

29th General Assembly – Division C, Honolulu (Hi), 08/10/2015

# **A new neolithic circular enclosure in Central Germany**

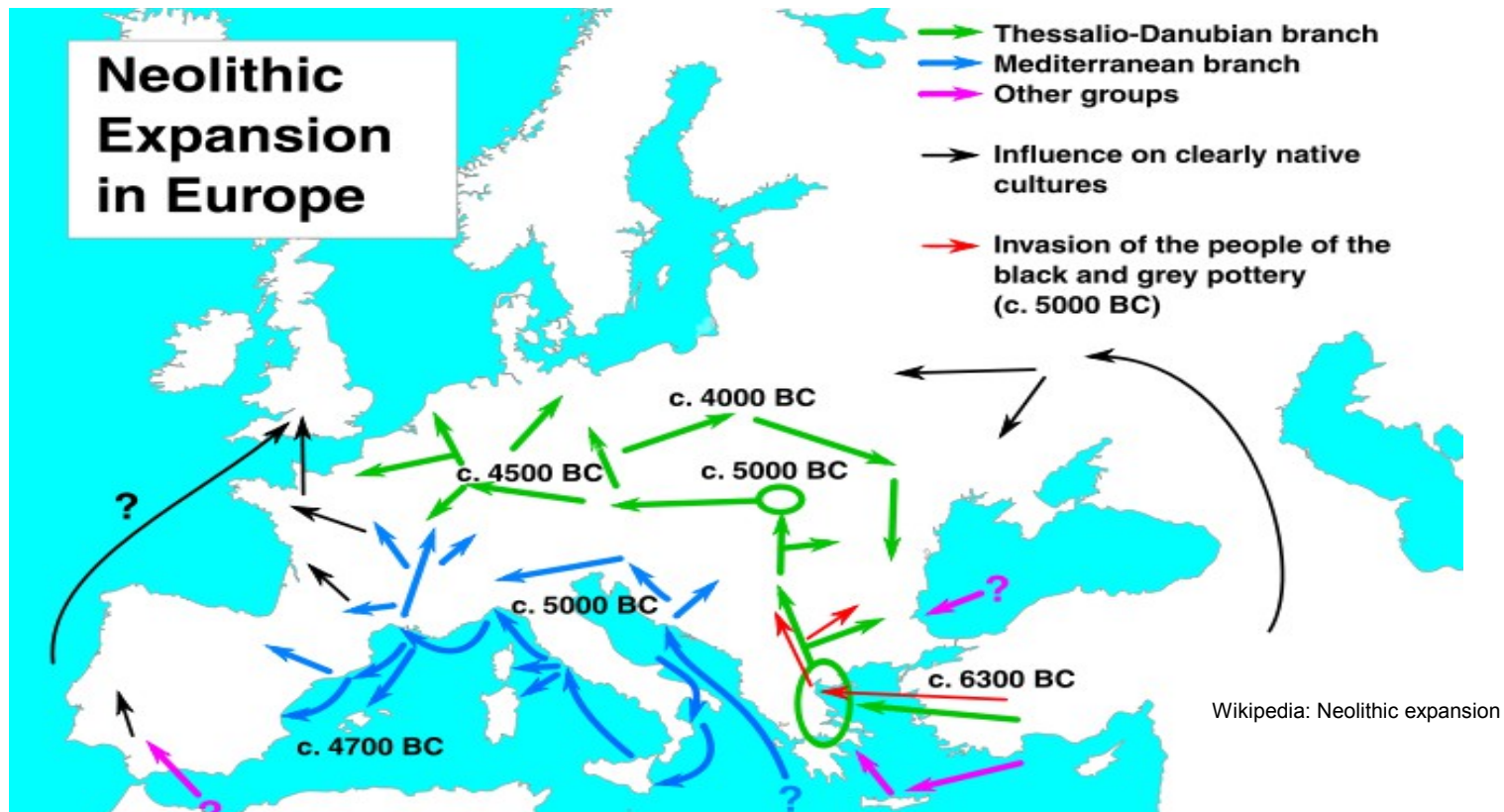


Olaf Kretzer

Observatory with Planetarium Suhl, Germany

# How it began: Neolithic expansion

- 5000 years B.C. there were significant changes in the colonization of central Europe – also called **neolithic expansion**
- The **background of immigrants** who came to Europe from the South-East is **still largely unknown**

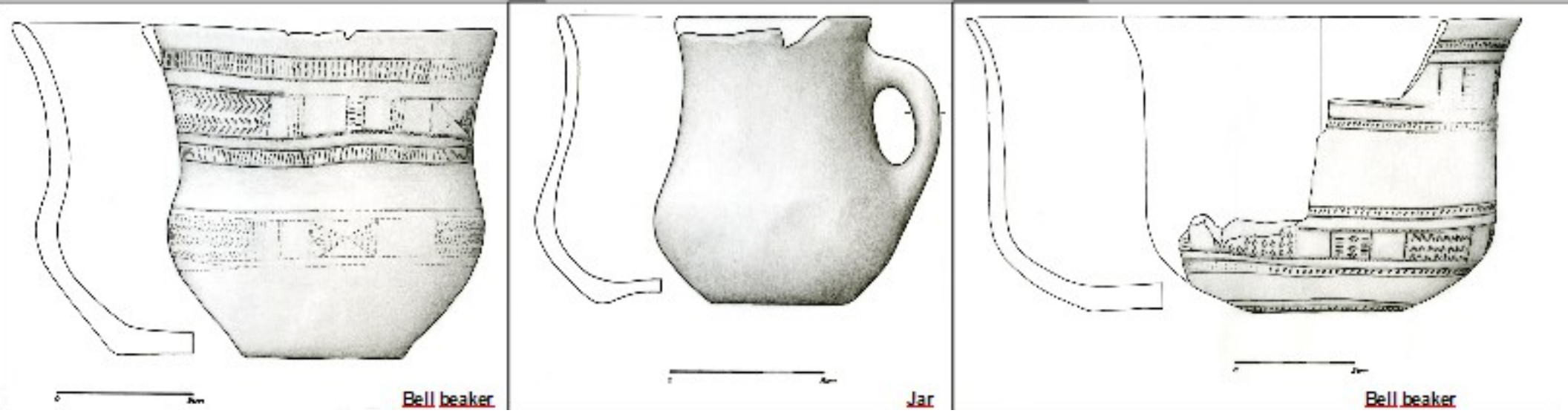


# How it began: Neolithic expansion

- People were classified after the kind of pottery which they produced and used
- The so called **Stroked Pottery** especially interesting
- At this time (5000-4500 B.C.) many so called circular enclosures were built up in Central Europe



