THE MOON AT YOUR FINGERTIPS

Amelia Ortiz-Gil, Astronomical Observatory of the University of Valencia (Spain)

We have designed a tactile 3D model of the Earth's Moon with the aim of helping blind and visually impaired people learn about the main features on the surface of the Moon.

It is not a topographical reproduction: for example, we have given relief to the crater rays that, while being very bright, have no relevant height in reality, only because they are one of the main visible characteristics of craters.

We used the original map of the whole Moon compiled by NASA's Clementine mission. The original has been greately smoothed out in order to clarify features and avoid confusion to the users. A number of Moon features were selected and enhanced using the GIMP software.

The 3D file "3Dmoon.stl" has been produced using MeshLab (by Visual Computing Lab - ISTI - CNR), and is ready to be printed at any 3D printing service. It is is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.

User guidelines

The polar caps have been smoothed out and a "T" can be felt at the North Pole to help users in orienting the sphere. The vertical pole of the "T" points to the near side of the Moon.

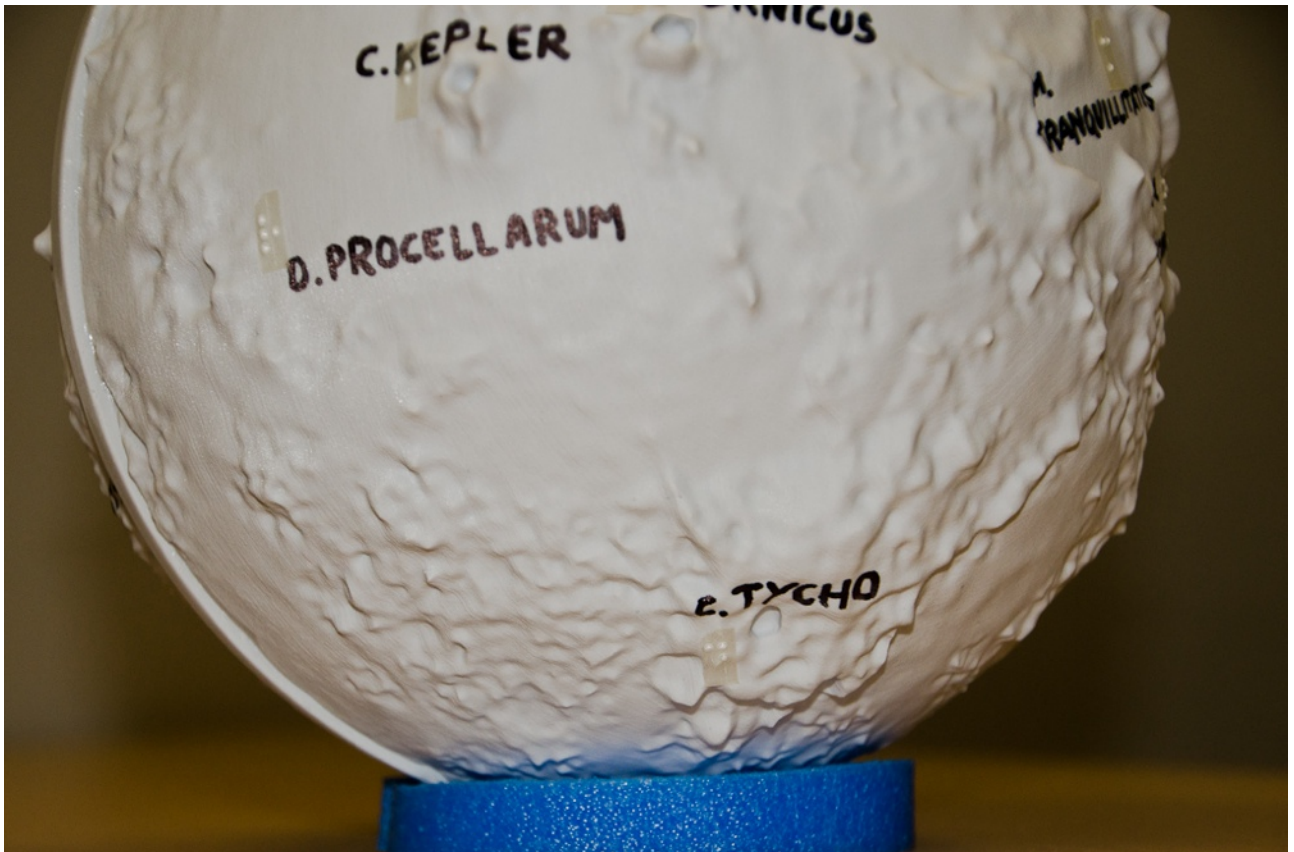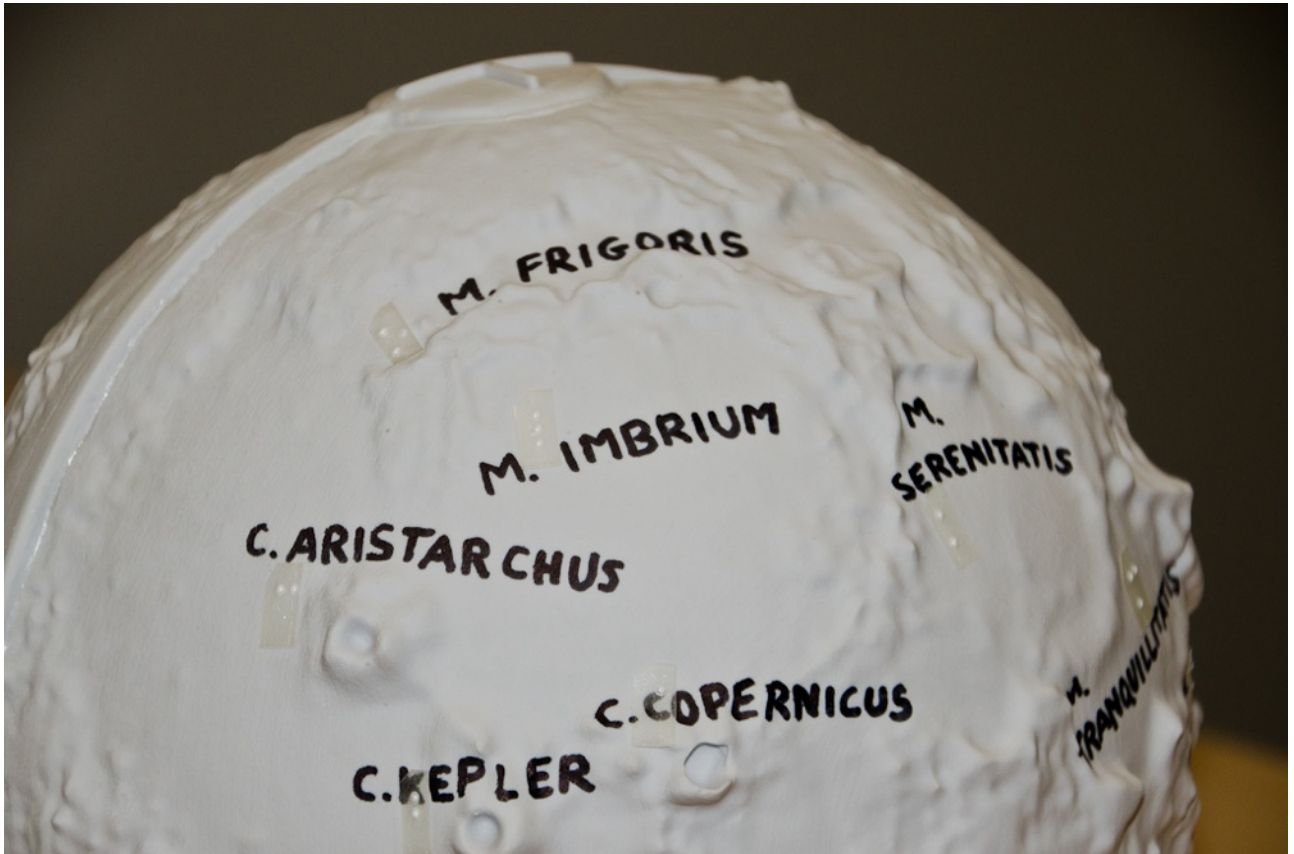The near and far sides of the Moon are divided by a meridian.

