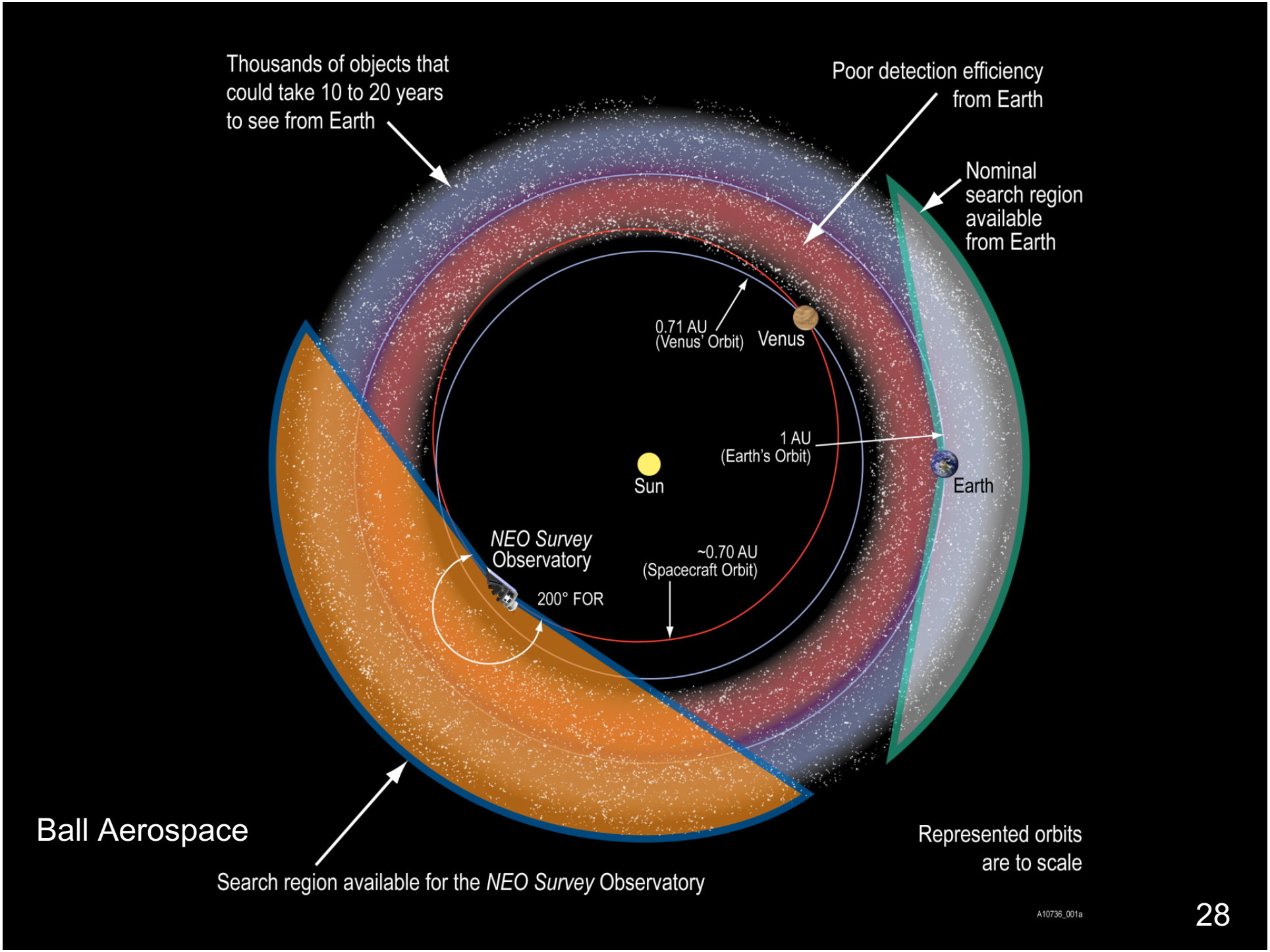
The Asteroid Itokawa, the ISS and MPCV



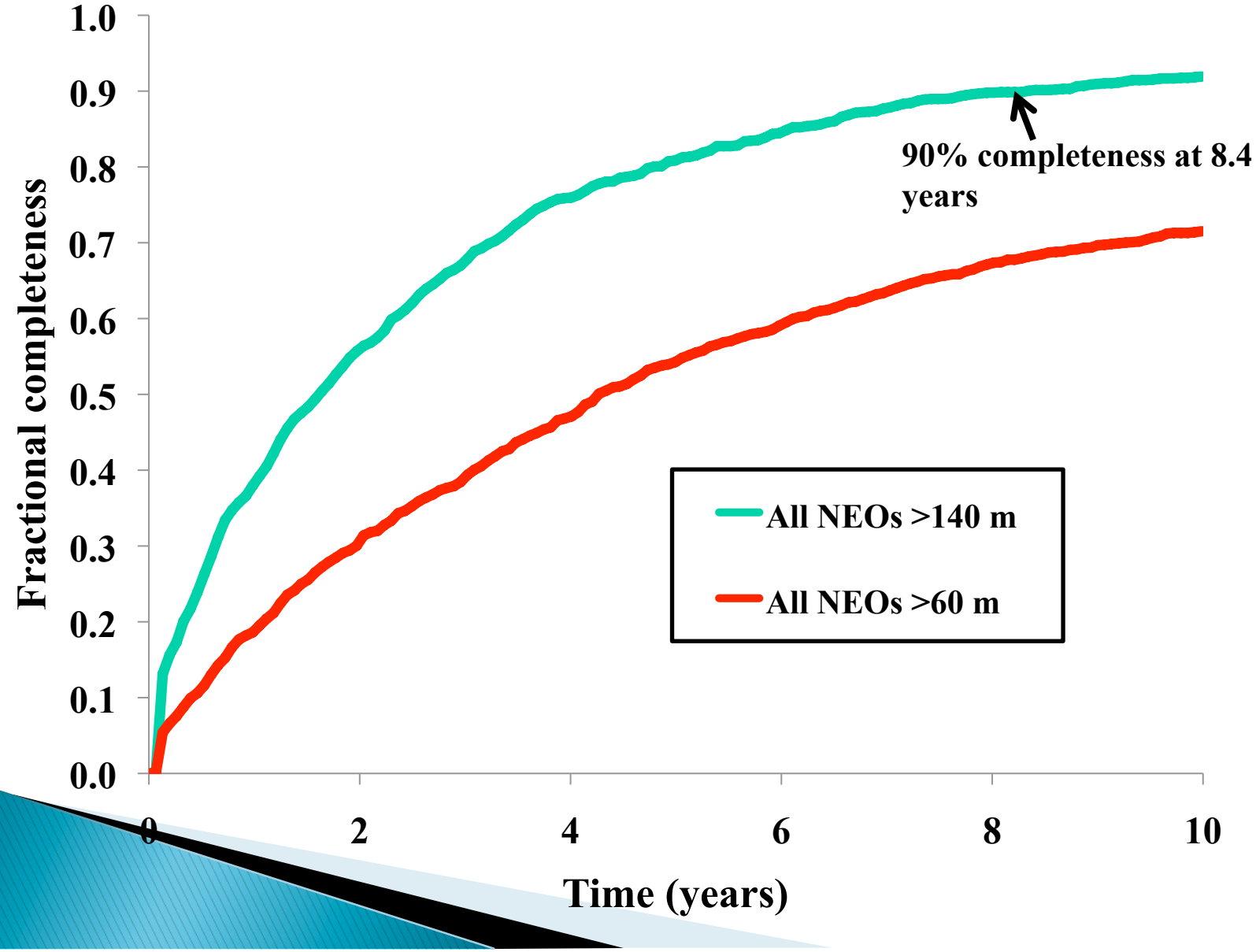

Impact Energy, MT
10^{-1}
10^{2}
10^{5}
10^{8}
10^{10}
10^{8}
10^{6}
10^{4}
10^{2}
10^{0}
N(<H)
Tunguska
K-T Impactor
NEAs, This report
Stuart 2001
Harris 2002
Brown et al. 2002, annual bolide event
Constant power law from 2003 SDT report
Discovered to 10/31/06
10^{0}
10^{2}
10^{4}
10^{6}
10^{8}
Impact Interval, years
Absolute Magnitude, H
31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9
0.01
0.1
1
10
Diameter, Km



