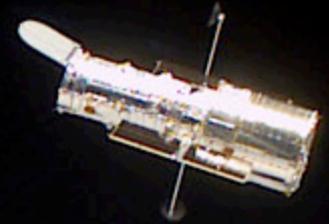
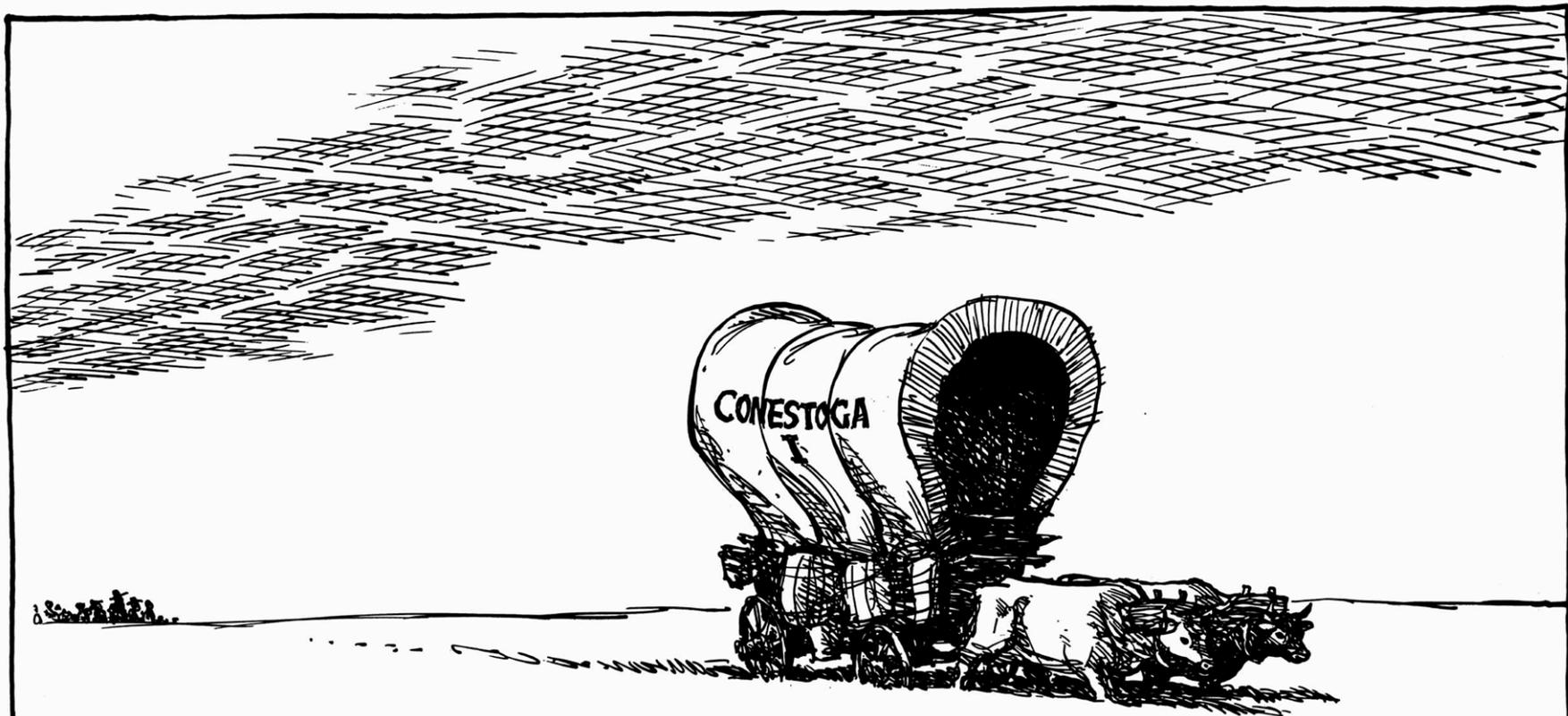


Risk and Exploration: Earth, Sea, and the Stars



Why We Explore



ALARMED BY THE MANY DANGERS, THE PIONEERS ABANDONED
WESTWARD EXPLORATION EXCEPT FOR A SERIES OF
UNMANNED PRAIRIE PROBE VEHICLES...

W. H. RAY

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Spirit at Columbia Hills Why We Explore:



**The desire to look over the next hill,
the driving force for exploration,
ultimately to bring home the experience of discovery**



Denali (6157m / 20320 ft)



..the farther we got
from base camp the
bigger the smiles ...



