Fusis Φυσις

Megalitismo e Astronomia

Organização ipt Instituto Politécnico de Tomar

cph.ipt Centro de Pré-História

Co-organização CONSTÂNCIA VILA FORMA MUNICÍPIO

Centro Ciência Viva de Constância PARQUE DE ASTRONOMIA

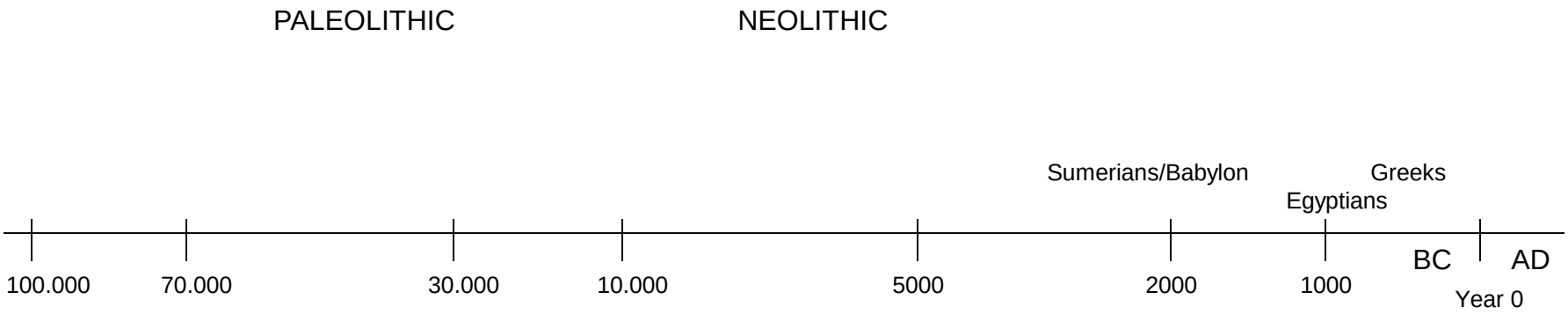
Megalitismo e Astronomia

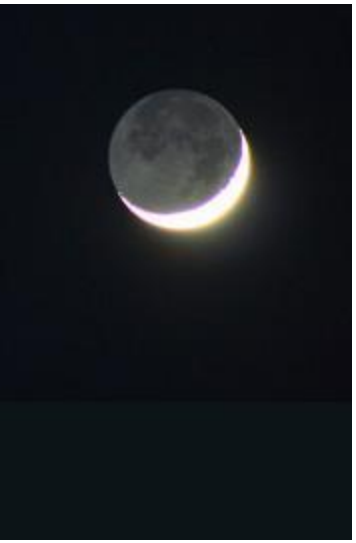
- Astronomias na Antiguidade (BC: Gregos)
- Registos escritos (Sumérios ;Babilónia)
- E antes da escrita !!? Que astronomias?
- Fim da última glaciação
- Caçadores Recolectores >10000BC
- Sedentarização ≈8000BC
- Neolítico

Ciclos e Sedentarização

- Importância da Paisagem
- Horizonte o céu e a terra
- Percepções do mundo envolvente
- Movimentos do Sol e da Lua
- Conjecturas e desafios
- Megalitismo como registo histórico

Time Line


PALEOLITHIC
NEOLITHIC
Sumerians/Babylon
Greeks
Egyptians
BC
AD
100.000
70.000
30.000
10.000
5000
2000
1000
Year 0



Time Line

PALEOLITHIC

NEOLITHIC

Sumerians

Greeks

Egyptians

100.000 70.000 30.000 10.000 5000 2000 1000 BC AD

Year 0

Record of Celestial and Meteo events

Erathostenes

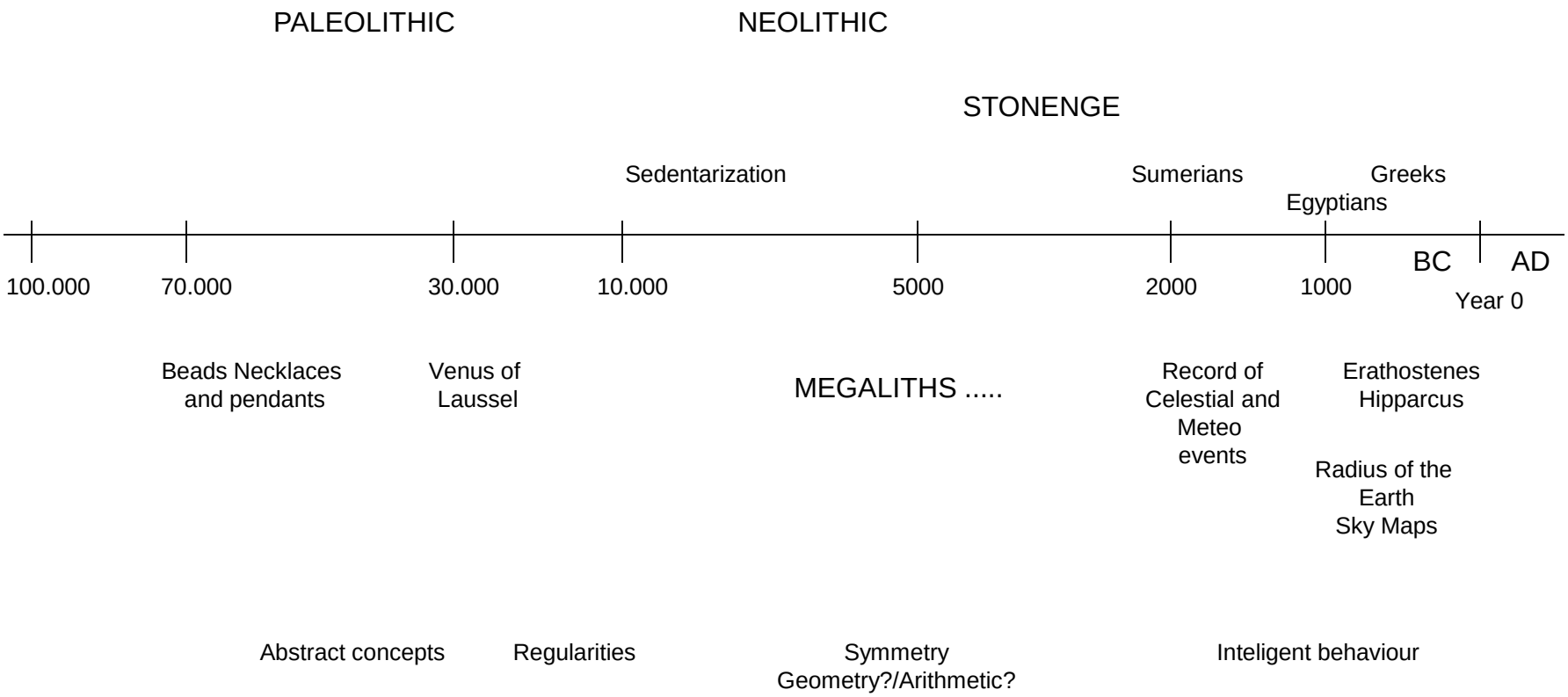
Hipparcus

Radius of the Earth

Sky Maps

Cosmologic Model

Time Line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Sedentarization
Sumerians
Greeks
Egyptians
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Year 0
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Beads Necklaces and pendants
Venus of Laussel
MEGALITHS .....
Record of Celestial and Meteo events
Erathostenes Hipparcus
Radius of the Earth
Sky Maps
Abstract concepts
Regularities
Symmetry
Geometry?/Arithmetic?
Inteligent behaviour

MEGALITHIC SITES IN IBERIA

ENCLOSURES - MENHIRS AND DOLMENS

Menir da Póvoa e Meada Castelo de Vide

Castelo de Vide

Menir do Outeiro and Lanscape ondulations

Close to Monsaraz

Landscape showing Moncarche and ondulations

Anta dos Maltezes - Alentejo Central

Anta do Paço 2 - Alentejo Central

Anta Moita do Gato - Alentejo Central

Time Line

PALEOLITHIC

NEOLITHIC

Sedentarization

Sumerians

Greeks

Egyptians

100.000 | 70.000 | 30.000 | 10.000 | 5000 | 2000 | 1000 | BC | AD

Year 0

Beads Necklaces and pendants

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10.000

5000

2000

1000

BC

AD

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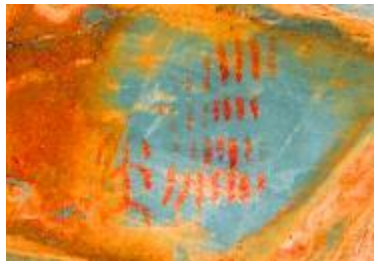
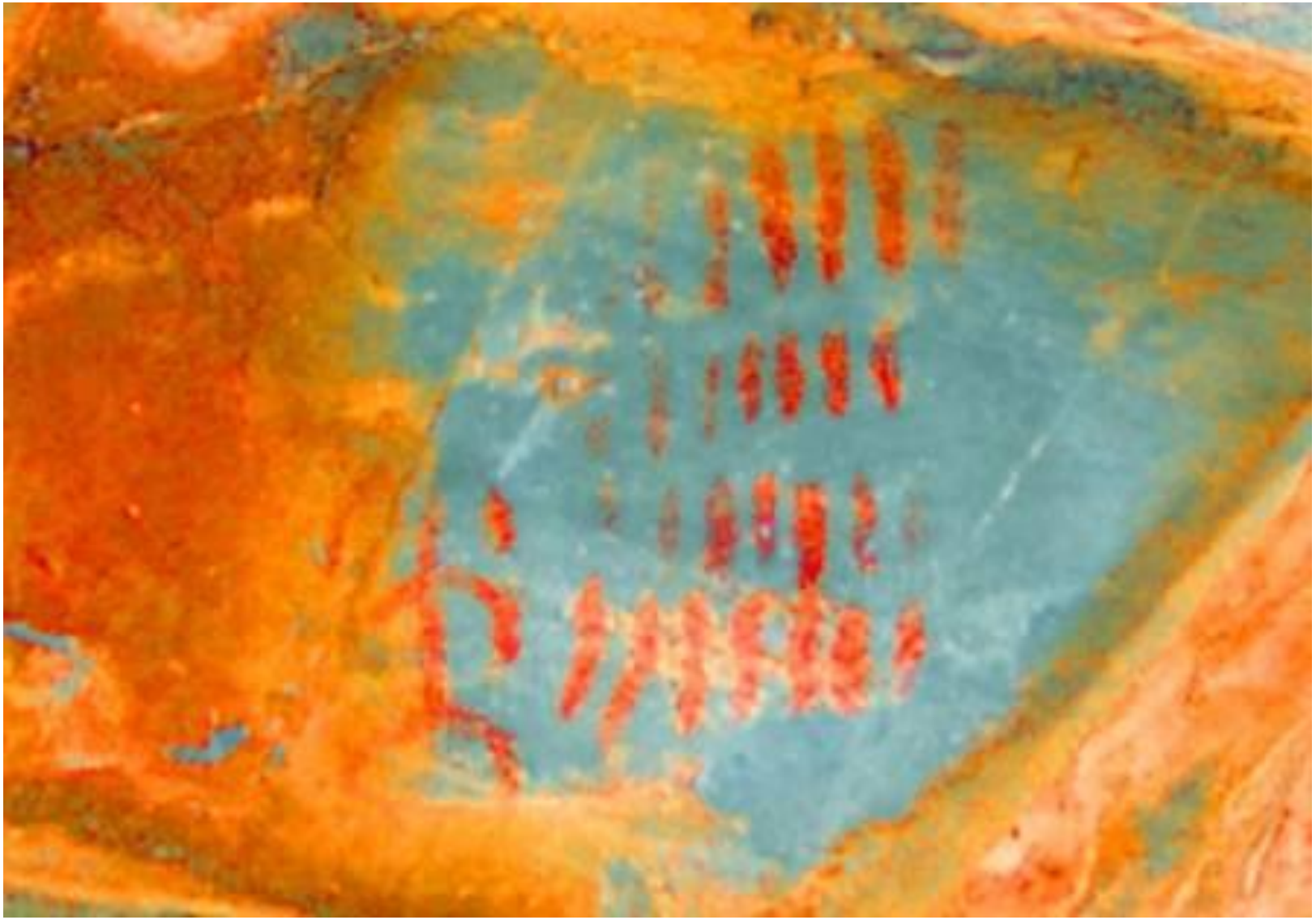


