Mapas celestes: desde el papiro al terabyte

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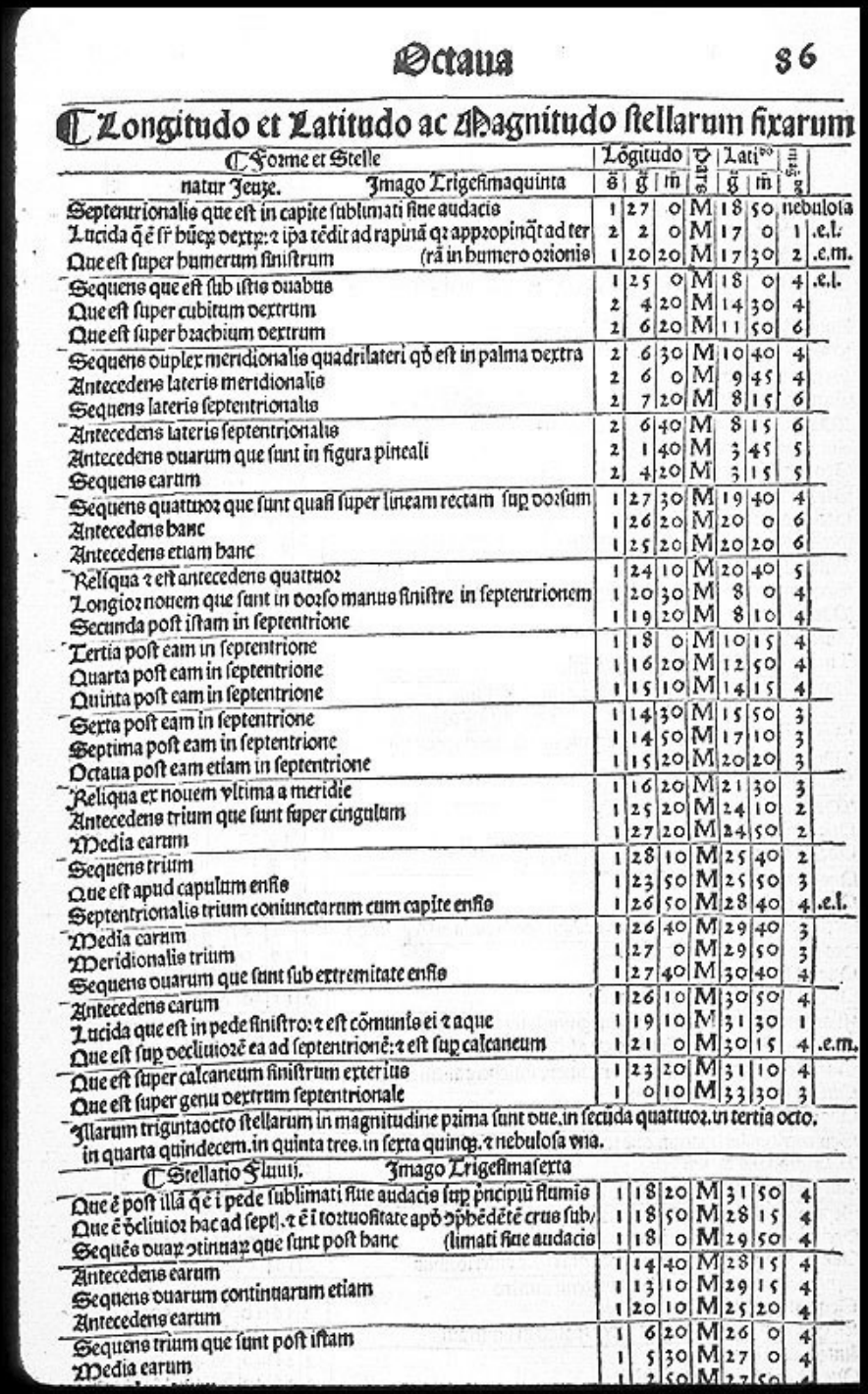
Semana de la Ciencia, CSIC, 17/11/2009

Mesopotamia

Zodíaco de Dendera (50 a. C., Egipto)

Phaenomena
Arato de Solis (315-240 a. C.)

Poeticon Astronomicon (~s. II d. C.)
Higinio (?)



Octaua 86

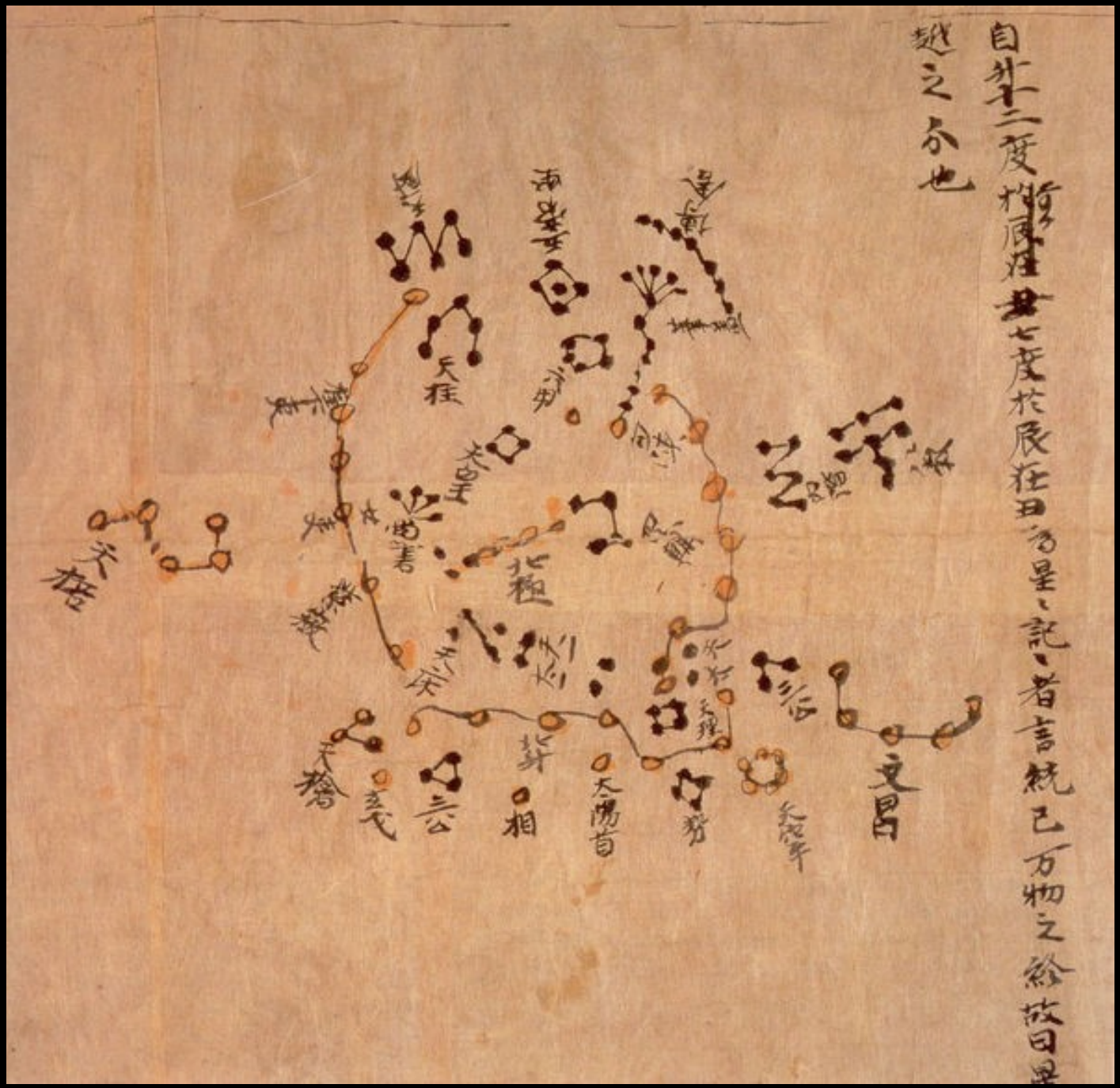
Longitudo et Latitudo ac Magnitudo stellarum fixarum

Forme et Stelle natur Jeuze.	Imago Trigesima quinta	Longitudo s	g	m	Stas	Latitudo g	m	mag	
Septentrionalis que est in capite sublimati fiue audacis		1	27	0	M	18	50	nebulosa	
Lucida q̃ ē ſſ̃ būeꝫ dextꝫ: ⁊ ipa rēdit ad rapiuā qꝫ appꝛopinq̃t ad ter		2	2	0	M	17	0	1	.e.l.
Que est super humerum sinistrum	(rā in humero oꝛionis	1	20	20	M	17	30	2	.e.m.
Sequens que est sub istis duabus		1	25	0	M	18	0	4	.e.l.
Que est super cubitum dextrum		2	4	20	M	14	30	4	
Que est super brachium dextrum		2	6	20	M	11	50	6	
Sequens duplex meridionalis quadrilateri qd̃ est in palma dextra		2	6	30	M	10	40	4	
Antecedens lateris meridionalis		2	6	0	M	9	45	4	
Sequens lateris septentrionalis		2	7	20	M	8	15	6	
Antecedens lateris septentrionalis		2	6	40	M	8	15	6	
Antecedens duarum que sunt in figura pineali		2	1	40	M	3	45	5	
Sequens earum		2	4	20	M	3	15	5	
Sequens quattuoꝫ que sunt quasi super lineam rectam sup dorsum		1	27	30	M	19	40	4	
Antecedens hanc		1	26	20	M	20	0	6	
Antecedens etiam hanc		1	25	20	M	20	20	6	
Reliqua ⁊ est antecedens quattuoꝫ		1	24	10	M	20	40	5	
Longioꝫ nouem que sunt in dorso manus sinistre in septentrionem		1	20	30	M	8	0	4	
Secunda post istam in septentrione		1	19	20	M	8	10	4	
Tertia post eam in septentrione		1	18	0	M	10	15	4	
Quarta post eam in septentrione		1	16	20	M	12	50	4	
Quinta post eam in septentrione		1	15	10	M	14	15	4	
Sexta post eam in septentrione		1	14	30	M	15	50	3	
Septima post eam in septentrione		1	14	50	M	17	10	3	
Octaua post eam etiam in septentrione		1	15	20	M	20	20	3	
Reliqua ex nouem vltima a meridie		1	16	20	M	21	30	3	
Antecedens trium que sunt super cingulum		1	25	20	M	24	10	2	
Media earum		1	27	20	M	24	50	2	
Sequens trium		1	28	10	M	25	40	2	
Que est apud capulum ensis		1	23	50	M	25	50	3	
Septentrionalis trium coniunctarum cum capite ensis		1	26	50	M	28	40	4	.e.l.
Media earum		1	26	40	M	29	40	3	
Meridionalis trium		1	27	0	M	29	50	3	
Sequens duarum que sunt sub extremitate ensis		1	27	40	M	30	40	4	
Antecedens earum		1	26	10	M	30	50	4	
Lucida que est in pede sinistro: ⁊ est cōmunis ei ⁊ aque		1	19	10	M	31	30	1	
Que est sup decliuioꝫē ea ad septentrionē: ⁊ est sup calcaneum		1	21	0	M	30	15	4	.e.m.
Que est super calcaneum sinistrum exterius		1	23	20	M	31	10	4	
Que est super genu dextrum septentrionale		1	0	10	M	33	30	3	
Illarum triguntaocto stellarum in magnitudine pima sunt due. in secuda quattuoꝫ. in tertia octo. in quarta quindecem. in quinta tres. in sexta quinq̃. ⁊ nebulosa vna.									
Stellatio Fluuij.	Imago Trigesima sexta								
Que ē post illā q̃ ē i pede sublimati fiue audacis sup pꝛincipiū flumis		1	18	20	M	31	50	4	
Que ē dcliuioꝫ hac ad sept). ⁊ ē i tortuositate apd ꝓpbēdētē crus sub/		1	18	50	M	28	15	4	
Sequēs duaꝫ ꝓtinuaꝫ que sunt post hanc	(limati fiue audacis	1	18	0	M	29	50	4	
Antecedens earum		1	14	40	M	28	15	4	
Sequens duarum continuarum etiam		1	13	10	M	29	15	4	
Antecedens earum		1	20	10	M	25	20	4	
Sequens trium que sunt post istam		1	6	20	M	26	0	4	
Media earum		1	5	30	M	27	0	4	
		1	2	50	M	27	50	4	

Claudio Ptolomeo (~100-170 d.C.)

