

FULL MOON FEELING

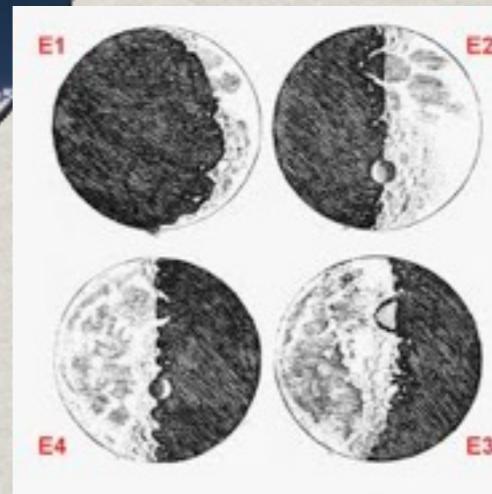
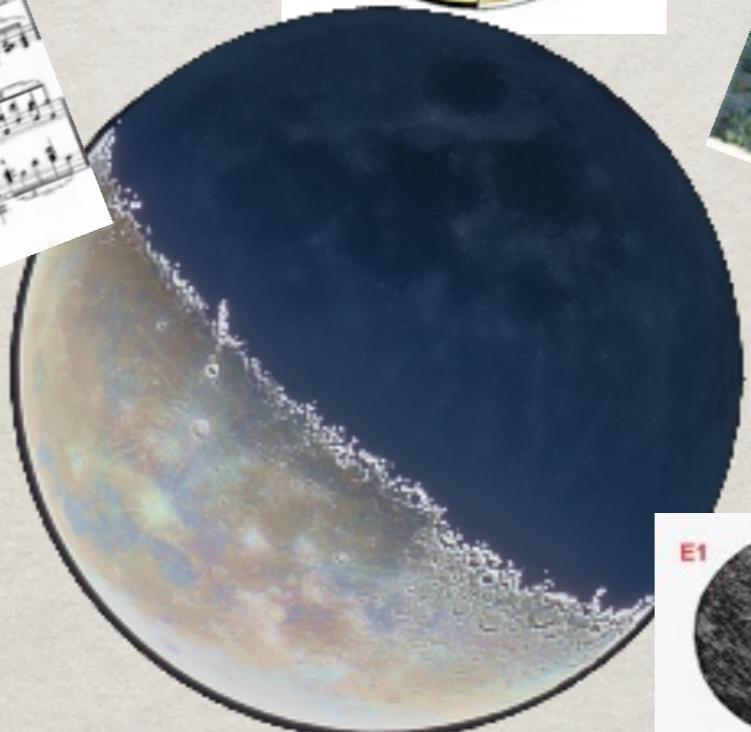
AMELIA ORTIZ GIL
ASTRONOMICAL OBSERVATORY
UNIVERSITY OF VALENCIA



Observatori Astronòmic
UNIVERSITAT DE VALÈNCIA



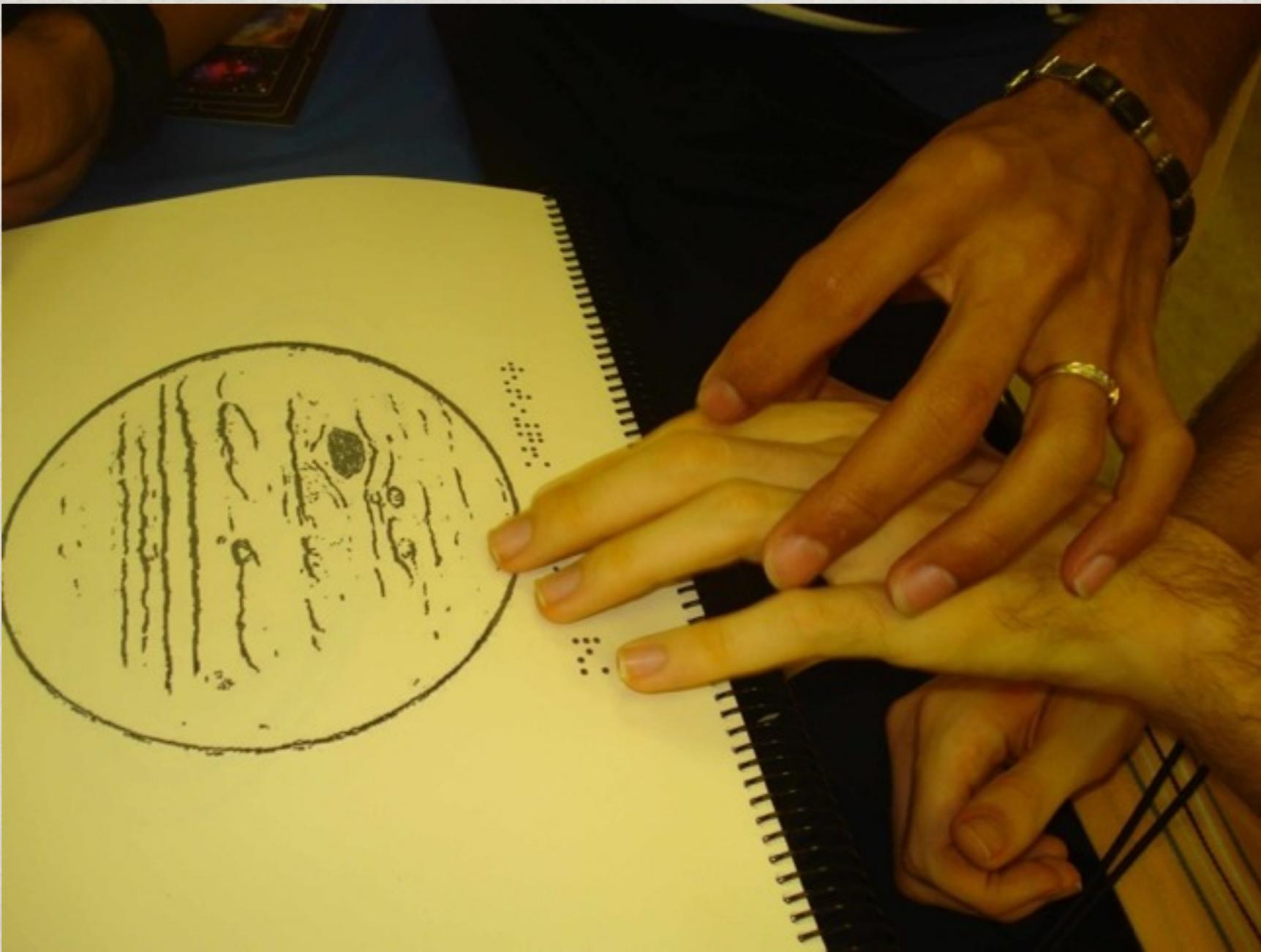
THE MOON AS A TOOL AND SOURCE OF INSPIRATION



A central element in human existence



NOT EVERYBODY CAN EXPERIENCE IT AS WE DO



ASTRONOMICAL TOOLS FOR PEOPLE WITH DISABILITIES



Planetarium show for the blind



A TACTILE MODEL FOR THE MOON



LOOKING FOR FUNDING: EUROPLANET

The screenshot shows the Europlanet website homepage. At the top, the Europlanet logo and text "A European Research Infrastructure for Planetary Science" are displayed, along with the European Union flag and the "SEVENTH FRAMEWORK PROGRAMME" logo. Below this is a large banner featuring various planets and a comet against a starry background. A navigation bar includes links for Home, Project, Media Centre, Outreach, Multimedia, and flags representing member countries. Below the navigation is a link to "Back to Outreach - Funding Scheme" and a section titled "Case Studies of projects funded by Europlanet". A blue header box highlights "Projects funded by Europlanet in 2011". It features two columns: one showing graphical concepts for a Mars Rover game and another showing a 3D tactile model of the Moon. To the right, there's a sidebar for "Outreach" with social media icons and a section for "Coming up" and "Outreach/Education Events" listing a conference in Beijing.

Europlanet
A European Research Infrastructure
for Planetary Science

Home Project Media Centre Outreach Multimedia

Back to Outreach - Funding Scheme

Case Studies of projects funded by Europlanet

Projects funded by Europlanet in 2011

First graphical concepts of the VMR game

VMR Mars Rover Challenge

Europa awarded a grant of 12 000 Euros to the Virtual Mars Rover (VMR) – Mars Life Challenge, a multiplayer game for mobile phones with Android OS (and later – other mobile OS). The creators belong to the Mars Society Polska and through the organisation

In 2011, Europlanet also awarded a grant of 4 000 Euros to the Astronomical Observatory – University of Valencia for the design and prototyping of a 3D tactile model of the Moon, to be used specially, although not exclusively, by blind and visually impaired people.

Outreach

Coming up

Outreach/Education Events

10-14 October 2011 - Communicating Astronomy with the Public (CAP) 2011 Conference - Xiyuan Hotel, Beijing, China

+ Spanish Foundation for the Communication of Science (FECyT)



PEOPLE INVOLVED...