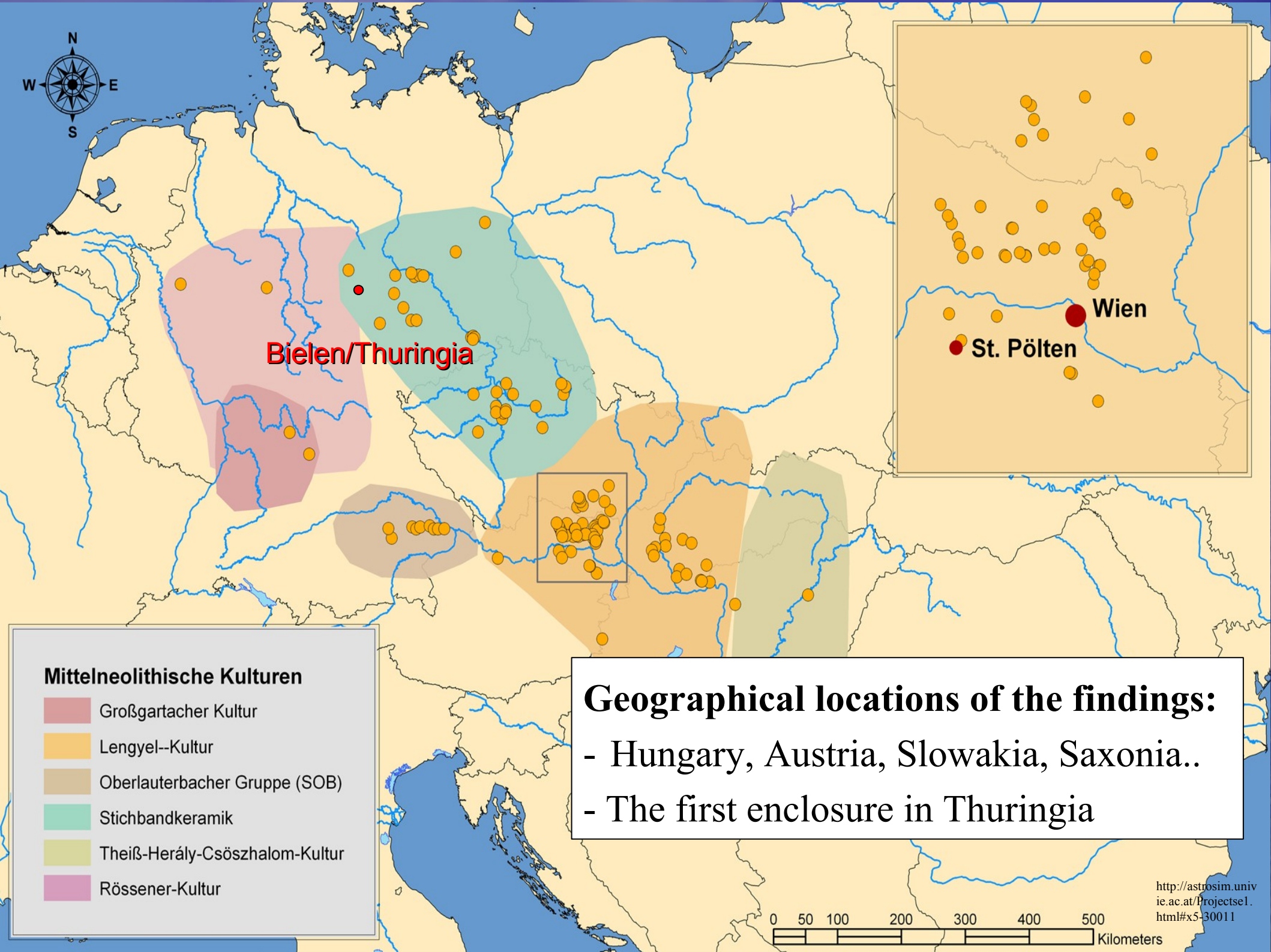




## Findings of Stroked Pottery in Bielen













**Bielen/Thuringia**

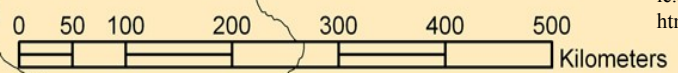
**Wien**  
**St. Pölten**

**Mittelneolithische Kulturen**

-  Großgartacher Kultur
-  Lengyel-Kultur
-  Oberlauterbacher Gruppe (SOB)
-  Stichbandkeramik
-  Theiß-Herály-Csöszhalom-Kultur
-  Rössener-Kultur

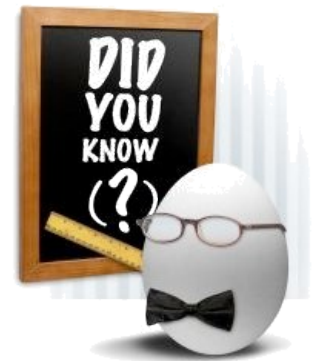
**Geographical locations of the findings:**

- Hungary, Austria, Slovakia, Saxonia..
- The first enclosure in Thuringia



# Facts about neolithic circular enclosures

- 1885 **first discovery** in Krpy (Bohemia, Czech Republic)
- 1919-1924 **first scientific examination** in Zeholfing (Bavaria, Germany)
- 1967 **first complete exposure** in Muehlbach (Austria)
- Assumptions why enclosures were built up:
  - **fortress**
  - **meeting point**
  - **astronomical observatory**
- The openings of the enclosures should be **aligned with points of sunrise or sunset at the solstices**
- Several authors believed that some of the openings are **aligned with points where special stars rise up or go down**
- Scientific research of the last 10 years shows: only the openings of a few enclosures are aligned with **special points in the sky**





