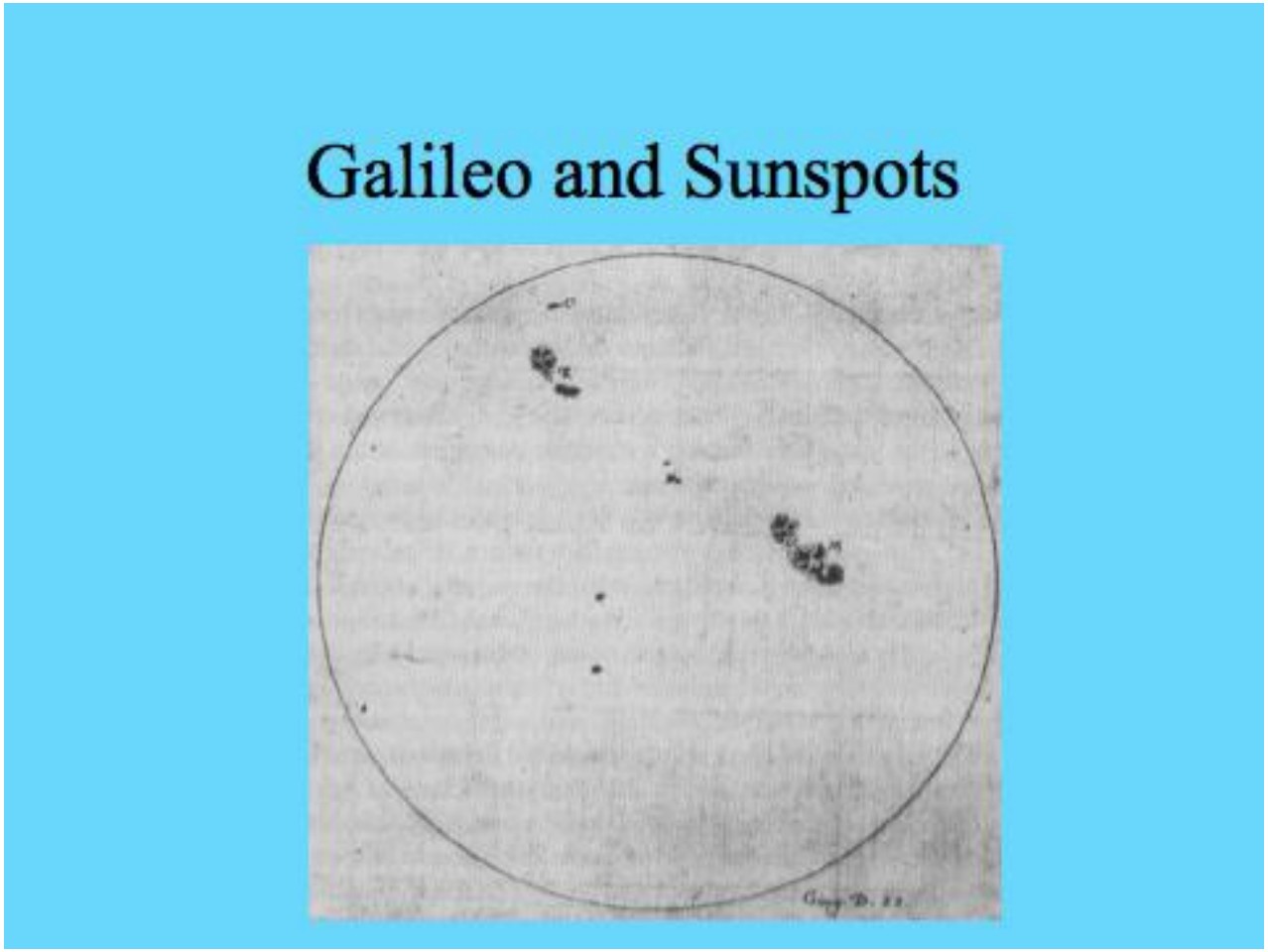

Welcome!
3rd SSN Workshop
National Solar Observatory
Tucson, Arizona
22-25 January 2013
Mark Giampapa

Looking back at the past....



A given spot moves across the surface of the Sun with a 29 day period.