- ✿ Rosa Doran (Nuclio - GTTP - GHOU)
- ✿ Gloria María Isidro (University of Puerto Rico)
- ✿ Caterina Boccato & Leopoldo Benacchio (Osservatorio Astronomico di Padova - INAF)
- ✿ Stefano Sandrelli & Monica Sperandio (Osservatorio Astronomico di Brera- INAF)
- ✿ Alberto Fernández-Soto, Fernando Ballesteros, Mariana Lanzara, Xusa Moya (Astronomical Observatory UV)
- ✿ Emilio García (Instituto Astrofísica de Andalucía)
- ✿ Pablo Santos (Observatoire de Paris)



THE MOON IS FLAT



Noreen Grice's book



Flat model (UPR)



Vivian Hoette, Yerkes



3D SPHERICAL MOON

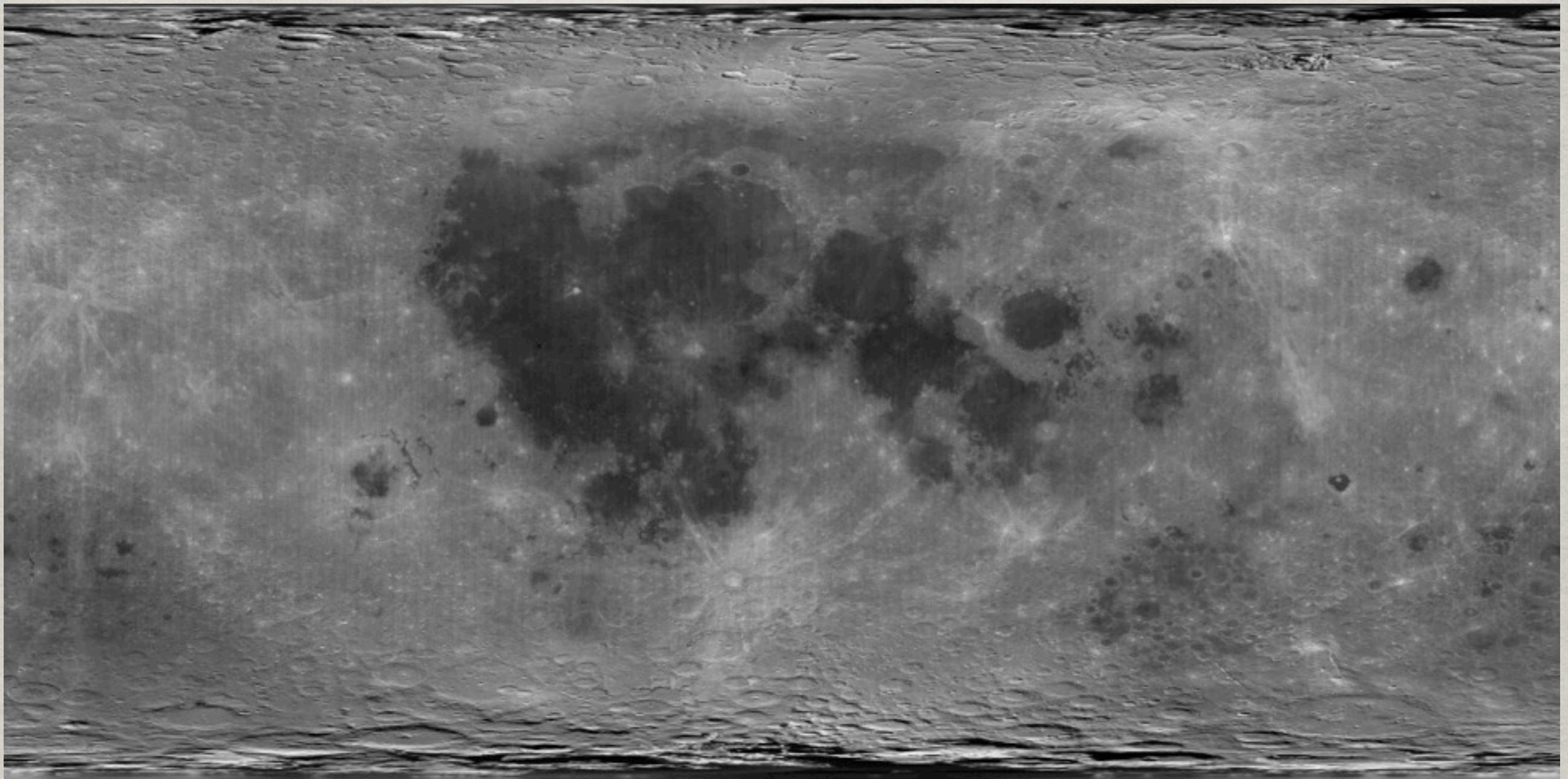
... NOT a
topographical
representation



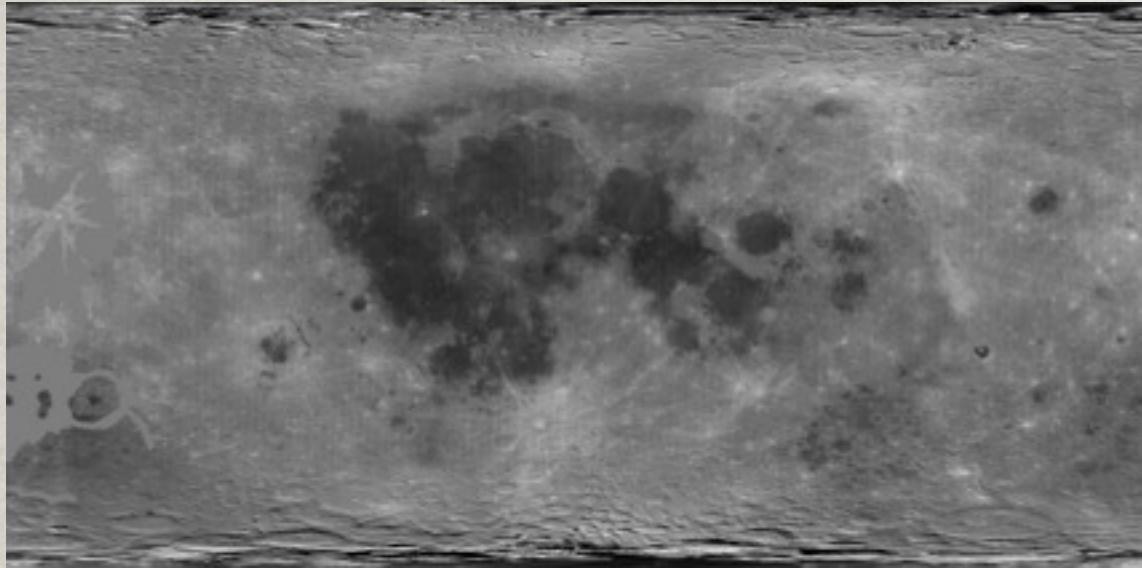
To convey the VISUAL
impression of the Moon



CHOSING THE IMAGE: CLEMENTINE'S MAP



ADAPTING THE IMAGE

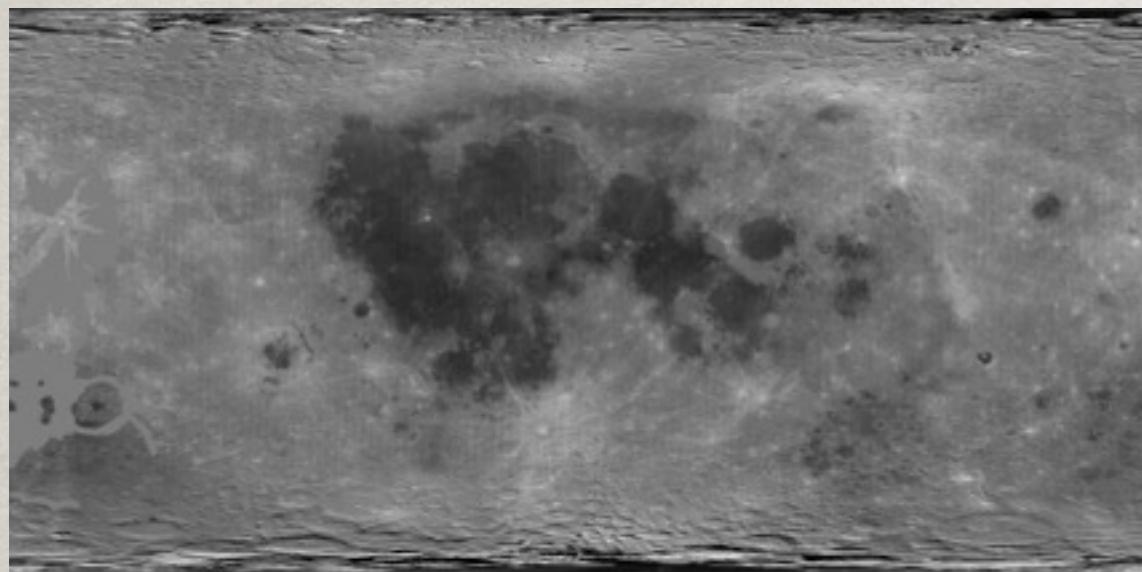


Too much detail
leads to confusion

Only main accidents in terms of visibility will
be represented:
large craters
large maria
large mountain ranges
conspicuous crater rays