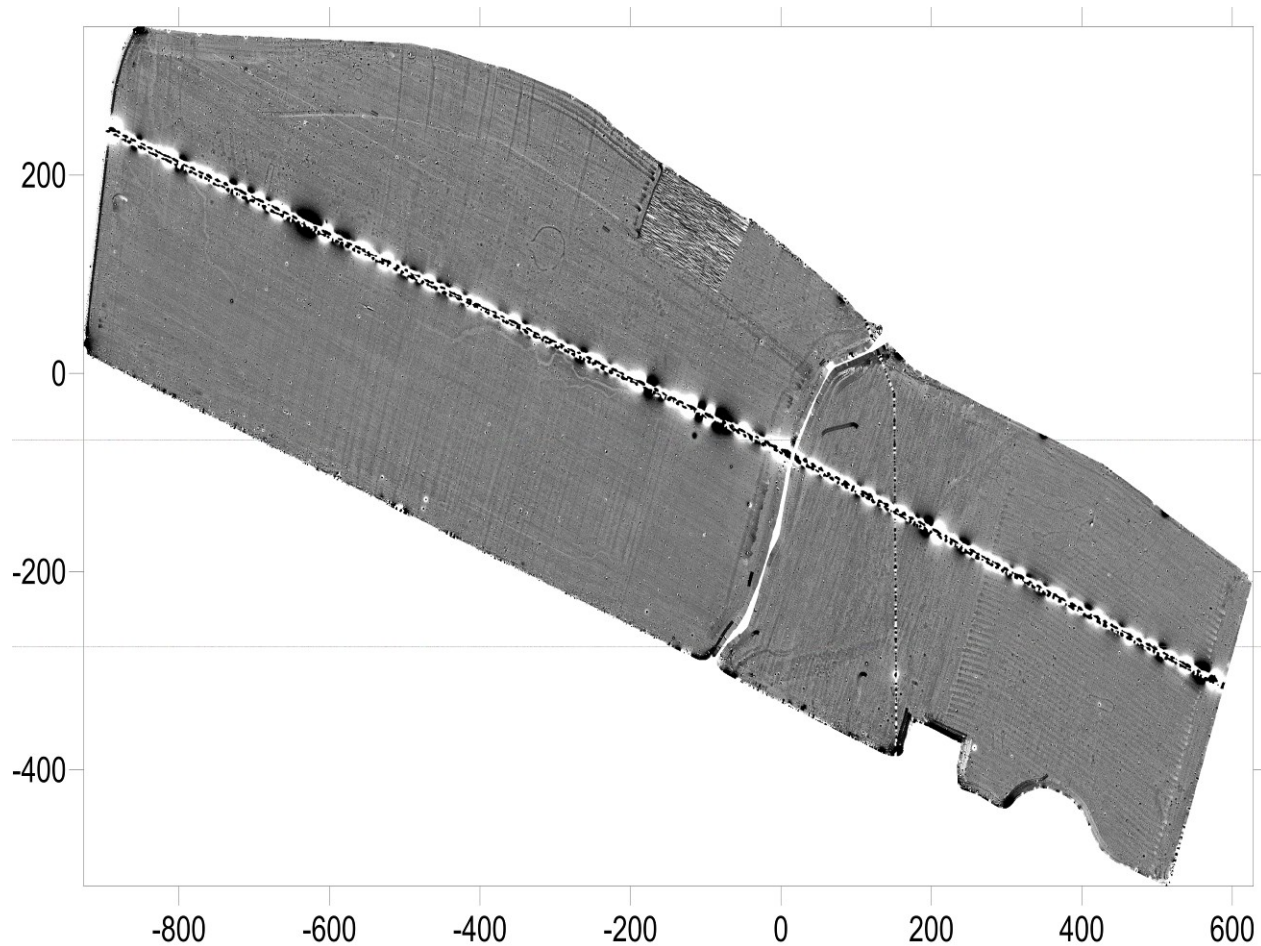
# Neolithic circular enclosure in Thuringia

- Plans for building a new street in Thuringia required the **analysis of magnetometer data** before construction work starts



# Neolithic circular enclosure in Thuringia

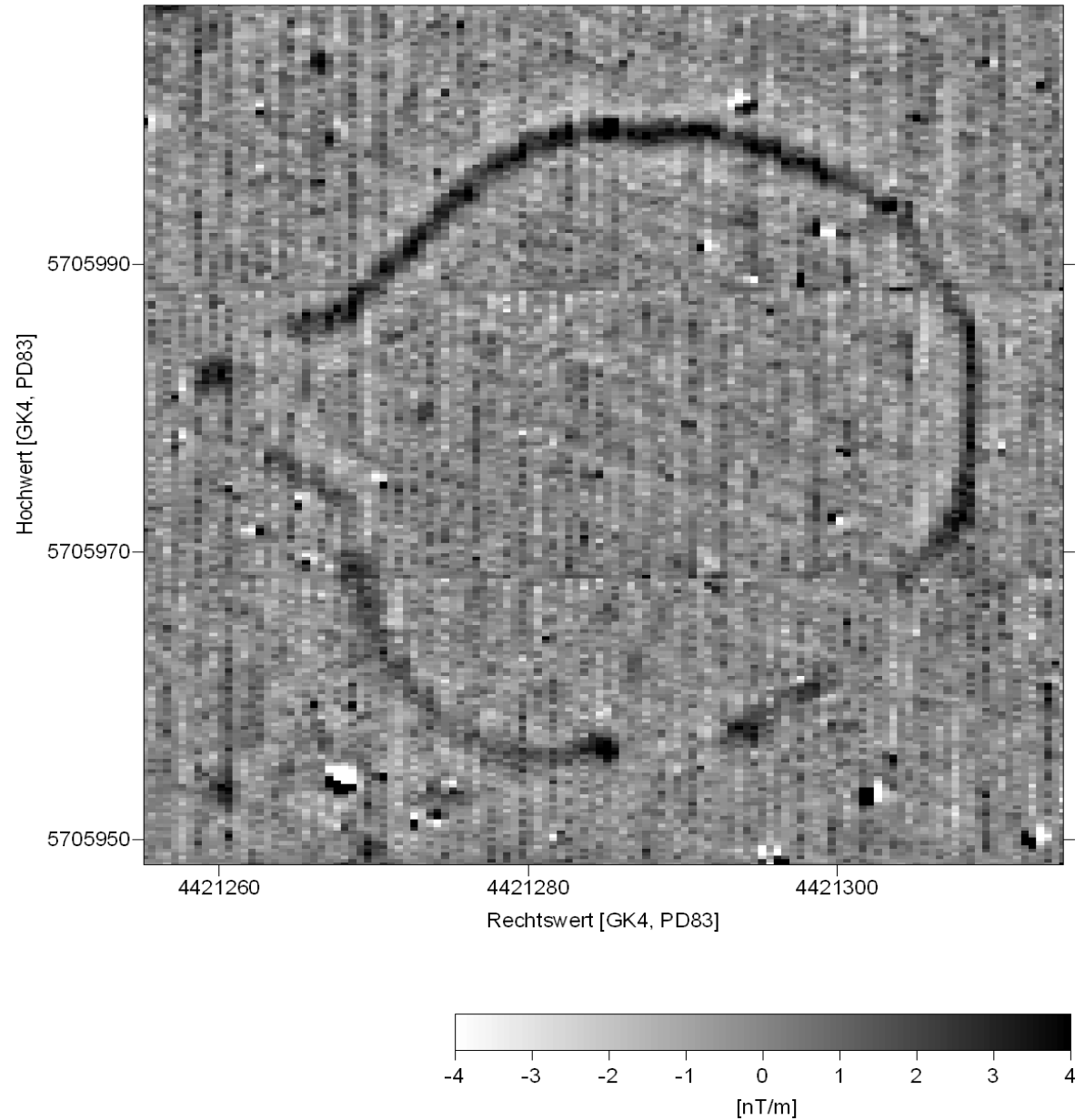
- **Short excursion** into measuring the variations in the magnetic field
- Two different possibilities: CS Magnometer and Flux Magnometer





