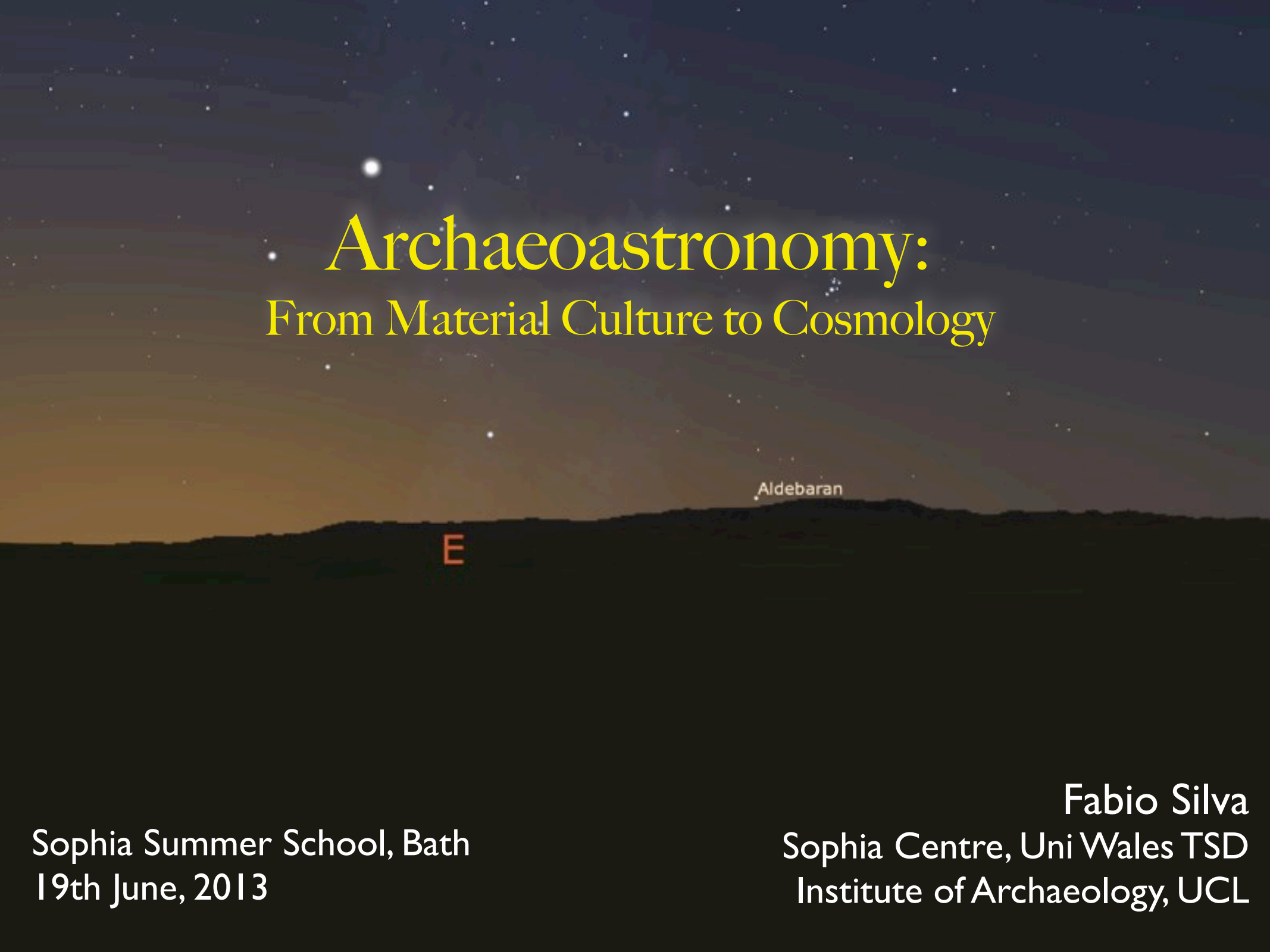




Archaeoastronomy: From Material Culture to Cosmology

Aldebaran

E

Sophia Summer School, Bath
19th June, 2013

Fabio Silva
Sophia Centre, Uni Wales TSD
Institute of Archaeology, UCL

WHAT IS ARCHAEOASTRONOMY?

One definition (Sophia Centre):

“the study of the incorporation of celestial orientation, alignments or symbolism in human **monuments and architecture.**”

Another definition (Clive Ruggles):

“the study of beliefs and practices relating to the sky **in the past**, especially in prehistory, and uses to which people’s knowledge of the skies was put.”

My proposal:

“the study of how people have understood the phenomena in the sky, how they used phenomena in the sky, and what role the sky played in their cultures, **through the study of their material remains.**”

WHAT IS ARCHAEOASTRONOMY?

“the study of how people have understood the phenomena in the sky, how they used phenomena in the sky, and what role the sky played in their cultures, **through the study of their material remains.**”

