

Dust, Atmosphere, and Plasma at the Moon

- I. Introduction and General Considerations (2 pages) [Farrell, Elphic]
 - a. Progress since last NVM – explosion of field with 7 s/c
 - b. Missions, Laboratory, Modeling
 - c. Integrated view of 3 apparent disparate topics
 - d. Chapter layout – drivers and responses

- II. Drivers of the Near-Lunar Space Environment (4 pages) [Killen, Fatemi, Szalay, Poppe]
 - a. Solar radiation (UV esp)
 - b. Charged particles (nominal solar wind, m-tail, energetic particles, CMEs)
 - c. Micro-meteoroids (nominal and streams)

- III. The Moon's Response to the Drivers
 - a. Neutral Exosphere (8 pages) [Grava, Benna, Hurley, Halekas, Retherford, Killen, Mahaffy]
 - i. Introduction (cite past reviews, like Stern)
 - ii. New findings (LADEE, ARTEMIS PUI, Energetic neutral H, LAMP H2/He, LCROSS special event, GB work)
 - b. Dust Exosphere (8 pages) [Horanyi, Szalay, Colaprete, Retherford, Wang]
 - i. Introduction (cite past reviews, like Krivov)
 - ii. New Findings (LADEE; LAMP)
 - c. Space Plasma Interactions (9.5 pages) [Halekas, Fatemi, Poppe, Saito, Nishino, Holstrom, Futaana, Kramer, Fatemi, Deca, Poppe, Yokota]
 - i. Introduction (surface effects, cite past reviews, Jasper's New View paper)
 - ii. New findings (LP; ARTEMIS; Wake-revisited; precursor regions; surface charging at global scale, sheath-scale and grain micro-scale; regional effects at terminator; flow in polar craters; mag anomalies; plasma-volatile connection (OH at mid-latitude, polar water erosion?))

- IV. System-level Effects
 - a. LADEE and the renewed appreciation of meteoric control of exosphere (1.5 pages) [Szalay, Horanyi, Elphic, Colaprete, Noble]
 - b. Lunar soil hydroxylation and its contribution to the water cycle (2 pages) [Hurley, Farrell, Kramer, Noble, Benna, Mahaffy, Clark]
 - i. Solar wind weathering manifestations
 - ii. Solar wind H inventory and the hydrogen sub-cycle
 - iii. Water delivery, creation, and transport
 - c. Laboratory studies (3 pages) [Horanyi, Wang, Collier]

- V. Future directions: (3 pages) [Collier, Colaprete, Clark, Elphic, Kramer]

- a. Cubesat missions
- b. RP (?)
- c. Getting surface measurements within special regions: mag anomaly, terminators, polar craters

VI. Conclusions (1 page) [Farrell, Horanyi, Halekas]

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