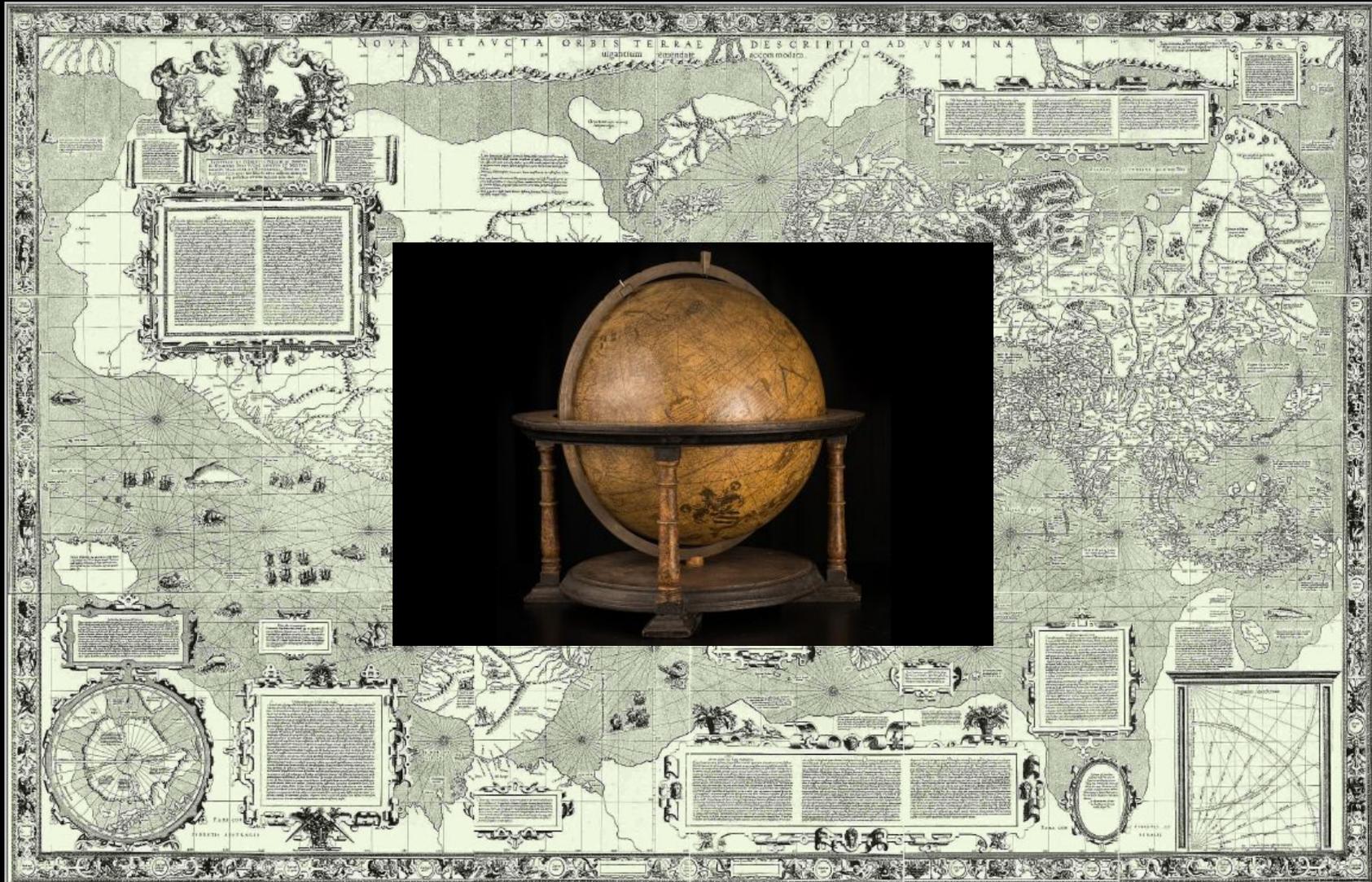


# Du dessin à la cartographie lunaire



Carte établie par Doppelmayr en 1642

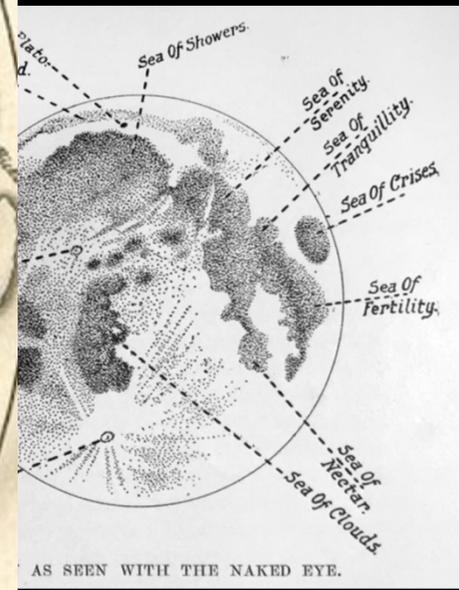


**Carte et globe terrestre de Gérard Mercator 1541**

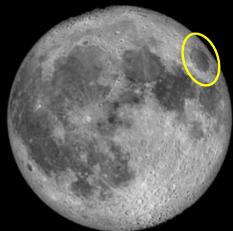
La lune vue  
à l'œil nu



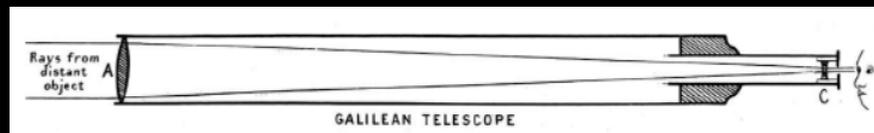
Serviss  
7  
5 cm



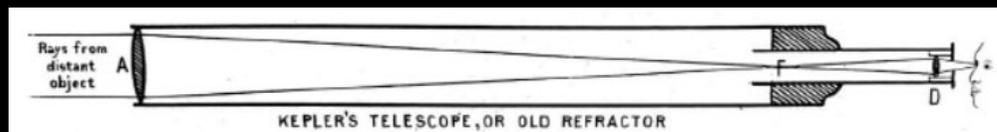
AS SEEN WITH THE NAKED EYE.



Mer des crises



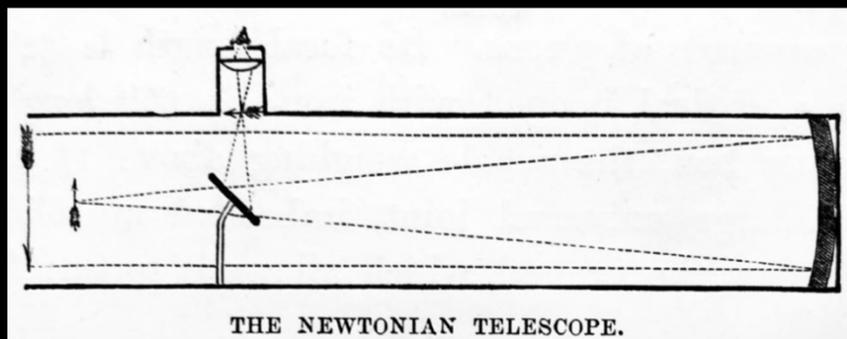
Lunette de Galilée 1608  
Lentille convexe et concave



Huygens ou Kepler  
2 lentilles convexes



Mer des crises



Télescope de Newton 1671  
miroir parabolique en bronze



## Allons voir les cartes

Carte de la lune dressée  
par Thomas Harriot en  
1609, cinq mois avant  
celle de Galilée

20 cm

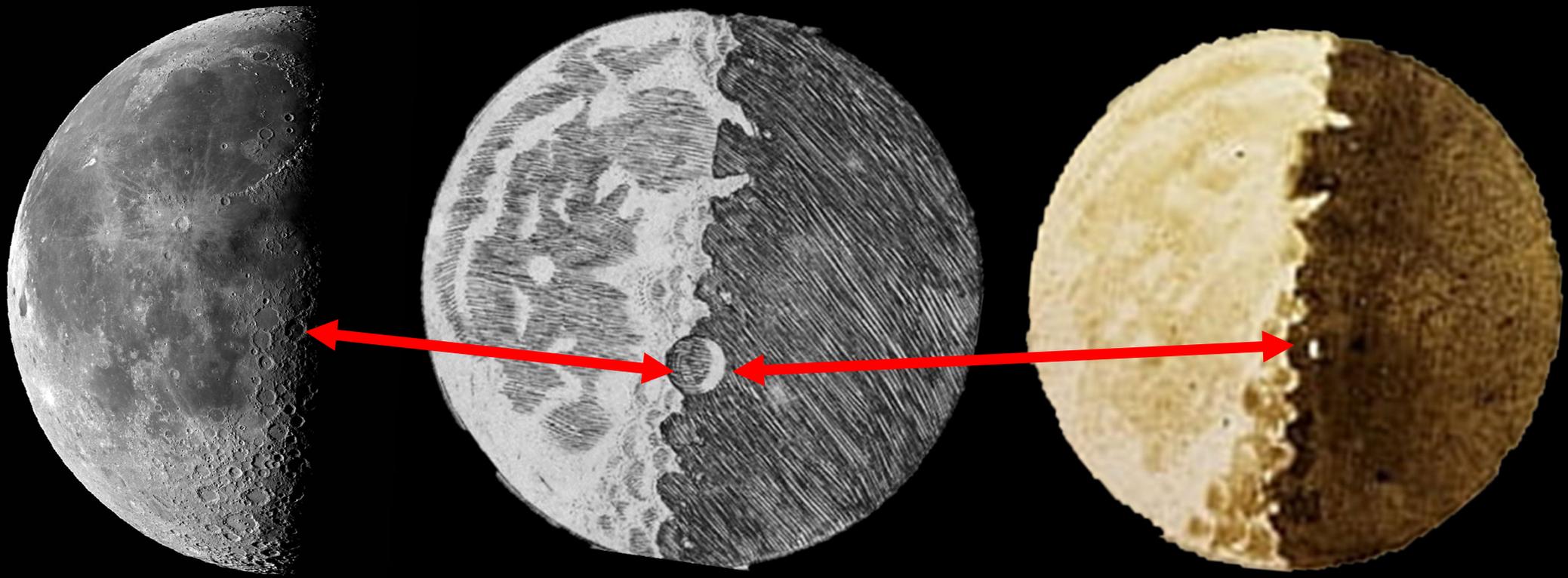
Carte publiée en  
1965 !





De l'instrument à l'image imprimée, un parcours qui va transformer le dessin





Le cratère Albatagnius ...

OBSERVAT. SIDEREAE

Quam daturam. Depressiores in super in Luna cernuntur magna macula, quam clariores plage; in illa enim tam crescente, quam decrecente semper in lucis tenebrarumque conlinio, prominente hinc inde circa ipsas magnas maculas contermini partis lucidioris; veluti in describendis figuris observavimus; neque depressiores tantummodo sunt dictarum macularum termini, sed aequabiliores, nec rugis, aut asperitatibus interrupti. Lucidior vero pars maximè propè maculas eminet; adeò ut, & ante quadraturam primam, & in ipsa fermè secunda circa maculam quandam, superiorem, borealem nempe Lunæ plagam occupantem valdè attollatur tam supra illam, quam infra ingentes quædam eminentiæ, veluti appositæ præferunt delineationes.



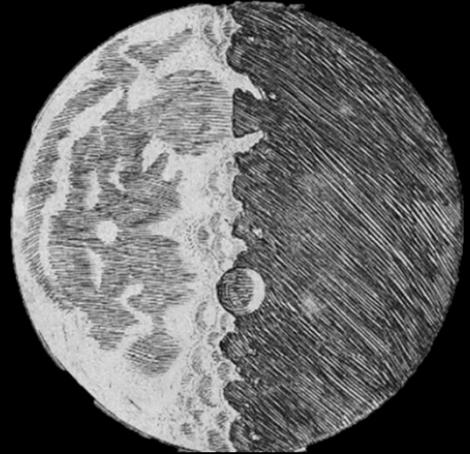
Hæc.

RECENS HABITAE



Hæc eadem insculâ ante secundam quadraturam nigrioribus quibusdam terminis circumvallata conspicitur, qui tanquam altissima montium iuga ex parte Soli averfa obscuriores apparent, quæ verò Solem respiciunt lucidiores extant; cuius oppositum in cavitatibus accidit, quarum pars Soli averfa splendens apparet, obscura verò, ac umbrosa, quæ ex parte Solis sita est. Imminuta deinde luminosa superficie, cum primum tota fermè dicta macula tenebris est obducta, clariora motuum dorfa eminenter tenebras scandunt. Hanc duplicem apparentiam sequentes figuræ demonstrant.

C a Vnum

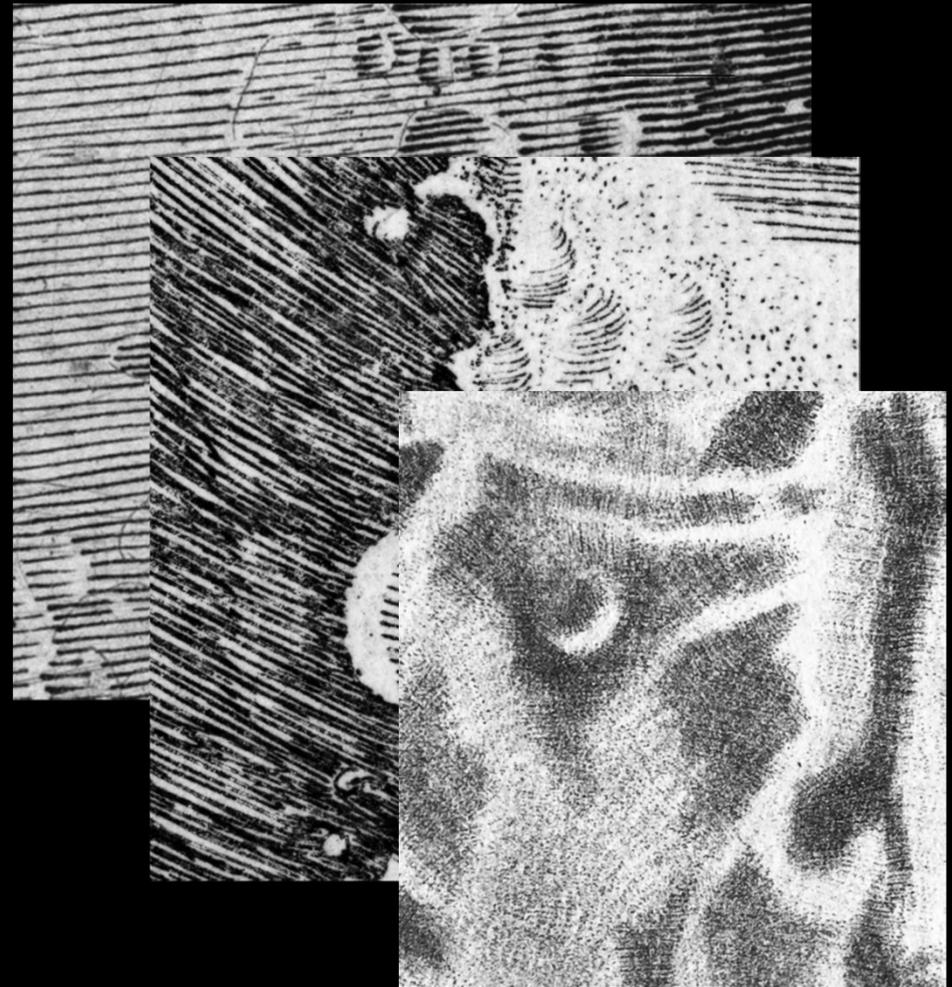
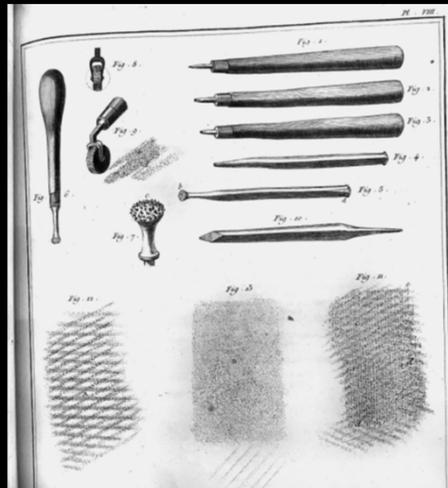
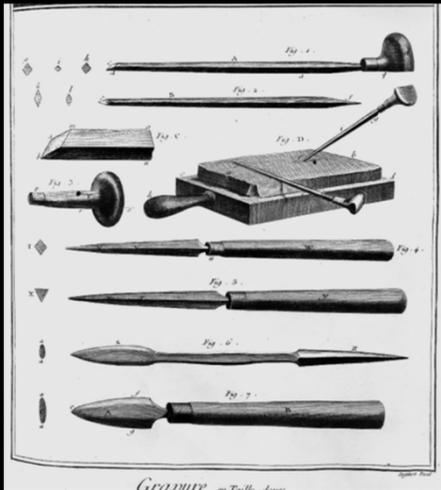


## Travail en creux :

On creuse toutes les zones qui doivent être imprimées.

