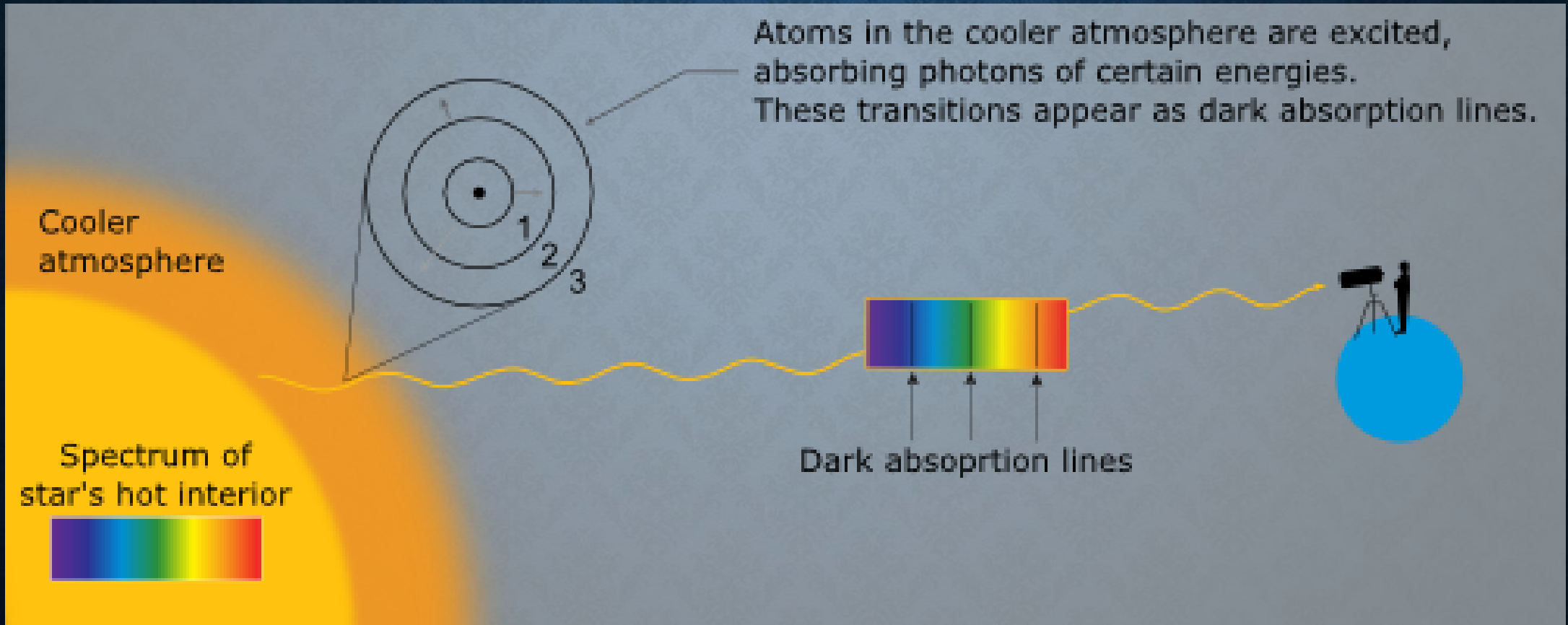


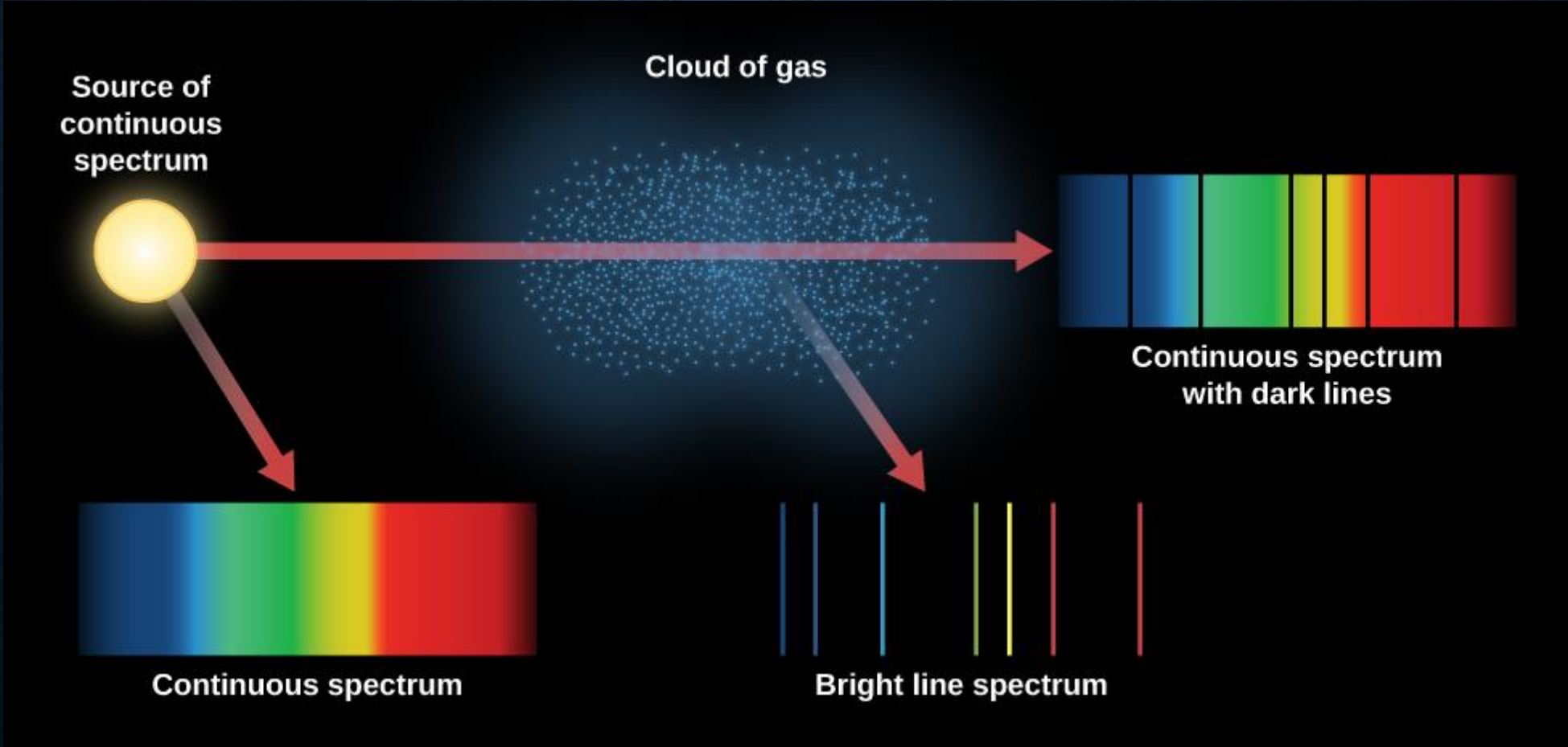
SPECTRAL CLASSIFICATION OF STARS

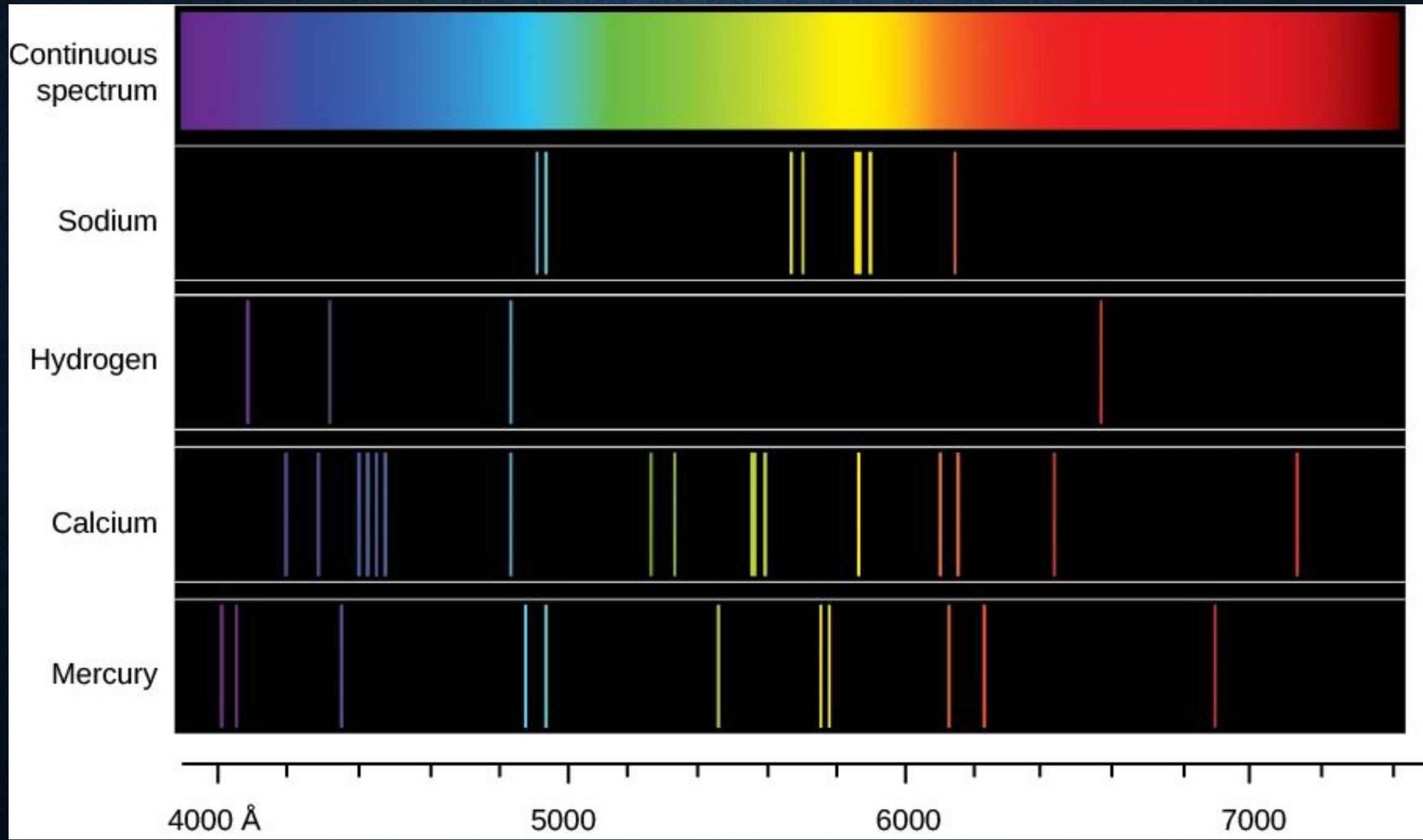
HISTORY

- Astronomers use a spectrograph to spread out light into a spectrum.
- In 1814, astronomers observed that the spectrum of our Sun showed dark lines crossing the bands of colors.
- In the 1860s, astronomers identified some of the same lines in the stellar spectra of known elements on Earth.
- This showed that the same chemical elements on Earth can be found in the Sun and other stars!

HOW DOES IT WORK?