IMAGE PROCESSING WITH GIMP



increasing contrast,
blurring and deleting

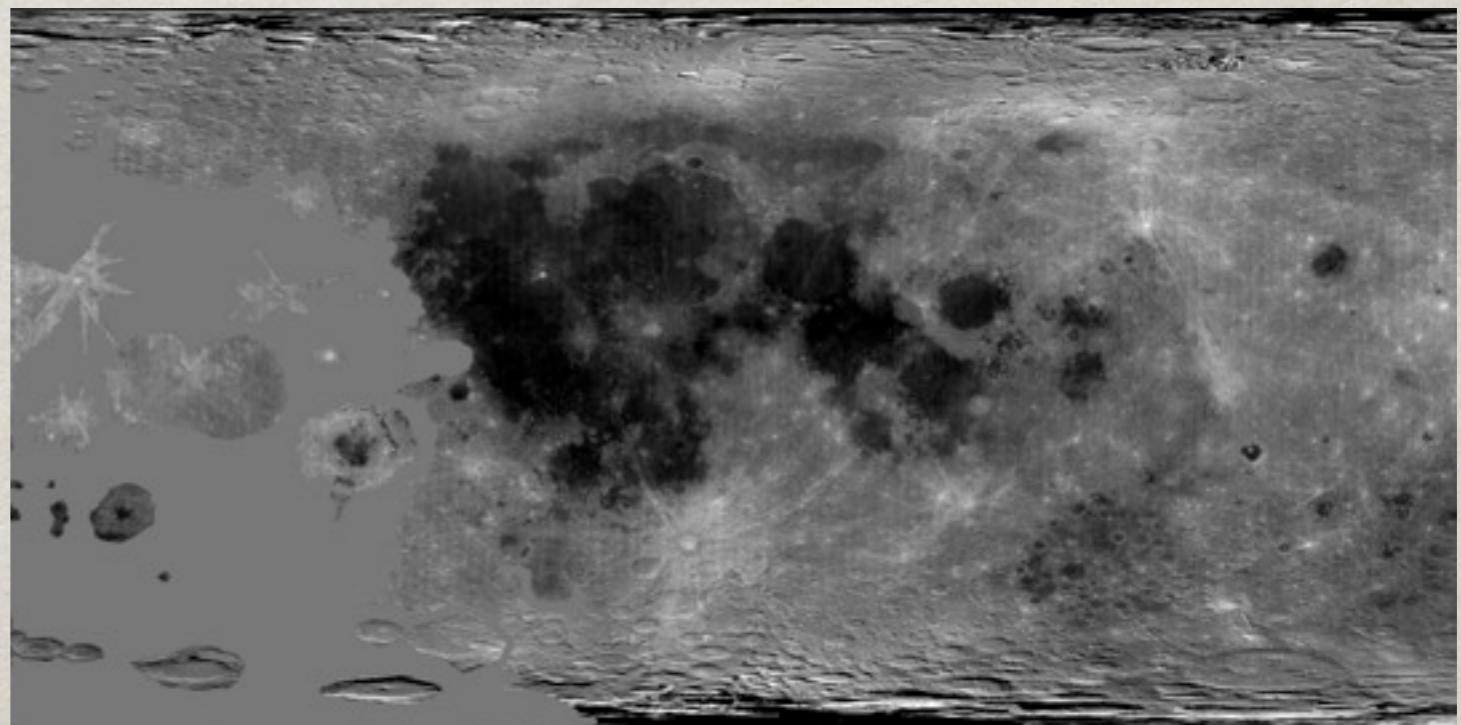
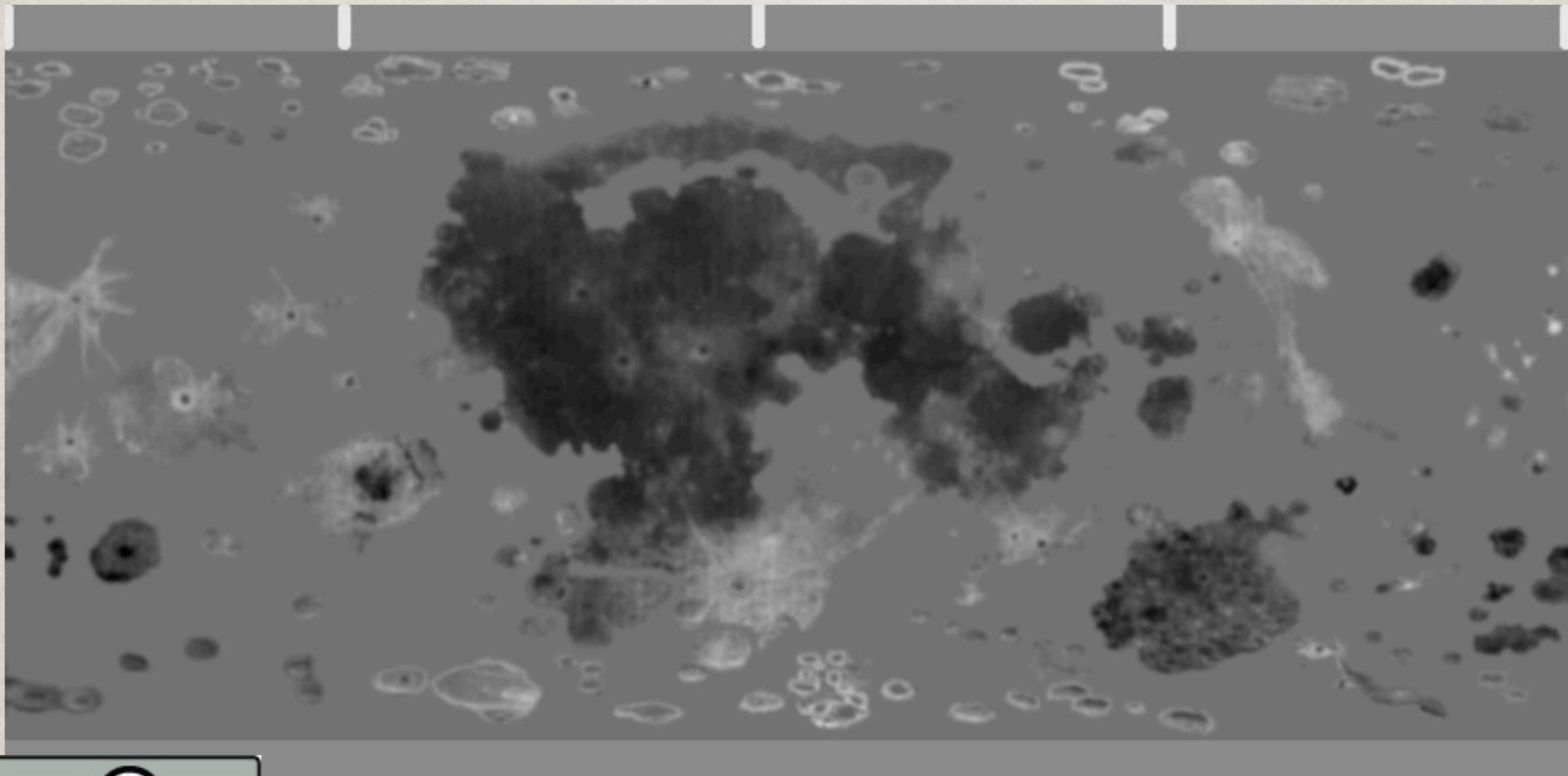
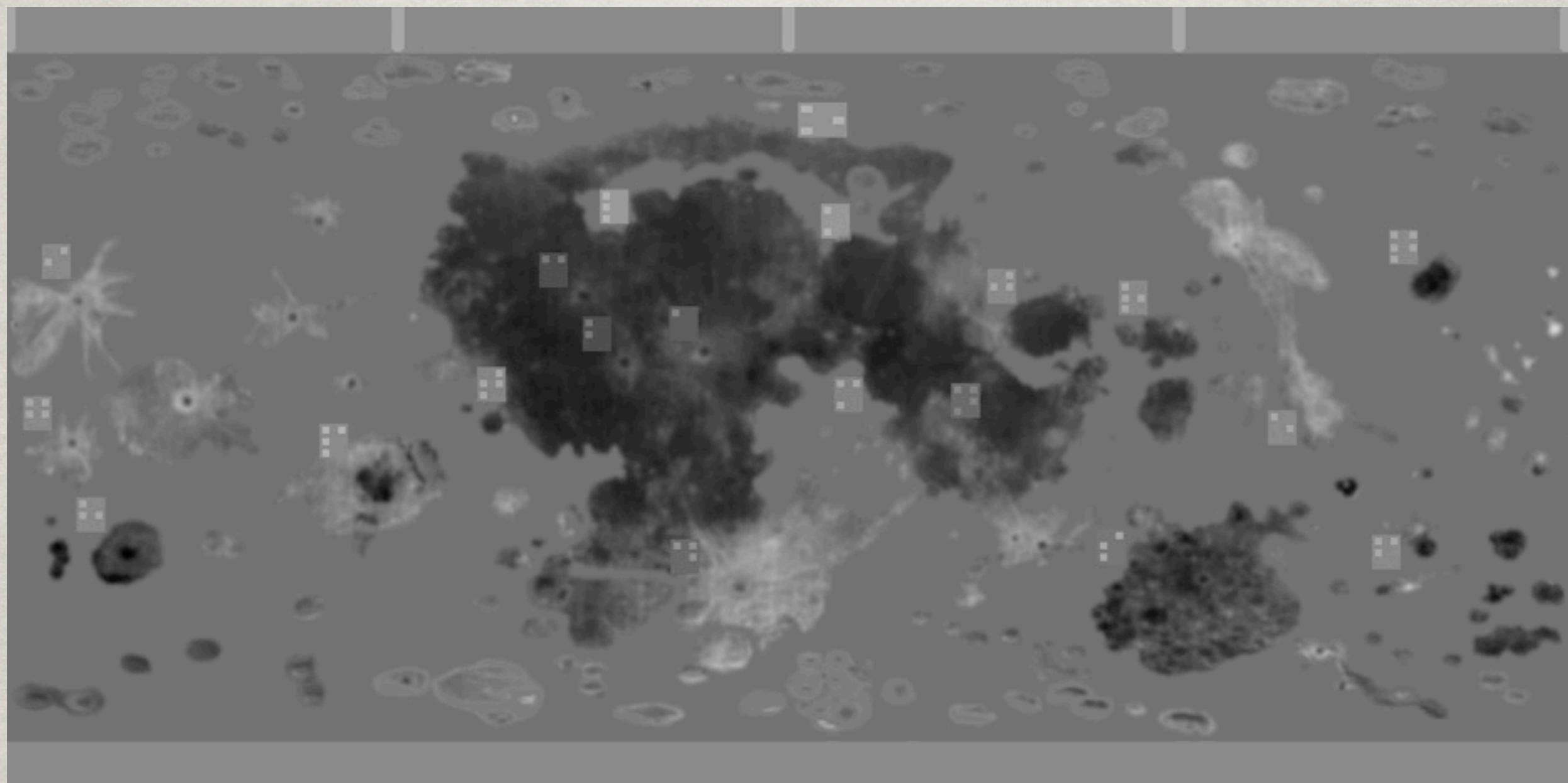