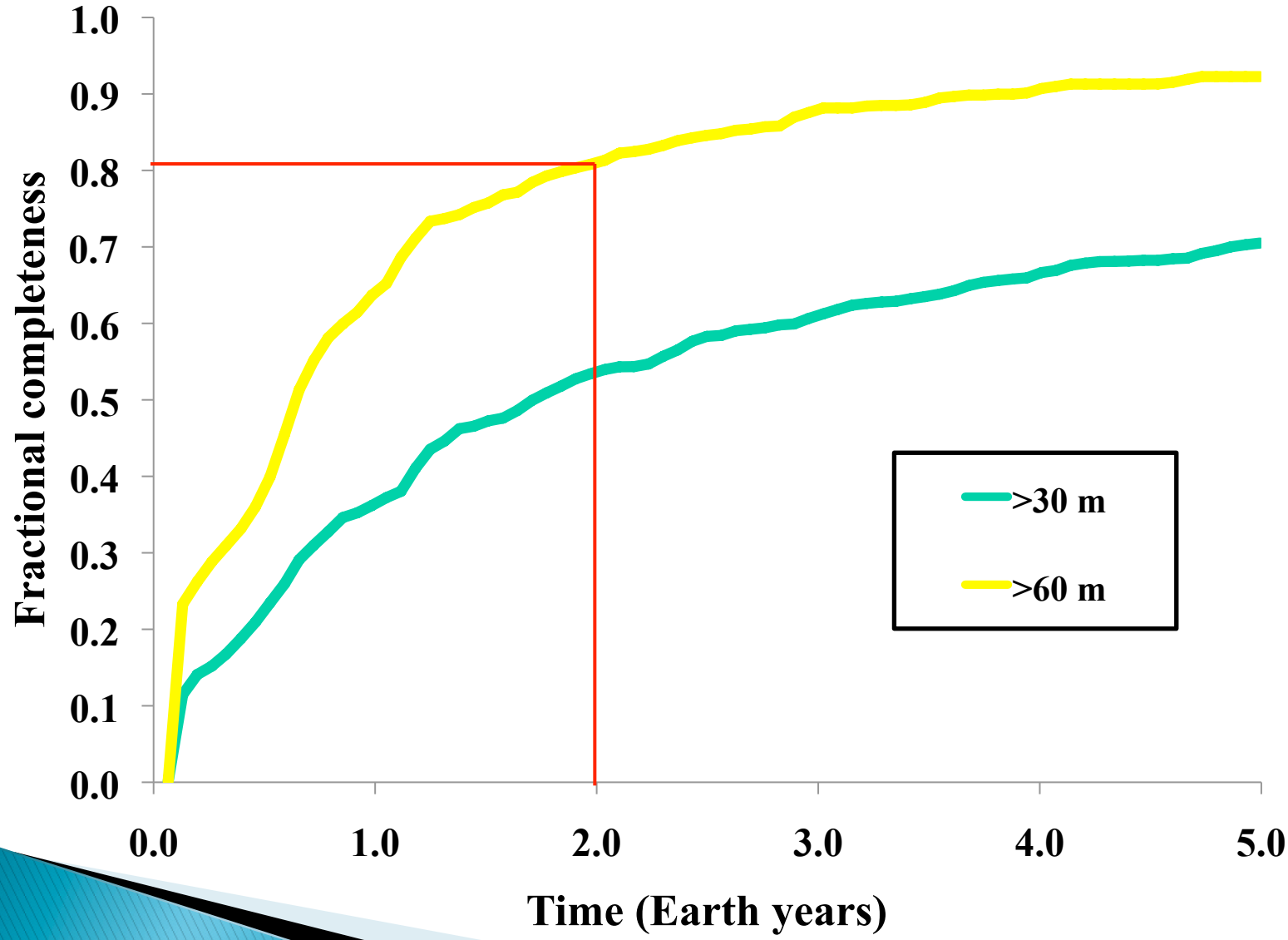
http://targetneo.org/


Thousands of objects that could take 10 to 20 years to see from Earth
Poor detection efficiency from Earth
Nominal search region available from Earth
0.71 AU (Venus' Orbit)
Venus
1 AU (Earth's Orbit)
Earth
Sun
NEO Survey Observatory
200° FOR
~0.70 AU (Spacecraft Orbit)
Ball Aerospace
Search region available for the NEO Survey Observatory
Represented orbits are to scale
A10736_001a

