

**ATLAS SERIES OF THE SOLAR SYSTEM (5 BOOKLETS) AND OTHER WORKS FOR EDUCATION AND PUBLIC OUTREACH BY COSMIC MATERIALS, PLANETOLOGY AND HUNVEYOR GROUPS OF THE EÖTVÖS UNIVERSITY, HUNGARY.** Bérczi Sz.<sup>1</sup>, Fabriczy A.<sup>2</sup>, Hargitai H.<sup>3</sup>, Hegyi S.<sup>4</sup>, Illés E.<sup>5</sup>, Kabai S.<sup>6</sup>, Kovács Zs.<sup>7</sup>, Kereszturi A.<sup>3</sup>, Opitz A.<sup>8</sup>, Sik A.<sup>3</sup>, Varga T.<sup>9</sup>, Weidinger T.<sup>10</sup>, <sup>1</sup>Eötvös University, Dept. G. Physics, Cosmic Mat. Sp. Res. Gr. H-1117 Budapest, Pázmány s. 1/a, Hungary, (bercziszani@ludens.elte.hu) <sup>2</sup>Eötvös University, Teachers Tr. College, H-1126 Budapest Kiss. J. altb. u. 42. Hungary, <sup>3</sup>Eötvös University, Dept. Phys. Geography, Budapest, Pázmány s. 1/c, <sup>4</sup>Pécs University, Dept. Informatics/ Technology, H-7625 Pécs, Ifjúság u. 6. Hungary, <sup>5</sup>Konkoly Observatory, H-1525 Budapest, Pf. 67. Hungary, <sup>6</sup>UNICONSTANT, H-4150 Püspökladány, Honvéd u. 3. Hungary, <sup>7</sup>Berzsenyi College, Dept. Technology, H-9700 Szombathely, Károlyi G. tér 4. Hungary, <sup>8</sup>Eötvös University, Dept. Theor. Physics, Budapest, Pázmány 1/a, <sup>9</sup>Aries Plus Kft. H-1111 Budapest, Bertalan u. 20. Hungary, <sup>10</sup>Eötvös University, Dept. Meteorology, Budapest, Pázmány s. 1/a, Hungary.

**Abstract:** The Atlas Series of the Solar System Research is recently a 5 booklet interactive material in space science education on Eötvös University: 1) Planetary petrography, 2) Surveyor-Hunveyor ed. robotics, 3) Planetary surfaces atl., 4) Planetary atmospheres, 5) Space sci. and geometry. Some maps and CD-s are also shown on the 34. LPSC Open House Event in LPI.

**Introduction:** Our Space Research Group on Eötvös University uses NASA Lunar set and NIPR Antarctic meteorite set during the last 8 years in studies and forming exciting planetary science education programs. In the last 3 years we compiled five high school atlases of the Solar System research, study, activities, field works, space probe constructions. Every year we make 3 new atlases. Now we show the first 5 volumes.

**1. Petrography of Planetary Rocks** (with Materials Maps of their formation). This first atlas shows evolution of two different sized body: a chondritic asteroid and the Moon.

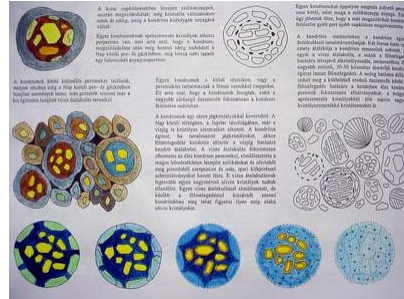


Fig. 1. Page from the Atlas (1) various chondrules. The chondritic body evolution: shown in 2 periods: 1) metamorphic events (with thin sections of the NIPR set) and 2) differentiation by melting and migrations.

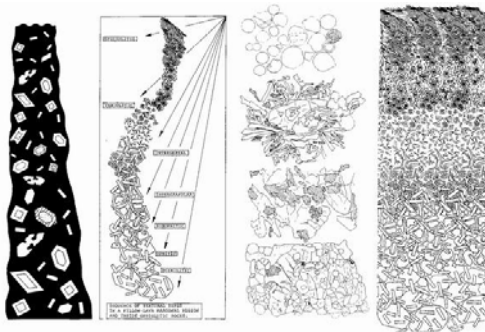


Fig. 2. Mare basalt textural layers of Atlas (1).

The lunar evolution is shown by NASA Lunar Set thin sections: 1) anorthositic crust evolution is shown (i.e. 60025, 78235), 2) mare formation by sequence of basalts (textures in cooling rate series: 74220, 12002, 12005, 7001), 3) breccia forming events (72275, 14301). Mirror units in the booklet correspond to 10 minutes video (or CD) units of a lecture film, too.