Anthropology



History

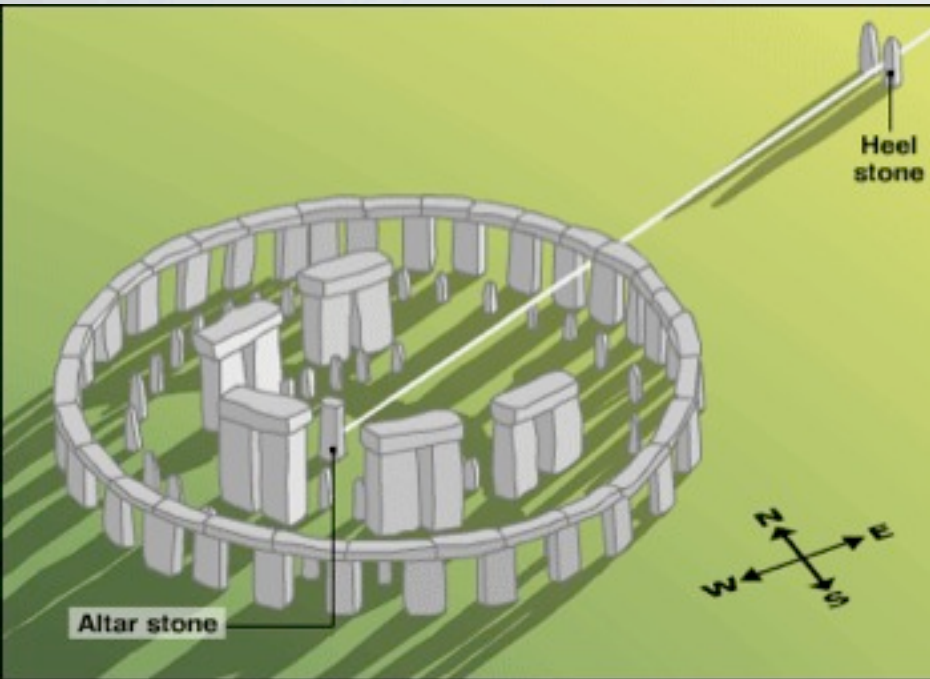


Cultural Astronomy and Astrology



Archaeology

THIS IS ARCHAEOASTRONOMY



Celestial Alignments

Newgrange on Winter Solstice

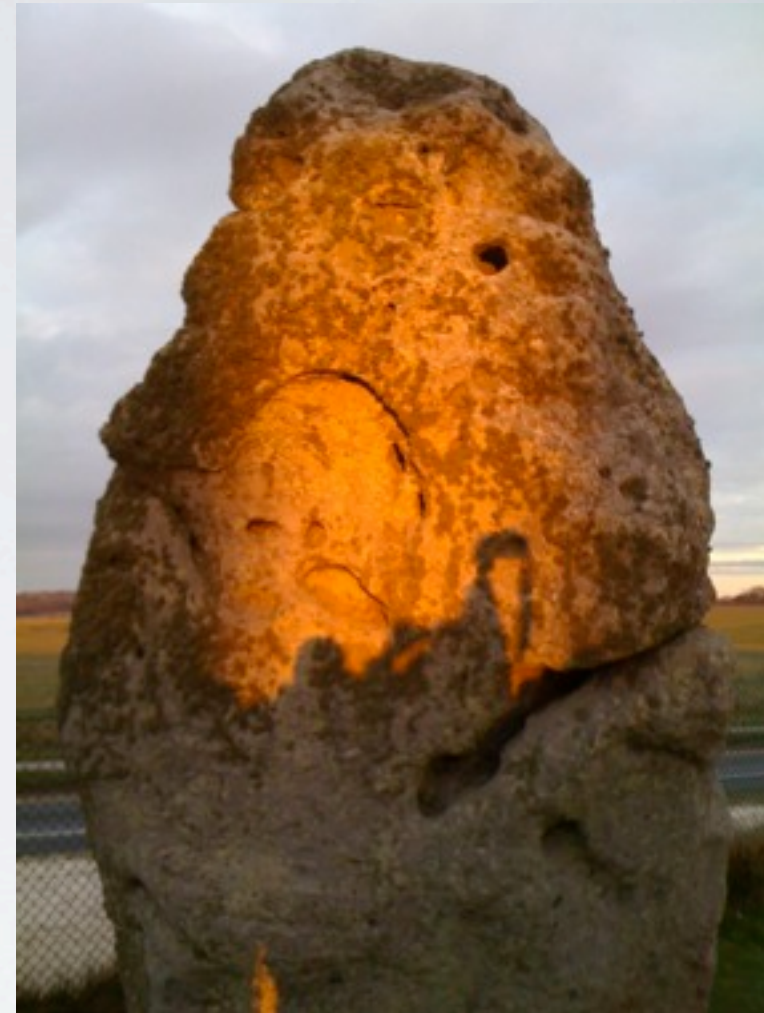
THIS IS ARCHAEOASTRONOMY

Ice Age art



Puebloan art

THIS IS ARCHAEOASTRONOMY



Photographical

Phenomenological

Experiential

THIS LECTURE'S AIM

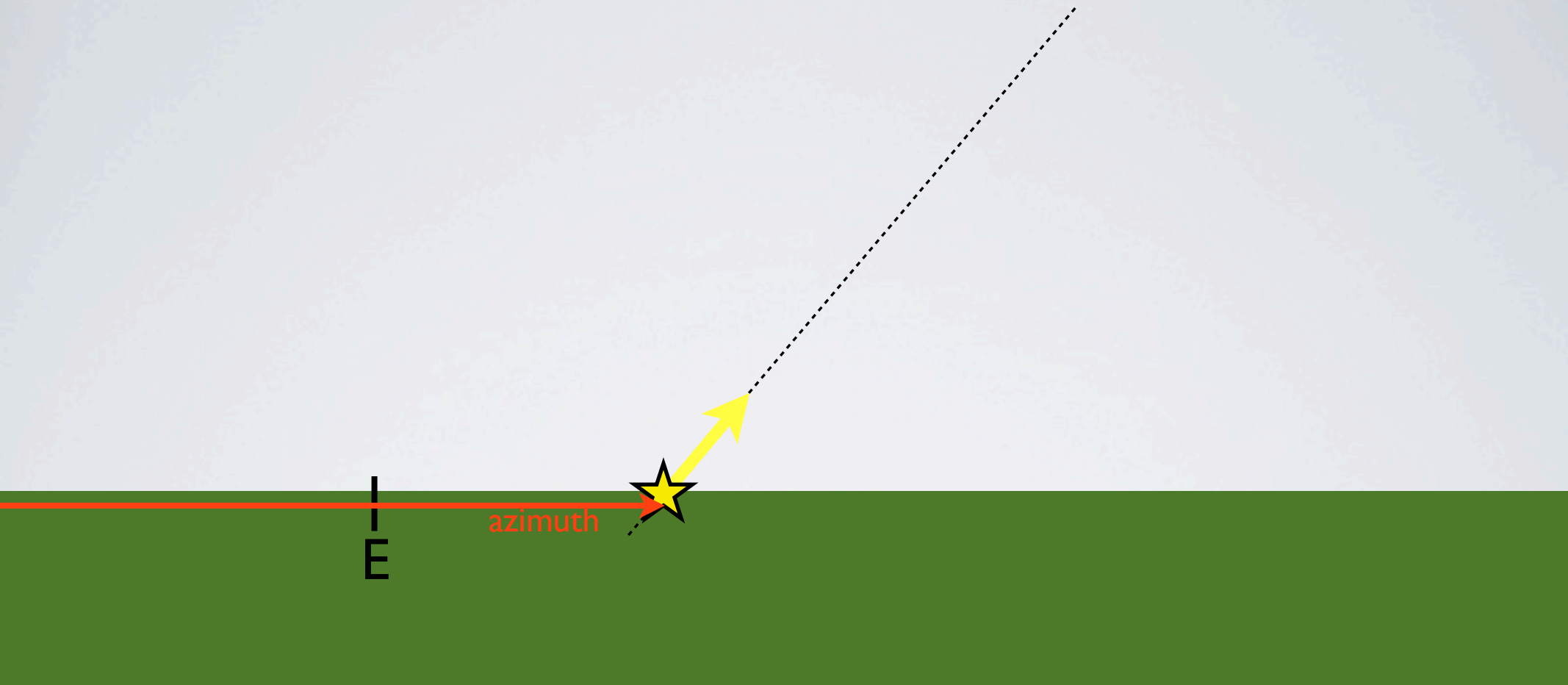
Dispel two myths about Archaeoastronomy:

- it's not just about alignments;
- it's not all about numbers, maths and stats.

