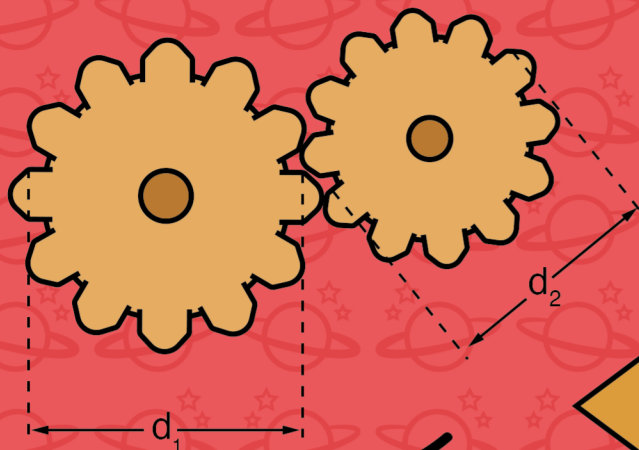


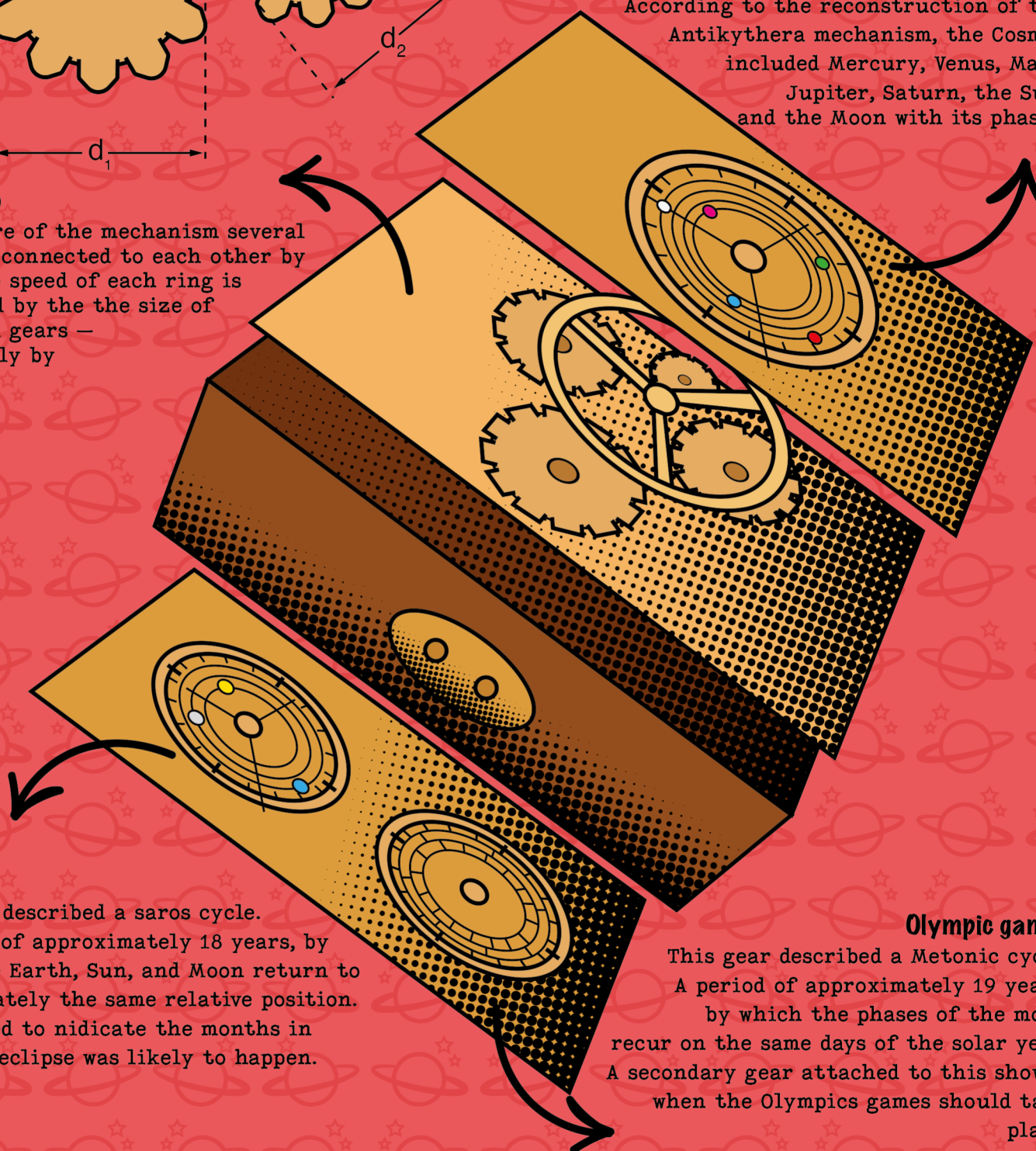
The planetarium

According to the reconstruction of the Antikythera mechanism, the Cosmos included Mercury, Venus, Mars, Jupiter, Saturn, the Sun, and the Moon with its phases.



Gear ratio

In the core of the mechanism several rings are connected to each other by gears. The speed of each ring is controlled by the size of connected gears — specifically by $K=d_2/d_1$



Eclipses

This gear described a saros cycle. A period of approximately 18 years, by which the Earth, Sun, and Moon return to approximately the same relative position. It was used to indicate the months in which an eclipse was likely to happen.

Olympic games

This gear described a Metonic cycle. A period of approximately 19 years, by which the phases of the moon recur on the same days of the solar year. A secondary gear attached to this showed when the Olympics games should take place.

Physics of the Antikythera mechanism

The Antikythera mechanism is the oldest geared instrument in the world. It was a mechanical computer that used complex combinations of gears to translate astronomical cycles into mechanical motion, enabling the estimate of the occurrences of astronomical events. The remaining 82 fragments were discovered in 1901 and only recently^[1] a model has been proposed to reproduce the whole mechanism. Thanks to X-ray tomographic reconstructions and to interpretations of the writings found on the back and front pieces of the mechanism, scientists were able to reconstruct ancient astronomical predictions.

[1] *Sci Rep* 11, 5821 (2021)



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