

The stony cosmos of Andreas Pleninger

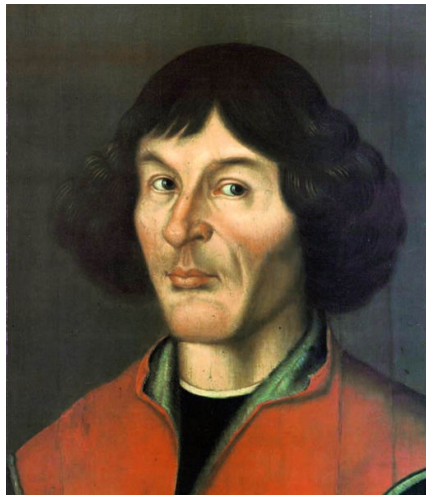
Astronomy and time measurement around 1600



Pleninger 1590 after Collaert 1581 ©Observatory monastery Chremsminster

R. Folk Lviv 2014
University Linz

The time about 1600

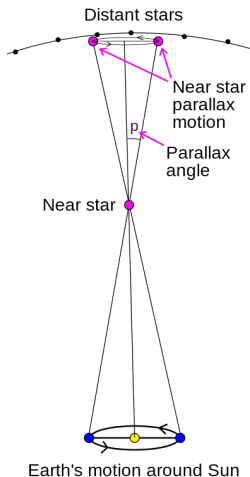


Copernicus (1473 - 1543)

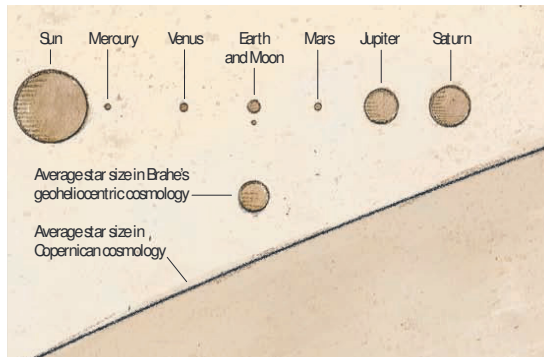


Tycho Brahe (1546 - 1601)

Problems with the heliocentric system



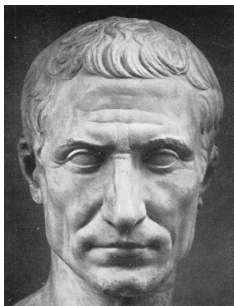
Parallax of stars



Size of stars

Ref.: D. Danielson, Ch.M. Graney (Scientific American Jan. 2014)

Problems with the calendar



Julius Caesar - 45 v. Chr .



I. Danti 1574
0.5cm



Gregor XIII - 1582

Length of the year

Vita of Andreas Pleniger (1555 - 1607)

1555 baptizes in **Regensburg** in the protestant parish church; visit of the Gymnasium poeticum; musical education; then apprenticeship in the art of stone etching and calligraphy in **Nuremberg**

1571 Kepler born

1575 first work in Bavaria a map of Europe after an etching by Tilemann Stella; collaboration (?)

1579 Liedertisch for Hans Adam Jörger from Tollet in Eferding; Working in Austria: Epitaphs in Lower and Upper Austria

1585 Organist und Mesner an der parish church in

Gmunden, **astronomical table** in the monastery Chremsminster (**1590**) **first sundial (1591)**

1598 The counter reformation forces him to return to **Regensburg**; in total roughly 28 stone etchings known.

Kepler has to leave Graz and arrives 1600 in Prag

1607 Pleniger dies in Regensburg and is buried at the St. Peters cemetery.

Kepler will be buried there 1630

6 astronom. tables in the monastery Chremsminster, Regensburg, Paris, Kassel, monastery Rein und **6 sundials**, **one in the British Museum**

