

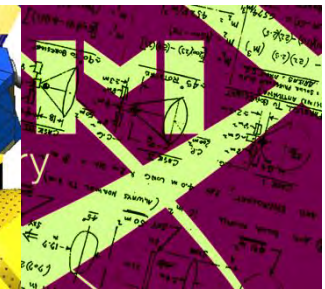
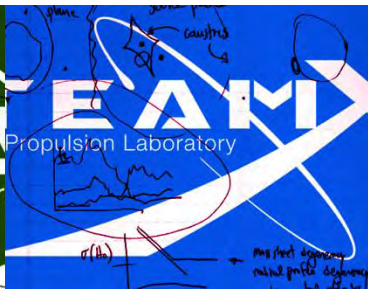


# Kelley Case

## Concept Design Methods Chief

### JPL Innovation Foundry

Caltech Space Challenge  
March 24, 2013



# What is Team X?



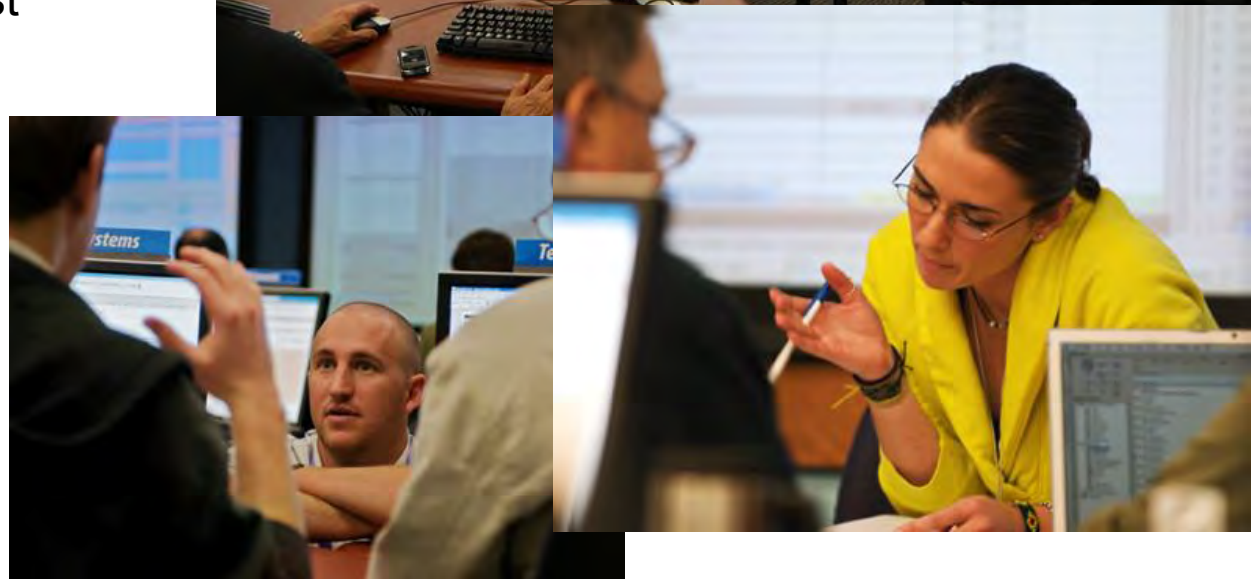
Team X is a concurrent engineering team for rapid design and analysis of novel space mission concepts