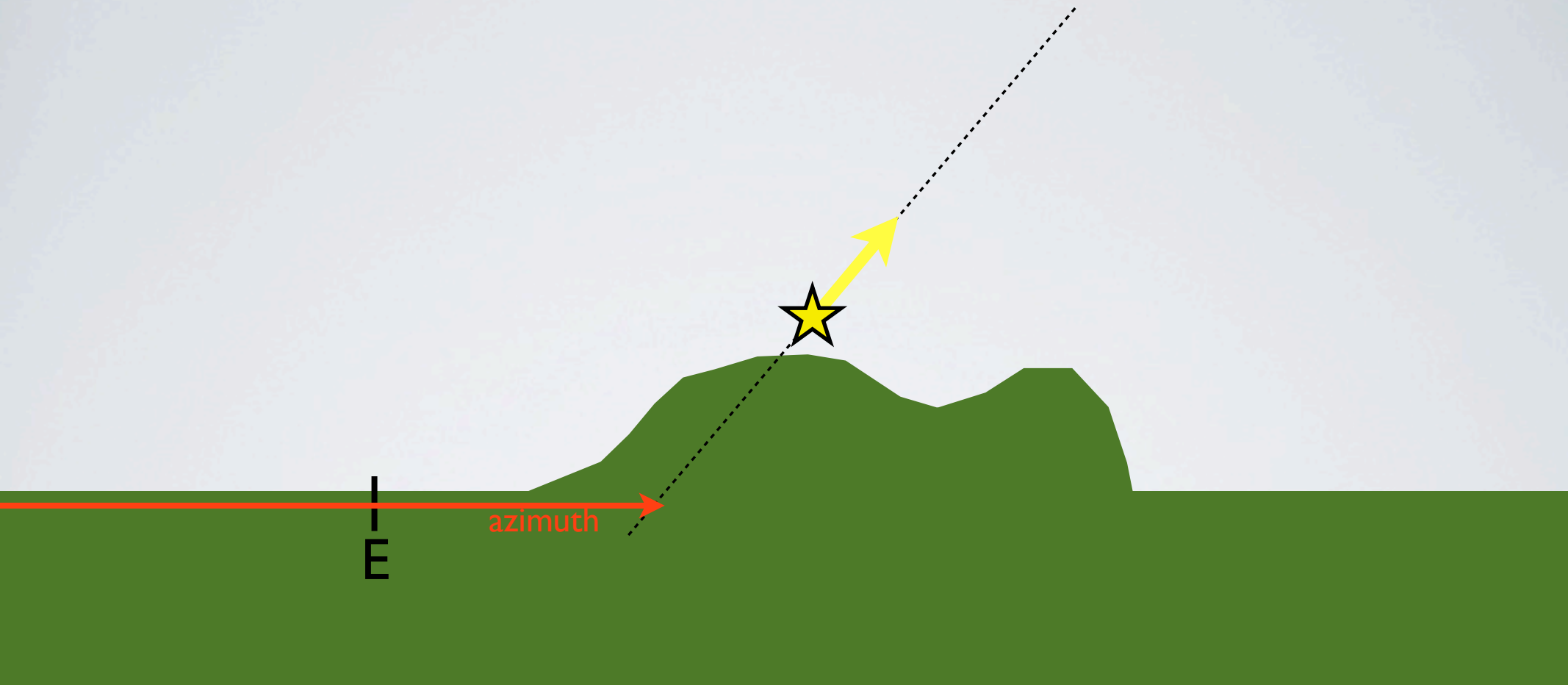
This will be illustrated by a case-study involving:

- phenomenology, as opposed to maths;
- pattern searching, as opposed to statistics;
- ethnography and folklore.

