

PLANETARY MAP SERIES FOR CHILDREN. H Hargitai¹, M Gede², J Zimbelman³, Cs Kőszeghy⁴, D Sirály⁵, L Marinangeli⁶, T Barata⁷, I López⁸, A Szakács⁹, K Dębniak¹⁰, T Feuillet¹¹, ¹ Eötvös Loránd University Cosmic Materials Space Reserach Group, 1117 Budapest Pázmány P st 1/A, Hungary, hhargitai@gmail.com, ² Department of Cartography ad Geoinformatics, Eötvös Loránd University, Budapest, Hungary, saman@map.elte.hu, ³ CEPS MRC 315, National Air and Space Museum, Smithsonian Institution, Washington, DC, 20013-7012, USA; zimbelmanj@si.edu, ⁴ 1147 Budapest Fűrés u 16/A, Hungary, csillesz@gmail.com, ⁵ Panorama 73 Eü. Szolg. Kft., Kincsesbánya 8044 József Attila u. 13. Hungary, www.siralydesign.hu, ⁶ TeleLab-DiSPUTer, Universita' G. d'Annunzio, via Vestini 31, Chieti, I, lucia.marinangeli@unich.it, ⁷ CITEUC - Centre for Earth and Space Research of University of Coimbra, Sta Clara, Coimbra, Portugal, mtbarata@gmail.com, ⁸ Universidad Rey Juan Carlos. 28933 Móstoles. Madrid, ivan.lopez@urjc.es, ⁹ Sapientia University, Matei Corvin St., 4, RO400112 Cluj-Napoca, Romania, ¹⁰ WROONA Group, Institute of Geological Sciences, Polish Academy of Sciences, Research Centre in Wroclaw, Poland, debniak.krzys@gmail.com, ¹¹ Institut de Géographie et d'Aménagement Régional de l'Université de Nantes, Campus du Tertre, BP 81 227, 44312 Nantes cedex 3, Thierry.Feuillet@univ-nantes.fr

Introduction: As part of the outreach activity of the ICA Commission on Planetary Cartography, we have developed a new series of planetary maps targeting young readers. This is the third map series from the commission [1]. We focused on the 8-12 age group, who already can read and are still interested in a wide range of disciplines (first years of elementary school). We decided not to use photomosaics or computer-generated data in the maps, but utilized a manual technique. We have selected six planetary bodies which could be the most interesting for children: Venus, the Moon, Mars, Io, Europa and Titan. We have invited six graphic artists – well-known illustrators of children's books – with very different visual styles, to create the maps in the visual language of children: *András Baranyai* (Venus), *Csilla Gévai* (Europa) (Fig. 1), *László Herbszt* (the Moon) (Fig. 2), *Csilla Kőszeghy* (Mars) (Fig. 3), *Panka Pásztohy* (Titan) and *Dóri Sirály* (Io) (Fig. 4). Although the overall structure of the maps is similar, the visual approach to each map is fundamentally different. We consider the series a *scientific-visual experiment*. Visual design is becoming of increasing importance in communicating science from news media to university levels [2, 3]. The initial question was, *can planetary maps be constructed using new visual approaches, but still in a scientifically correct way, and utilizing a standard projection*. In other words, we wished to create cartographically and scientifically correct maps that are attractive and also understandable for children.

Methods: The illustrators and the technical-scientific editor worked together on the maps from the beginning to the end of the project. The illustrators had the freedom of choosing a visual approach but had the limitation to strictly follow the projection and, with sufficient generalization (e.g., simplification, enhancement), depict the surface landforms where they occur. The actual depiction of the landform types was a choice of the illustrators and was varied from com-

pletely symbolic to more or less realistic views. Standard symbols were used throughout the maps (see [4] for professional maps) for common landforms, mixed with unique representations for the more unusual features.

Since the surface is shown in a manually *designed representation*, these maps are not as *objective* as photomosaic or topographic (relief) maps: they are interpretative maps, similar to regular terrestrial color-coded relief maps. This helps the better understanding of these unfamiliar landscapes [5].

In the narrative of the maps, the two hemispheres are shown as if they were seen through the windows of an imaginary spaceship, whose control panel occupies the lower portion of the map. This control panel was designed by the illustrators and shows the physical and orbital parameters of the represented body.