It is important to note to the users that these *are not real* Moon features, just elements to help with the orientation.
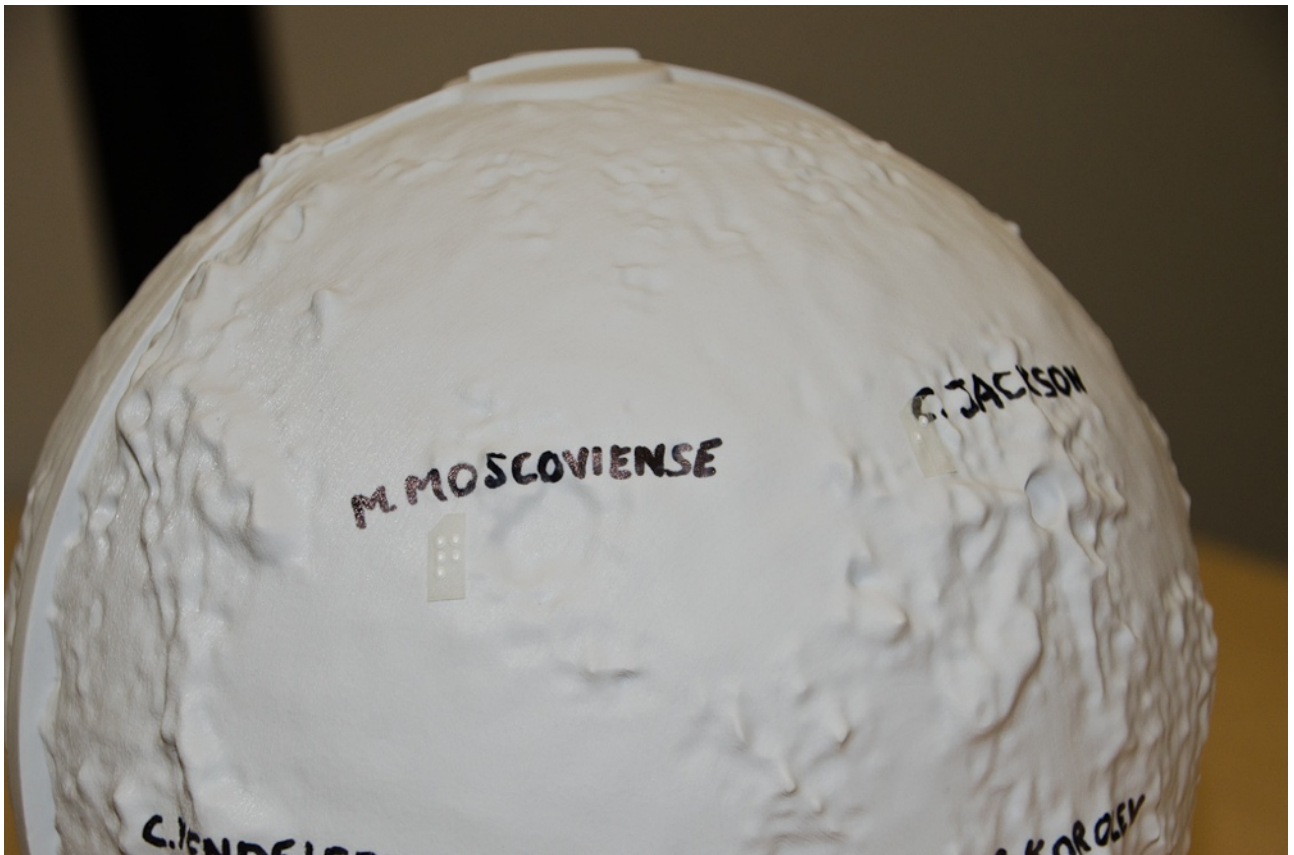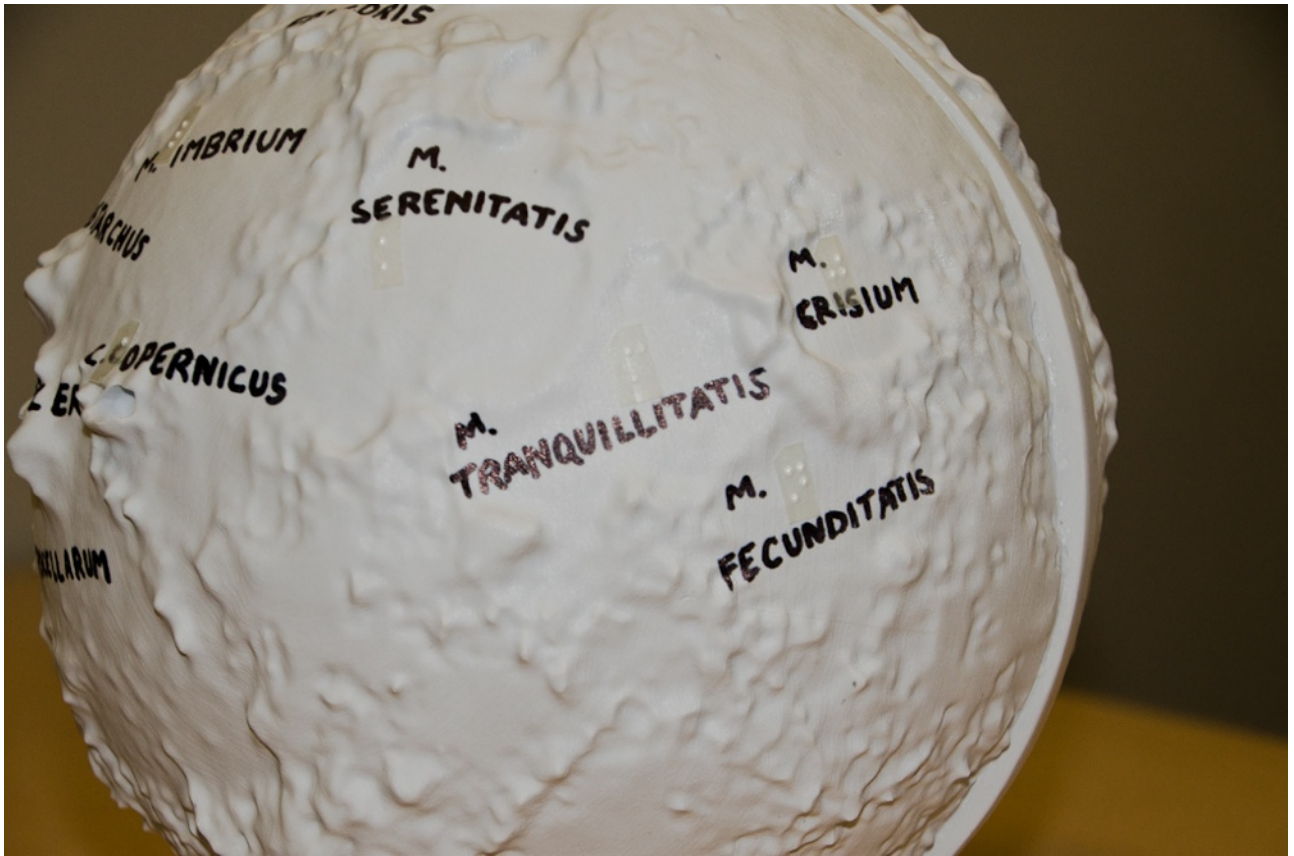
- For those with visual impairment