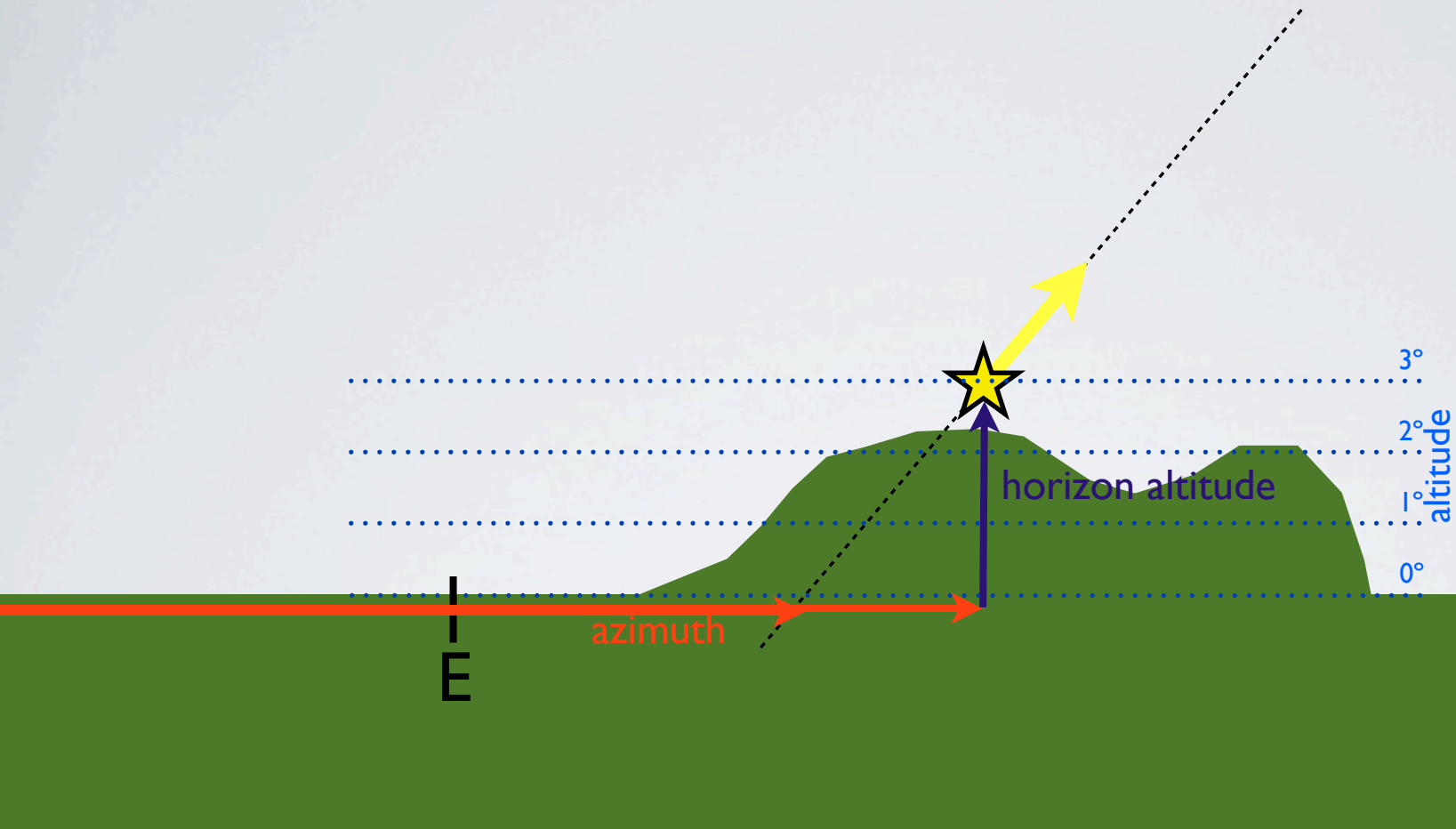
HORIZON ASTRONOMY 101



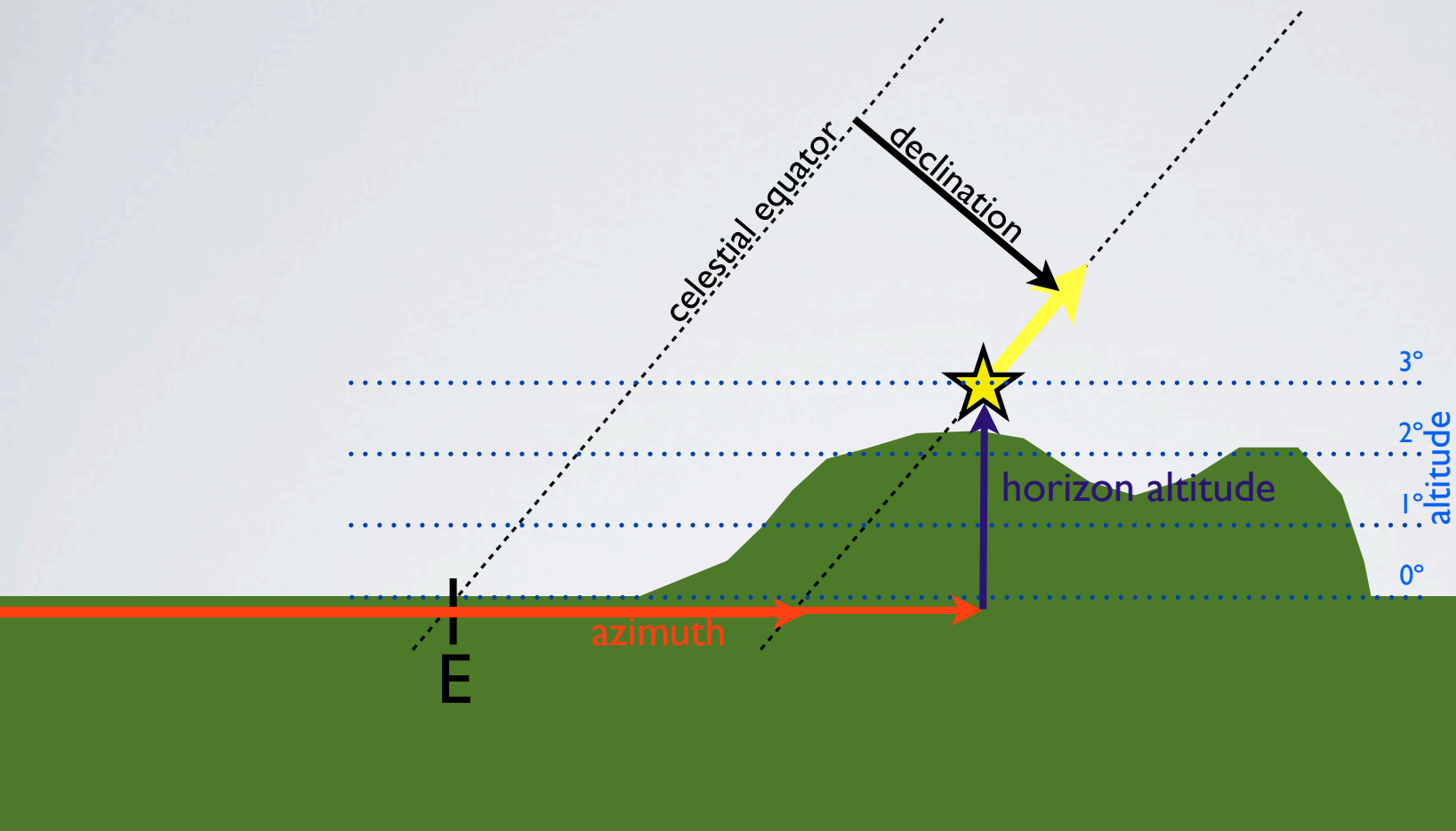
HORIZON ASTRONOMY 101



HORIZON ASTRONOMY 101



HORIZON ASTRONOMY 101



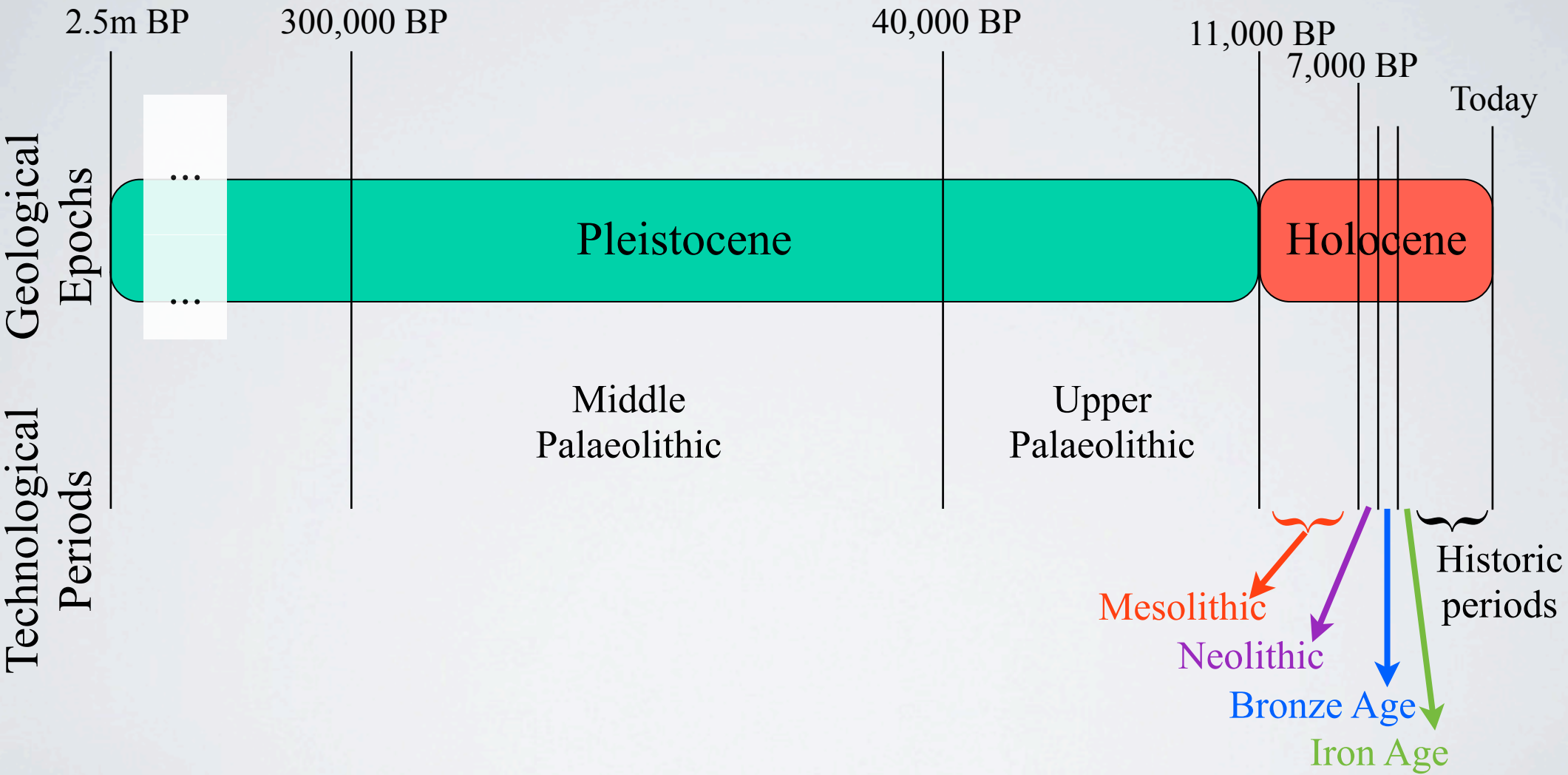
CASE STUDY

THE NEOLITHIC DOLMENS OF N PORTUGAL

CASE STUDY: LOCATION



CASE STUDY: PERIOD



CASE STUDY: PERIOD

Neolithic (started at c. 5,000 BCE)

Early Neolithic (5,000 - 4,500 BCE):

Introduction of foreign elements:

- pottery
- polished stone tools
- domesticates (animals and plants)

Anthropic landscape changes: e.g. forest clearings by fire.

