

ISDC 2002 Denver

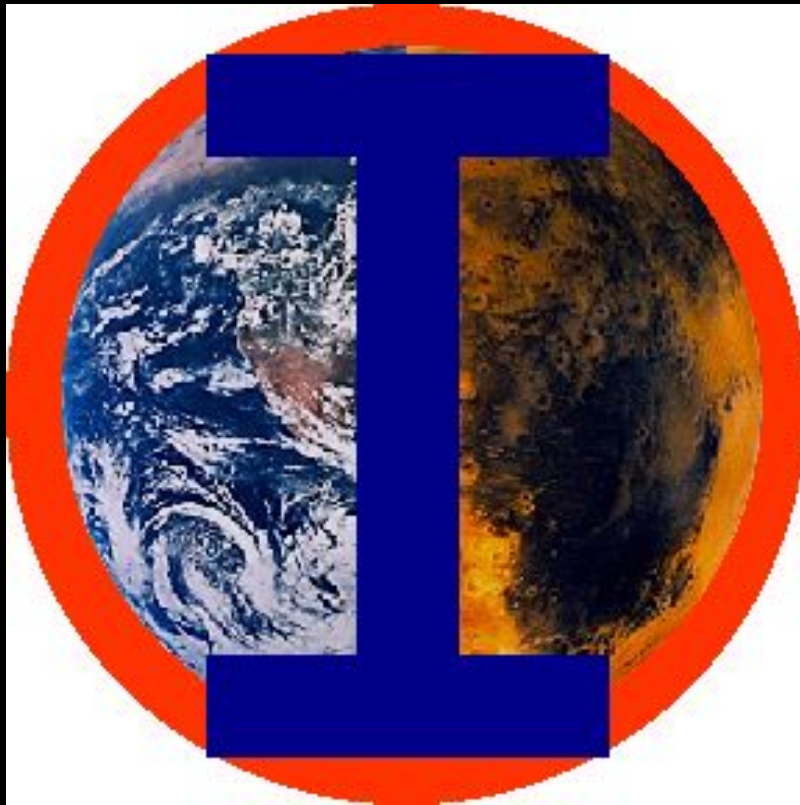
# Mission Simulation

Welcome to  
Corpates Base



# Acknowledgements

without these folks, this sim would not have been possible!



- Marsh Cuttino, MD
- Tom Hill
- Gary McQueen
- Lynn Messina, Ph.D
- Eleanor O'Rangers, Pharm.D.
- Linda Plush, MSN
- Frank Sietzen

# Overall team responsibilities:

*major things to keep in mind*

- Know your mission rules and don't break them!
- Mission Control needs to constantly "think ahead" and anticipate crew's needs and likely issues.
- And...

The Flight Director is  
"the final word"!!

# Mission Control

*Medical Team*  
*Life Support Team*  
*Engineering Team*  
*Science Payloads*  
*Press Corps*  
*Capcom*  
*Flight Director*



# Simulation

## *Other "players"*

- o *Mars I Crew*
  - a. Commander: Richard Alexandre (former pilot)
  - b. Pilot/ENG-1: Helmut Scherrer
  - c. ENG-2: Nancy Kringlen
  - d. SCI-1: Patricia Aude
  - e. MD/SCI-2: David Balaam
- o Citizen Explorer (CE): William Findley
- o The Chinese mission (in Martian orbit)

# Sim improvements over 2001

- ✓ Increased realism by running sim in multiple rooms
- ✓ Multiple endings to accommodate creativity
  - Flexibility for crew to react to MC's decisions
- ✓ Video communications vs still slides and "radio"
  - Enhanced realism of scenario
    - More interactive
    - Flexibility for crew to react to MC's decisions
    - Time delay
- ✓ More balance of tasks between MCC teams
  - More complex scenario
- ✓ Larger room
- ✓ More advertising: Ad Astra ad, article

# Sim improvements in 2002

- ✓ Technical manuals improved
  - Better tailored to scenario
  - Mission rules added

# Room for improvement

- Crew script
  - "director" notes (MC actions, Mars actions, timeline)
  - flow chart/decision tree for all possible MC responses
    - However, Mars base was able to respond to MC's decisions which kept sim interesting
- 2 cameras (and tripods!)
- One-way vs two-way sim?
- Minor issues with technical manuals
  - ex: enhanced glossary of medical terms
  - ex: quantities of consumables, fuel
- MC team activity balance could be better optimized
  - Life Support and Science Payloads

# Room for improvement

- Separating video comm from data comm?
  - ex: vital signs, consumable data in separate data stream from video
- More realistic "set"
  - Mars Base crew in flight suits
  - Mars "backdrop"
- Need to separate Flight Director from "coach" for simulation?
  - Coach for each MC team may be helpful
- Need to have dedicated Public Affairs Officer who strictly interfaces with Press Corps?
- "Conflict"/need for interdependence between MC teams could be enhanced
- Project Team must attend sim to maximize number of "experts" available for audience consultation

# If we were mission planners, what did we learn?

- Need to be explicitly clear when transmitting communications
  - Disconnect between MC and Mars base understanding their respective issues and concerns
    - Ex. but Mars base was not clearly communicating MD's activities
- Learning to anticipate and think ahead
  - Need to have multiple contingency procedures "ready to go"
  - Too many assumptions of what crew "should know"?
  - Prioritization of tasks
- Expect (and plan for?) the unexpected!