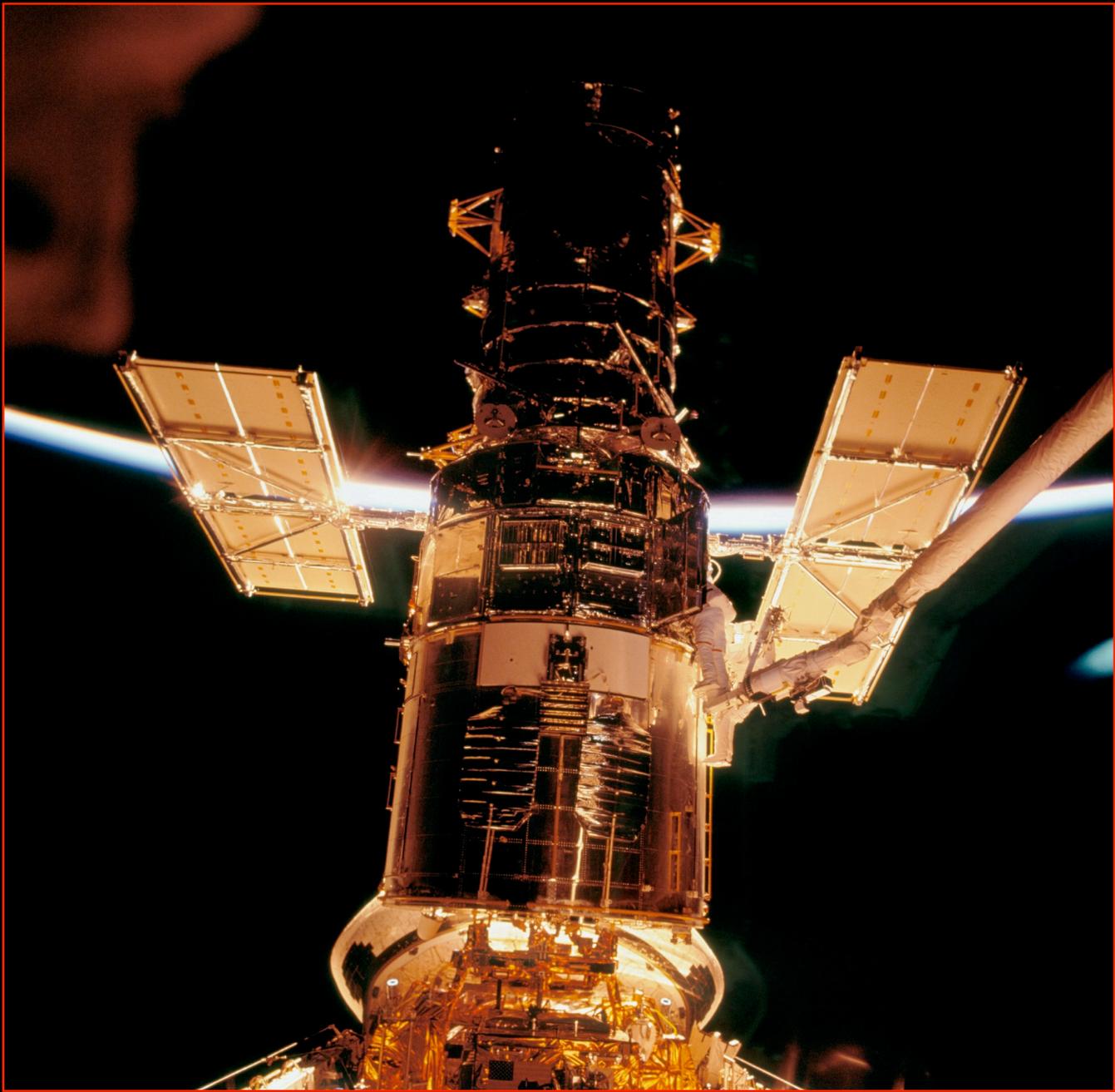
“Bad News...”

