

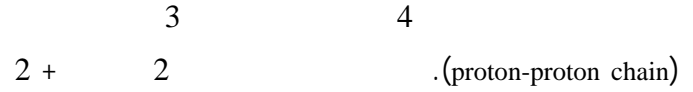


كل شيء عن الشمس

د. محمد فراس الصفدي

149,600,000	
152,100,000	
147,100,000	
8	
696,000	
1500	
30,000	
8,000	
25	
34	
16,000,000	
5,800	
4,500	
1,000,000	
$^{30}_{10} \times 1.99$	
G2	

:
 (core)
 %25 (1)
 16
 150
 (%34)
 1882-) Arthur Stanley Eddington
 (nuclear fusion) (1944)
 1926 .1920
 "The Internal Constitution of the Stars"
 .(plasma)
 :
 %25



$$E=mc^2$$

:

(1) 70% 25% (radiative zone)

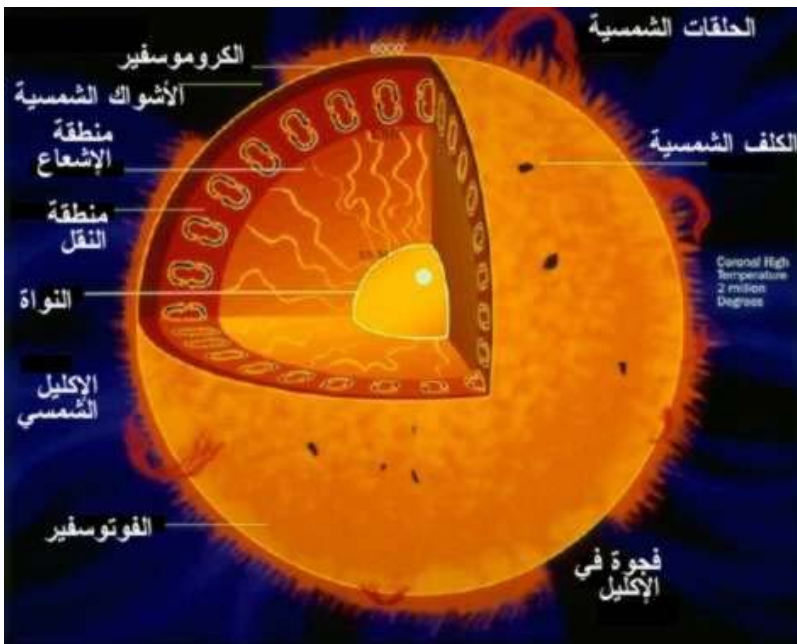
2 - 1.5 8 25%

(radiation)

(10^{-6})

(200,000 - 120,000) 170,000

170,000



(1)

:

(convection zone)
 .(1) %100 %70
 ()
 2 -1.5
 6,100

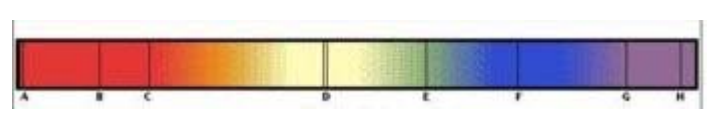
10 -5

:

(photosphere) ()
 5800 %0.03 200

%21 %79

(2) Fraunhofer



) (2)
 (

:(granules) .1

(granules)

1500 - 1000 (3)

15 100

:(super granules) .2

30,000

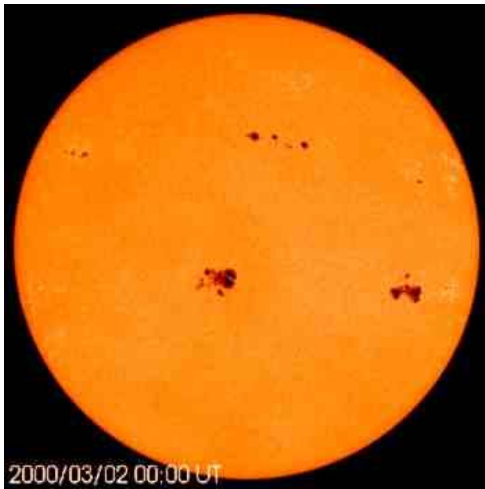
(sunspots) .3

50,000 - 2,500 (4)

5,800 4,500

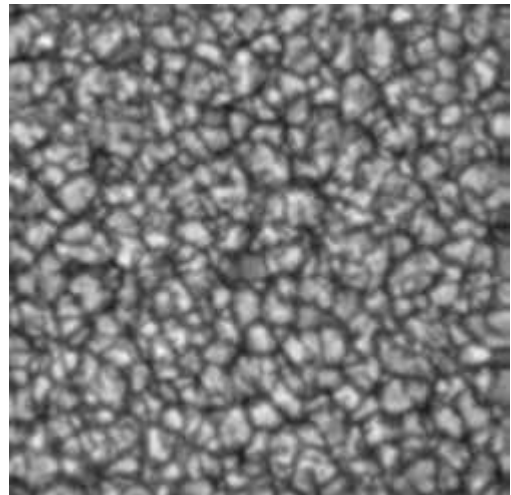
25

(differential rotation) 34



:(4)

4500



:(3)

2001

11

)

.2012

.(55

.(5)

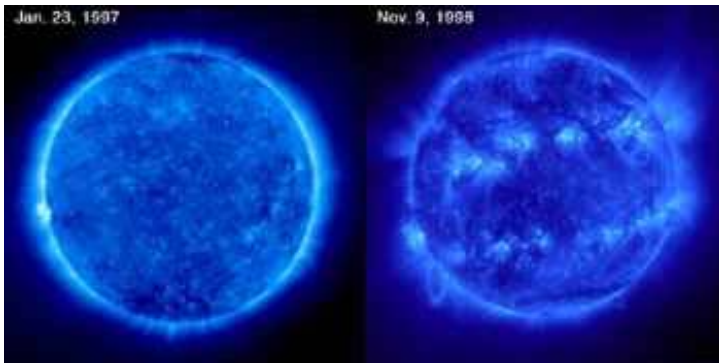
Babcock

.1961

11

()

.(active region)



() 1997

:(5)

.() 1998

:

(corona)

(chromosphere)

10,000

5,800

(solar wind)

2 - 1

(6)

(1,000,000)

coronal)

(1) (holes

4

/ 450



:(6)

:

:(spicules)

.1

(6)

5

:(coronal loops)

.2

(7)

50,000

:(prominences)

.3

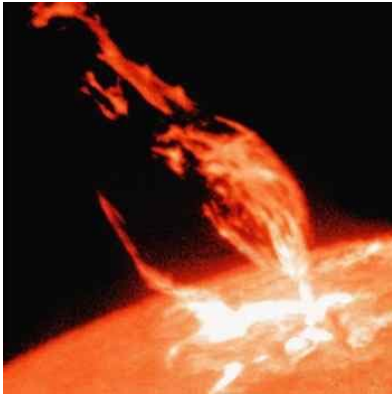
3 - 2

:(flares)

.4

1% (8).

5



(8):



(7):

(9) (aurora).



(9):