Abstract concepts

Regularities

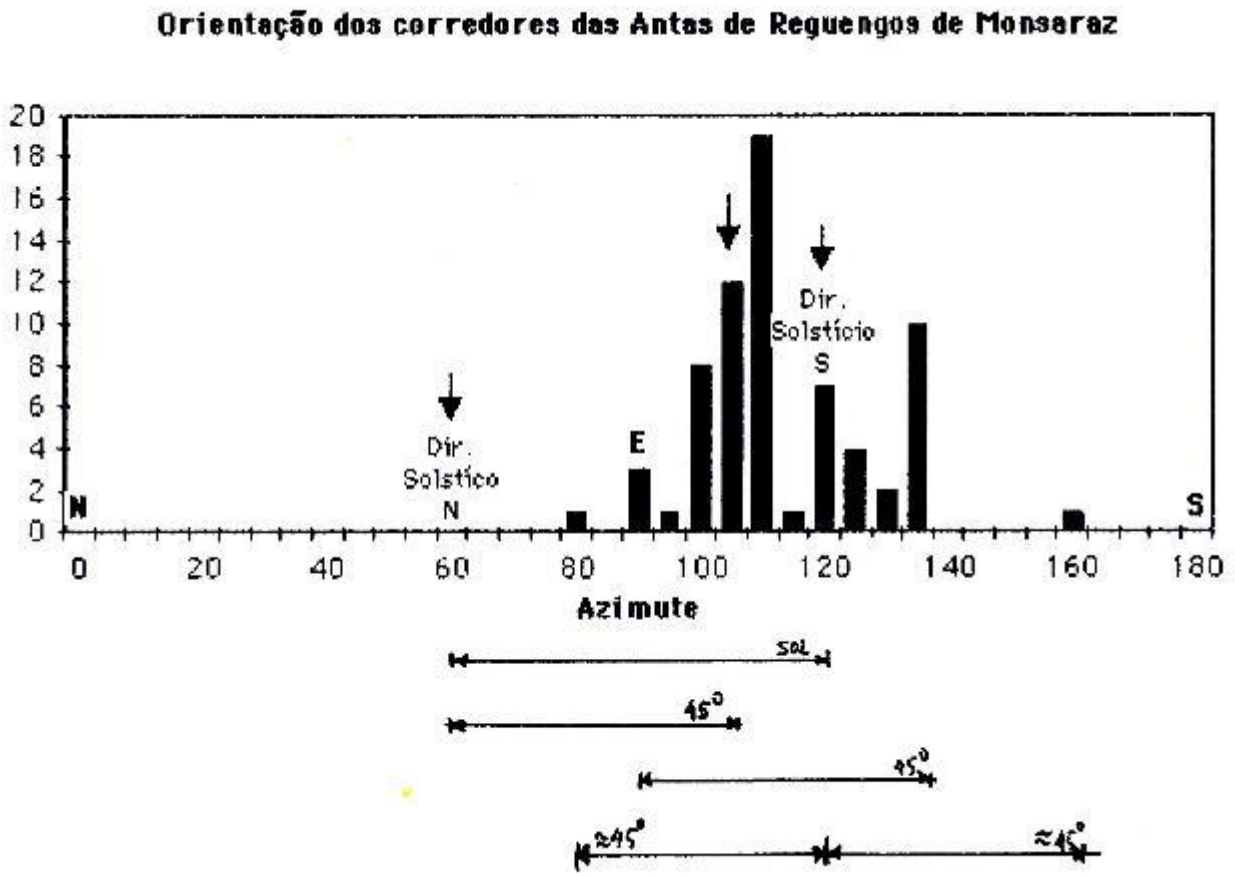
Inteligent behaviour

Pintura Rupestre, Arronches - Alentejo



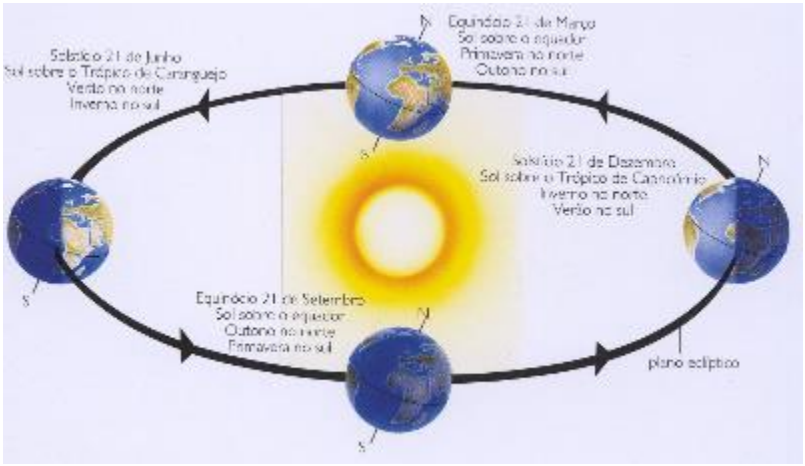
Antas from Reguengos de Monsaraz, orientations

Data from Leisner's



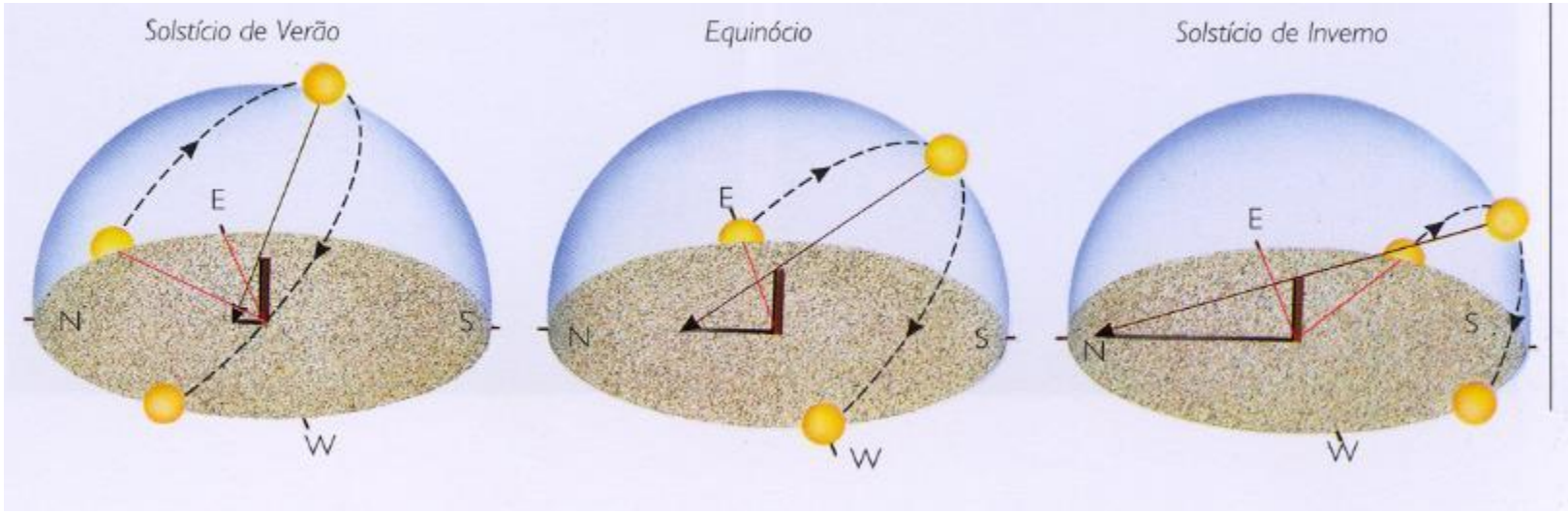
Conceitos básicos de Astronomia

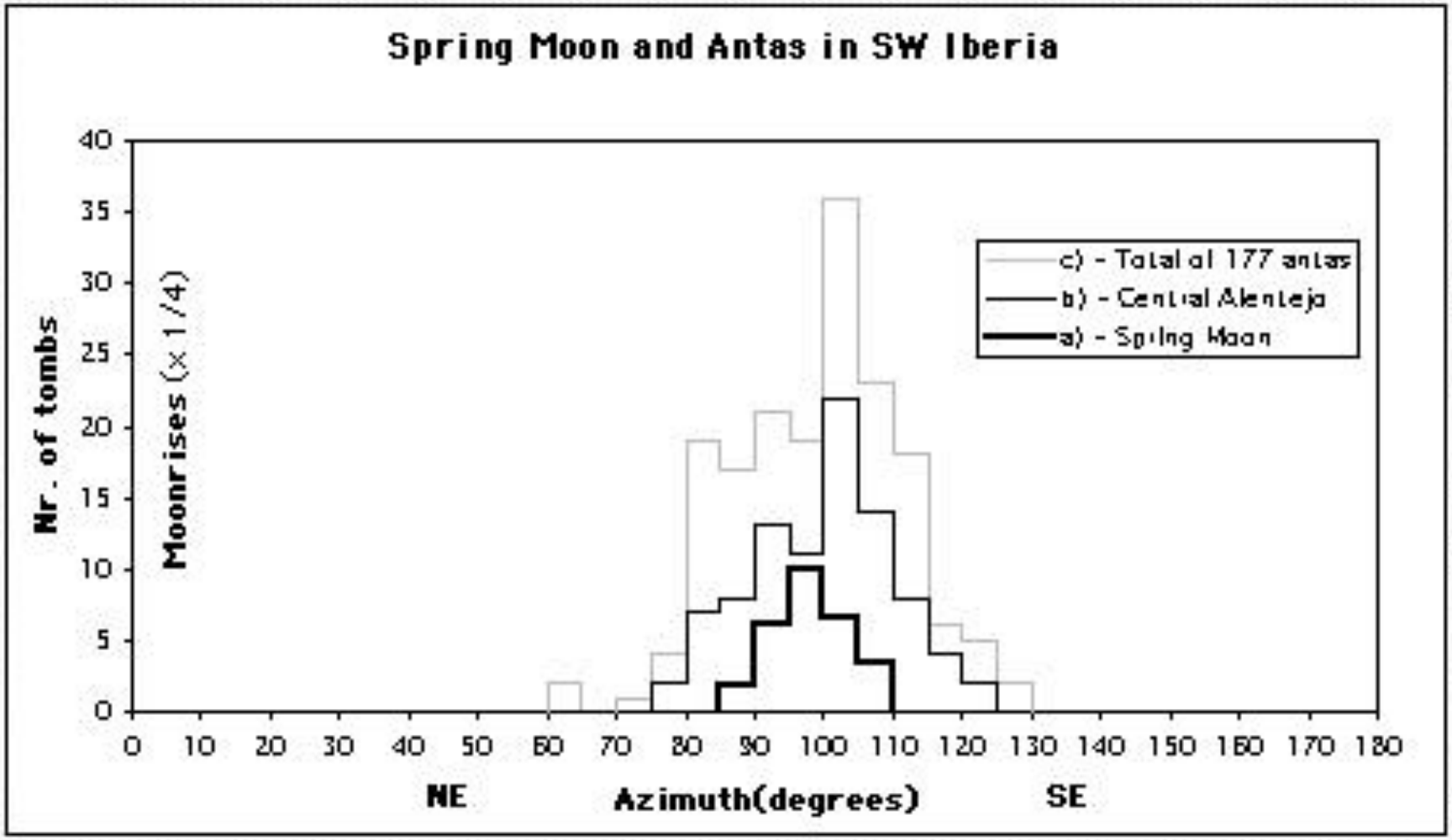
- Órbita da Terra vs. eclíptica
- Solstícios e equinócios
- Estações do ano