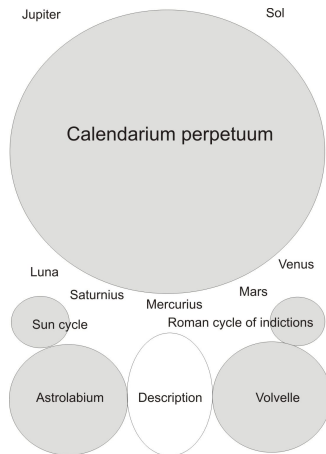


Hogenberg 1594 *Civitates Orbis*

The astronomical table from 1590 at the observatory of the monastery Chremsminster



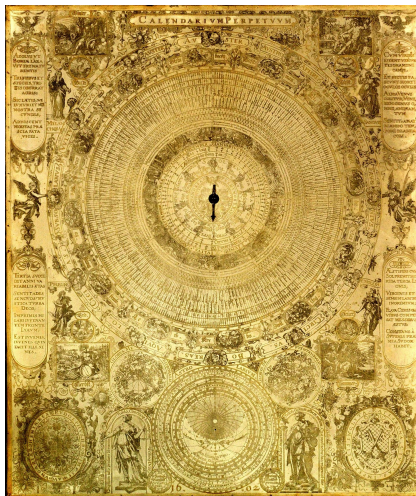
©Observatory monastery Chremsminster



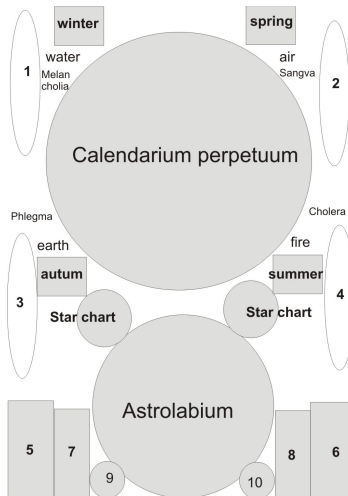
Size: 95 x 66,5 cm

P. Altman Pötsch, *Der ewigwährende Kalender - „Astronomischer Tisch“*. Öffentliches
Stiftsgymnasium Kremsmünster 154. Jahresbericht, Seite 93 (2011)

The astronomical table from 1602 devoted to the Town of Regensburg and Emperor Rudolf II.



©Historisches Museum Regensburg



Size: 123 x 105 cm

Information on the table

- Perpetual calender
- Names of the days, movable feasts
- Occupations of the month
- Seasons
- Temperaments, Elements
- Sun cycle, Moon cycle
- Length of daytime, time of sunrise
- Planets
- **Astrolabe**
- Horoscope, astrological aspects
- Volvelle
- **Star chart**
- Zodiac
- Rising and declining of stars



The topological order of the world

G. u. H. Böhme *Feuer, Wasser, Erde, Luft* 1996;Stefen Siegel, *Kosmos und Kopf. Die Sichtbarkeit des Weltbilds* 2008

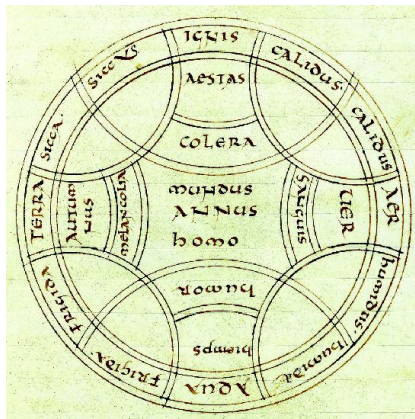
WORLD VIEW COSMOS

mundus	annus	homo
World	Time	Man

The Pythagorean Tetrad

Connection of micro- with macrocosm

Element	Season
Air	Spring
Fire	Summer
Earth	Autumn
Water	Winter
Quality	Temperament
hot-moist	Sanguine
hot-dry	Choleric
cold-dry	Melancholic
cold-moist	Phlegmatic

Isidor von Sevilla, *De natura rerum* 8. Cent.F. T. Marchese *The origins and Rise of Medieval Information Visualization* IEEE 2012 and ©St. Gallen Stiftsbibliothek