# Neolithic circular enclosure in Thuringia

- **Short excursion** into measuring the variations in the magnetic field
- **Figure: Dec 2011, Bielen**



# Neolithic circular enclosure in Thuringia

- Because of the results of the measurements of the magnetic field it was decided to start excavations
- The **excavations revealed remains of archeological memorial**
- As a consequence, **aerial photographs** were taken









# Neolithic circular enclosure in Thuringia

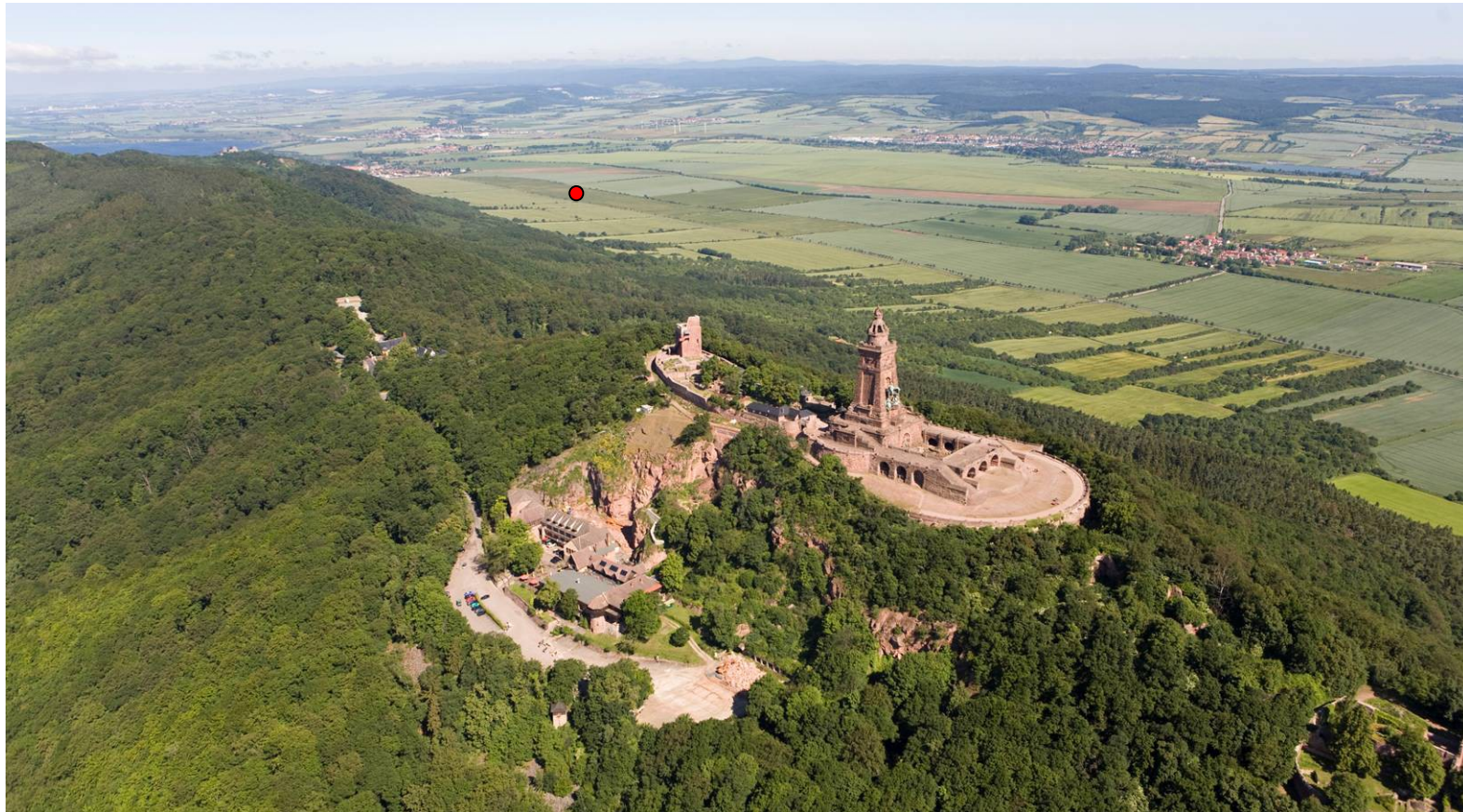
- Bielen is near Goseck – the world famous neolithic „sun observatory“  
*Can we find openings aligned to the points of sunrise and sunset at the solstices?*