**Gravure directe** : burin sur plaque de cuivre brute  
C'est une **TAILLE DOUCE**

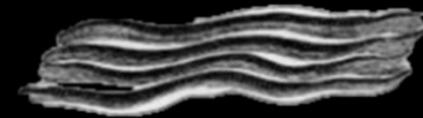
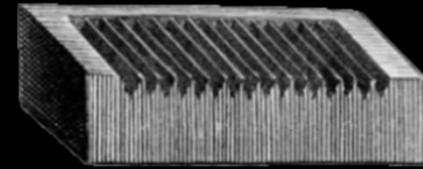
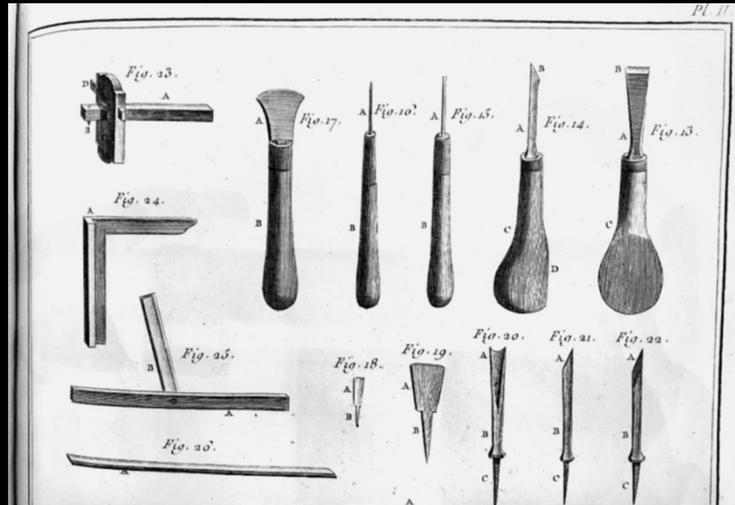
**Gravure indirecte** : pointe sèche sur vernis  
C'est une **EAU FORTE**



Jusqu'à la fin du XVIIIe

# Travail en relief du bois : la xylographie

On creuse toutes les zones qui ne doivent pas être imprimées.



Typographie

sicut & alia innumera vmbra lunulis obiecta, & ipsa Luniformes, ex obiectu partium eminentiorum creata. *Tertio*, Lux Luna ab antiquis maculis distincta & ipsa inæqualis, nam quædam quasi gemmæ ex ea elucent intensissimi candoris, qualis est N & O; Lu-



nula item apud H, apud I, ad K, iuxta L, M & D, aliaq; gemmæ innumera. *Quarto*, Maculæ nigræ, vt P, Q R & alia hinc inde, eaq; satis stabiles. *Quinto*, confinium lucis & vmbrae, quale nunc est, ST VX, semper anfractuosum asperum & inæquale, quod causant partes eminentes lucem solarem inæqualiter impediens. *Sexto* vmbrosa Lunæ pars XYS, tota lucida est, luce secundaria, & splendori Saturnio par. de qua mox disquisitione sequente. *Septimo*, huius ipsius partis vmbrosæ triplex inuenitur lucis differentia; nam ordinaria

Gravure sur bois d'après  
une observation de  
Christophe Scheiner 1613

9,2 cm

Impression « en relief »



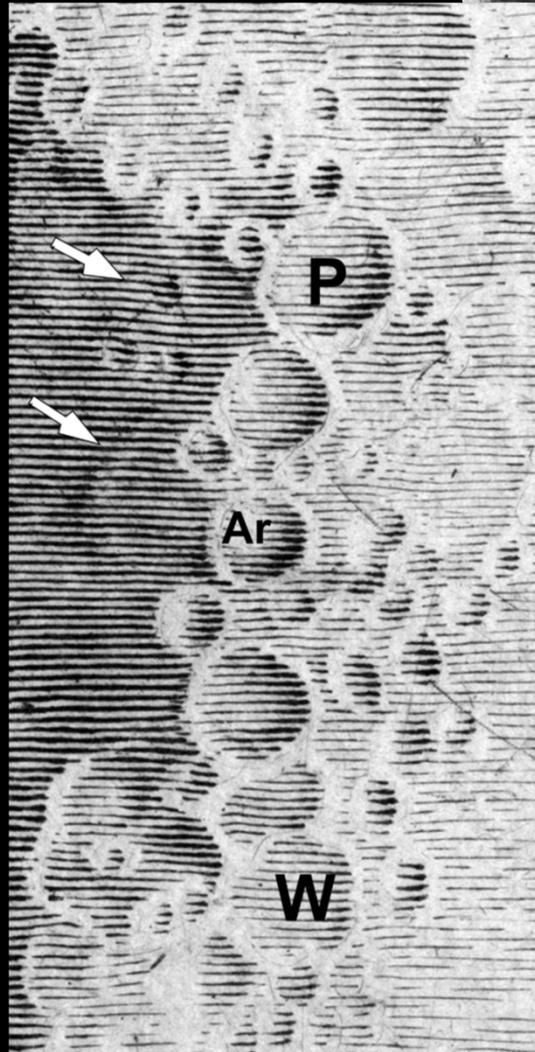
Carte et texte  
imprimés en une  
« passe »

Les formations  
sont désignées  
par des lettres

Claude Mellan



Gravure de 23 cm 1635



On recherche un dessinateur...



Fabri de Peiresc



Pierre Gassendi



Dernier  
quartier



Pleine lune  
*la première carte lunaire...*



Premier  
quartier



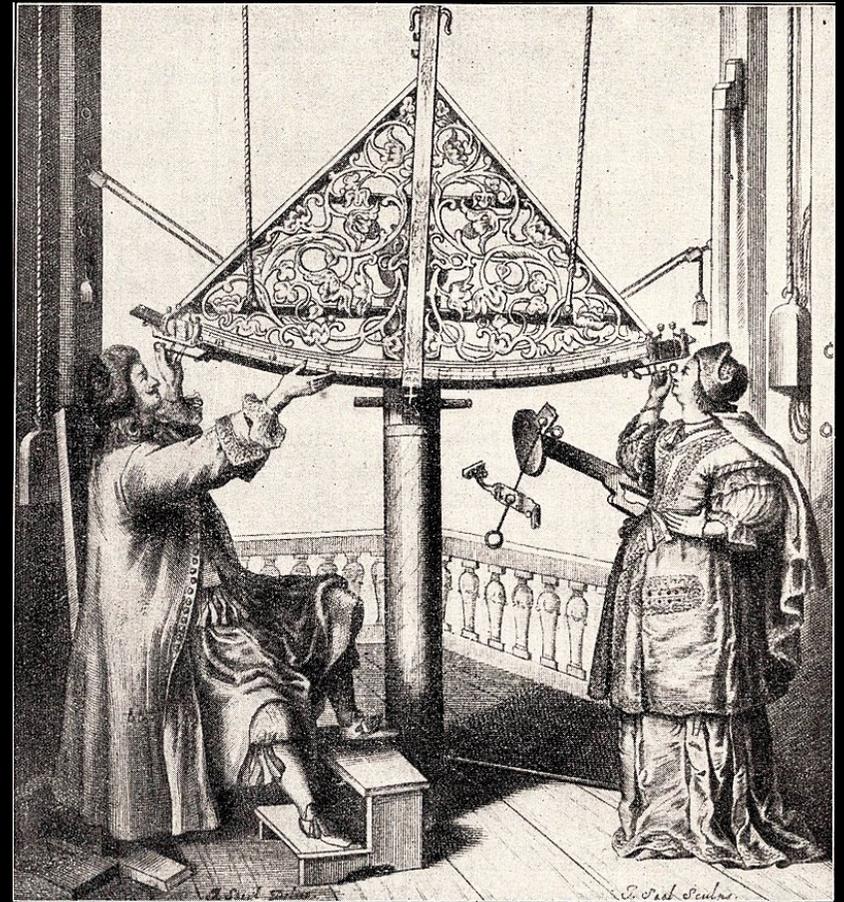


**Johann Hevelius**  
Né en  
Pologne  
1611-1697



Auteur du livre Sélénographia 797 pages  
(Astronome, dessinateur, graveur...)

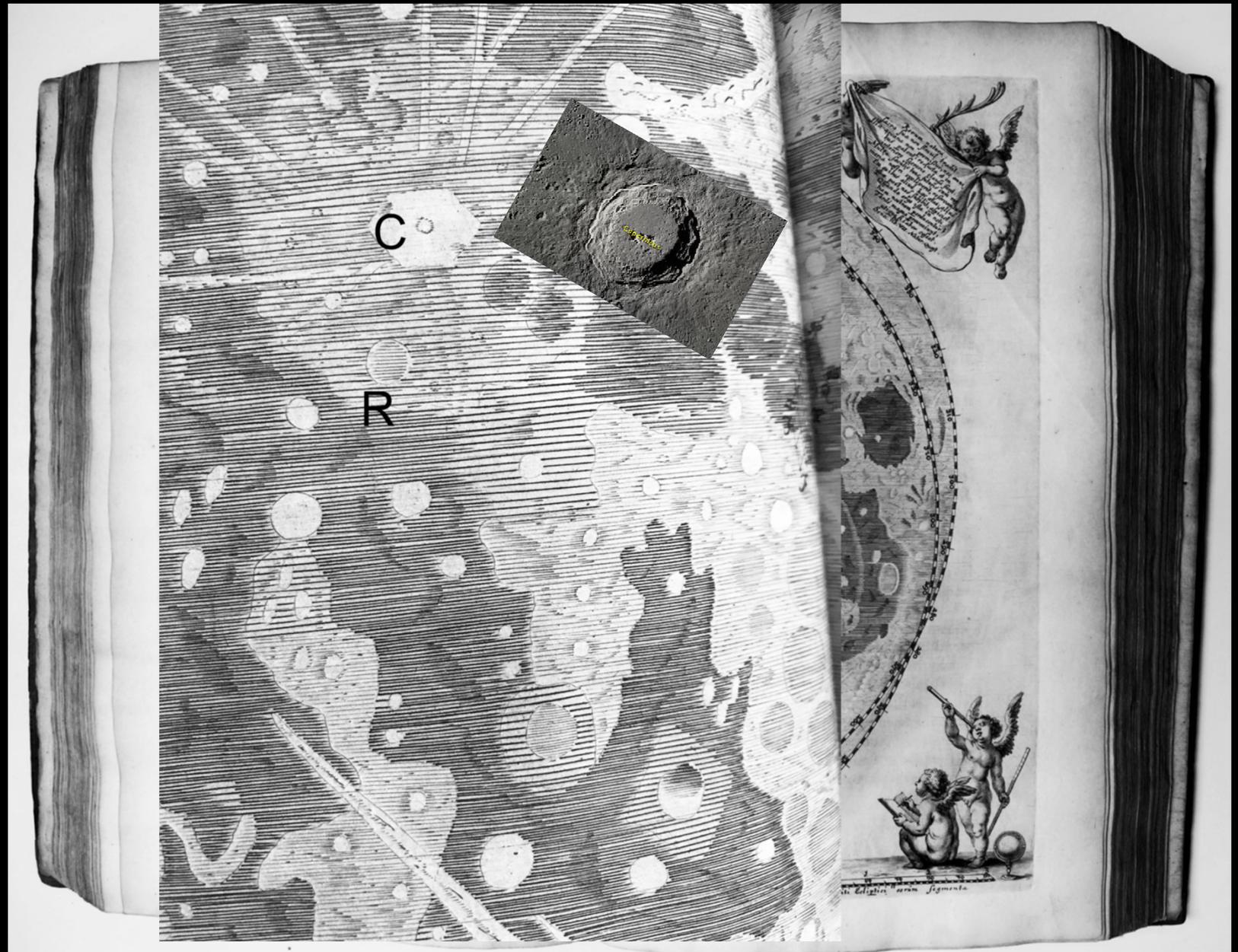
...Il était aussi brasseur !

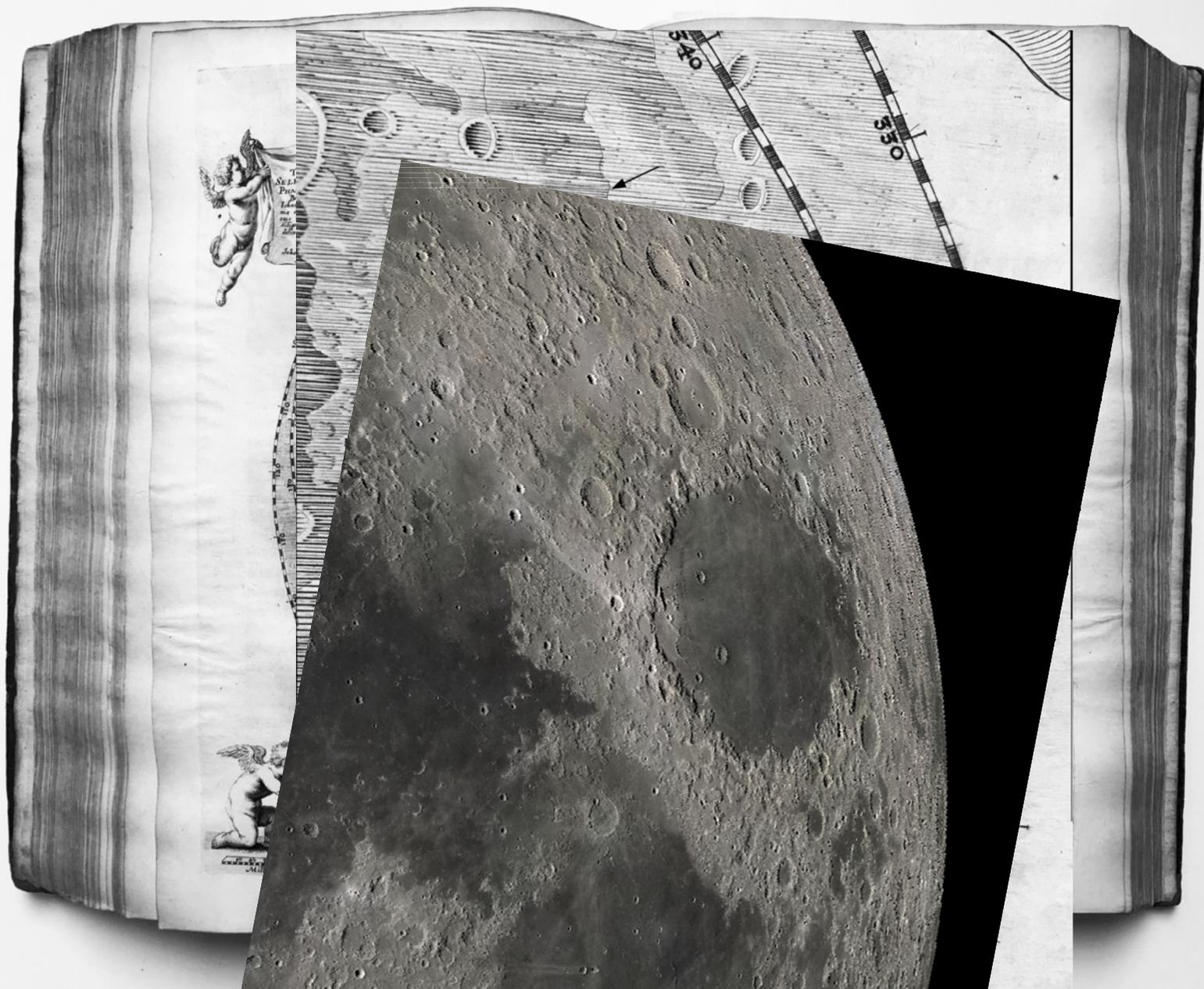


Elisabeth et Johann  
HEVELIUS  
Un couple astronome !

Hevelius  
Une première  
carte gravée  
de sa main  
1647 de 29 cm

Forme du  
cratère Copernic







*Sphecia, Mejonis, Arofa, Paphus, Chetima, Citica, Sec.*

**Cyanea Europea**, Insula Bosporo Thracio adjacens.

**D**

**Delanguer, Mons**, olim *Imaus* ex Radicibus Tauri exoritur: à Ptolemaeo *Chemantini Montes* appellantur.

**Didymę**, Insulę Maris Mediterranei  
**Didymus, Mons** Asię Minoris: alias quamplurimi reperiuntur hujus nominis montes.

**E**

**Ebissus**, hodie *yvica*, Insula maris Balearici.

**Echinades**, Insulę sunt maris Ionii nostrę tempestate *Cozzulari* vocantur.

**Eos, Mons** Ægypti.

**Eoum Mare**, seu Orientale.

**Erichtini Scopuli**, in Ponto Euxino.

**Erroris Insula**, quę & *Albusama* maris Mediterranei, hodie vocatur *Alboran*.

**Eryx Mons**, vel *Montes Erycini*, hodie *Trapani & Monte S. Iuliano*, in Sicilia.

**Evila**, desertum in Palestina.

**F**

**Ficaria Insula**, in Cæsariensi

**Germanicianus mons**, alias *Iovis*, in Africa.

**H**

**Hajalon Vallis**, in Palestina, sive *Valis Lunę* alias nominata.

**Herculeus Lacus**, in Sicilia circa Ætnam situs, quatuor stadiorum fuit in ambitu, in Leontino agro. Diodor. Sic.

**Herculis Mons**, juxta Promontorium Heracleum.

**Hereus, Mons** Sicilię, alias *Artifino & Tauris*.

**Herculeum Promontorium**, ad Paludem Meotidis.

**Heracleum**, Promontorium Ponti Euxini.

**Hermo Mons**, & *Galaad*, Palestinae.

**Hiera**, Insula, juxta Siciliam & *Hieroneos*; vel *Maritima* nominata; hodie *Maretano*, non procul Promontorio Lylibeo, ubi & alia reperiuntur Insulę.

