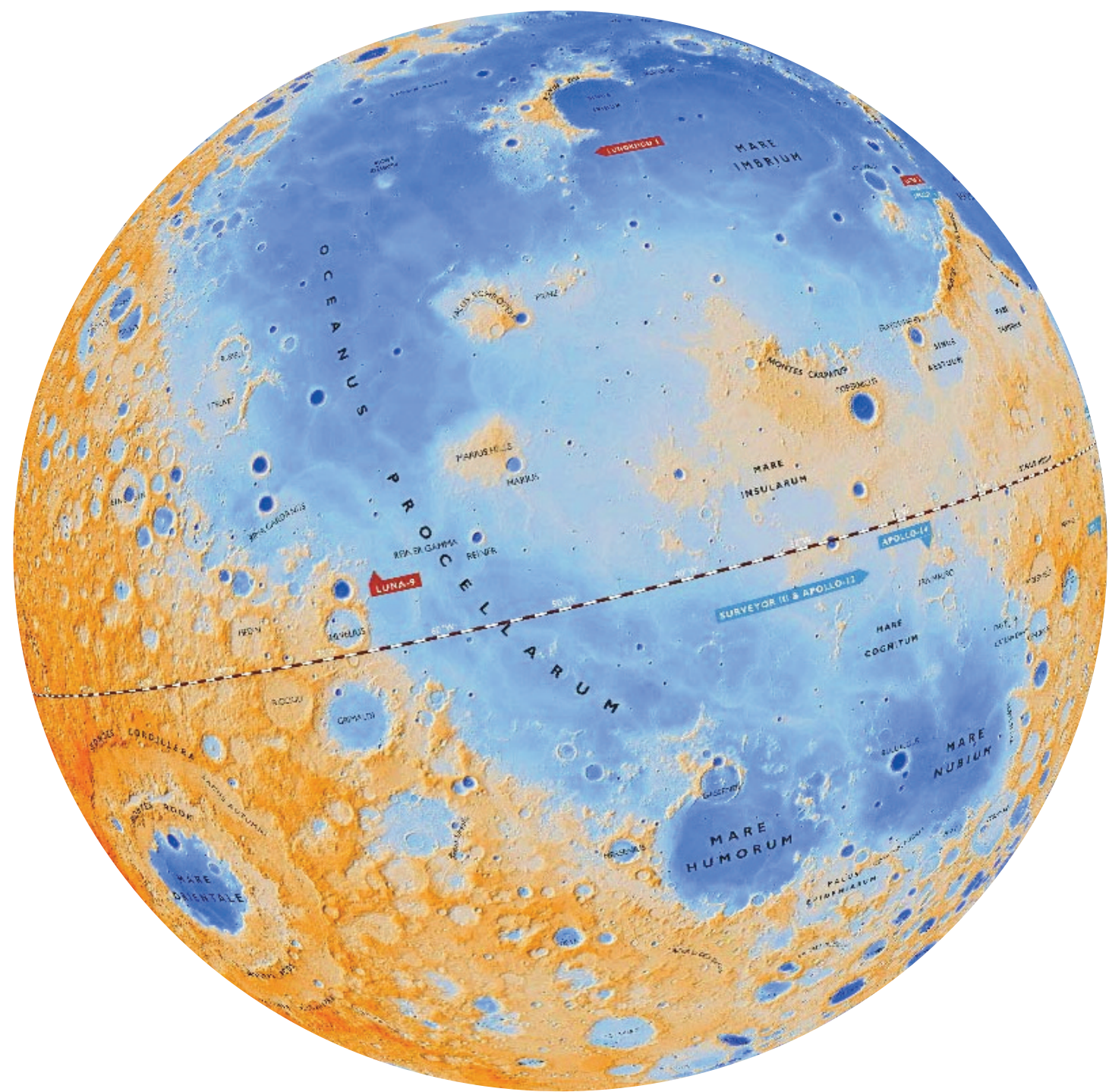




Map of the Moon. (ICA 2012). The map can be viewed as a Google Earth add-on. Labels are non-scalable. LROC data provided courtesy of NASA/GSFC/Arizona State University/DLR <http://lroc.sese.asu.edu>

Geobrowsers vs. Cartographic Art-works: Virtual Planetary Globes Designed for K-12 Education

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Abstract. Virtual planetary globes provide a new, exciting mean of geographical discoveries on both Earth and other planetary bodies. Photomosaic maps are excellent tools but for K–12 education, they are not self-explanatory maps. To make full use of the virtual globe technology, non-automated cartographic products should complement the high resolution imagery. On planetary maps and virtual globes, the “art” part of cartography seems to be marginalized; however, to create attractive and easy-to-understand virtual maps, graphic arts should have the same importance as the technology and science aspects of cartography.