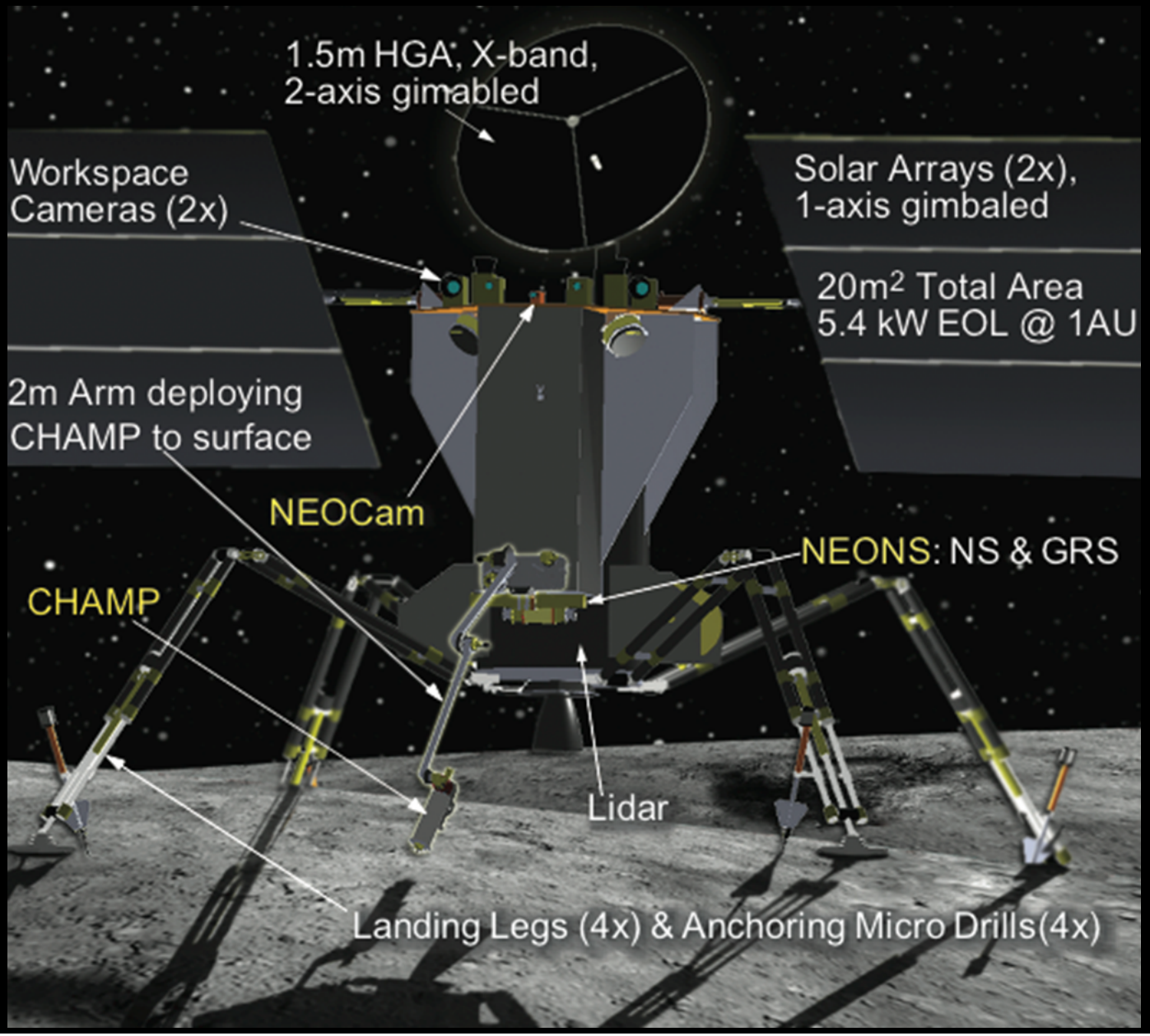
Completeness for entire NEO population: IR space telescope only

