

# Development of 3D multimedia with advanced computer animation tools for outreach activities related to Meteor Science and Meteoritics

**J.M. Madiedo (1,2)**

<sup>1</sup>Facultad de Física, Universidad de Sevilla, Departamento de Física Atómica, Molecular y Nuclear, 41012 Sevilla, Spain.

<sup>2</sup>Facultad de Ciencias Experimentales. Universidad de Huelva, 21071 Huelva, Spain (madiedo@uhu.es).

## Abstract

Documentaries related to Astronomy and Planetary Sciences are a common and very attractive way to promote the interest of the public in these areas. These educational tools can get benefit from new advanced computer animation software and 3D technologies, as these allow making these documentaries even more attractive. However, special care must be taken in order to guarantee that the information contained in them is serious and objective. In this sense, an additional value is given when the footage is produced by the own researchers. With this aim, a new documentary produced and directed by Prof. Madiedo has been developed. The documentary, which has been entirely developed by means of advanced computer animation tools, is dedicated to several aspects of Meteor Science and Meteoritics. The main features of this outreach and education initiative are exposed here.

## 1. Introduction

"Impacts and meteorites" (Fig. 1) is the name of a 28' documentary produced during 2010 with the aim to allow the public to know the importance of meteorites for science and which are the main consequences of impacts for the evolution of the Solar System and even for the evolution of life on Earth. It was fully developed by a researcher working in meteor science and meteoritics by using advanced computer animation software tools. Since 2010 it has been used in the context of several outreach and education activities organized in Spain.

## 2. Contents

"Impacts and meteorites" covers different topics related to meteoroids, meteors, meteorites and the

role that impacts play in the evolution of the solar system. These include, for instance: a) The origin of meteoroids and meteor showers. b) Meteorites: how to recognize them and basic types (stony, iron and stony-iron). c) Where do these meteorite types come from? d) Organic molecules in meteorites: carbonaceous chondrites. e) How the Moon was born. f) The role of impacts on life on Earth. g) Impacts on other bodies in the Solar System.

## 3. Methods

A virtual scene was created for every sequence in the documentary by means of computer animation software tools. This implied a careful selection of proper materials, textures, illuminations, objects and effects. These scenes were then rendered with a battery of 5 PC computers. As in most cases the renderization process needed a big amount of time, several computers were used at the same time in order to decrease the production time. Besides, 3D footage was prepared by means of special software tools that allowed the use of two virtual cameras in the same scene, but placed in slightly different positions to simulate the stereo vision effect. This implied that every frame had to be rendered twice: one for the left-eye camera and another one for the right-eye camera. Then, these images were combined to create the final 3D footage. A 2D version was also prepared. Although several options were available with respect to the 3D technique employed, the anaglyph method was selected for simplicity and lower cost, as anaglyph glasses are much cheaper than active or passive polarized glasses and, so, less funding is necessary to organize an activity for a big audience.

## 4. Summary and conclusions

A documentary has been developed as a tool for outreach activities to promote the importance of meteor science and meteoritics. For this purpose, advanced computer animation techniques have been employed. The documentary has been fully produced and directed by a researcher working in these areas, and 3D and 2D versions were produced.



Figure 1: Screenshots from the 2D version of the documentary "Impacts and Meteorites".