

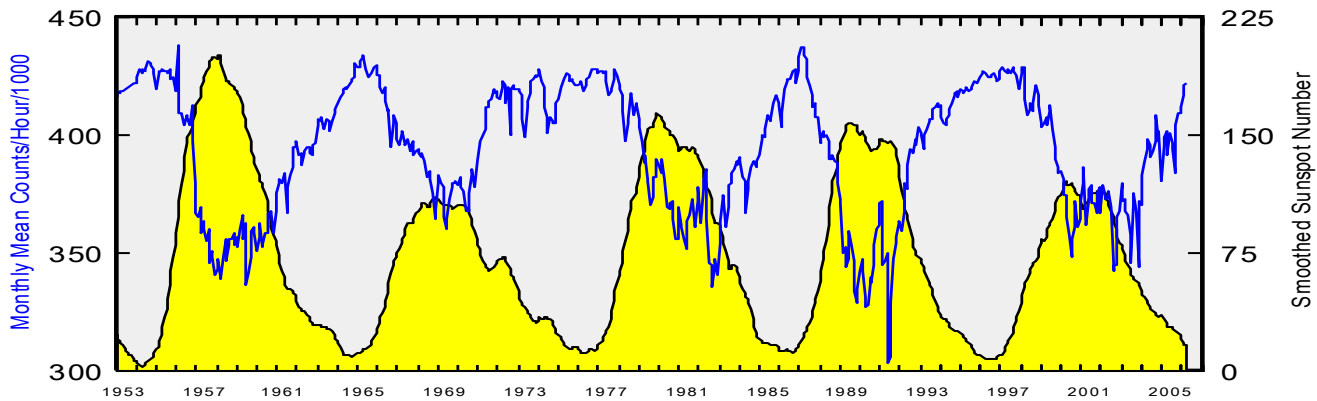


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FY07 Cosmic Rays -- new

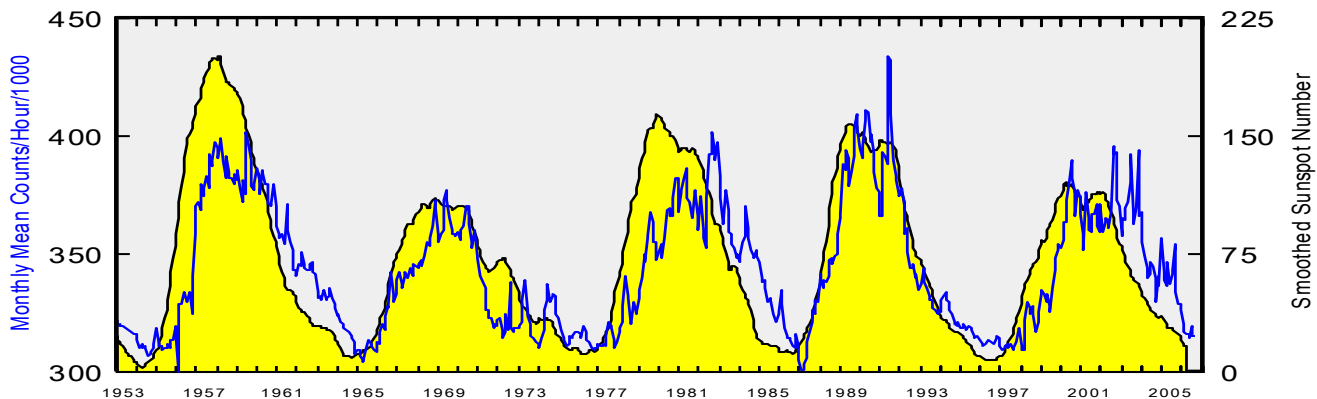
# Cosmic Rays Long Term Record

Cosmic Ray Counts and Smoothed Sunspot Numbers



Cosmic ray database begins in 1951. They have an inverse solar cycle behavior.