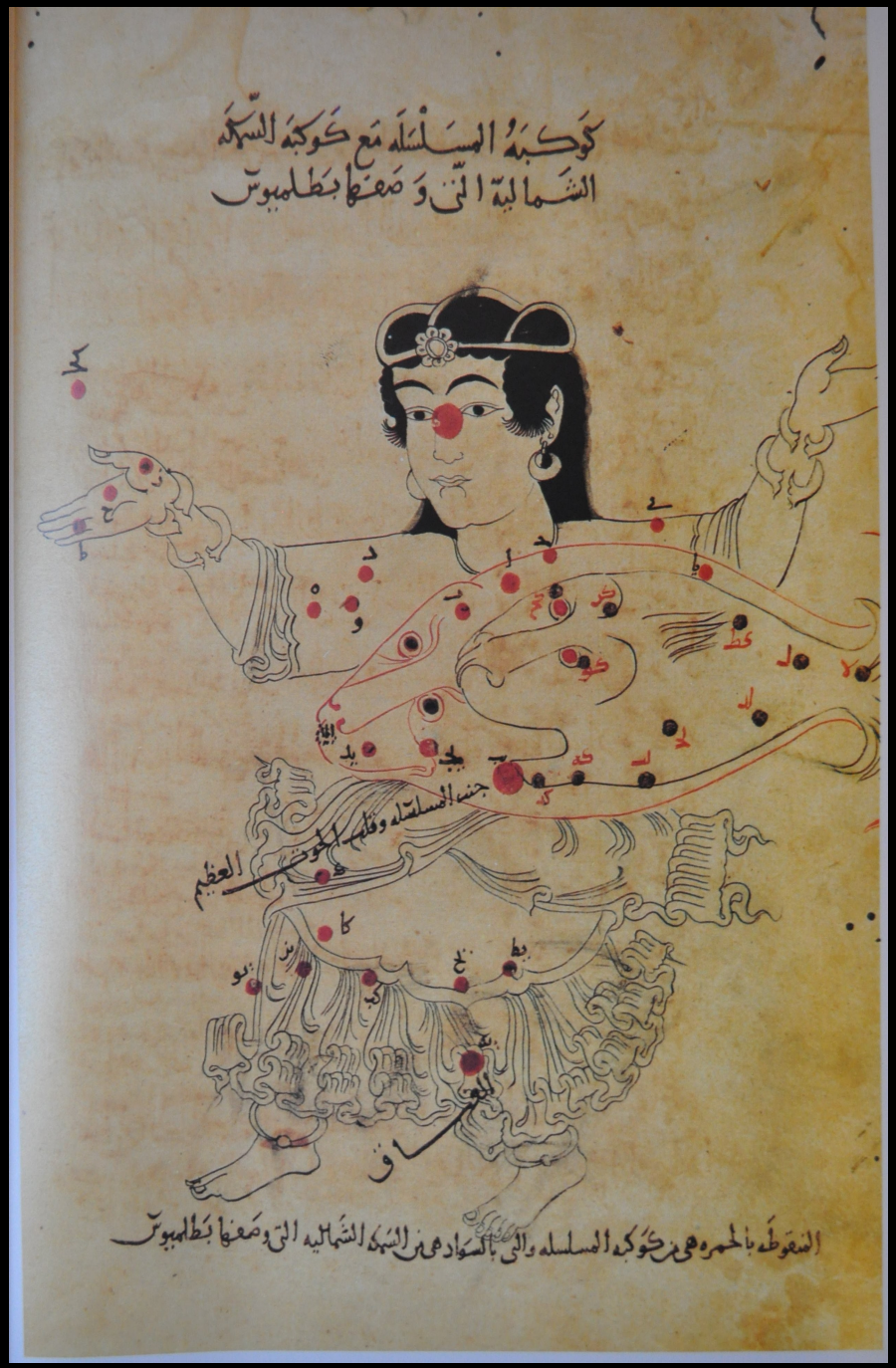
Almagesto (~150 d. C.)

Harmonia Macrocosmica (1660),
Andreas Cellarius (1596-1665)



Mapa Estelar
de las cuevas de
Mogao, Dunhuang
(s. VII d. C.)

1345 estrellas
257 “constelaciones”

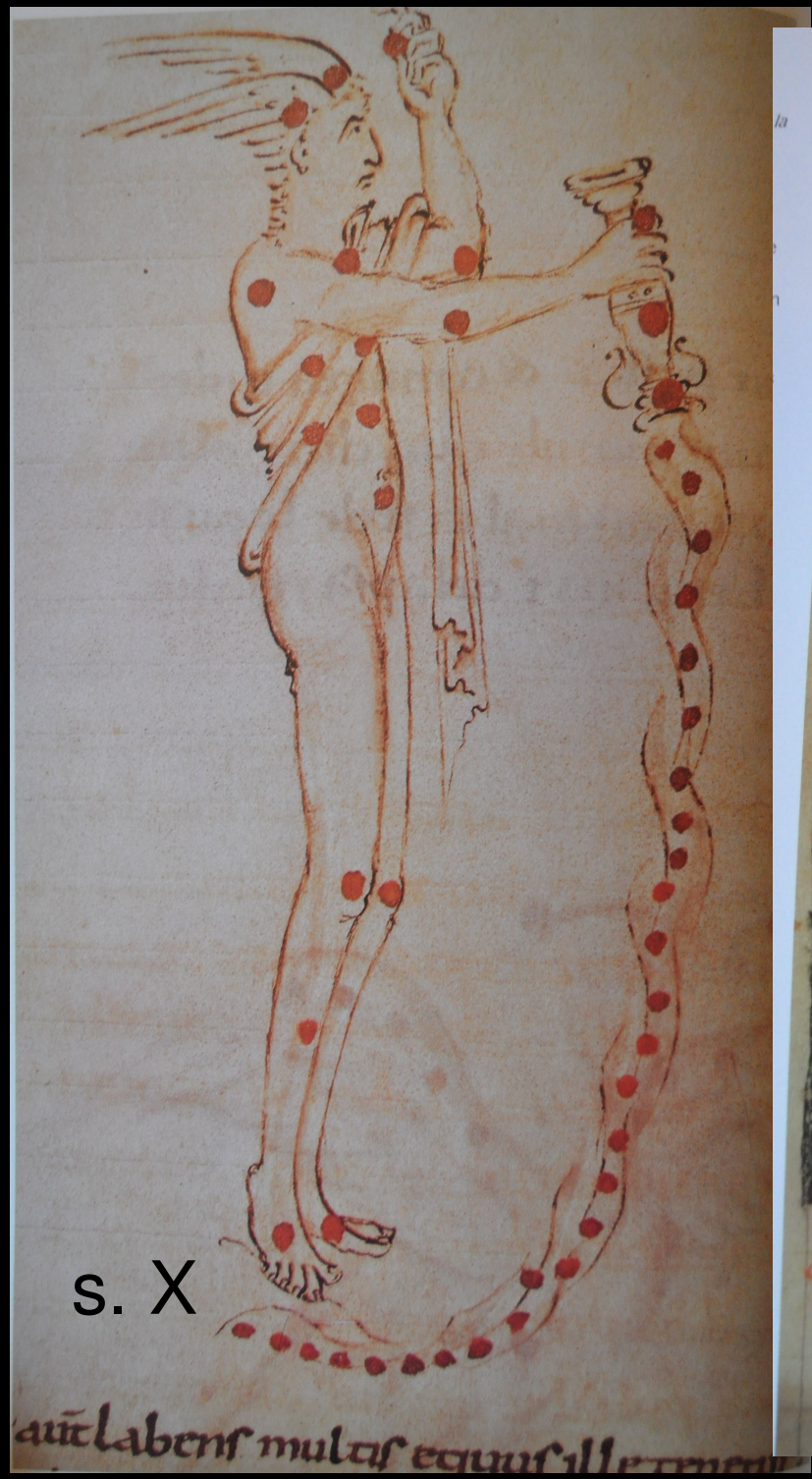


“El libro de las estrellas fijas” (964 d. C.), de Al-Sufi (903-986 d.C.)

A veces tengo una terrible necesidad de, me atreveré a decirlo, religión. Entonces salgo de noche y pinto las estrellas.

Vincent van Gogh (1853-1890)


1469

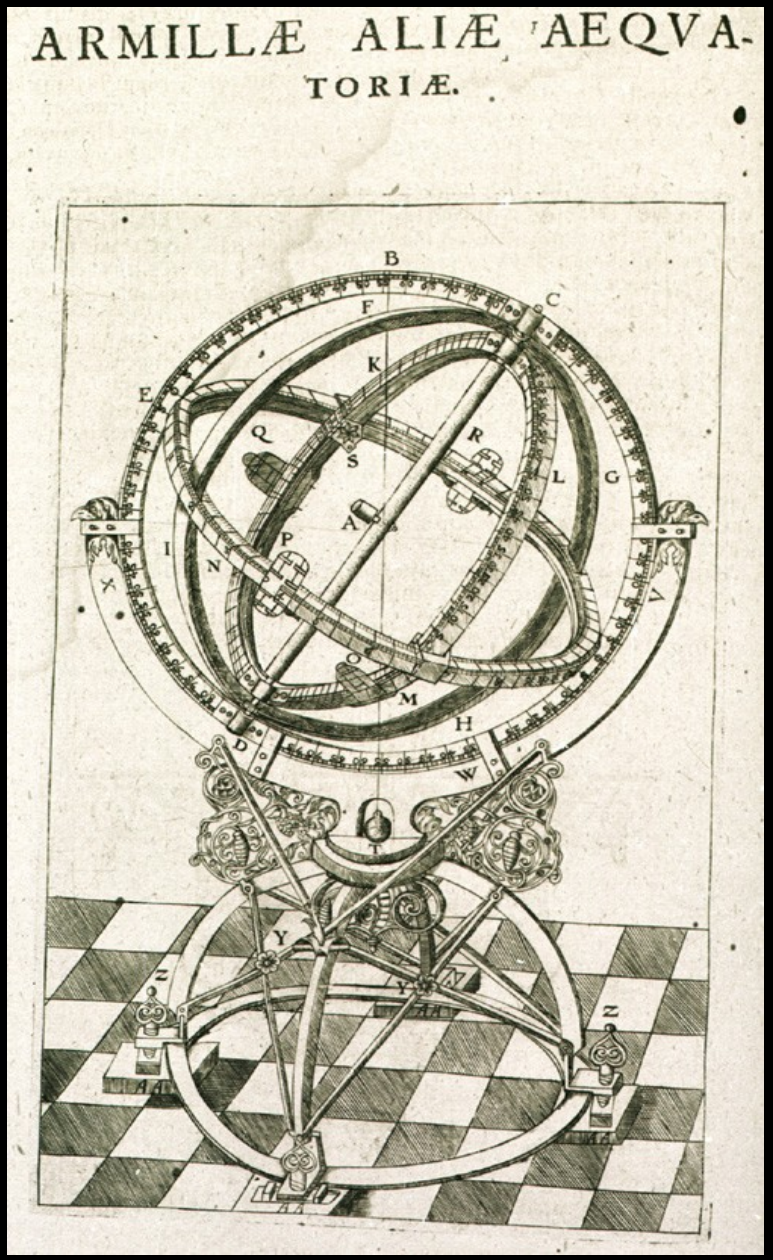

s. X


~1490

Tycho Brahe (1546-1601)

Modelo geo-heliocéntrico de Tycho Brahe


EFFIGIES TYCHONIS BRAHE O.F.
ÆDIFICII ET INSTRUMENTORUM
ASTRONOMICORUM STRUCTORIS.
A. DOMINI 1587. ÆTATIS SUÆ 40.

