

**“VIRTUAL MOON ATLAS PRO 6” FREEWARE.** Christian Legrand<sup>1</sup> and Patrick Chevalley<sup>2</sup>, <sup>1</sup>Software designer / Ch. Legrand 668 Rue du Tour de Préaux 76160 PREAUX (France) / [chlegrand76@hotmail.fr](mailto:chlegrand76@hotmail.fr) , <sup>2</sup> Software programmer / P. Chevalley 160 Route d’Aire CH-1219 AIRE (Switzerland) / [pch@ap-i.net](mailto:pch@ap-i.net).

**INTRODUCTION:** Since 2002, we develop a freeware to help Moon observing, to improve interest for Moon in general public, and to provide a basic lunar tool to professionals.

**PRESENTATION:** Pro” version uses datas coming from NASA, USGS, JPL and from Dr Robinson, Binder, Gaddis, Zuber and Salamuniccar teams, and from Kaguya, and Chang’é missions

The software includes management of a complete database (Near 60 000 entries) of named or satellite or anonymous features of Moon Nearside and Farside.

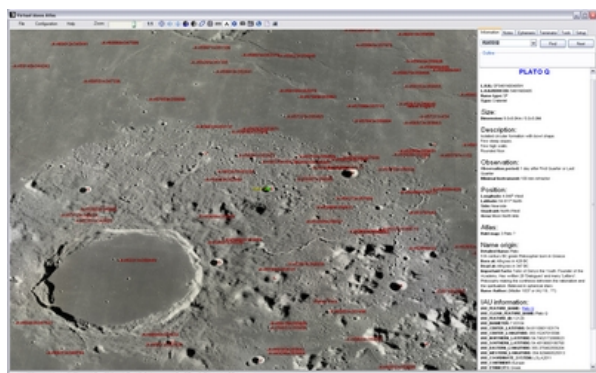
Pictures libraries presenting each formations and coming from LPI resources and amateurs shootings are associated and contain more than 8 000 pictures. PHOTLUN © is a specific included pictures manager.

VMA Pro 6.0 is presently available for Windows, Linux and Mac OS.

VMA software has been reviewed in main amateur astronomy magazines [1],[2],[3],[4]..., downloaded more than 760 000 times worldwide since 2002 and presented on Charles Wood’s LPOD blog.

Several translations are available in all major languages (FR / EN / GE / SP / IT / CN...).

VMA software is or has been used by several professional organizations such as Kitt Peak Observatory, National Japan Observatory, Birkbeck College / University College London (K. Joy), BBC Sky at night, several French astronomy magazines and astronomy writers (P. Harrington...) . Recommended by ESA, registered as educational software by French ministry for education, it has also yet been presented at 2006 & 2007 LPSC and PCC2 in 2011



**Picture 1 : Plato area with LRO texture, localized anonymous craters and information thumbnail**

**REFERENCES:** [1] G. Seronik. (2003) Sky & Telescope. [2] R. Bartlett (2003) Astronomy Magazine. [3] J.L. Dauvergne (2012) Ciel & Espace

**SOFTWARE FEATURES :**

- « Map » window with various functions thumbnails as « Information », « Ephemeris », « Notes », « Tools », « Setup », ...
- Complete rotating Moon globe with coordinates grid
- Second window opening permitting comparisons between different textures and overlays combinations
- Real time or choosen phase and librations display
- Orientation of the lunar disk with powerful zoom
- Formations search function starting from name
- Formations names display according to zoom power
- Orbital viewing simulation
- Integrated notepad for your own notes on formations
- Size and distance measurement tool on maps
- Context menu on right mouse click
- Maps and databases printing with captions setup
- Eyepieces and CCD cameras field simulation
- Full screen display for public videoprojections

**DATABASES :** Included databases contains more than 60 000 formations:

- Nearside named formations
- Farside named formations
- Nearside satellite formations
- Farside satellites formations
- First anonymous craters database
- Human exploration sites (Historical)
- Lisa Gaddis pyroclastic deposits
- ALPO domes databases

For each formation, included informations about :

- Formation geology
- Formation localization on lunar disk
- Formation detailed description
- Detailed formation name origin
- Official IAU 2012 datas

All these databases include the “LUN / Lunar Universal Number” conceived by us and permitting quick “naming” and localization of any lunar formation more than 30 m wide.