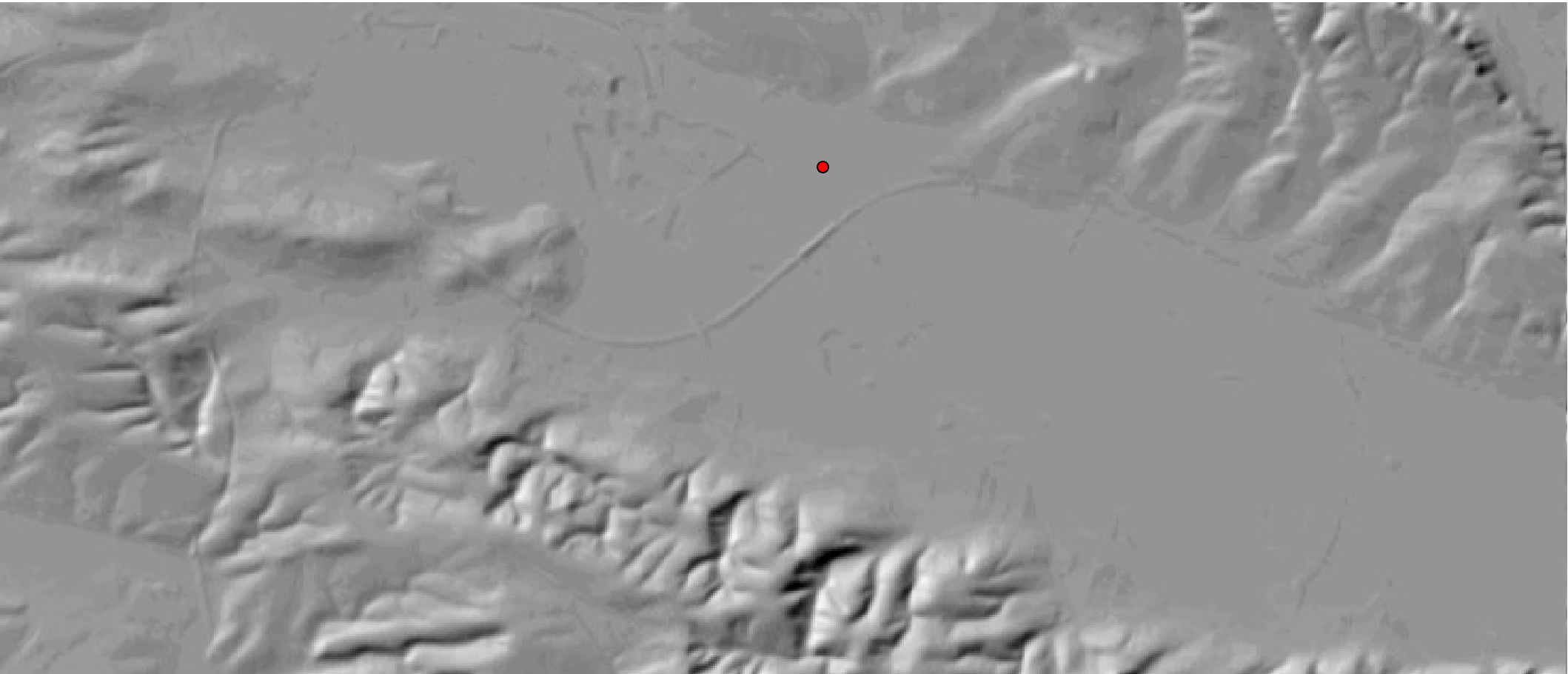
# Geographical conditions 5000 B.C.

- Other findings from this time showed that there were no trees in the neighborhood of the enclosure
- Therefore people had a free view to the nearby mountains



# Geographical conditions 5000 B.C.

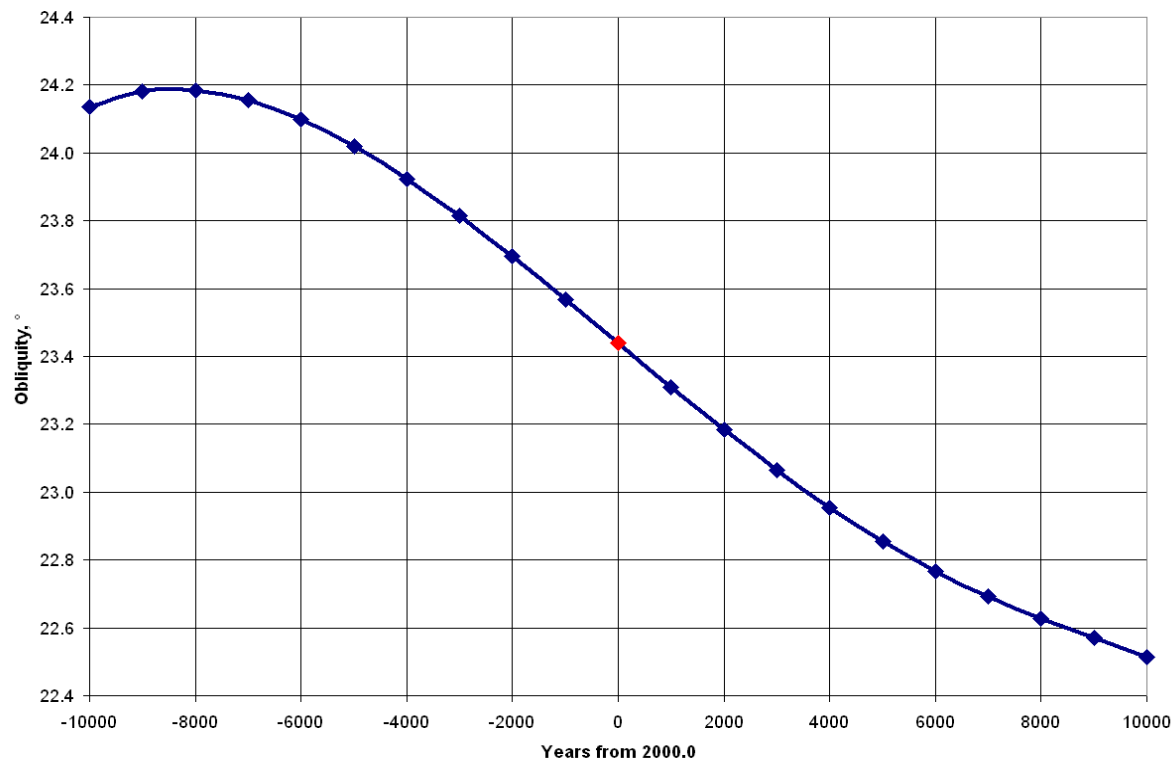
- The area is flat therefore the astronomical calculations can be simplified