IMAGE PROCESSING WITH GIMP

final image



LABELING THE IMAGE (GIMP)



Each ‘important’ feature is labeled with a braille letter on top of a smooth square to make it distinctive from the lunar surface



LABELING THE IMAGE (GIMP)

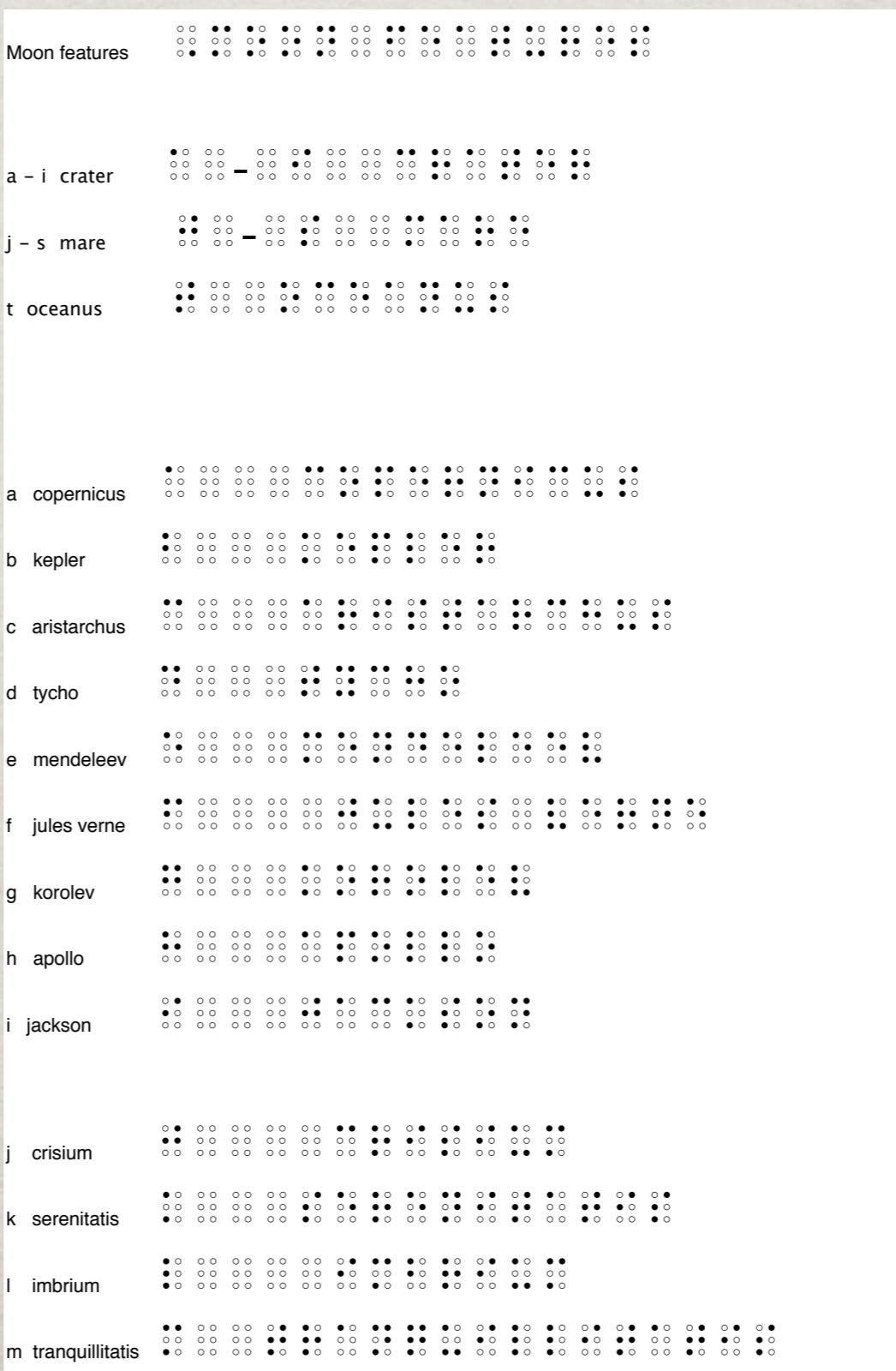


IMAGE FORMAT

Computer, easy to share format:
3D printing format .stl

Need for a 3D rendering software: MeshLab, Google SketchUp

MeshLab

From Wikipedia, the free encyclopedia

MeshLab, is a free 3D mesh processing software program; MeshLab, started in late 2005, is an open-source general-purpose system aimed to help the processing of the typical not-so-small unstructured 3D models that arise in the pipeline of processing of the data coming from 3D scanning. MeshLab is oriented to the management and processing of unstructured large meshes and provides a set of tools for editing, cleaning, healing, inspecting, rendering and converting these kinds of meshes.

The automatic mesh cleaning filters includes removal of duplicated, unreferenced vertices, non manifold edges, vertices and null faces. Remeshing tools support high quality simplification based on quadric error measure, various kinds of subdivision surfaces and two surface reconstruction algorithms from point clouds based on the ball-pivoting technique and on the Poisson surface reconstruction approach. For the removal of noise, usually present in acquired surfaces, MeshLab supports various kinds of smoothing filters and tools for curvature analysis and visualization. It includes a tool for the registration of multiple range maps based on the Iterative Closest Point algorithm. MeshLab also includes an interactive direct paint-on-mesh system that allows to interactively change the color of a mesh, to define selections and to directly smooth out noise and small features.

MeshLab is available for most platforms, including Windows, Linux and Mac OS X. The system supports input/output in the following formats: PLY, STL, OFF, OBJ, 3DS, VRML 2.0, U3D, X3D and COLLADA. MeshLab allows also to directly import the point clouds reconstructed using Photosynth to further process and reconstruction.

MeshLab is used in various academic and research contexts, like microbiology^[1], Cultural heritage^[2], surface reconstruction^[3] and desktop manufacturing^[4].