Conceitos básicos de Astronomia

- Movimento diurno
- Altura do Sol
- Meio dia

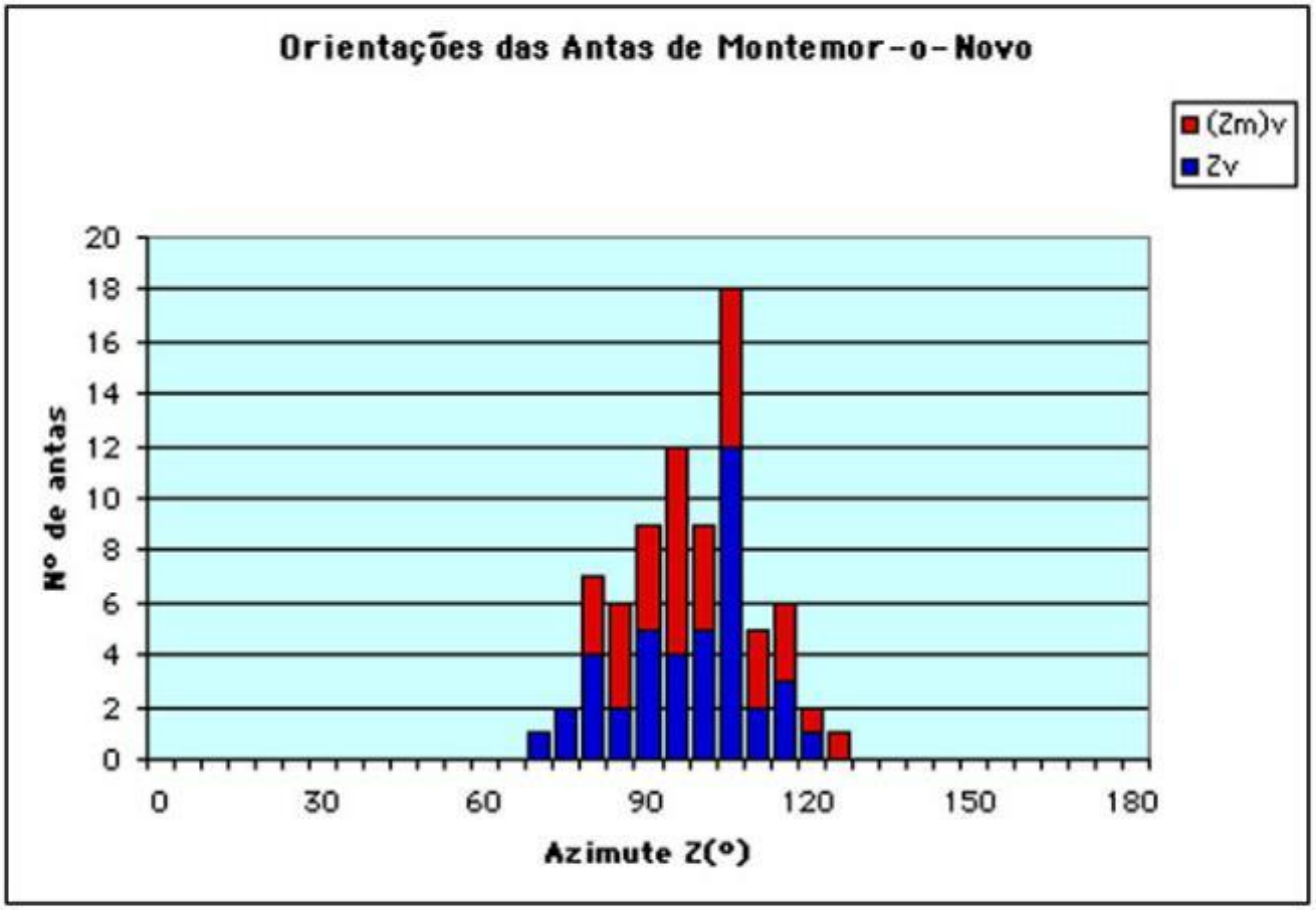




The average value of the measurements of the dolmens corridor is coincident with the average value of distribution of the Spring Full Moon in the East (85º - 115º) . Average Value of the SFM azimute Z = 98º.

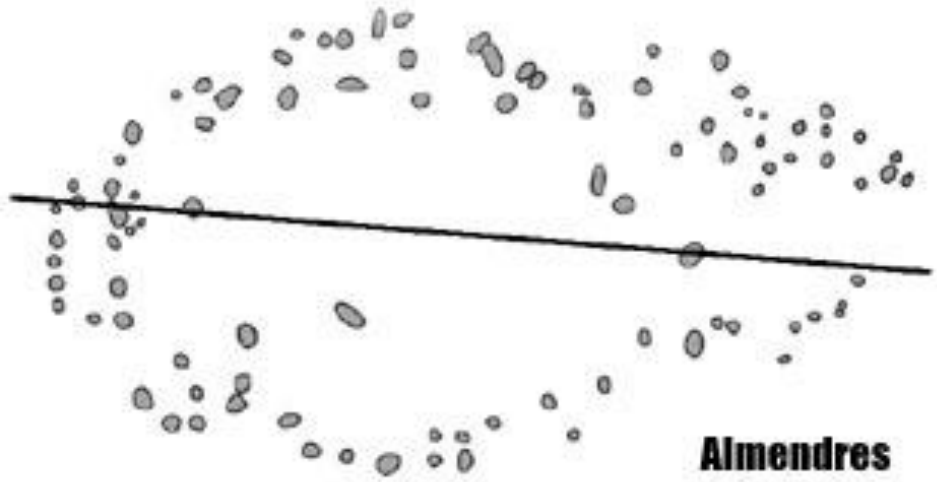
Dolmen orientations in Montemor-o-Novo

(in Revista Portuguesa de Arqueologia)

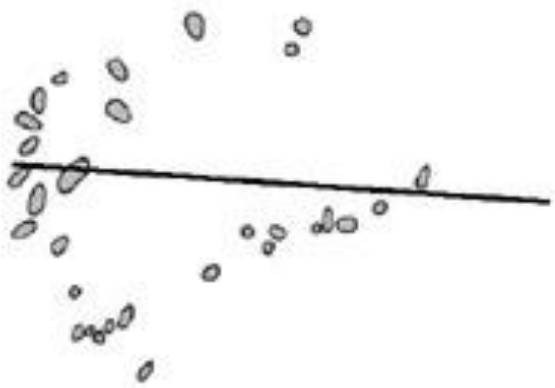


Lua da Primavera, Montemór-o-Novo

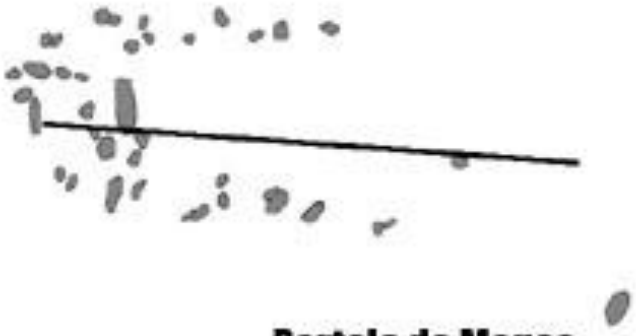
Megalithic Enclosures



Almendres



Vale Maria do Meio



Portela de Mogos

Cuncos

Vale d'el Rei

Vale-del-Rey horseshoe cromelech

Looking West

Lua da Primavera - Tera

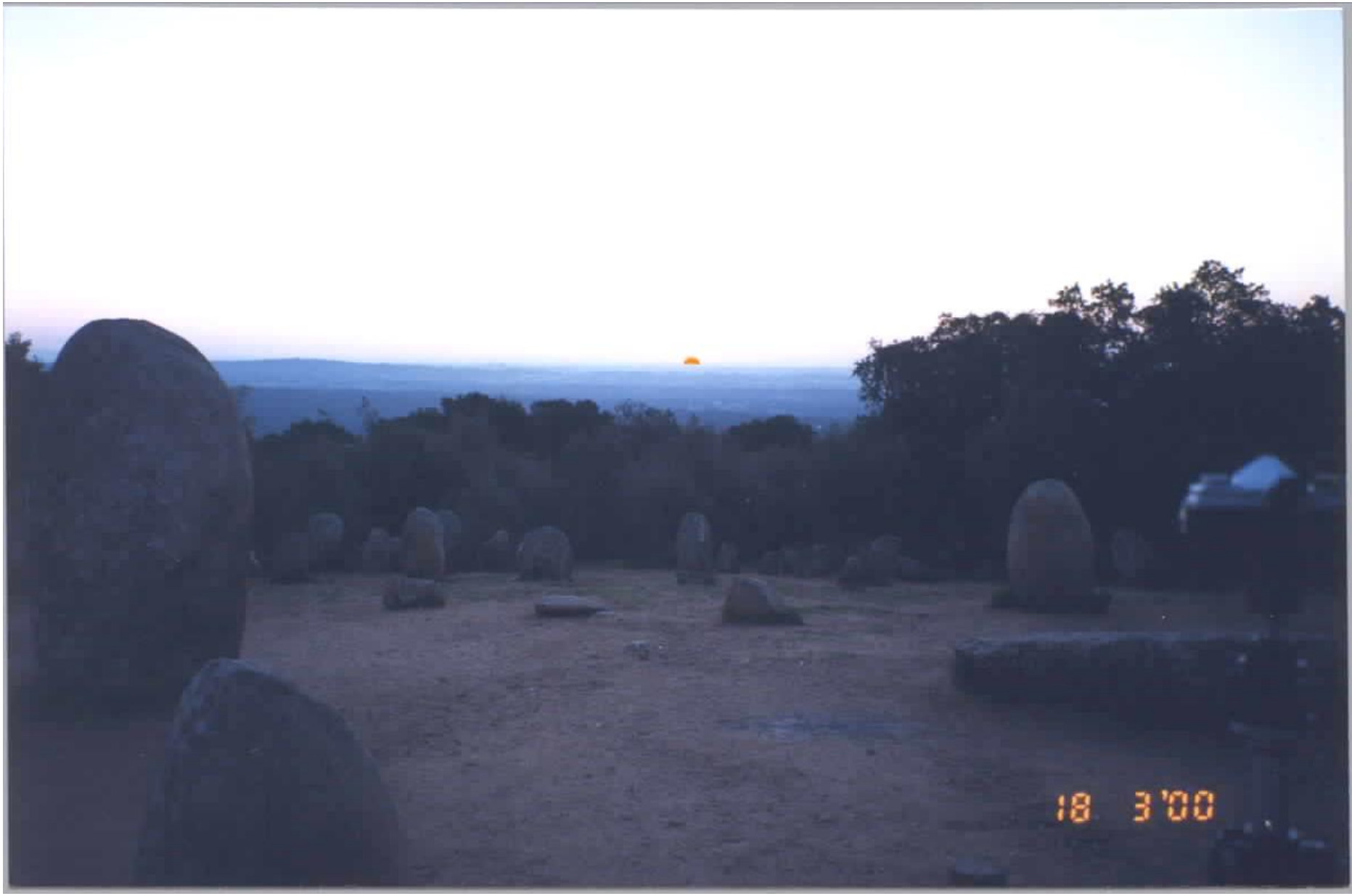
Two Factors:

1 - Sedentarization

2 - Awareness of the Sky

- not territory
- horizon

Almendres - Évora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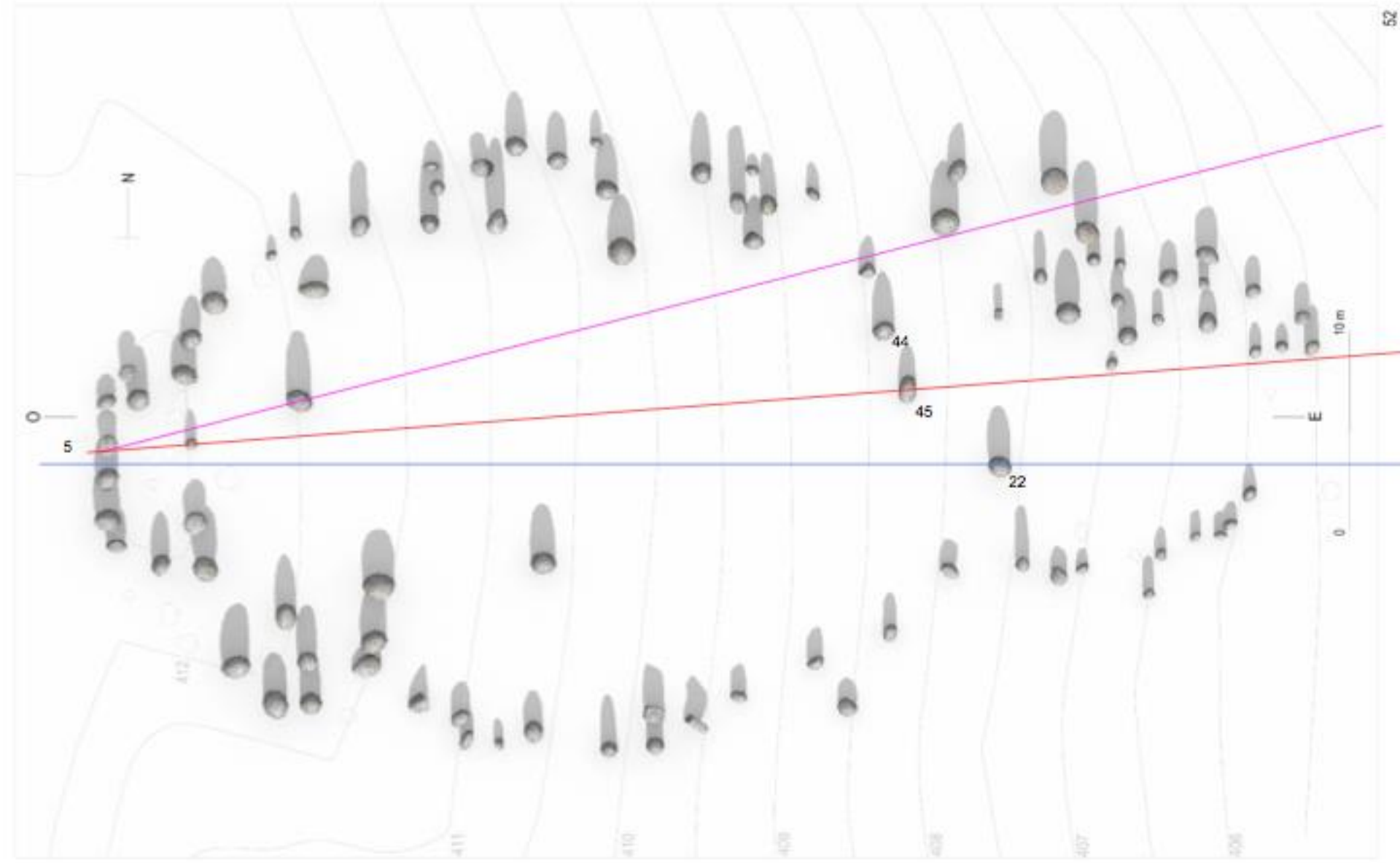
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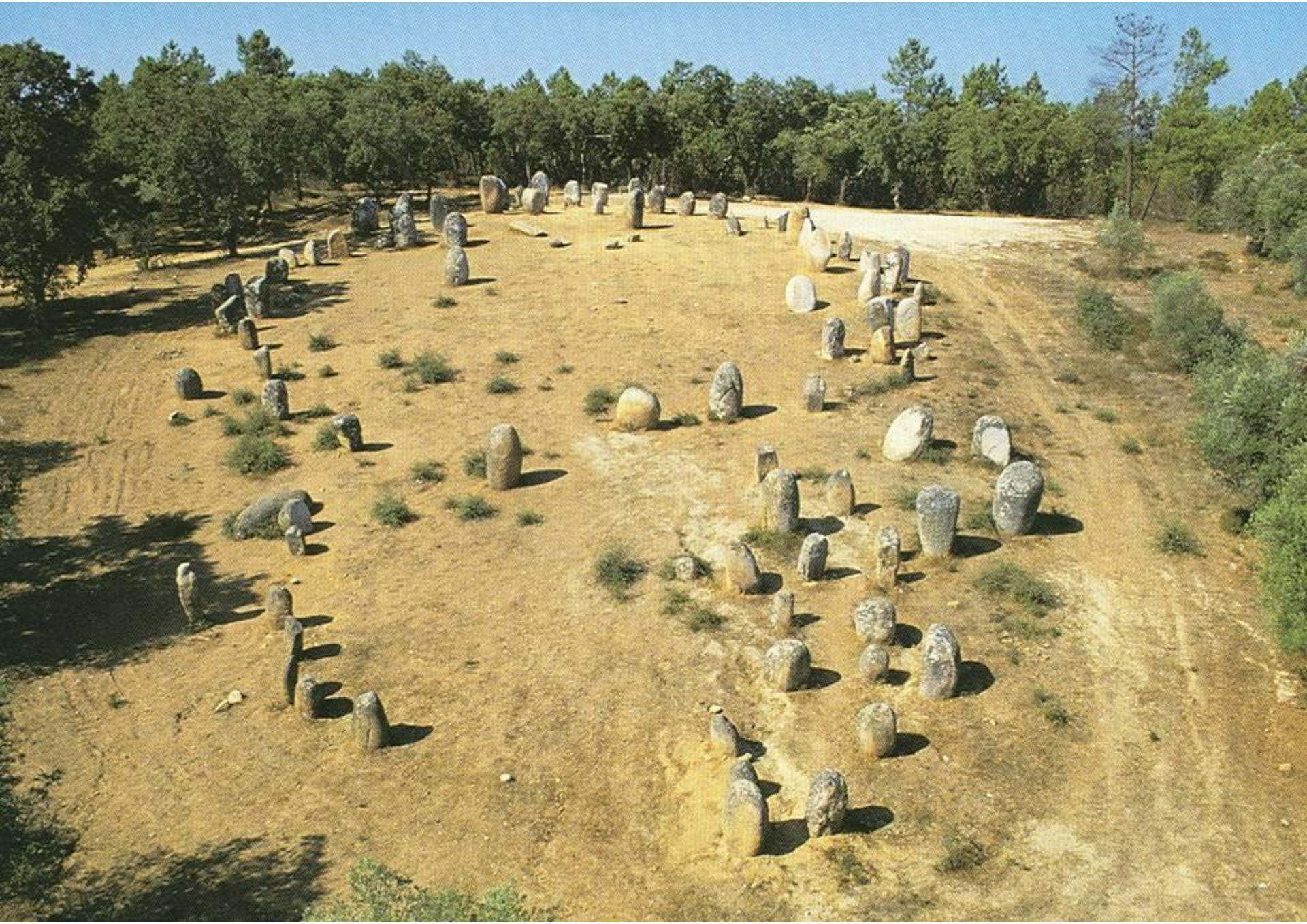
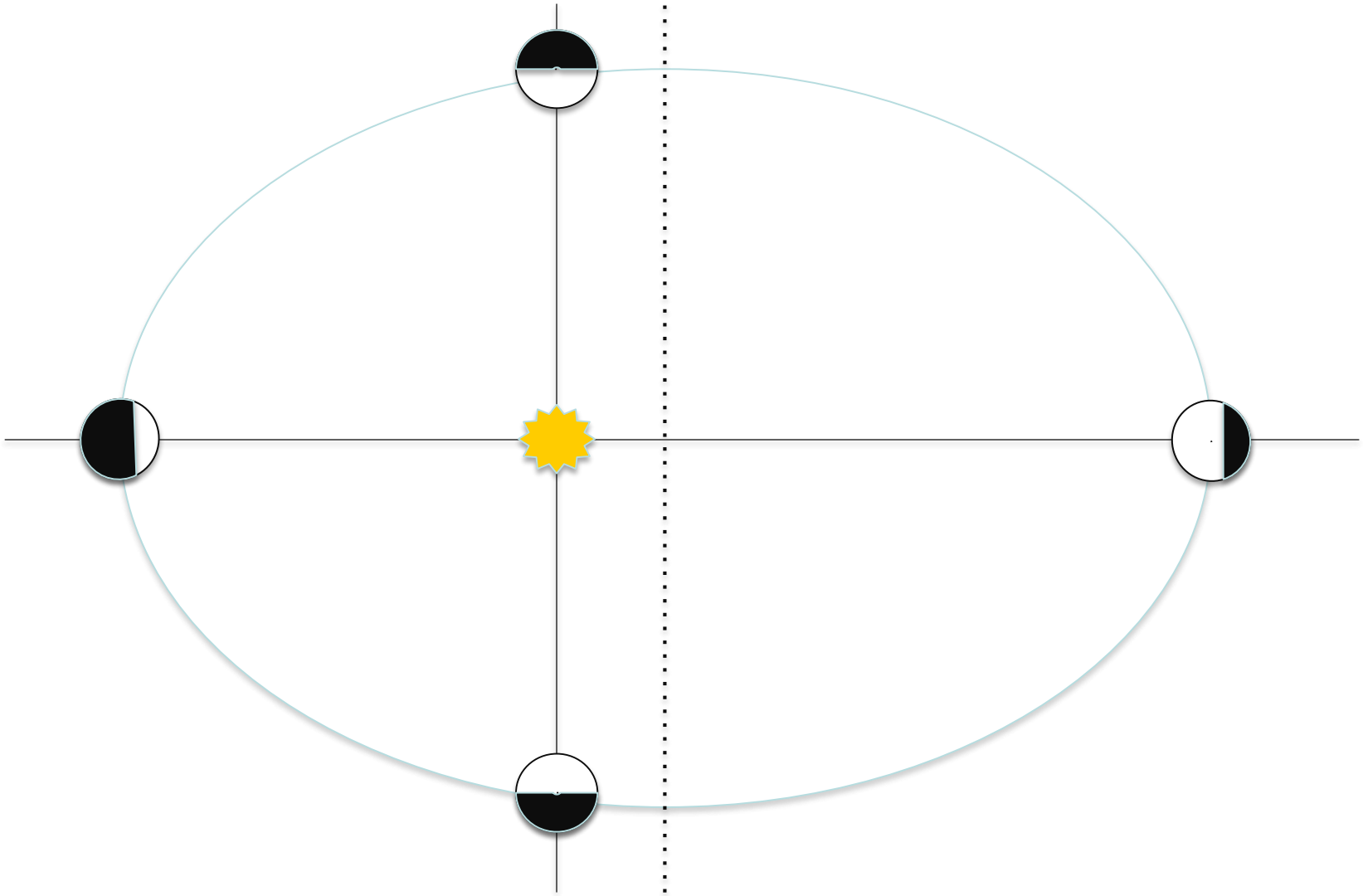