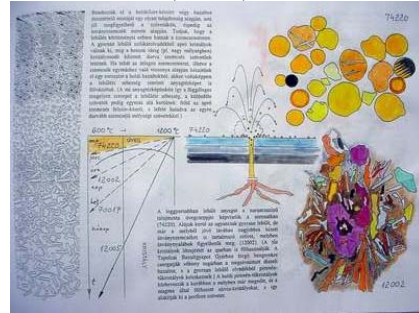


Fig. 3. Mare basalt thin sections in Atlas (1).

**2. Surveyor - Hunveyor:** In this work we describe our experimental university robot, Hunveyor, example for which was the American Surveyor. We show the hearth of the system: two computers connected with each other, form a communication channel but use different peripheries. On the "terrestrial" side the active, directing and controlling peripheries are dominant (joystick, clavatures, monitors) while on the "planetary" side the sensorial, manipulator peripheries are dominant. of electronic and some activities and possible combinations. Not only simple experiments but complex space simulators can grow up in this program.

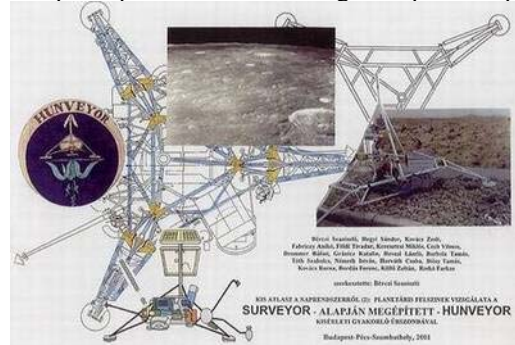


Fig. 4. Cover of the Atlas (2) Surveyor/Hunveyor.

**3. The Atlas of Planetary Bodies:** In this atlas we collected the most important and typical features of our planetary neighbours, and we combine basic planetary knowledge with the up-to-date scientific

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results. The bodies are followed in two evolutionary sequences, one for rocky bodies (from chondritic primitive asteroids to Earth), and another for the icy bodies (from primitive cometary nuclei to Europa) Some interesting episodes are: the greenhouse-effect on Planet Venus or the volcanism on Io. Layers of the terrestrial fields (gravity, magnetic, atmospheric and hydro-circulations) are shown according to their symmetries.

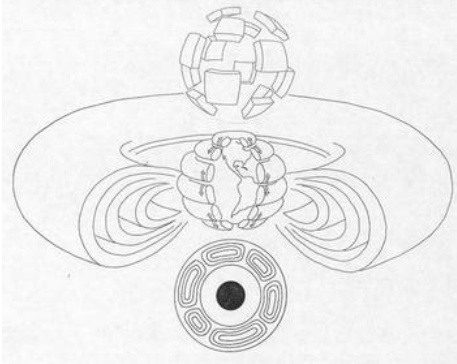


Fig. 5. Materials if the force-field layers of the Earth from Atlas (3).

Local characteristics on surfaces are also followed: the windstorms on Mars or the boulders and grooves on Eros and Phobos. With a lot of maps and figures to be painted and reworked this booklet is a kind of workbook in an "interactive publication style".



Fig. 6. Cover of Atlas (3) in the series.

**4. The Atlas of Planetary Atmospheres:** In this atlas we collected the most characteristic features of the atmospheric phenomena on planets. Both the atmospheres of the rocky planets and Jovian planets and some outer moons as Titan and Triton are shown.



Fig. 7. Cover of Atlas (4) in the series.

Both the internal and external heat sources, the role of volcanism, the magnetic field are discussed on at-

mospheres. Special role has the terrestrial system: together with the hydrosphere, winds, weathering, ice, water circulation. Like in the case of the planetary surfaces atmospheres of the planetary bodies are also taken one by one and also from a comparative point of view. The global evolutionary picture of planetary atmospheres is also discussed.

**5. Space science and geometry:** In this atlas we follow an interesting way. We begin ancient use of geometry: spherical coordinate systems and also the symmetry concept and crystallography. Along this line we study both crystal structure for materials and for architectural space constructions. Some historical events (i.e. Measuring the Earth's diameter by Eratosthenes) are also involved.

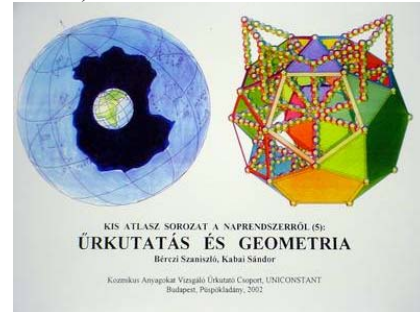


Fig. 8. Cover of Atlas (4) in the series.

**Summary:** The first five atlases were successfully used on our planetary science university, college, and public educational programs.

**Acknowledgment:** The MUI-TP-154 and 190 grants are highly acknowledged.

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