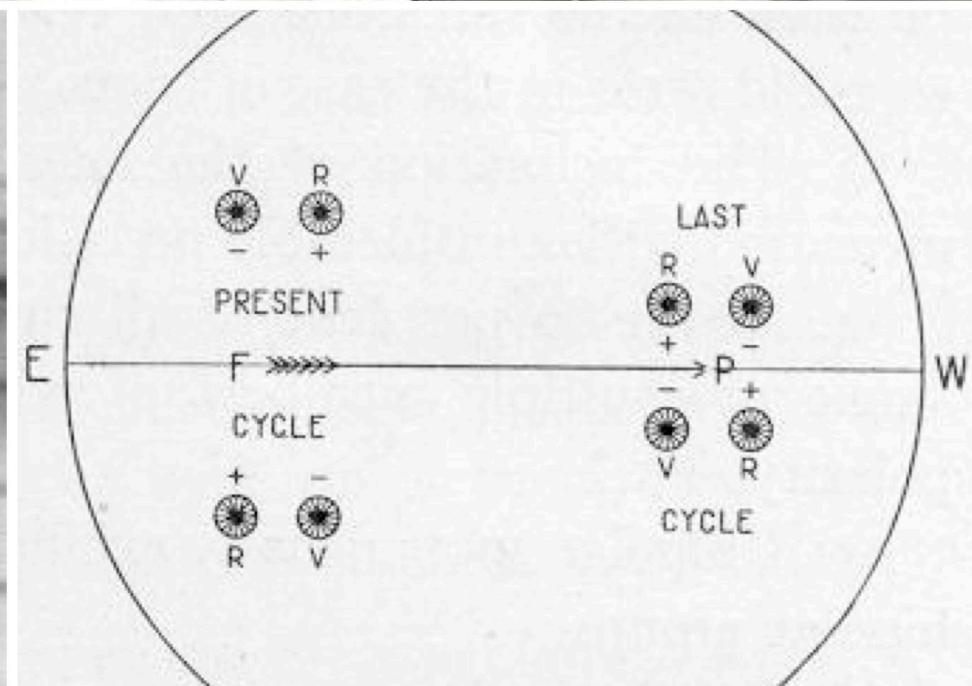
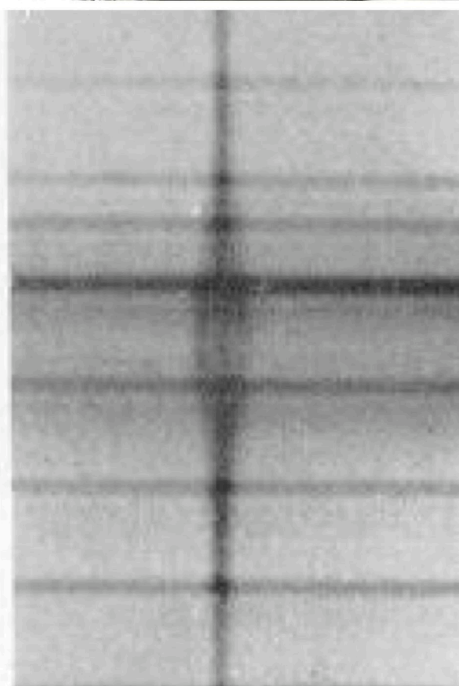
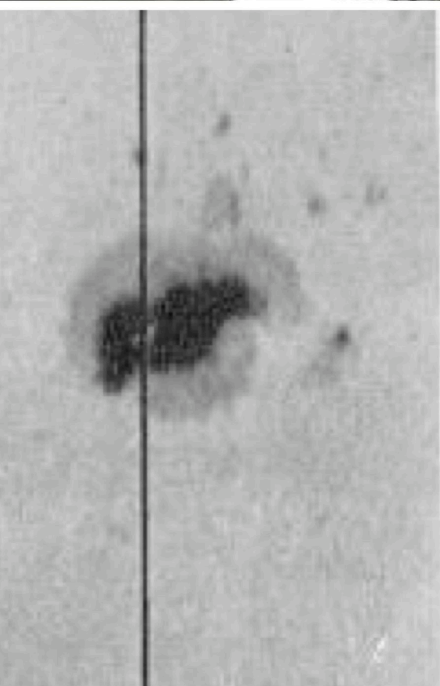




Southern California Astronomy

Department of Physics and
Astronomy at California State
University Northridge

To mark the telescopic viewing of
celestial objects by Galileo Galilei 400
years ago, 2009 is the International Year
for Astronomy.



