

Copernicus at 500

by James Stokley

On February evenings the bright stars characteristic of the winter skies are at their best. They are joined by the planet Saturn, high in the southwest in the constellation Taurus. Taurus also contains the bright star Aldebaran but Saturn is two and a half times brighter. South, and lower, is Canis Major with Sirius. Between Canis Major and Taurus stands Orion with two bright stars. Betelgeuse is above and Rigel below.

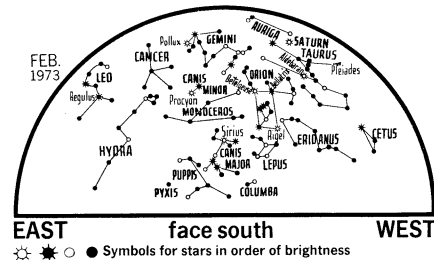
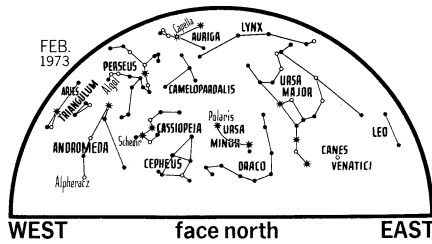
During February and March scientists in many parts of the world will celebrate an important astronomical anniversary. This is the 500th birthday of a man whose work drastically changed man's idea of the universe.

On Feb. 19, 1473, Niklas Koppernigk was born at Torun in West Prussia, which is now part of Poland. Scholars in those days wrote in Latin, which was a universal language. Thus his name is best known in its Latinized form of Nicolaus Copernicus.

(At that time people used the Julian calendar. Thirteen days must now be added to a Julian date to get the equivalent in our Gregorian calendar. This would make his birthday come on March 4, in our reckoning.)

His father was a wealthy merchant and his uncle a bishop. He was a student at the University of Cracow, in Poland. Later he went to Italy where he studied medicine and canon law at Bologna and other universities. Returning to Poland he went to Frauenburg, in his uncle's diocese, where he served as a canon of the cathedral. He did not, however, become a priest.

Scholars then accepted the Ptolemaic theory of the universe. This put the



earth in a fixed place at the center, with sun, moon, planets and stars revolving around it. But planets do not move uniformly across the sky. Usually they go eastward, but sometimes they seem to back up, and move westward for a time. The ancient explanation, usually named for Ptolemy, who lived in Alexandria in the 2nd century A.D., provided a very complicated arrangement.

The main orbit of a planet was a large circle around the earth called a deferent. Around the deferent moved the center of a smaller circle, the epicycle, in which the planet moved. As more accurate observations were made of planetary motions, additional epicycles were added, one on top of another. This gave a fair approximation of the observed movement.

About 265 B.C. the Greek astronomer Aristarchus, who lived on the island of Samos, had already rebelled

against such complexities. He proposed that the earth and all the other planets revolved around the sun. When the faster moving earth passes a slower planet, farther out, that one seems to go backward. But these ideas were not accepted.

Copernicus knew about the ideas of Aristarchus and they seemed to him to be reasonable. About 1506 he seems first to have worked out the sun-centered system now known by his name. But he still thought planets could only move in circles so he retained many of the epicycles of the Ptolemaic system. A German astronomer, Johann Kepler, about a century later, showed that planetary orbits are ellipses.

The accompanying maps show the skies as they appear about 10 p.m. local standard time at the first of February; they will look the same an hour earlier on the 15th and two hours earlier at the end of the month. □

CELESTIAL TIMETABLE		
Feb.	EST	
1	4:00 pm	Moon passes north of Jupiter (from parts of the N. Pacific and northwestern North America, the moon will pass in front of the planet)
3	4:23 am	New moon
10	9:05 am	Moon in first quarter
11	1:40 am	Algol at minimum brightness
	11:00 pm	Moon passes north of Saturn
13	6:00 am	Moon nearest, distance 228,700 miles
	10:30 pm	Algol at minimum
16	7:20 pm	Algol at minimum
17	5:07 am	Full moon
19	4:10 pm	Algol at minimum
24	10:10 pm	Moon in last quarter
25	8:00 am	Moon farthest, distance 251,200 miles
	3:00 pm	Mercury farthest east of sun
27	8:00 pm	Moon passes north of Mars.

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