**Hippoci Montes**, hodie *Mazarisci*, in Asia, circa Tartariam.

**Hippolai Promontorium** in Scythia Europę ad Boristhenem.

**Hipponiates Sinus**, alias *Vibonensis, Terineus, Napetinus, Bruttius, Laneticus*, hodie *Golfo di Taranto*.

**Hor, Mons** Palestinae.

Carte 29 cm  
Gravée par un  
professionnel  
Jérémie Falck dans le  
style des cartes  
terrestres de l'époque



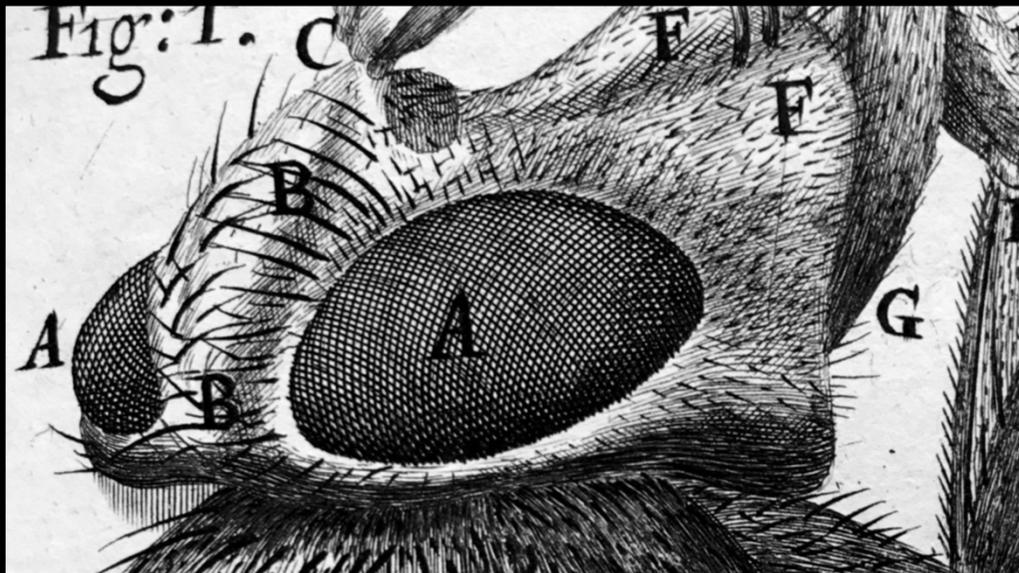
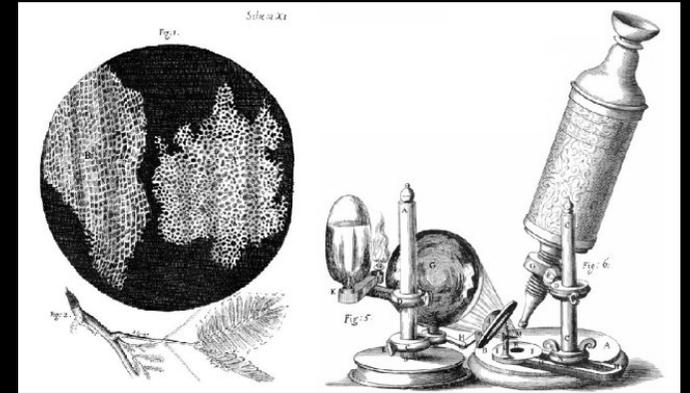
VI. FIGURA PRO NOMENCLATURA ET LIBRATIONE LUNARI  
Nec Homines Lunam incolunt. II. OCTANS Nec Anime in Lunam migrant.

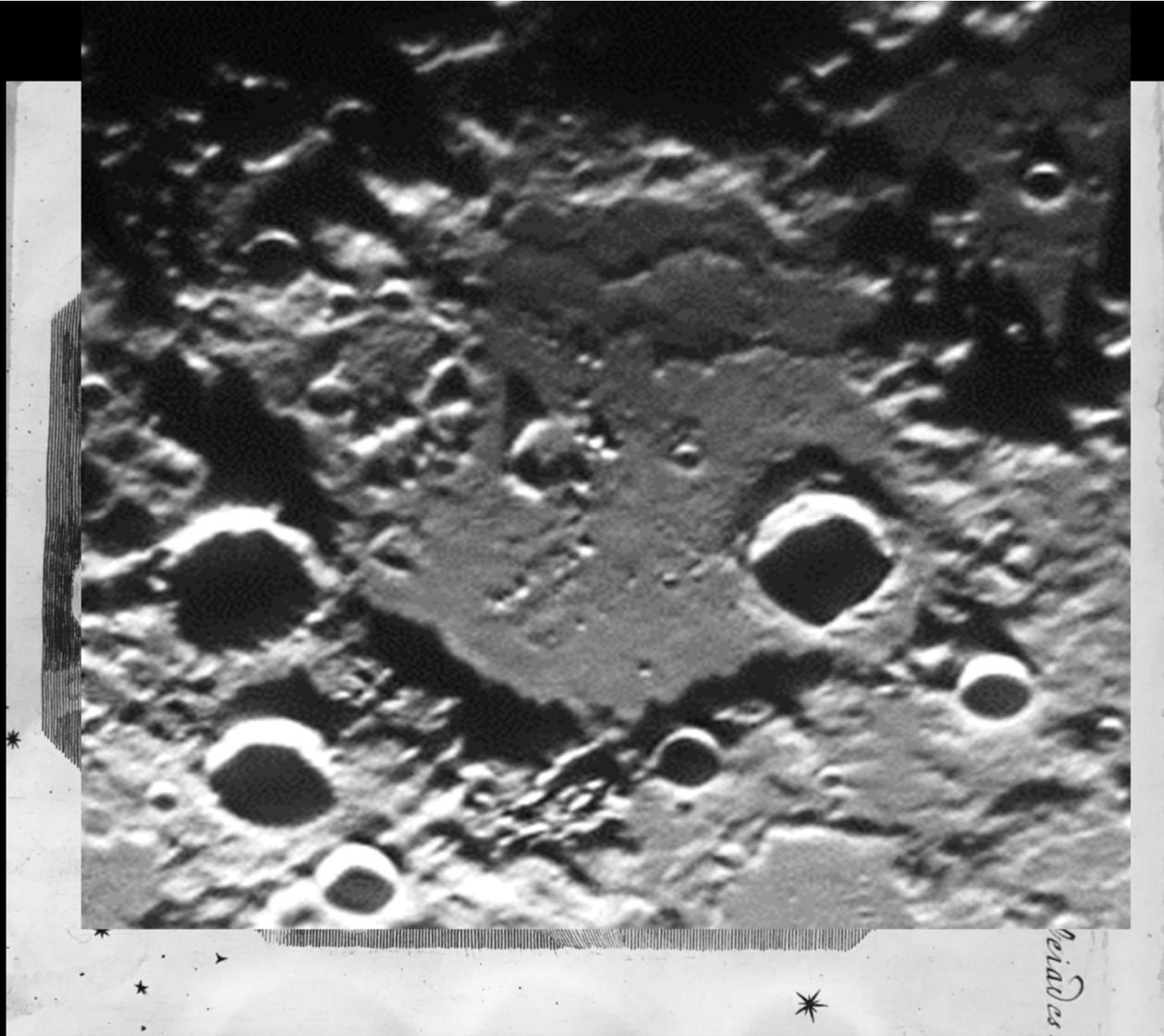
Carte de Grimaldi (dessin) et Riccioli





Robert Hooke  
1635-1703  
Un scientifique  
« expérimental »

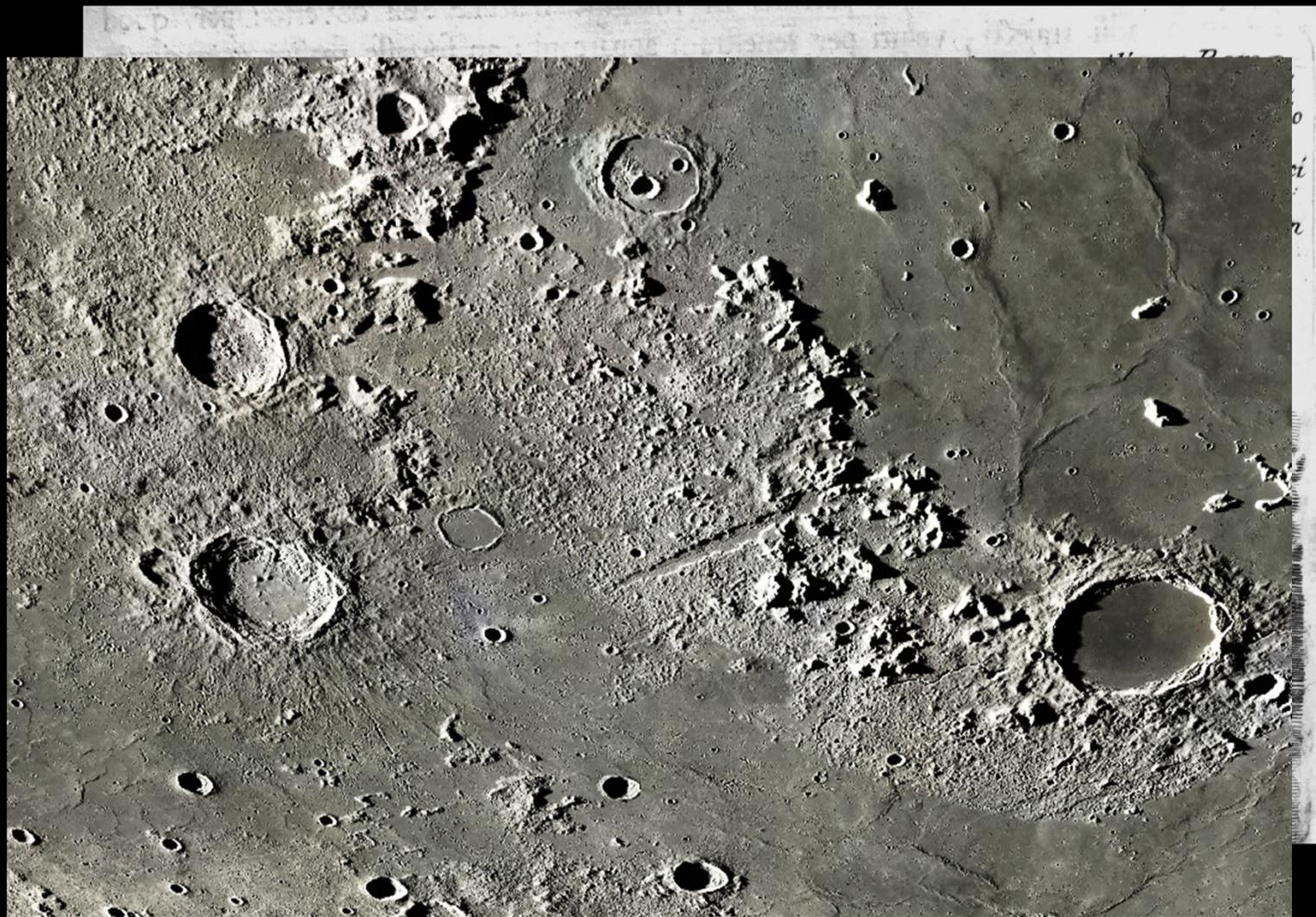




Eau forte de  
Robert Hooke's  
1664

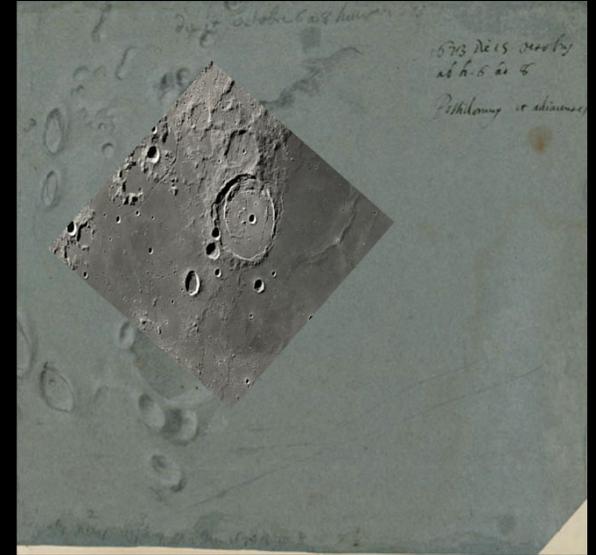
Cratère Hipparchus

Dessin de  
François  
Bianchini 1727



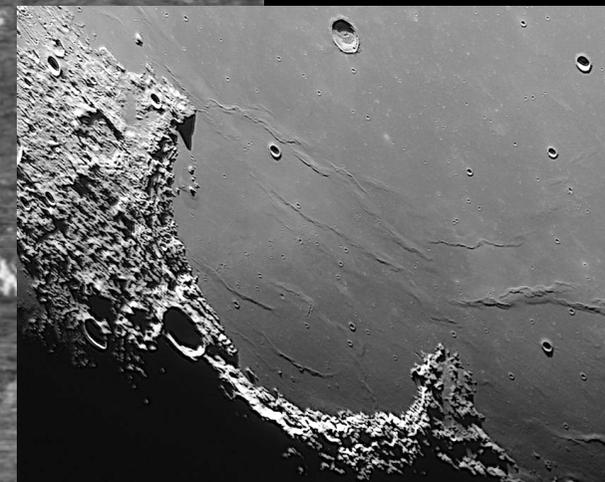
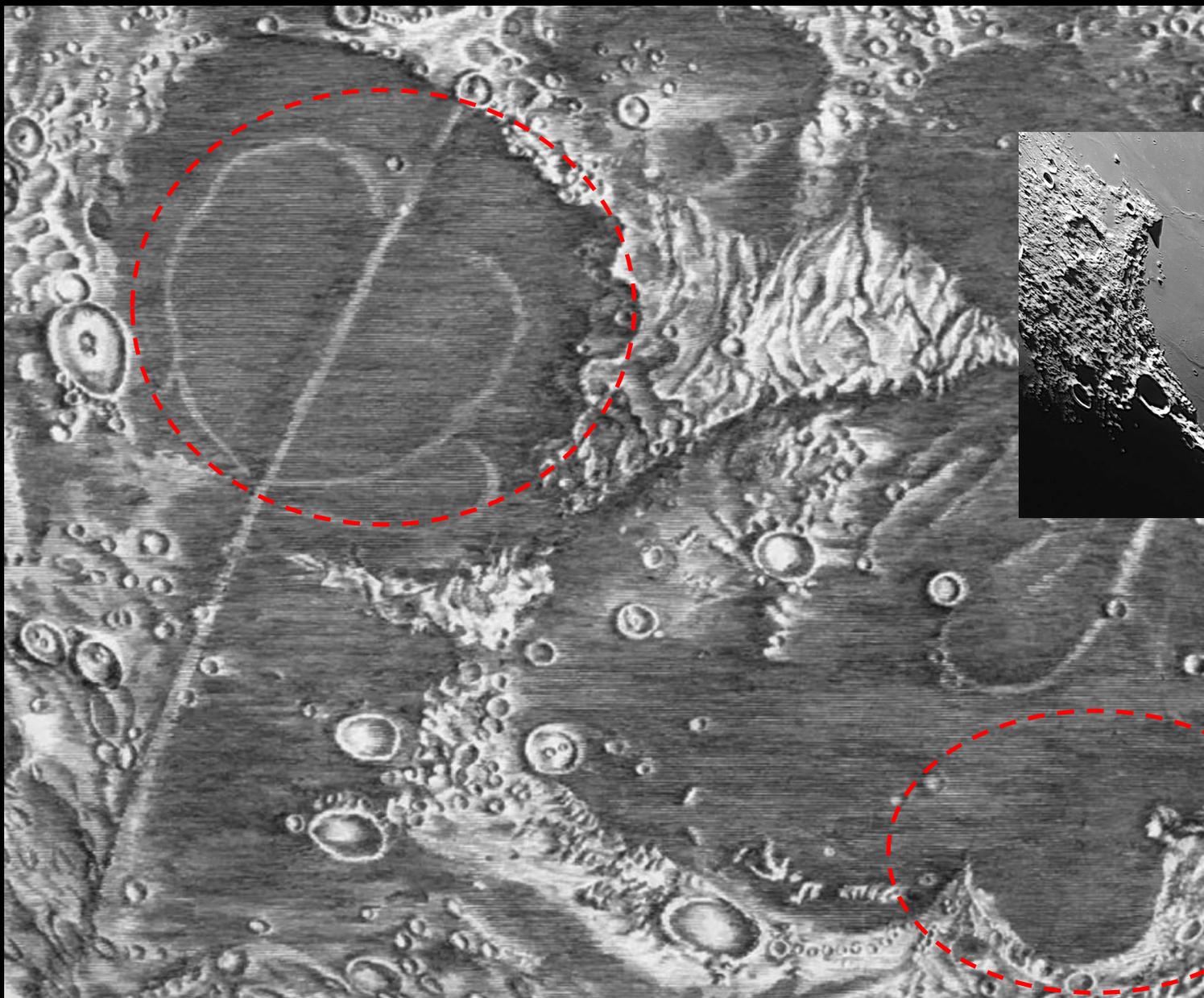


Eau forte de Sébastien Leclerc  
et Jean Patigny carte 53 cm



Jean-Dominique  
Cassini (1625-1712)

Un grand  
cœur  
« serein »



Un visage  
sur le  
promontoire  
des  
Héraclides



Nomina macularum insigniorum  
sec. Ricciolum, sec. Hevelium.