Magnetic field out side the earth was first discovered by George Hale in 1908 at Mt. Wilson Observatory using the Zeeman effect of the sunspot spectrum (left bottom). He also discovered Hale's Polarity law describing the hemispheric sunspot polarity in different solar cycles (right bottom).

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

December 2008

S	M	T	W	T	F	S
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February 2009

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

January 2009

TIME

THE WEEKLY NEWSMAGAZINE



ASTRONOMER HUBBLE

Will Palomar's 200-inch eye see an exploding universe?
(Science)

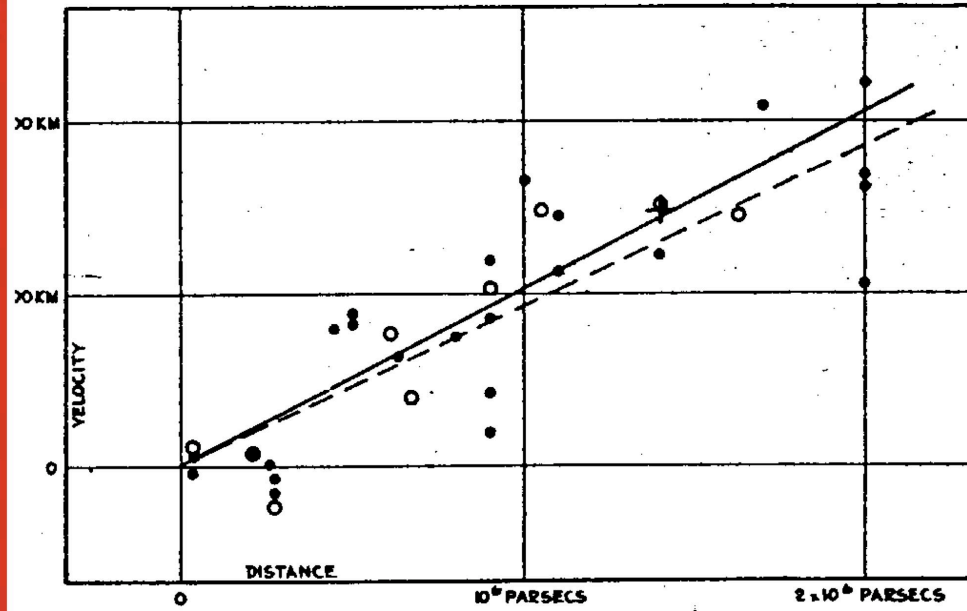


FIGURE 1

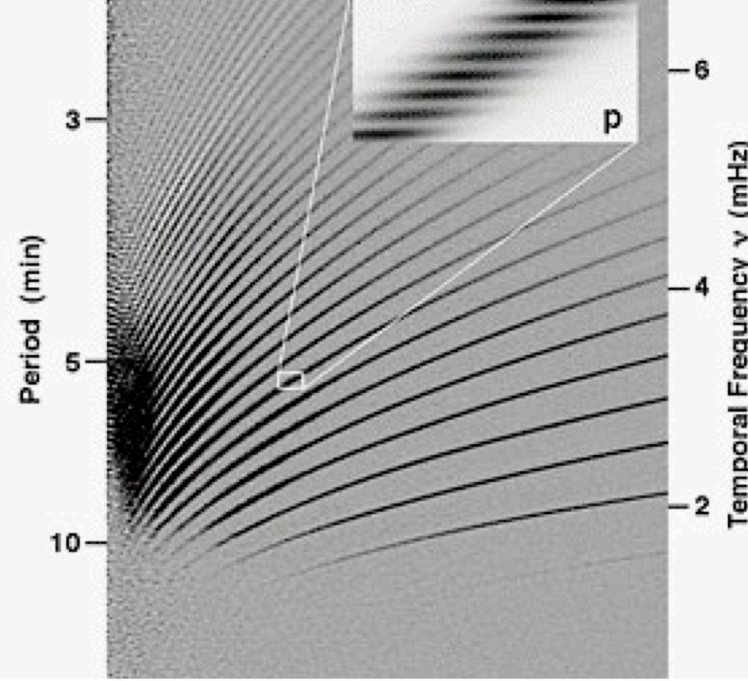
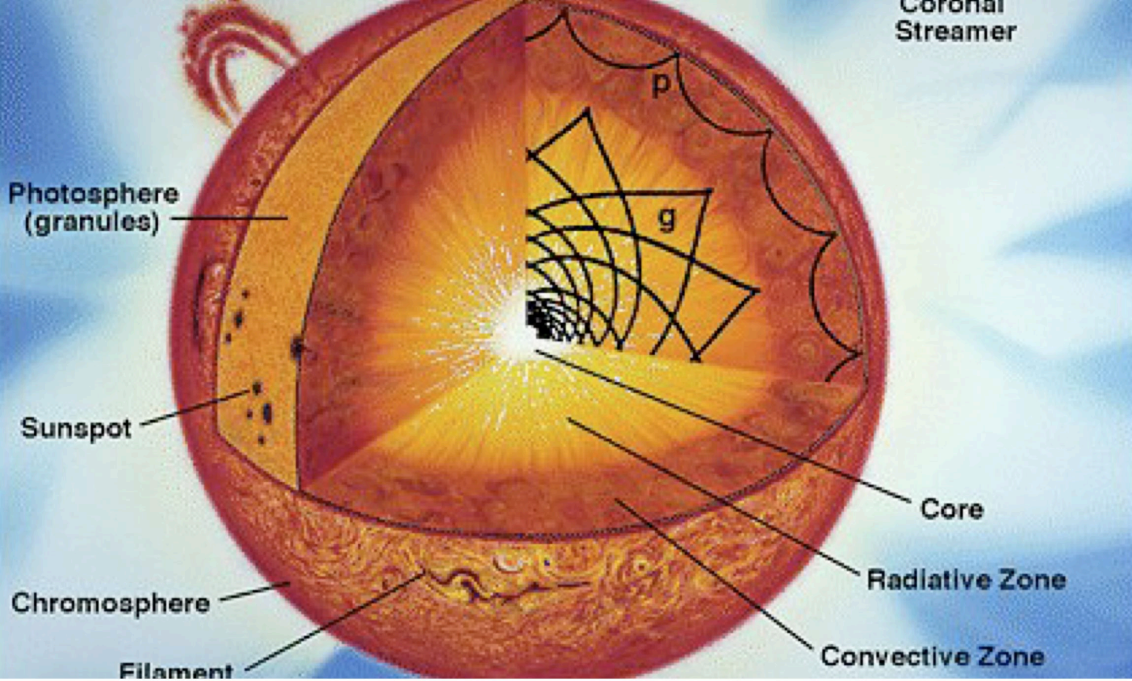


Edwin Hubble discovered the expanding universe at the Mt. Wilson and Palomar Observatories in 1929. Hubble's Law (top right) relates the distance to a galaxy with its recession velocity.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
1	2	3	4	5	6	7

January 2009							March 2009						
S	M	T	W	T	F	S	S	M	T	W	T	F	S
				1	2	3	1	2	3	4	5	6	7
4	5	6	7	8	9	10	8	9	10	11	12	13	14
11	12	13	14	15	16	17	15	16	17	18	19	20	21
18	19	20	21	22	23	24	22	23	24	25	26	27	28
25	26	27	28	29	30	31	29	30	31				

February 2009



Solar oscillation was discovered in 1960 by Robert Leighton using the Mt. Wilson solar telescope (bottom right). The sun oscillates predominately with a five minute period due to the sound waves traveling through its interior (top).