See also [edit]

- Geometry processing
- 3D scanner



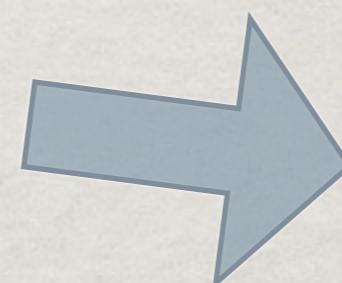
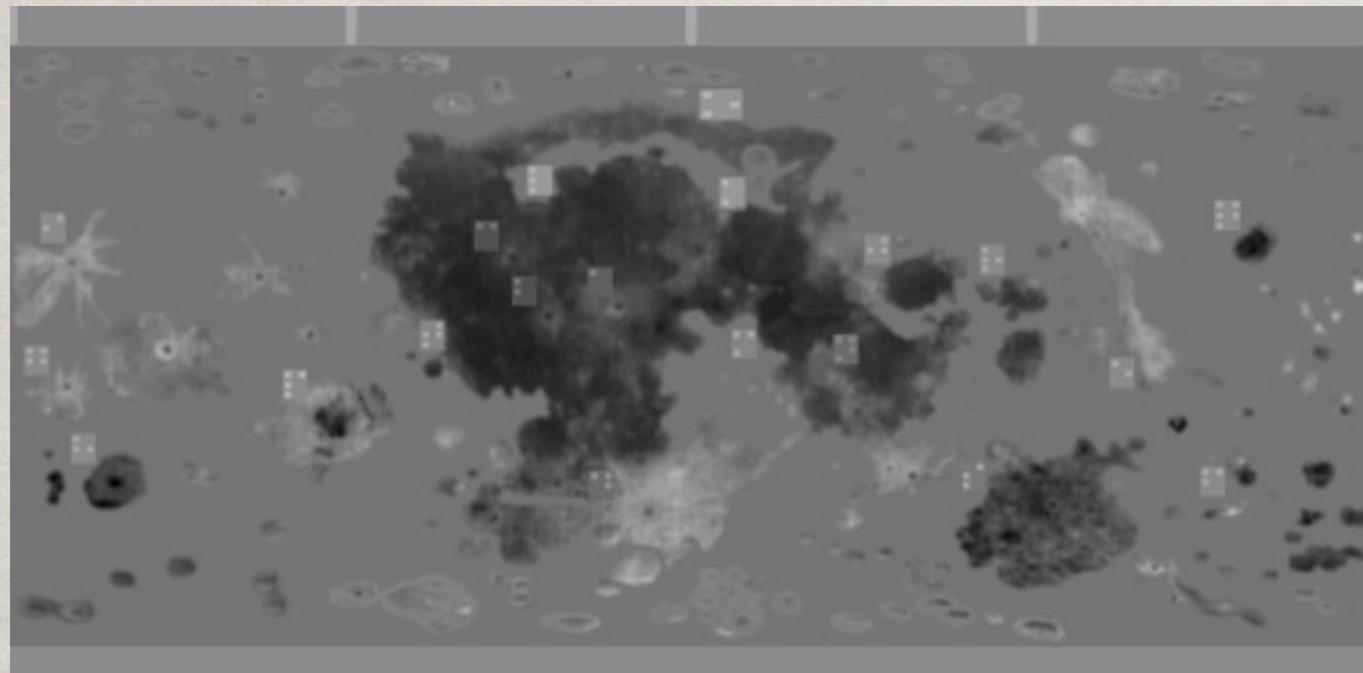
MeshLab 1.2.1

Developer(s)	ISTI - CNR
Stable release	1.3.0 / February 16, 2011; 6 months ago
Written in	C++
Operating system	Cross-platform
Type	graphics software
License	GPL
Website	meshlab.sourceforge.net

 Free software portal



INPUT IMAGE FOR MESHLAB

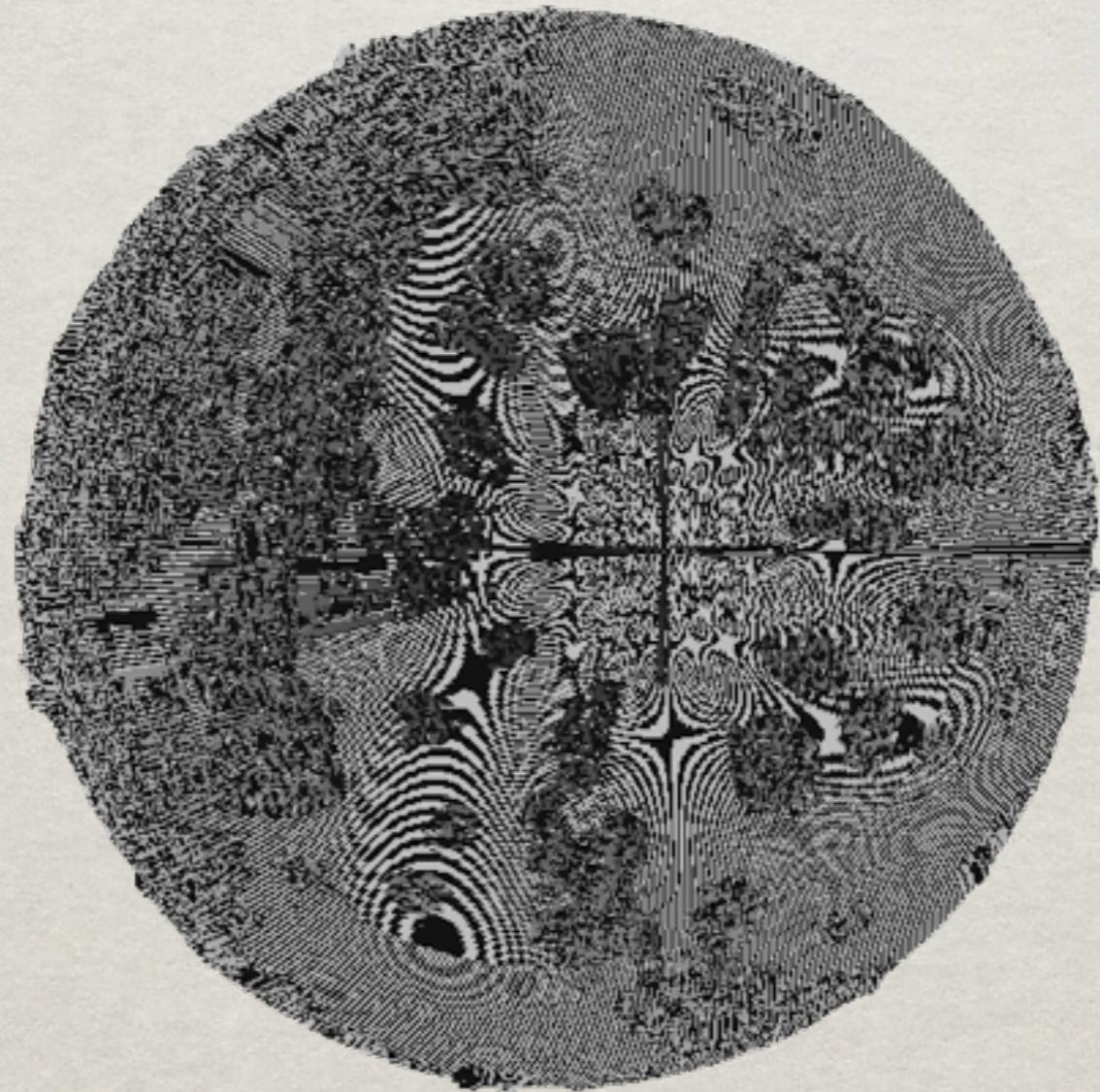


	Clementine_albedo
1	0.0000, 0.0000, -129.7451
	0.7548, 0.0000, -129.7429
	0.7548, 0.0044, -129.7429
	0.7548, 0.0088, -129.7429
	0.7547, 0.0132, -129.7429
	0.7546, 0.0176, -129.7429
	0.7545, 0.0220, -129.7429
	0.7544, 0.0263, -129.7429
	0.7542, 0.0307, -129.7429
	0.7540, 0.0351, -129.7429
	0.7538, 0.0395, -129.7429
	0.7536, 0.0439, -129.7429
	0.7533, 0.0483, -129.7429
	0.7530, 0.0527, -129.7429
	0.7527, 0.0570, -129.7429
	0.7523, 0.0614, -129.7429
	0.7520, 0.0658, -129.7429
	0.7516, 0.0702, -129.7429
	0.7511, 0.0745, -129.7429
	0.7507, 0.0789, -129.7429
	0.7502, 0.0833, -129.7429
	0.7497, 0.0876, -129.7429
	0.7492, 0.0920, -129.7429
	0.7487, 0.0963, -129.7429
	0.7481, 0.1007, -129.7429
	0.7475, 0.1051, -129.7429
	0.7469, 0.1094, -129.7429
	0.7462, 0.1137, -129.7429
	0.7455, 0.1181, -129.7429
	0.7448, 0.1224, -129.7429