TOB. MAYERI TABULA SELENOGRAPHICA.

Nomina macularum insigniorum  
sec. Ricciolum, sec. Hevelium.

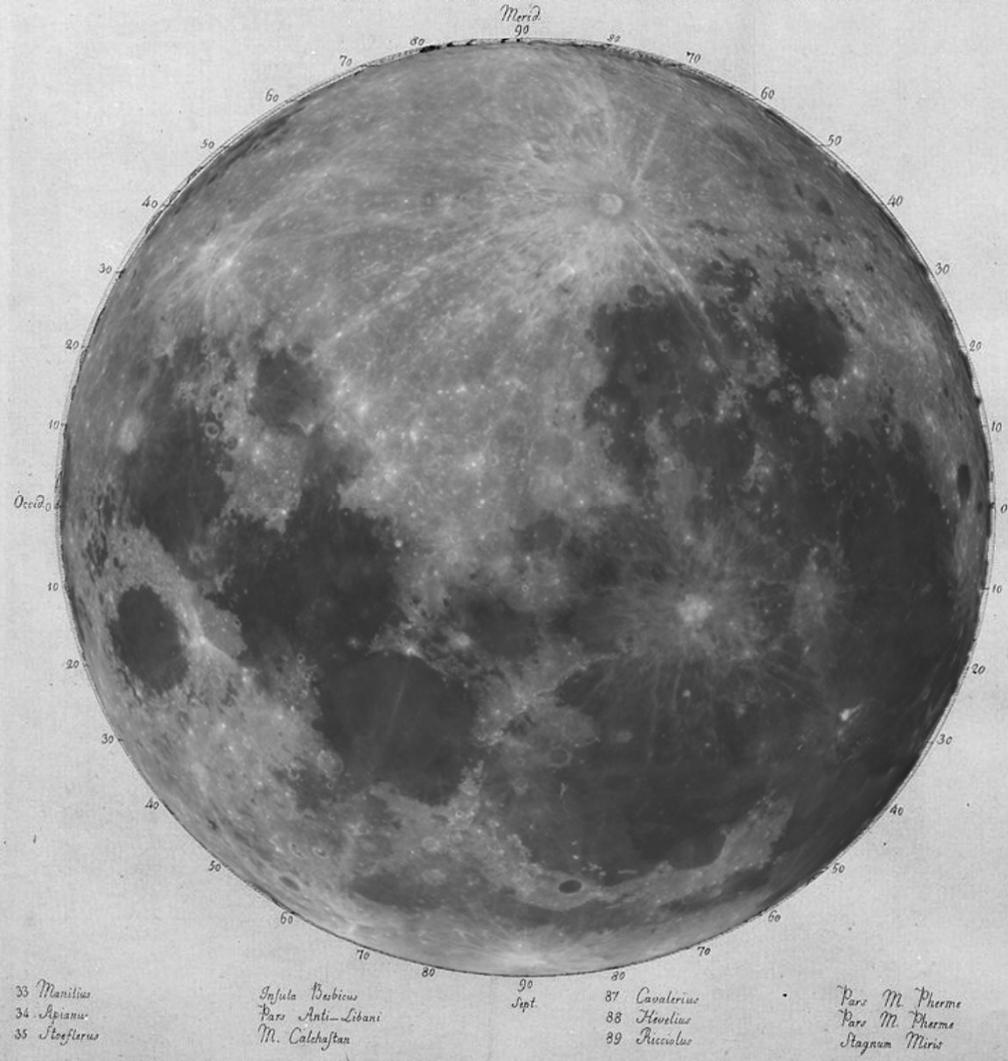
T.V

- A. Mare Crisium
- B. M. Jovianitatis
- C. M. Nestaris
- D. M. Tranquillitatis
- E. M. Jovianitatis
- F. Lacus Somniorum
- G. Lac. mortis
- H. Palus Sarrum
- J. Mare Trigris
- K. M. vaporum
- L. Sin. aestivum
- M. Mare nubium
- N. M. humorum
- O. Sinus epidemiarum
- P. Oceanus procellarum
- Q. Mare imbricum
- R. Sinus iridium
- S. Sinus roris

- Palus Marotis
- Mare Caspium
- Sin. Athen. et Sin. ext. Ponti
- Pontus Euxin.
- Sinus Cercinites
- Monte Peuce
- Lac. Corcondameti
- Mare Hyperboreum
- Popontis
- Mare Adriaticum
- M. Pamphilum
- Sin. Serbon. et M. Aegyptiac.
- Insula Didymae
- Mare Coon. et M. medit. pars
- Mare mediter. pars septent.
- Sinus Apollinis
- Sinus Hyperboreus

- 1. Serica
- 2. Mercurius Jafus
- 3. Mercurius
- 4. Langrenus
- 5. Vendelinus
- 6. Suerorius
- 7. Clemens
- 8. Petavius
- 9. Neuvius
- 10. Endymion
- 11. Inellus
- 12. Tarantius
- 13. Atlas
- 14. Proclus
- 15. Guelnius
- 16. Hercules
- 17. Conforvius
- 18. Cracistorius
- 19. Pucolominus
- 20. Pofidonius
- 21. Vetrivius
- 22. Theophilus
- 23. Cyrillus
- 24. Plinius
- 25. Catharina
- 26. Dionysius
- 27. Aristoteles
- 28. Cudoxus
- 29. Menelaus
- 30. Calippus
- 31. Maurolycus
- 32. Aristidea

- Mons Alpinus
- Lacus hyperboreus inf.
- Insula maior
- Pars montis Parapanisi
- Pars mont. Riphases
- Petra Sogdiana
- P. mont. Parapanisi
- Lac. hyperbor. sup.
- M. Parapanisus
- Sin. Phasianus
- Pars M. M. Macroceum.
- M. Corax
- M. Caucasus
- P. Mont. Macroceum.
- P. Mont. Herculis
- Lac. Thepitis
- Pars M. M. Sogdian.
- Insula Macra
- Apollonia maior
- Pars M. Moschi
- Pars M. Moschi
- Promont. Archerusia
- Pars M. Moschi
- Pars M. Hormini
- M. Jerrorum
- M. Carpathes
- Dyzantium
- M. Amus
- Pars M. Antilauri



- 36. Alincifer
- 37. Venerius
- 38. Fernelius
- 39. Hipparchus
- 40. Albatagnus
- 41. Aristillus
- 42. Autolycus
- 43. Waltherus
- 44. Regiomontanus
- 45. Parbachius
- 46. Archimedes
- 47. Ptolemaeus
- 48. Arzachel
- 49. Alphonsus Rex
- 50. Orontius
- 51. Magnus
- 52. Alptragius
- 53. Plato
- 54. Tycho
- 55. Cratotheneus
- 56. Simocheris
- 57. Petrus
- 58. Hadrius
- 59. Clavius
- 60. Dominici Maria
- 61. Pytheas 2
- 62. Landbergius
- 63. Aheticus
- 64. Copernicus
- 65. Longomontanus
- 66. Pytheas 1
- 67. Guilielmus Hoff Landg.
- 68. Bullialdus
- 69. Blancanus
- 70. Annhold
- 71. Heraclides Jaff
- 72. Scheinerus
- 73. Heraclides verus
- 74. ---
- 75. Kepler
- 76. Guffendus
- 77. Harpalus
- 78. Aristarchus
- 79. Meftinus
- 80. Marius
- 81. Schickhardus
- 82. Galilaeus
- 83. Phacides
- 84. Pythagoras
- 85. Sileucus
- 86. Grimaldus

- Pars Anti-Libani
- Pars Anti-Libani
- Pars M. Hormi
- M. Olympus
- M. Ptolemaeus
- M. Siquinius
- M. Montaniatus
- M. Tebor
- Pars M. Libanon
- Pars M. Libanon
- M. Argentarius
- M. Sippus
- M. Crayus
- M. Masjylus
- M. Hormi
- M. Sui
- Promont. Anaricum
- Lacus niger maior
- M. Sinai
- Ins. Vulcanica
- Ins. Coslica
- Mare mortuum
- Pars lacus Herculis
- Desert. Hevilo
- Pars lacus Herculis
- 
- Ins. Malta
- Pars lacus Herculis
- M. Aetna
- M. Annae
- Ins. Jardiua
- M. Heros
- Ins. Creta
- Desert. Raphidim
- M. Neptunus
- Pars Vallis Hejalon
- Sinus Syrticus
- Laca paludosa
- M. Cataractes
- Ins. Sin. Hyperb.
- M. Porphyritic
- M. Ajax
- M. Germanicus
- M. Jovius
- M. Aedus
- M. Tardus
- ad Sinum hyperbor.
- M. Pentadactylus
- Palus Marotia

- 33. Manilius
- 34. Apianus
- 35. Stefflorus
- Insula Babilus
- Pars Anti-Libani
- M. Calchastan
- 87. Cavalarius
- 88. Hevelius
- 89. Ricciolus
- Pars M. Phormi
- Pars M. Phormi
- Stagnum Miris

A. J.

# la cartographie lunaire...une œuvre d'artiste



John Russel  
1745-1806  
Un observateur  
pastelliste

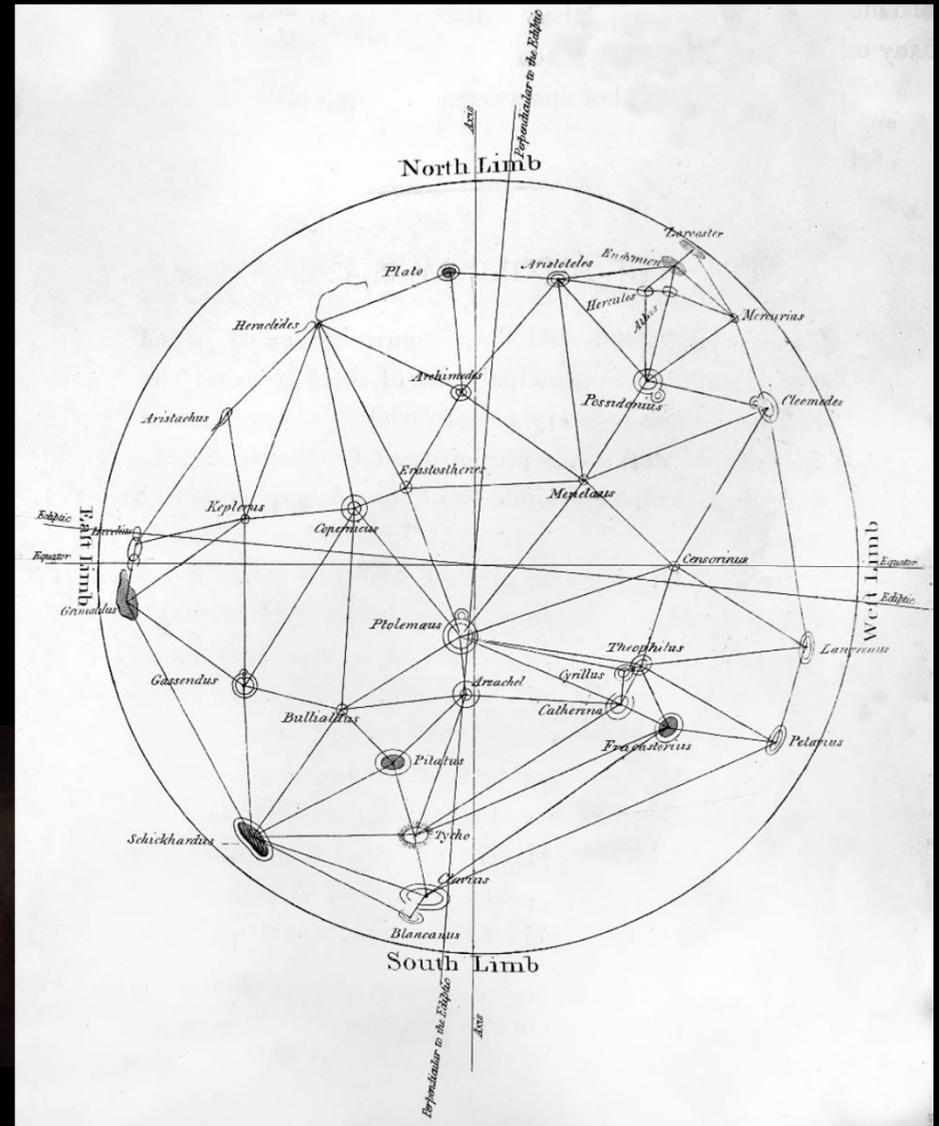


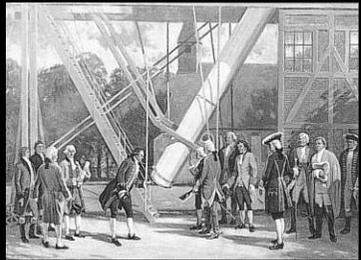
Photo G.Coute



Photo montage NASA

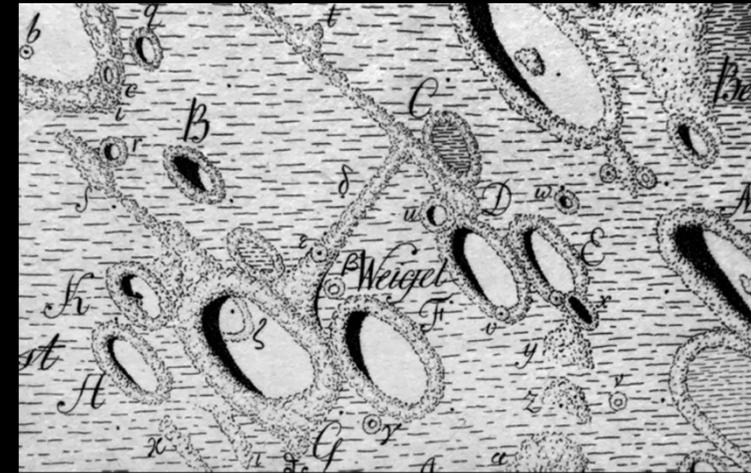
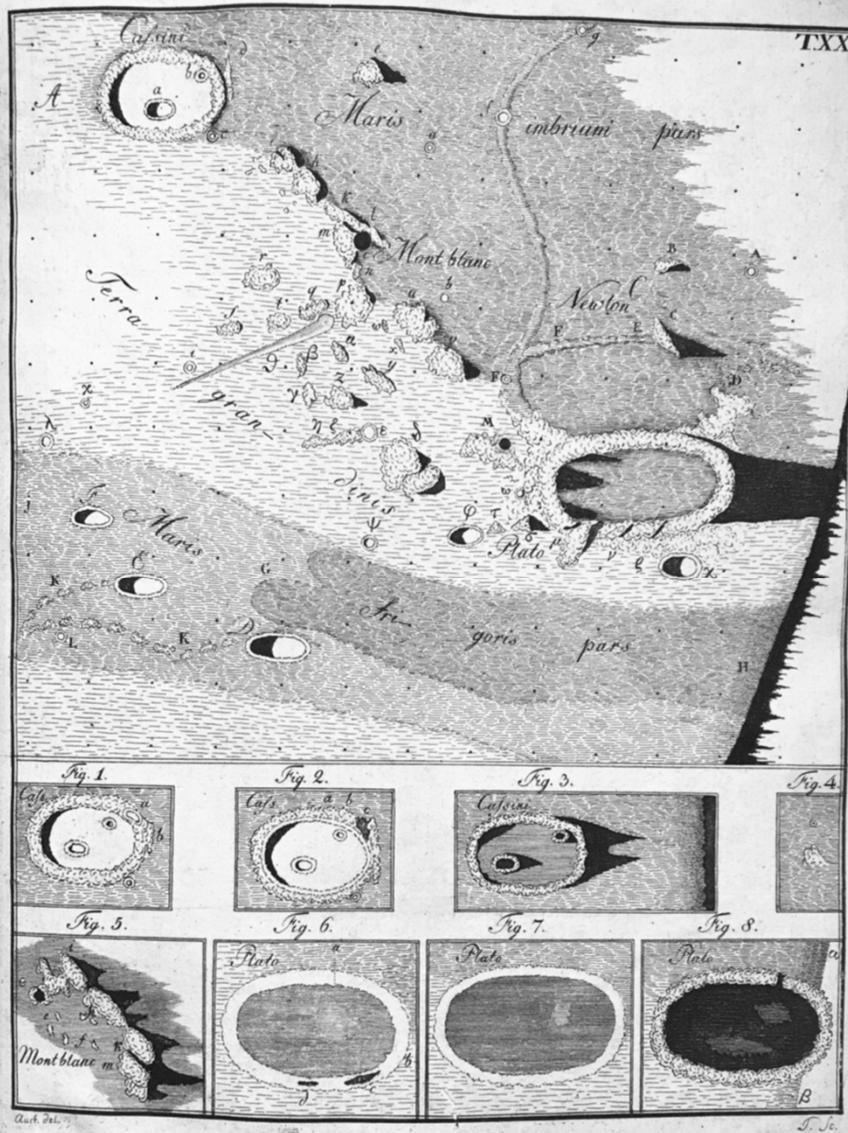


Johann  
SCHROËTER  
1745-1816  
Eau forte de  
G.Heinrich  
TISCHBEIN



Réflecteur de  
18 ½ pouces

Des dessins  
d'étude 1791

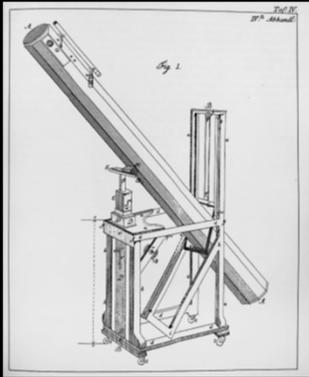


Le style « chou-fleur »



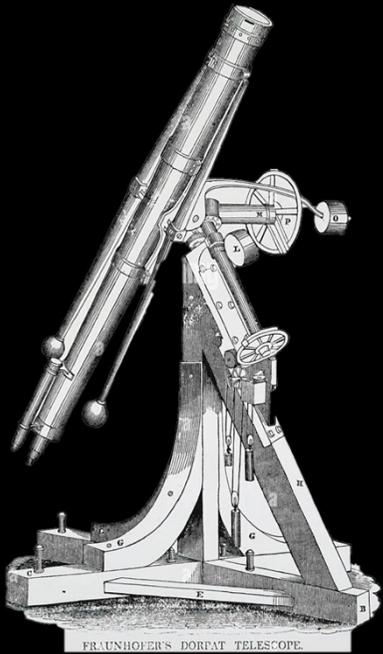
## Les grandes cartes ...