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

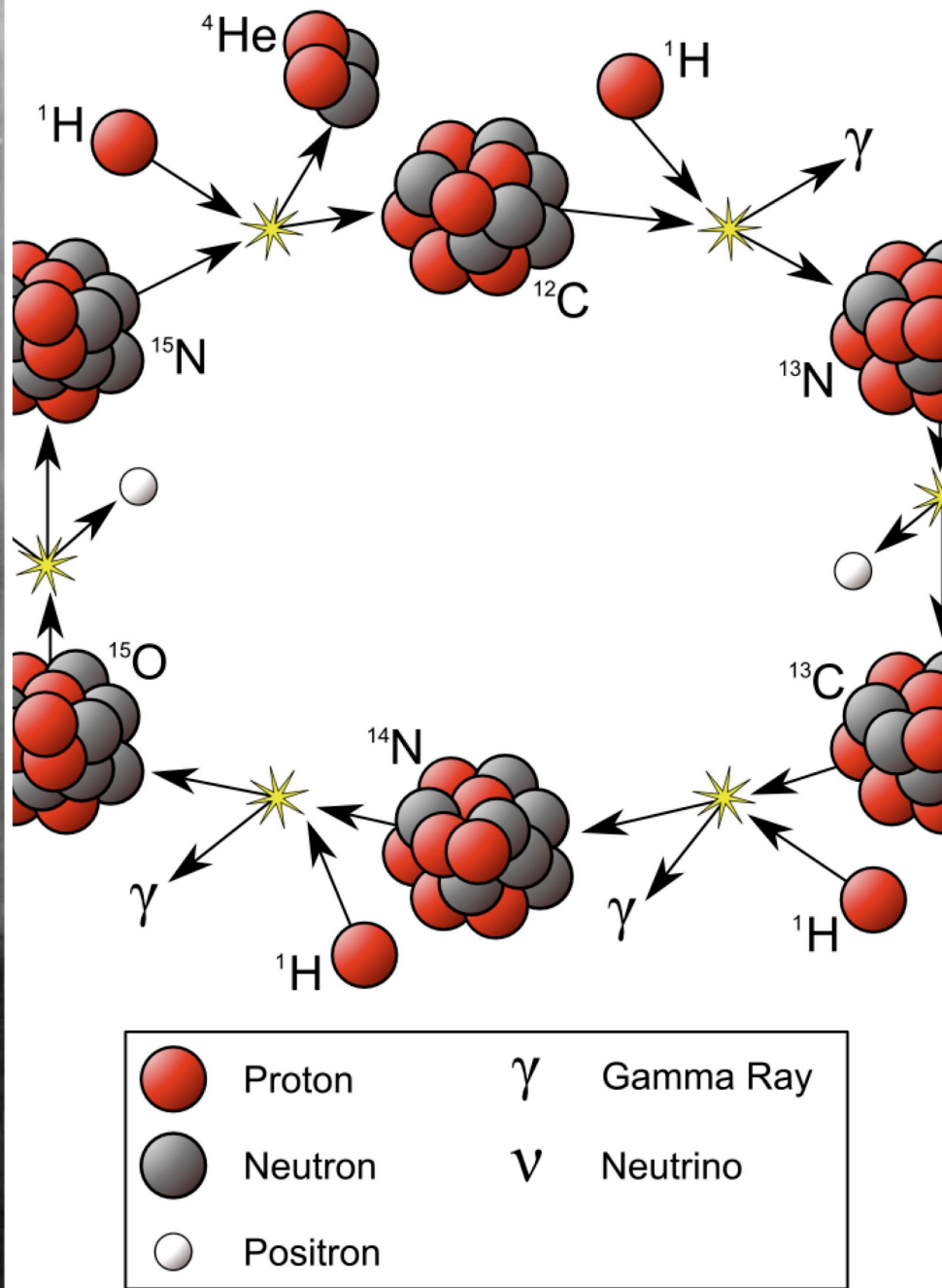
February 2009

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

April 2009

S	M	T	W	T	F	S
		1	2	3	4	
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

March 2009



Caltech professor William Fowler received the 1983 Nobel Prize in Physics for his "theoretical and experimental studies of the nuclear reactions of importance in the formation of chemical elements in the universe."

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	31	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1	2

March 2009

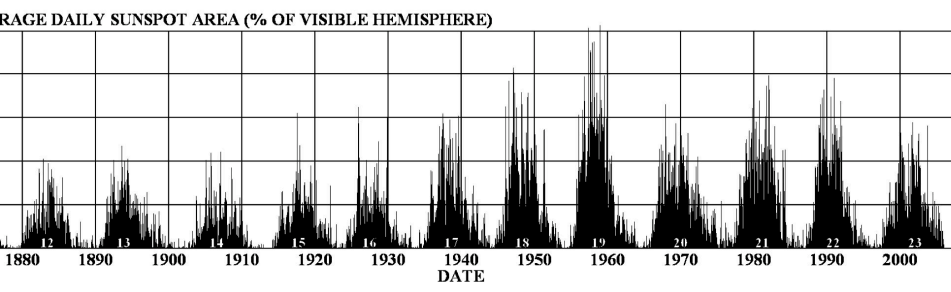
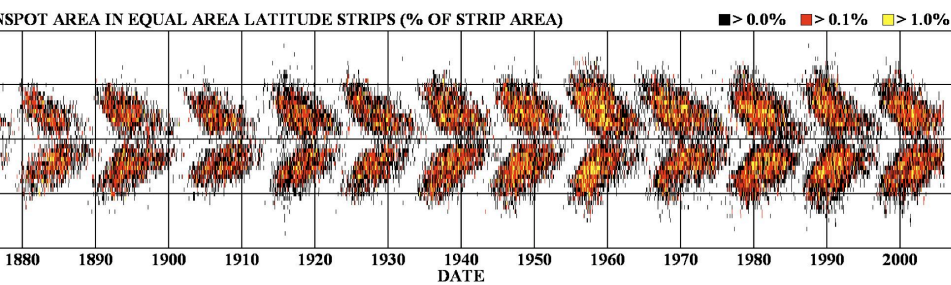
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