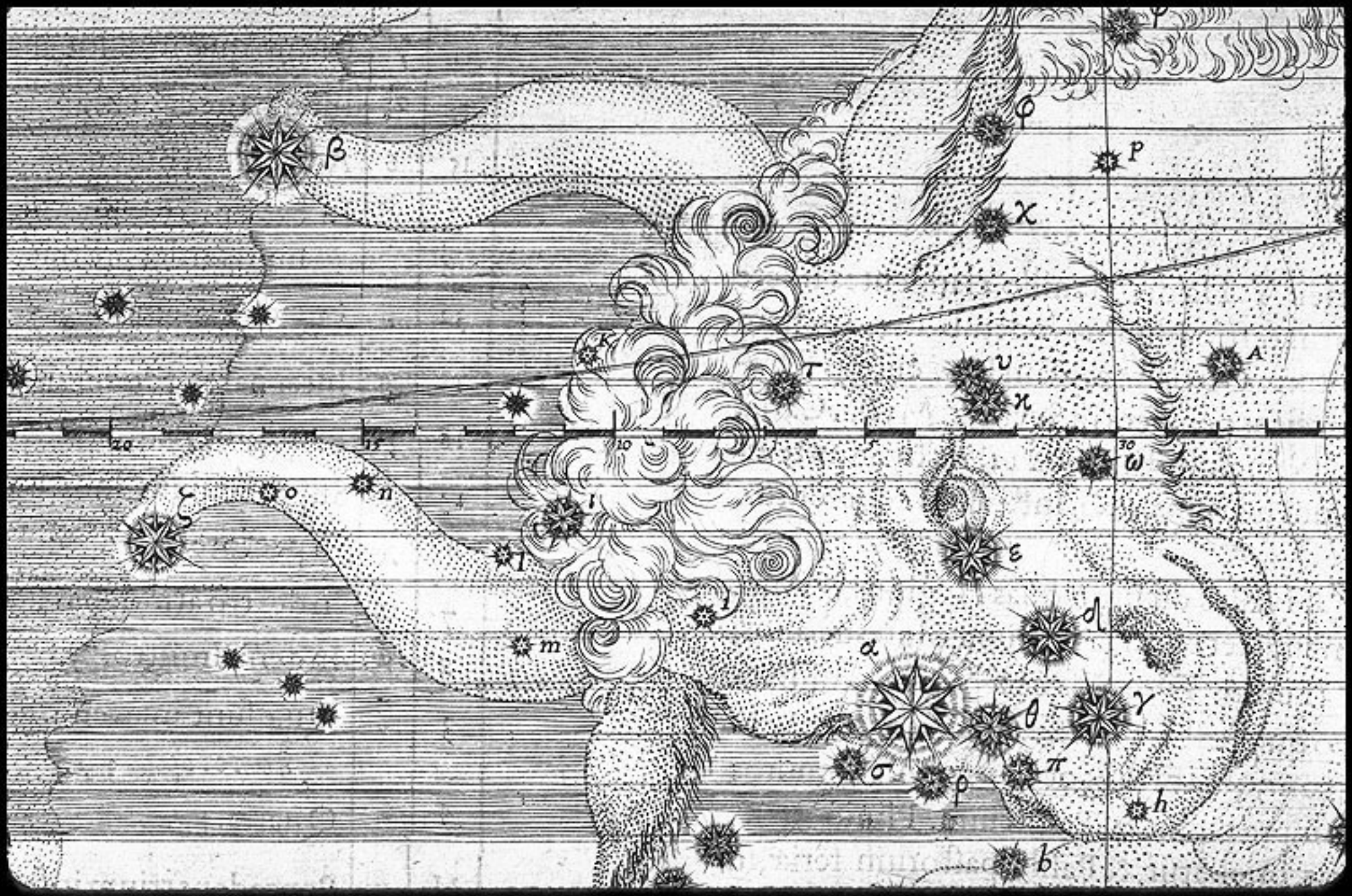

ARMILLÆ ALIÆ AEQVA-
TORIÆ.

Albrecht Dürer
(1471-1528)

De le Stelle Fisse (1540)

Alessandro Piccolomini (1508-1579)

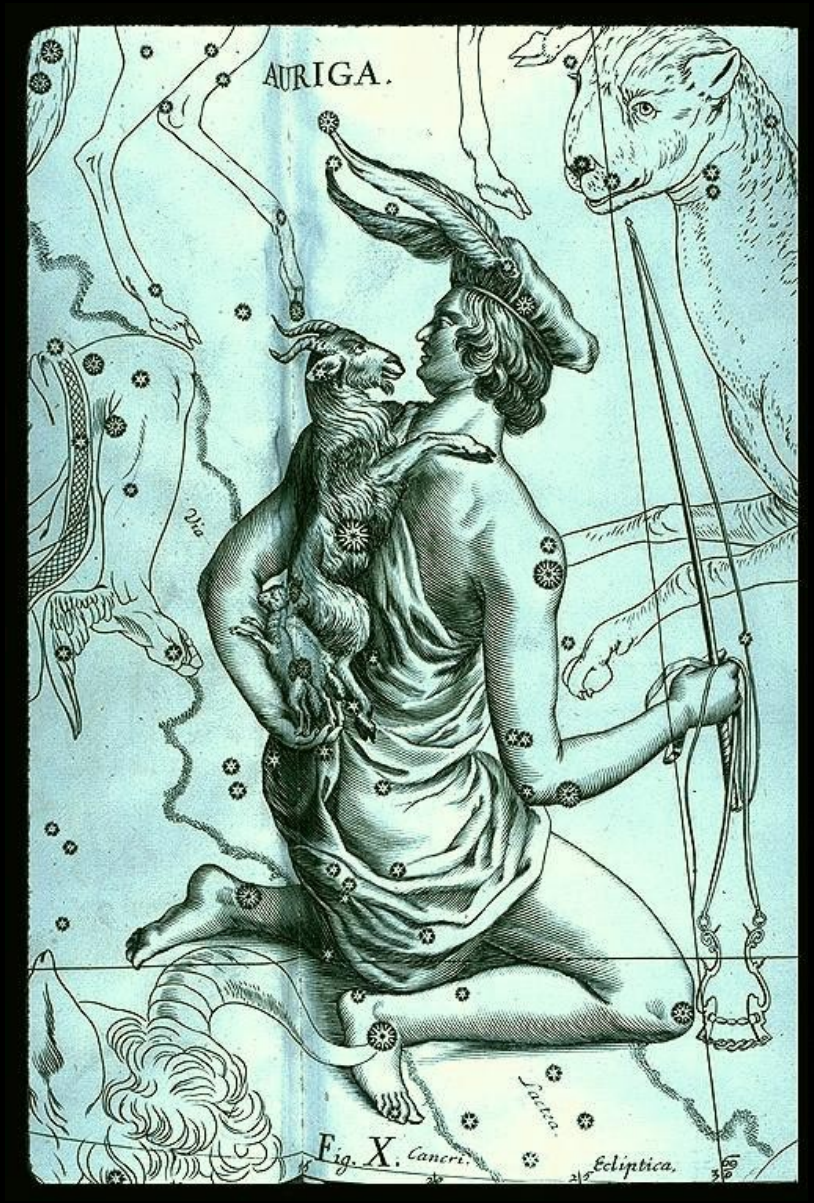
"Uranometria" (1603). Johann Bayer (1572-1625)

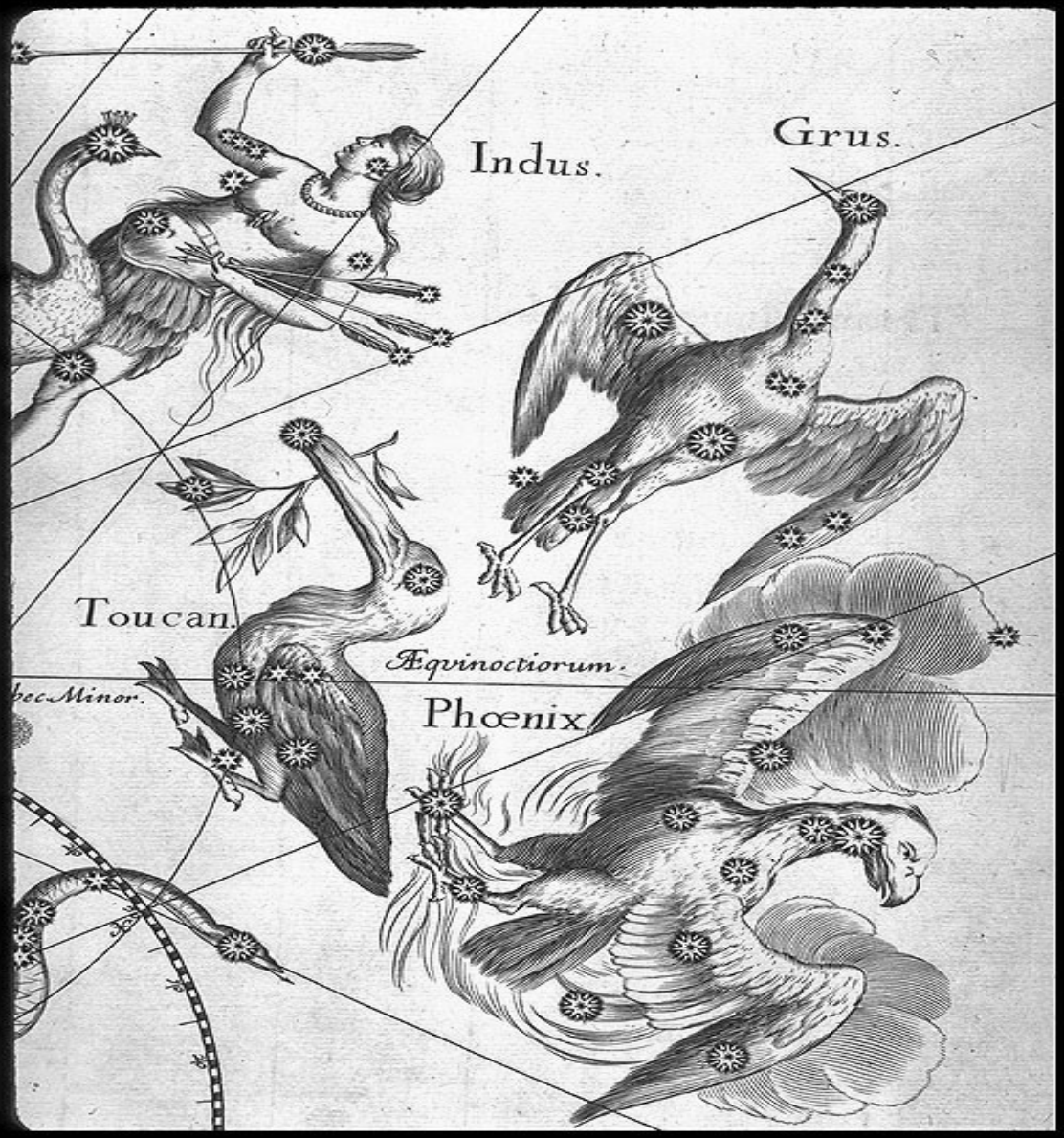


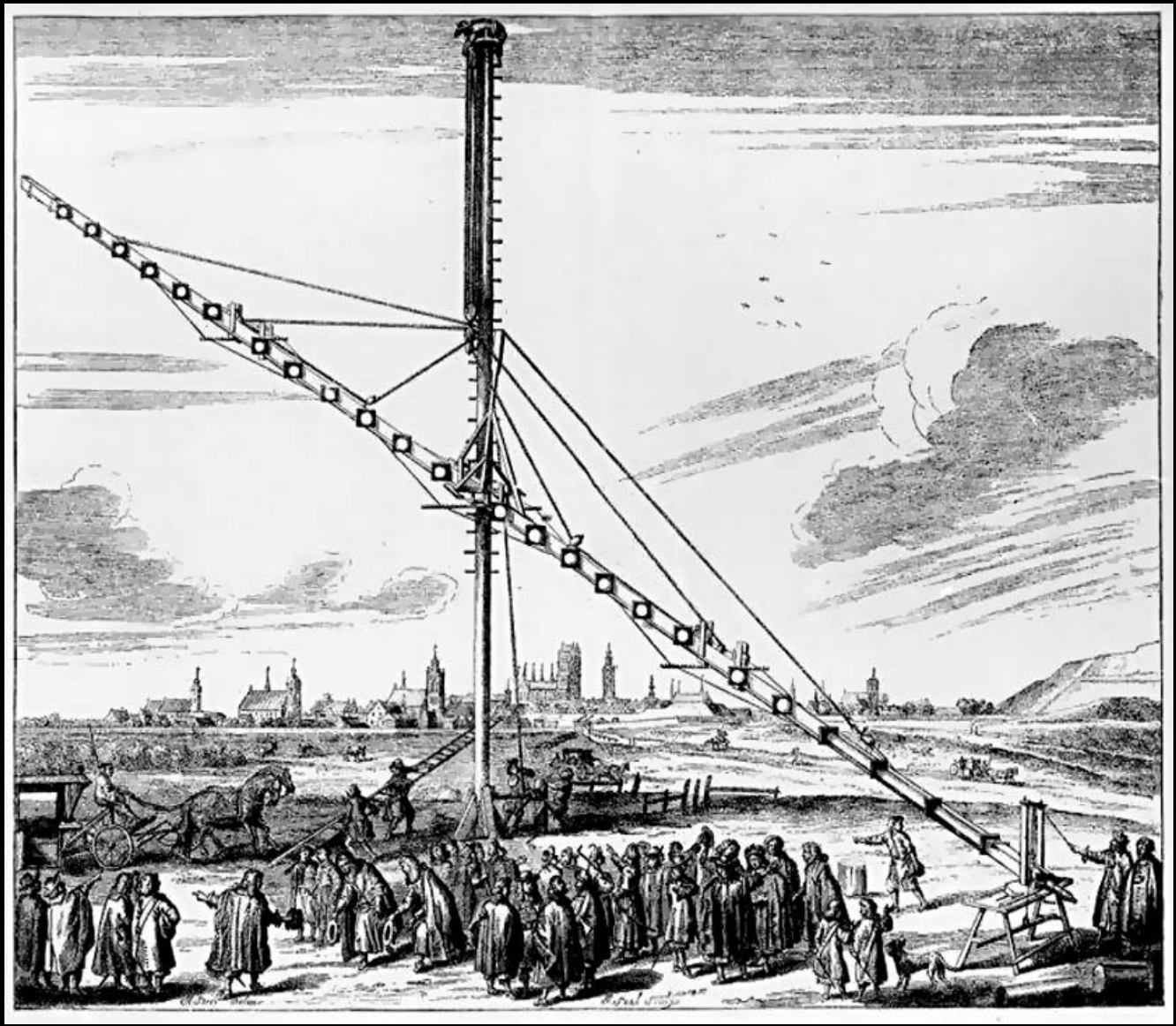
D

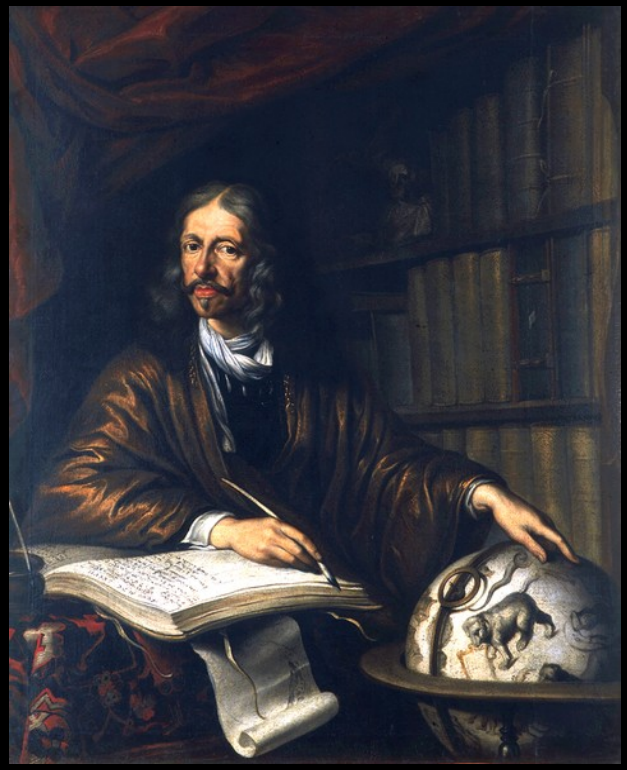
Galileo Galilei (1564-1642)

