

1st Edition of the Solar Science Quiz

Take part and win attractive prizes!

Solutions can be sent until **December 15, 2011** to the following address: focus solar GmbH, Marie-Curie-Str. 1, 26129 Oldenburg, Germany. Everybody from all over the world is welcome to send their solutions. Please indicate your name, contact address and phone number!

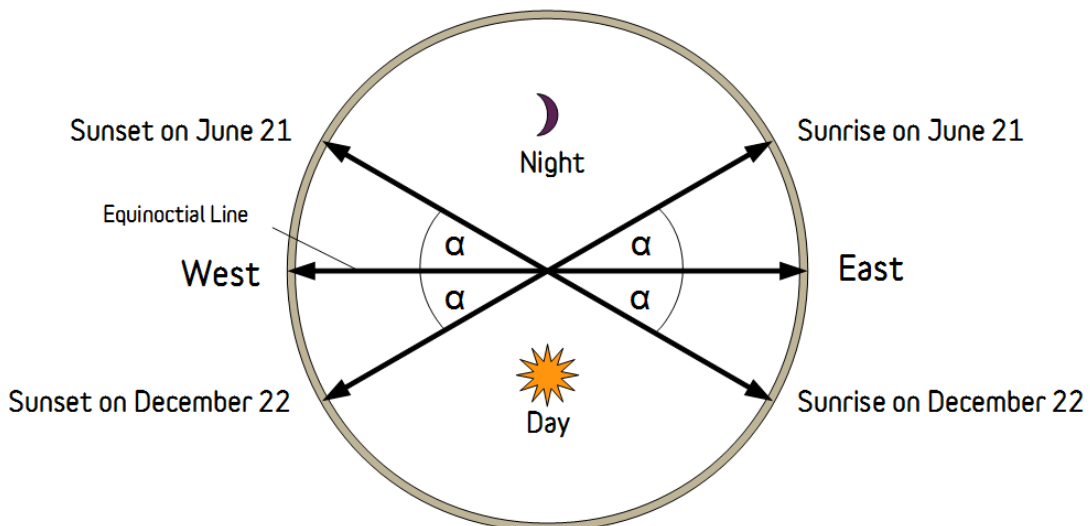
Prizes: Participants who find the right answer to the problem stand to win great book prizes. Winners of the Solar Science Quiz will be announced on www.focussolar.de and the best solutions published.

Handover of Prizes: Book prizes will be mailed to winners by Christmas 2011.

What solar compass did the Maya use?

The ancient Maya culture of Central America is well known for their knowledge in solar astronomy. They built temples, developed solar calendars and found ways to measure the passage of time. Besides the mythological dimension, the calendar had very practical use for the Maya, guiding them in the cycle of sowing and harvesting their corn.

The Maya developed a directional diagram, which resembles our compass, and is still as significant today as it was thousands of years ago. The diagram has a line running from East to West. Yet, the remaining corner points do not point in the cardinal directions of North and South, but towards the sunrise and sunset positions of the summer and winter solstices, as shown below.



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For an observer on the ground, the sun rises on different points on the horizon depending on the time of year. The same is true for the sunset position which also varies over the year. Only at the time of equinox, when the length of day equals that of night, does the sun rise exactly in the East and set exactly in the West. For all other days sunrise and sunset directions are shifting to other points on the horizon. The turning points are reached on the solstices when the sun flips its course. The angle α describes the difference in sunrise direction between an equinox (on March 21 and September 20) and a solstice (on June 21 and December 22). The same angular difference α occurs for the sunset positions of equinox and solstice. These distinguished sunrise and sunset directions can be found in the temples of the Maya, where they constitute special lines of sight.

How big is the angle α ? Please fill in the missing numbers in this table:

Location	Latitude	Angle α
Maya area (in present-day Mexico)	18° N	?
My home town: ?	?	?

Copy this table on a sheet of paper or postcard and replace the four question marks with your entries. It's sufficient when all fields are completely filled in. You can also send your derivation of the solution, but that's not required.

Enjoy the riddle! Math skills in trigonometry is all that's required to solve this problem.