

DAY 1, June 21

8:30 -8:45 Introduction: Extreme environments in solar system exploration, Elizabeth Kolawa, JPL

Low temperature environments:

8:45-9:15 “An overview of the past missions operating in low temperature environments (architectures, issues, failures) and currently considered architectures (eg. Titan, Mars)”, Andrew Ball, Open University, UK

9:15-10:00 “Low temperature mobility and mechanisms”, (Lutz Richter, Exploration Technology, DLR Institute for Space Systems, Bremen)

10.00-10:15 BREAK

10:15-10:45 “Sensors and instruments for operation at low temperatures”, Craig Peterson, JPL

10:45-11:30 “Low temperature electronics”, John Cressler, Georgia Tech

11:30-12:00 “Low temperature energy storage”, Rao Surampudi, JPL

12:00-1:00 LUNCH

High temperature and high pressure environments

1:00-1:30 “An overview of the past Venus missions (architectures, issues, failures) and currently considered architectures for future missions”. (Tibor Balint, JPL)

1:30-2:15 “Pressure vessel and thermal control technologies (pressure vessel design, critical requirements, passive and active thermal control)”, Michael Pauken, JPL

2:15-3:00 "High temperature sensors and electronics", Gary Hunter, NASA Glen

3:00-3:30 “High temperature energy storage”, Rao Surampudi, JPL

3:30-3:45 BREAK

3:45-4:15 “High temperature mechanisms (motors, actuators for sample acquisition system, robotic arm”, Jerry Li, Honeybee

4:15-4:45 "Mobility and power in high-temperature environments", Geoff Landis, NASA GRC

4:45-5:15 “Thermal Protection Systems (TPS)”, Bernie Laub, NASA Ames

5:15-5:45 “Space qualification process for extreme environments electronics and packaging”, Yuan Chen, JPL

DAY 2, June 21

8:00-11:00 Class exercises

Case studies:

- Venus mission

- Titan mission

11:00-1:00 Discussion: Case studies results