Pythagoras (570 - 510 BC) Empedokles (492 - 432 BC) Aristoteles (384 - 322 BC)

S.K. Heninger Jr., *Some Renaissance Versions of the Pythagorean Tetrade* (1961), *The Cosmographical Glass. Renaissance Diagrams of the Universe* (1977)

The topological order of the world

Pythagorean Tetrad on Pleninger's table in Kassel 1605

The Pythagorean Tetrade

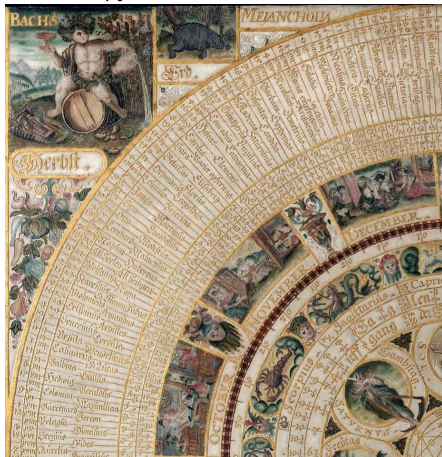
Connection of micro- with macrocosm

Season	Element	Temperament
Spring	Air	Sanguine
Summer	Fire	Choleric
Autumn	Earth	Melancholic
Winter	Water	Phlegmatic
Months	Zodiac	Planets
April-Juni	♈♉♊	Venus/Jupiter
Juli-Sept.	♊♋♌	Mars/Sun
Oct.-Dec.	♌♍♎♏	Saturn/Moon
Jan.-March	♏♐♑	Moon/Saturn
		Merkur

The Wittenberg scholars expressed in astrology the unit of the two books [the book of nature and the Bible]. (Brosseder 2004)

C. Brosseder, *Im Bann der Sterne* (2004); *The Writing in the Wittenberg Sky: Astrology in Sixteen-Century German* JHI 2005

Autumn Crispijn de Passe Th Older ~ 1600



©Museumslandschaft Kassel

Astronomy on the tables

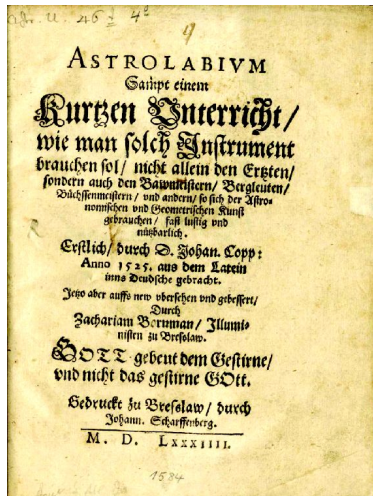


©Observatory monastery Chremsminster

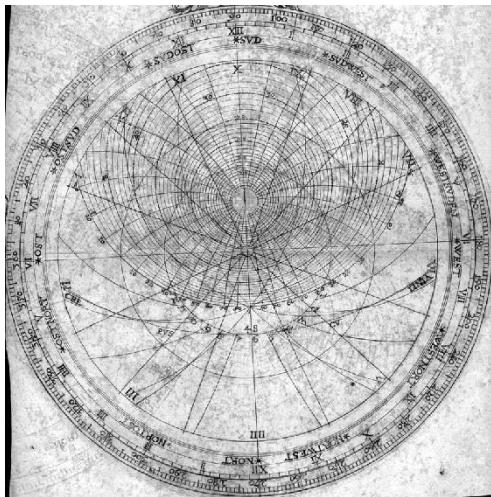
©Hist. Museum Regensburg



The Book: Johan Copp Astrolabium Sampt einem kurzen Unterricht 1584



1584 ©Bayer. Staatsbibliothek



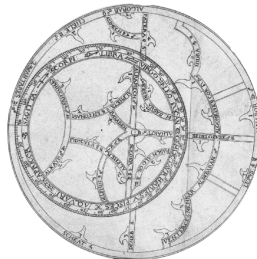
1597 ©ETH Zürich

The rete of Copp's *Astrolabium* 1584; 1597

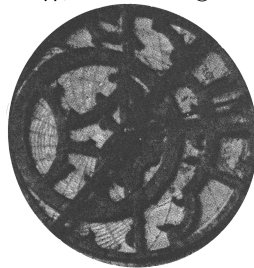
Die Namen der Sternen, welche in dem Rete begriffen sind: The names of the stars, which are in the rete