Wilhelm Lohrmann  
Carte de 94 cm de 1824  
Télescope de 4,8 pouces (122 mm)



25 sections !

Carte de Beer  
et Madler 1834  
95 cm



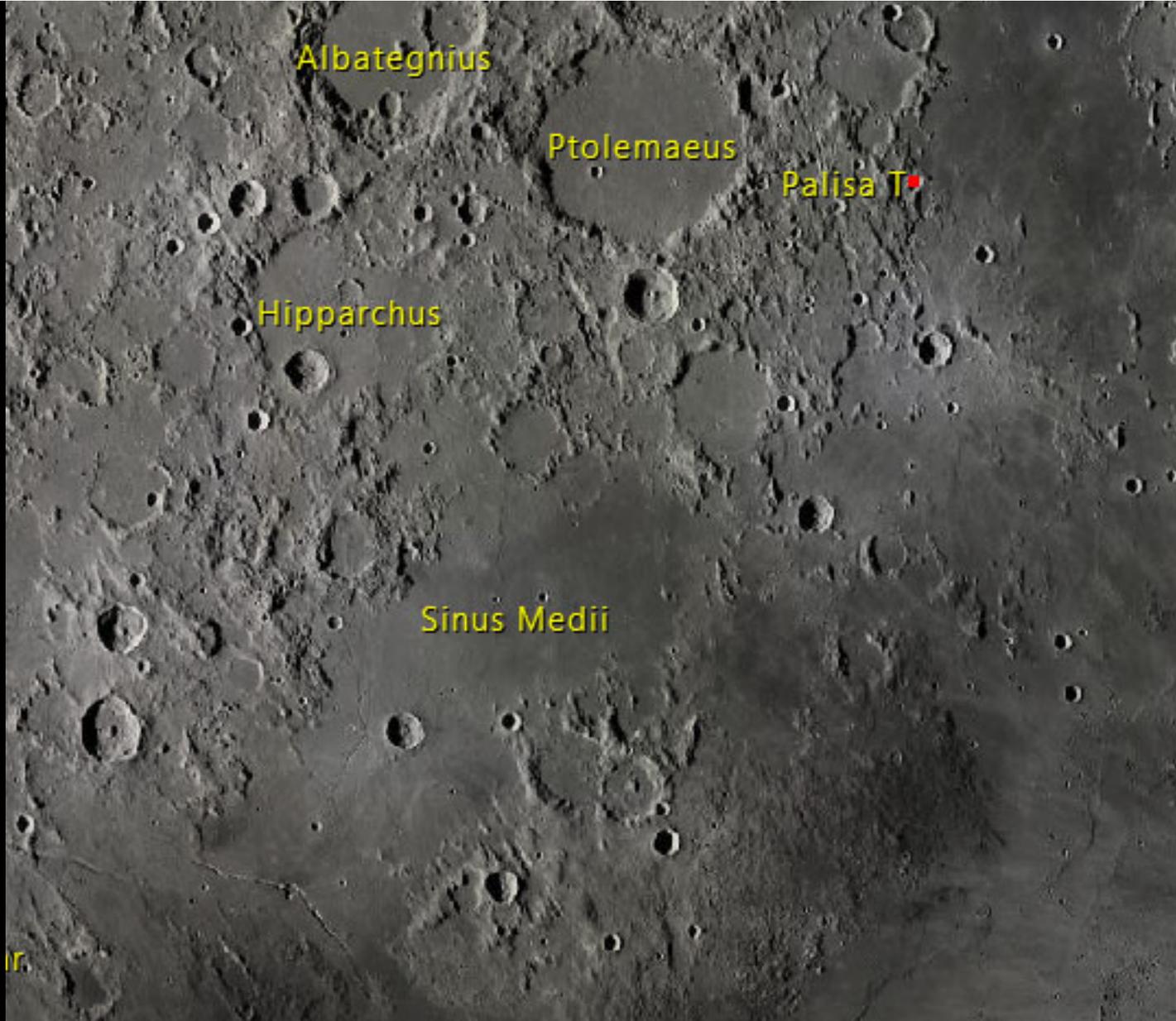
Lunette Fraunhofer  
diamètre 94 mm



Carte de Julius  
Schmidt 1858  
Diamètre 2,70 m  
25 sections  
1 carré = 54 cm



Plus de 33000  
cratères !  
Les noms de huit  
graveurs ont été  
retrouvés sur ces  
cartes



Carte reproduite  
par  
photolithographie

# Lithographie

Travail sans relief ni creux : procédé planographique inventé en 1796 à Munich.

Crayon gras sur pierre polie



Ce procédé a favorisé la diffusion des images auprès d'un

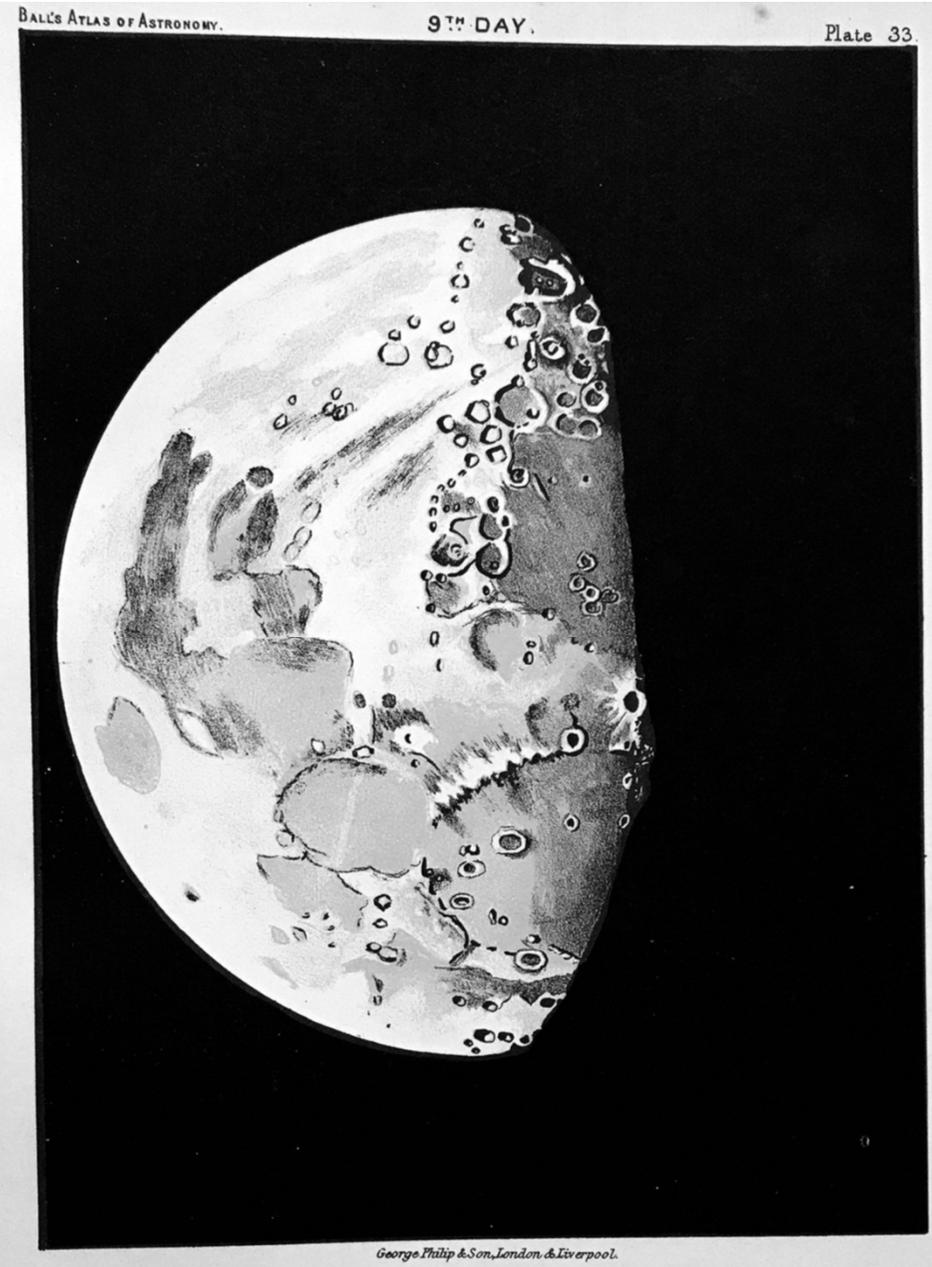
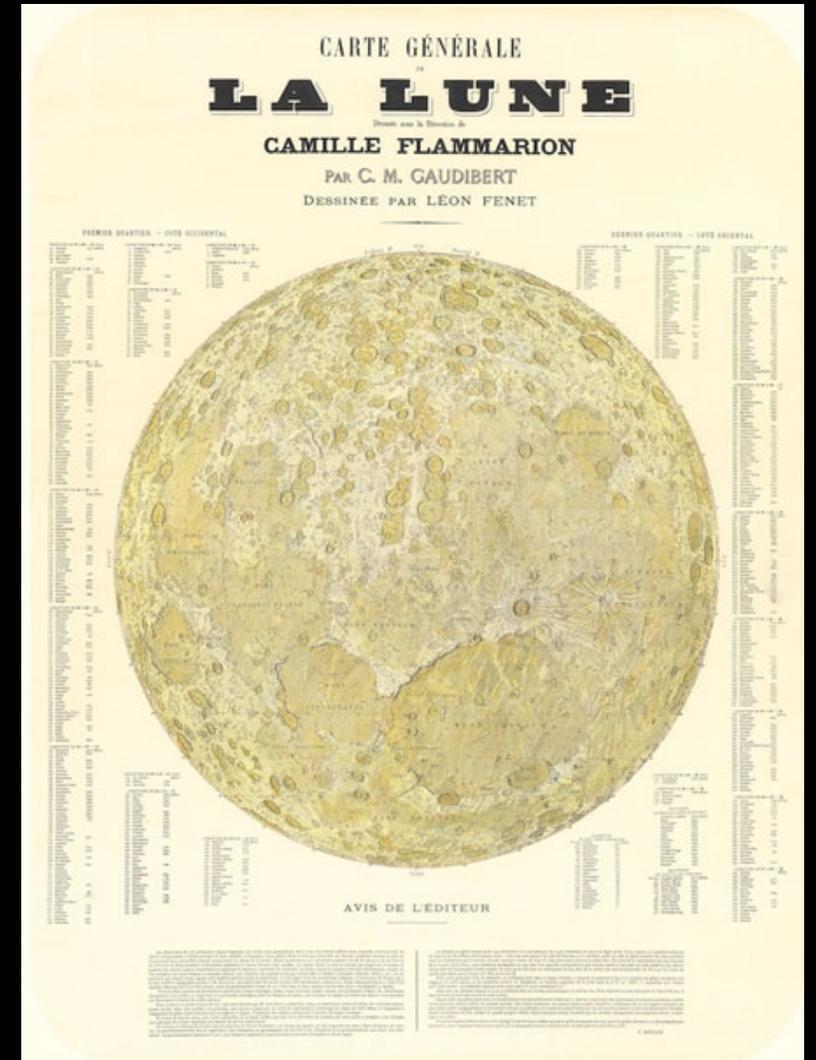
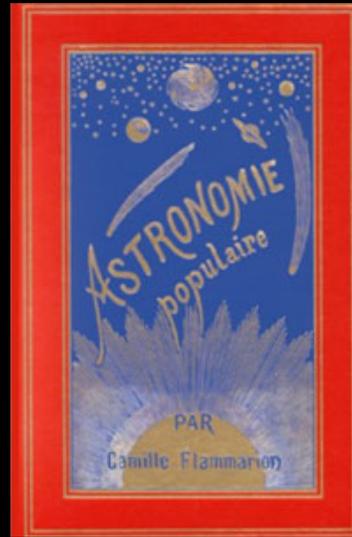
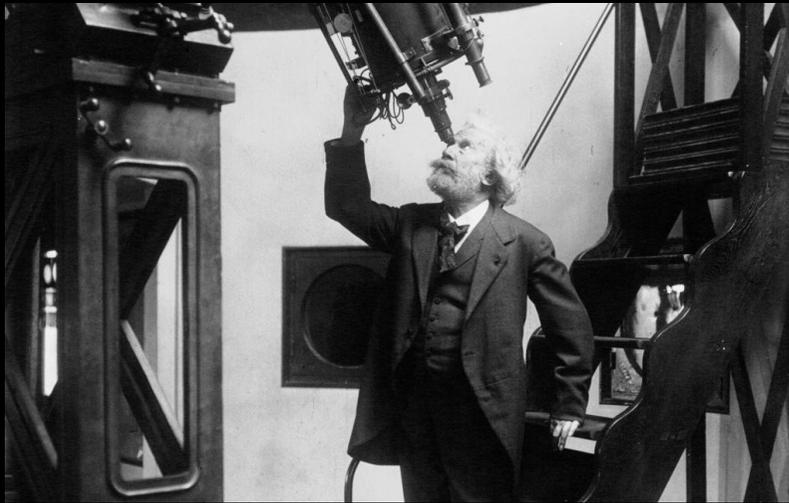