Firmamentum Sobiescianum sive Uranographia (1687),
de Johannes Hevelius





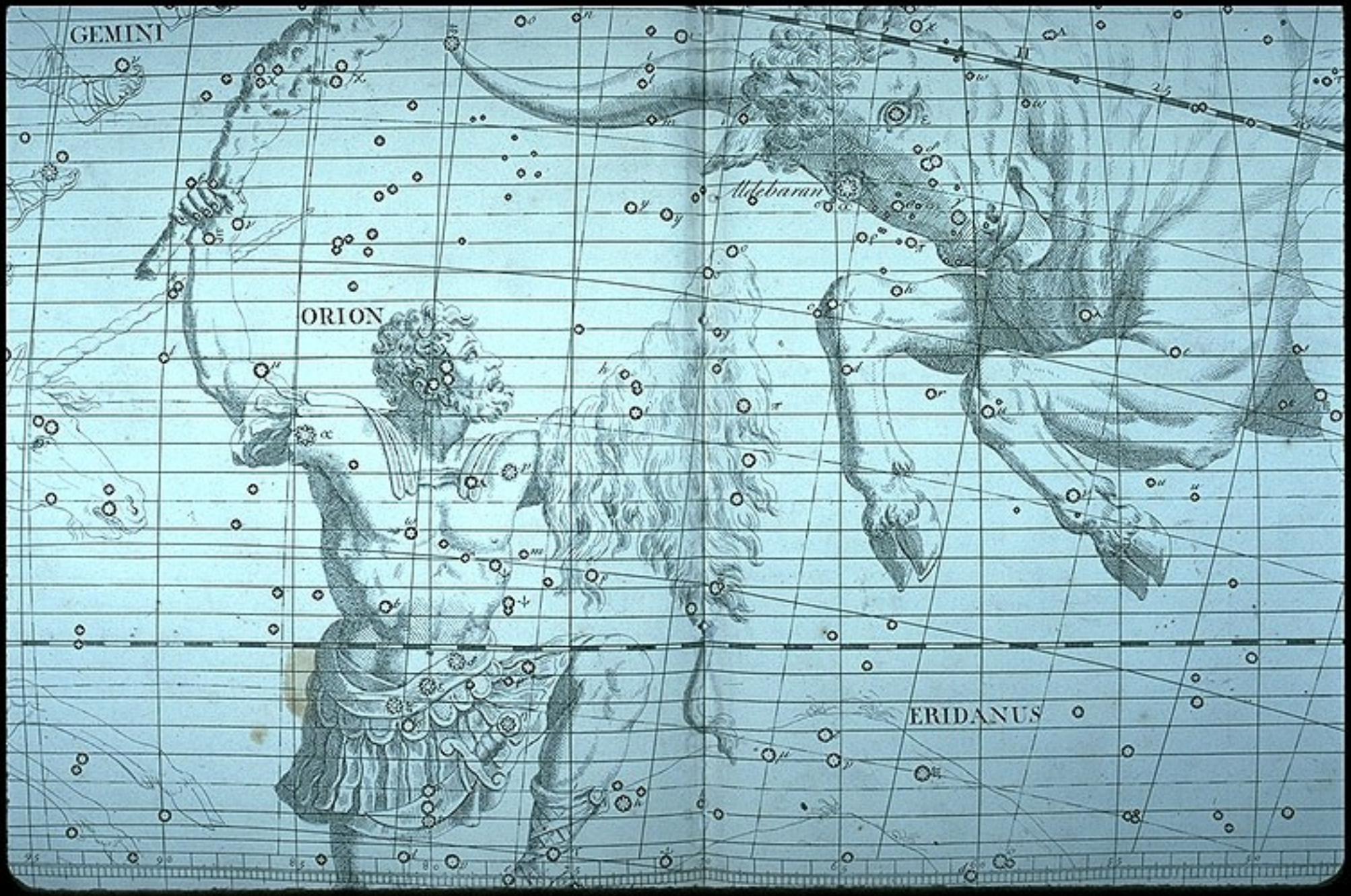




Johannes Hevelius
(1611-1687)


TABULA SELENOGRAPHICA
in qua
Lunarium Macularum exacta Descriptio secundum Nomenclaturam
Præstantissimorum Astronomorum
tum
HEVELII quam RICCIOLI
Curiosis Rei Sidereæ Cultoribus exhibetur
IOH. GABR. DOPPELMAJERO MATH. P.P.
opera
IOH. BAPTISTAE HOMANNI
Norimbergæ
OCEANUS
PROCELLARUM
PONTUS
EUXINUS
TERRA SICCITATIS
MARE IMBRIUM
MARE SERENITATIS
TERRA HUMORUM
TERRA STERILITATIS
TERRA CALORIS
SOL

Historia Coelestis Britannica (1725, póstumo),
de John Flamsteed (1646-1719)



La Era del Descubrimiento

Anno Duodecimo

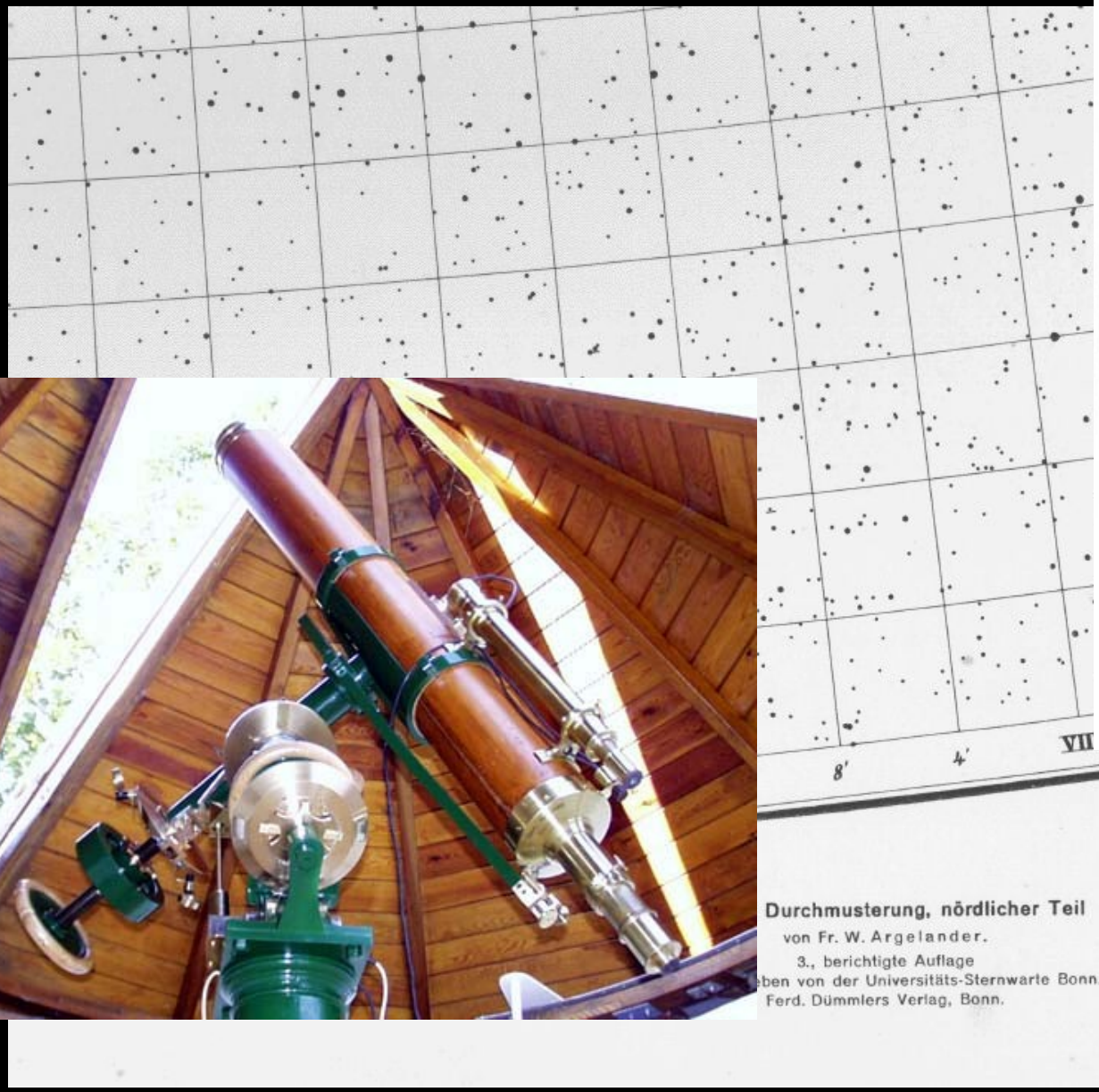
Annæ Re

An Act for Providing a Publick R
ſon or Perſons as ſhall Diſco
at Sea.

Whereas it is wel
acquainted wit
on, That noth
and deſired at
of the Longitu
Quickneſs of
vation of Ships
And whereas i
Mathematician
veral Methods
covered, true in
ficult in Practic
(is reaſon to expect) may be capable of
ready Diſcovered may be propoſed to t
may be Invented hereafter: And whereas ſuch a Diſcovery
would be of particular Advantage to the Trade of Great Britain,

Uranometria (1801),
de Johann E. Bode (1747-1826)

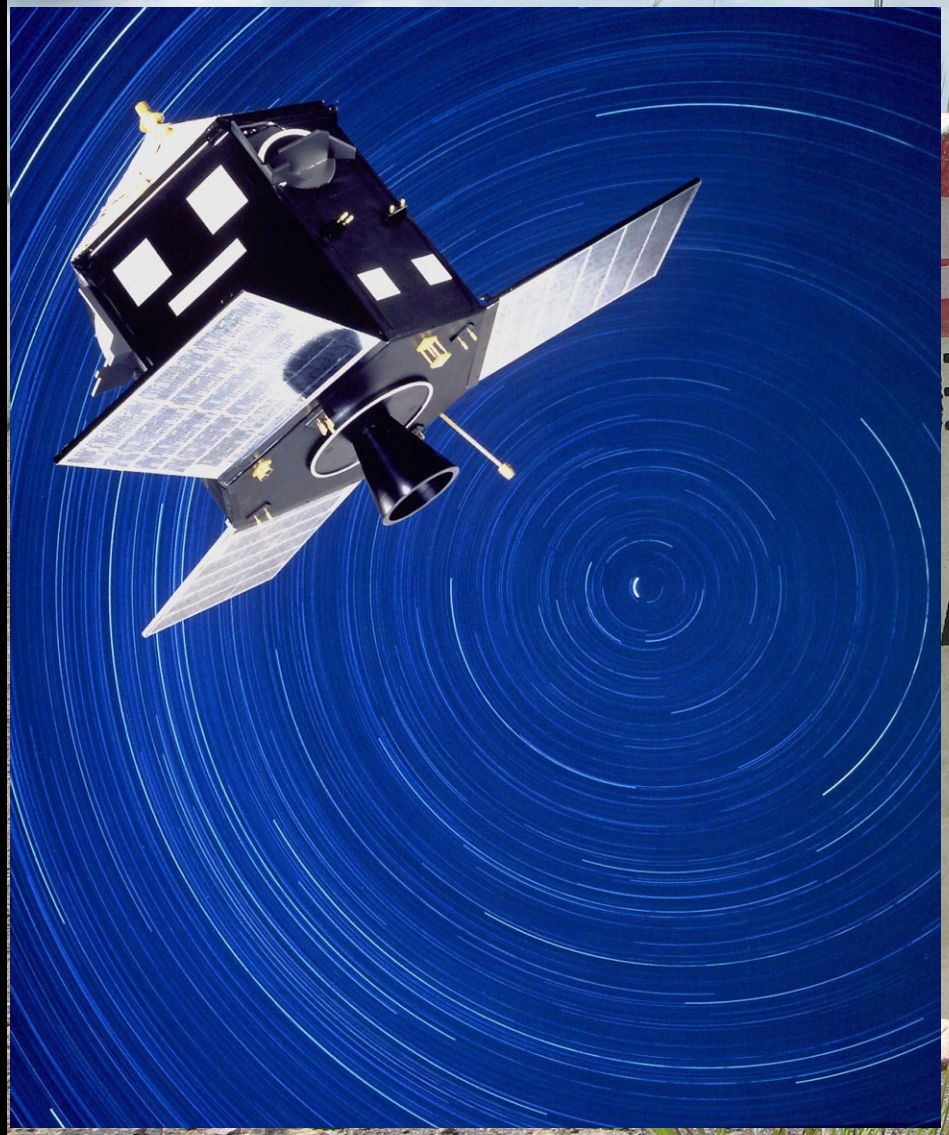
Bonner Durchmusterung (1852-1859), de Friedrich W. Argelander (1799-1875) et al.

