



Comets and Asteroids Educator Conference

Exploring Our Solar System's Smaller Bodies

Bob Mase, Dawn Project Manager
NASA's Jet Propulsion Laboratory

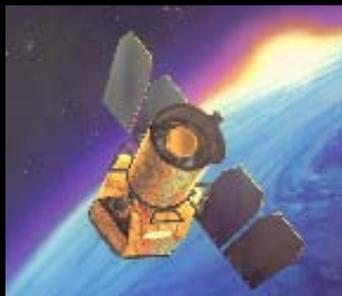
February 05, 2011

JPL is part of NASA and Caltech

- Federally-Funded (NASA-owned) Research and Development Center (FFRDC)
- University Staffed and Managed (Caltech)
- \$1.7B NASA Budget
- 5,000 Employees
- 177 Acres



Nineteen spacecraft, nine instruments across the solar system (and beyond)



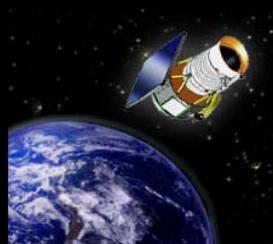
GALEX



Spitzer



Twin Voyagers



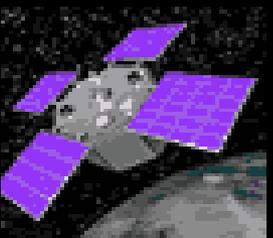
Kepler



ACRIMSAT



Dawn



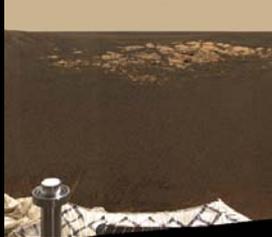
Wide-field Infrared Survey Explorer (WISE)



Mars Odyssey



Spirit



Opportunity



Mars Reconnaissance Orbiter



Cassini



Stardust-NExT



EPOXI - Deep Impact



Jason 1 and Jason 2



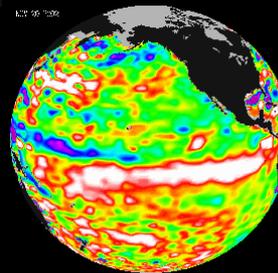
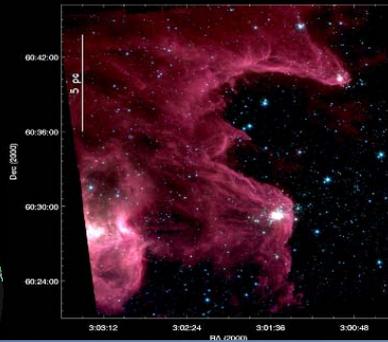
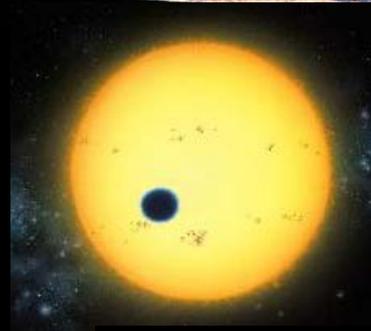
GRACE

Plus Instruments:

- ASTER
- MISR
- TES
- MLS
- AIRS
- MIRO
- Herschel
- Planck
- Diviner

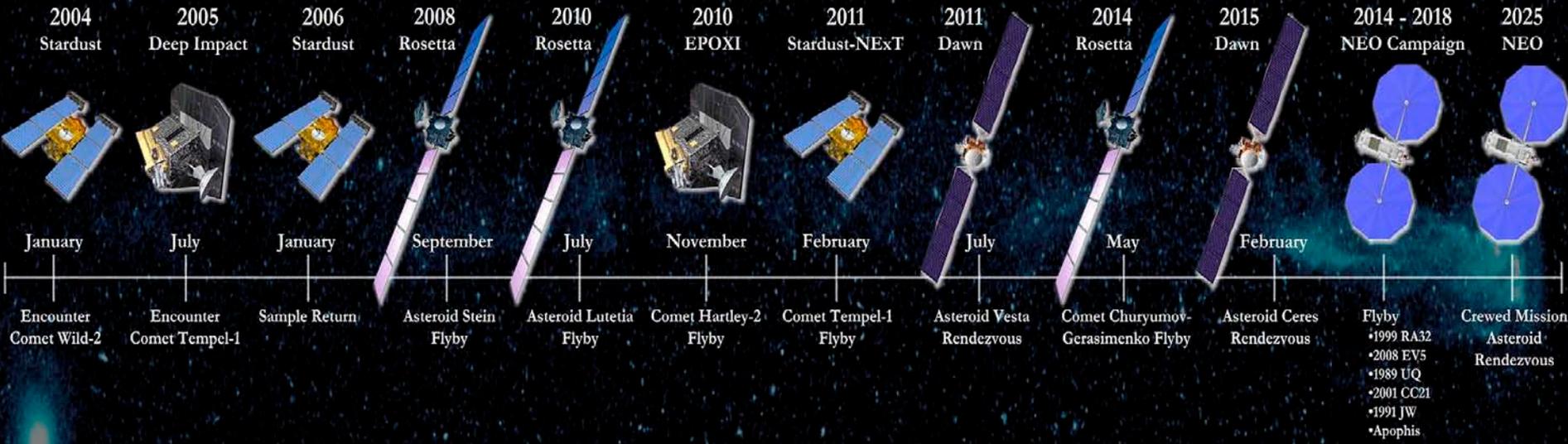
JPL's mission for NASA is robotic space exploration

