Linking Our Worlds

The Rise of Life

Climate Change

Geological Evolution

Worlds to Explore

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California Institute of Technology

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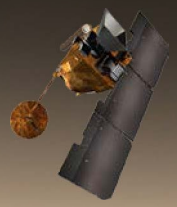
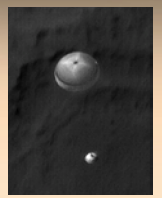
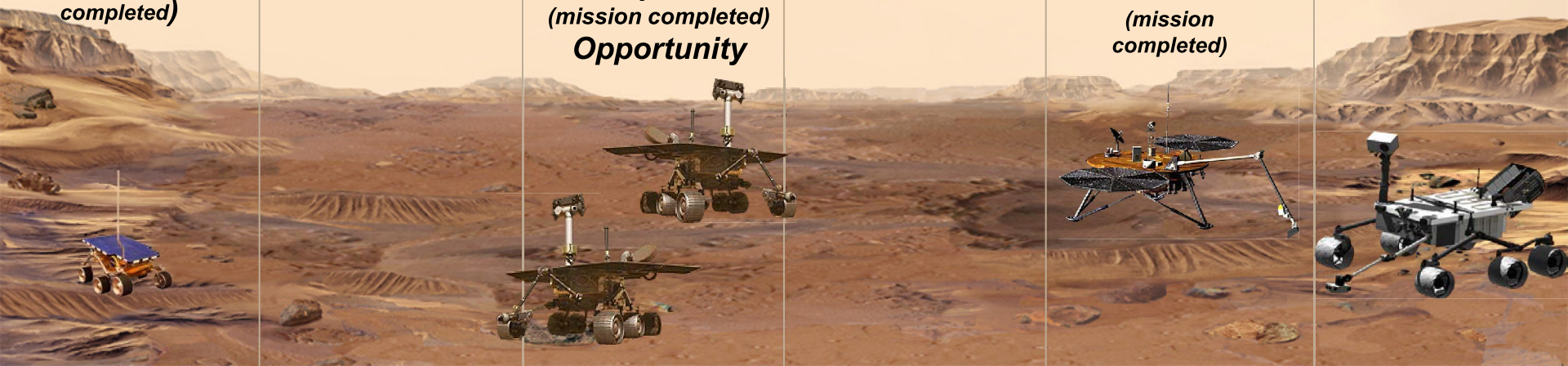
A Presentation for
Humans to Mars Panel:
Science and Engineering
Moderator: Michele Gates (NASA HQ)