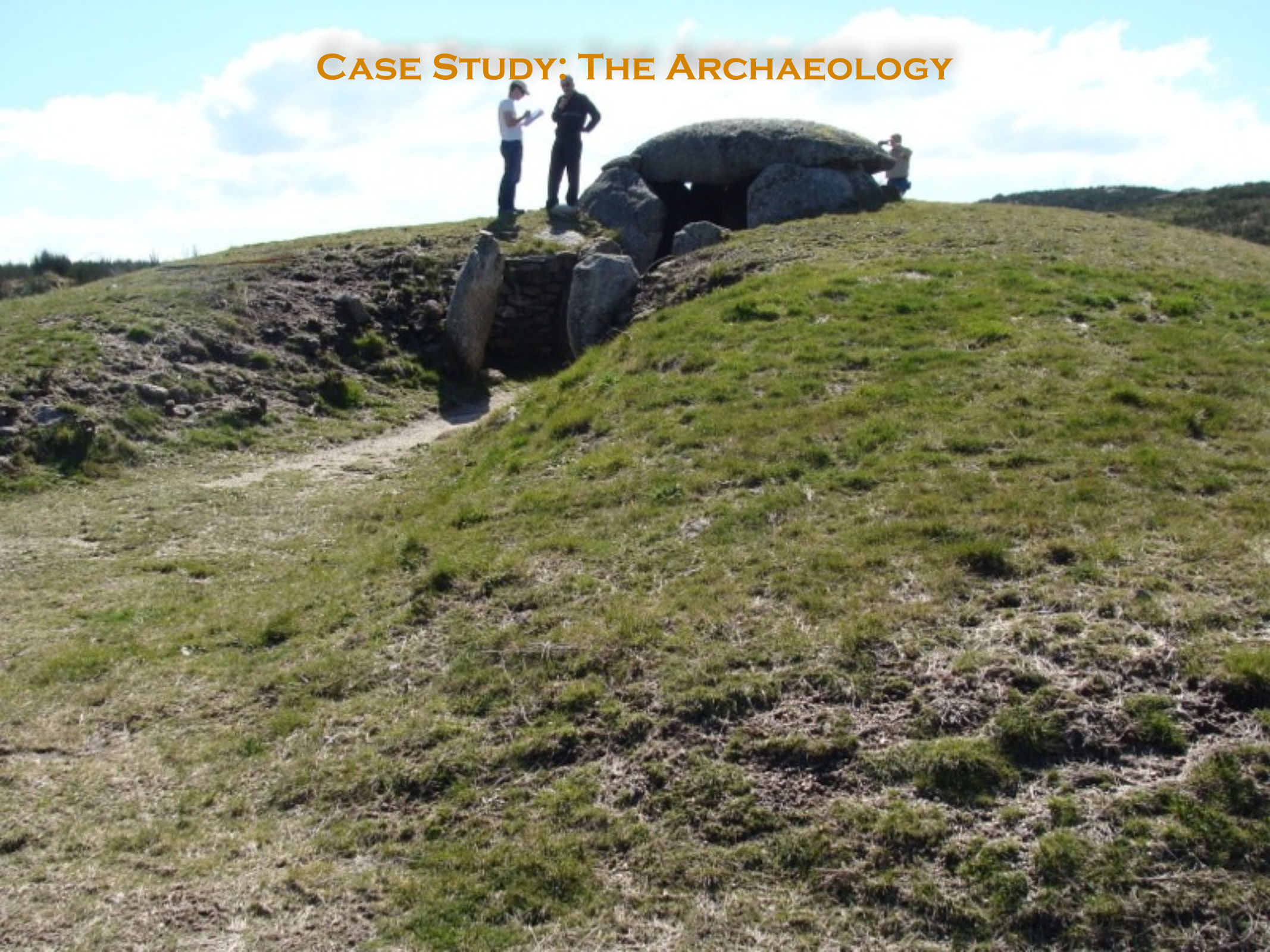
Middle Neolithic (4,300 - 3,500 BCE):

Rise of monumentality, particularly dolmens.

However:

- hunting and gathering still main form of subsistence.
- groups were more mobile, and less dependent on marine resources, than in the Mesolithic
- “boom-and-bust” farming

CASE STUDY: THE ARCHAEOLOGY



CASE STUDY: THE ARCHAEOLOGY



CASE STUDY: THE ARCHAEOLOGY



CASE STUDY: THE ARCHAEOLOGY



CASE STUDY: THE ARCHAEOLOGY



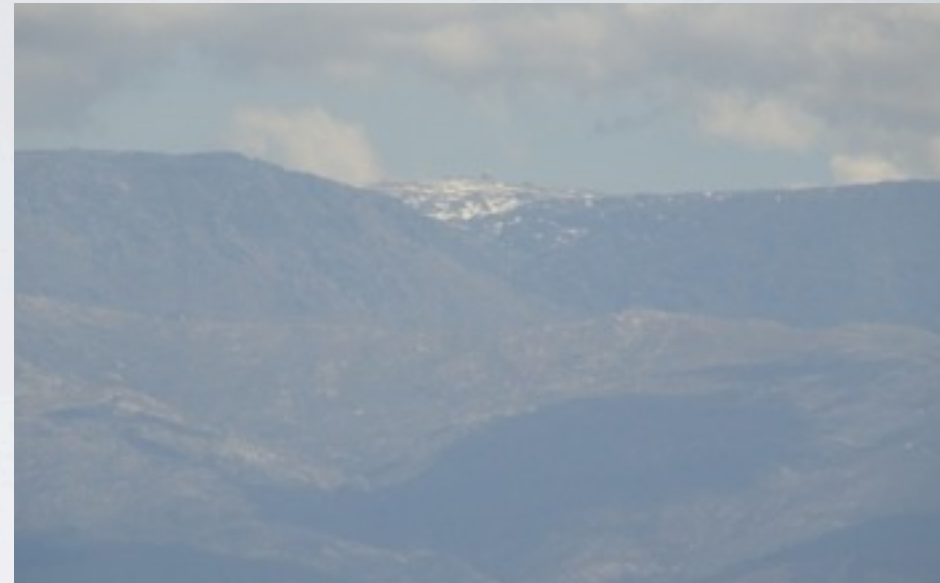
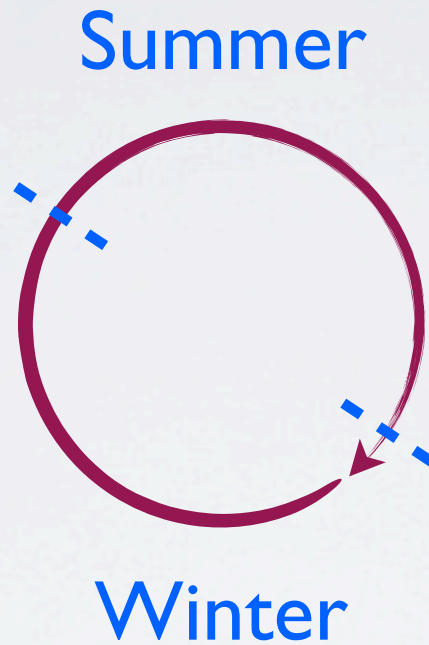
CASE STUDY: THE ARCHAEOLOGY