Die Namen der Sternketten/ welche in dem Rete begriffen sind: Arabisch / Lateinisch vnd Deutsch.		
E Xtremum Caudæ Ursæ Maioris. Der letzte Stern am schwanz des gro- ßen Böhren.	Magnitud. 2	Natura.
Rasaben, Caput Draconis. Das Trachen haupt.	3	♂ ♀
Alamech, Arcturus. Zwischen den Beinen Bootis.	1	♂ ♀
Alpheta, Lucida Coronæ Septentrio- nalis. Die Mitternächtsche Krone.	2	♂ ♀
Engunast, Caput Herculis. Das Haupt Herculis.	3	♂ ♀
Fidicula, Lyra. Der Adler.	1	♂ ♀
Scheder, Pectus Cassiopeiæ. Ander Brust Cassiopeæ.	1	♂ ♀
Rasch Algol, Caput Medusæ. Das Haupt Medusæ.	2	♂ ♀
Alha-		

J. Copp Astrolabium... ©ETH Zürich

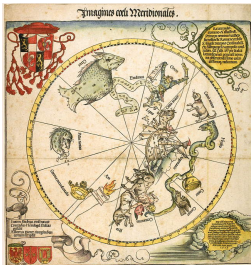


Johann Copp, *Astrolabium*... ©ETH Zürich



The star charts of Dürer, Honter und Amman

S. Dackerman, Prints and Pursuit of Knowledge in Early Modern Europe 2011



Dürer 1515 from outside



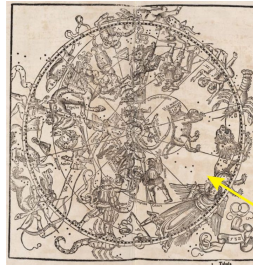
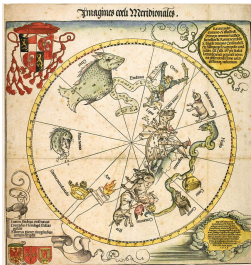
Honter 1532 from the earth



Amman 1564 from outside

The star charts of Dürer, Honter und Amman

S. Dackerman, Prints and Pursuit of Knowledge in Early Modern Europe 2011



Dürer 1515 from outside Honter 1532 from the earth

Amman 1564 from outside

The star charts of on the table in the Historical Museum Regensburg: North

print



Amman 1564

©Staatliche Bibliothek Regensburg

stone etching



Pleninger 1602

©Hist. Museum Regensburg

Measurement of time

Movement on heaven
Ancient world



2013 ©Uni Basel

1300 v. Chr.

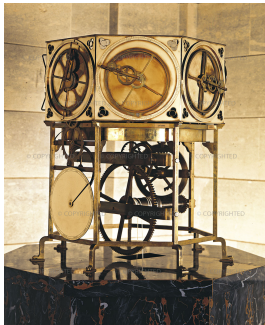
from Valley of the Kings

Astronomy

Optics

Kepler's equation

Wheelwork
since 1300



©Museo Galileo

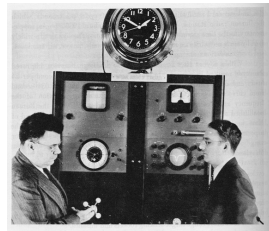
Astrarium (facsim.)