Developed in 1995 by JPL to reduce study time and cost

More than 1100 studies completed

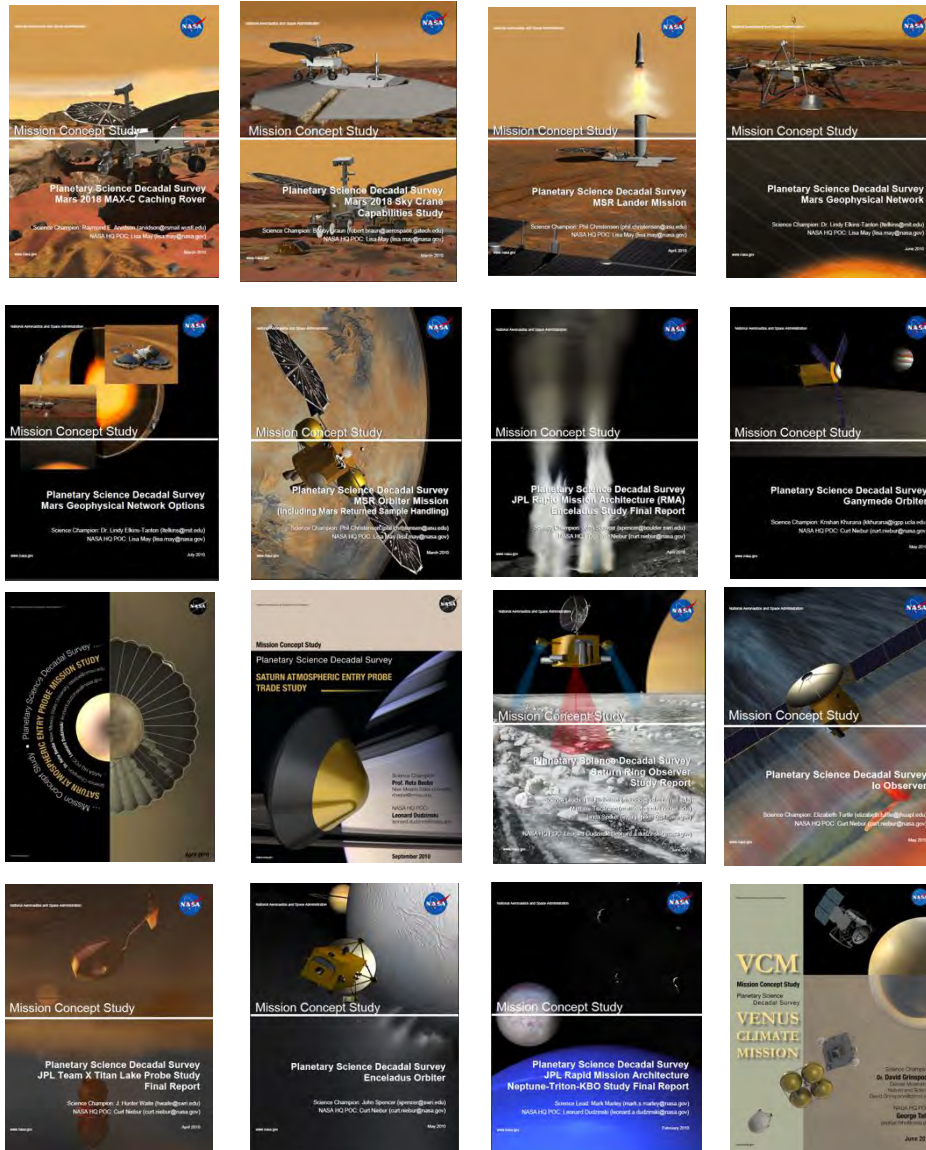
Institutionally endorsed

Emulated by many institutions





# High Visibility Products



✦ Team X supported 16 architecture and mission concepts for Planetary Science Decadal Survey

✦ Team X supported 14 instrument and mission concepts for Astrophysics 2009 Decadal Survey

# What is Concurrent Engineering?



## Traditional Mission Concept Method – Serial



## Concurrent Engineering Approach – Parallel

- Diverse specialists working in real time, in the same place, with shared data, to yield an integrated design





# The Mission Team



- Over 200 Specialists Trained and On Call
  - Extensive bench depth allows rapid staffing



Study Lead	Thermal
Systems Engineer	Attitude Control Systems
Science	Command and Data Systems
Instruments	Telecom Hardware
Mission Design	Telecom Systems
Trajectory and	Flight Software
Visualization	Ground Data Systems
Configuration	Programmatics / Risk
Power	Cost
Propulsion	Domain specialists as needed
Mechanical	



# Broad Mission Capabilities



- ✧ Architectures
  - S/C Constellations
  - Campaigns
- ✧ Space Missions
  - Planetary
  - Mars
  - Earth
  - Lunar
  - Astrophysics
  - Human/Robotics
- ✧ Flight Systems
  - Orbiters
  - Rovers
  - Landers
  - Aerobots
- ✧ Instruments
  - Remote sensing
  - *In situ*





# Every mission starts with a spark