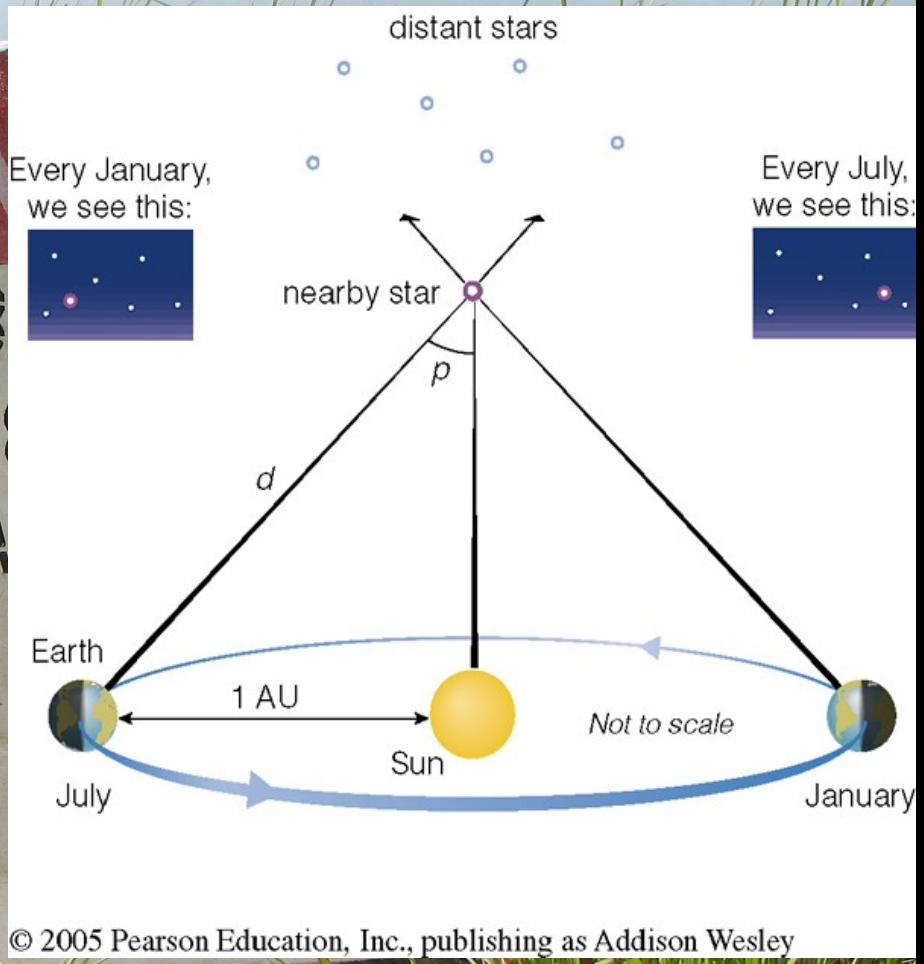


Annie Jump Cannon (1863-1941)

Palomar Observatory Sky Survey (POSS, 1948-1958)

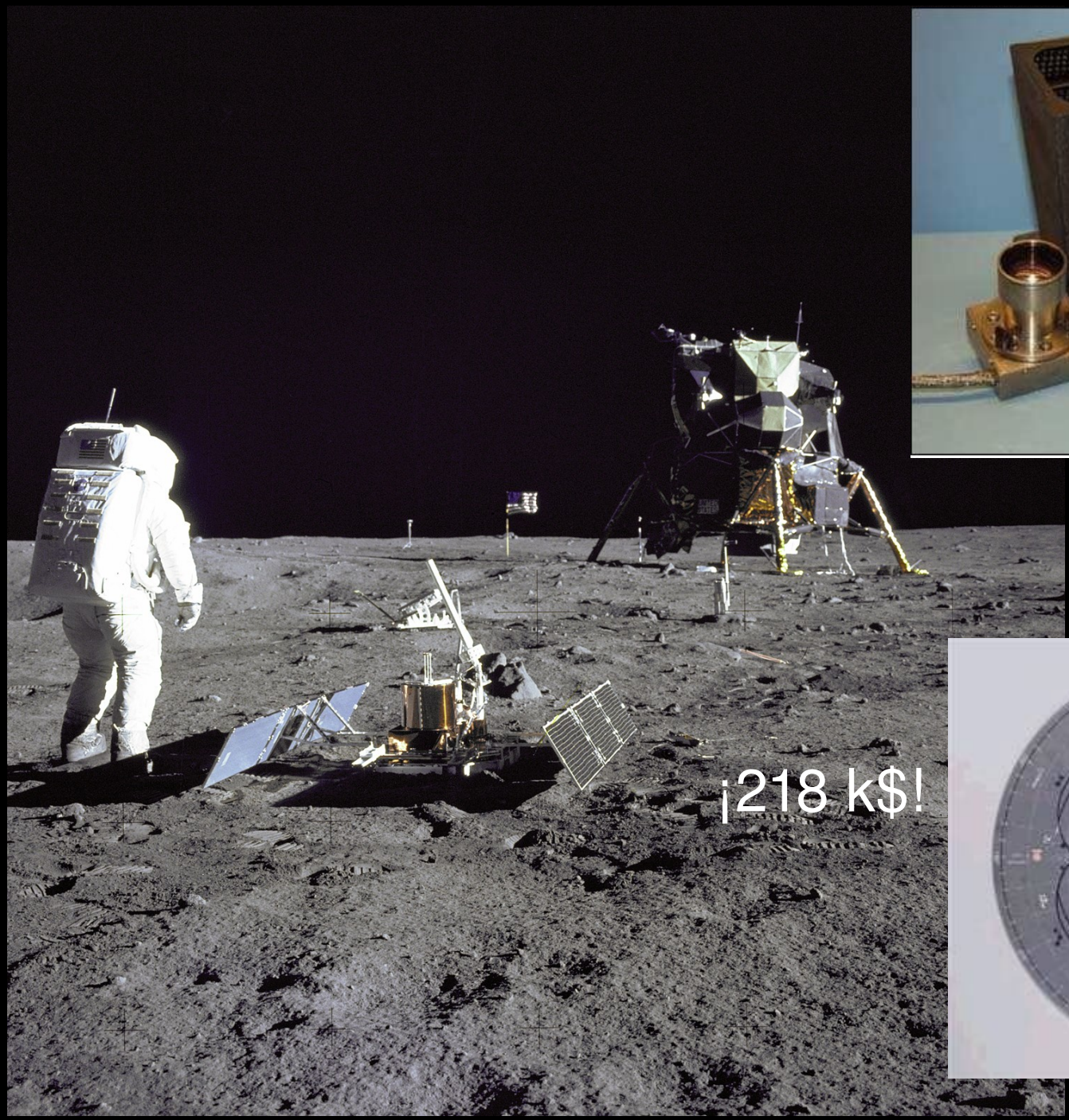
Hipparcos (1989-1993)



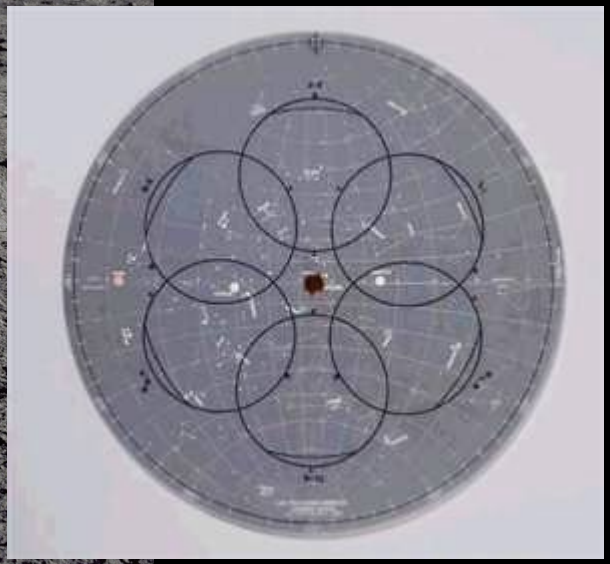


El espacio es el nuevo océano y tenemos la intención de navegarlo.

John F. Kennedy



¡218 k$!

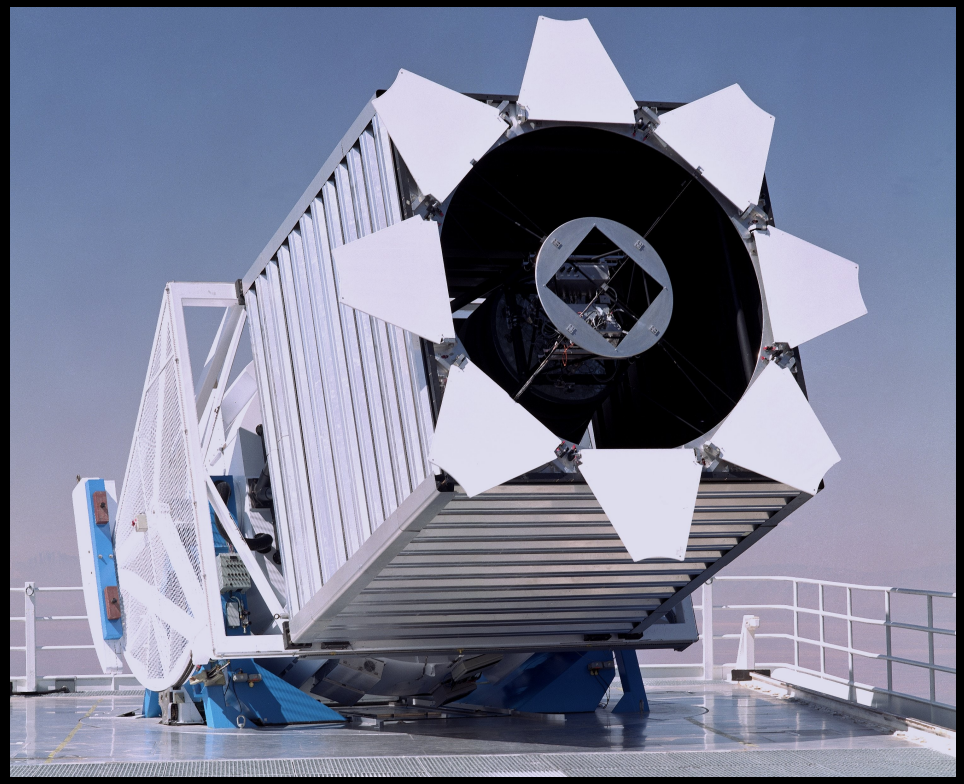


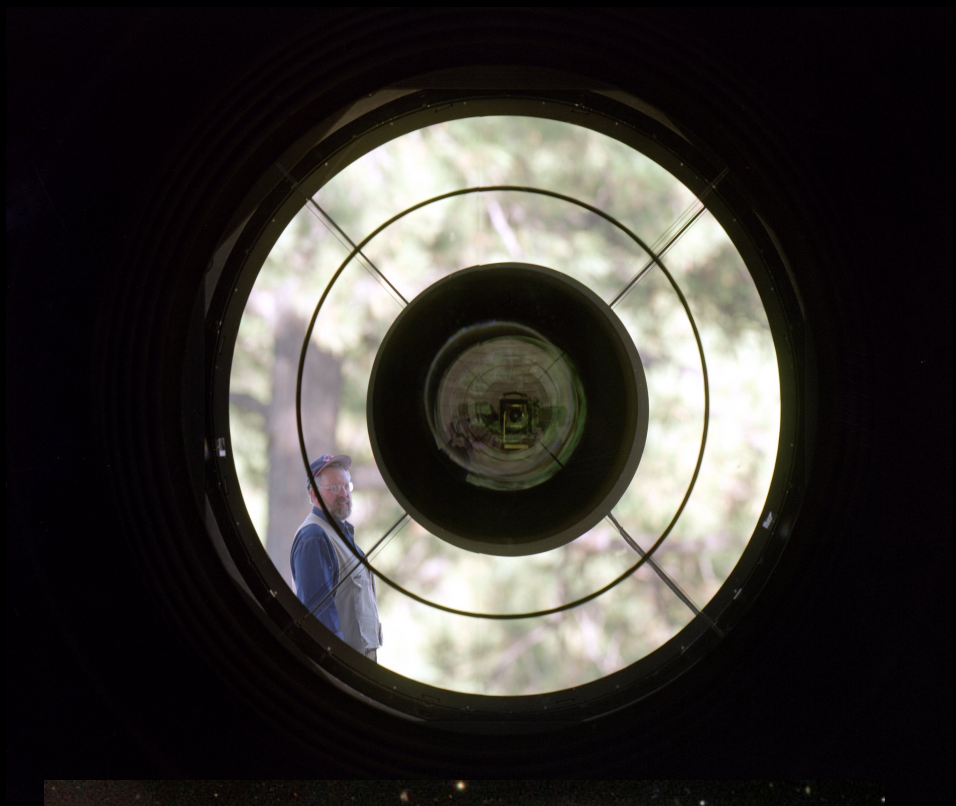
Sloan Digital Sky Survey (2000-2008)

