

PLANETARY SCIENCE MULTIMEDIA: ANIMATED INFOGRAPHICS FOR SCIENTIFIC EDUCATION AND PUBLIC OUTREACH. F. Saavedra¹ and L. Lozano², ¹Department of Geosciences, Universidad Nacional de Colombia, Carrera 45 No 26-85 Edificio 224, Bogotá D.C., Colombia, fsaavedra@unal.edu.co, ²Department of Geosciences, Universidad Nacional de Colombia, Carrera 45 No 26-85 Edificio 224, Bogotá D.C., Colombia, lalozanog@unal.edu.co.

Introduction: Visual and graphic representation of scientific knowledge is one of the most effective ways to present complex scientific information in a clear and fast way. Furthermore, the use of animated infographics, video and computerized graphics becomes a vital tool for education in Planetary Science. Using infographics resources arouse the interest of new generations of scientists, engineers and general public, and if it visually represents the concepts and data with high scientific rigor, outreach of infographics resources multiplies exponentially and Planetary Science will be broadcast with a precise conceptualization and interest generated and it will benefit immensely the ability to stimulate the formation of new scientists, engineers and researchers.

For these reasons, I have made a multimedia work which mixes animated infographics, 3D computer graphics and video with vfx, with the goal of making an introduction to the Planetary Science and its basic concepts. The work It is directed primarily to undergraduate students in sciences and engineering and the general public with interest in actual scientific knowledge.



Fig 1. Screenshot of Planetary Science Multimedia home page.

Multimedia. Topics Planetary Science introductory, basic concepts and data tables were represented in various content formats.

Data tables. Basic data as equatorial radius, mass, density, mean distance from the Sun, orbital period and the rotation period of the planets were dia-

grammed in interactive data tables where user can display additional information about each aspect and within this information find links to other parts of multimedia or another content online science pages.

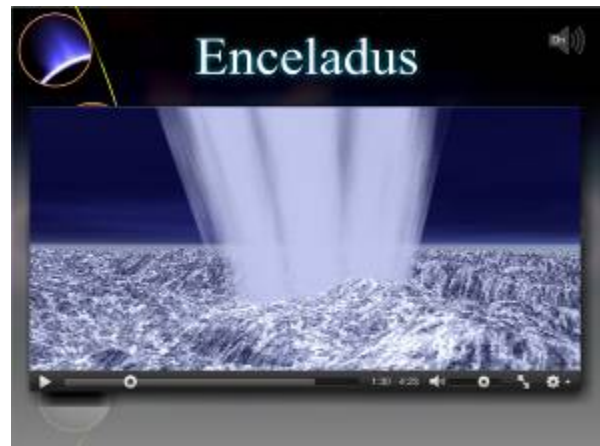


Fig 2. Screenshot of 3D computer graphics inside multimedia.

3D computer graphics. The three-dimensional computer models can explain Planetary Science basic concepts and natural phenomena that occur within the Solar System in a clear and precise way, with a high degree of realism and effective learning. In addition, this type of infographic resources attracts greatly interest of general public and arouses the curiosity of youngest, as their level of entertainment is similar to video games and animated films today. The techniques used to 3D animation includes fractal terrains modeling, fluids simulation and particle system animation. The purpose of using these techniques for making animations is that user is immersed in a virtual environment where can see different Solar System places as if it were there. Users can interact with the animation, controlling play/pause and deploying additional information (as in interactive data tables) by hovering the cursor over the aspect that interests within the animation. These were done with scientific rigor needed to spread Planetary Science as accurately as possible.

Videos. The introduction to planetary science and its basic concepts are explained in video format, narrated and musicalized, with subtitles for people with hearing impaired. They can be played within the same

multimedia without an external player required. The videos are recorded and edited in high quality and contain simultaneously animated infographics and 3D computer animations accompanied by their respective narration with high quality sound to be fully understood.

Requirements. Planetary Science multimedia is programmed in order to no high-performance hardware are needed. Their requirements are equivalent to those of a netbook that is used to access internet to watch videos or use applications based on Adobe Flash and Adobe Shockwave.

Availability. Originally, the media was designed to be seen from a DVD-ROM due to its large size in megabytes of videos and animated infographics. At this time, contents are being adapted to be viewed on-line. The entire work will be displayed in the summer of 2013 at the following URL: <http://www.cienciasplanetarias.org.co/>

Language. The Spanish language is originally used to produce the multimedia, but is also fully translated into English. For the future, it is planned translations into other languages such as French and Portuguese, to reach even greater audience worldwide.

Educational Impact. This multimedia is pioneer the disclosure of Planetary Science and related issues simultaneously is pioneer in use of new information technologies with educational objectives in Colombia. In Colombia, Planetary Science disclosure is poor (if not practically non-existent) so this multimedia work is intended as an important reference source for all those interested in subject. Also, this work aims to influence new generations of Colombian scientists to promote work on issues related to Planetary Science particularly those belonging to departments of geology, physics, astronomy, chemistry and biology of different Universities and Institutes of higher education in the country. Besides, this work pretends to perform the same functions of science education and public outreach on Latin America, taking advantage of Spanish language that unites the scientific communities of Latin American countries.

Public outreach. The Colombian and Latin American public has a strong interest in Planetary Science and this multimedia pretends meet the needs of this audience, yet without have a scientific or belong to a scientific institution, continues marvelling at the knowledge that has been acquired about planets and Solar System and all related topics. Also, this work has been done in order to captivate the interest of people unaware the topics to create a new generation

of scientists and engineers, who will work in the future in Planetary Science.

Conclusions. The Planetary Science Multimedia is an interactive infographic tool designed to be used to introduce these scientific disciplines to the general public, also to be used as an educational tool to strongly spread knowledge has been acquired thus far. All this multimedia work will be available online from summer 2013.