CASE STUDY: THE ARCHAEOLOGY

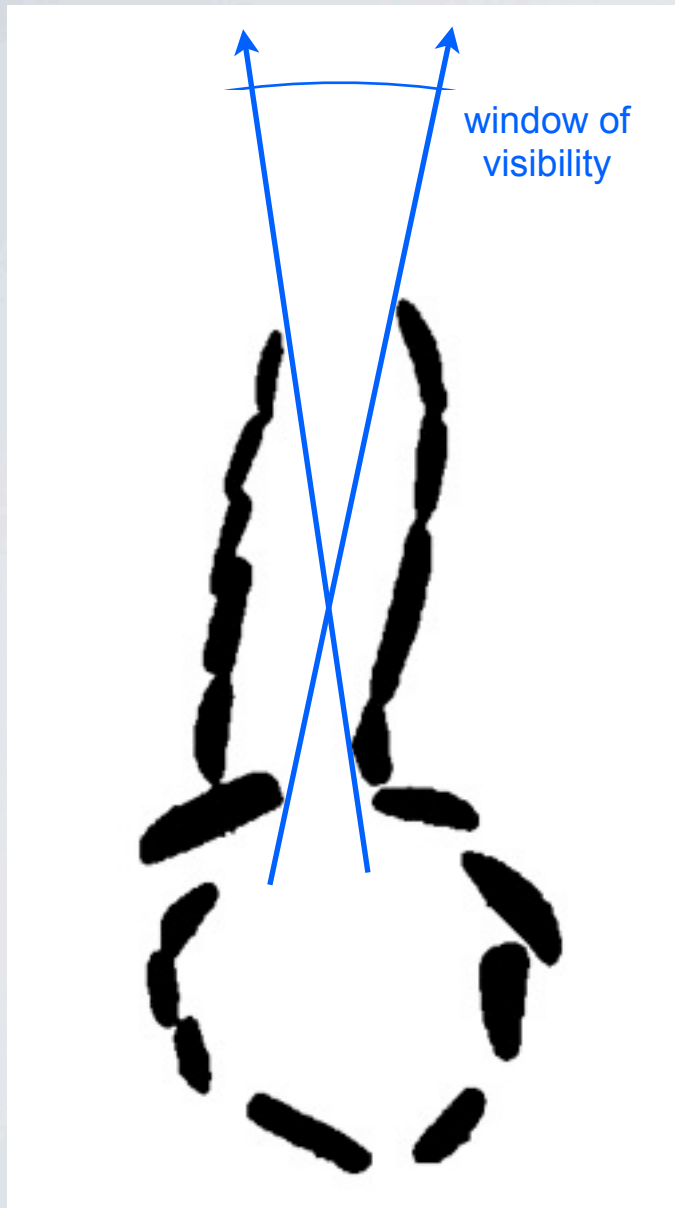


low ground



high ground

CASE STUDY: METHODOLOGY



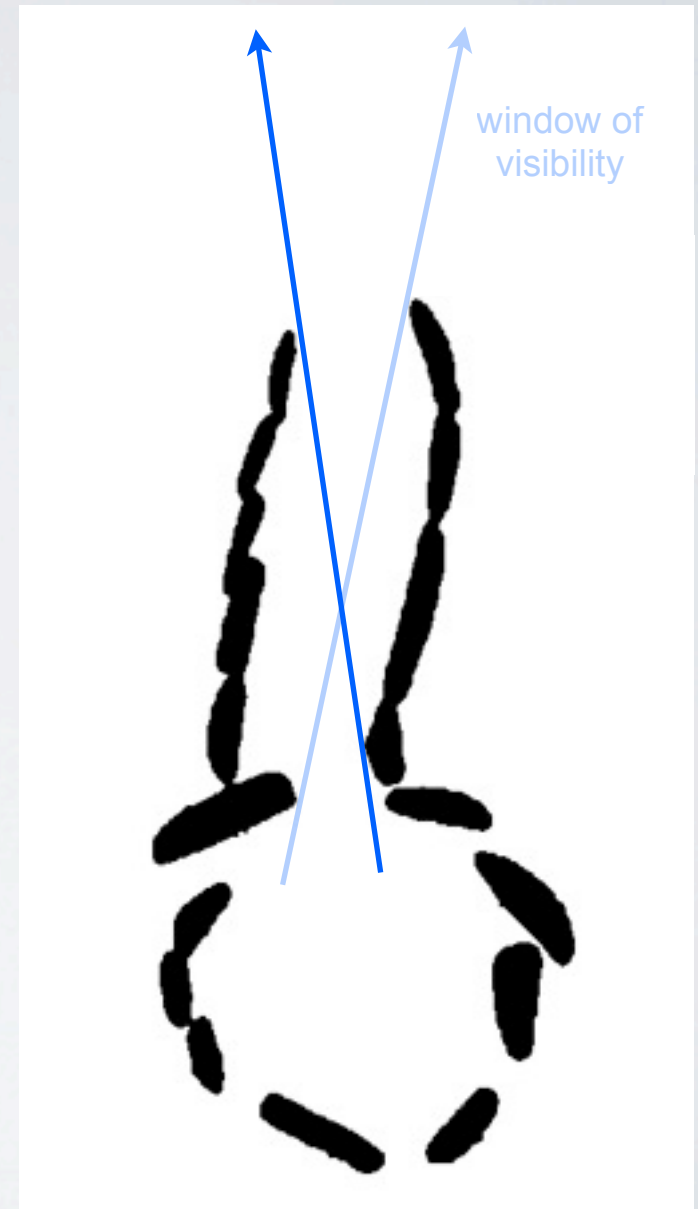
Fieldwork consisting of:

measurement of a *window of visibility*, i.e. the range of horizon visible from inside the dolmen's chamber.

This was achieved by measuring the diagonals of the corridor (blue lines in figure), using a compass.

Plus, accurate site coordinates (Lat, Lon) using a GPS handheld.

CASE STUDY: METHODOLOGY



CASE STUDY: LANDSCAPE AND THE HORIZON



Serra da Estrela

Dolmen chamber
(now destroyed)

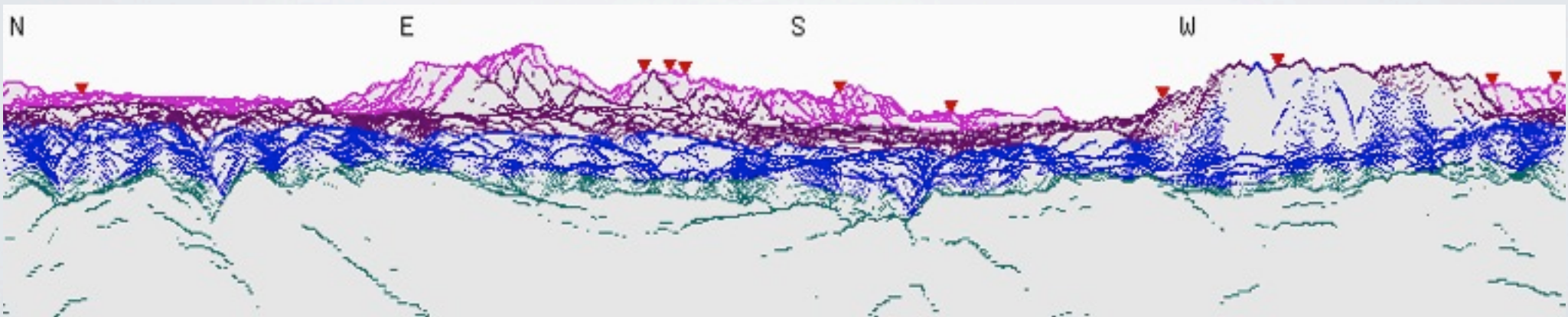
Extent of *tumulus*

CASE STUDY: LANDSCAPE AND THE HORIZON

Tree cover prevented *in situ* observation of horizon in most cases.