O6.5

B0

B6

A1

A5

F0

F5

G0

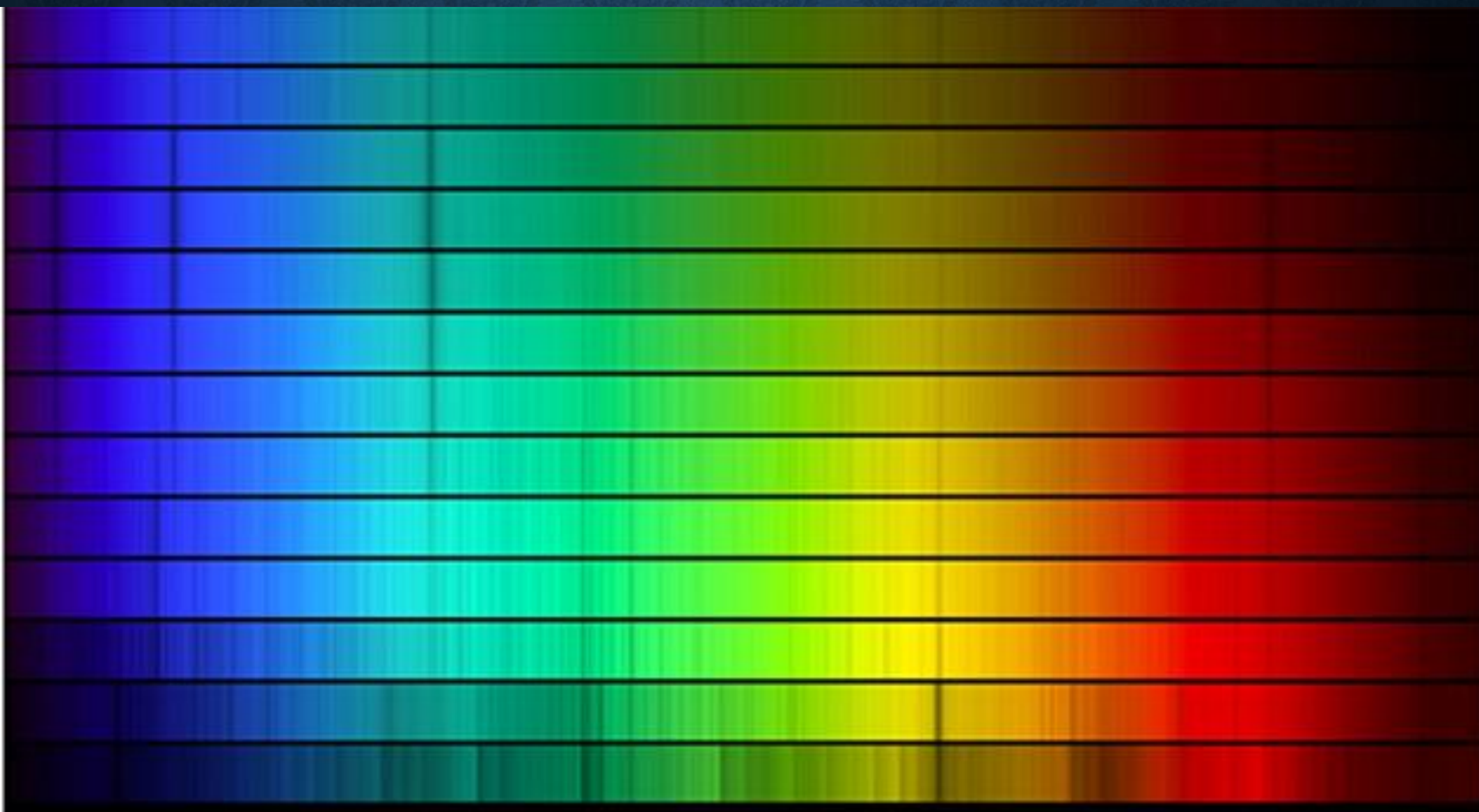
G5

K0

K5

M0

M5

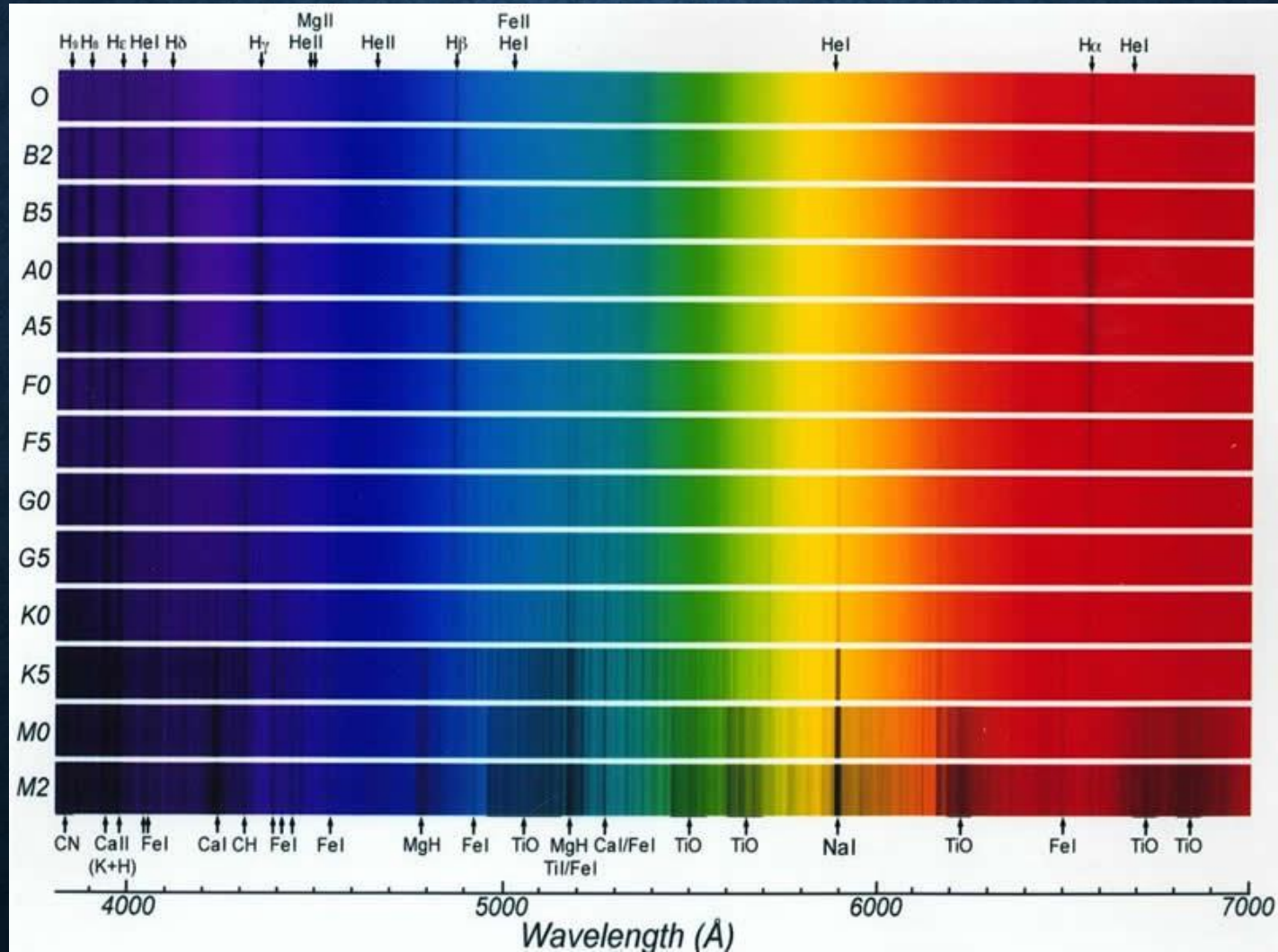


Spectral Classes for Stars

Spectral Class	Color	Approximate Temperature (K)	Principal Features	Examples
O	Blue	> 30,000	Neutral and ionized helium lines, weak hydrogen lines	10 Lacertae
B	Blue-white	10,000–30,000	Neutral helium lines, strong hydrogen lines	Rigel, Spica
A	White	7500–10,000	Strongest hydrogen lines, weak ionized calcium lines, weak ionized metal (e.g., iron, magnesium) lines	Sirius, Vega
F	Yellow-white	6000–7500	Strong hydrogen lines, strong ionized calcium lines, weak sodium lines, many ionized metal lines	Canopus, Procyon
G	Yellow	5200–6000	Weaker hydrogen lines, strong ionized calcium lines, strong sodium lines, many lines of ionized and neutral metals	Sun, Capella
K	Orange	3700–5200	Very weak hydrogen lines, strong ionized calcium lines, strong sodium lines, many lines of neutral metals	Arcturus, Aldebaran
M	Red	2400–3700	Strong lines of neutral metals and molecular bands of titanium oxide dominate	Betelgeuse, Antares
L	Red	1300–2400	Metal hydride lines, alkali metal lines (e.g., sodium, potassium, rubidium)	Teide 1
T	Magenta	700–1300	Methane lines	Gliese 229B
Y	Infrared ¹	< 700	Ammonia lines	WISE 1828+2650