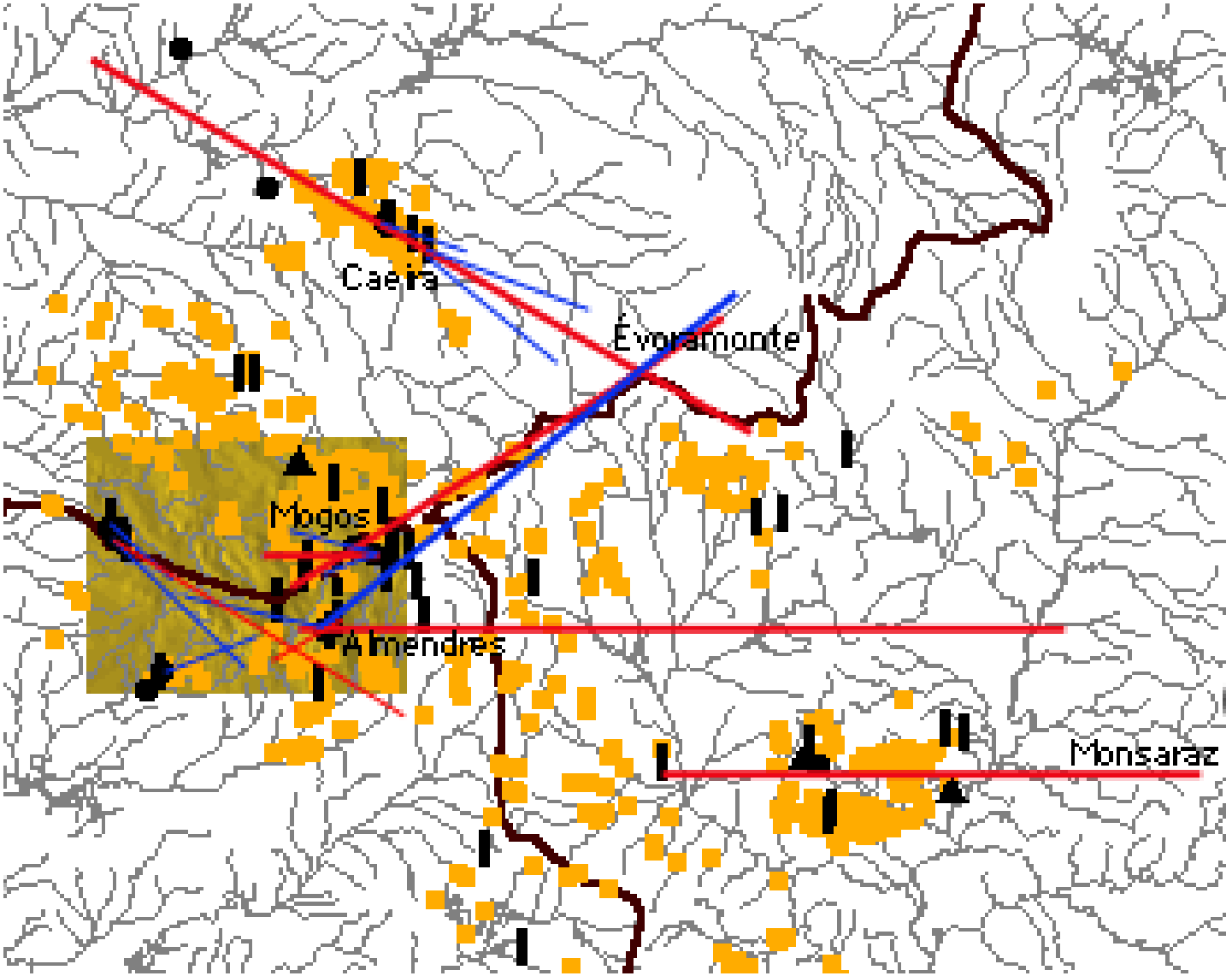
Pôr do Sol no Equinócio nos Almendres

Pôr do Sol no Equinócio nos Almendres

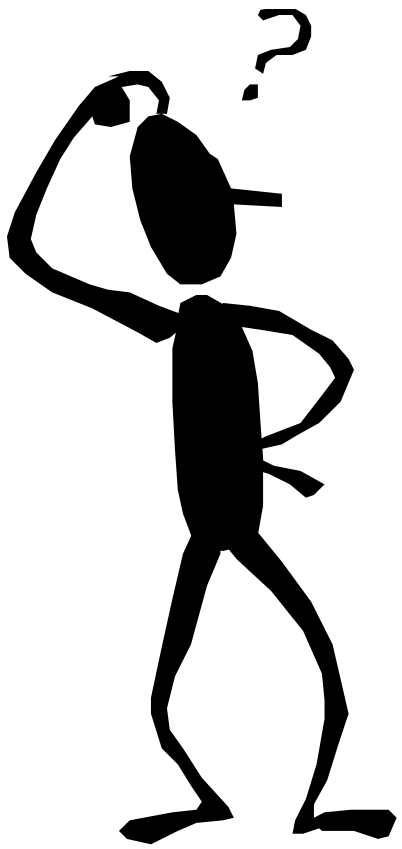
Pôr do Sol no Equinócio nos Almendres

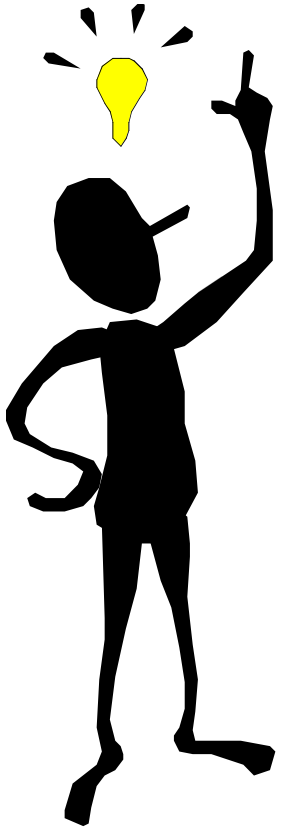


Solar and Lunar Orientations

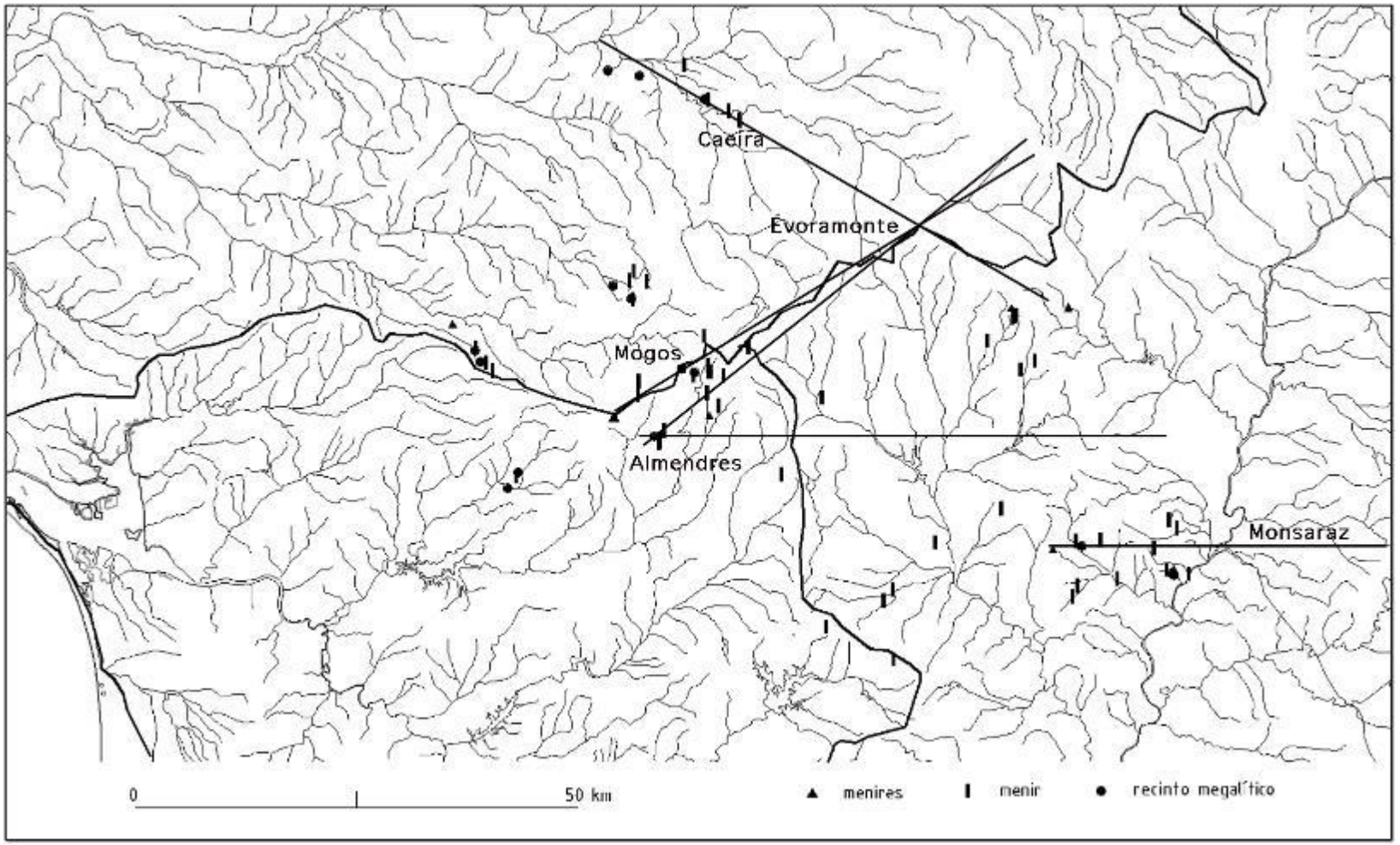


Fim





Best candidates to orientation of “archaeoastronomy” significance



Portela de Mogos - Évoramonte
Solstício de Verão (27/5/01)

