

**VIRTUAL MUSEUM FOR METEORITES: ACCESSIBILITY FROM NEW PLATFORMS AND DEVICES.** J.M. Madiedo. ETSI, University of Huelva, Campus de La Rábida, Palos de la Frontera (Huelva), Spain, madiedo@uhu.es.

**Introduction:** The Virtual Museum for Meteorites (Figure 1) was created in 2011 as a web tool for students, educators and researchers [1, 2]. One of the aims of this online resource is to promote the interest in meteorites. Thus, the role of meteorites in education and outreach is fundamental, as these are very valuable tools to promote the public's interest in Astronomy and Planetary Sciences. Meteorite exhibitions reveal the fascination of students, educators and even researchers for these extraterrestrial rocks and how these can explain many key questions related to the origin and evolution of our Solar System.

This virtual museum takes advantage of HTML and related technologies to overcome local boundaries and offer its contents for a global audience. However, as new devices and platforms are available, it is more challenging to create web contents that can reach the widest audience possible. In particular, the recent limitations imposed by some devices and web browsers to previous multimedia formats (such as SWF files) have resulted in a deep modification of the technology employed by the Virtual Museum for Meteorites. A description of the recent developments performed in the framework of this virtual museum is given in this work.

**The collection behind the Virtual Museum:** The specimens included in the Virtual Museum for Meteorites are based on the private meteorite collection owned by Prof. Jose Maria Madiedo [3]. The Madiedo Meteorite Collection consists of over 900 specimens which are available for research purposes but also for education and outreach. Some of these meteorites are being regularly exhibited in Spain in collaboration with universities, museums, research centers and other institutions.

**Description of the Virtual Museum:** The Virtual Museum for Meteorites (Figure 1) is available in both, English and Spanish versions, since November 2011 at <http://www.museodemeteoritos.es>. The extraterrestrial rocks exhibited there were photographed by using two different techniques. Thus, some of them were imaged from different angles in order to make small interactive animations that can be easily manipulated from the user-friendly web interface. In this way, the visitor can rotate 360° the corresponding meteorite to visualize the rock from different points of view. This has one big advantage, since interesting and important features present on the whole surface of the meteorite can be easily displayed. For other specimens, however, high-resolution digital photographs were taken in order to display zoomed images of these meteorites.

These images can be also manipulated by the visitor from the web interface.

The contents exhibited by the Virtual Museum are placed within six virtual rooms dedicated to different subjects related to meteorites and impacts:

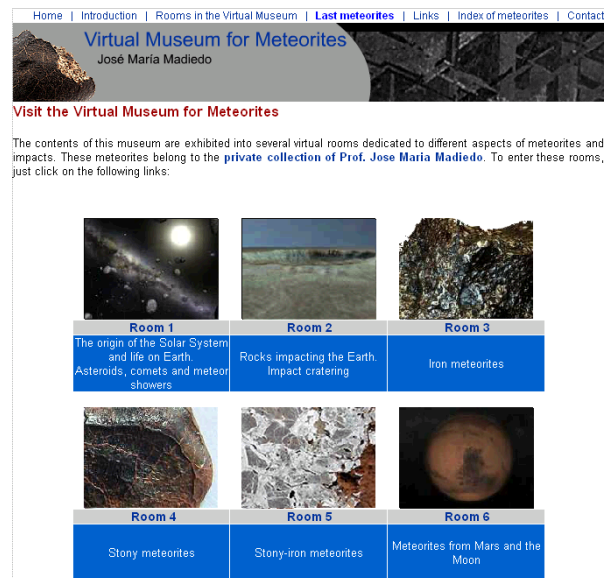


Figure 1. Screenshot of the web page from which the different exhibition rooms in the Virtual Museum for Meteorites can be accessed.

Room 1: The origin of the Solar System and life on Earth. Asteroids, comets and meteor showers

Room 2: Rocks impacting the Earth. Impact cratering.

Room 3: Iron meteorites.

Room 4: Stony meteorites

Room 5: Stony-iron meteorites.

Room 6: Meteorites from Mars and the Moon.

**Accessibility from new devices:** The expansion of smartphones and tablets has resulted in an increasing number of potential visitors accessing the virtual museum from platforms other than traditional computers. A wide number of these new devices, however, do not support some multimedia files traditionally employed by web developers to display special contents, such as the well-known Flash SWF format. This format was employed by the Virtual Museum for Meteorites to display some of the specimens, for instance. In addition, some of the interactive features available in this virtual museum were also based on SWF files (Figure

2). In order to overcome this problem, SWF contents have been transformed to the most recent HTML5 format.

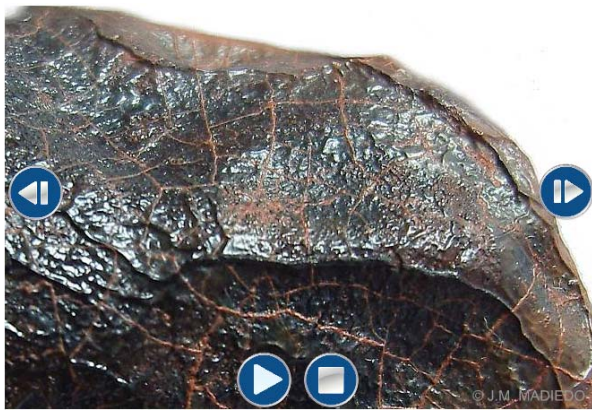


Figure 2. Image showing one of the interactive animations exhibited by the Virtual Museum for Meteorites. This example corresponds to a specimen of the Millbillillie eucrite.

**New specimens:** New meteorites have been included in the Virtual Museum for Meteorites. The most remarkable specimens that have been added are two pieces of the well-known Chelyabinsk meteorite, which fell in Russia in February 2013 (Figure 3). Among the new pieces displayed in the virtual museum are the Dar Al Gani 400 lunar anorthosite and the North West Africa 6963 shergotitte. This martian meteorite was found in 2011.



Figure 3. One of the specimens of the Chelyabinsk meteorite exhibited in the Virtual Museum for Meteorites since 2013.

Besides, the number of anaglyph red-cyan images available to show some of the meteorites has increased. This provides interesting 3D views of these specimens and makes the contents of the Virtual Museum more attractive. These anaglyph images were

prepared by obtaining two images of the rock from slightly different points of view and then by combining them with a software.

**Conclusions:** The Virtual Museum for Meteorites has been recently modified in order to allow accessibility from new platforms and devices which do not support the flash SWF multimedia format. In this way, the contents of this museum can be accessed by a wider audience using smartphones, tablets and similar devices to view websites. During 2013 other significant improvements have been performed. Among these, the most important ones are related to an increase in the number of specimens exhibited, but also to the availability of additional 3D images for some of the meteorites.

**References:** [1] Madiedo J.M. (2012) *43st LPSC*, Abstract #1300. [2] Madiedo J.M. (2012) *EPSC*, Abstract #Vol. 7 EPSC2012-3. [3] Madiedo J.M. (2012) *EPSC*, Abstract #Vol. 7 EPSC2012-7.