Use www.heywhatsthat.com to reconstruct vegetation-free horizon.

Anta da Arquinha da Moira

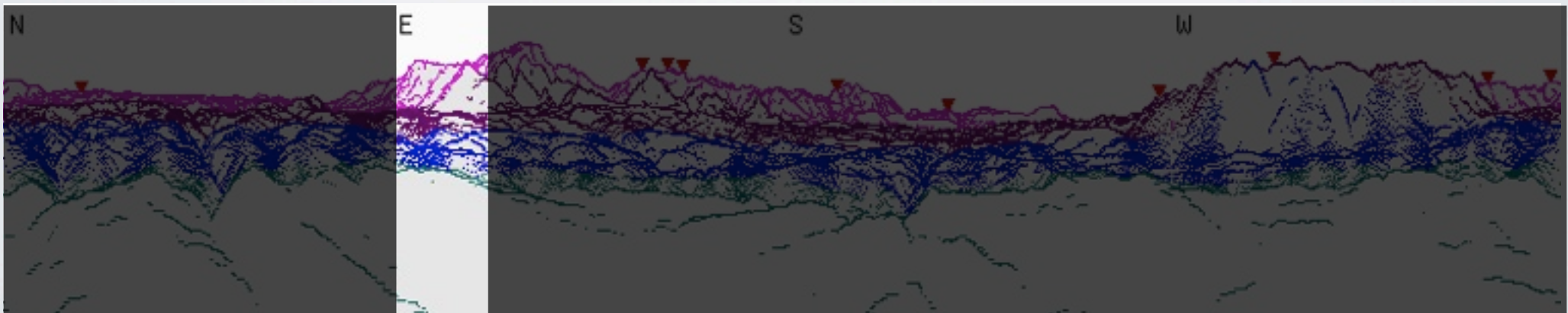


CASE STUDY: LANDSCAPE AND THE HORIZON

Tree cover prevented *in situ* observation of horizon in most cases.

Use www.heywhatsthat.com to reconstruct vegetation-free horizon.

Anta da Arquinha da Moira

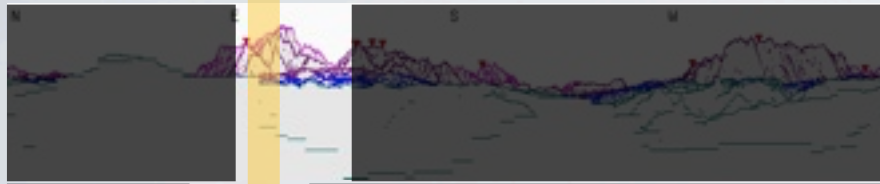


↑
window of visibility

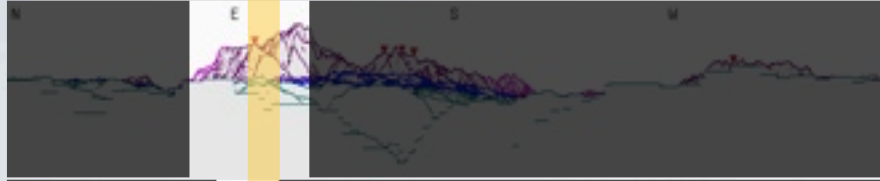
CASE STUDY: LANDSCAPE AND THE HORIZON



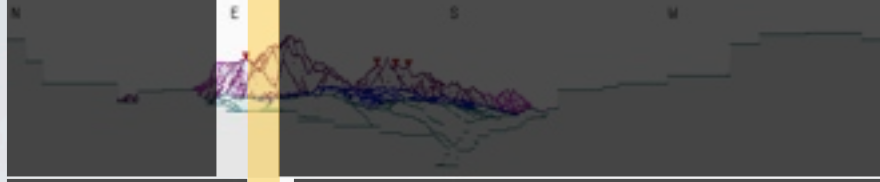
Orca das Pramelas



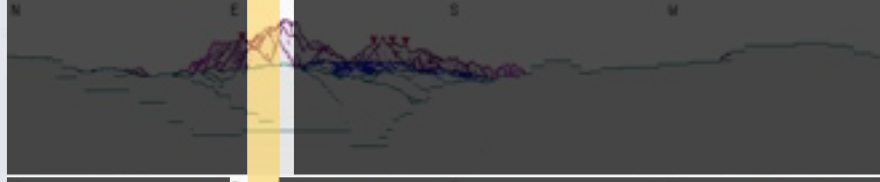
Orca de St Tisco



Orca do Outeiro do Rato



Orca do Santo



Dolmen da Orca



Anta da Arquinha da Moira

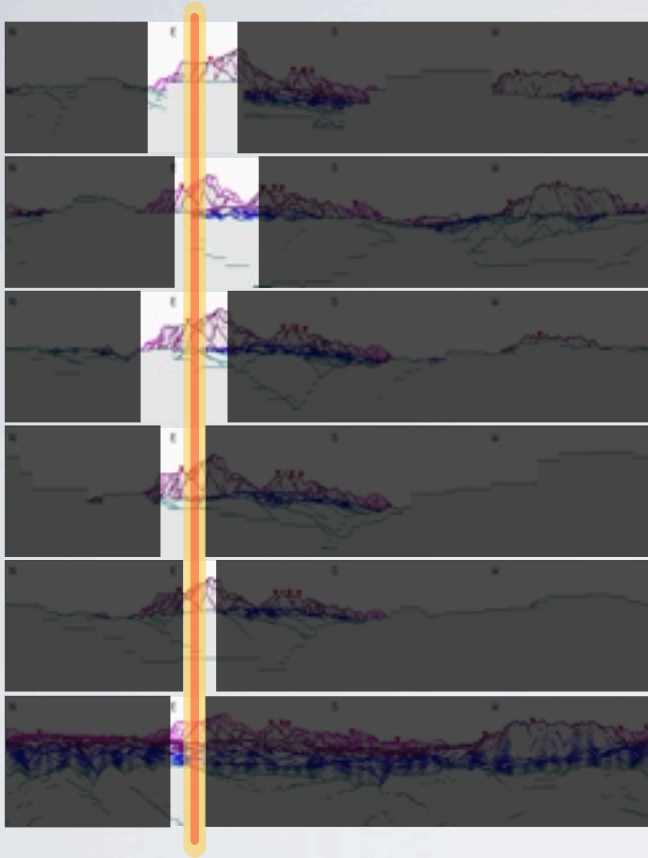
↑ pattern: azimuths ranging from 98° to 111°
horizon altitude between 2° and 2.5°

CASE STUDY: STELLARIUM

Use Planetarium software to reconstruct ancient skies.

E.g. Stellarium

CASE STUDY: ALDEBARAN



↑
Aldebaran rising 4,300-3,700 BCE

	4,300 BCE	3,700 BCE
Heliacal Rising	~ 18th April	~ 27th April

Aldebaran's heliacal rising occurred roughly one month after the spring equinox, just as spring starts to reinvigorate the landscape.

This astronomical event could then mark “spring”, or the start of the warm half of the year, and the Neolithic move to higher pastures.

Not unlike Ancient Egyptians (Sirius) or contemporary Amazonian peoples (Pleiades).