May 2009

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

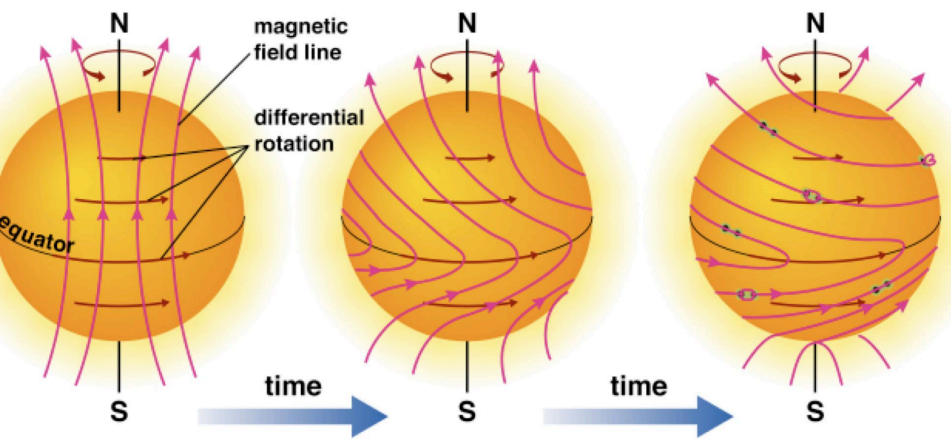
April 2009

DAILY SUNSPOT AREA AVERAGED OVER INDIVIDUAL SOLAR ROTATIONS



source:msfc.nasa.gov/sol/images/bfly.gif

NASA/NSSTC/HATHAWAY 21



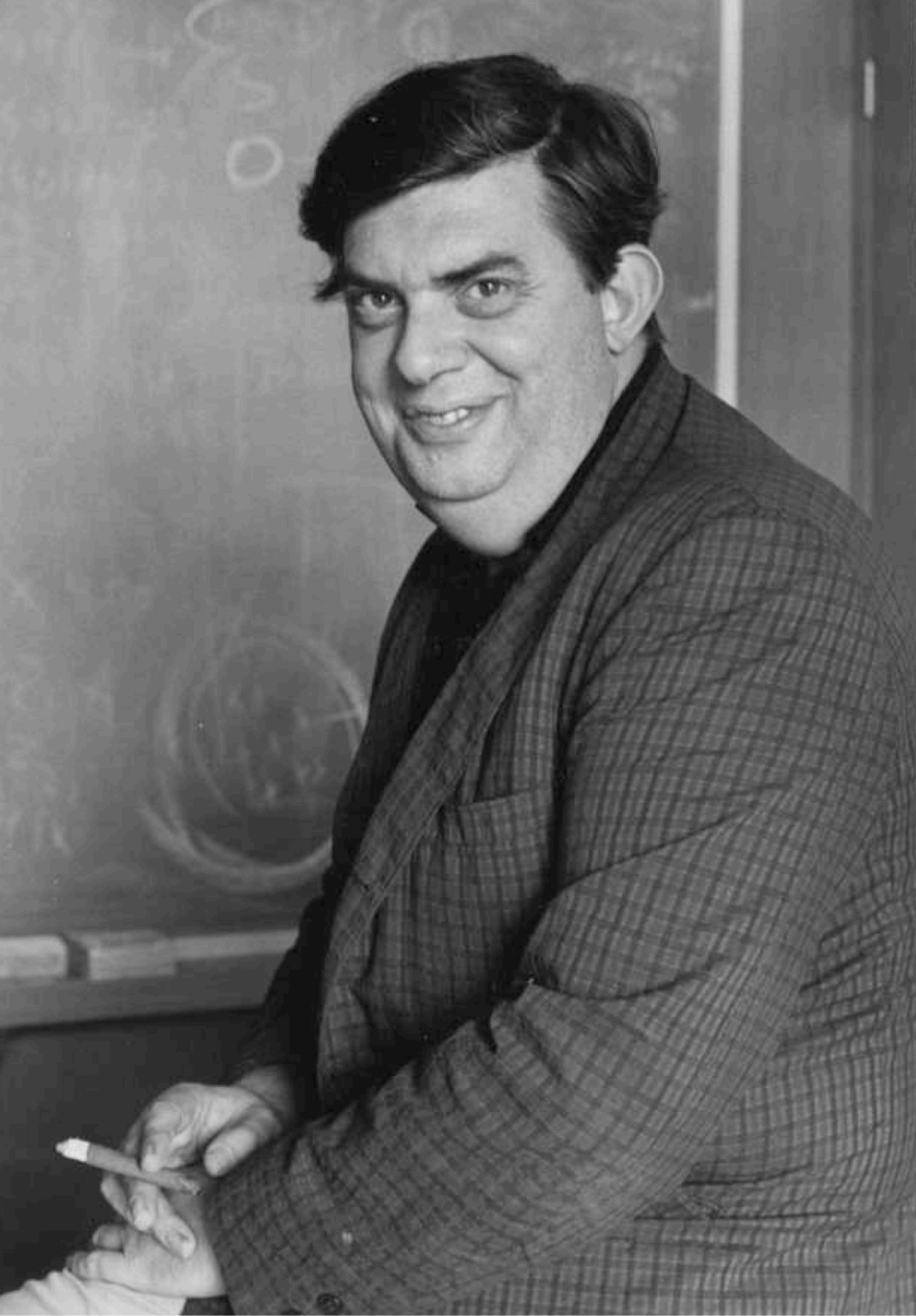
© Addison Wesley



Harold Wavcock, professor at Caltech, discovered the solar dynamo in 1961, which explained the 11 year sunspot cycle and the butterfly diagram

Sunday							Monday							Tuesday							Wednesday							Thursday							Friday							Saturday								
April 2009														June 2009														28	29	30	1	2																		
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
			1	2	3	4	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30														
5	6	7	8	9	10	11	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																				
12	13	14	15	16	17	18	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																											
19	20	21	22	23	24	25	21	22	23	24	25	26	27	28	29	30																																		
26	27	28	29	30	28	29	30																																											
3							4							5							6							7							8															
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17							18							19							20							21							22															
24							25							26							27							28							29															
31							1							2																																				

May 2009



In 1956, the University of California at San Diego professors Geoffrey and Margaret Burbridge, along with William Fowler and Sir Fred Hoyle, showed how heavier elements can be built up from lighter ones in the interior of stars.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
31	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	1	2	3	4