Virtual globes vs. printed maps

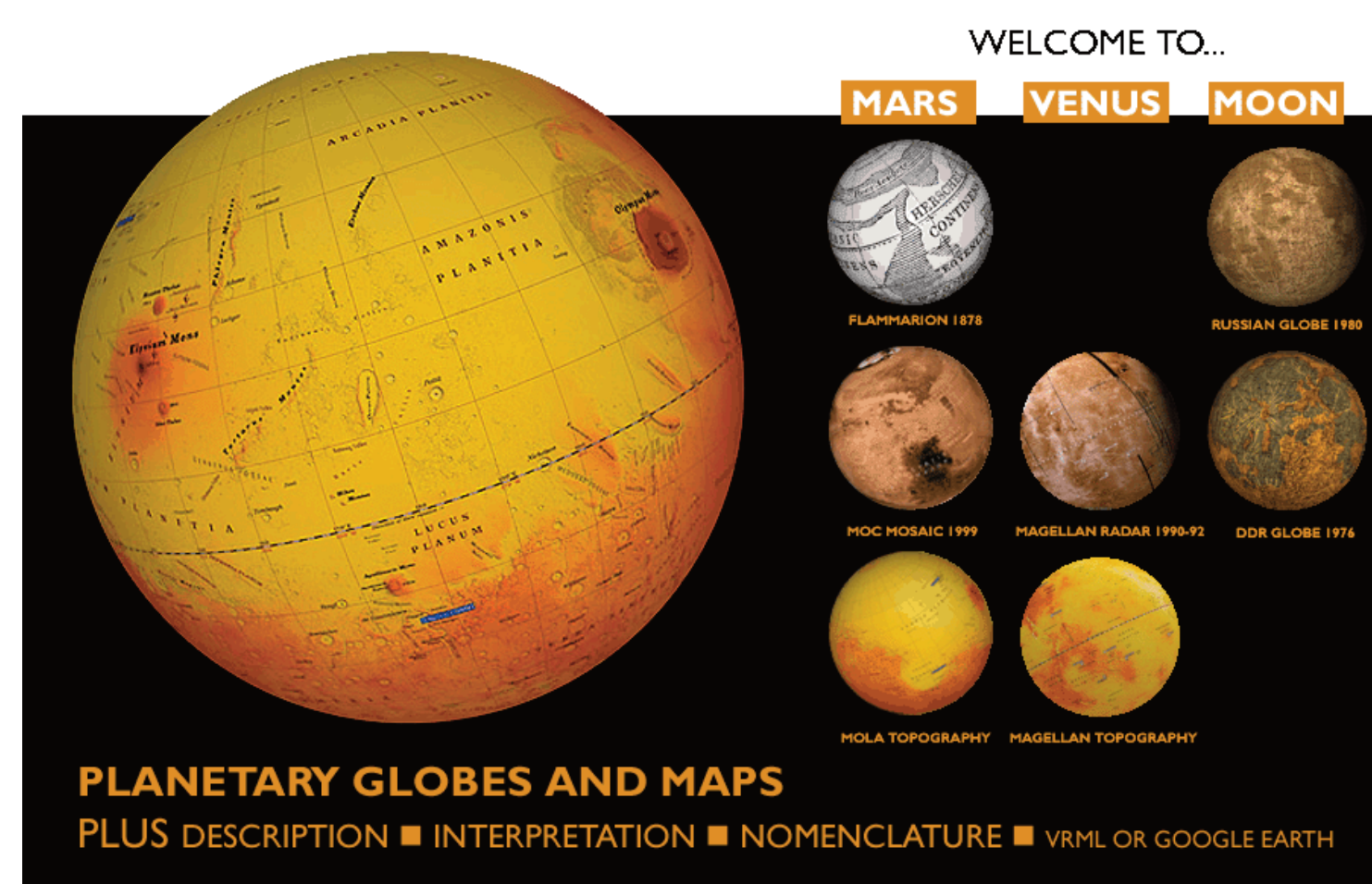
- (1) Virtual globes can provide a relatively distortion-free view of the entire surface,
- (2) Virtual globes can give more “realistic” views from planetary – spacecraft-based – perspective, and are best suitable for a “whole-planet” perspective
- (3) the most abundant objects are craters: circular object which can be better visualized throughout the entire planet using distortion free globes, and
- (4) much studied polar areas, their extent and context are better visualized.
- (5) multilayer technology allows fast comparison of different datasets.



