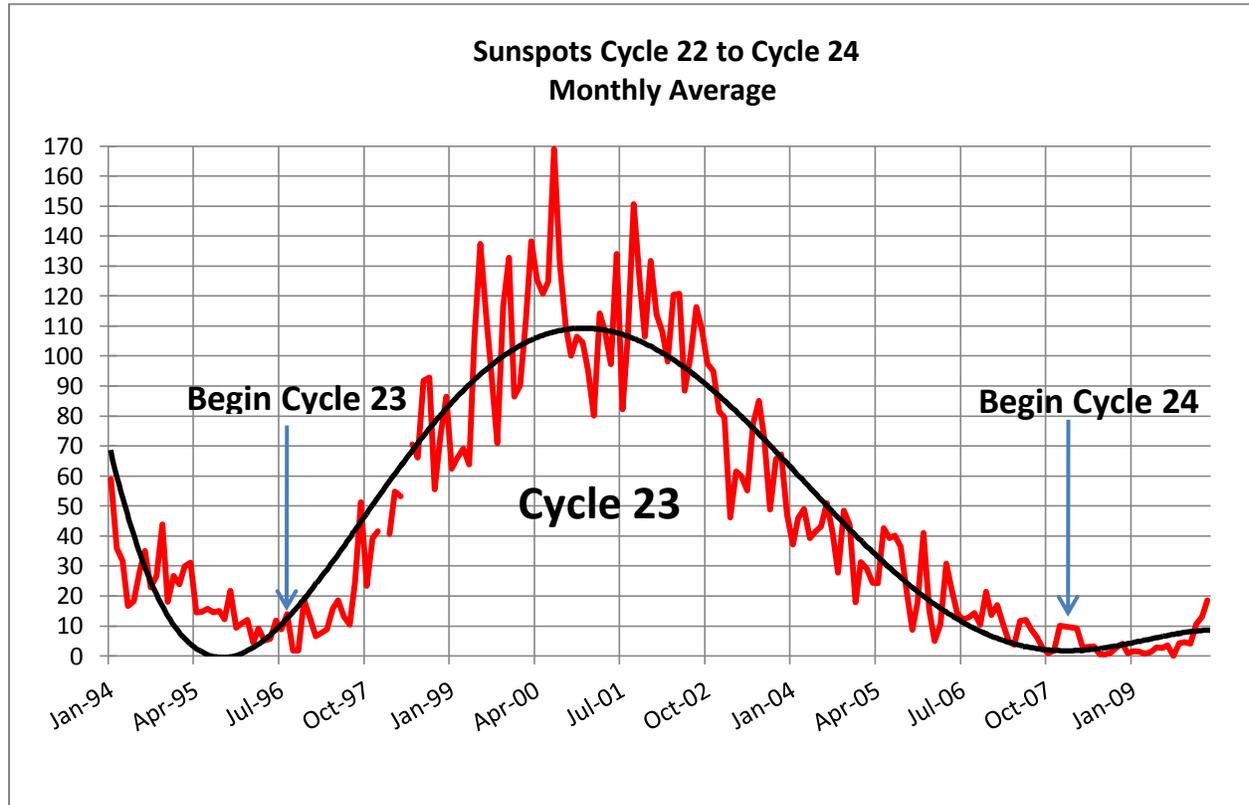


## Sunspotters ... "It's Alive, it's Alive! \*

The Sun has become slightly more active in the number of sunspots and is now fully in Cycle 24.