It was the illustrator's responsibility to create a *unique narrative* for the map, which was a specific requirement for this target audience. Although it might be confusing, the maps are populated by stories and creatures. We have used several themes to populate the lifeless surfaces with life. To avoid confusions, we added a short note on the website explaining that no life forms are yet known to occur off the Earth. The children can browse on the map on-line, finding out the stories behind the features represented on each map. The commemorative and mythological names of the IAU nomenclature provided abundant opportunities for the map narratives. Another theme was the research history of the body, i.e. older theories about its surface and other cultural associations. And finally, the imagination of the graphic artists, who created their own stories and life forms. These themes made the maps emotionally charged, which may be an equally important aspect than its scientific content, for the age of the target group. In addition, they could be starting points to spin-offs of the series: short stories or even story books, using the same localities and creatures. This will be the next stage in the project.

Language versions. Translation to the native language of this age group is essential [6]. The final marginal text from the explanations to the legend was translated into 11 languages spoken in Europe (English, French, Hungarian, German, Italian, Polish, Portuguese, Romani, Romanian, Spanish, and Russian). The translation was made by earth and planetary scientists to ensure scientific accuracy. The most unique language version is Romani (Gipsy), which is spoken in several Central European countries, and for which version several new words had to be created.

Conclusion: This is the first project in which detailed hand-drawn lunar and planetary maps were created for children, in the most spoken languages of Europe. We have created experimental maps that use special visual language to communicate scientific information to young audience. This joint work of illustrators and scientists shows that the interpretative representation of these surfaces with new graphic styles require the use of primary scientific data, collected directly from the most current scientific literature combined with a narrative that tells stories in the visual language of children. Planetary surfaces can be mapped from many approaches, some very different from the automated techniques, but these may be more suitable for the younger generation in communicating scientific information and also raising interest in planetary science than the – visually also attractive – photomosaic or topographic maps.

The English version is available at <http://childrensmaps.wordpress.com/>

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References: [1] Shingareva, KB, Zimelman J, Buchroithner MF and Hargitai HI (2005) *Cartographica* 40(4), DOI 10.3138/3660-4078-55X1-3808 [2] Kereszturi A, Hyder D (2012) *Journal of Geography in Higher Education* 36, 499-525, [3] Hargitai HI (2006) *Cartographica* 41(2) 149-167. [4] Nass A, van Gassel S, Jaumann R, Asche H (2011) *Planetary and Space Science* 59(11-12):1255-1264, [5] Hargitai H (2012) *Lecture Notes in Geoinformation and Cartography* 5. Springer. [6] Hargitai H, Li C, Zhang Z, Zuo W, Mu L, Li H, Shingareva KB, Shevchenko VV (2014) *The Cartographic Journal* DOI: dx.doi.org/10.1179/1743277413Y.0000000051,



Fig. 1. Portion of the map of Europa. Illustrator: Csilla Gévai.

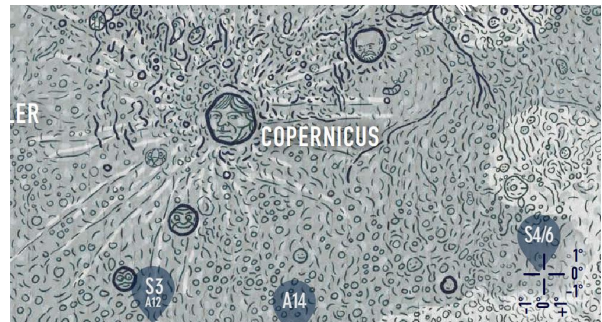


Fig. 2. Portion of the map of the Moon. Detail. Illustrator: László Herbszt.



Fig. 3. The map of Mars. Full layout. Illustrator: Csilla Kőszeghy.

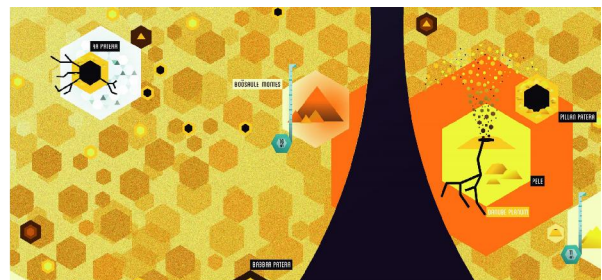


Fig. 4. Portion of the map of Io. Detail. Illustrator: Dóri Sirály.