Giovanni de' Dondi

(1318-1389)

Mechanics

Movement of atoms
since 1946



©marcdatabase.com

Quantum theory

Schrödinger's equation

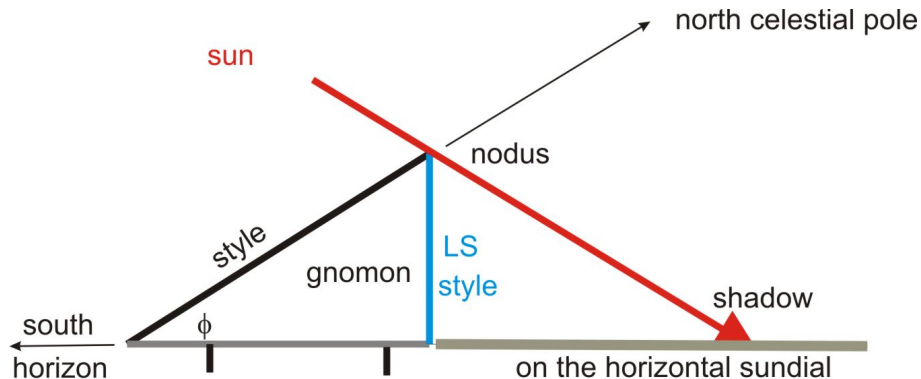
Today GPS

Theory of Special
and Gen. Relativity

Lit.: Haroche, Brune, Raimond

Physics Today Jan 2013

A horizontal sundial



polar height $\sim$ latitude ϕ

Shadow of the style $\rightarrow$ common hours

Shadow of the nodus $\rightarrow$ diurnal lines

The sundials and parapegmas



1591 Brunn

©Mährische Galerie

Lit.: W. Eckhardt unpublished manuscript



1601 Hamburg

©M. Kunst und Gewerbe



1601 London

©British Museum

1601: Tycho Brahe dies in Prague; Kepler starts to write *Astronomia nova*

In Padua Galilei has money troubles and has to teach

Sundials for social hegemony

Schechner JHA xxxii (2001)



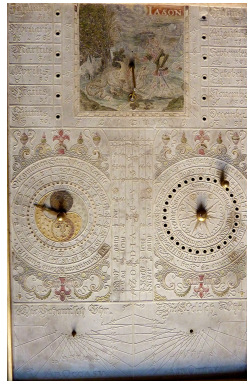
1601 Wien

©MAK



~1600 Regensburg

©Hist.M.



~1600 Prag

©M. of Decor. Arts

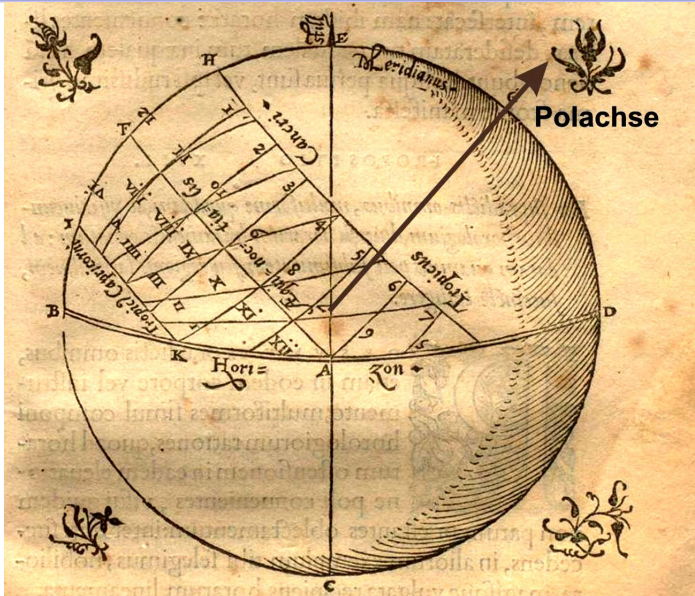
for Hans Jörger (Mautner in Aschach)
and Maria born Plassin (Gmunden)