DATLUN © is a specific database manager using menus or SQL requests for sortings and extractions on every word of all the databases (54 Mo datas).

IDN	NAME	TYPE	PERIOD	NAMEDETAIL	NAMEORIGIN	LANGRENUS	HEVELIUS	RICCOLI	WORK	COUNTRY
NSN	APAGO ALPHA	Dome	Ishtar (From 3.95 E Anago Alpha - France) (75)		Not named	Not named	Not named	Not named	Astronomer and phys	France
NSN	APAGO BETA	Dome	Ishtar (From 3.95 E Anago Beta - France) (75)		Not named	Not named	Not named	Not named	Astronomer and phys	France
NSN	CAUCHY OMEGA	Dome	Ishtar (From 3.95 E Cauchy Omega - Au) (75)		Not named	Not named	Not named	Not named	Mathematician	France
NSN	CAUCHY TAU	Dome	Ishtar (From 3.95 E Cauchy Tau - Au) (75)		Not named	Not named	Not named	Not named	Mathematician	France
NSN	DOME KES FI	Dome	Ishtar (From 3.95 E Dôme de Kes FI - 44) (75)		Not named	Not named	Not named	Not named	Mathematician and astronomer	Belgium
NSN	DOME LANSBERG D	Dome	Ishtar (From 3.95 E Dôme of Lansberg D) (75)		Not named	Not named	Not named	Not named	Doctor and astronomer	Belgium
NSN	DOME MARPAN T	Dome	Ishtar (From 3.95 E Marpan T - Jean-Jacq) (75)		Not named	Not named	Not named	Not named	Astronomer	France
NSN	DOME MILCHUS	Dome	Ishtar (From 3.95 E Milhaus FI - Jacob A) (75)		Not named	Not named	Not named	Not named	Doctor philosopher &	Germany
NSN	DOMES GAMBART C	Dome system	Ishtar (From 3.95 E Domes of Gambart C) (75)		Not named	Not named	Not named	Not named	Astronomer	France
NSN	DOMES MARBUS	Dome system	Ishtar (From 3.95 E Domes of Marbus - S) (75)		Not named	Not named	Not named	Not named	Astronomer	Germany
NSN	HENDRIKUS OMEGA	Dome	Ishtar (From 3.95 E Hendrikus Omega - H) (75)		Not named	Not named	Not named	Not named	Astronomer	France
NSN	HENDRIKUS OMEGA	Dome system	Ishtar (From 3.95 E Domes of Hendrikus) (75)		Not named	Not named	Not named	Not named	Astronomer	Netherlands
NSN	MONS GRILHUSEN	Dome	Ishtar (From 3.95 E Mount Grilhusen S) (75)		Not named	Not named	Not named	Not named	Astronomer and natl	Germany
NSN	MONS REIMKER	Dome	Ishtar (From 3.95 E Mount Reimker (Re) - Scheid) (1978)		Not named	Not named	Not named	Not named	Astronomer	Germany
NSN	TOBIAS MAVER DOTA	Dome system	Ishtar (From 3.95 E Tobias Mape Dots) (75)		Not named	Not named	Not named	Not named	Astronomer	Germany

**Picture 2 : DATLUN main screen**

**MAPPING TEXTURES :** JPL shaded relief with albedo (1500 m/pix) and without albedo (1000 m / pix), Dr Robinson teams Clementine (200 m / pix) and LRO (120 m/pix), USGS Lunar Orbiter and CNSA Chang'è 2 (60 m per pixel) high resolution textures.

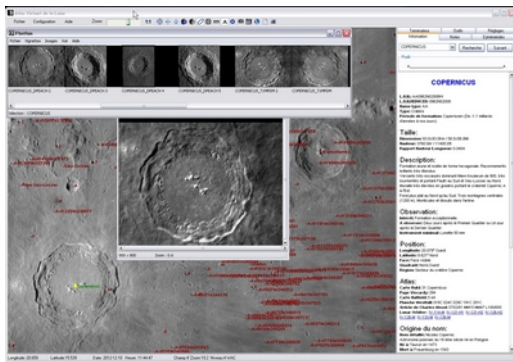
**HISTORICAL TEXTURES :** Permitting easy comparisons of these pioneers works with present datas: (Langrenus 1645 / Hevelius 1647 / Cassini 1679 / Tobias Mayer 1791)

**SCIENTIFIC OVERLAYS :** 44 different ones : Gravity, temperature, altimetric, geologic, various elements as thorium, iron, several neutrons varieties... overlays can be applied on each texture. Double window feature permits comparisons between 2 overlays.