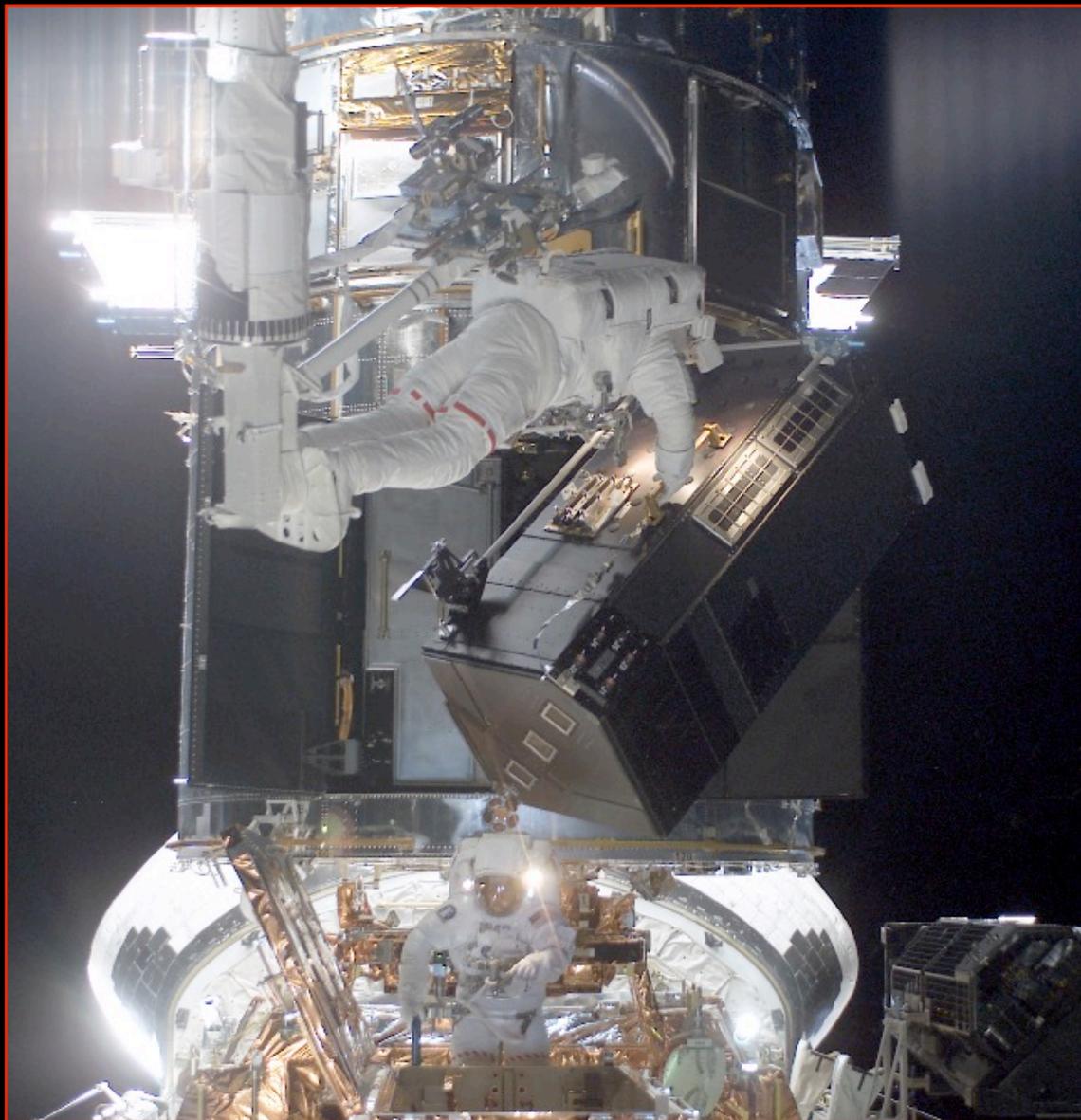




The Hubble Decision: A case study in Risk and Exploration

- Decision not to return to HST with the Space Shuttle
- Compliance with Columbia Accident Investigation Board Recommendations
- The only limit is our imagination
- How can we service Hubble?
- Robot to the Rescue!
- Robotic Servicing as a catalyst for Exploration
- Pushing farther with high performance challenges





The Hubble Decision: A case study in Risk and Exploration

- Rendezvous
- Proximity Operations
- Autonomous Docking/
Grapple
- Robotic Assembly
- Dexterous Manipulation
- Tele-robotic Control

**HST Robotic Servicing:
Robot to the Rescue!**

Explore, Discover, Inspire: the essential human experience



STS-114: Return to Flight



*For I dipped into the future,
far as human eyes could see
Saw the vision of the [new] world[s]
and all the wonder that would be
Tennyson*