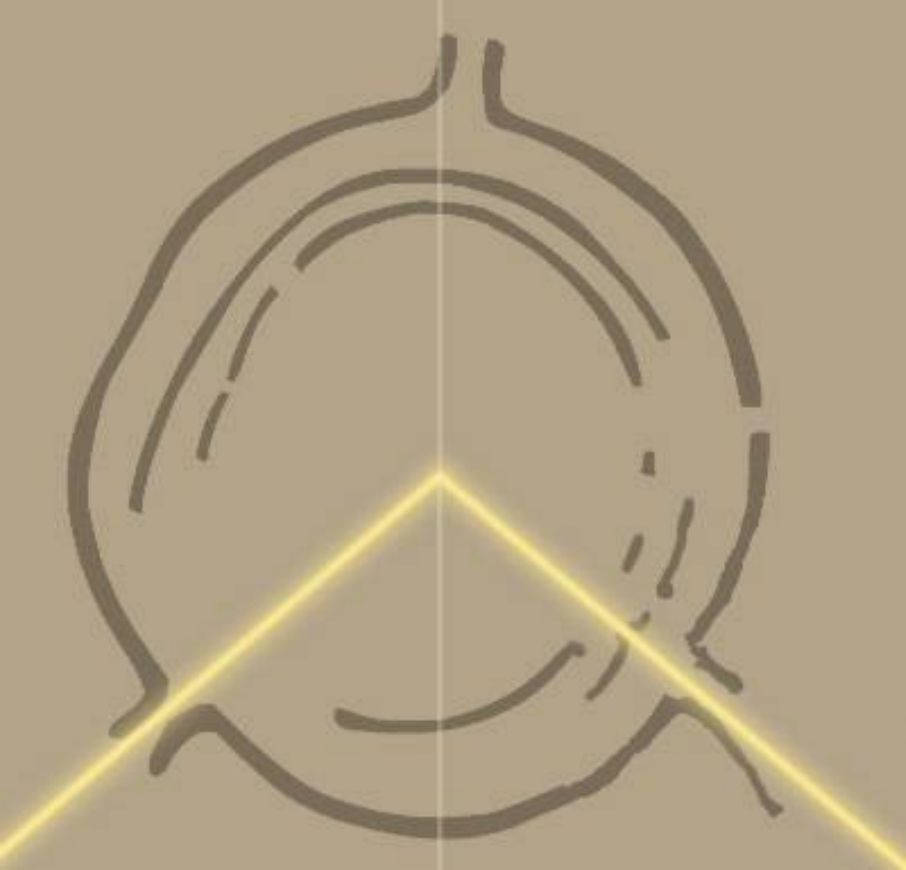




# Astronomical conditions

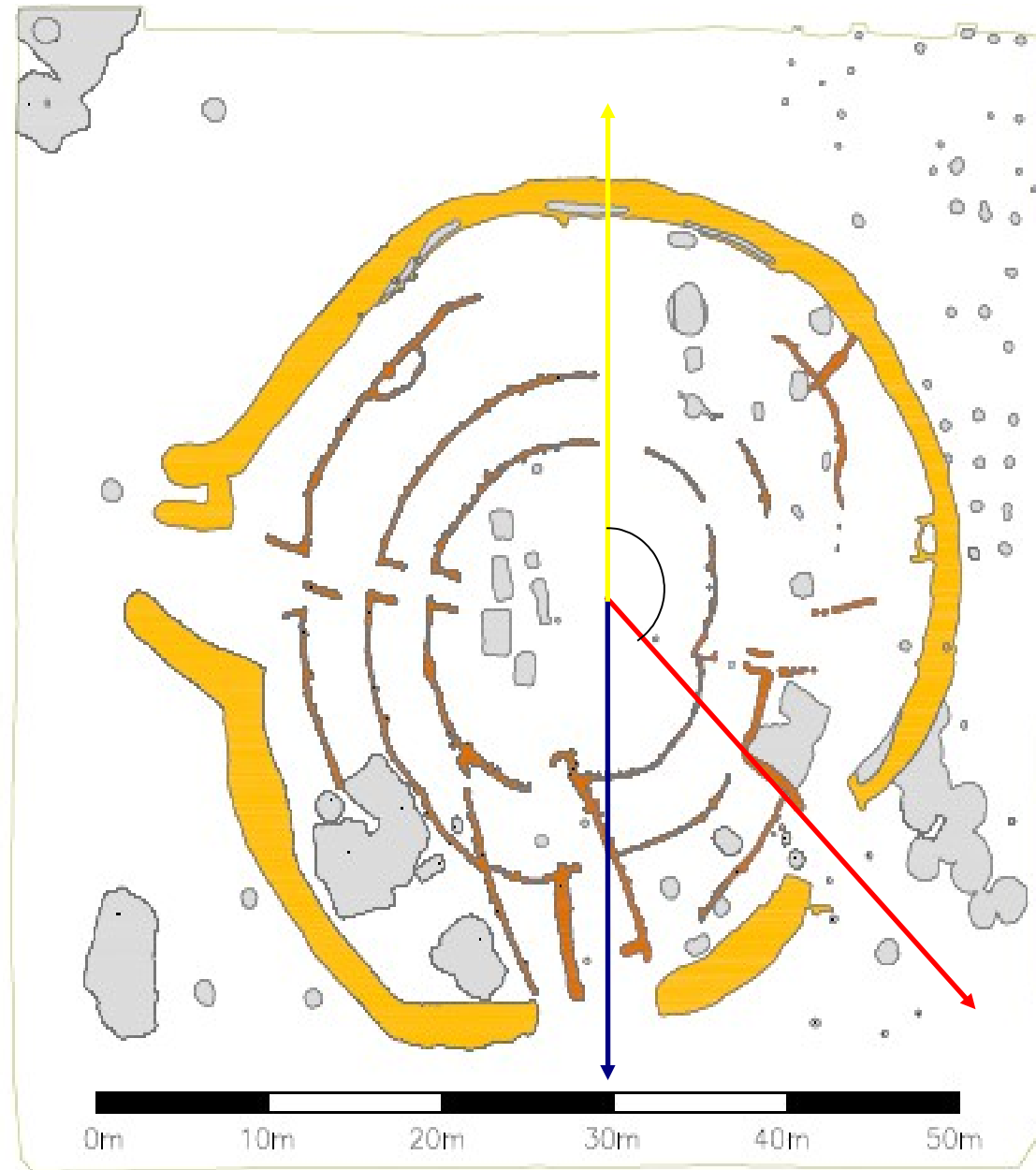
- Effects of atmosphere and celestial mechanics have to be considered:
- **Refraction** caused by the atmosphere when lights go through the air
- **Inclination of the ecliptic**: since the inclination of the ecliptic is not constant, we have to use mathematical models in order to figure out where the sunrise was 7000 years ago (Lasker/2012)