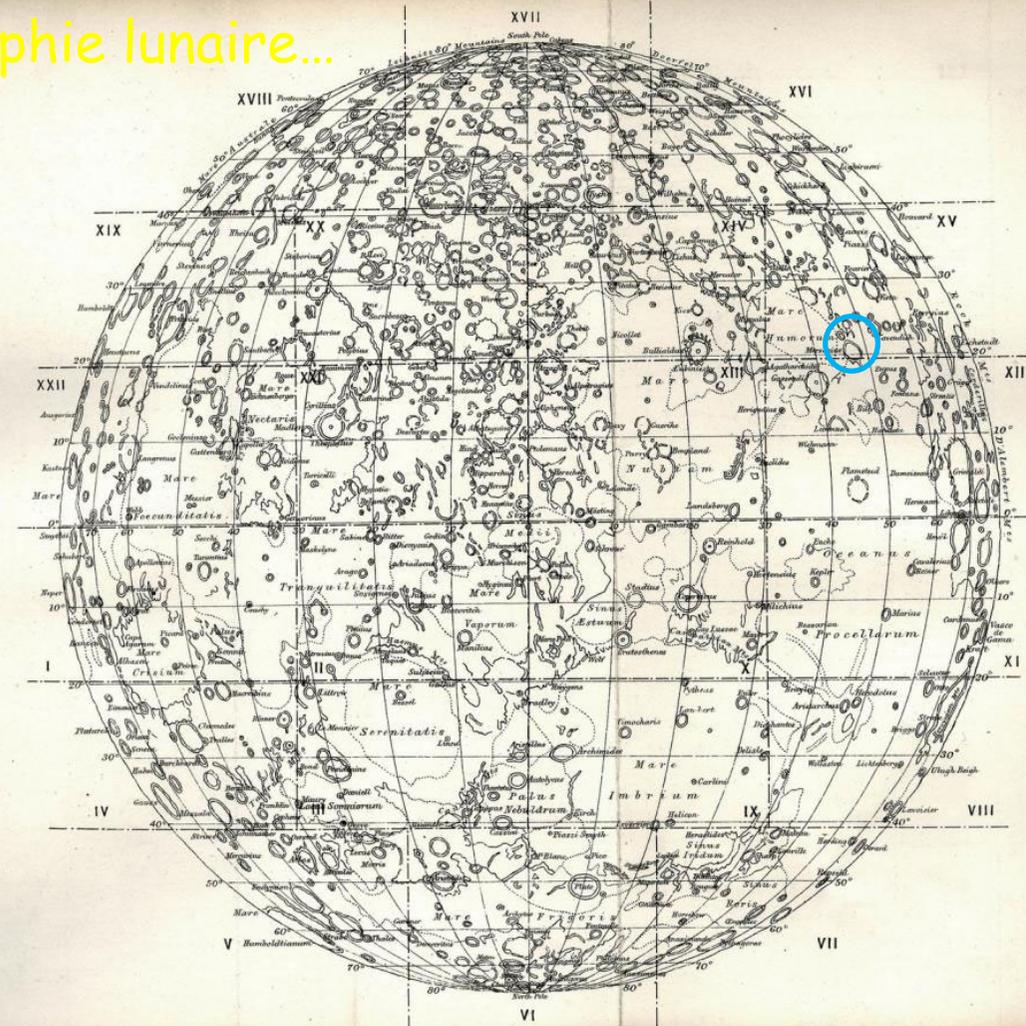
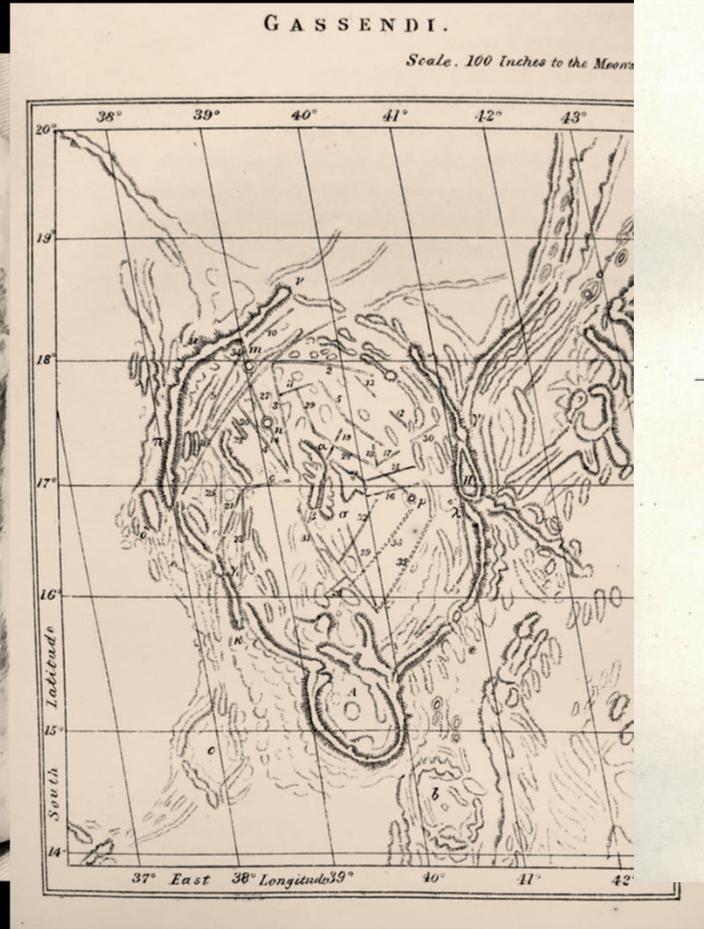
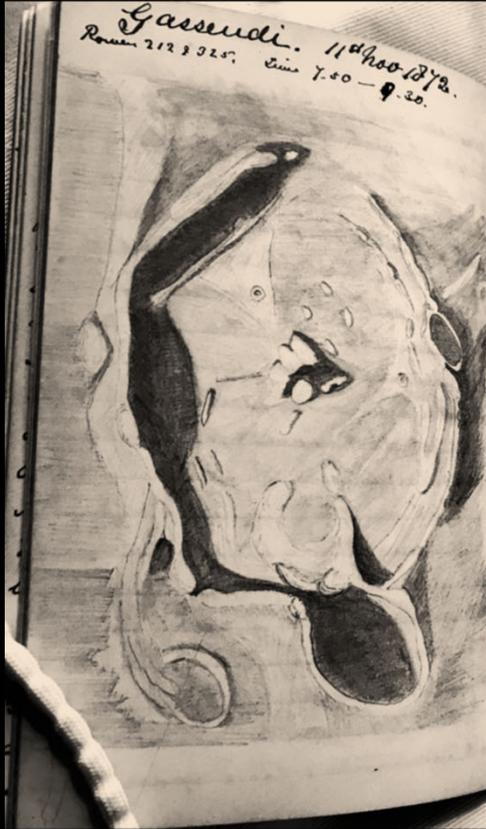
Illustration  
de Elder  
1895  
12,6 cm

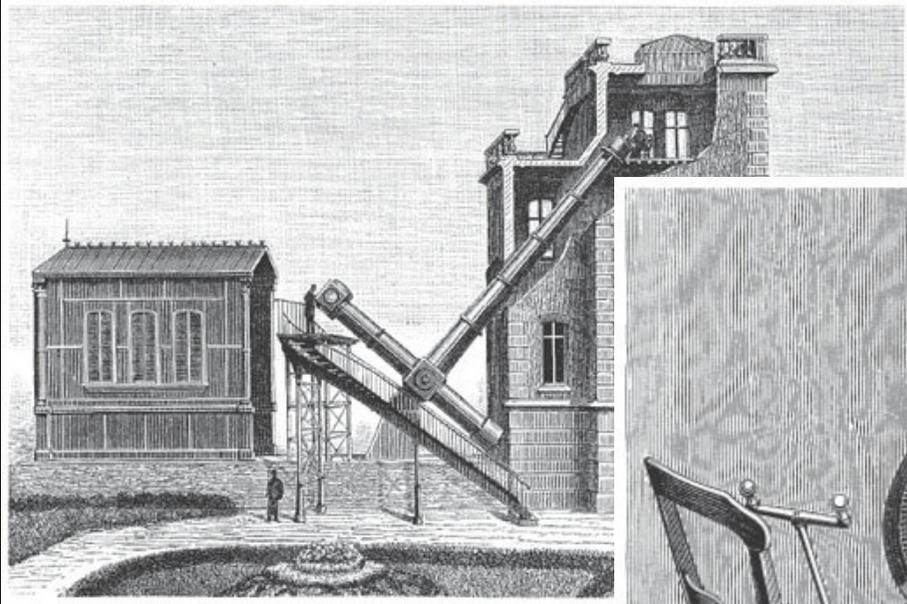
John Léopold  
Delvelot (1827-95)



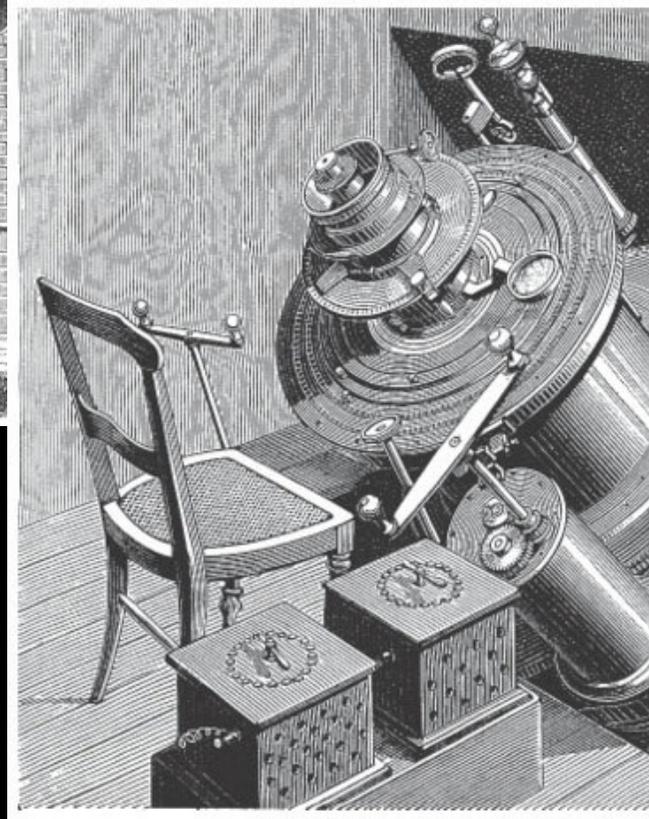
Edmund Neison  
1849-1940

## Du dessin à la cartographie lunaire...

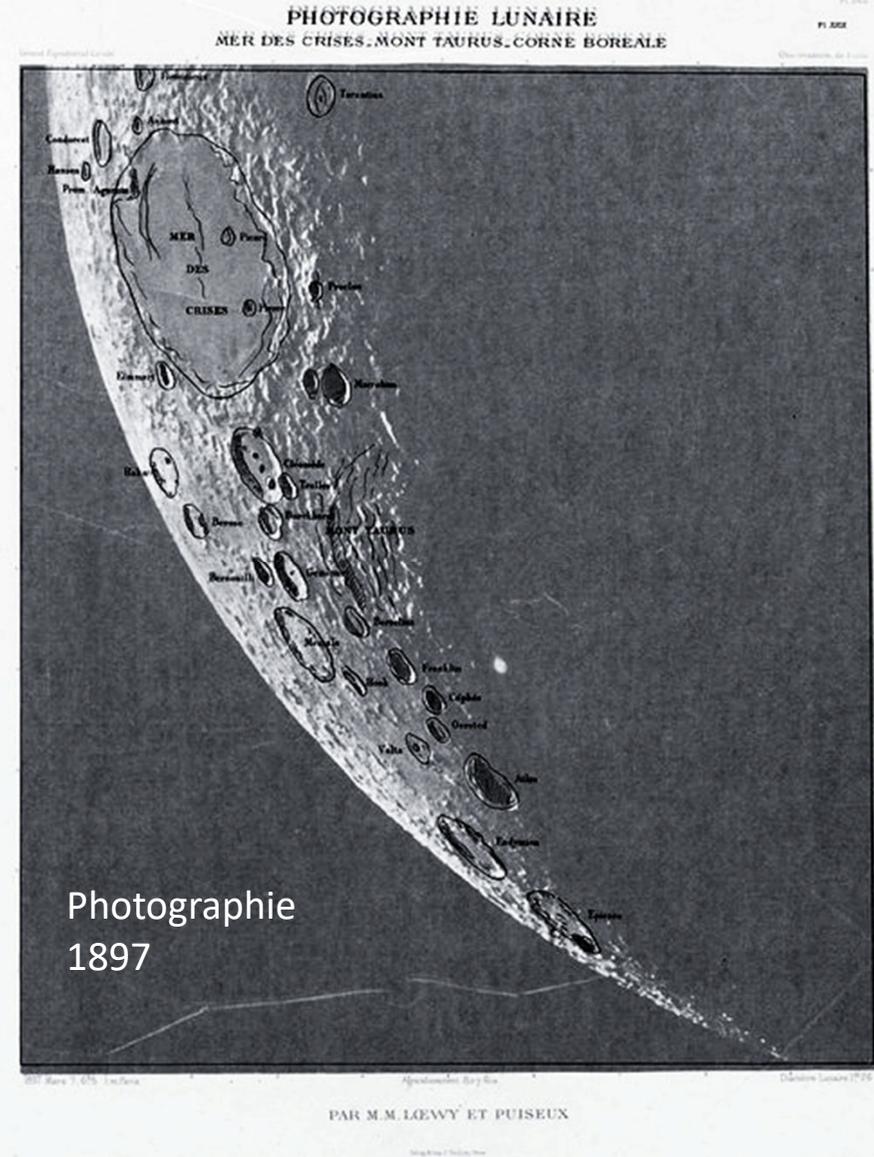




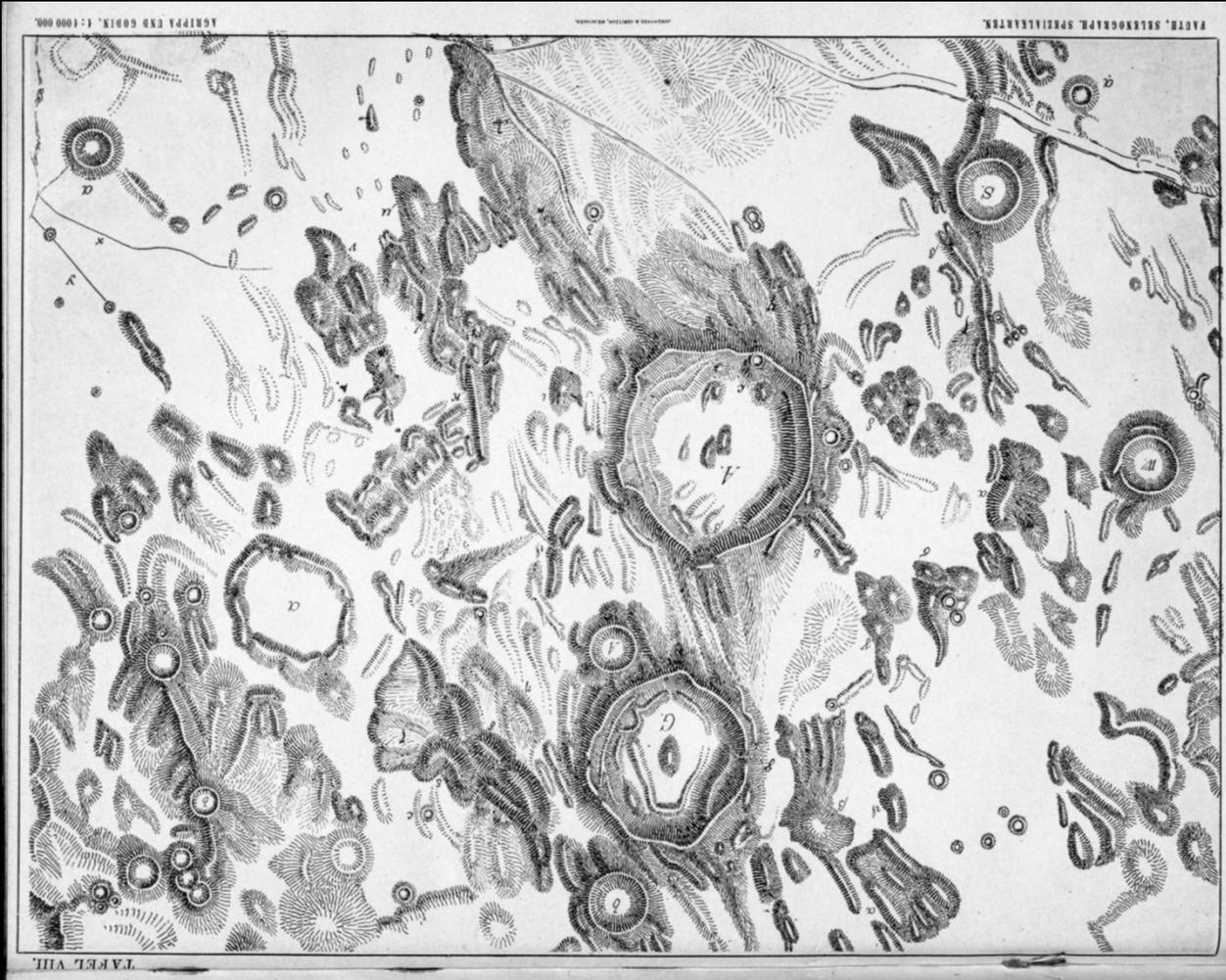
Le grand équatorial coudé de l'Observatoire de Paris 1891