Cosmic Ray Counts (Inverted) and Smoothed Sunspot Numbers



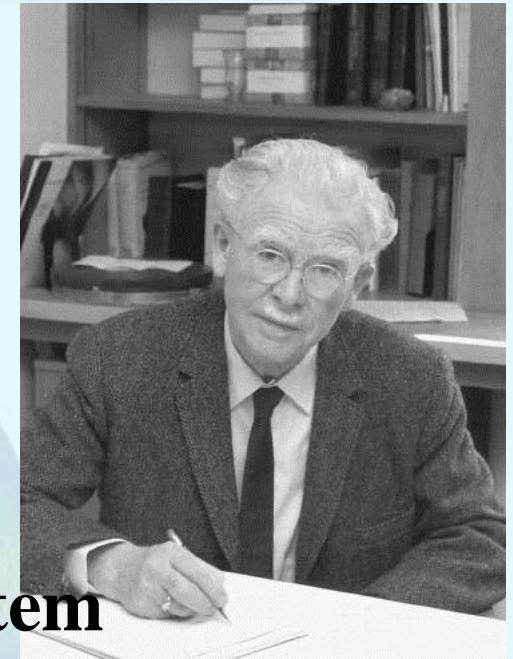
Earlier data exist.



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## **Archives from Scott Forbush, early cosmic ray scientist**



Cosmic ray ionization chamber data  
available beginning in 1936

### **Six worldwide stations monitoring system**

Cheltenham (later replaced by Fredericksburg), Maryland;  
Christchurch, New Zealand; Godhavn, Greenland; Climax,  
Colorado; Huancayo, Peru; and Mexico City, Mexico for the time  
period 1936-1959

### **Proposal:**

Migration of historical cosmic ray observations on  
photographic charts and published bi-hourly values to  
digital format



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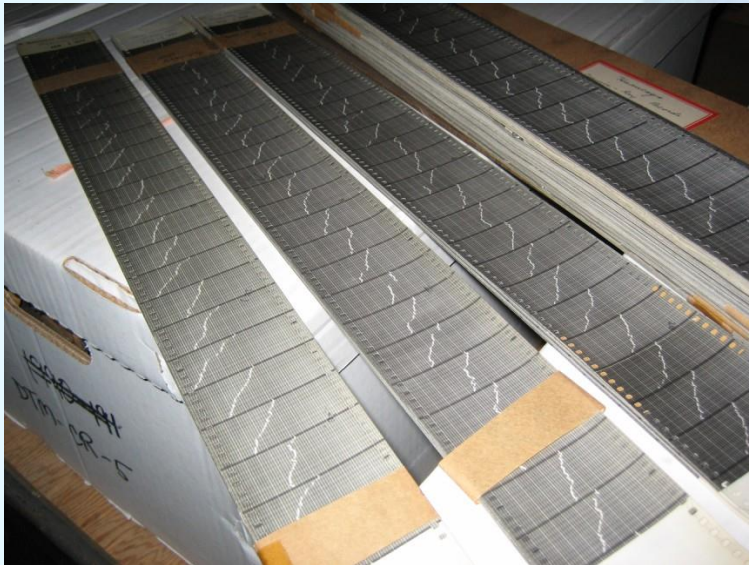
## Cosmic Ray legacy data

The ionization chamber adds up the ionization on a capacitor, i.e., it gives a time integral of the cosmic ray flux.



## CDMP Cosmic Ray Digitization Project

Nine boxes of photographic charts



Every hour the capacitor is shorted out-- that is the step you see every hour on the charts.

### Digitize in 2 minute intervals

-- annual bundles of strip charts

Each day is about 24 inches long by 2 inches wide  
– 1 hour/inch

Dr. Ken McCracken will help with timing issues.



## **Cosmic Ray legacy data**

- contain important information never made public
- highly relevant to modern day scientific studies

### **Photographic charts:**

- 9 boxes of 114 station years data, thus 70 Mbytes of data total from 2 minute digitization.
- PDF scans would also be valuable before discarding data

### **Bi-hourly data in books keyed in:** (1140 station months, plus summary tables)

Huancayo 1936-68

Cheltenham/Fredericksburg 1936-68

Christchurch 1947-61

Godhavn 1947-Jul 59

Mexico Jul 1957-58