Portela de Mogos - Évoramonte
Solstício de Verão (2/6/01)

Portela de Mogos - Évoramonte
Solstício de Verão (13/6/01)

Portela de Mogos - Évoramonte
Solstício de Verão (17/6/01)

Portela de Mogos - Évoramonte
Solstício de Verão (20/6/01)

Portela de Mogos - Évoramonte
Solstício de Verão (20/6/01)

Portela de Mogos - Évoramonte
Solstício de Verão (20/6/01)

Portela de Mogos - Évoramonte
Solstício de Verão (20/6/01)

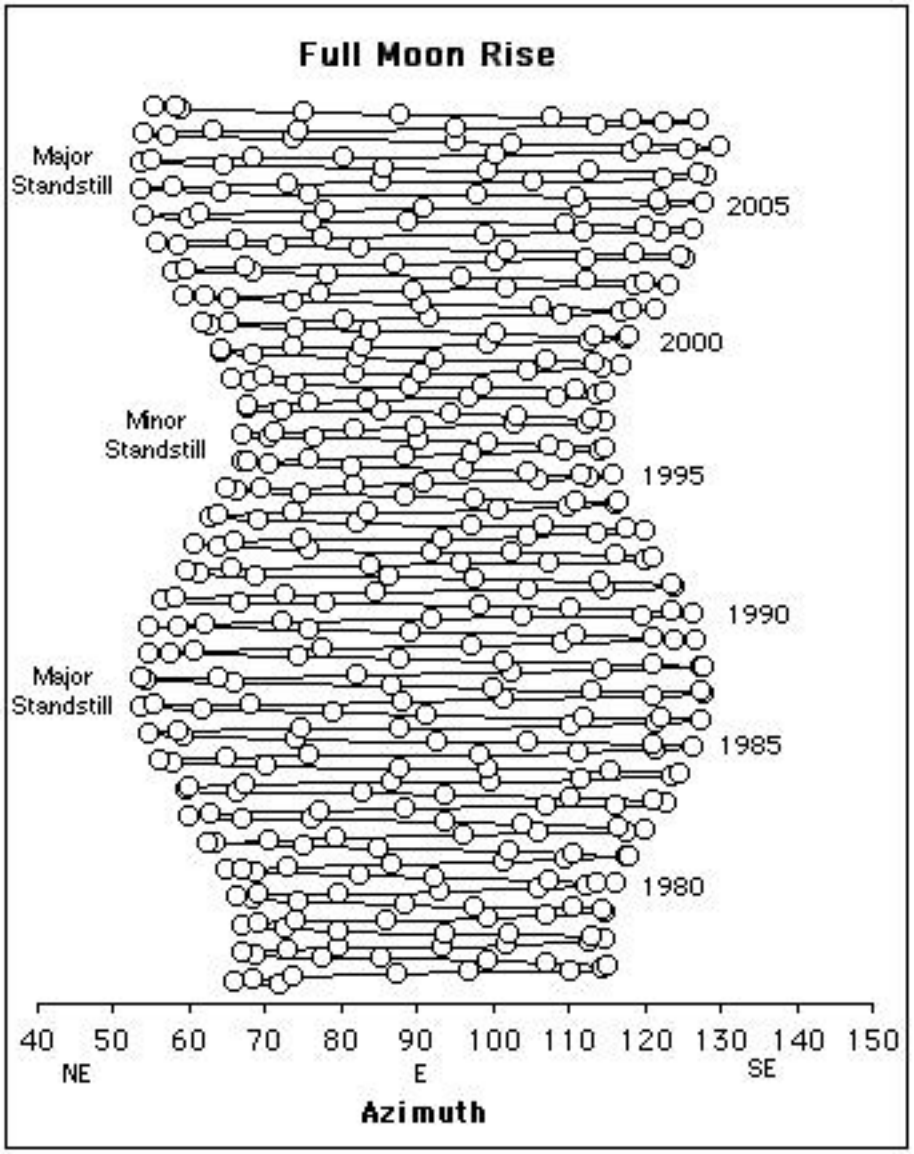
Portela de Mogos - Évoramonte
Solstício de Verão (20/6/01)

Summer solstice : Sunrise over Évoramonte

Seen from S. Sebastião da Giesteira

Azimuths of the rising Full Moon over more than one synodic cycle

(in J. of Iberian Archaeology)



The Moon rising over Évoramonte close to the Winter Major Standstill

Seen from Almendres

Geographical distribution of Dolmens in Montemor-o-Novo

(data from Leonor Rocha thesis and Catarina Oliveira thesis)
(in Revista Portuguesa de Arqueologia)

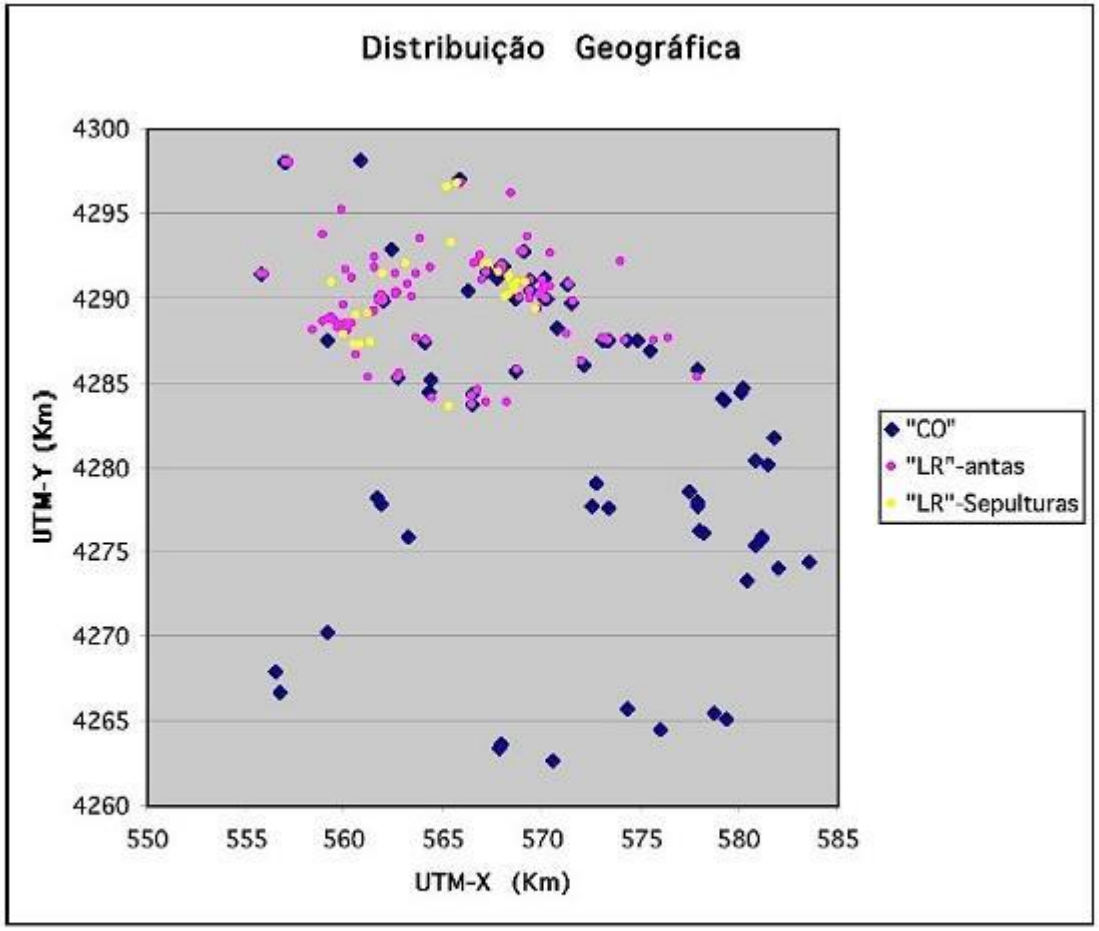
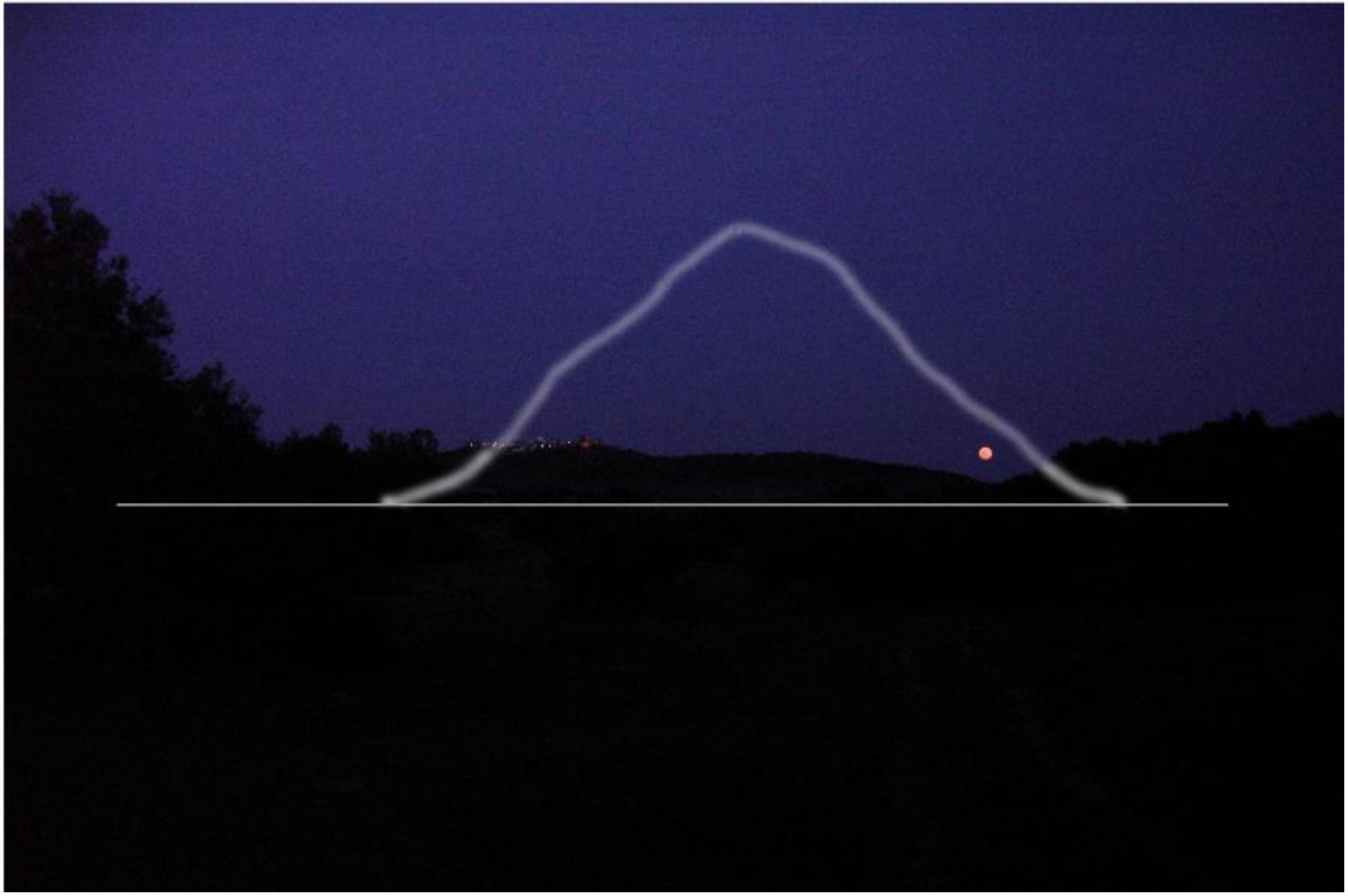
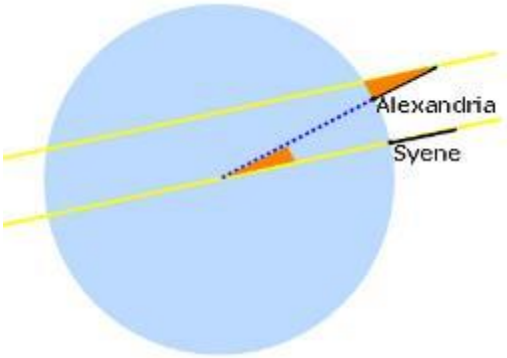