Jerger: Baseler family; on 12.12.1618 named as witness in a document

Lit.: Siegmacher; acknowledgement to H.Aue for identifying the coat of arms

The sun in the sky: Polar height 48 degrees,

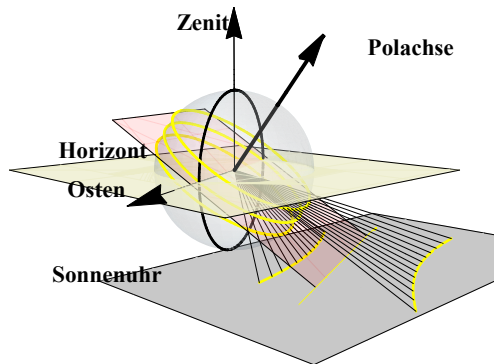
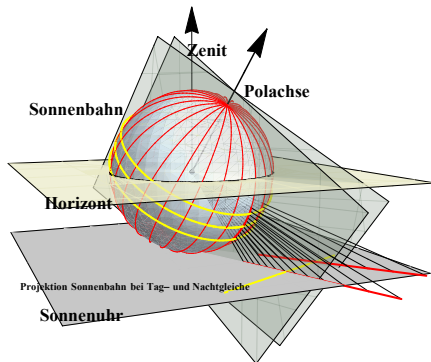
O.Finè (1494 - 1555) *de solaribus horologiis* 1560



This diagram illustrates a celestial sphere with various astronomical features. A red line, likely representing a comet's path, curves across the upper left quadrant. A black arrow points from the center towards a star labeled 'Polachse' in the upper right. The sphere is marked with lines for the 'Tropicus' (Tropic of Cancer) and 'Equinoctialis' (Equinoctial). Other labels include 'Hori' (Horizon), 'Zon' (Zone), and 'Meridianus'. The diagram is decorated with floral motifs at the corners.



Time of the sun: Equal hours - diurnal lines



Gnomonic projection

Great circle in line; small circles in hyperbolas (conic sections)

Needs only compass and straight-edge Dürer *Überweisung der messung ...* von 1525

Analysis of the equal hours



Auß diser tafel werden gemacht die horologia vff der ebne.
Grad der erhöhung des Polus.

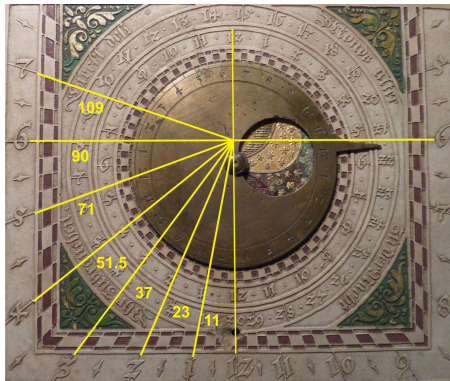
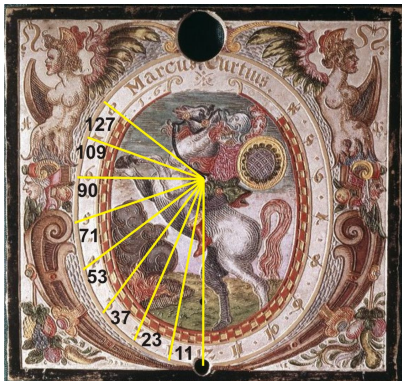
		42	43	44	45	46	47	48
		G m	G m	G m	G m	G m	G m	G m
12	12	0	0	0	0	0	0	0
11	1	10	10	10	25	10	40	10
10	2	21	6	21	30	21	50	11
9	3	33	40	34	0	34	30	35
8	4	48	50	49	50	50	0	50
7	5	68	0	68	24	68	55	69
6	6	90	0	90	0	90	0	90

Grad der erhöhung des Polus.

