

AGENDA

May 4, 2000

7:30 a.m.	Continental Breakfast
8:30	Welcome to LPI — David Black, Director
8:45	John Connolly, NASA Johnson Space Center — “Strategic Directions for HEDS”
9:30	Break
9:45	University of California, Berkeley — “The Hunt for Liquid Water, Life and Landing Sites on the Surface of Mars Today”
10:30	University of Washington — “Studies on Closed Ecosystems: Biosphere in a Bottle”
11:15	University of Texas, Austin — “Automated Construction of a Martian Base”
12:00	Lunch
1:30 p.m.	University of Colorado — “MARV: Mars Aerial Research Vehicle”
2:15	University of Maryland — “Project Magellan: Racing the Sun around the Moon”
3:00	California Institute of Technology — “Mars SCHEME: The Mars Society-Caltech Human Exploration of Mars Endeavor”
3:45	Break
4:00	Embry Riddle Aeronautical University — “LIRA: Lunar Interferometric Radio Array”
4:45	Wichita State University — “Mars Airborne Exploration Vehicle”
5:30	Posters and Reception

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7:30 a.m.	Continental Breakfast
8:30	Colorado School of Mines — “Excavating Martian Regolith to Extract Water”
9:15	Rowan University — “A Comparison of Preliminary Design Configurations for Liquid, Solid and Hybrid Mars Ascent Vehicles using In Situ Propellants”
10:00	Break
10:15	Pennsylvania State University — “Scaling the Martian Walls of Time”
11:00	Georgia Institute of Technology — “A Moon-based Advanced Reusable Transportation Architecture: The MARTA Project”
11:45	Embry-Riddle Aeronautical University — “Red Mars – Green Mars? Martian Regolith as a Plant Growth Medium”
12:30 p.m.	Lunch
2:00	“Exploration of the Moon,” P. Spudis, LPI
2:30	“Searching for Life on Mars,” D. McKay, JSC
3:00	“Drilling for Water on Mars,” S. Clifford, LPI
3:30	“The Haughton Crater Mars Analog,” P. Lee, Ames Research Center
4:00	“Advanced Life Support for Long-Duration Missions,” D. Henninger, JSC
4:30	Presentation of Awards
5:00	Adjourn

The Forum

The Forum is a two-way communication event, with university teams presenting the results of their studies and NASA, industry, and others presenting recent advances in space exploration. The interchange is productive and stimulating, with ideas for next year's HEDS-UP program emerging.



Dr. Pascal Lee, an astrobiologist at the NASA Ames Research Laboratory, discusses plans for a Mars analog test facility at the Haughton meteorite crater in the Canadian Arctic.

Dr. David S. McKay, a geologist at NASA's Johnson Space Center, discussed the problems of finding evidence for ancient life on Mars. Mars may once have been water-rich, though now only traces of water can be found in its atmosphere.



Dr. Paul Spudis, Assistant Director of the Lunar and Planetary Institute, discussed the future exploration of the Moon. Here he explains how water ice might be trapped in permanently shadowed areas near the lunar poles.

The Teams



A team of graduate students from the Georgia Institute of Technology worked with Dr. John Olds (arrow) on an analytical study of the cost of transporting materials from the Moon to space.



A team of students, under the direction of Dr. Anthony Marchese (left) of Rowan University in New Jersey, studied the variety of propulsion systems that might be used to take people off the surface of Mars on their trip back to Earth.

Dr. Frieda Taub, of the University of Washington, advised a student team that studied “Biospheres in a Bottle,” an approach intended to learn about characteristics of small closed systems such as would exist in a spacecraft on its way to Mars.





The Pennsylvania State University team was advised by Professor Wojciech Klimkiewicz (arrow). They studied a novel concept that allows instruments to descend a steep-sided canyon wall on Mars to study the layering. They tied for third place among the undergraduate teams at the HEDS-UP Forum.



The Caltech student chapter of The Mars Society, with the advice of Jim Burke (not shown) of the Jet Propulsion Laboratory and Caltech, presented their integrated study of a complete round trip for humans to go to Mars (tied for third place).

Wichita State University contributed a study of an research vehicle (a glider of sorts) for studying the atmosphere on Mars. Their advisor, Dr. Gawad Nagati, is not shown.





The University of California at Berkeley contributed two studies. This one, presented only as a poster, studied the relationship of metabolic activity to the design of spacesuits for astronauts.



The other UCB team, shown here with their advisor Dr. Larry Kuznetz (arrow) and mentor David Gan (right), studied the question of whether liquid water might be able to form under some circumstances on the surface of Mars.

A team from the University of Maryland, with their advisor Dr. David Akin (arrow), presented Project Magellan, the first human circumnavigation of the Moon's equator, using a pressurized roving vehicle. They were awarded second place among the undergraduate teams.





Students at the University of Texas, Austin, are shown here with their faculty advisor, Dr. Wallace Fowler. The students were one of four UT teams, who worked on different problems. This team studied the possibility of robotic construction of a human outpost on the Moon.