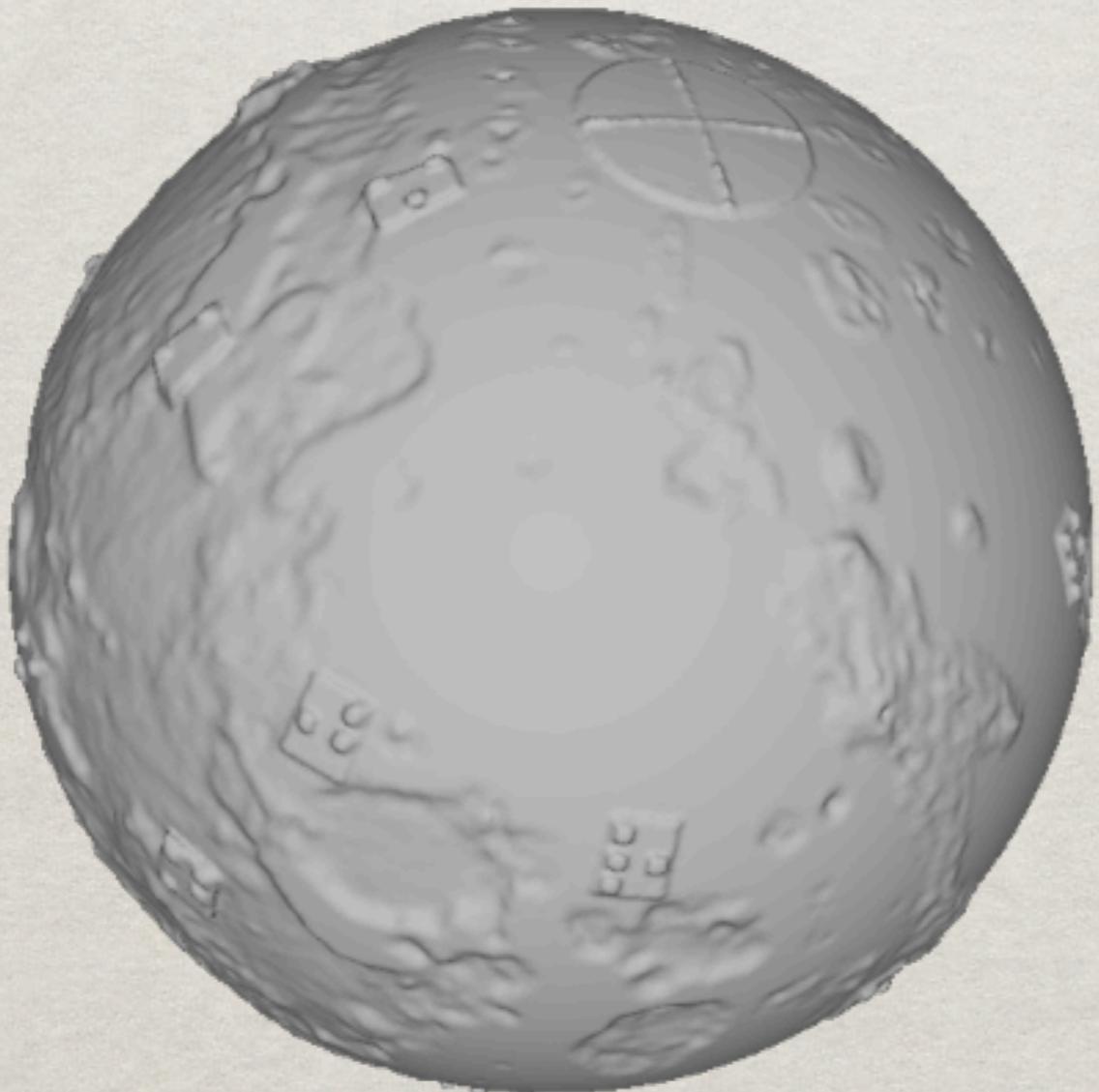
WORKFLOW ON MESHLAB

Cloud of points



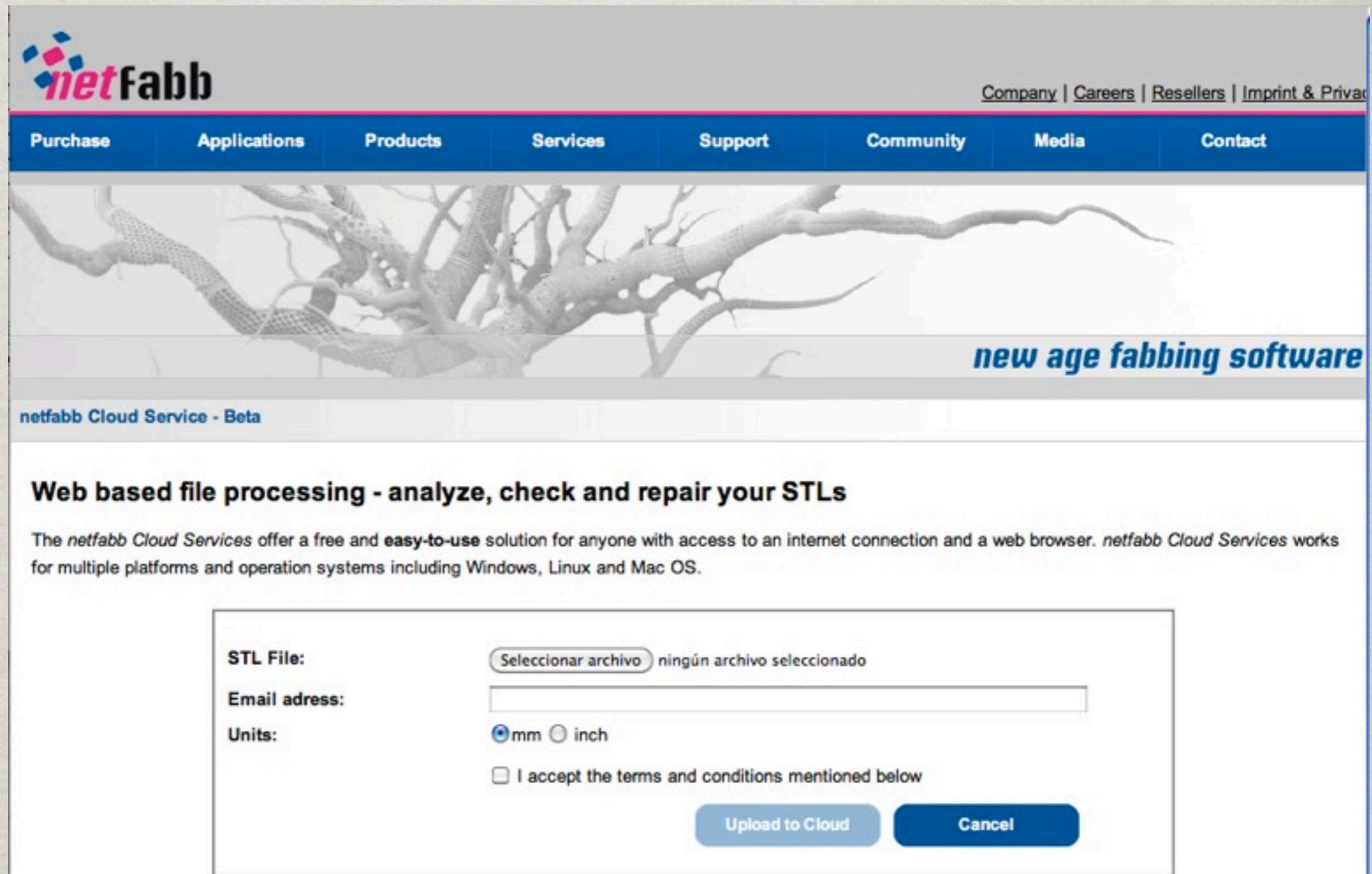
WORKFLOW ON MESHLAB

Surface reconstruction by triangulation



FINAL CHECKING OF THE MODEL ONLINE

Checking for
holes with
netfabb.com



The screenshot shows the netfabb Cloud Service - Beta interface. At the top, there's a navigation bar with links for Purchase, Applications, Products, Services, Support, Community, Media, and Contact. Below the navigation is a large image of a complex 3D printed part with many internal holes and structures. To the right of the image, the text "new age fabbing software" is displayed. Underneath the image, the text "netfabb Cloud Service - Beta" is visible. A prominent feature is a web-based file processing form. It includes fields for "STL File" (with a "Seleccionar archivo" button and a message "ningún archivo seleccionado"), "Email address" (an empty input field), "Units" (radio buttons for "mm" and "inch" with "mm" selected), and a checkbox for accepting terms and conditions. At the bottom of the form are "Upload to Cloud" and "Cancel" buttons. Below the form, a descriptive text explains the service's purpose: "While three dimensional printing is becoming more and more popular, creating valid input files is not the easiest task. This website is dedicated to anybody who". It then lists requirements for users: "• has the need to analyze STL files for errors and buildability", "• struggles with uploading STL file to a 3D printing service", and "• has the need to get a quick automatic repair STL files for any other purpose". Finally, it notes: ".. but is missing time and software for proceeding. netfabb Cloud Services extend the repair functionalities of the free netfabb Studio Basic software in an easy to use way."

Company | Careers | Resellers | Imprint & Privacy

Purchase Applications Products Services Support Community Media Contact

new age fabbing software

netfabb Cloud Service - Beta

Web based file processing - analyze, check and repair your STLS

The netfabb Cloud Services offer a free and easy-to-use solution for anyone with access to an internet connection and a web browser. netfabb Cloud Services works for multiple platforms and operation systems including Windows, Linux and Mac OS.

STL File: Seleccionar archivo ning n archivo seleccionado

Email address: _____

Units: mm inch

I accept the terms and conditions mentioned below

Upload to Cloud **Cancel**

While three dimensional printing is becoming more and more popular, creating valid input files is not the easiest task. This website is dedicated to anybody who

- has the need to analyze STL files for errors and buildability
- struggles with uploading STL file to a 3D printing service
- has the need to get a quick automatic repair STL files for any other purpose

.. but is missing time and software for proceeding. netfabb Cloud Services extend the repair functionalities of the free netfabb Studio Basic software in an easy to use way.