- Mars
- Solar system
- Exoplanets
- Astrophysics
- Earth Science
- Interplanetary network



ASTEROID & COMET ENCOUNTERS

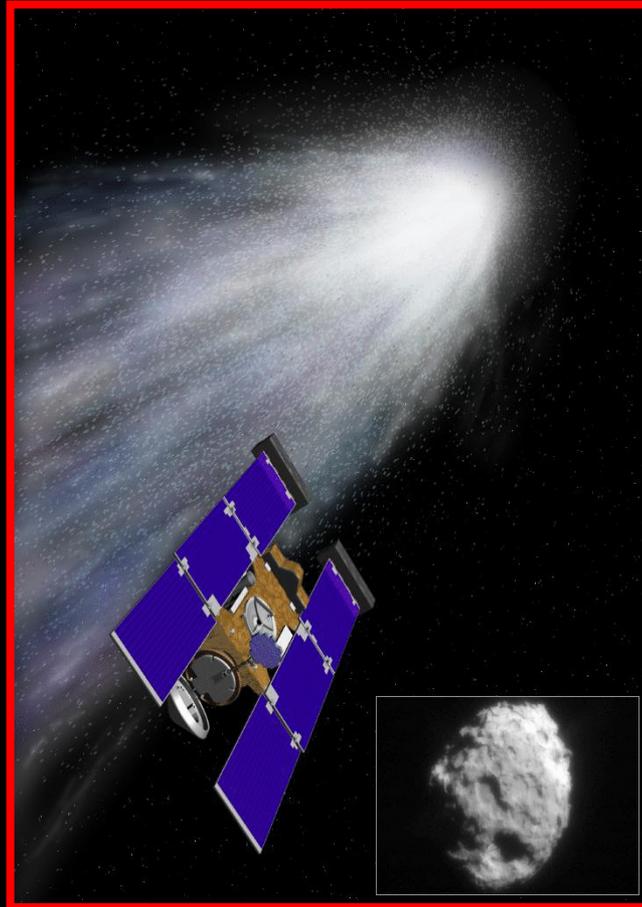
Future Exploration of
Near Earth Objects (NEOs)