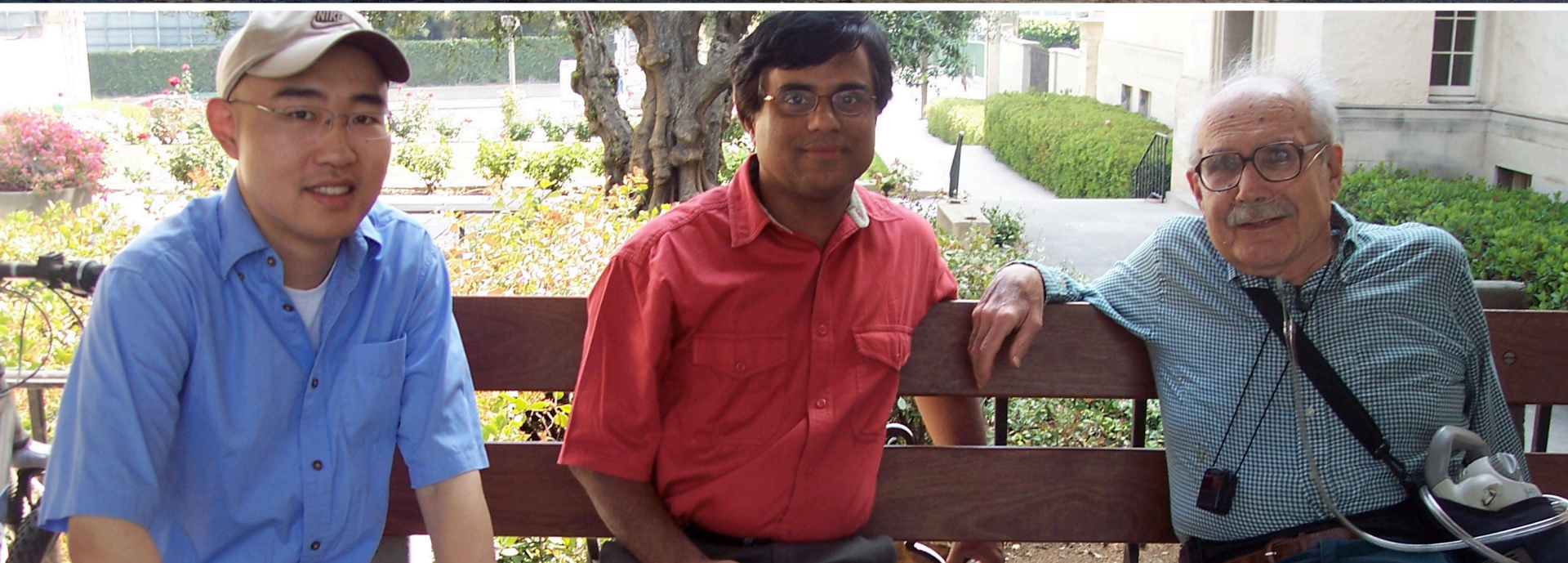
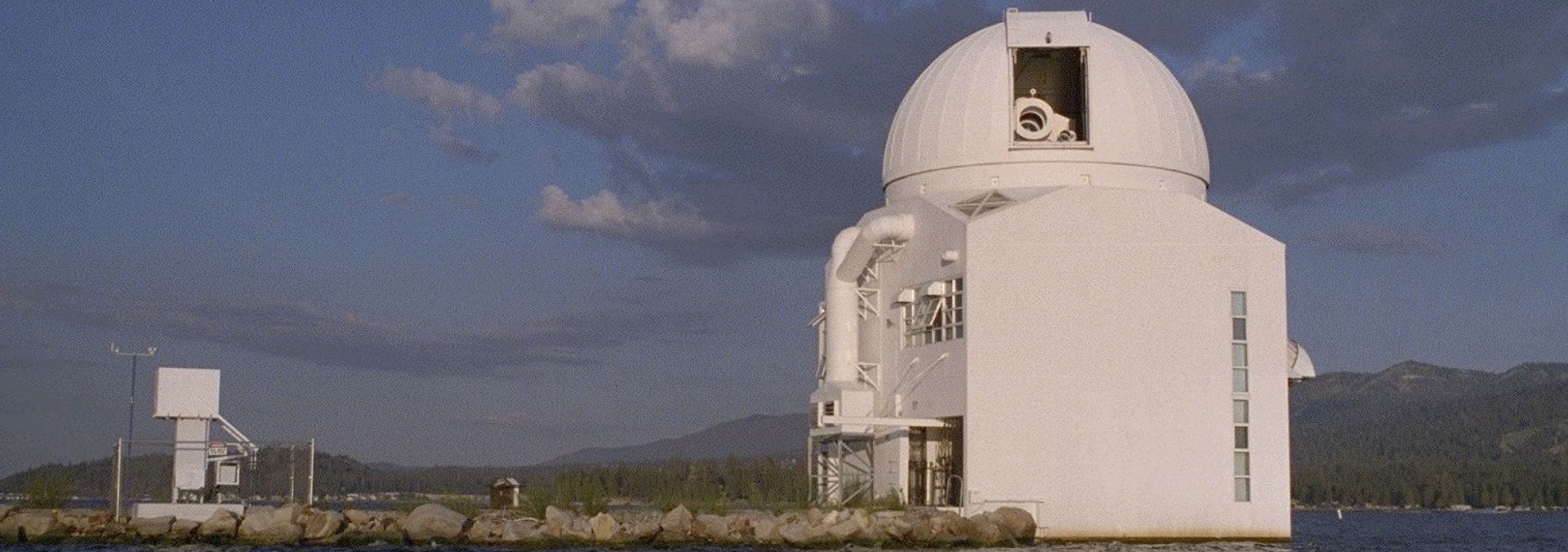
May 2009

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

July 2009

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

June 2009



Built in 1969, the Big Bear Solar Observatory, under the leadership of Professor Harold Zirin (bottom right), advanced the understanding of the solar chromosphere with high resolution images of the sun on a sustained basis. Currently, the observatory is managed by New Jersey Institute of Technology.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

June 2009

S	M	T	W	T	F	S
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

August 2009

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

July 2009



The Palomar Observatory, established in 1948 by Caltech, houses the 5.08 meter Hale telescope. It was the largest of its time. When the Palomar Sky Survey was completed, it was the most extensive survey ever.

Sunday							Monday							Tuesday							Wednesday							Thursday							Friday							Saturday																	
July 2009														September 2009														28	29	30	31																												
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S				
			1	2	3	4	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30																												
2							3							4							5							6							7							8																	
9							10							11							12							13							14							15																	
16							17							18							19							20							21							22																	
23							24							25							26							27							28							29																	
30							31																																																				

August 2009



The Griffith Observatory sits on Mount Hollywood in the middle of Los Angeles. It was established in 1933 with a grant from J Griffith. It attracts tourists from everywhere, and more people have viewed its primary telescope than any other telescope in the world.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
30	31	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	1	2	3

August 2009

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

October 2009

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

September 2009



Built in the early 1970's the San Fernando Observatory has extensive ground-based solar irradiance measurements.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
27	28	29	30	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