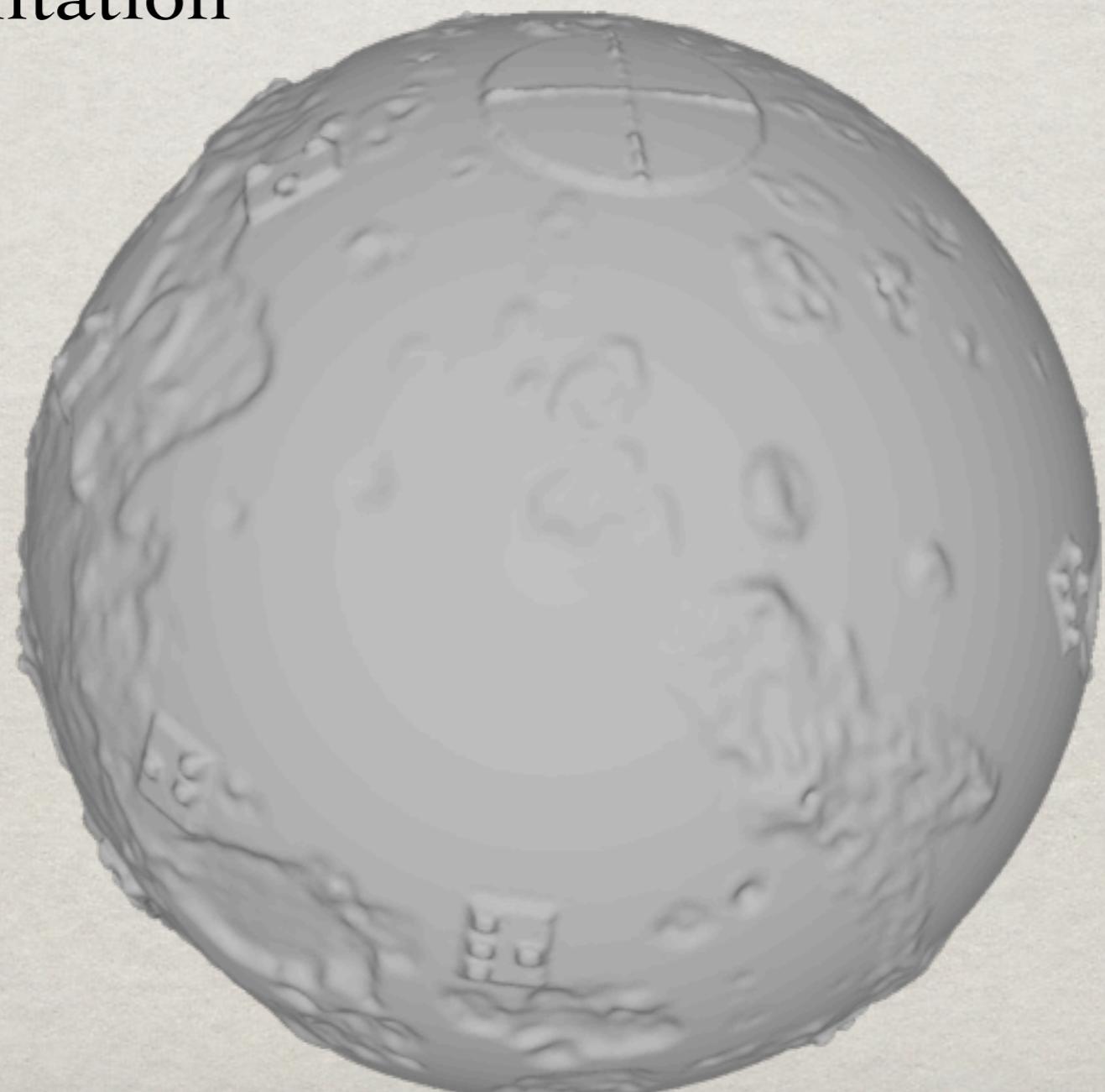


FINAL RESULT

Smooth poles and cross at the North pole to help with orientation

Braille letters
on top of
smooth
rectangles

Few features for clarity



THE MAKING OF THE MOON



prototype made on polyamide
silicone mould
20 copies in resine



TESTING THE MOON

At the University of
Valencia



Unitat per a la Integració de Persones amb Discapacitat
UNIVERSITAT DE VALÈNCIA

At the University of
Puerto Rico



TESTING THE MOON

In different countries around the world: Portugal, Italy, Ireland, Argentina, Brazil, India, and USA



3D Moon Model feed back part 1

Mani Makkal sevagan Suscribirse 51 videos

63 reproducciones

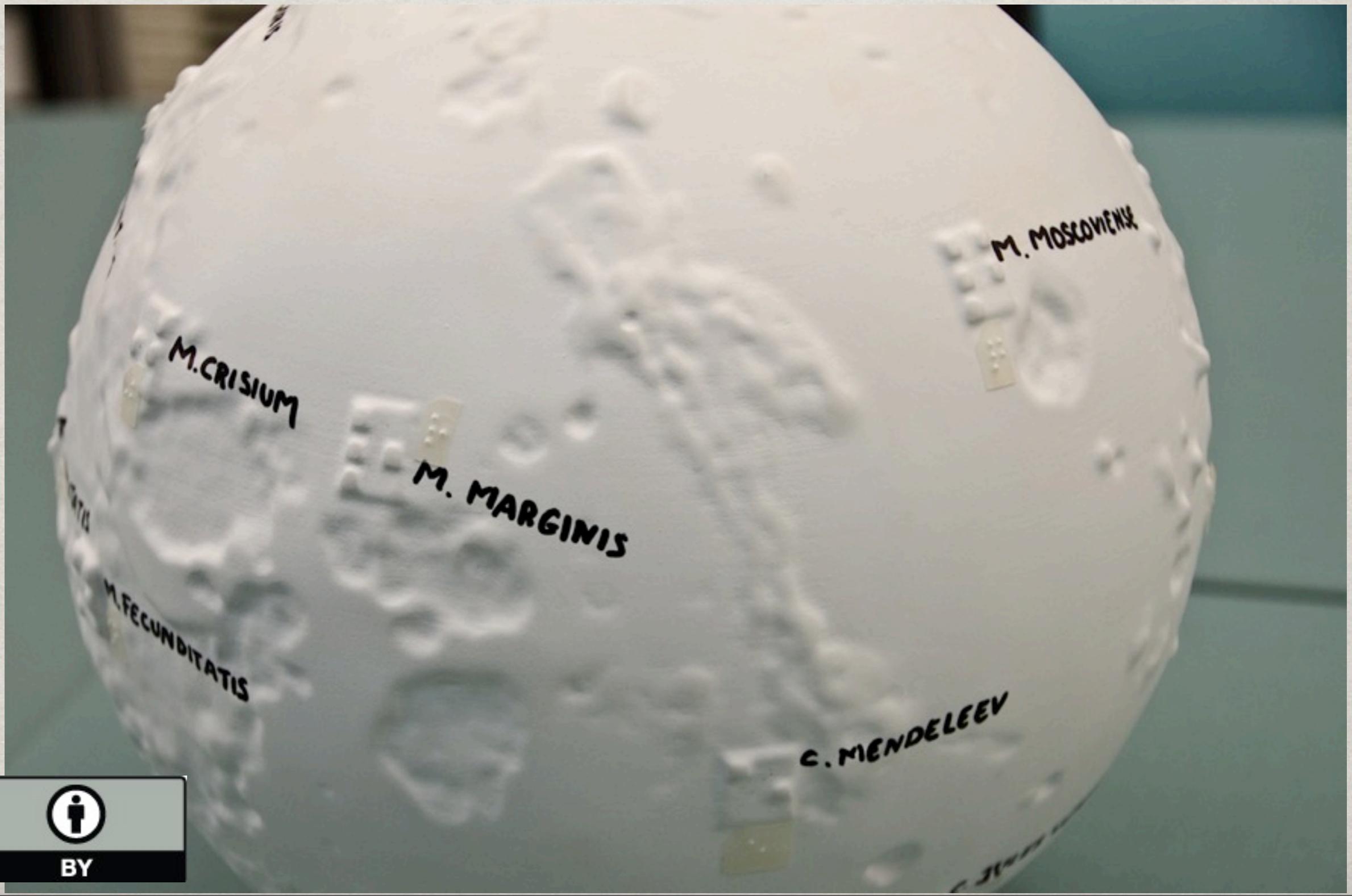
Publicado el 01/05/2012 por Mani Makkal sevagan
This video was taken in Sivaganga Government school, Tamil nadu, India.