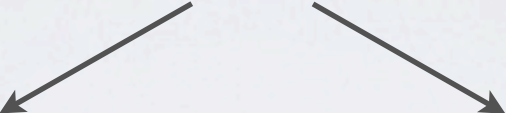
CASE STUDY: CONCLUSIONS

To conclude the analysis of fieldwork results, one can say that the following narrative was reconstructed from the archaeological record:

- The Neolithic monuments of the *Mondego* valley, built in the period 4,300 - 3,700 cal BC, show a preference for locations from which *Serra da Estrela*, containing the highest peak in continental Portugal and the very source of the *Mondego* river, can be seen.
- From within the chambers of these dolmens it would be possible to see the star Aldebaran rise above *Serra da Estrela*. Around 4,000 cal BC, this star would disappear from the night-sky at the end of February/beginning of March. It would then reappear in the eastern sky at dawn before sunrise in late April, just as spring was starting to reinvigorate the landscape.
- This was when these Neolithic communities would “follow this star” and transition to the high pastures of the mountain range it illuminates.

CASE STUDY: CONCLUSIONS?

But this is not the end of the story...



Why *Serra da Estrela*
(Star mountain range) ?

Why align the dolmens?

CASE STUDY: FOLKLORE

“People say that the name *Serra da Estrela* was given in the olden days by a shepherd living in an unknown place in the *Mondego* valley. He spent his nights contemplating a star that was so bright that it illuminated the top of a nearby mountain range. He decided to take his faithful dog and follow the scintillating light that attracted him so much. After climbing for many days they reached the peak. Impressed by the luminosity of the star the shepherd told his dog: “to this place that seems to be favoured by the celestial objects [*astros*] I will name *Serra da Estrela*, and to you that accompanied me I’ll give the same name.”



Tilley said that the ‘building of the monuments prevented the ritual and mythological significance of particular places being lost and forgotten’ (1994: 204). The reverse seems to also be possible: the folktale preserved the link between star and mountain range that was only visible from across the *Mondego* valley where the *Carregal do Sal* dolmens lie.

CASE STUDY: SOME VARIATIONS

Some versions continue the story of our shepherd and his Star:

“The star then descended from the heavens and took the shape of a woman. Together, both shepherd and Star lived happily in the hills of *Serra da Estrela*. A king heard of this story and coveted the Star for himself. He sent for the shepherd and asked/ordered him to give him the most beautiful Star in exchange for wealth. The shepherd refused.”

In some versions the story ends here, in others the Star, having “witnessed first-hand the greed of men”, returns to her celestial form and rises again into the sky.”

The Christian version (or interpretation?) of this folk tale, has Mary appear to a shepherd on *Serra da Estrela*, in the form of Our Lady of the Good Star (depicted on the right), patroness of shepherds.



CASE STUDY: OUR LADY OF THE GOOD STAR



CASE STUDY: OUR LADY OF THE GOOD STAR

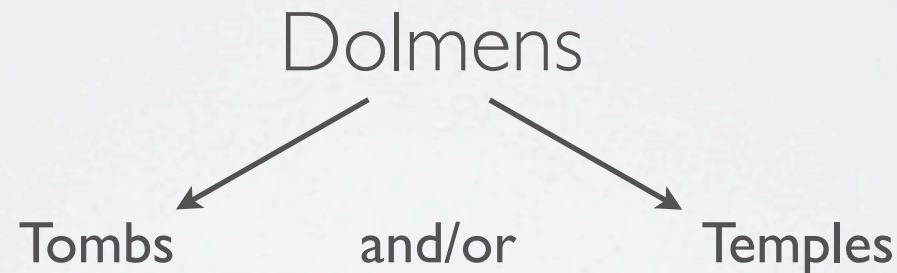


CASE STUDY: WHY ALIGN A MONUMENT?

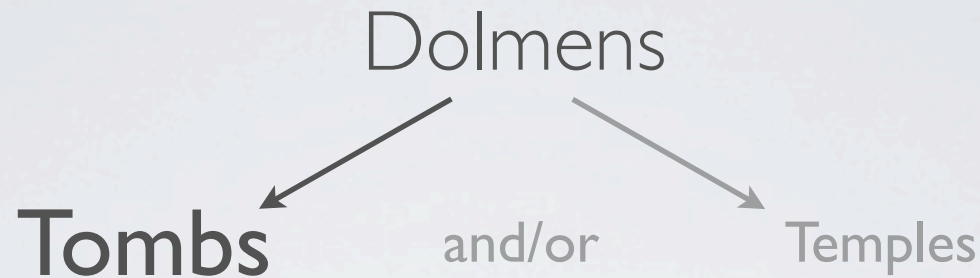
But the observed alignment is still unexplained !!!

There is no need to build a monumental structure, and embed a celestial alignment, to watch the heliacal rise of a star.

Why, then, did Neolithic Iberians went to all this effort?



CASE STUDY: WHY ALIGN A MONUMENT?



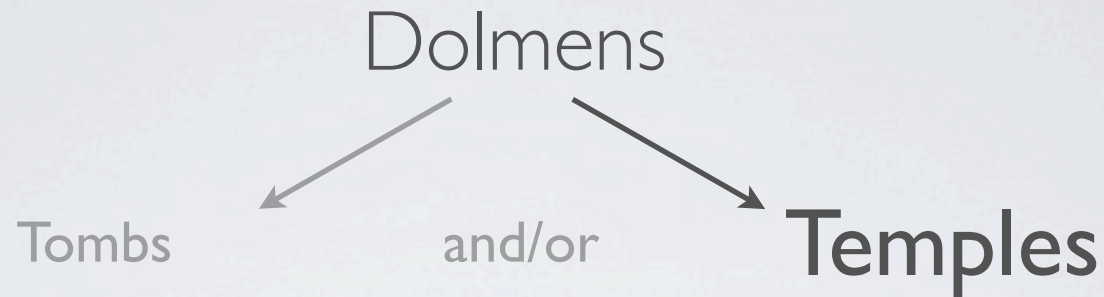
Was Aldebaran the abode of dead ancestors or their escort to the afterlife?

Was the star meant to take care of the buried ancestors, while the living went away for the summer?

Was it a beacon so the ancestors would know where the living had moved to, maybe even to ensure fertility of the high pastures of *Serra da Estrela* during the warm half of the year?

Or was the star a beacon for the ancestors to move to *Serra da Estrela* too, thus ensuring that the seasonality that marked their life was continued in the afterlife?

CASE STUDY: WHY ALIGN A MONUMENT?



Was the heliacal rising of Aldebaran a trigger for any ceremonies at the dolmens?

Could the dolmens have been used as initiation chambers?

If so, was the observation of the heliacal rising part of the “secret knowledge” being transmitted?

CONCLUSION

Archaeoastronomy is more than simply collecting measurements and using advanced maths to analyze (deconstruct?) them.

It is, particularly in the absence of other records, the only means of access to a society's celestial beliefs and related practices.

It is a broad field encompassing many varied analytical approaches, but deeply rooted in fieldwork and material culture (i.e. rooted in Archaeology).

-X-

Statistics and other mathematical approaches have been a great help in disproving the “null hypothesis” (i.e. that the sky was not important for prehistoric societies), but recently they have become more of a burden.

New views, approaches and methodologies are needed, and interpretation needs a more rigorous foundation in culture.

In sum: **ARCHAEOASTRONOMY NEEDS YOU!**