# Neolithic circular enclosure in Thuringia

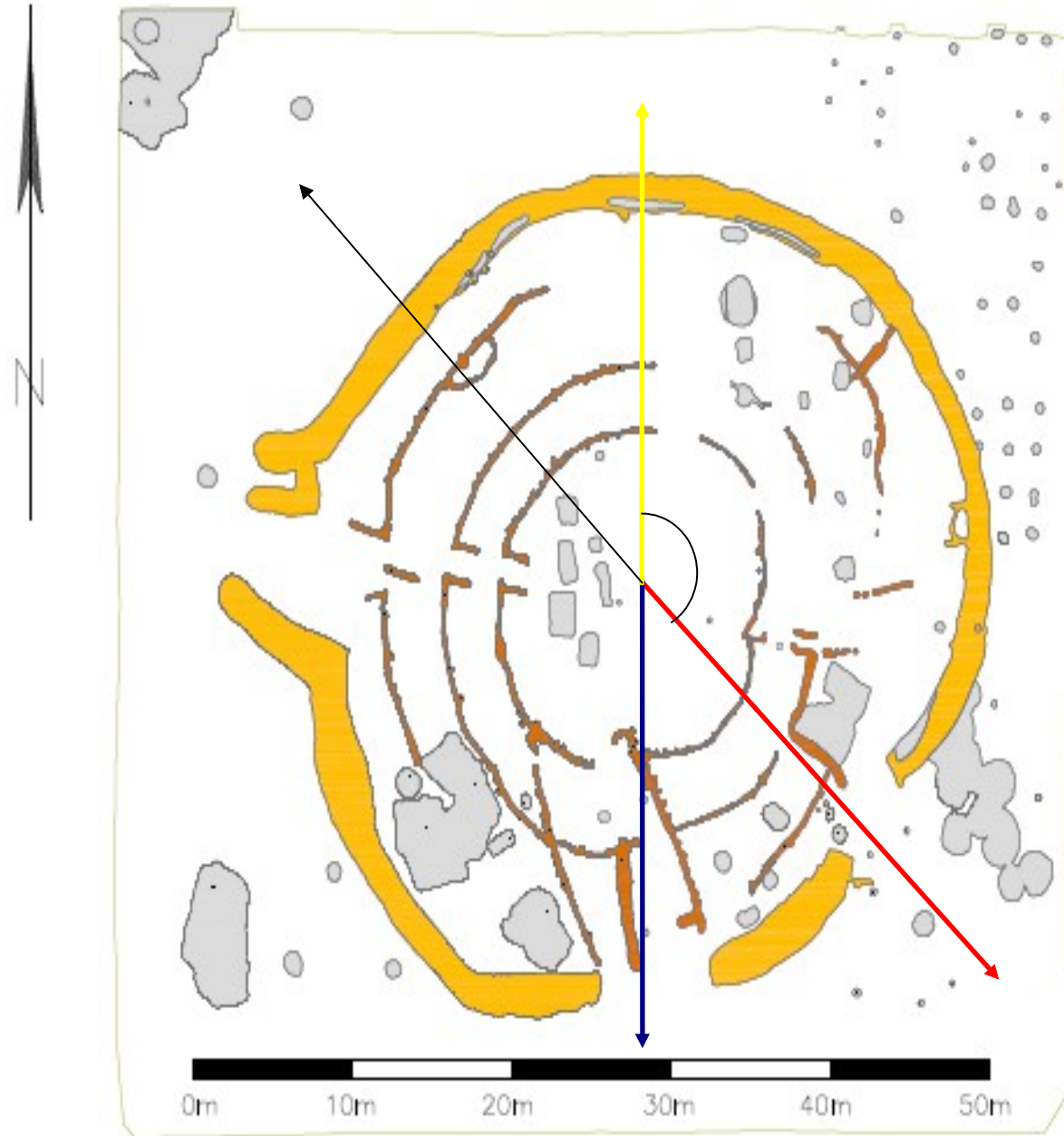
- **Geometrical groundplan** of the enclosure based on excavations
- **Three openings:**
  - One directed to the South
  - One directed to the South-East (inclination to north:  $129.7^\circ$ )





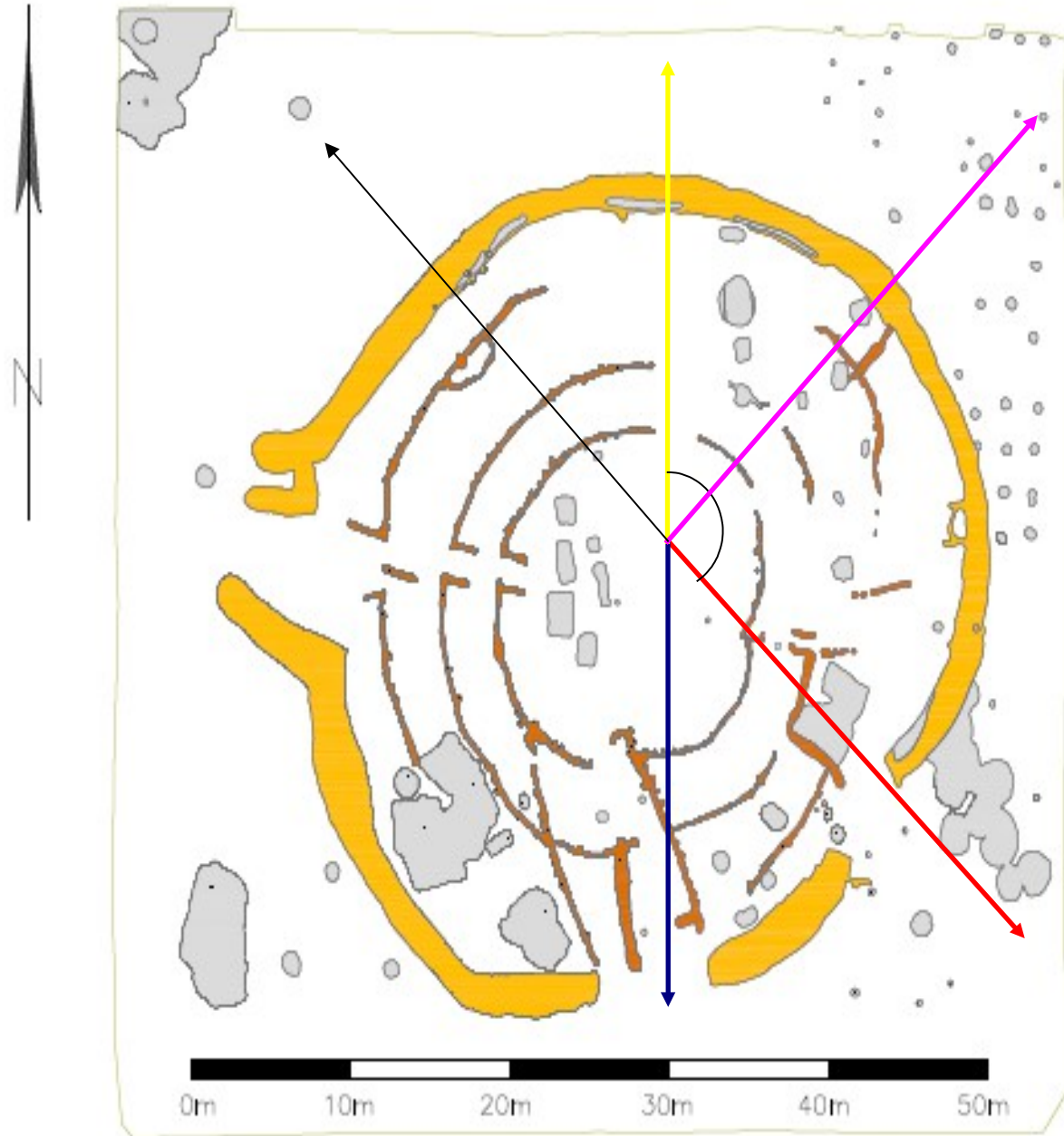
# Neolithic circular enclosure in Thuringia