Me gusta: 3, No me gusta: 0



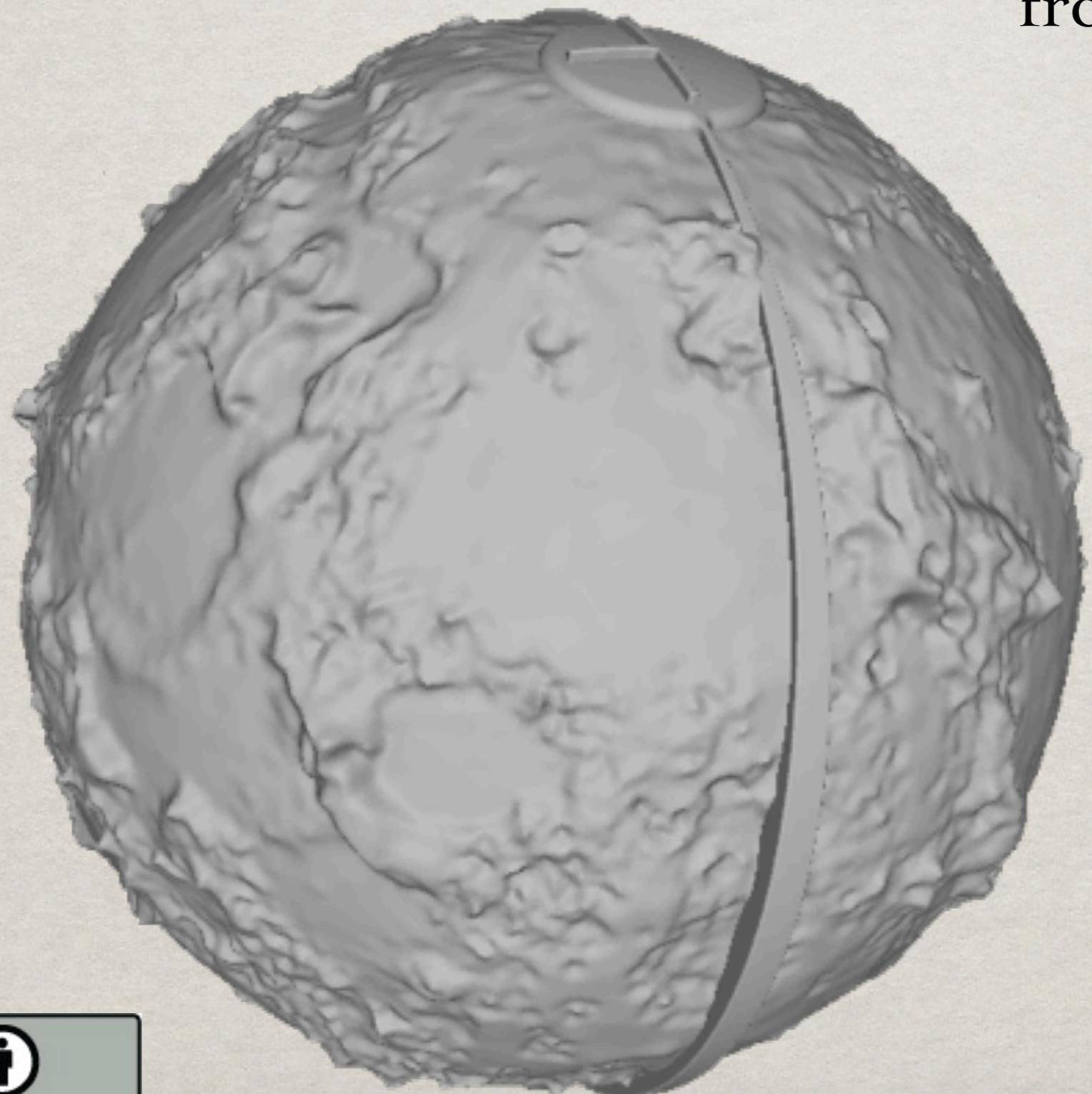
FINAL DESIGN

from user's feedback



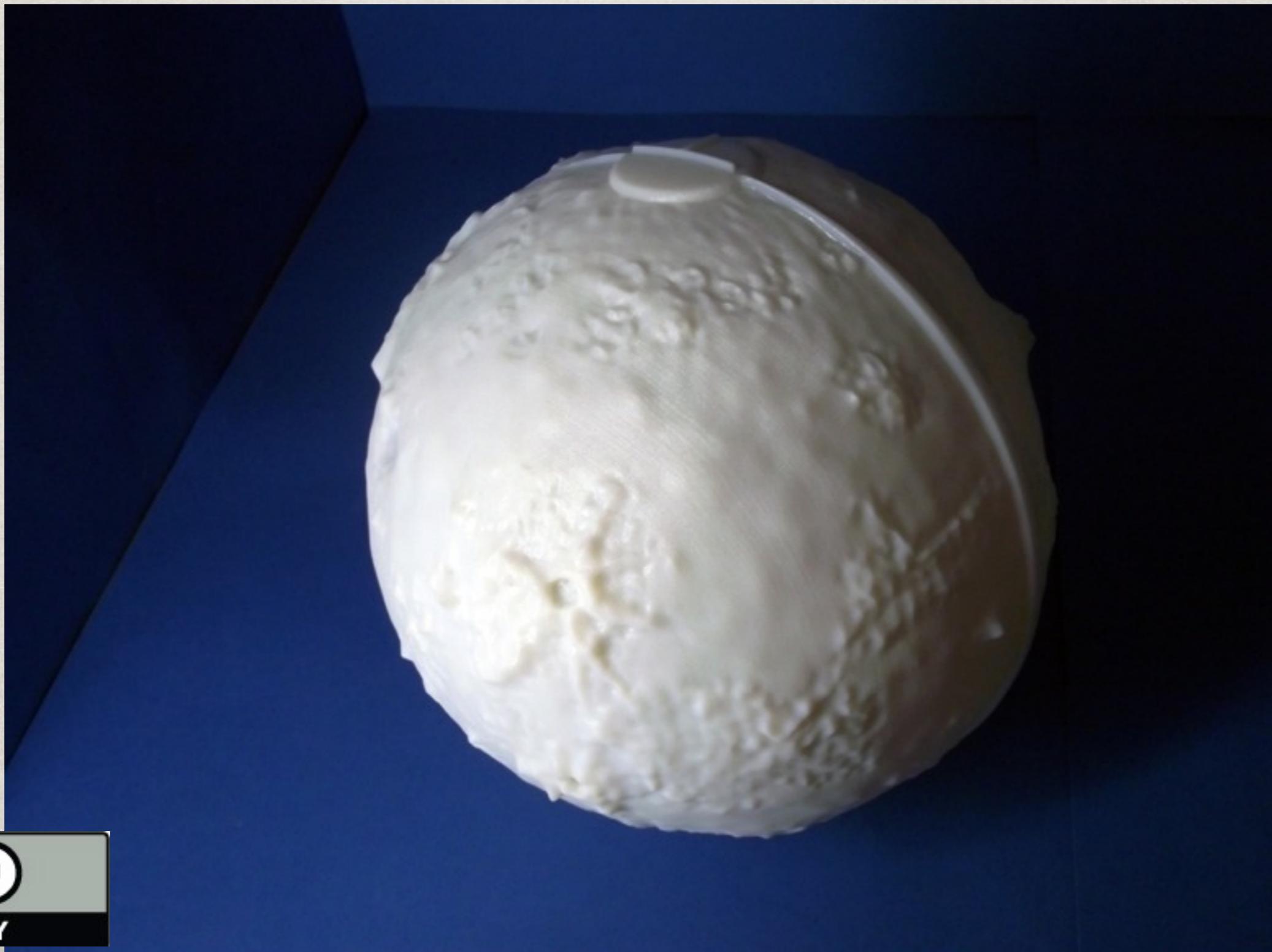
FINAL DESIGN

from user's feedback



FINAL DESIGN

from user's feedback



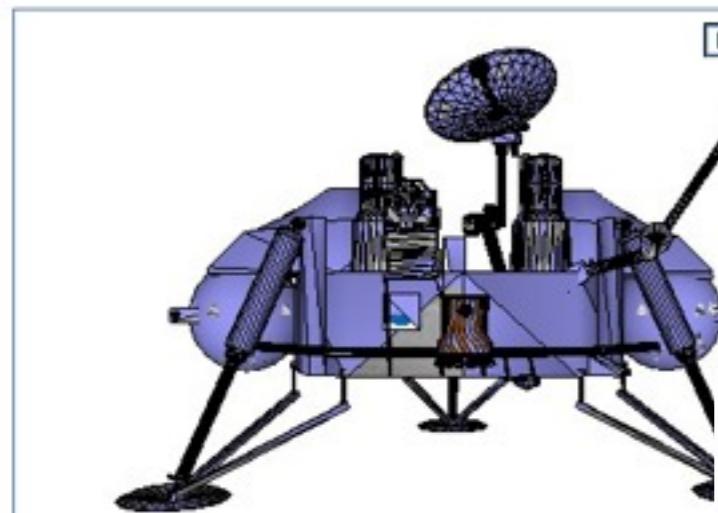
FINAL DESIGN



CONCLUSIONS

3D modeling as a resource to create and share educational material

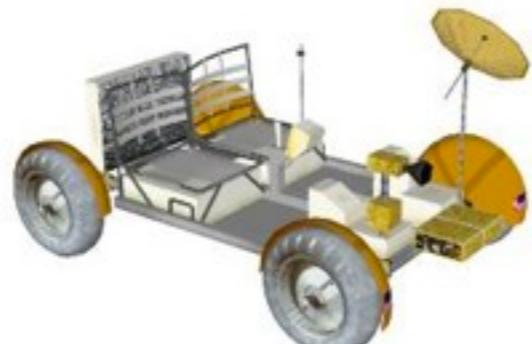
Viking



Vistas: 13584
Descargas: 1965

Descargar

Apollo Lunar Moon Rover



Vistas: 5183
Descargas: 2809

Descargar modelo ▾

Phoenix lander

Imagen Mapa

Imagen Vista 3D



1724
gas: 723

Descargar modelo ▾

Public repository at
Google 3D warehouse



BY

CONCLUSIONS

We can touch the Moon now!



We'll be working on an activity booklet during the next months

Amelia Ortiz-Gil
amelia.ortiz@uv.es

