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Planets In Your Hand

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Abstract

Mankind has an inherent desire to explore the planets, which is closely connected with the nature and curiosity of human beings. Unfortunately, the actual exploration is a privilege of only a few people, at least in the near future. The presented project, entitled “Planets In Your Hand” (PIYH) gives everyone the chance to see, touch and feel the differences of each planetary surface in our Solar System and learn about the world we all live in. The PIYH project consists of a portable exhibition of planetary surface models in square frames. It is carefully designed and addressed to both young and elder people, families, students, educational institutions and especially to visually impaired individuals, giving them a unique opportunity to meet and get familiar with planetary science.

1. Introduction

Planets In Your Hand (PIYH) Team, a public outreach team from the Department of Physics of National and Kapodistrian University of Athens, won one of the two funding awards of the competition "Europlanet Funding Scheme 2017", organized by Europlanet. The proposed project consists of an exhibition of eight planetary surfaces, 4 gaseous and 4 terrestrial, giving a visual and tangible representation of a wide range of environments in our Solar System. The visitors of this exhibition will have the chance to see, touch and have a sense of each surface, where the basic planetary characteristics will be given. For example, large temperature difference on Mercury, high temperature on Venus, the red colour of Mars, the gaseous and windy giant planets will be modelled, by utilizing special materials for surface structure, warm and cool air, gaseous and cold surface, and special LED illumination effects.

2. PIYH project

2.1 Construction

The three-dimensional mockup surfaces of the exhibition will be displayed in wooden frames based on wooden pedestals (Figures 1, 2). The embossed surface of terrestrial planets are represented with solid materials, colours, various textures and geological formations, offering a multi-sensory experience to the visitors. On the other hand, gaseous planets are equipped with special illumination and proper fans, representing the planetary atmosphere, in combination with dry ice and low temperature (Table 1).

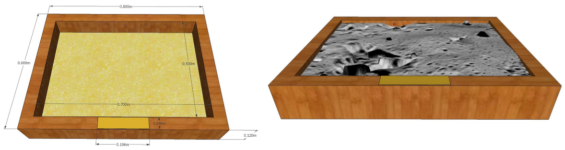

Figure 1: Wooden frame for the planetary surfaces

Figure 2: A 3D virtual wooden pedestal for each surface

The work progress specifically includes the gathering of the necessary materials for every planetary model, the construction of wooden frames in which the planetary surfaces will be inserted and the simulation of the temperature and other circumstances, using suitable materials and effects. Plaster and paint were

used to construct the planetary models, in small and regular scale. An electrical circuit with resistances has also been created, in order to complete planetary surfaces that require higher temperatures, such as Venus and Mercury.

Table 1: Main materials for each planetary surface

Planet	Material	Extra
Mercury	Plaster, Grey paint,	Hot only from one side (resistors)
Venus	Plaster, Yellow-Orange-White paint	Hot everywhere (resistors)
Earth	Plaster, Blue-White & Green-Brown paint	Sand (ground) - gelatin (water)
Mars	Plaster, Ceramic-Red paint	Sand (ground)
Jupiter	Plexiglas, Yellow-Orange-White paint	Gas (dry ice), fans & LEDs
Saturn	Plexiglas, Orange-White paint	Gas (dry ice), fans & LEDs
Uranus	Plexiglas, Cerulean paint	Gas (dry ice), fans & LEDs
Neptune	Plexiglas, Ultra-marine paint	Gas (dry ice), fans & LEDs

2.2 Social media and website

The project is accompanied with social media accounts and a specially developed website, including all information about the Solar System and the exhibited planets. The developed website (*en.planetsinyourhand.phys.uoa.gr*)includes a brief description of the project, information about the exhibition and forthcoming events, as well as information and details about the team members. All information is provided in both Greek and English language. Social media pages (*Facebook*, *Twitter*, *Instagram*), as well as an email address have been also created. Visitors can be immediately informed about the progress of the project and follow our activities. The response and attraction with the public, will give a valuable insight and a quantified measure of our achievement.

2.3 Outreach on schools and institutes

Meanwhile, the communication with organizations that would be interested in the exhibition is also very important. Schools and Educational Institutions in Greece, which would like to host the exhibition, have already been reached out. Since the exhibition is portable, it could travel even further, among other cities and countries. Also, schools and groups with visually impaired people have been reached out, in order to give us some advice about details we should pay attention to for a functional exhibition. Furthermore, brochures with information about our exhibition and the exhibited planets have been redacted and will be distributed in our exhibition in Greek, English and Braille language. Talks about the planets and our Solar System, as well as special events have been arranged for the public about PIYH project.

Figure 3: Suggested layout of the exhibition

3. Summary and Conclusions

People who are not familiar with physics and/or planetary science usually tend to have a wrong impression about the size, the surface structure and the morphology or other relevant properties of the planetary system. Such impression is usually confused when interplanetary travelling is discussed or when a mission to a distant planet is scheduled. The goal of this project is to clarify the above concepts, eliminate such or similar misunderstandings, and give knowledge or even trigger people to get themselves occupied with physics and science. It will be ideal to change the way that people think about planetary physics and we will try to make them love planetary science and space exploration and appreciate it the way we do.

Acknowledgements

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