- Considering the astronomical and geographical conditions, the **point of sunrise at the winter solstice can be determined**
- The **deviation** is only  $0.5^\circ$



# Neolithic circular enclosure in Thuringia

- No clear proof for an alignment to the point of sunset at the summer solstice was found
- Evidence for an **orientation to the sunrise at summer solstice** were found



# Relevance of the neolithic circular enclosure in Thuringia

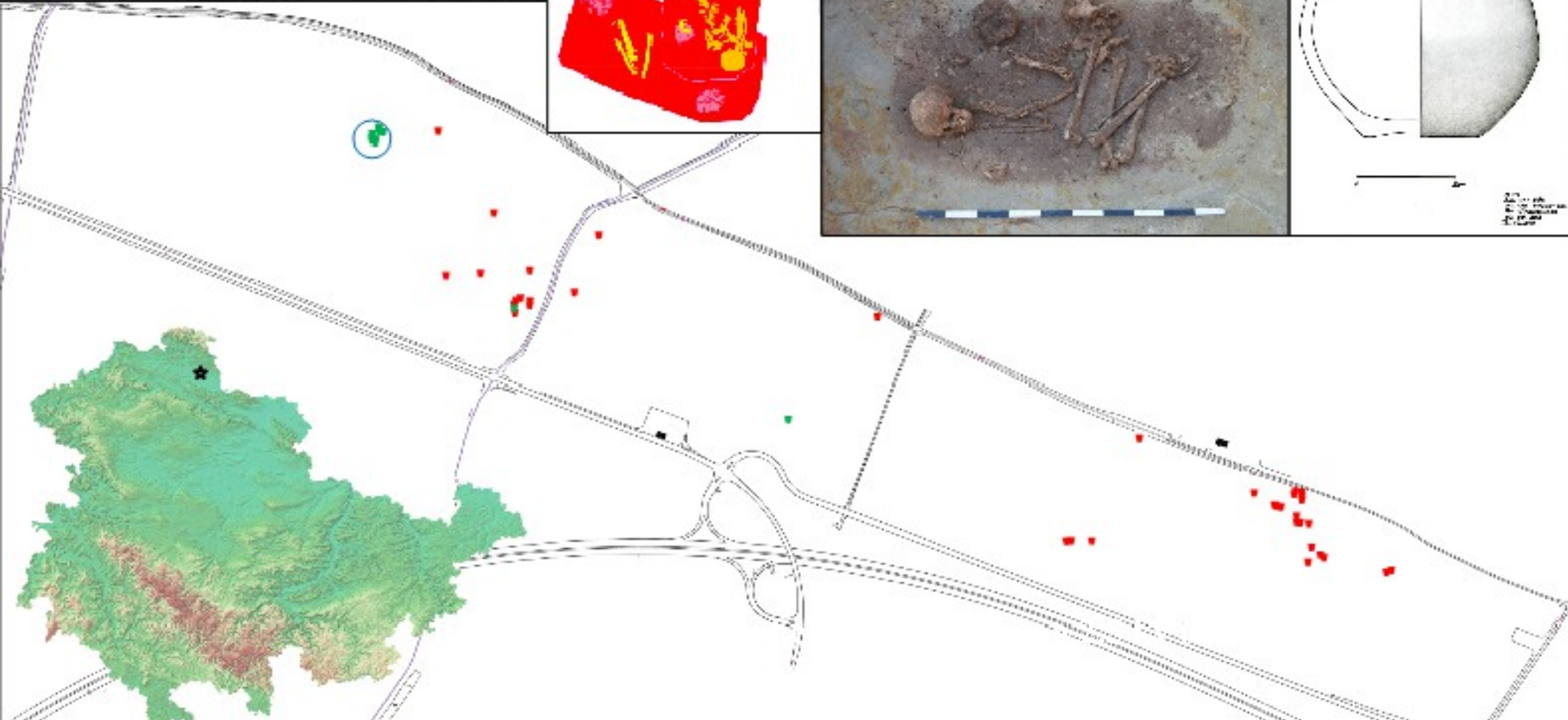
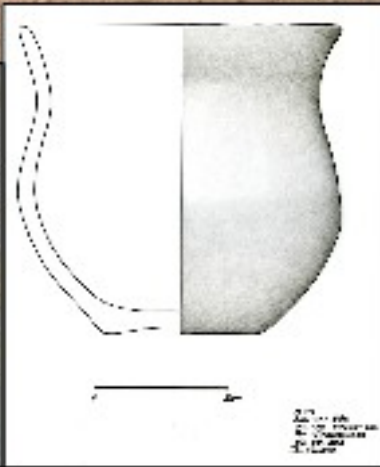
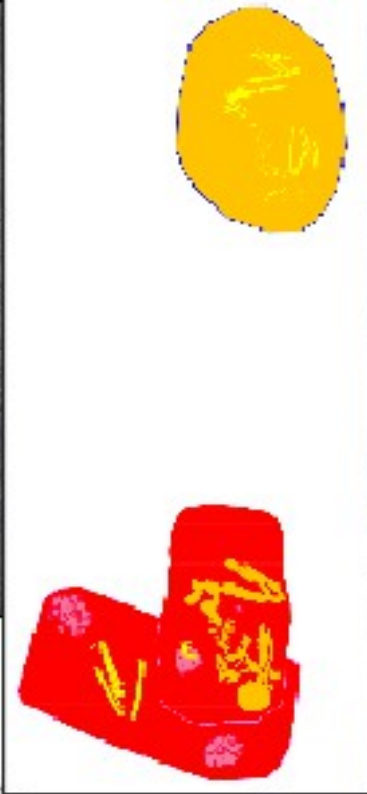
The enclosure was still relevant for humanity, 2000 years after it was set up. The sanctuary was used as grave.











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# Conclusion

- 2000 years after the set up of the enclosure, it was still relevant for humanity. The sanctuary was used as grave.
- The south west **opening is directly aligned to the point of sunrise 5000 B.C.**
- **Evidence found** that the builder of the enclosure also knew where the **points of sunrise and sunset** at the summer solstices were
- No evidence found that the openings were aligned to points where stars go up or down
- In the future the whole enclosure will be simulated with the help of **3 D software**



**Thank you very much for your  
attention!**