A team of graduate students from Embry-Riddle Aeronautical University worked on the question of whether plants would grow well in the surface regolith on Mars. They were organized and led by Tony De Tora (right), a graduate student who also contributed to the study.



The University of Colorado, Boulder, considered the design of a Mars Airplane, as initially specified by NASA for the 2003 mission to Mars. Here the team is shown with their faculty advisor, Jason Hinkle (in front).

An undergraduate team from Embry-Riddle University, shown here with advisor Mehmet Reyhanoglu (left), described the design and construction of an interferometric array of radiotelescopes that could be erected on the Moon.

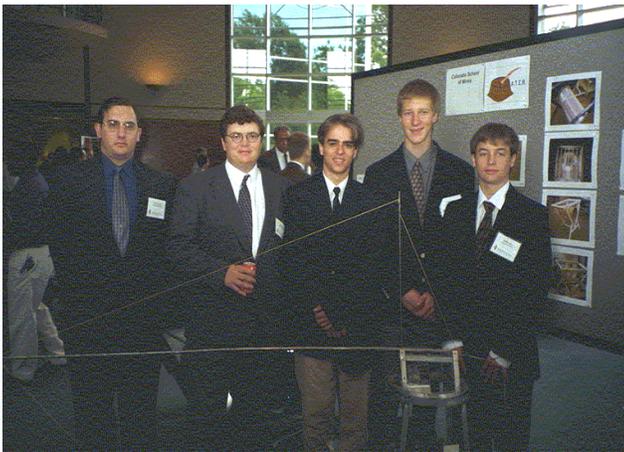


The Colorado School of Mines Engineering Practices Initial Course Sequence (EPICS) program involved over 400 students in a contest to design a robotic excavator for Mars. C.R.A.T.E.R., the winning team from their competition, also won first place at the HEDS-UP Forum among undergraduate teams. Their advisor, Dr. Robert Knecht, is not shown.



The Poster Session

One of the highlights of the HEDS-UP Forum is the poster session and reception, during which the students, faculty, and NASA/industry guests can meet one another and show off their wares. Several of the teams brought models, prototypes, or experimental apparatus.



Members of the Colorado School of Mines team demonstrate their Mars drag-line concept.



The University of California, Berkeley's experimental apparatus for producing liquid water under martian atmospheric conditions.



Wichita State University student Ravi Malla shows the model they had constructed to illustrate their concept for a martian aerial reconnaissance vehicle.



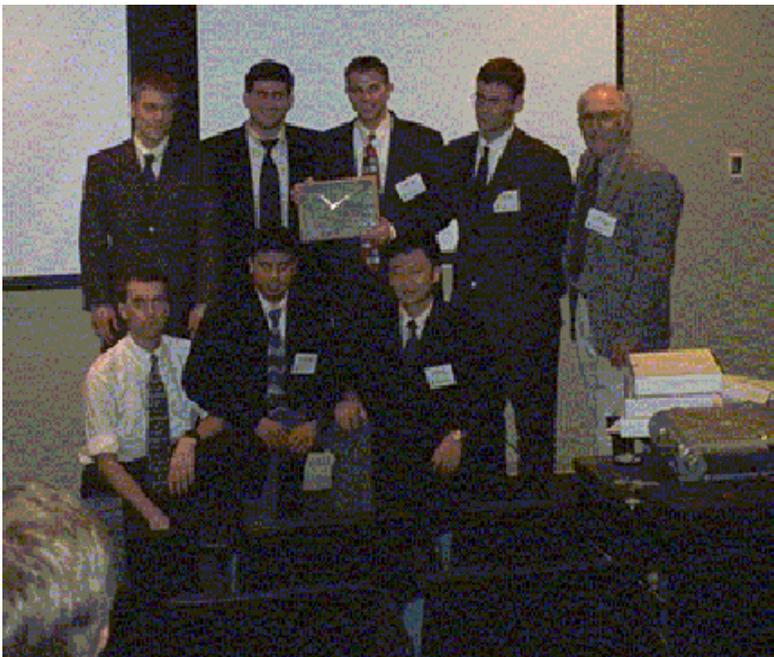
Professor Gawad Nagati of Wichita State University in discussion with a HEDS-UP student.

The Winners

A panel of judges based their awards on both a written report and the oral presentation made to the Forum. And the winners are . . .



Dr. Michael Duke of the Lunar and Planetary Institute (at right) presents the first-place award for undergraduates to team C.R.A.T.E.R. from the Colorado School of Mines.



The team from Georgia Institute of Technology was awarded first place among graduate teams for their study of the economics of lunar transportation systems.

Among the undergraduate teams, the University of Maryland placed second and a tie for third was awarded to the teams from Caltech and Penn States. Only a first-place award was made to the graduate teams. Each team received a HEDS-UP plaque for their efforts.