Un poste d'observation confortable  
60 cm et 18 m de focale



Photographie  
1897

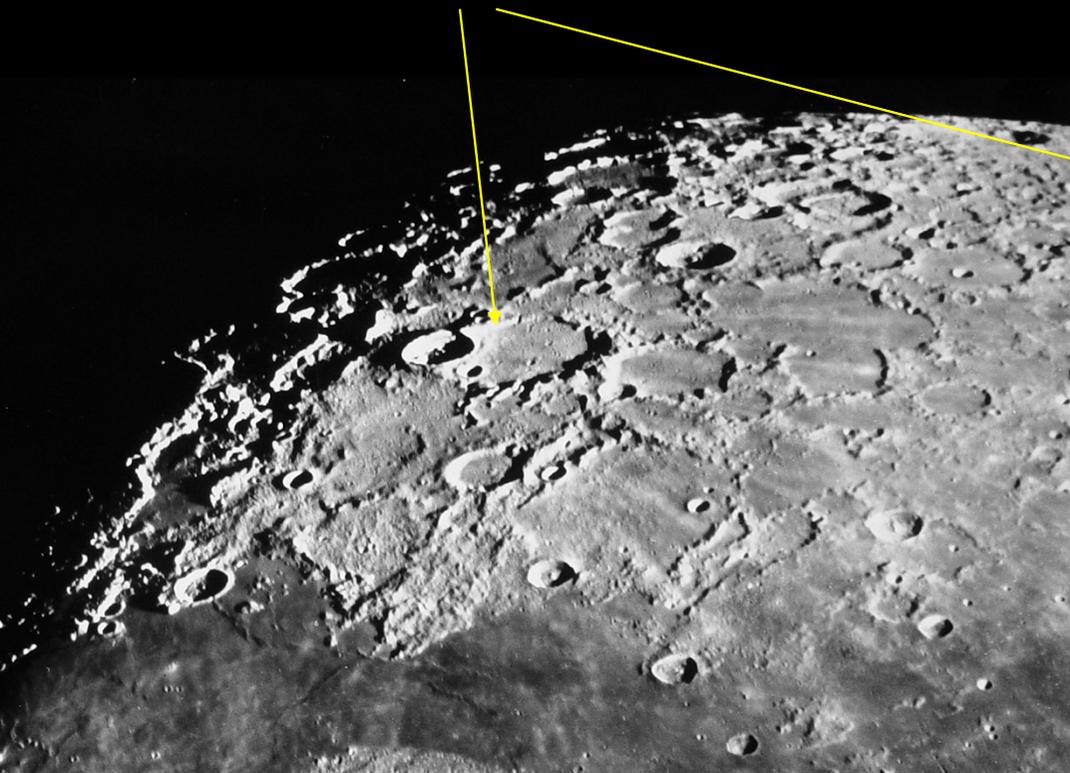


Carte de Philip FAUTH  
1932

Le 20<sup>è</sup> siècle à surtout utilisé la photo comme base cartographique

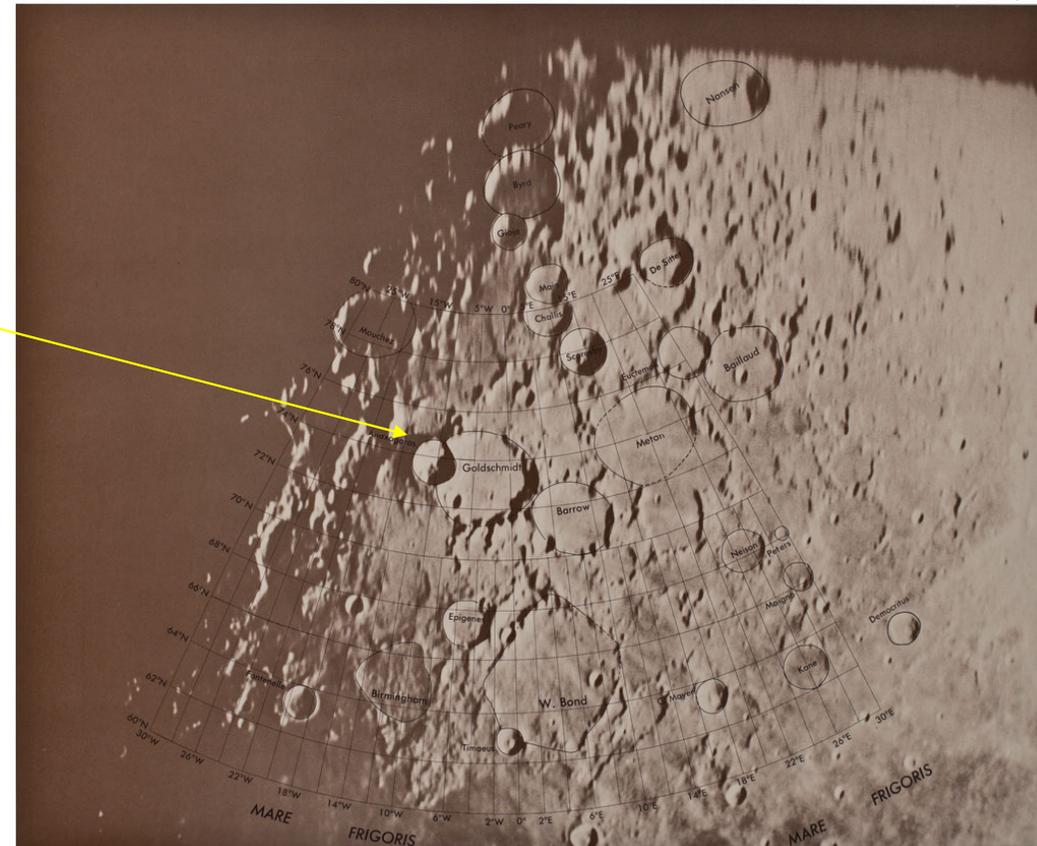
Afin de disposer de projections cartographiques on photographiait des vues projetées sur une sphère

Cratère Goldschmidt  
pôle nord



2-a RECTIFIED LUNAR ATLAS

COORDINATES AND NOMENCLATURE

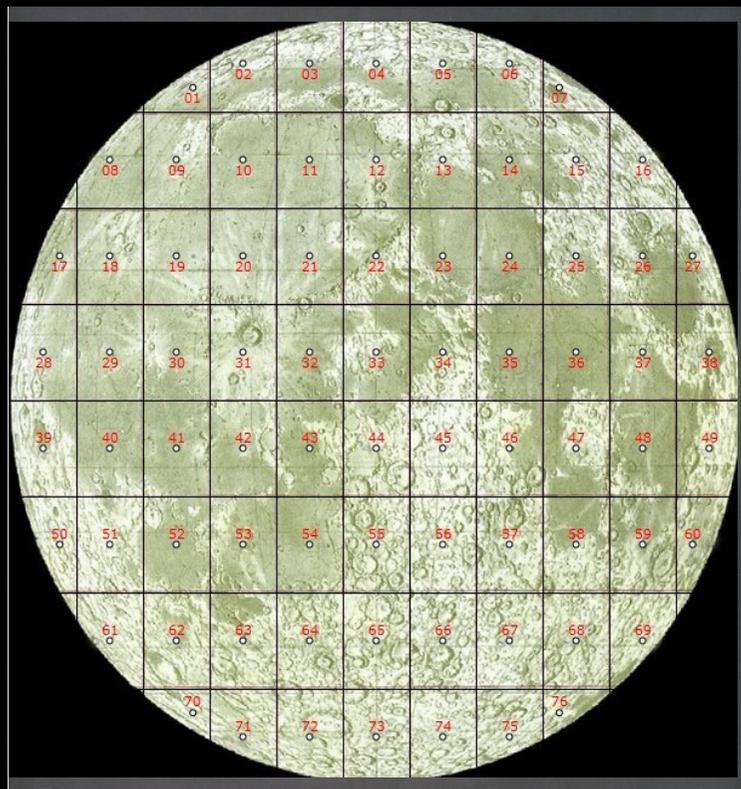


Positions of meridians and parallels taken from the Orthographic Atlas of the Moon. Adopted nomenclature explained in Introduction.

Scale 1:3,500,000 approximate  
3.5 kilometers per millimeter 55 miles per inch

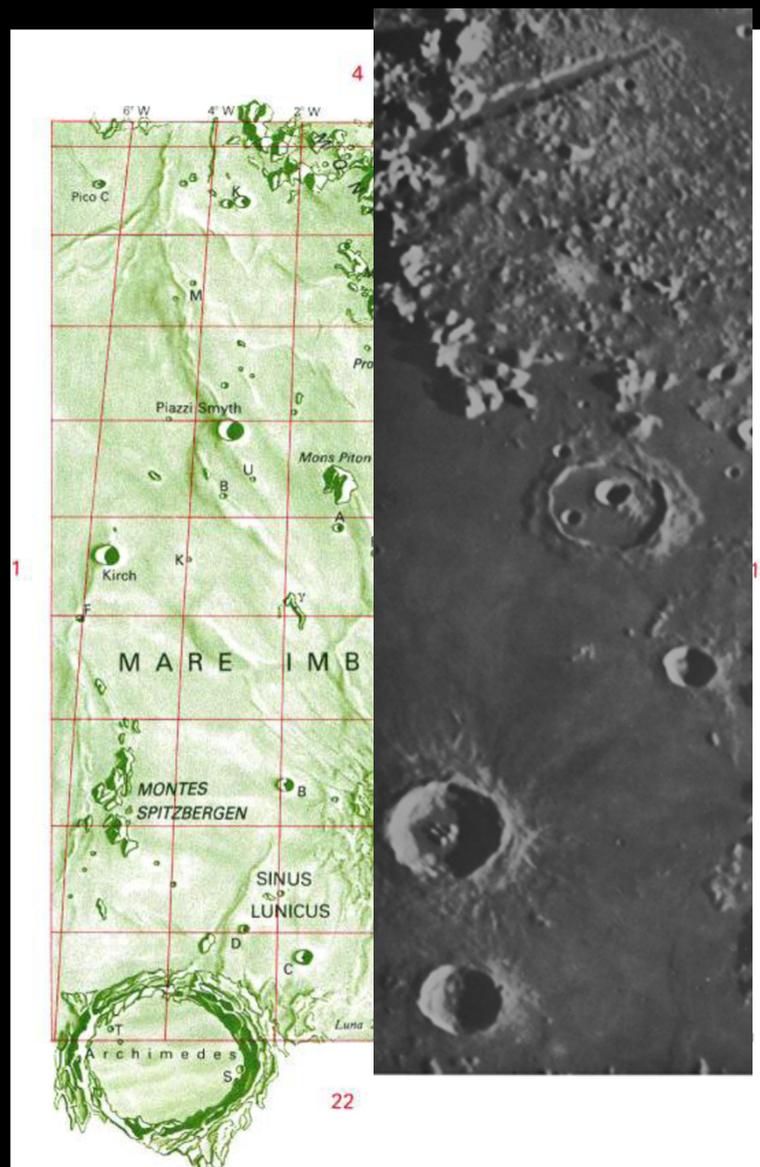
North is uppermost and selenographic east to the right, following the convention adopted by the I.A.U. at Berkeley in 1961.

# Projection orthographique



Antonin RUKL 1976  
76 planches A4  
Carte de 1,45 m  
Échelle 1/2400 000

# Planche 13



PH [2]3

44 Cartes LAC 1965  
73 cm x 55 cm  
échelle 1/ 1000 000

Projection cartographique  
cônique

**LUNAR CHART**  
SCALE 1:1,000,000  
PUBLISHED BY  
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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
AERONAUTICAL CHARTS DIVISION  
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WASHINGTON, D.C. 20330

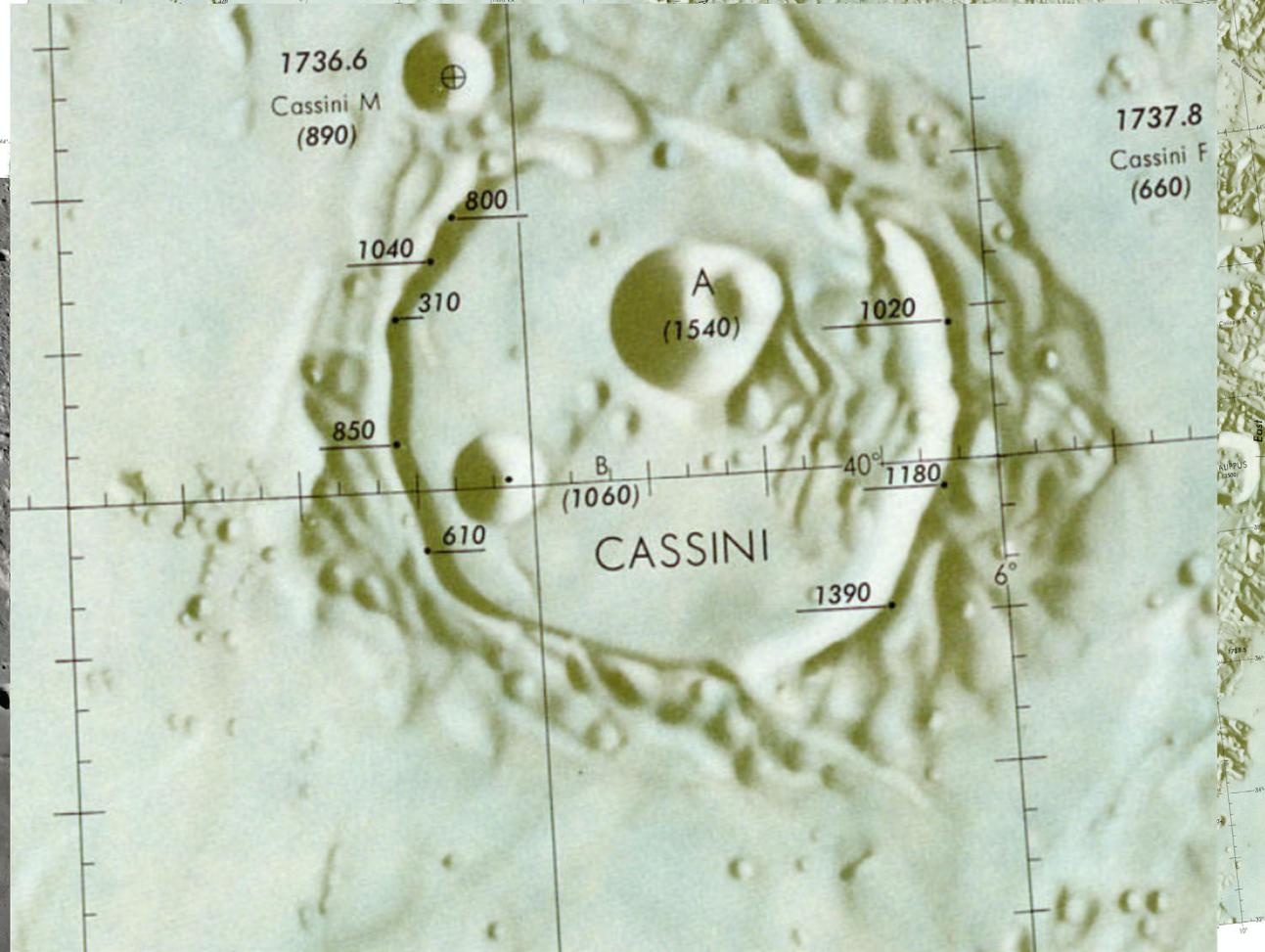
**CASSINI**  
LAC 25

Latest Available Photographs  
Standard Parallels 21°22' and 42°42'

1ST EDITION SEPTEMBER 1966

**NOTES**  
This chart was prepared with advisory assistance from  
Dr. Gerard P. Kuiper and his collaborators, D.V. 65.  
Author and R.A. Wetmore.

**DATUM**  
The horizontal and vertical positions of features on  
this chart are based on astronomical measurements  
made by A.C. and published in A.C. Technical Paper  
No. 15, "Coordinates of Lunar Features," March 1965.  
The vertical scale here is that of a sphere corre-  
sponding to the mean lunar radius of 1738 kilometers.  
Supplementary features are indicated in the chart  
area as an extension of the primary control.  
Primary Control Features: Cassini M (890), Cassini F (660),  
Supplementary Control Features: Cassini A (1540), Cassini B (1060).



