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Title:
Earth-based And Cassini-spacecraft Observations Of Irregular Moons Of Jupiter And Saturn

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Abstract:
We observed irregular satellites of Jupiter and Saturn with the ISS camera of the Cassini spacecraft [1] and with the 1.23-m telescope of the Calar Alto observatory in Spain [2]. Scientific goals are the determination of rotation periods, rotation-axis orientations, spin directions, size parameters, color properties, phase curves, and searches for binaries.

Himalia (J6), the largest of the irregular jovian moons, has been imaged by Cassini on 18 Dec 2000; a body size of 120±5 km x 150±10 km and an albedo of 0.05±0.01 have been measured [3,4]. Earth-based observations revealed that Himalia's rotation period is probably 9.3 h, which is in agreement with the 9.2 to 9.8 h suggested by [5], although periods of 7.8 or 11.7 h cannot be ruled out yet.

In the saturnian system, 10 irregular moons were scheduled for Cassini ISS observations over time spans >9 hrs until end-of-August, 2010. Observation distances vary between 5.6 and 22 million km, corresponding to ISS pixel scales of 34 to 130 km. For the objects measured so far, the rotation periods vary significantly. For instance, Siarnaq (S/2000 S3; size ~40 km) and Ymir (S/2000 S1; ~18 km) exhibit rotation periods of ~6.7 h and ~7.3 h, respectively, while Kiviuq (S/2000 S5; ~16 km) might take about 22 h for one rotation. First results from the observation campaigns will be presented at the meeting.

References: [1] Porco, C.C., et al. (2004), Space Sci. Rev. 115, 363; [2] http://www.caha.es /CAHA/Telescopes/1.2m.html; [3] Denk, T. et al. (2001), Conference on Jupiter (Planet, Satellites & Magnetosphere), Boulder, CO, 25-30 June 2001, abstracts book p. 30-31; [4] Porco, C.C., et al. (2003), Science 299, 1541; [5] Degewij, J., et al. (1980), Icarus 44, 520.

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13. Irregular Satellites

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