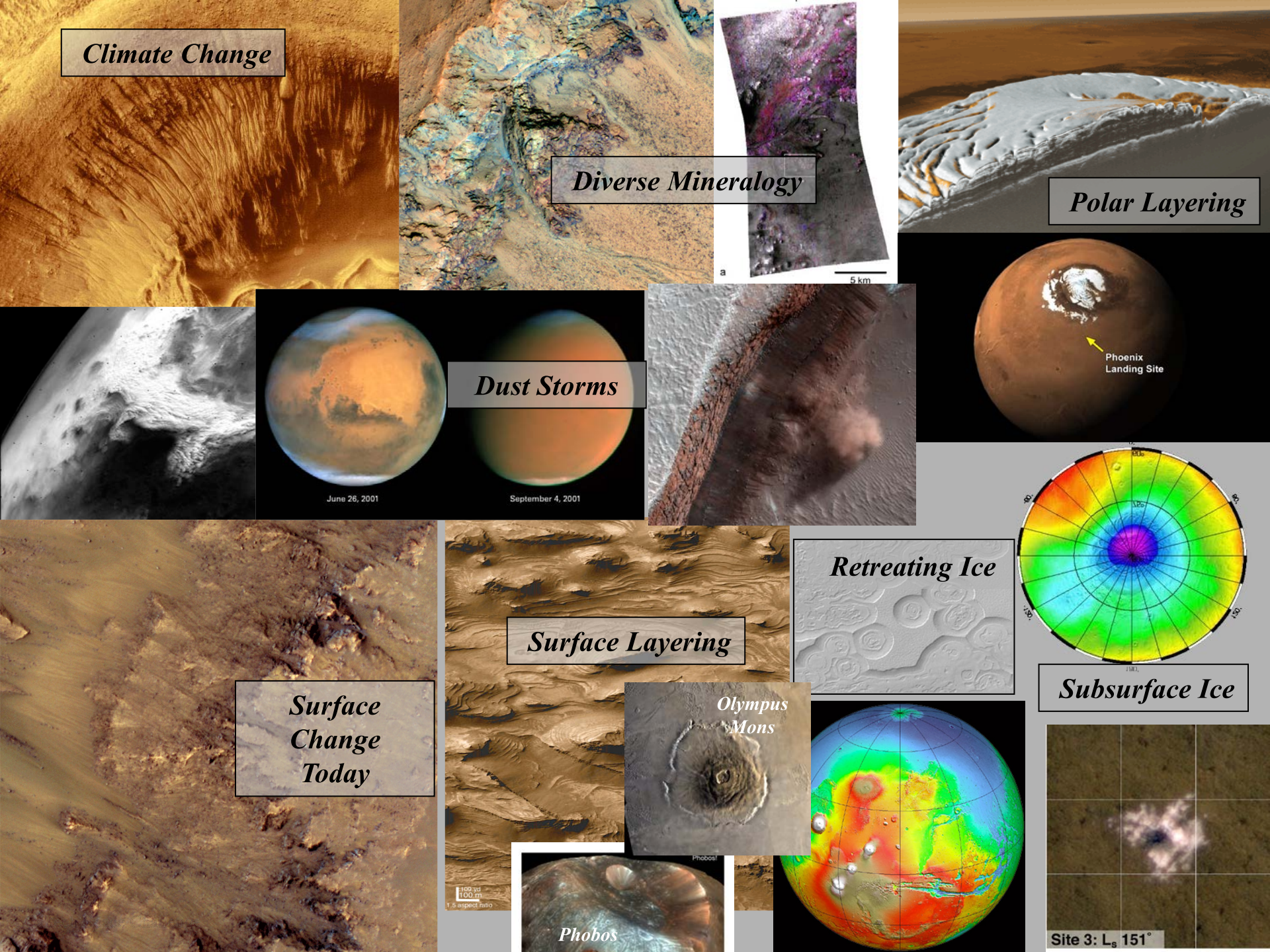
May 6, 2013

Second Wave of Mars Exploration

Launch Year

1996	2001	2003	2005	2007	2011
					
Mars Global Surveyor (mission completed)	**Mars Odyssey**		**Mars Reconnaissance Orbiter**		
Mars Pathfinder *(mission completed)*		**MEP Rovers** ***Spirit*** *(mission completed)* ***Opportunity***		**Phoenix** *(mission completed)*	**Mars Science Laboratory**



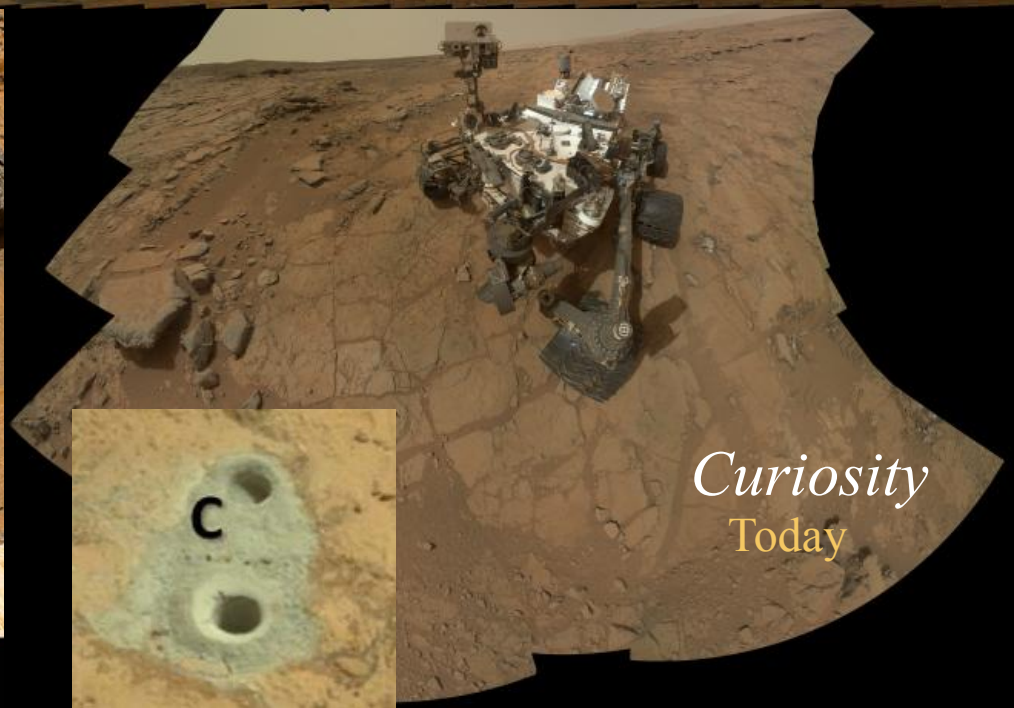

Climate Change
Diverse Mineralogy
a
5 km
Polar Layering
Phoenix
Landing Site
Dust Storms
June 26, 2001
September 4, 2001
Retreating Ice
Subsurface Ice
Surface
Change
Today
Surface Layering
Olympus
Mons
Phobos
Site 3: L_s 151°