First astrophysical measurement of a celestial body

Basic Observed Spot Phenomena

- The spots are on the Sun
- Spots move across the Sun w/29 day period
- Annual (seasonal) variation in the tilt of the path of spots across the face of the Sun
- No obvious diurnal variation in spots

Geocentrism *vs* Heliocentrism

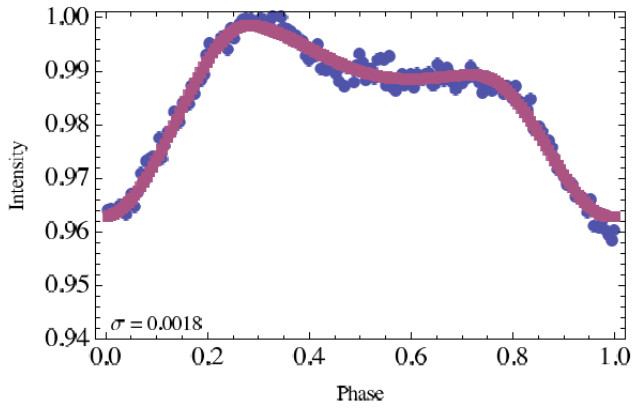
HELIOCENTRIC

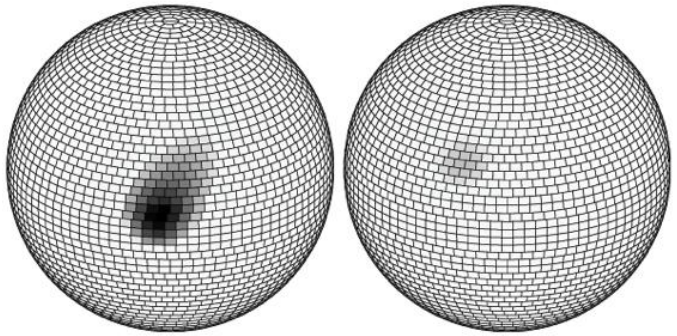
- Sun rotates on axis in 29 days
- Diurnal rotation of Earth
- Annual orbit of Earth about the Sun
- Respective tilts of axes of rotation of the Earth and Sun

GEOCENTRIC

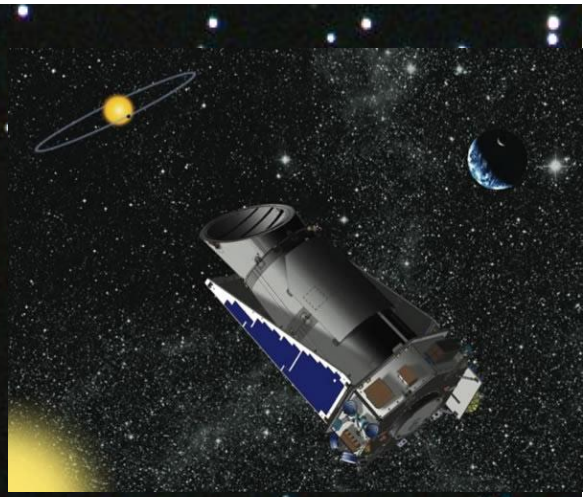
- Sun rotates on axis in 29 days
- Sun's rotation axis precesses systematically in one year as Sun traces out the ecliptic
- Sun's rotation axis remains locked to Earth's orientation over the course of a day

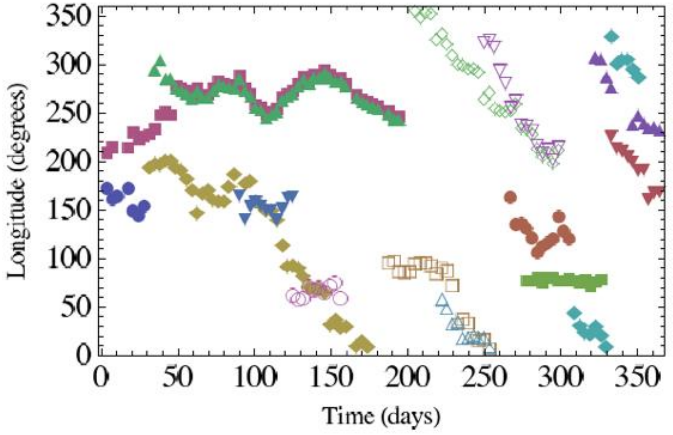
Fast-forward to the future……





A sample reconstructed surface of KIC 5110407. On the left, phase = 0.0 of the associated light curve (See Figure 2), and on the right, phase = 0.5 of the same light curve.