CONVERSION OF ELEVATIONS  
Feet: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20  
Meters: 0 0.3 0.6 0.9 1.2 1.5 1.8 2.1 2.4 2.7 3.0 3.3 3.6 3.9 4.2 4.5 4.8 5.1 5.4 5.7 6.0 6.3 6.6 6.9 7.2 7.5 7.8 8.1 8.4 8.7 9.0 9.3 9.6 9.9 10.2 10.5 10.8 11.1 11.4 11.7 12.0 12.3 12.6 12.9 13.2 13.5 13.8 14.1 14.4 14.7 15.0 15.3 15.6 15.9 16.2 16.5 16.8 17.1 17.4 17.7 18.0 18.3 18.6 18.9 19.2 19.5 19.8 20.1 20.4 20.7 21.0 21.3 21.6 21.9 22.2 22.5 22.8 23.1 23.4 23.7 24.0 24.3 24.6 24.9 25.2 25.5 25.8 26.1 26.4 26.7 27.0 27.3 27.6 27.9 28.2 28.5 28.8 29.1 29.4 29.7 30.0 30.3 30.6 30.9 31.2 31.5 31.8 32.1 32.4 32.7 33.0 33.3 33.6 33.9 34.2 34.5 34.8 35.1 35.4 35.7 36.0 36.3 36.6 36.9 37.2 37.5 37.8 38.1 38.4 38.7 39.0 39.3 39.6 39.9 40.2 40.5 40.8 41.1 41.4 41.7 42.0 42.3 42.6 42.9 43.2 43.5 43.8 44.1 44.4 44.7 45.0 45.3 45.6 45.9 46.2 46.5 46.8 47.1 47.4 47.7 48.0 48.3 48.6 48.9 49.2 49.5 49.8 50.1 50.4 50.7 51.0 51.3 51.6 51.9 52.2 52.5 52.8 53.1 53.4 53.7 54.0 54.3 54.6 54.9 55.2 55.5 55.8 56.1 56.4 56.7 57.0 57.3 57.6 57.9 58.2 58.5 58.8 59.1 59.4 59.7 60.0 60.3 60.6 60.9 61.2 61.5 61.8 62.1 62.4 62.7 63.0 63.3 63.6 63.9 64.2 64.5 64.8 65.1 65.4 65.7 66.0 66.3 66.6 66.9 67.2 67.5 67.8 68.1 68.4 68.7 69.0 69.3 69.6 69.9 70.2 70.5 70.8 71.1 71.4 71.7 72.0 72.3 72.6 72.9 73.2 73.5 73.8 74.1 74.4 74.7 75.0 75.3 75.6 75.9 76.2 76.5 76.8 77.1 77.4 77.7 78.0 78.3 78.6 78.9 79.2 79.5 79.8 80.1 80.4 80.7 81.0 81.3 81.6 81.9 82.2 82.5 82.8 83.1 83.4 83.7 84.0 84.3 84.6 84.9 85.2 85.5 85.8 86.1 86.4 86.7 87.0 87.3 87.6 87.9 88.2 88.5 88.8 89.1 89.4 89.7 90.0 90.3 90.6 90.9 91.2 91.5 91.8 92.1 92.4 92.7 93.0 93.3 93.6 93.9 94.2 94.5 94.8 95.1 95.4 95.7 96.0 96.3 96.6 96.9 97.2 97.5 97.8 98.1 98.4 98.7 99.0 99.3 99.6 99.9 100.2 100.5 100.8 101.1 101.4 101.7 102.0 102.3 102.6 102.9 103.2 103.5 103.8 104.1 104.4 104.7 105.0 105.3 105.6 105.9 106.2 106.5 106.8 107.1 107.4 107.7 108.0 108.3 108.6 108.9 109.2 109.5 109.8 110.1 110.4 110.7 111.0 111.3 111.6 111.9 112.2 112.5 112.8 113.1 113.4 113.7 114.0 114.3 114.6 114.9 115.2 115.5 115.8 116.1 116.4 116.7 117.0 117.3 117.6 117.9 118.2 118.5 118.8 119.1 119.4 119.7 120.0 120.3 120.6 120.9 121.2 121.5 121.8 122.1 122.4 122.7 123.0 123.3 123.6 123.9 124.2 124.5 124.8 125.1 125.4 125.7 126.0 126.3 126.6 126.9 127.2 127.5 127.8 128.1 128.4 128.7 129.0 129.3 129.6 129.9 130.2 130.5 130.8 131.1 131.4 131.7 132.0 132.3 132.6 132.9 133.2 133.5 133.8 134.1 134.4 134.7 135.0 135.3 135.6 135.9 136.2 136.5 136.8 137.1 137.4 137.7 138.0 138.3 138.6 138.9 139.2 139.5 139.8 140.1 140.4 140.7 141.0 141.3 141.6 141.9 142.2 142.5 142.8 143.1 143.4 143.7 144.0 144.3 144.6 144.9 145.2 145.5 145.8 146.1 146.4 146.7 147.0 147.3 147.6 147.9 148.2 148.5 148.8 149.1 149.4 149.7 150.0 150.3 150.6 150.9 151.2 151.5 151.8 152.1 152.4 152.7 153.0 153.3 153.6 153.9 154.2 154.5 154.8 155.1 155.4 155.7 156.0 156.3 156.6 156.9 157.2 157.5 157.8 158.1 158.4 158.7 159.0 159.3 159.6 159.9 160.2 160.5 160.8 161.1 161.4 161.7 162.0 162.3 162.6 162.9 163.2 163.5 163.8 164.1 164.4 164.7 165.0 165.3 165.6 165.9 166.2 166.5 166.8 167.1 167.4 167.7 168.0 168.3 168.6 168.9 169.2 169.5 169.8 170.1 170.4 170.7 171.0 171.3 171.6 171.9 172.2 172.5 172.8 173.1 173.4 173.7 174.0 174.3 174.6 174.9 175.2 175.5 175.8 176.1 176.4 176.7 177.0 177.3 177.6 177.9 178.2 178.5 178.8 179.1 179.4 179.7 180.0 180.3 180.6 180.9 181.2 181.5 181.8 182.1 182.4 182.7 183.0 183.3 183.6 183.9 184.2 184.5 184.8 185.1 185.4 185.7 186.0 186.3 186.6 186.9 187.2 187.5 187.8 188.1 188.4 188.7 189.0 189.3 189.6 189.9 190.2 190.5 190.8 191.1 191.4 191.7 192.0 192.3 192.6 192.9 193.2 193.5 193.8 194.1 194.4 194.7 195.0 195.3 195.6 195.9 196.2 196.5 196.8 197.1 197.4 197.7 198.0 198.3 198.6 198.9 199.2 199.5 199.8 200.1 200.4 200.7 201.0 201.3 201.6 201.9 202.2 202.5 202.8 203.1 203.4 203.7 204.0 204.3 204.6 204.9 205.2 205.5 205.8 206.1 206.4 206.7 207.0 207.3 207.6 207.9 208.2 208.5 208.8 209.1 209.4 209.7 210.0 210.3 210.6 210.9 211.2 211.5 211.8 212.1 212.4 212.7 213.0 213.3 213.6 213.9 214.2 214.5 214.8 215.1 215.4 215.7 216.0 216.3 216.6 216.9 217.2 217.5 217.8 218.1 218.4 218.7 219.0 219.3 219.6 219.9 220.2 220.5 220.8 221.1 221.4 221.7 222.0 222.3 222.6 222.9 223.2 223.5 223.8 224.1 224.4 224.7 225.0 225.3 225.6 225.9 226.2 226.5 226.8 227.1 227.4 227.7 228.0 228.3 228.6 228.9 229.2 229.5 229.8 230.1 230.4 230.7 231.0 231.3 231.6 231.9 232.2 232.5 232.8 233.1 233.4 233.7 234.0 234.3 234.6 234.9 235.2 235.5 235.8 236.1 236.4 236.7 237.0 237.3 237.6 237.9 238.2 238.5 238.8 239.1 239.4 239.7 240.0 240.3 240.6 240.9 241.2 241.5 241.8 242.1 242.4 242.7 243.0 243.3 243.6 243.9 244.2 244.5 244.8 245.1 245.4 245.7 246.0 246.3 246.6 246.9 247.2 247.5 247.8 248.1 248.4 248.7 249.0 249.3 249.6 249.9 250.2 250.5 250.8 251.1 251.4 251.7 252.0 252.3 252.6 252.9 253.2 253.5 253.8 254.1 254.4 254.7 255.0 255.3 255.6 255.9 256.2 256.5 256.8 257.1 257.4 257.7 258.0 258.3 258.6 258.9 259.2 259.5 259.8 260.1 260.4 260.7 261.0 261.3 261.6 261.9 262.2 262.5 262.8 263.1 263.4 263.7 264.0 264.3 264.6 264.9 265.2 265.5 265.8 266.1 266.4 266.7 267.0 267.3 267.6 267.9 268.2 268.5 268.8 269.1 269.4 269.7 270.0 270.3 270.6 270.9 271.2 271.5 271.8 272.1 272.4 272.7 273.0 273.3 273.6 273.9 274.2 274.5 274.8 275.1 275.4 275.7 276.0 276.3 276.6 276.9 277.2 277.5 277.8 278.1 278.4 278.7 279.0 279.3 279.6 279.9 280.2 280.5 280.8 281.1 281.4 281.7 282.0 282.3 282.6 282.9 283.2 283.5 283.8 284.1 284.4 284.7 285.0 285.3 285.6 285.9 286.2 286.5 286.8 287.1 287.4 287.7 288.0 288.3 288.6 288.9 289.2 289.5 289.8 290.1 290.4 290.7 291.0 291.3 291.6 291.9 292.2 292.5 292.8 293.1 293.4 293.7 294.0 294.3 294.6 294.9 295.2 295.5 295.8 296.1 296.4 296.7 297.0 297.3 297.6 297.9 298.2 298.5 298.8 299.1 299.4 299.7 300.0

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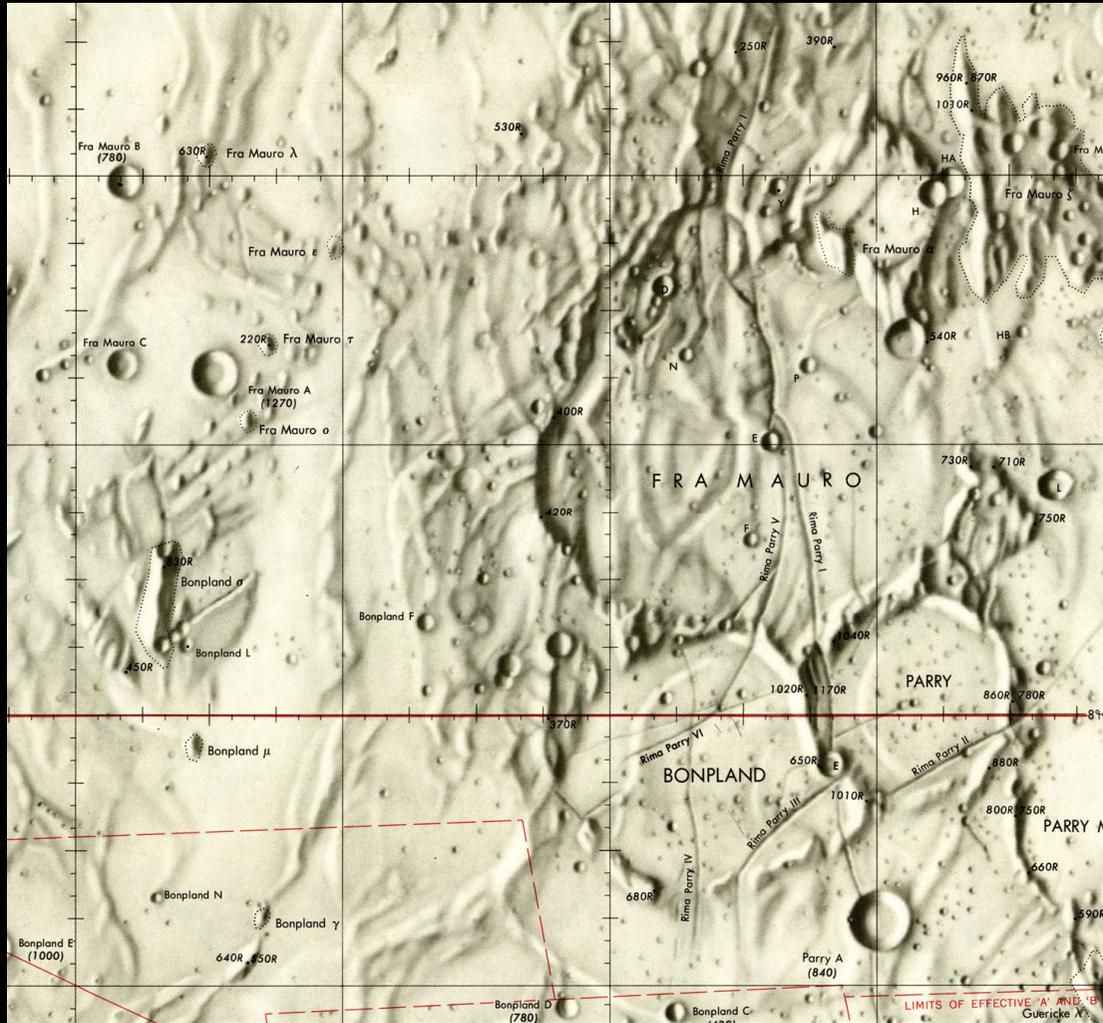
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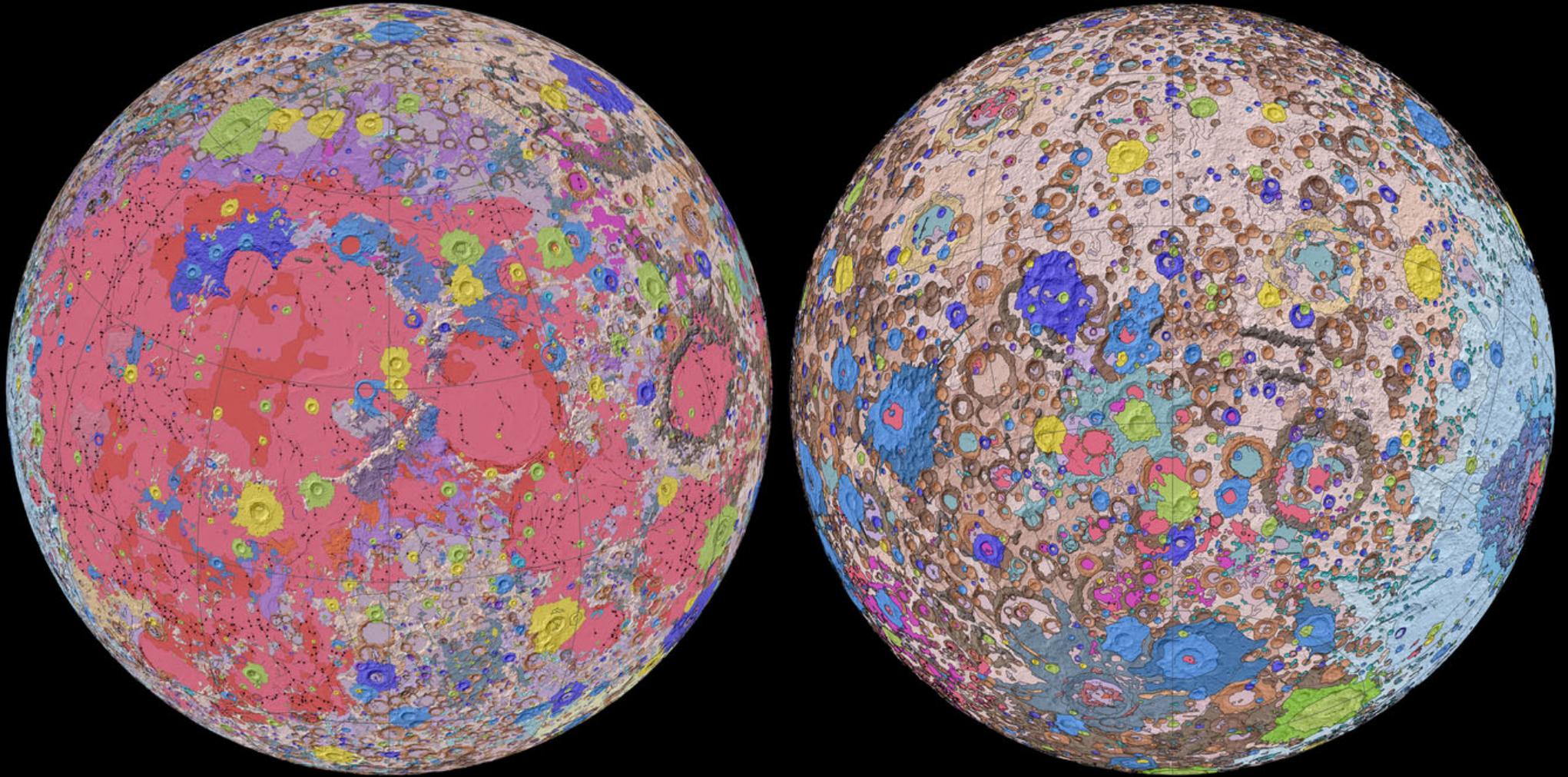
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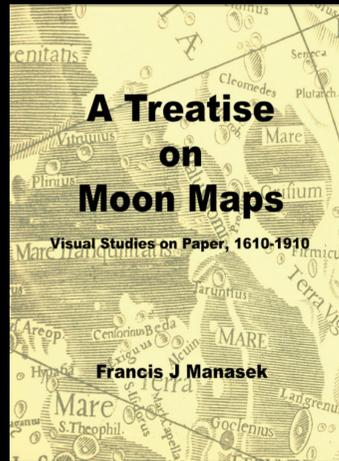
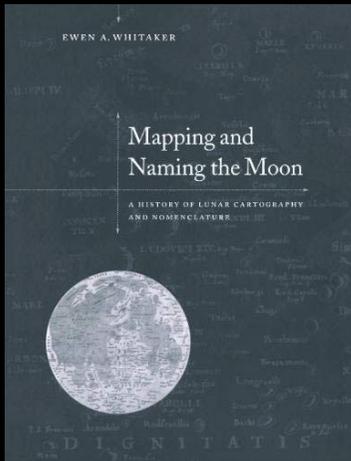
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Image Sonde KAGUYA 2007

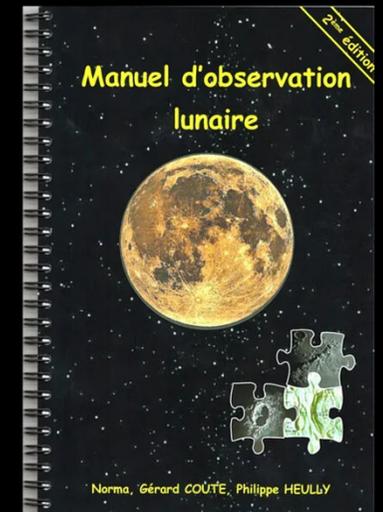


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