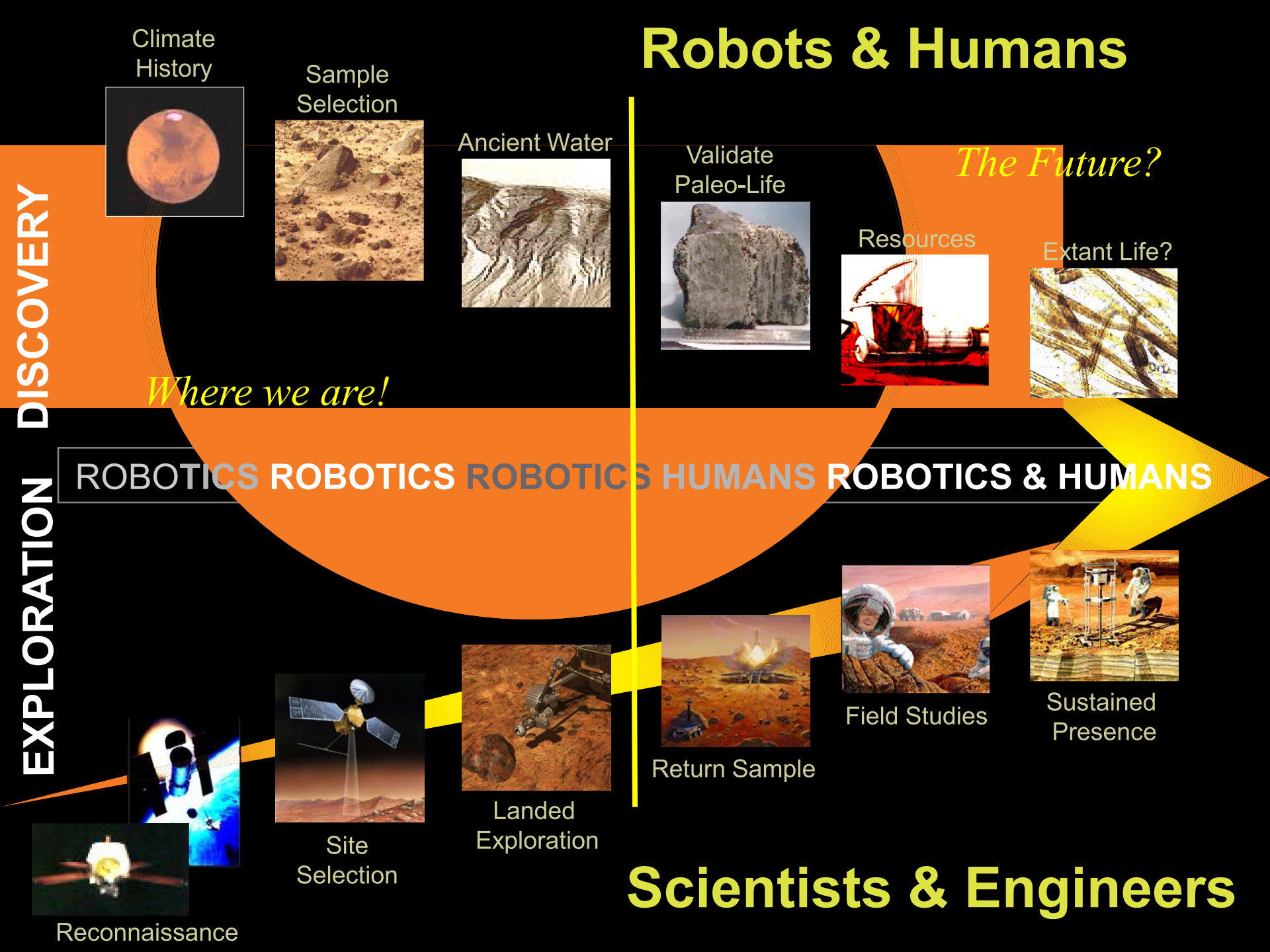
Viking
1976 - 1981

Mars Exploration Rovers
2004 - Today

Mt. Sharp
Tomorrow

Sojourner
1986


C
Curiosity
Today


Robots & Humans
Climate History
Sample Selection
Ancient Water
Validate Paleo-Life
The Future?
Resources
Extant Life?
DISCOVERY
Where we are!
ROBOTICS ROBOTICS ROBOTICS HUMANS ROBOTICS & HUMANS
EXPLORATION
Field Studies
Sustained Presence
Return Sample
Landed Exploration
Site Selection
Reconnaissance
Scientists & Engineers