

USING OPEN INNOVATION IN REDUCING RISK TO CREWS

Mel Ferebee
Manager Space Technology
Project Office/ESOD
May 11, 2010

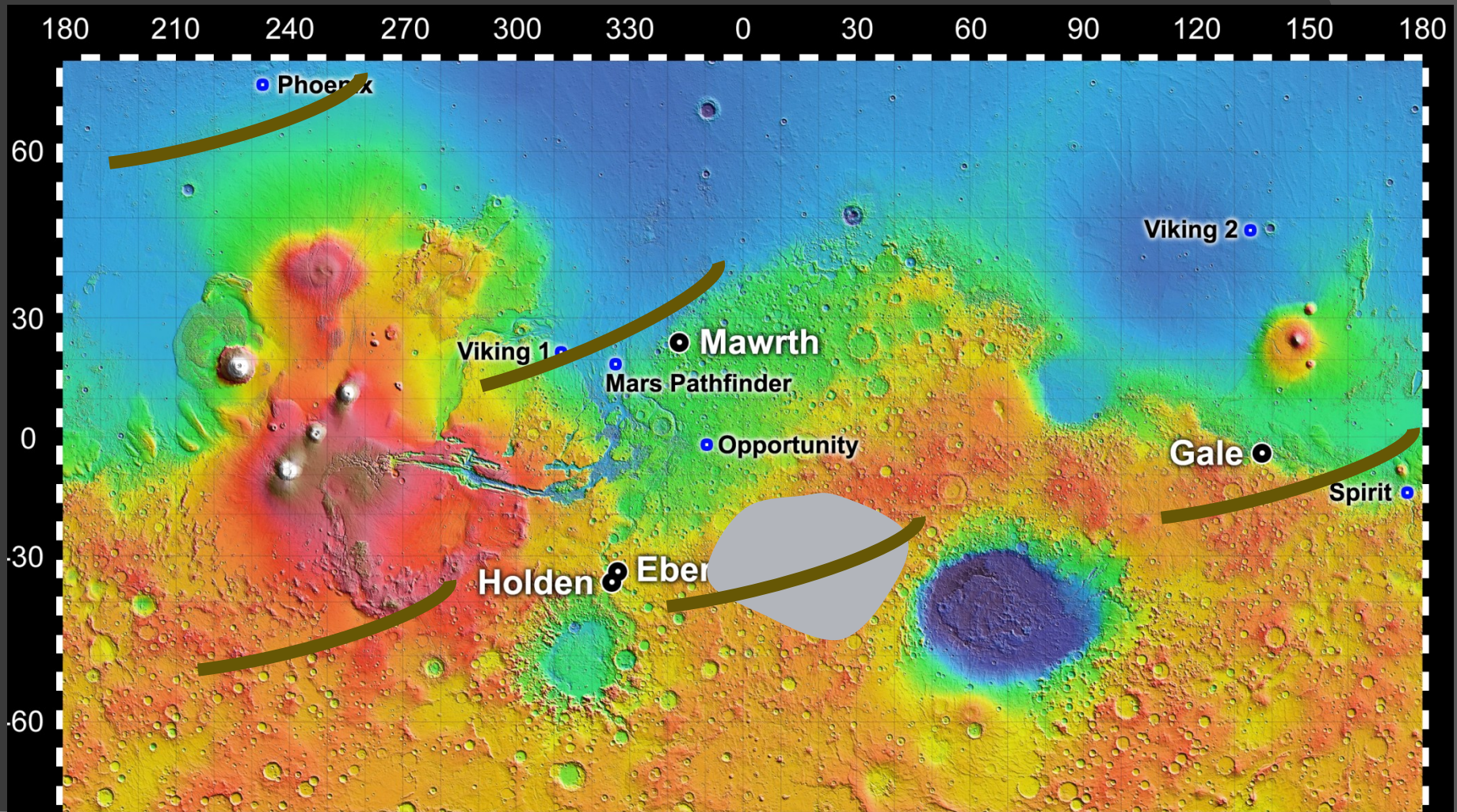
Outline

- ⦿ Background
- ⦿ Looking for Answers in all the “Wrong” places
- ⦿ The Challenge
- ⦿ The Technology Need
- ⦿ Solutions

Looking for Answers in all the Wrong Places

- ⦿ Expand solution space into fields that lie outside of Aerospace
- ⦿ Expand solution space globally
- ⦿ Searching hobbyists and academicians
- ⦿ Tap into global innovation networks
- ⦿ Use 3rd party Open Innovation providers
 - Innocentive.com
 - Yet2.com
- ⦿ *Not searching for the “answer” but partial solutions that can advance the research*

Mars Exploration: Landing Sites



Using a Swarm of Sensors for Regional Investigations



Challenge: Coordination of Sensor Swarms for Extraterrestrial Research

- \$20,000 Challenge
- Owner: Erik Vedeler, RD
- 60 Day Duration:
 - 2/27/10-4/26/10
- IP Licensed from Solvers
- Types of sensors
 - Types of measurements to be made
 - Communication Method
 - 80% Failure of elements retain 100% of data acquired
 - How to power sensors?
- Swarming protocols
 - Sensor “Awareness of each other?”
 - Sensor Array capabilities?
 - Should there be locomotion considered (atmospheric and/or ground)



Technology Needs

◎ The problem

- How to determine indigenous extraterrestrial life from life that survived the trip from Earth?

◎ Decomposed the problem into two “needs”

- Ideas and Protocols that can differentiate extraterrestrial life from indigenous exobiological life
- System for qualitative analysis of microorganisms and their taxonomic classification

Solutions

◎ **Coordination of Sensor Swarms Challenge**

- 423 Project Rooms from 49 Countries
- 37 Solution Submissions from 11 Countries
- 22 Solutions reach NASA Langley

◎ **Identification of extraterrestrial life**

- **One** person with a feasible solution

Results from Challenge/Solver Process

- ◎ Sensor Swarm Challenge (\$18,000 awarded)
 - \$8,000 awarded to Simone Sergi, *Modena, Italy*
 - \$8,000 awarded to Tad Hogg, *Mountain View, CA*
 - \$2,000 awarded to Fabrizio Invernizzi, *Lagnasco, Italy*
- ◎ Differentiation of Extraterrestrial Life
 - A manager of a BASF paper factory in Germany

Reflections on the Processes

⦿ Sensor Swarms

- Evaluation Team needs to have a say in the creation of the challenge
- Evaluators should have at least the innovative eye as the solution providers

⦿ Differentiation of Life

- Not all technology needs/challenges lend itself for these innovation platforms.