**PICTURES LIBRARIES :** VMA includes lunar pictures libraries (More than 9 000 pictures) from :

- Lunar Orbiter Photographic Atlas of Moon
- Lunar probes
- Apollo missions mapping and 70 mm
- Consolidated Lunar Atlas
- Lunar Astronautical Charts and Lunar Maps
- Best amateur lunar imagers pictures

PHOTLUN © specific pictures manager with editing possibilities permitting basic processing included.



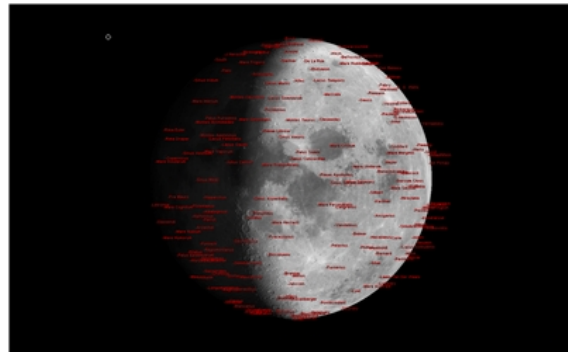
Picture 3 : PHOTLUN main screen

**INTERNET CONNECTION :** The WEBLUN © module using a special lunar Internet sites database permits connection and interactivity while using VMA.

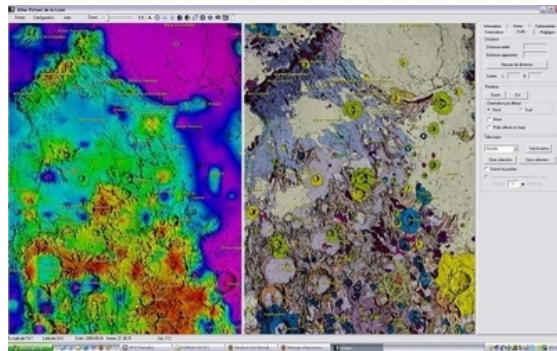
**DISTRIBUTION :** VMA Pro 6 version and all add-ons collection are freeware and downloadable free from our Web site <http://www.ap-i.net/av1/en/start>

A DVD version can also be ordered. We maintain a discussion forum and we encourage other languages translations. We also listen continuously to our users requests, (including professionals), trying to update the software with new useful functionalities.

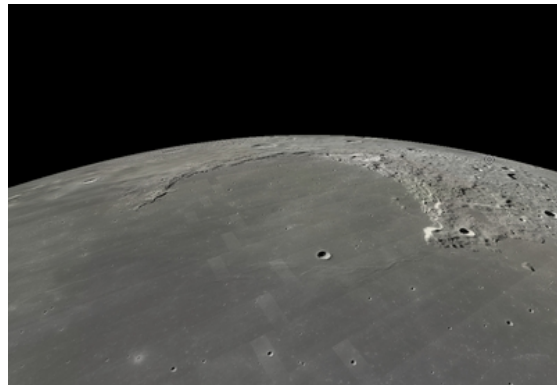
**OTHERS SCREEN CAPTURES :**



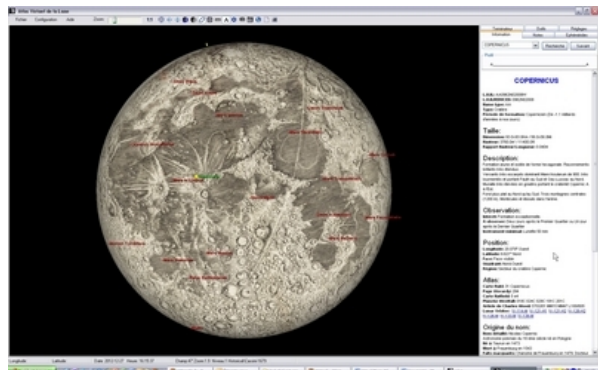
Picture 4 : Full screen for public education events



Picture 5 : Double window with altitude & geology overlay for correlation search



Picture 6 : Sinus Iridum fly over with LRO texture



Picture 7 : Cassini 1679 historical texture