EPSC Abstracts,
Vol. 4, EPSC2009-601, 2009
European Planetary Science Congress,

Communicating astronomy with the Human Orrery

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Introduction

The learning process is often enhanced by active participation (e.g., [1]). Combining this idea with the concept of an orrery – a mechanical model of the planetary system – leads us to the possibility of a Human Orrery, in which users play the role of the planets. Such an exhibit has been constructed at the Armagh Observatory in Northern Ireland (Fig. 1) and has been used to explain principles of planetary motion to the general public [2]. The Human Orrery has proved successful and another version, using the same template, is now (2009) being built at the Kings School, Peterborough in England.

Figure 1: The Armagh Observatory Human Orrery

Design

The scale of the Human Orrery is 1 metre to 1 astronomical unit and the available area in the Observatory grounds allows the region out to the orbit of Saturn to be represented. Circular, stainless steel tiles are laid out to a precision better than 1 cm and represent the positions of the planets at 16 day intervals (Fig. 2).

Use

We have gained experience of presenting the Human Orrery to groups of many different ages, most recently

Figure 2: The Sun tile and some inner planet tiles

(2009 April) to children aged around 14 at the Schools Science Conference held in Armagh (Fig. 3). An important feature of the Orrery is that it allows explanations to be tailored to the knowledge level of the group. Visibility of planets in the sky as seen from Earth can be related to their heliocentric positions shown on the Orrery. Kepler's laws are clearly demonstrated when people representing each planet step from one tile to the next in rhythm with each other.

Figure 3: Explaining the Orrery

References

[1] Francis, P. (2006) *Astron. Educ. Rev.*, 4(2), 1–9.

[2] Asher, D.J. et al. (2007) *Astron. Educ. Rev.*, 5(2), 159–176.