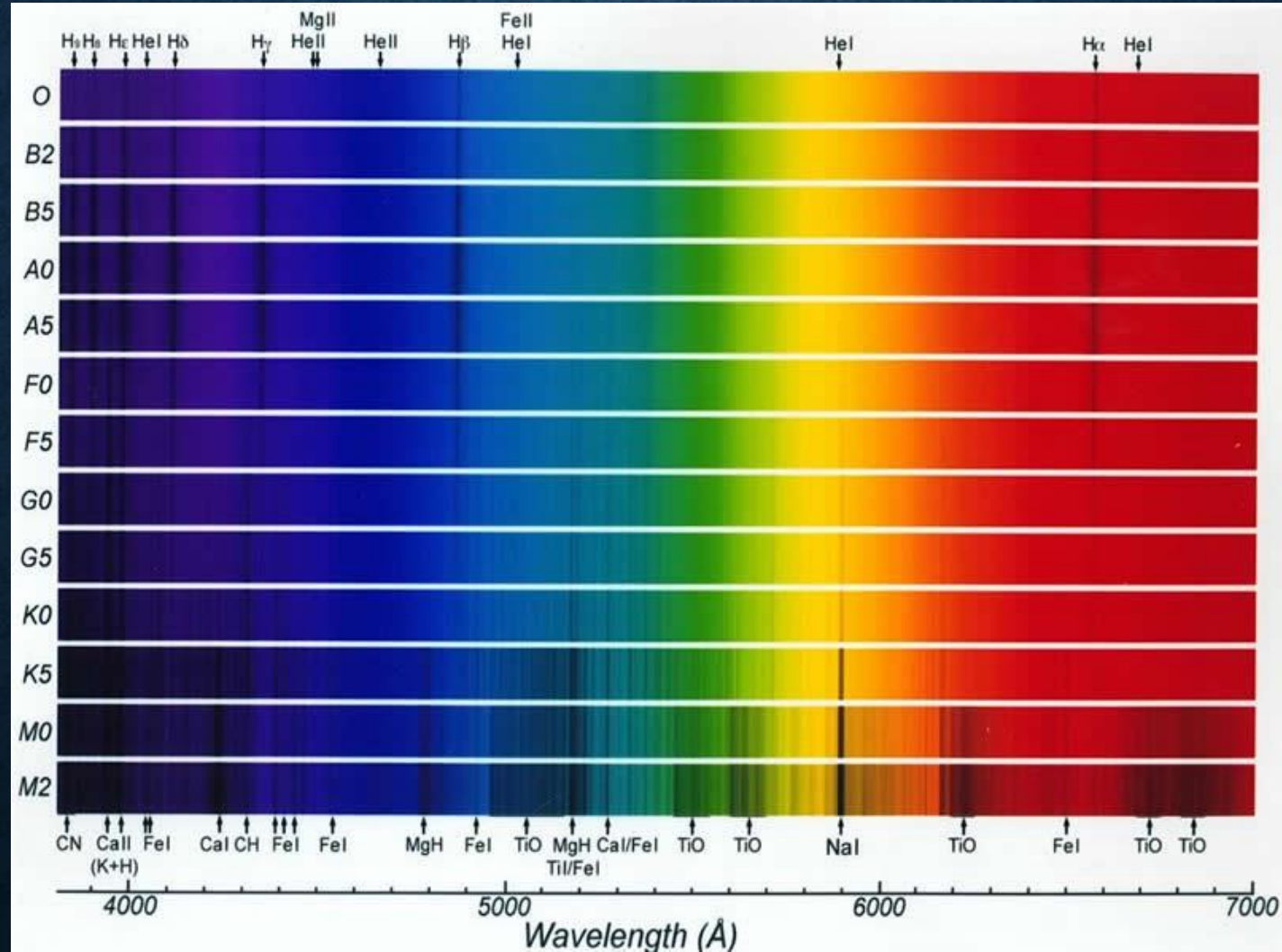
SPECTRAL CLASSIFICATION - O

Weak Hydrogen
and Helium lines