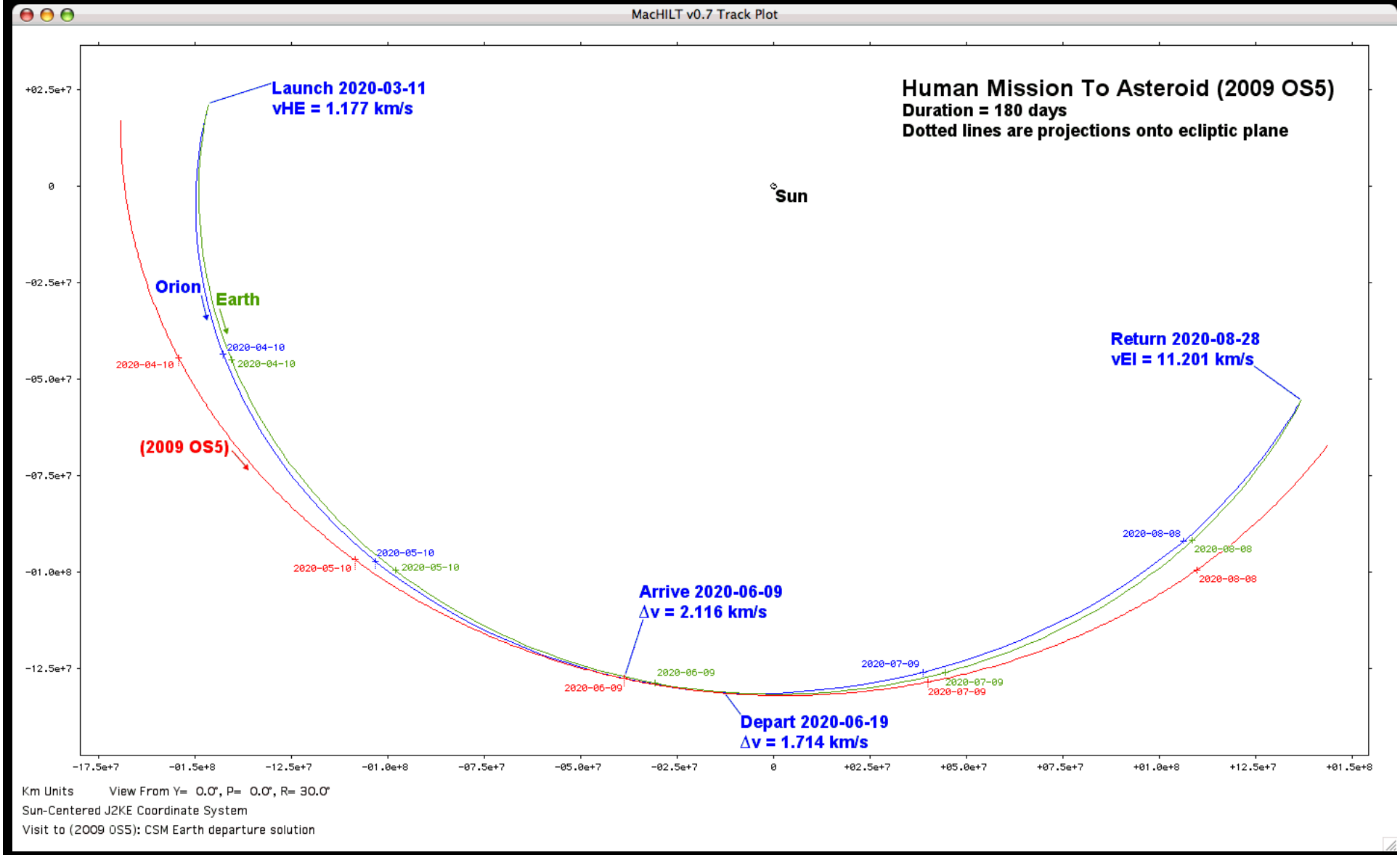


Completeness on Human Exploration targets: IR space telescope only