Stardust Mission: *Comet Sample Return Mission*



Launch – Feb 7, 1999



Encounter with Wild 2 – Jan 2, 2004

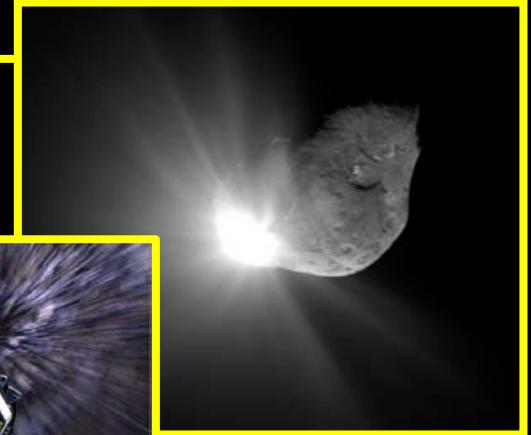


Return to Earth – Jan 15, 2006

Deep Impact: *Comet Surveyor and Impactor*



Launch – Jan. 12, 2005

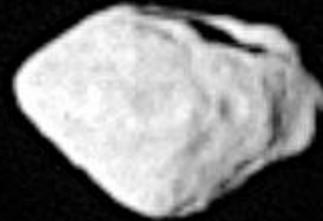


Encounter and Impact of Comet
Tempel 1 – Jul 4, 2005

Rosetta Mission: Comet Orbiter and Lander



Launch – Mar 2 2004
On Ariane-5G rocket
from Kourou, French Guiana



Fly-by Asteroid Steins –
July 8, 2008



Asteroid Lutetia – July 2010

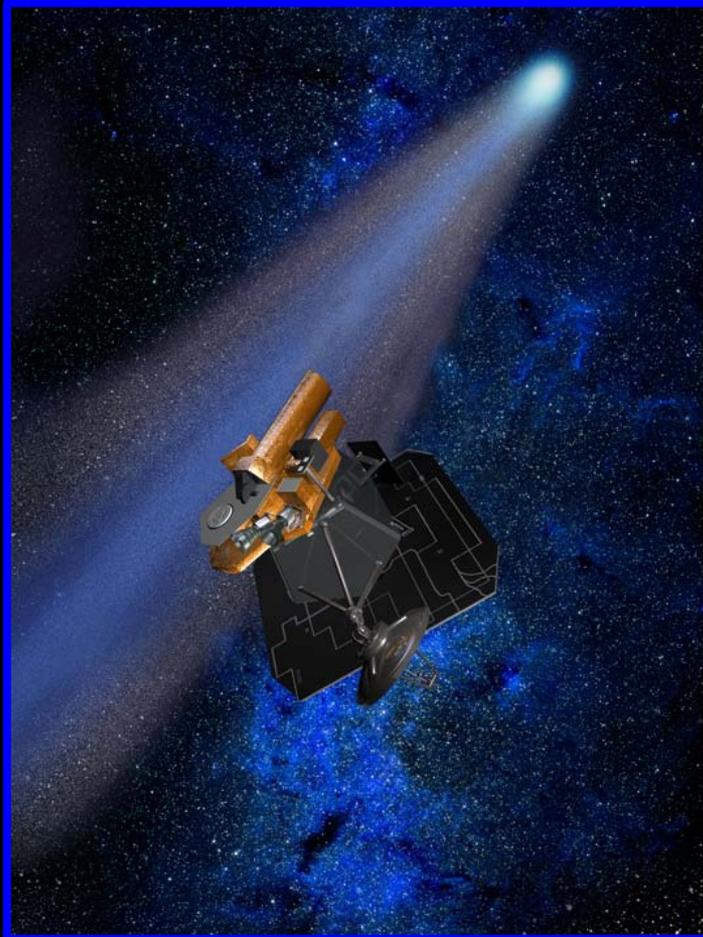


Arrival at Comet P67/Churyumov –Gerasimenko
Deployment of Philae Lander –
Nov 2014

EPOXI: *Two missions*

EPOCh (Extrasolar Planet Observation and Characterization)

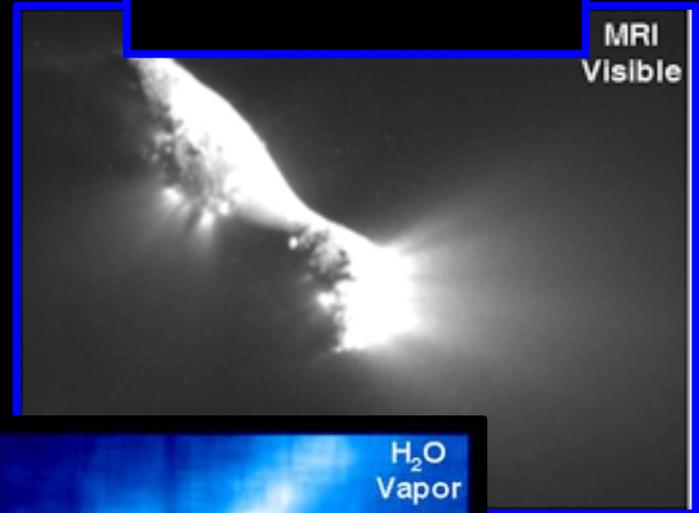
DIXI (Deep Impact Extended Investigation)



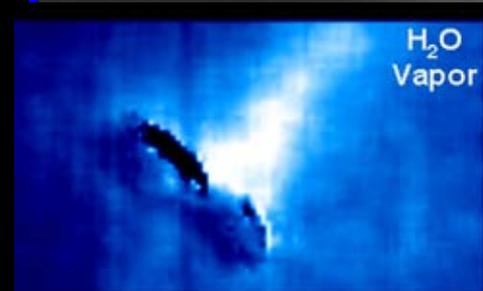
Nov 4, 2010 Encounter with Comet Hartley 2