		49	50	51	52	53	54	55
		G m	G m	G m	G m	G m	G m	G m
12	12	0	0	0	0	0	0	0
11	1	11	30	11	40	11	50	11
10	2	23	35	23	55	24	15	24
9	3	37	0	37	29	37	50	38
8	4	52	36	53	0	53	30	53
7	5	70	30	70	50	71	10	71
6	6	90	0	90	0	90	0	90

Table from Münster's *Fürmalung und künstlich Beschreibung der Horologien...* of 1537, which gives the angle of equal hours as function of latitude. ©Monastery Chremsminster

Analysis of the equal hours -> Latitude 48,5 Grad



Polar string in direction of earth axis; 'Modernising' in baroque time by exchanging the polar triangle by a string and inserting a compass

Lit.: W.Eckhardt (unpublished manuscript)

Information on the polar triangle and/or the gnomon



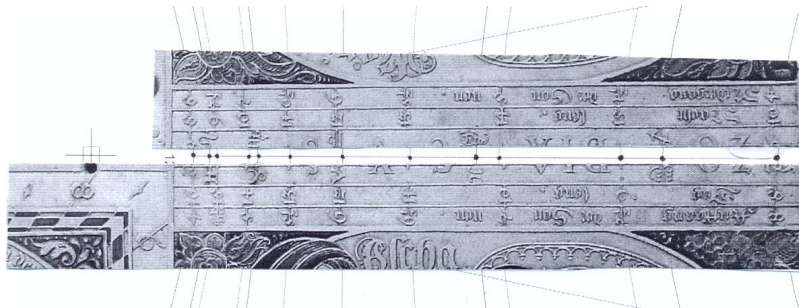
(italienischen) Uhr. Bild und Ornamente farbig; Schrift vergoldet. Rechts unten steht L. S., welches Zeichen auch die oben beschriebenen Tafeln von 1560 aufweisen. (Ein Leonhard Straßer, Fleischschreiber, ist 1603 hier gestorben laut Totenbuch der Neupfarrkirche.)

LS no signature

Meaning of LS = longitudo stili due to Ilse Fabian

Analysis of the Meridian of the sundial in Vienna; result: agreement with polar height of 48.5 degrees.

Calculation with the program 'Sonne38beta' (author: H. Sonderegger)



Time of sunrise and sunset (4-18 every half hour) length of day and night (16-8 resp. 8-16 every hour) 9 marks) in addition entrance into the signs of zodiac (7 marks)

3 marks are identical, in total 13 marks

Acknowledgment

- Observatory of Monastery Chremsminster: P. Amand Kraml
- Monastery Chremsminster: P. Altman Pötsch
- museumslandschaft hessen kassel, Kassel: Karsten Gaulke
- Bibliotheque National Paris: Benoit Cote-Colisson
- MAK Wien: Dr. Elisabeth Schmuttermeier
- Keplerhaus Regensburg: M.A. Matthias Freytag
- Historisches Museum Regensburg: Dr. P. German-Bauer
- Museum of Decorative Arts in Prague: Ing. Jiří Fomin
- Museum für Kunst und Gewerbe Hamburg: Dr. des. Christine Kitzlinger (Manuskript Eckhardt)
- London: British Museum: Oliver Cooke
- Moravian Gallery in Brno: PhDr. Alena Krkošková
- M. Lippitsch, S. Draxler *Der Kalendertisch im Stift Rein*. Graz 2013
- Dr. Ilse Fabian

Iconology of the tables

M. Quinlan-McGrath, *Influences Art, Optics and Astrology in the Italian Renaissance* 2013

What is the meaning of the displayed graphics

- What is the intellectual world behind?
- Which original or templates have been used?
- Which media have been used for similar (applied) artwork?



Planetary Clock Baldewein
1563 - 1568 **Dresden**



Imago mundi Pierre d'Arras
1217 - 1235 **Lausanne**



Zodiac of Dendera
~ 50 BC **Paris**

See also **Kunstammer Wien**: clock by Jan Taborsky 1572 and monastery **Chremsmünster**: clock by Jorgen Eckler