You can write down the names of different features on the Moon, with large characters and high contrast.
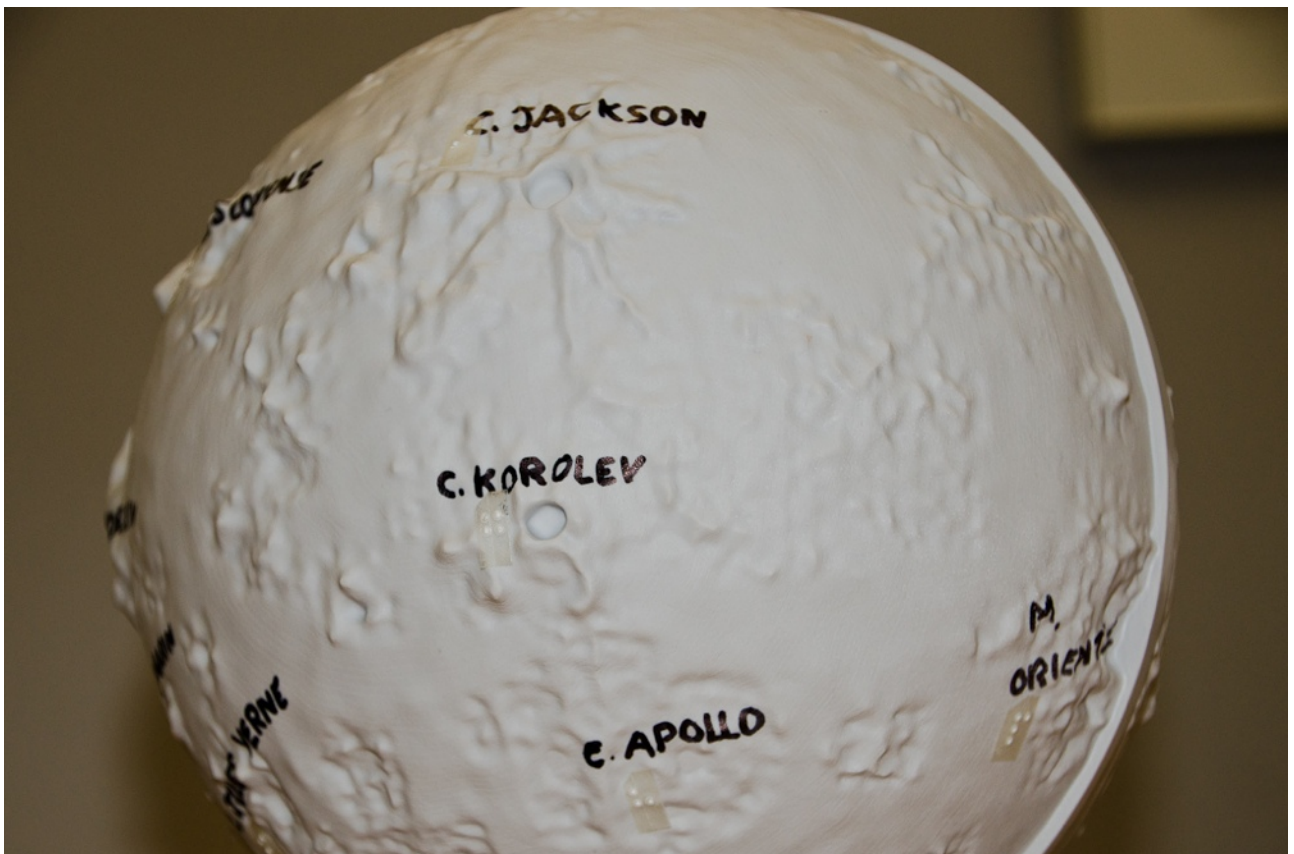
Or, you can paste the names, so you can change the named features according to the lesson (if it is about craters only, or landing sites, or water locations).