Amor NEO Lander Concept - ARC



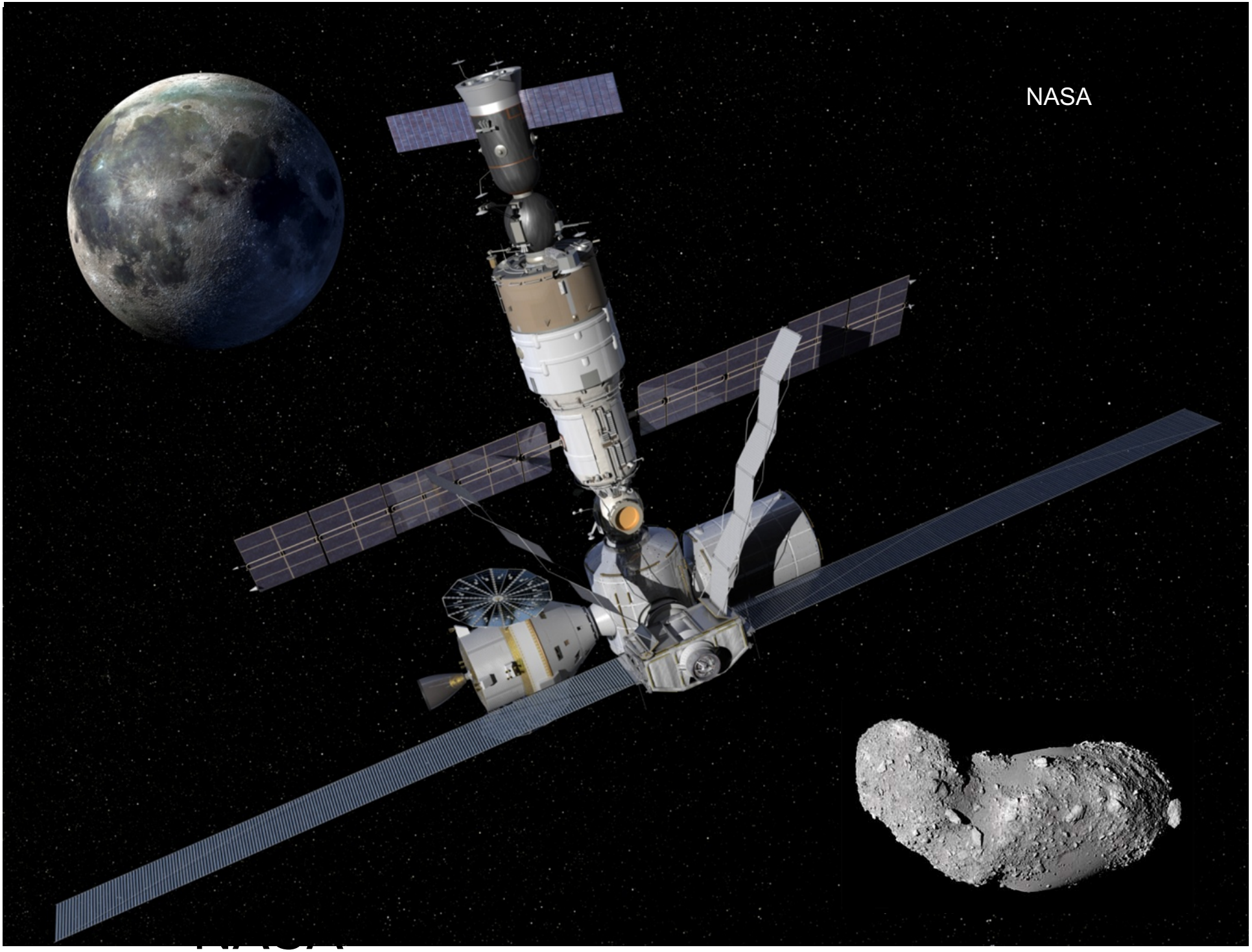


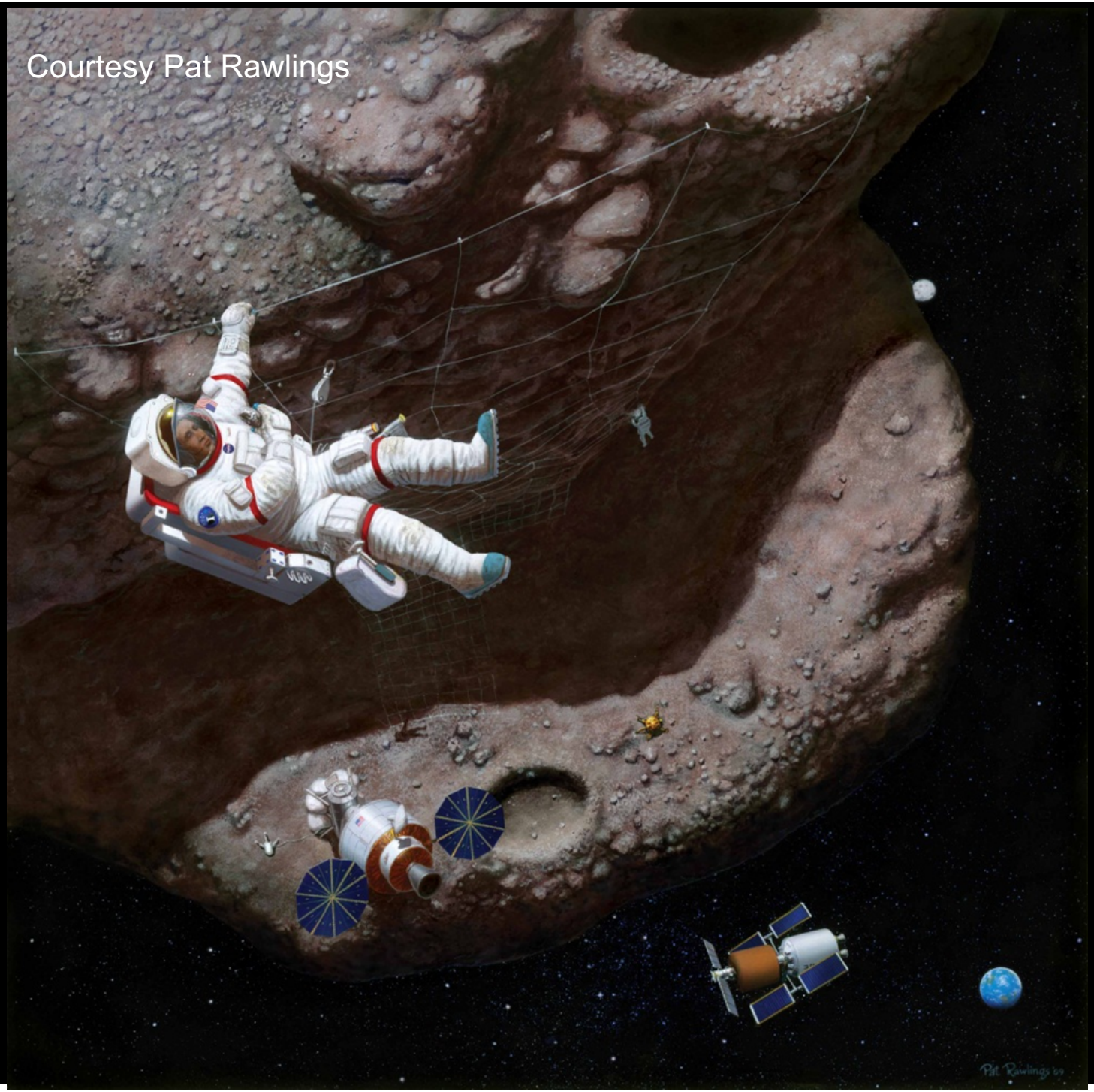
(Courtesy Dan Adamo)