Figura 1. Distribuição geográfica dos monumentos compilados no Inventário



Time Line



PALEOLITHIC

NEOLITHIC

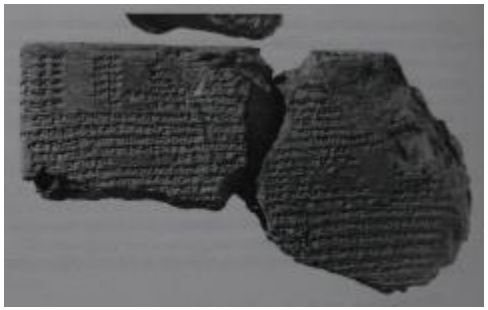
Sumerians/Babylon

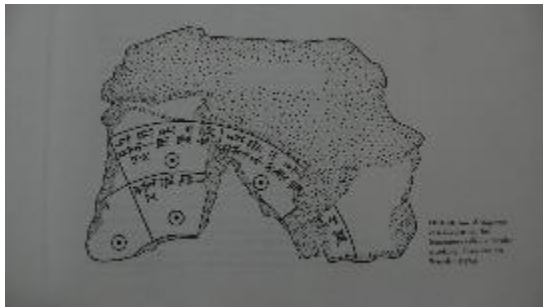
Greeks

Egyptians

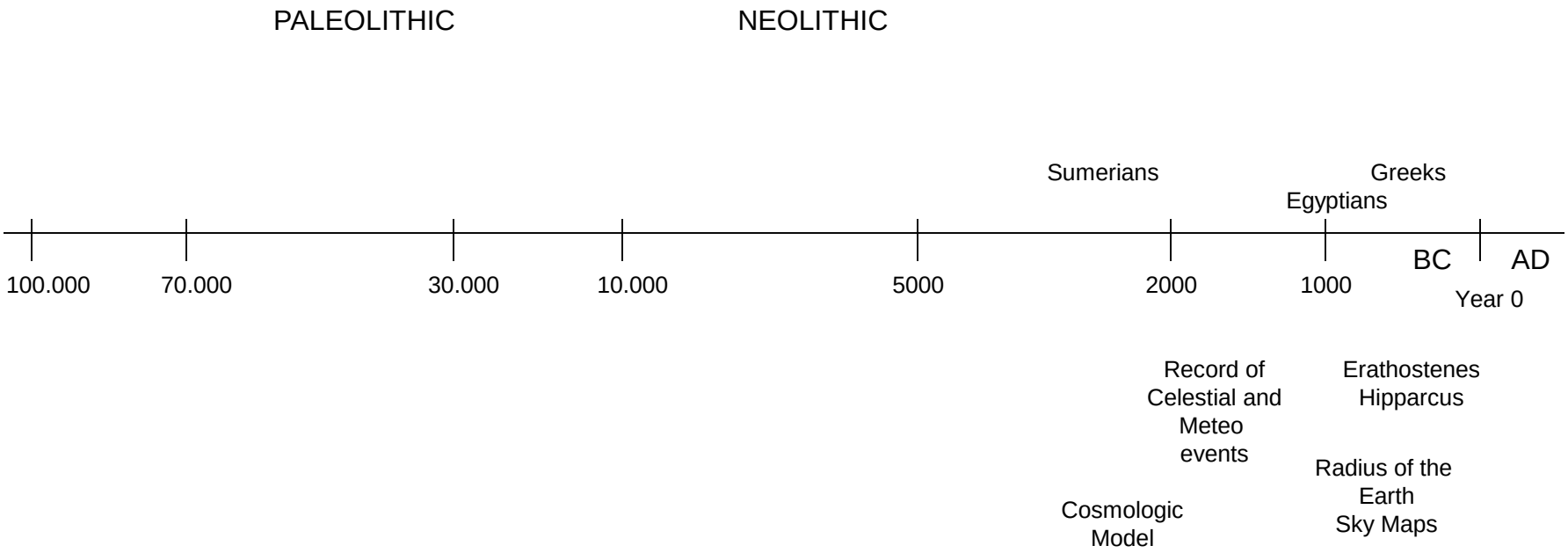
100.000 70.000 30.000 10.000 5000 2000 1000 BC AD