Earth imaged from 30 million miles distance



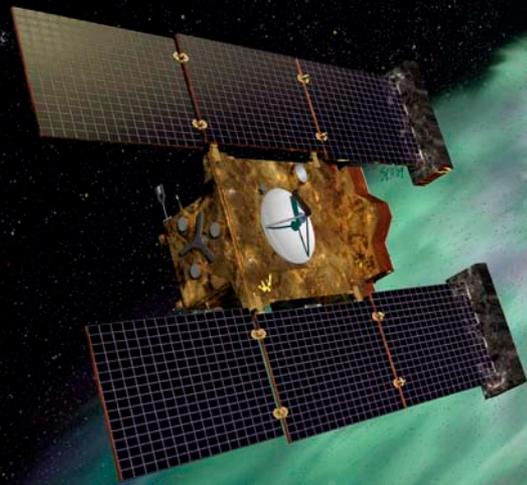
MRI Visible



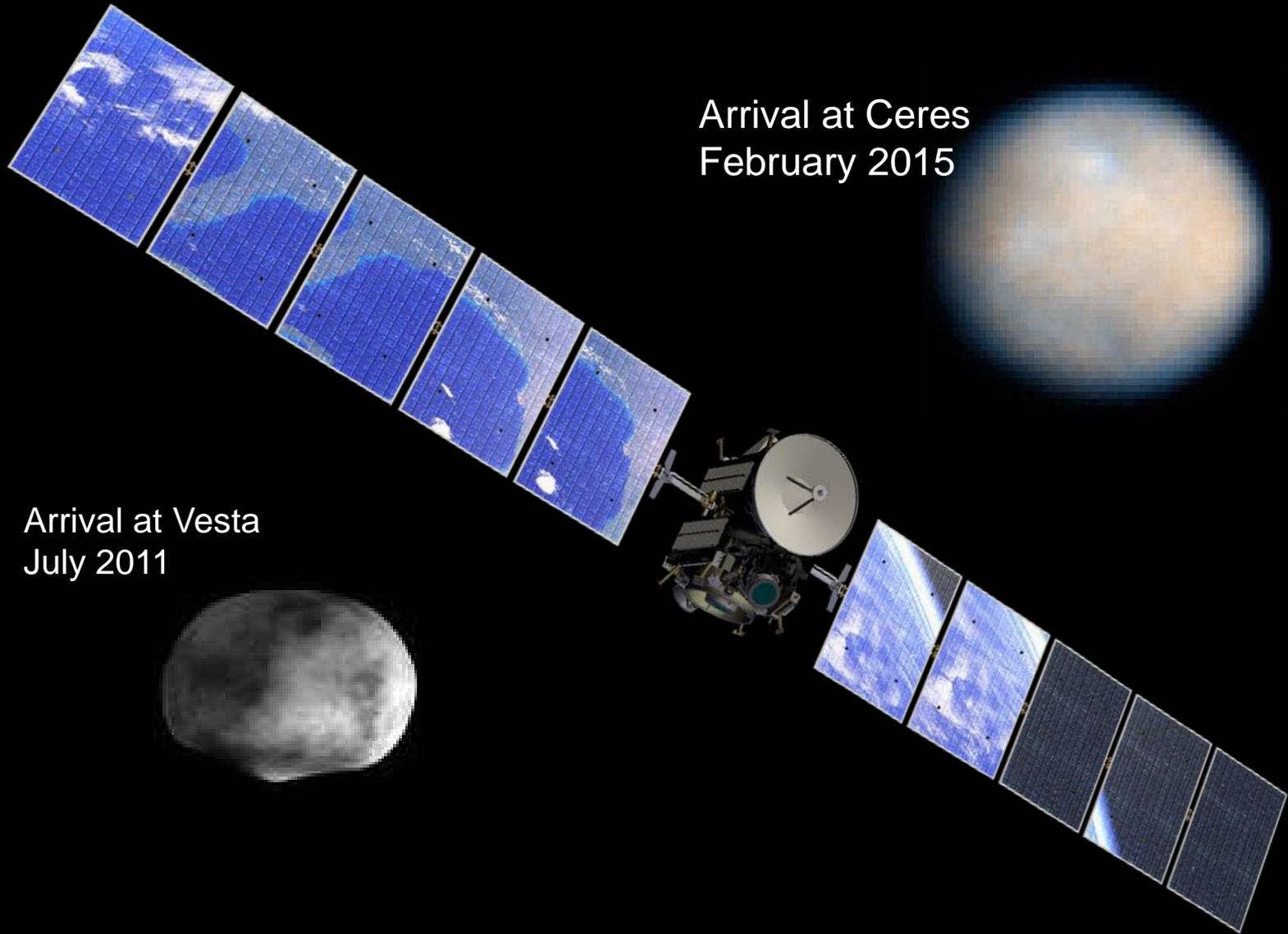
H₂O Vapor

Stardust-NExT : New Exploration of Tempel 1

Encounter with Comet Tempel 1
Feb 14, 2011



Dawn Mission: Asteroid/Dwarf Planet



Arrival at Ceres
February 2015

Arrival at Vesta
July 2011

Return on Investment

- Broaden Our Understanding of the Solar System Formation
- Origin of Comets
- Comparative Planetology
- Rich Abundant Metallic Deposits
- Possible landing site for astronaut program in 2025