Ecliptic Armilla 黄道经纬仪

The Ecliptic Armilla was completed in 1673, the 12th year of the Kangxi Emperor's reign in the Qing Dynasty. It is one of the instruments designed by Ferdinand Verbiest. It was the first astronomical instrument with an ecliptic coordinate system in China. The Ecliptic Armilla measures six feet in diameter and is composed of several layers: a meridian circle,a zodiacal circle, a longitude circle and a polar circle.Its structure was based on the Tychonian ecliptic armillary sphere and is similar to the equatorial armilla. The ecliptic armilla was used to measure the ecliptic longitude differences and latitudes of celestial bodies. The ecliptic coordinate system was a typical European astronomical observation method and was simpler than the equatorial coordinate system when observing the sun and the planets.

黄道经纬仪：

制于康熙八年至十二年(公元1669-1673年),黄道经纬仪是中国第一架采用独立的黄道坐标系统的天文观测仪器。黄道是太阳相对地球的周年视运动轨道，黄道经纬仪由子午圈、黄道圈、黄道经圈、极至圈和支架等部分组成。子午圈安放在一个半圆的云座之中，由两条背对的苍龙托起，龙的后足立于交梁之上，底盘部分基本上与赤道经纬仪相同。

黄道圈与极至圈连为一体，并可共同绕极至圈上的南北两极旋转。黄经圈固定在极至圈的南北黄极上，在两黄极之间贯有一通轴，通轴中部竖有一个三寸横表，其功用与赤道经纬仪相同。黄经圈可绕通轴在黄道圈和极至圈内旋转。黄道圈与通轴垂直，圈面上分别用满汉两种文字刻有黄道十二宫，每宫三十度，每度亦用横向划分法分为六十分，用游表可精确到十五秒。黄道圈的上下侧平面上分别刻有宫度和二十四节气。十二宫的划分源于西方，而二十四节气的划分则创立于中国。黄道经纬仪上的这种刻画，实为中西合壁的结果。

黄道经纬仪主要用来测量天体的黄道经度和纬度，并测定节气。对于太阳和行星的观测，使用黄道坐标系统要比使用赤道坐标系统更为方便，这也是西方一直沿用黄道经纬仪的原因。