POSS (~1 hora)

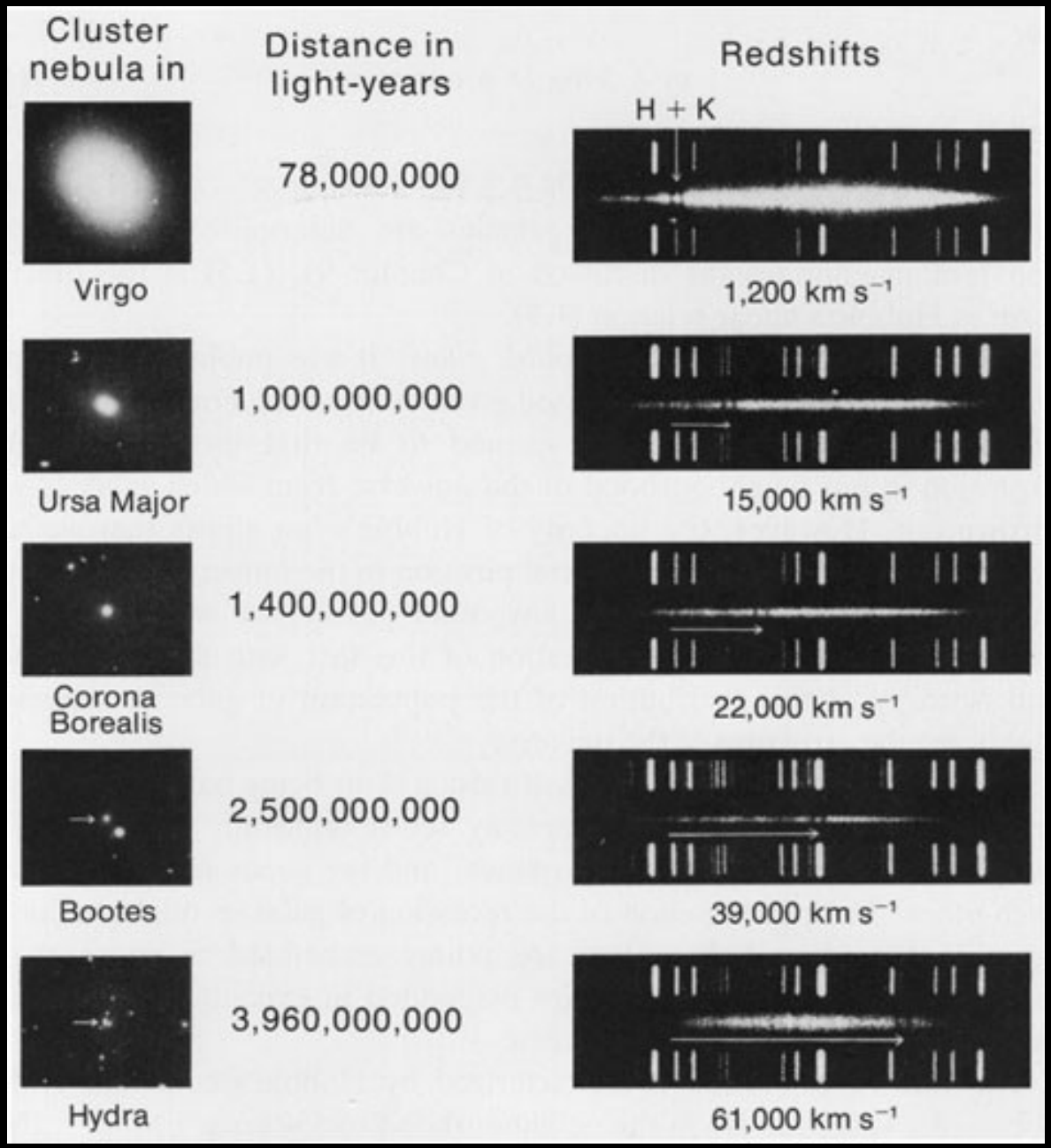
SDSS (~1 minuto)

Sloan Digital Sky Survey





Ley de Expansión de Hubble



Ley de Expansión de Hubble

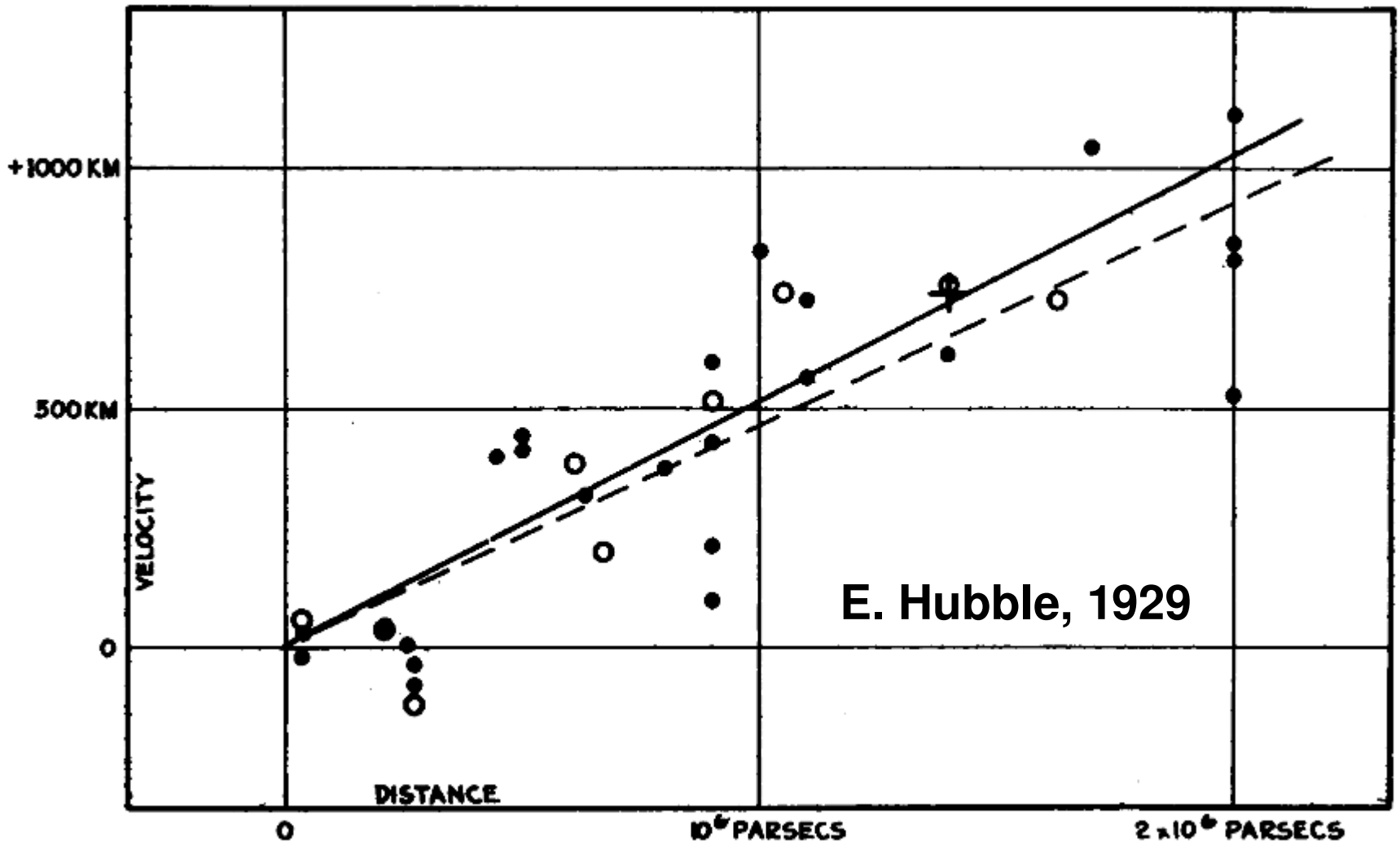
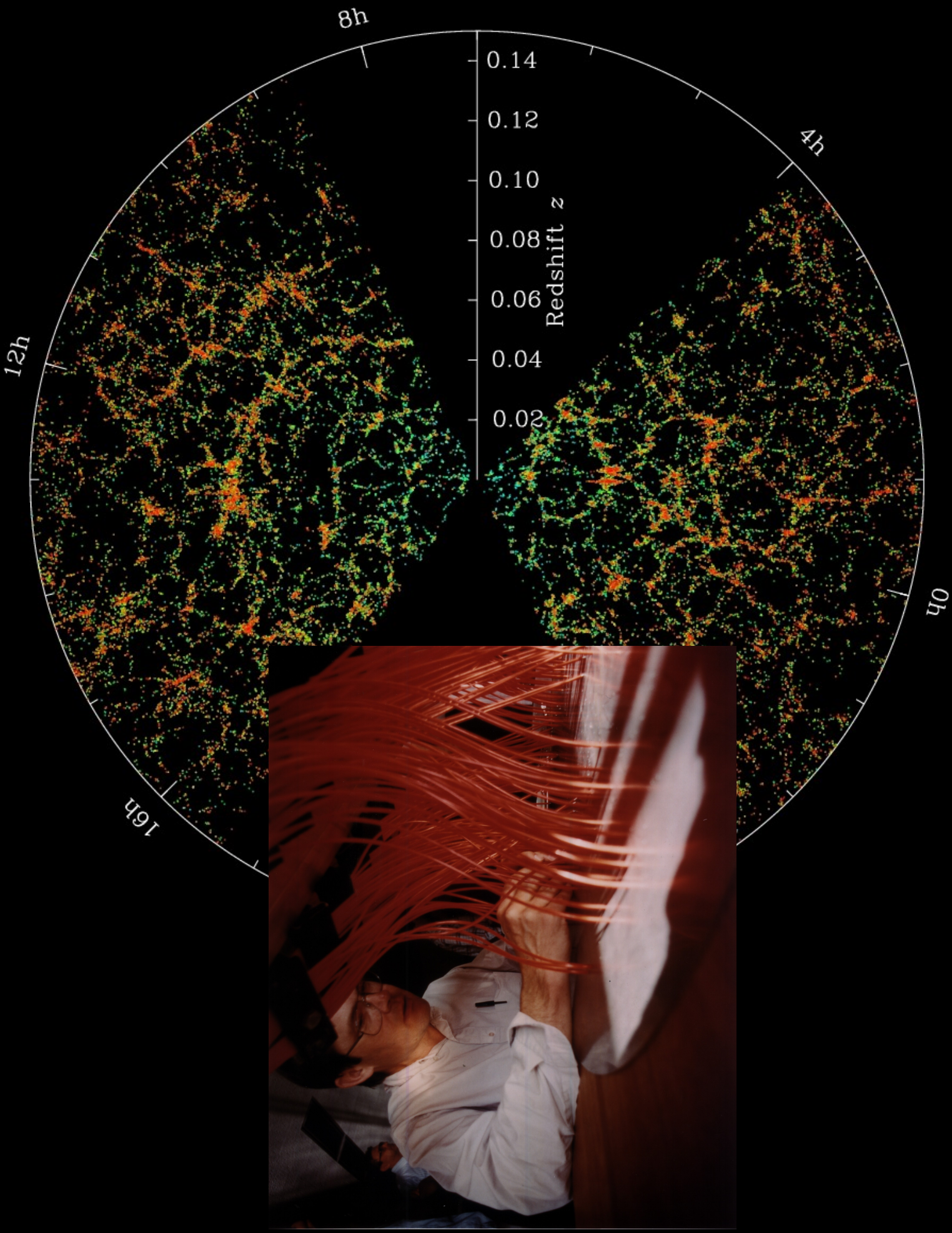
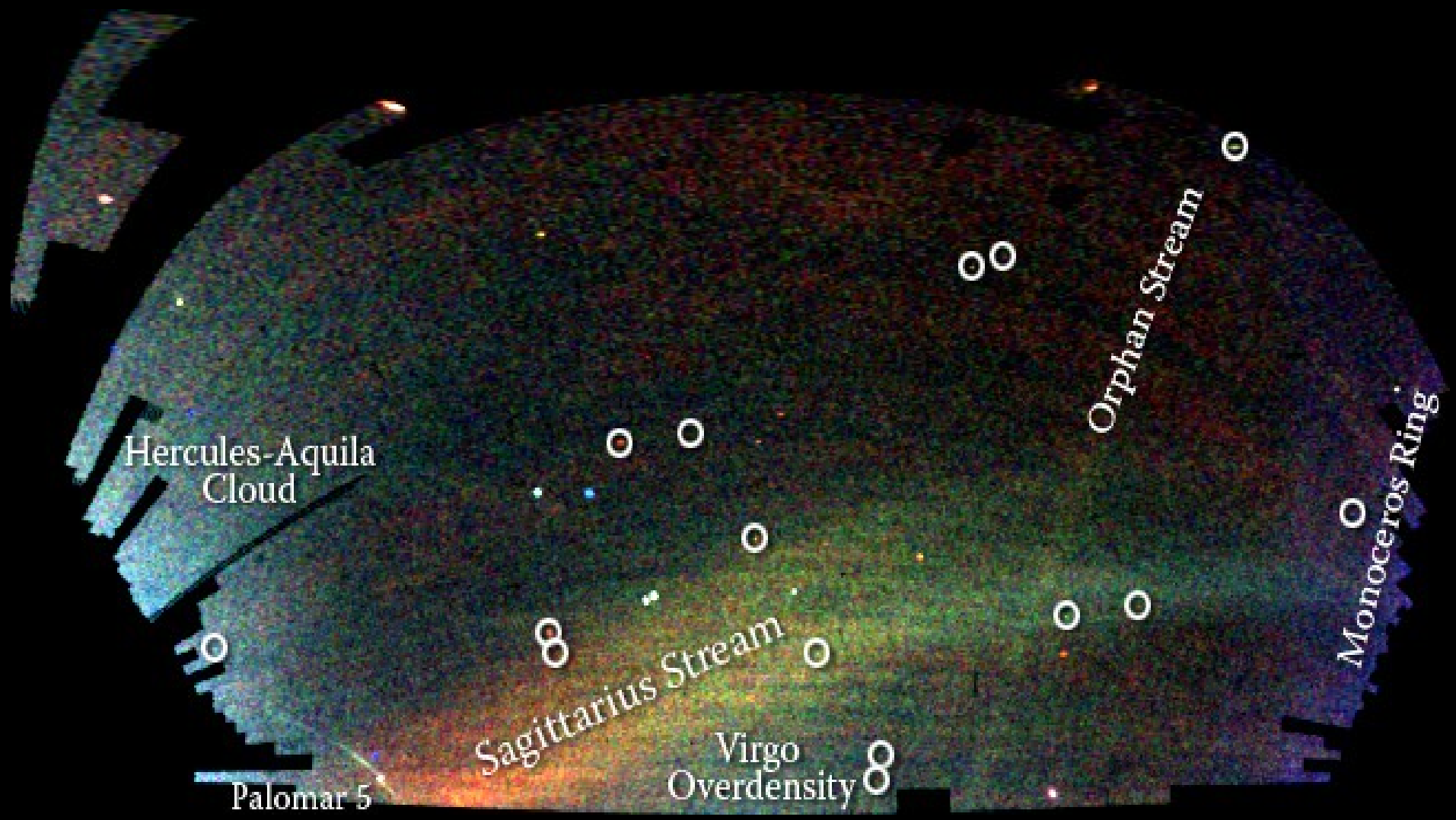