We include here some pictures of the Moon with the names of a selection of craters and maria to help you identify them on your Moon copy.

M. FRIGORIS

M. IMBRIUM

M. SERENITATIS

C. ARISTARCHUS

C. COPERNICUS

C. KEPLER

M. TRANQUILLITATIS

C. KEPLER

COPERNICUS

M. TRANQUILLITATIS

D. PROCELLARUM

C. TYCHO

M. IMBRIUM
...ORIS
M. SERENITATIS
...TARCHUS
M. CRISIUM
C. COPERNICUS
Z ER...
M. TRANQUILLITATIS
M. FECUNDITATIS
...CELLARUM

M. MOSCOVIENSE
C. JACKSON
C. TSIOLKO...
...KOROLEV

M. MOSCOVIENSE   C. JACKSON

...OPLEV

C. ...

O. PROCELL...

...ROLEV

M.
ORIENTALE

...APOLLO

- For the blind

For those who are able to read Braille, you can tag the Moon features with Braille letters. Here we suggest an example. You can see the letter pasted to the Moon in the pictures above.

You can print the doc below for them to read the name of the feature corresponding to each Braille letter on the Moon.

In our example:

Moon features   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀

a – i crater   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
j – q mare   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
r oceanus   ⠀⠀⠀⠀⠀⠀⠀⠀⠀

a   copernicus   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
b   kepler   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
c   aristarchus ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
d   tycho   ⠀⠀⠀⠀⠀⠀⠀
e   mendeleev   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
f   jules verne ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
g   korolev   ⠀⠀⠀⠀⠀⠀⠀⠀⠀
h   apollo   ⠀⠀⠀⠀⠀⠀⠀⠀
i   jackson   ⠀⠀⠀⠀⠀⠀⠀⠀⠀

j   crisium   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
k   serenitatis ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
l   imbrium   ⠀⠀⠀⠀⠀⠀⠀⠀⠀
m   tranquillitatis ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
n   fecunditatis ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
o   frigoris   ⠀⠀⠀⠀⠀⠀⠀⠀⠀
p   orientale   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
q   moscoviense ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀

r   procellarum ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀

Observatori Astronòmic
VNIVERSITAT Ð VALÈNCIA

Authorship and conditions

The model has been designed by Amelia Ortiz-Gil and Fernando Ballesteros Roselló, at the Astronomical Observatory of the University of Valencia (Spain), and Alberto Fernández-Soto, at the Physics Institute of Cantabria IFCA (Spain), with the priceless advice of Gloria Maria Isidro, at the University of Puerto Rico, and helpful discussions with Vicent Peris, astrophotographer at the Astronomical Observatory of the University of Valencia.

Please send your feedback about the project or any suggestions for future improvements to Amelia Ortiz-Gil at amelia.ortiz@uv.es .