



PLANETarium Pilot: visualizing PLANET Earth inside-out on the planetarium's full-dome

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In the past decade, projection systems in most planetariums, traditional sites of outreach and education, have advanced from interfaces that can display the motion of stars as moving beam spots to systems that are able to visualize multicolor, high-resolution, immersive full-dome videos or images. These extraordinary capabilities are ideally suited for visualization of global processes occurring on the surface and within the interior of the Earth, a spherical body just as the full dome. So far, however, our community has largely ignored this wonderful interface for outreach and education, and any previous geo-shows have mostly been limited to cartoon-style animations. Thus, we here propose a framework to convey recent scientific results on the origin and evolution of our PLANET to the >100 million per-year worldwide audience of planetariums, making the traditionally astronomy-focussed interface a true PLANETarium. In order to do this most efficiently, we intend to show „inside-out“ visualizations of scientific datasets and models, as if the audience was positioned in the Earth's core. Such visualizations are expected to be renderable to the dome with little or no effort. For example, showing global geophysical datasets (e.g., gravity, air temperature), or horizontal slices of seismic-tomography images and spherical computer models requires no rendering at all. Rendering of 3D Cartesian datasets or models may further be achieved using standard techniques. Here, we show several example pilot animations. These animations rendered for the full dome are projected back to 2D for visualization on the flatscreen. Present-day science visualizations are typically as intuitive as cartoon-style animations, yet more appealing visually, and clearly with a higher level of detail. In addition to e.g. climate change and natural hazards, themes for any future geo-shows may include the coupled evolution of the Earth's interior and life, from the accretion of our planet to the evolution of mantle convection as well as the sustainment of a magnetic field and habitable conditions. We believe that high-quality tax-funded science visualizations should not exclusively be used for communication among scientists, but also recycled to raise the public's awareness and appreciation of the Geosciences.