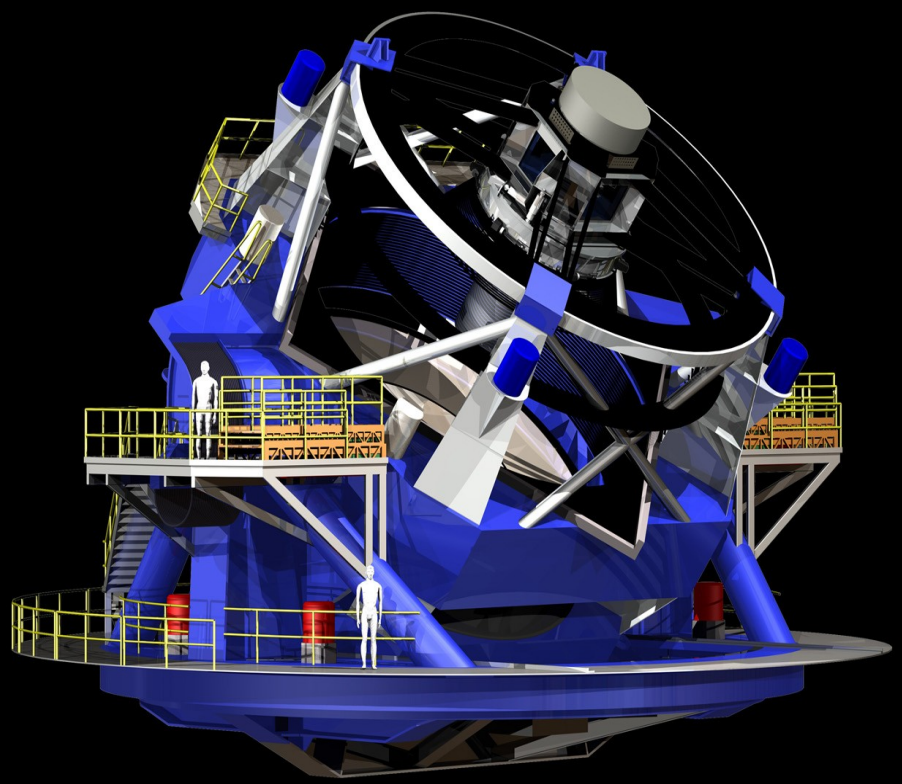
FIGURE 1

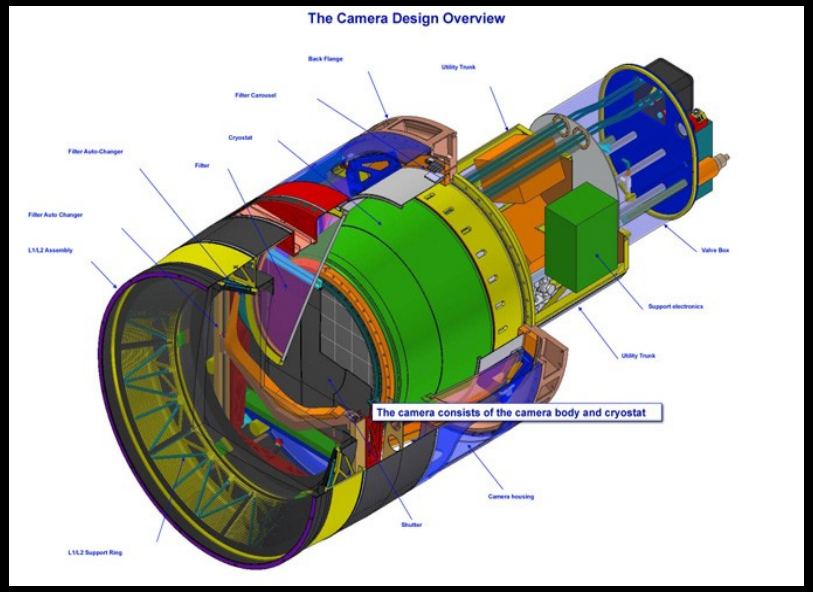

8h
4h
0h
16h
12h
0.14
0.12
0.10
0.08
0.06
0.04
0.02
Redshift z

Sloan Digital Sky Survey

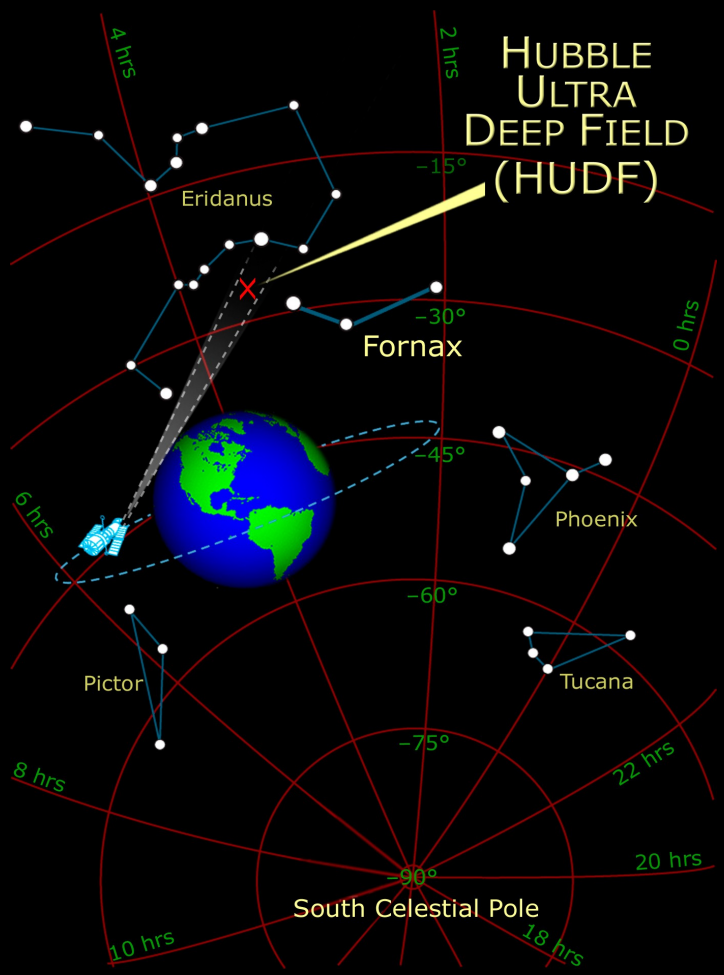


Large Synoptic Survey Telescope (2015?)