A cartoon-like representation of Mars, showing the major physiographic features. Title frame from an outreach video produced by Jet Propulsion Laboratory in 2012. Major features are clearly recognizable. http://www.nasa.gov/multimedia/videogallery/index.html?media_id=154944441

Planetary Globe Series by ICA

Published: virtual globes of Mars, the Moon, Venus and Titan – topographic, photomosaic (albedo/radar/IR) and historic maps – in the series “Multilingual Maps of Terrestrial Planets and the Moon” coordinated by the Commission on Planetary Cartography of the International Cartographic Association (ICA)



<http://planetologia.elte.hu/globes/>

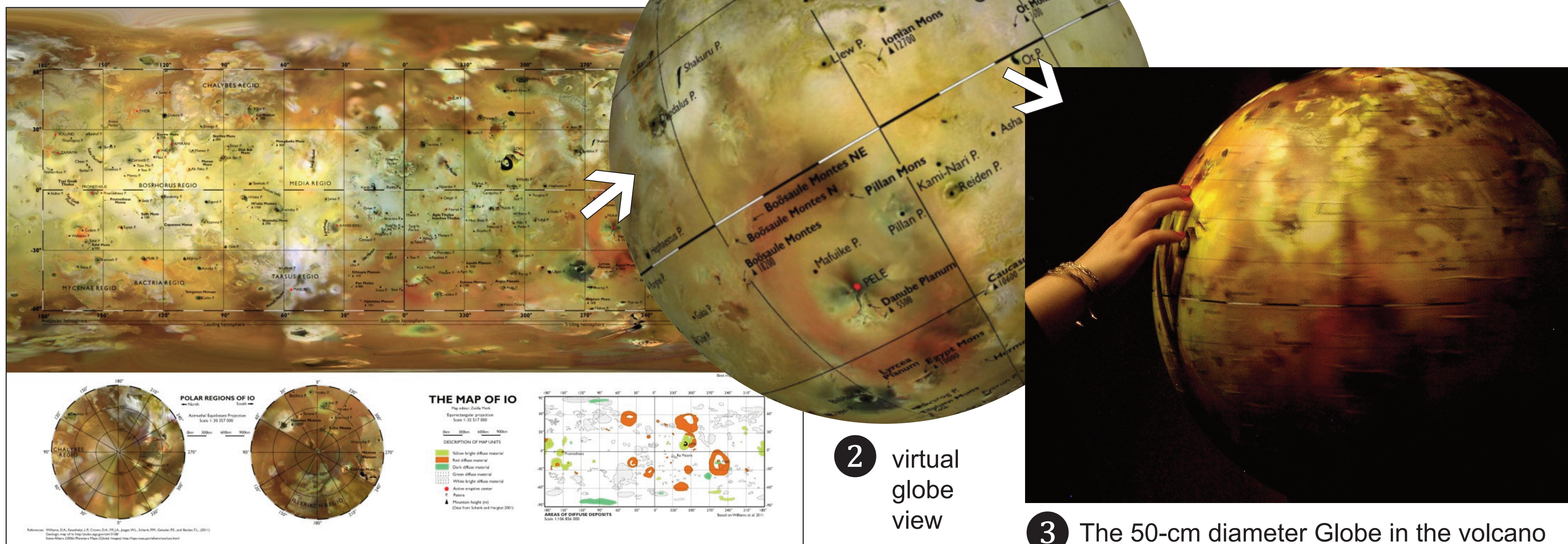
Globe made by graphic artists. *From automated products to hand-made maps.*

Virtual globes of planetary surfaces made of actual automatically derived topographical data **are still too complex**. In order to make it interpretable at K-12 school level, it requires **simplification and generalization**. Its **nomenclature** should be in the mother tongue of the pupils, and its **visual appearance** should only show the very basic features on the planet or moon, as very small scale global maps on Earth show continents and oceans, deserts and forests, mountain chains and main cities in a very simple way. It is not possible to create such visualizations by using any automated process. In the next phase of this project, professional graphic artists, cartographers and planetary scientists together will create simple, **visually attractive and still scientifically accurate** maps to create the planetary equivalents of well known very small scale global cartographic visualization of the Earth.

This globe is planned to use **simple symbols, non-scalable labels** and show only the major types of landforms and other surface features on planetary bodies, to give a general overview of the basic surface properties of a planetary body. This map will be transformed to a virtual globe and be published in several localized versions, in several language variants and will extensively use the possibility of having „points of interest” with auxiliary images and text, that can provide additional information on the features displayed on the globe.

Planned publication date: 2014

Globe of Io, moon of Jupiter



1 The original map

2 virtual globe view

3 The 50-cm diameter Globe in the volcano museum of Celldömök, Hungary