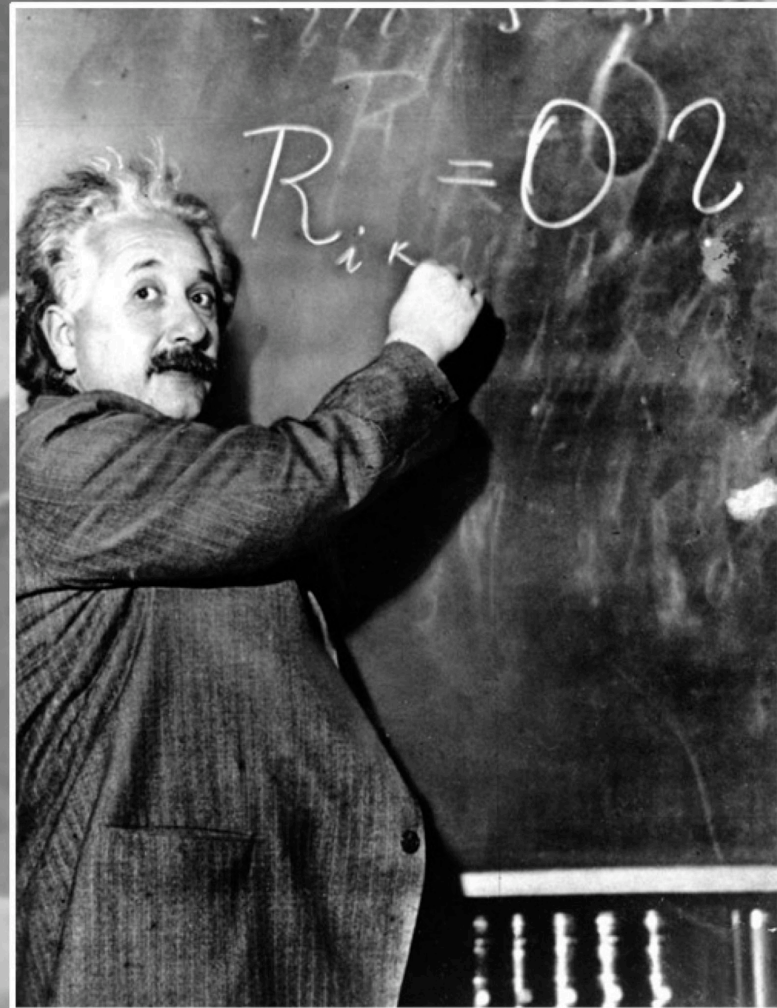
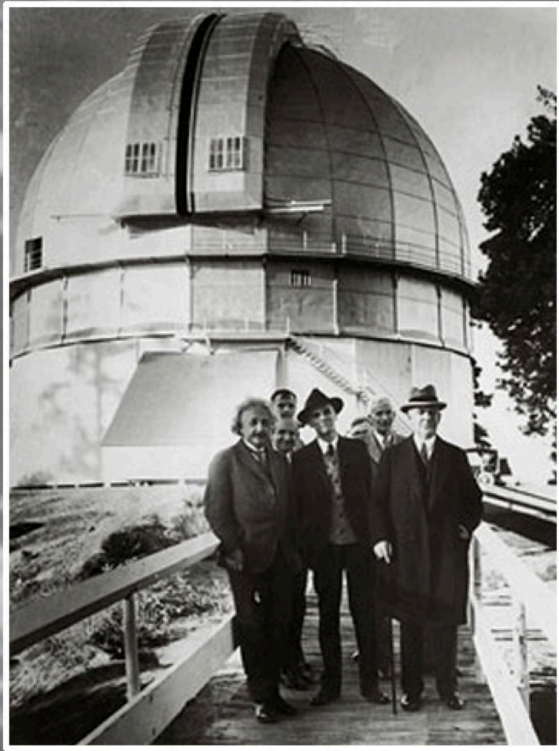
September 2009

S	M	T	W	T	F	S
	1	2	3	4	5	
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

November 2009

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October 2009



On a visit to Mt. Wilson Observatory (left), Einstein demonstrated his calculation of the density of the Milky Way (right). The 100-inch Hale telescope (background) was used by Edwin Hubble to show evidence for an expanding universe.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

October 2009

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

December 2009

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

November 2009



The thirty meter telescope (TMT), being planned by Caltech and the University of California, is expected to see "first light" in 2017. It will be able to look at the first stars and protogalaxies and be able to directly image extra-solar planets.

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
29	30	1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31	1	2

November 2009

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

January 2010

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

December 2009