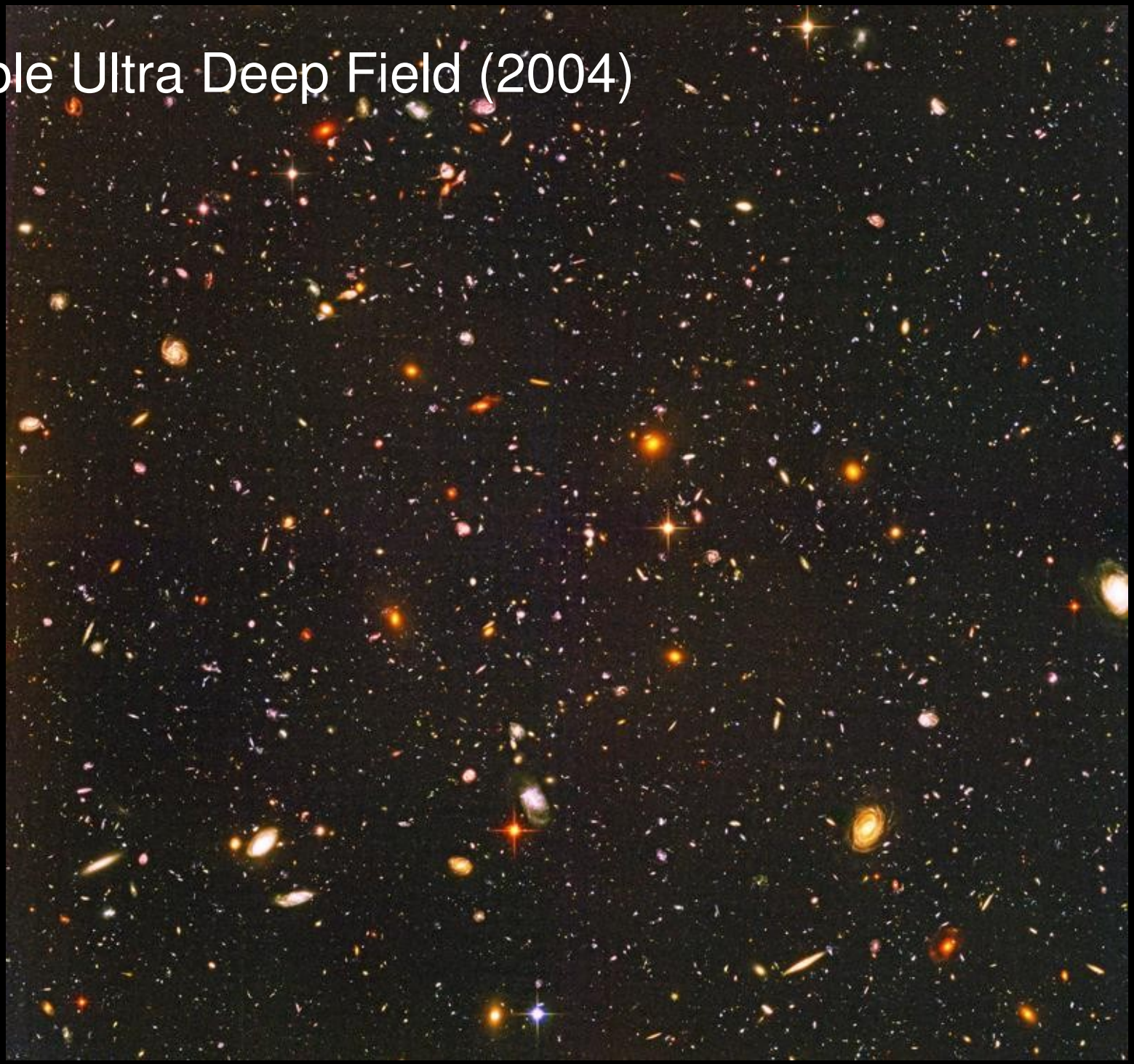




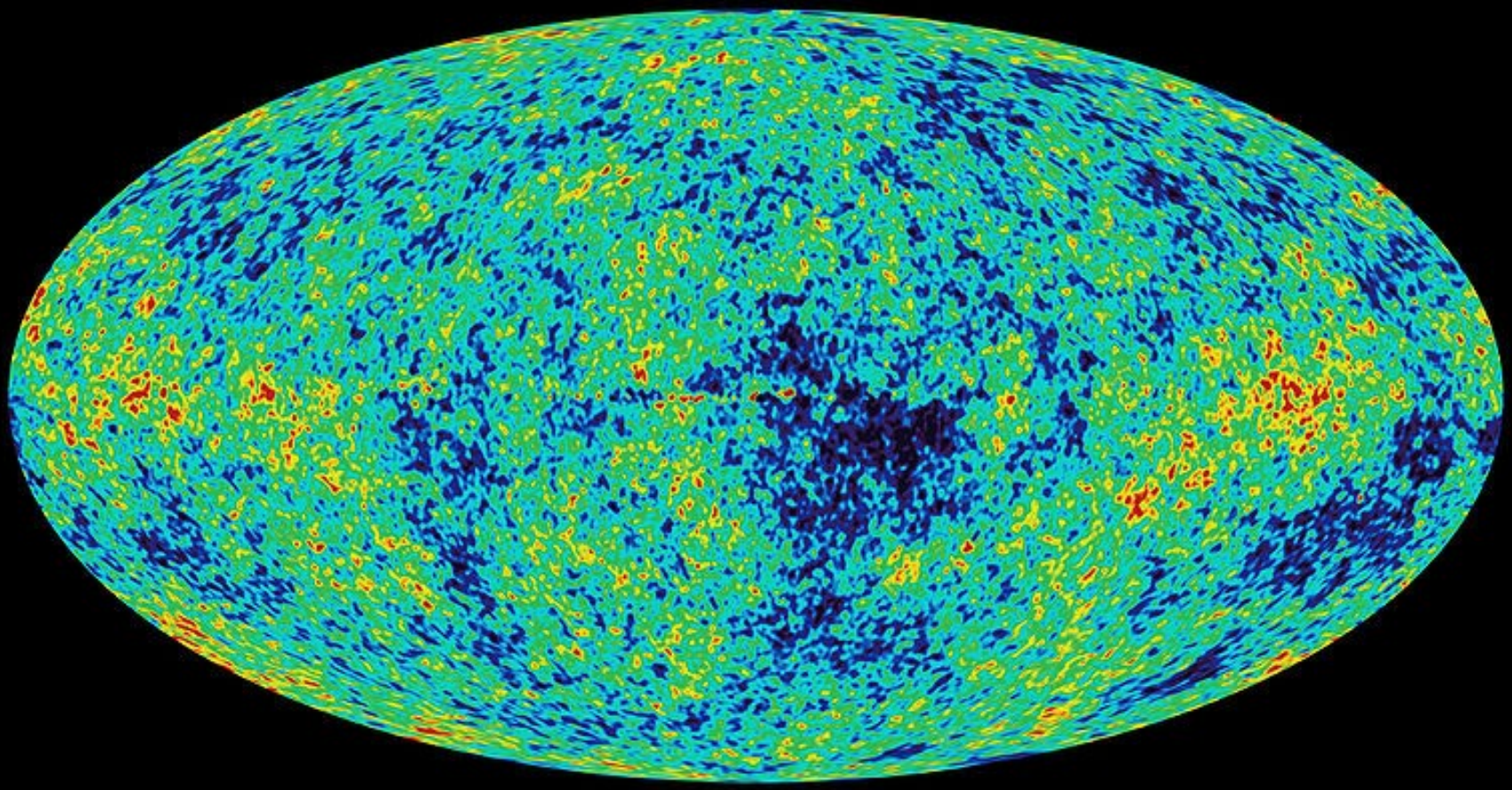
Hubble Ultra Deep Field (2004)

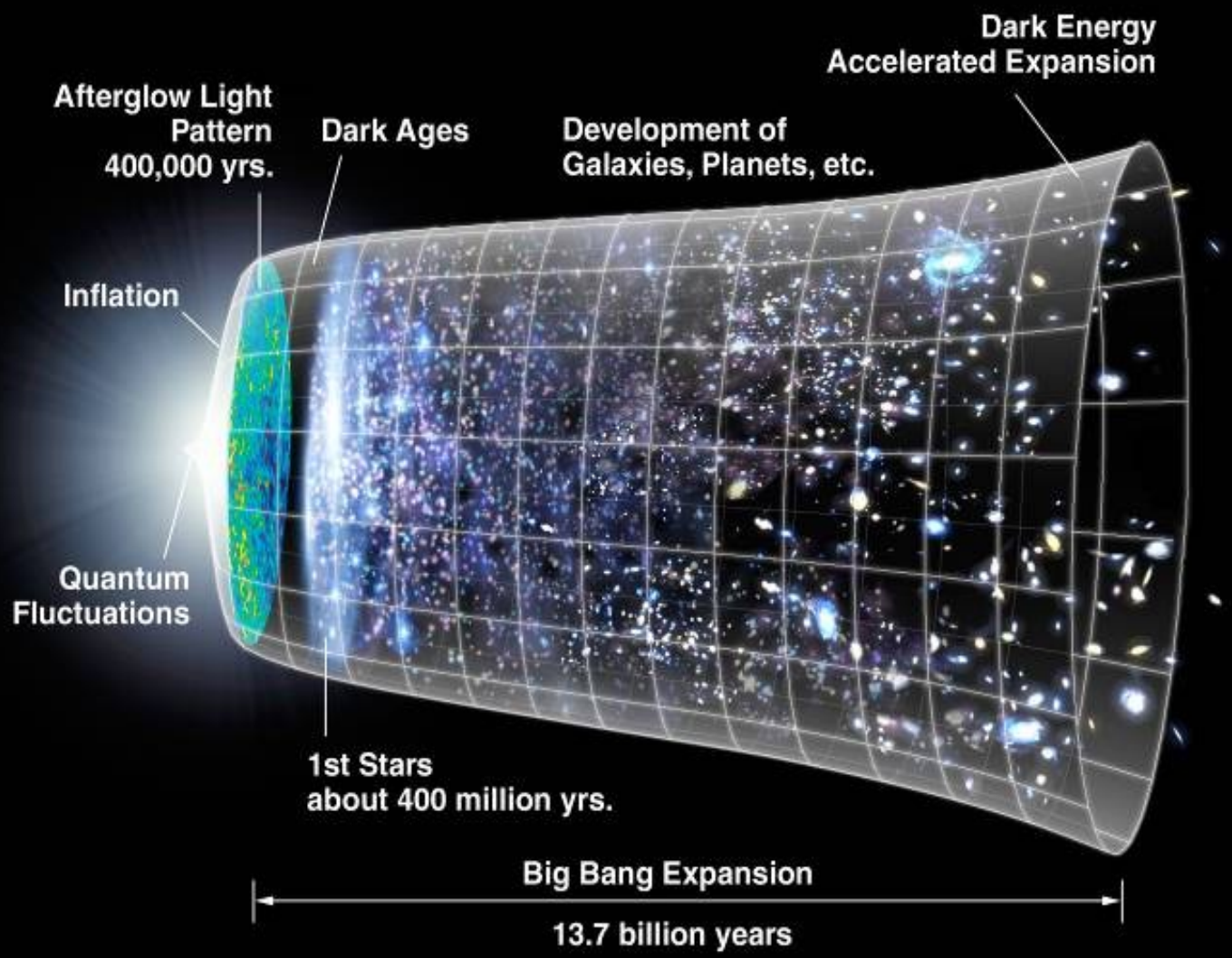


Hubble Ultra Deep Field (2004)

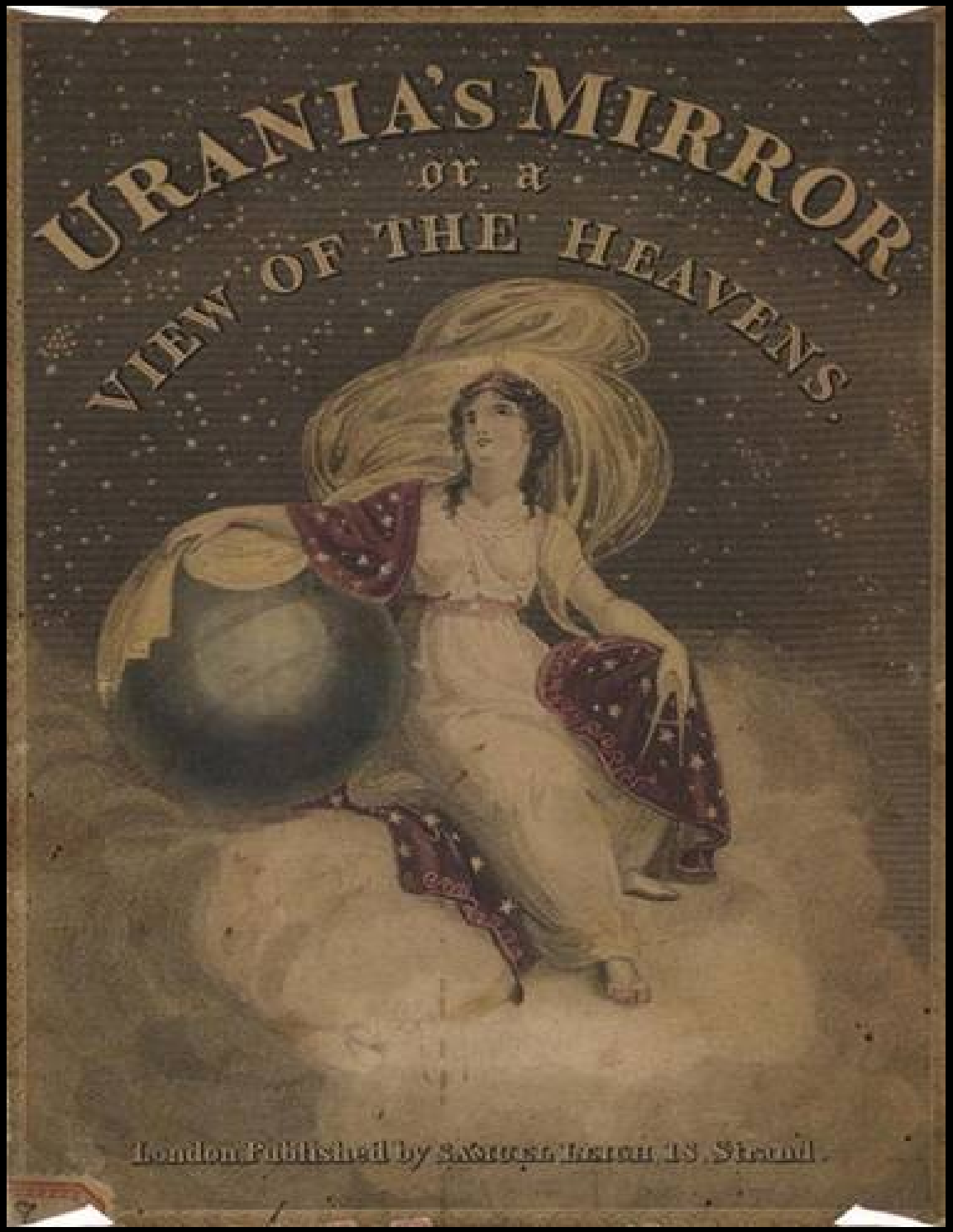


Wilkinson Microwave Anisotropy Probe (WMAP, 2001-)




Dark Energy
Accelerated Expansion
Afterglow Light
Pattern
400,000 yrs.
Dark Ages
Development of
Galaxies, Planets, etc.
Inflation
Quantum
Fluctuations
1st Stars
about 400 million yrs.
Big Bang Expansion
13.7 billion years

URANIA'S MIRROR,
or a
VIEW OF THE HEAVENS.



London Published by Samuel Leigh 18 Strand.