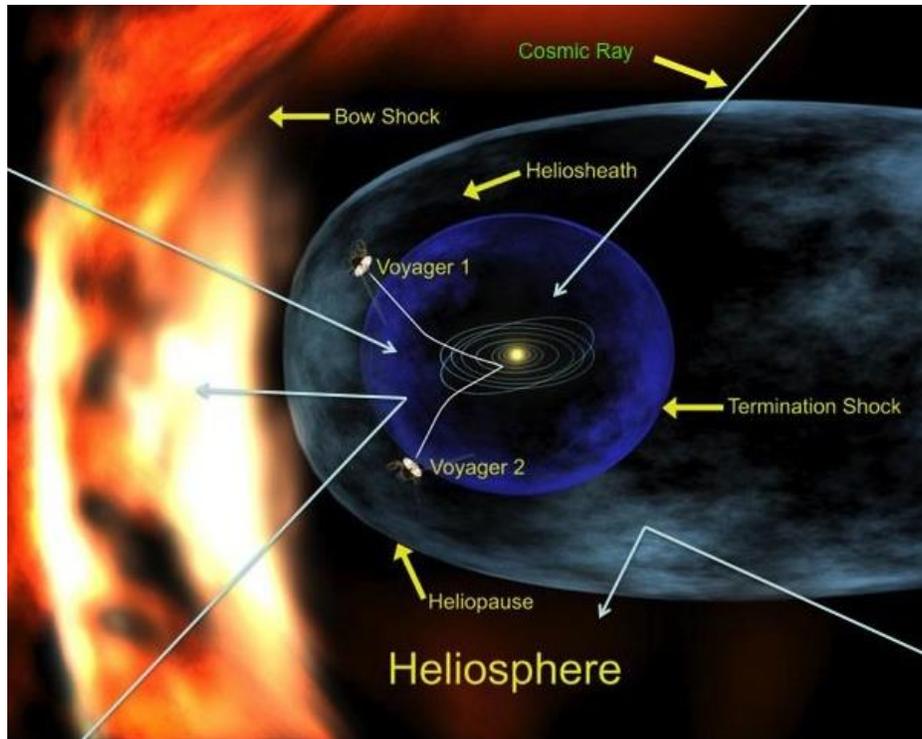
"Flash Backward" for some Newbies.

Why are the numbers of Sunspots on the Sun important?

None or low levels of Sunspots during the average 11 year cycle means less solar energy to the earth, less mass ejections, and a weakened Solar protective magnetic field.

- The "Little Ice Age" occurred from 1300 to 1850 when the sun had very low levels of sunspots.
  - The deepest cold of this period was The Maunder Minimum. This occurred between 1645 and 1715 when very few sunspots were observed. In 70 years there were only a **total** of about 30 **spots** observed. This was the coldest period of the "little ice age".

- High solar activity causes enhanced plasma and magnetic field emissions which blocks high energy cosmic rays. With low activity ... **more high energy cosmic rays hit earth.**
  - Increase in cosmic rays results in more cloud formation.
  - Increased cloud cover causes reflection of sun's energy away from Earth.



- Recent research indicates that Ozone depletion increases when the number of cosmic rays increases.
  - Cosmic rays facilitate the destruction of Ozone by HFCs (hydrofluorocarbons)
  - Less Ozone over the poles, more of Earth's latent heat radiated into space
- Good news – lower activity means less harm to astronauts and satellites due to less mass emissions of charged solar particles toward earth

## Where we stand today

Cycle 24 ramp up in activity is one of the slowest in 100 years.

Predicted to be a Cycle with low total counts

## How low can we go?

This Cycle has wrecked all past prediction models.

We need a few more years to understand “how low we can go”.

Peak of Cycle will occur in 5 or so years.

**Update as of 8/2013 ... field reversal appears imminent so peak will be in about 4 years.      [Link to article](#)**

[http://science.nasa.gov/science-news/science-at-nasa/2013/05aug\\_fieldflip/](http://science.nasa.gov/science-news/science-at-nasa/2013/05aug_fieldflip/)

Note in first graph how quickly the transition occurred between Cycle 22 and Cycle 23 and how slow is the growth in sunspots between Cycle 23 and 24.

## Comparison to recent Cycles

Since Cycle 17 started in 1933, the last 6 Cycles **peak** monthly activity ranged from 110 to 201

At best, Cycle 24 will peak at about 90 and may be even lower if activity remains low.

## The great Solar scientific adventure continues!

### Stay Tuned!

### Footnote

\*\*“Dr. Frankenstein” screams in the movie “Frankenstein” as “The Creature” finally moves - “It’s Alive, It’s Alive.”

And, pleeeze never call “The Creature”, Frankenstein ... that’s always the Doctor.

And, in the “Dr. Who?” BBC TV series, on pain of banishment from all Sci-Fi, **never**, ever call “The Doctor” in the series,

“Doctor Who!”

He is always referred to as “THE DOCTOR”. PERIOD.....