Year 0





Time Line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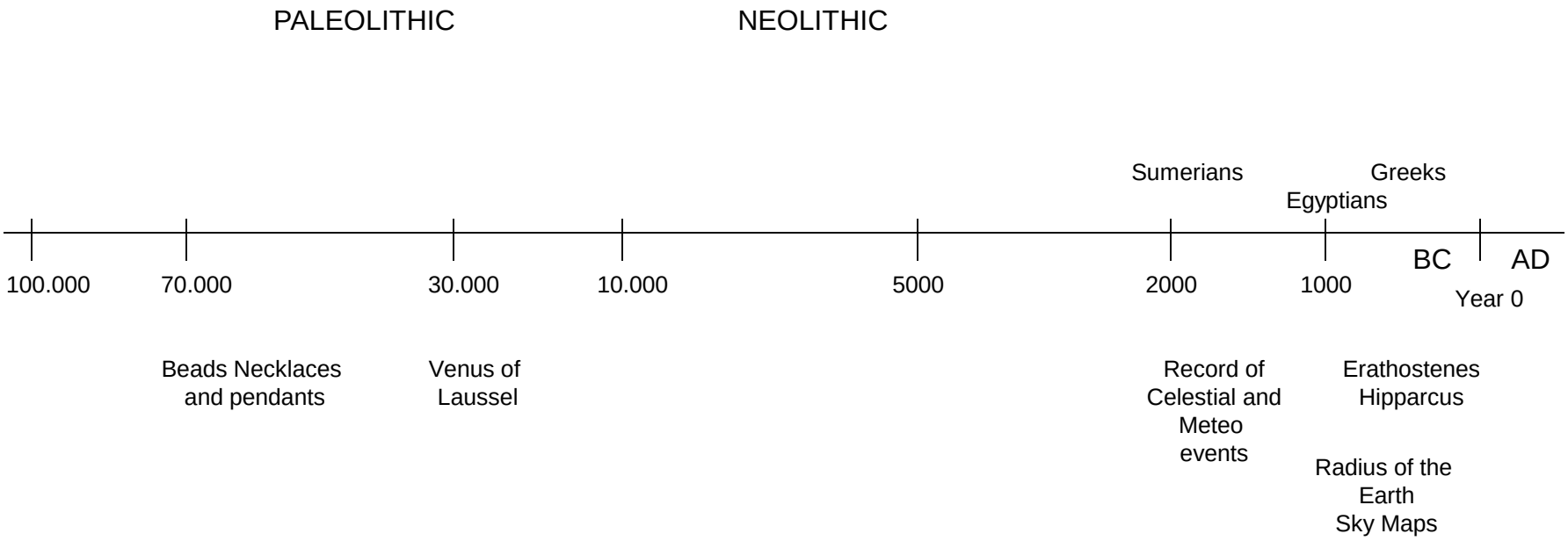
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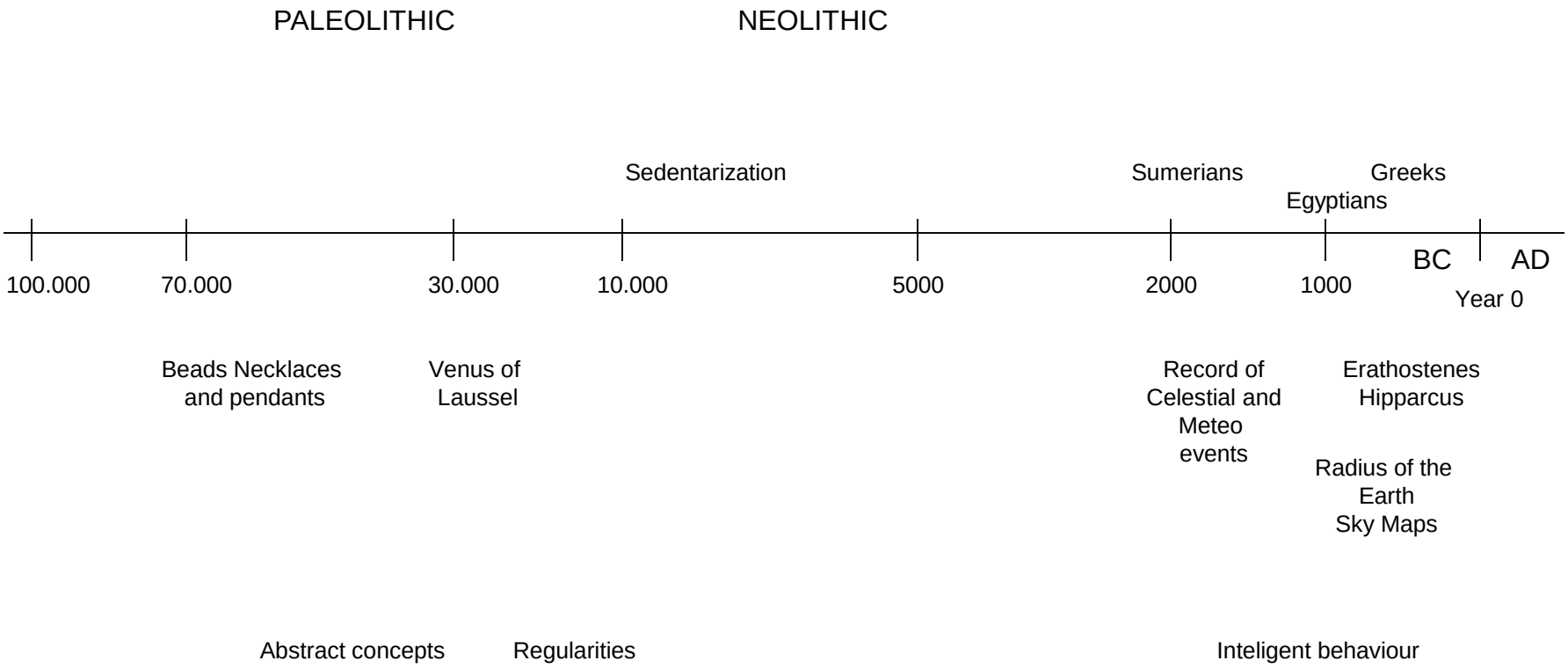
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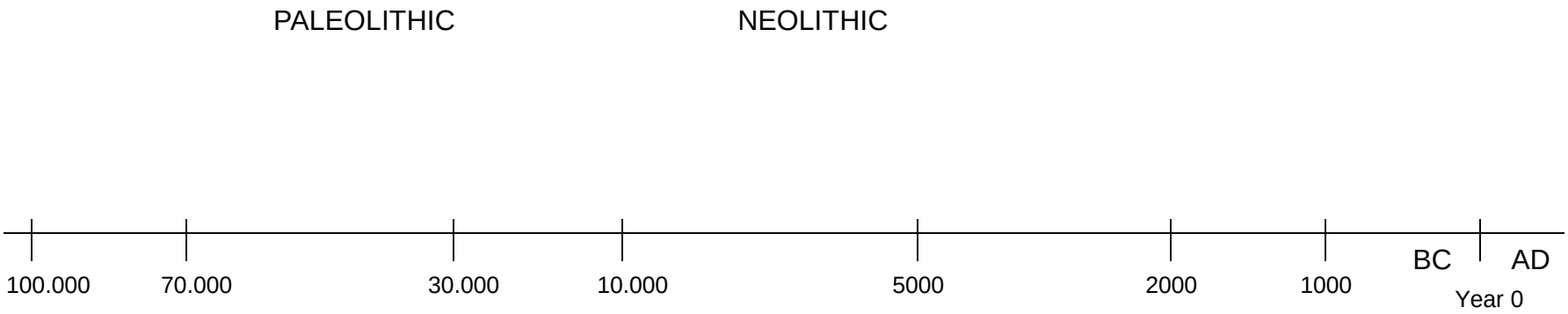
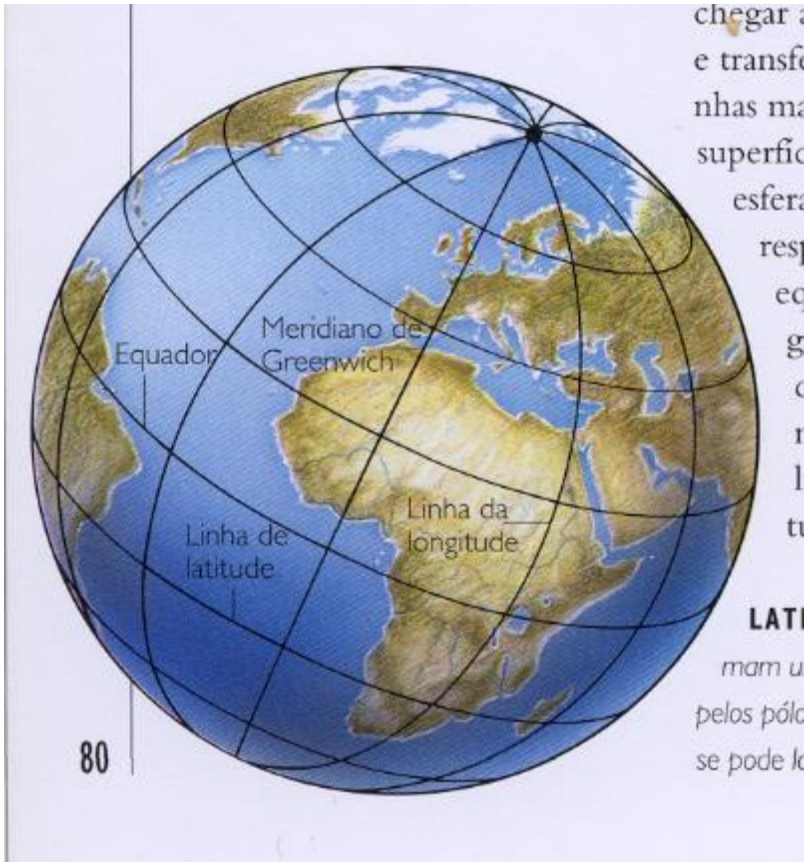

PALEOLITHIC
NEOLITHIC
100.000
70.000
30.000
10.000
5000
2000
1000
BC
AD
Year 0

Hoje !
Conceitos básicos de Astronomia

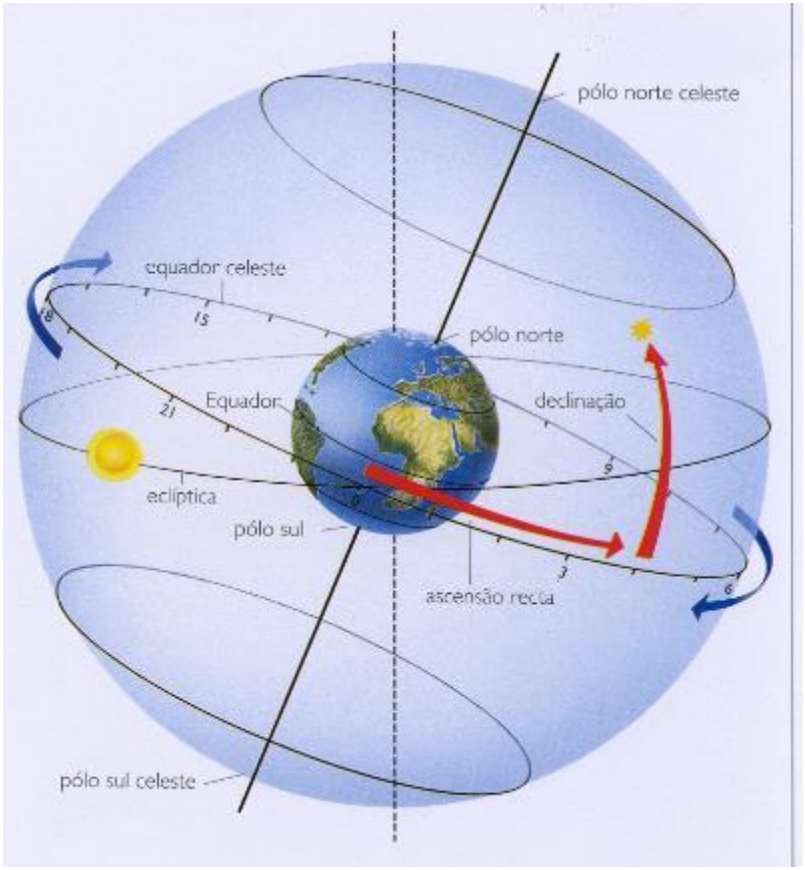
Para perceber o Neolítico

- Astronomia elementar
- Coordenadas geográficas
- Calendário (estações)



Conceitos básicos de Astronomia

- Coordenadas celestes
- Declinação
- Ângulo horário e ascensão recta
- Eclíptica



Esfera celeste local - Latitude

Menir da Courela da Casa Nova

Lines of potential astronomical relevance (in J. Iberian Arch.)

TABLE I

Line	Elongation	Conformity		Obs.
Mogos Cr.-Évoramonte	30.6±0.5	Very-Good	Sun	Summer-Solstice, Rise
Veladas m - Mogos Portela ◊	31.6±0.5	Good	Sun	Summer-Solstice, Rise
Almendres Cr.-Évoramonte	38,2±0,5	Very-Good	Lmax	Lunar MajStd-still, N,Rise
Almendres m-AlmendresCr.◊	32.0±0.5	Good	Sun	Winter-Solstice, Set
Almendres Cr. - axis.	1.0±0.5	Very-Good	Sun	Equinoctial, Rise
Almendres Cr. truncated m.◊	4.0±0.5	Very-Good	Sun	Equinoctial, Set
Almendres Cr.-S.Sebastião m	[+25]	Approximate	Lmin	Lunar MinStd-still, N,Set
Vale Maria do Meio Cr.	0.0±0.5	Good	Sun	Equinocial, Set
Idem(Moon min S)	-24±2	Approximate	Lmin	Lunar MinStd-still, S, Set
Idem(Moon min N)	+24±2	Approximate	Lmin	Lunar MinStd-still, N,Set
Tojal Cr. - axis	[+24]	Apparent	Lmin	Lunar MinStd-still, N,Rise
Tojal Cr. - Monfurado	[+24]	Approximate	Lmin	Lunar MinStd-still, N,Rise
Courela C.Nova m. - Paião	(-38.5±0.5)	Good	Lmax	Lunar MajStd-still, S,Rise
Sideral Menhir - Monfurado	[-39]	Apparent	Lmax	Lunar MajStd-still, S,Rise
Fontaínhas Cr.-Serra d'Ossa#	[-24]	*		
Caeira Menhir - Serra d'Ossa	-31.5±0.5	Good	Sun	Winter-Solstice S, Rise
Idem(Moon min S)	-24	Approximate	Lmin	Lunar MinStd-still, S,Rise
Idem(Moon min S)	-38	Approximate	Lmax	Lunar MajStd-still, S,Rise
Mt.Figueira Cr. - axis#	[-24]	Apparent	Lmin	Lunar MinStd-still, S,Rise
Perdigões - Monsaraz	[0.0±0.5]	Very-Good	Sun	Equinoctial, Rise
Mt.da Ribeira Cr.-Monsaraz	[0.0±0.5]	Very-Good	Sun	Equinoctial, Rise

◊elevated horizon; *not visible; #Plant only; Cr. = Cromlech; m=Menhir

Table I compiles a total of twenty lines : Four solsticial and five equinoctial for the Sun, and four in Major Standstill and seven in Minor Standstill for the Moon.

Landscape Ondulations

East of the Póvoa e Meada menhir

Xerez Cromlech, Monsaraz

Landscape