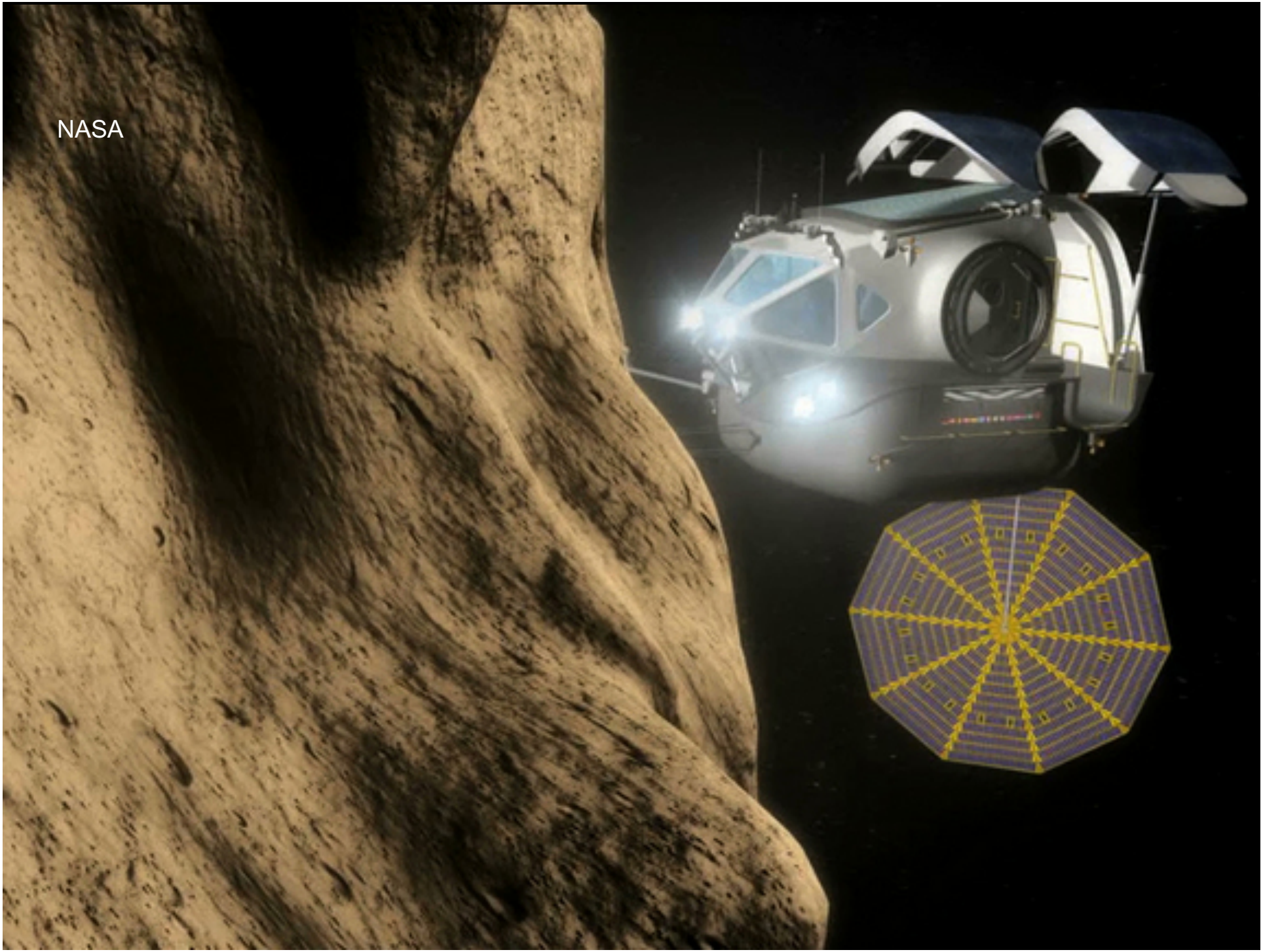

Art by Dan Durda



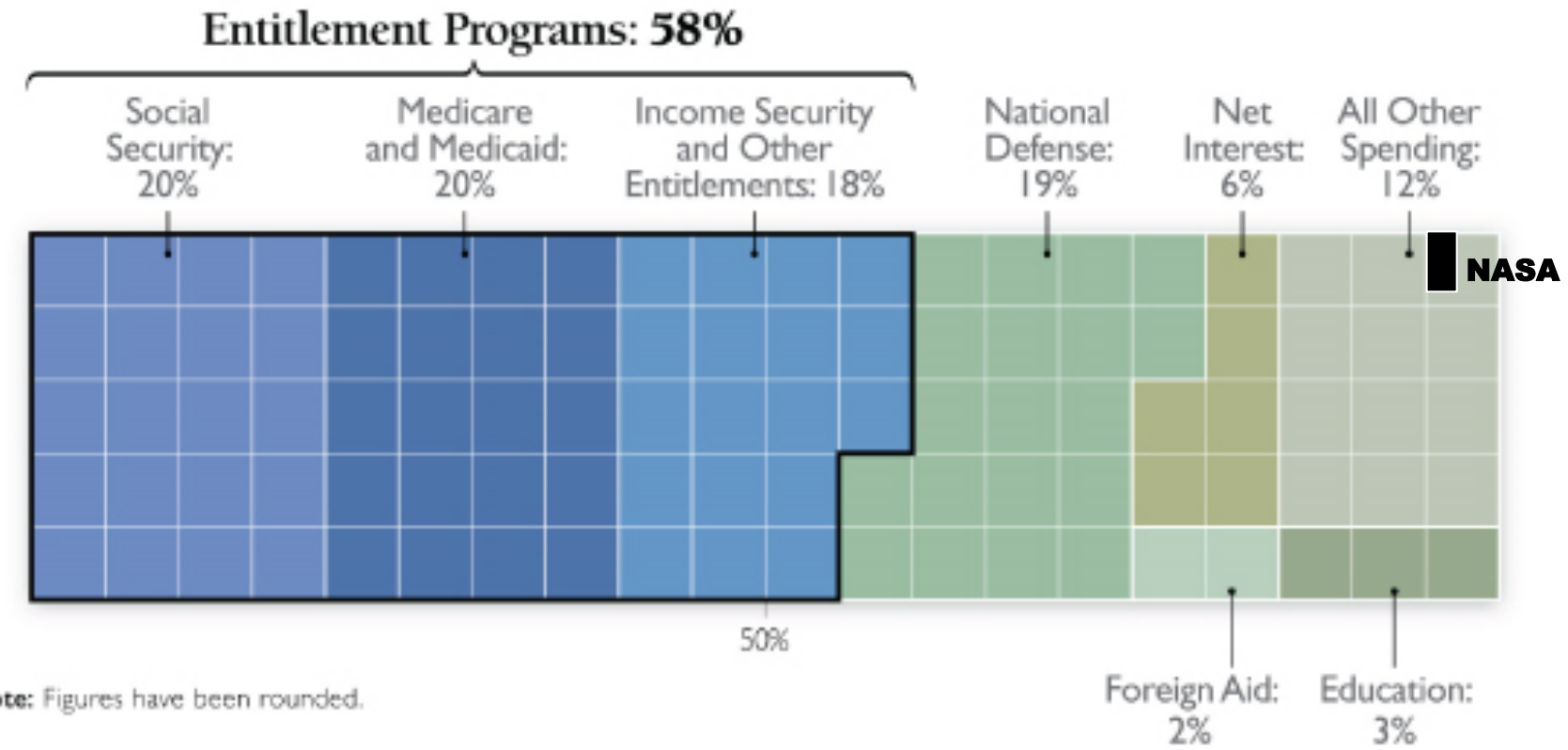
Lockheed Martin


NASA


Courtesy Pat Rawlings


NASA

PERCENTAGE OF THE PRESIDENT'S FY2012 BUDGET



Note: Figures have been rounded.

Source: White House Office of Management and Budget.

Federal Spending Chart 6 • 2011 Budget Chart Book heritage.org

Association of Space Explorers

skywalking1@gmail.com



Art by Dan Durda