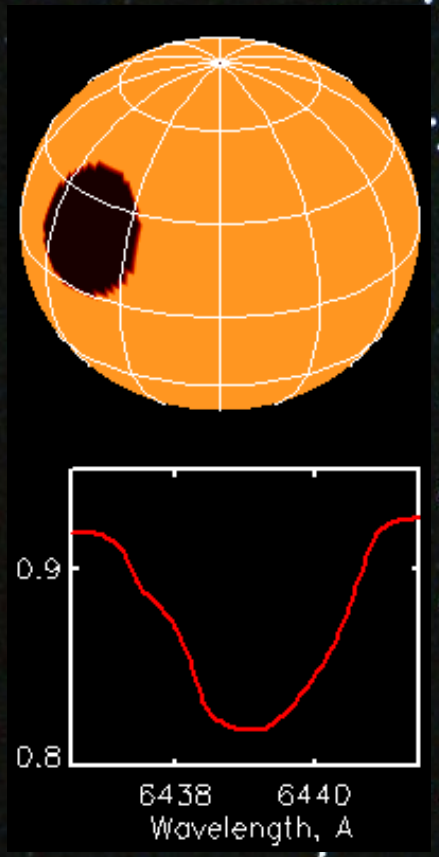


Monnier, Roettenbacher, Barclay & Harmon (2013)

Zeeman-Doppler imaging

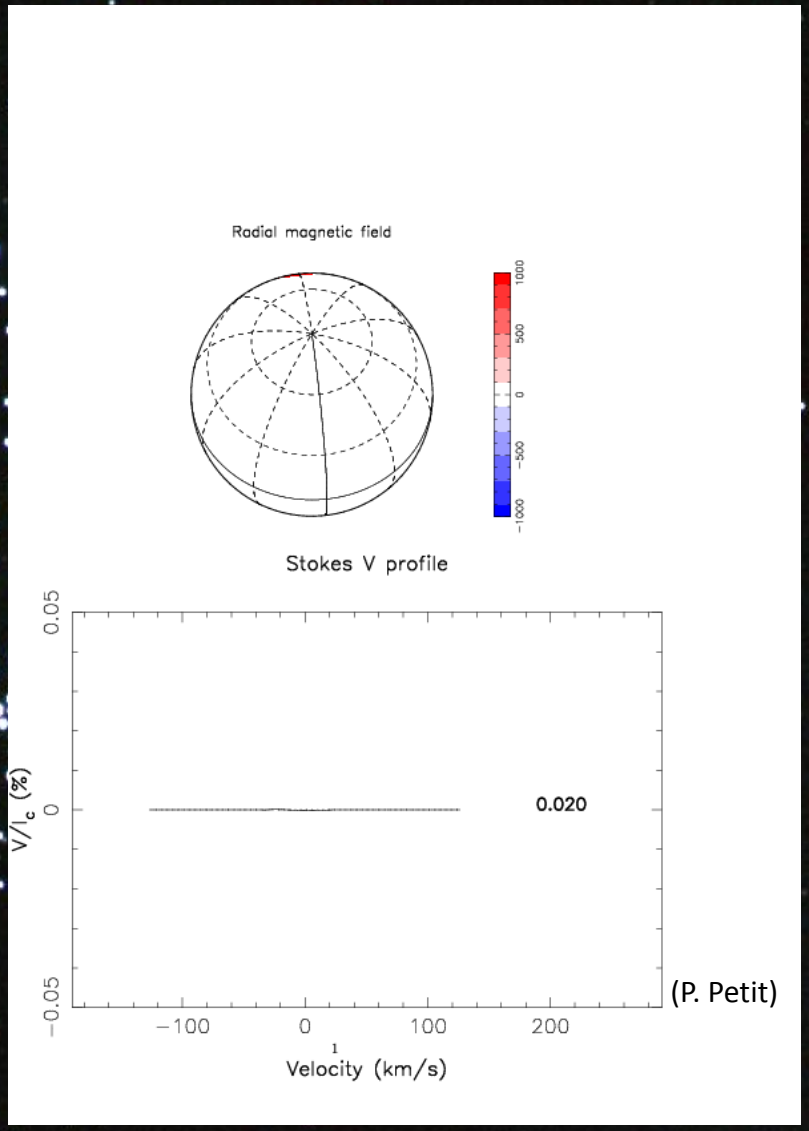
- **Doppler Imaging**

Atomic lines



Observational evidence for magnetic fields across the HR diagram, IAUS 259, Nov 5, 2008, Tenerife Berdyugina

- **Zeeman-Doppler Imaging**



(P. Petit)