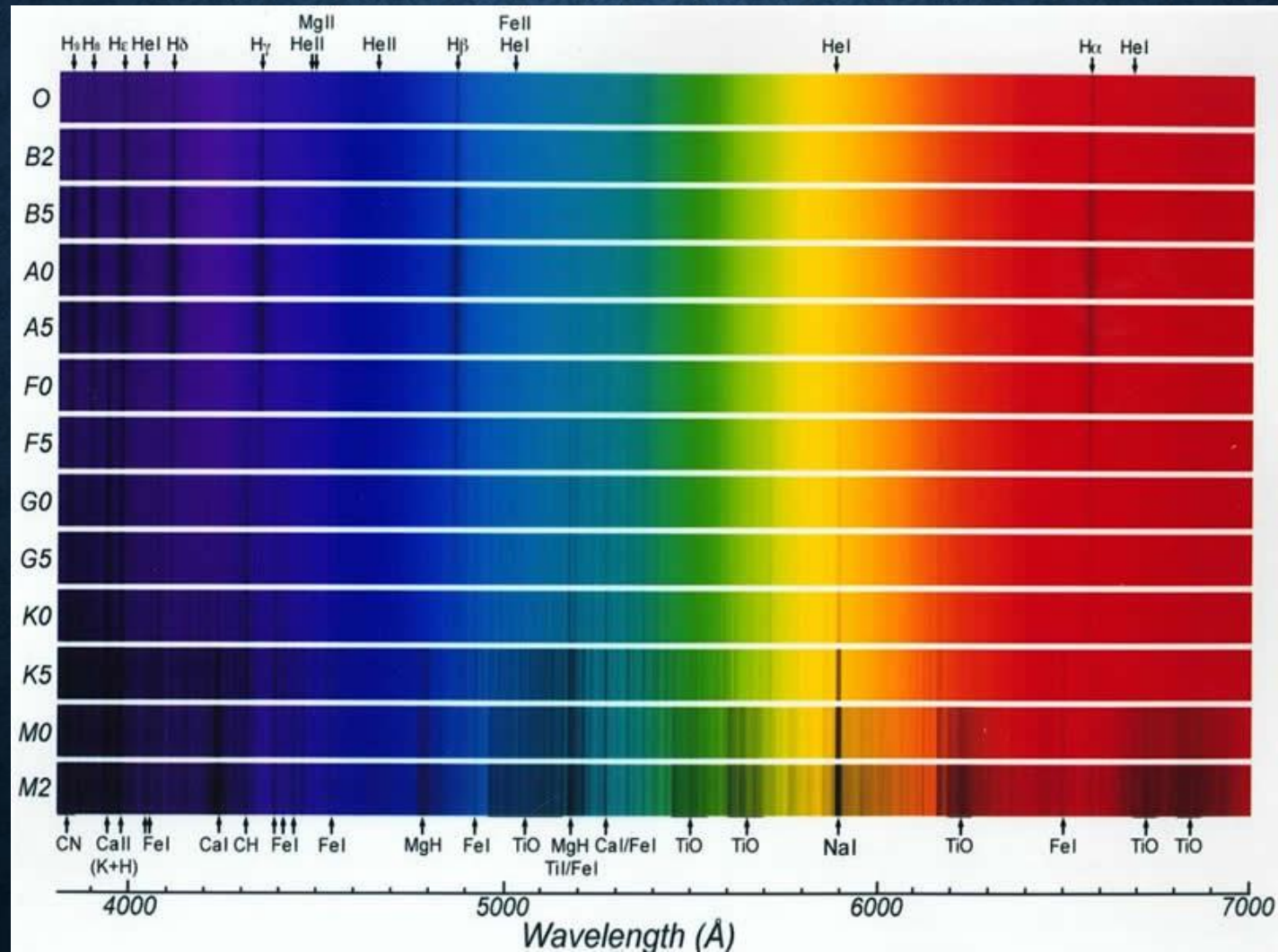
SPECTRAL CLASSIFICATION - B

Stronger
Hydrogen and
weak Helium
lines



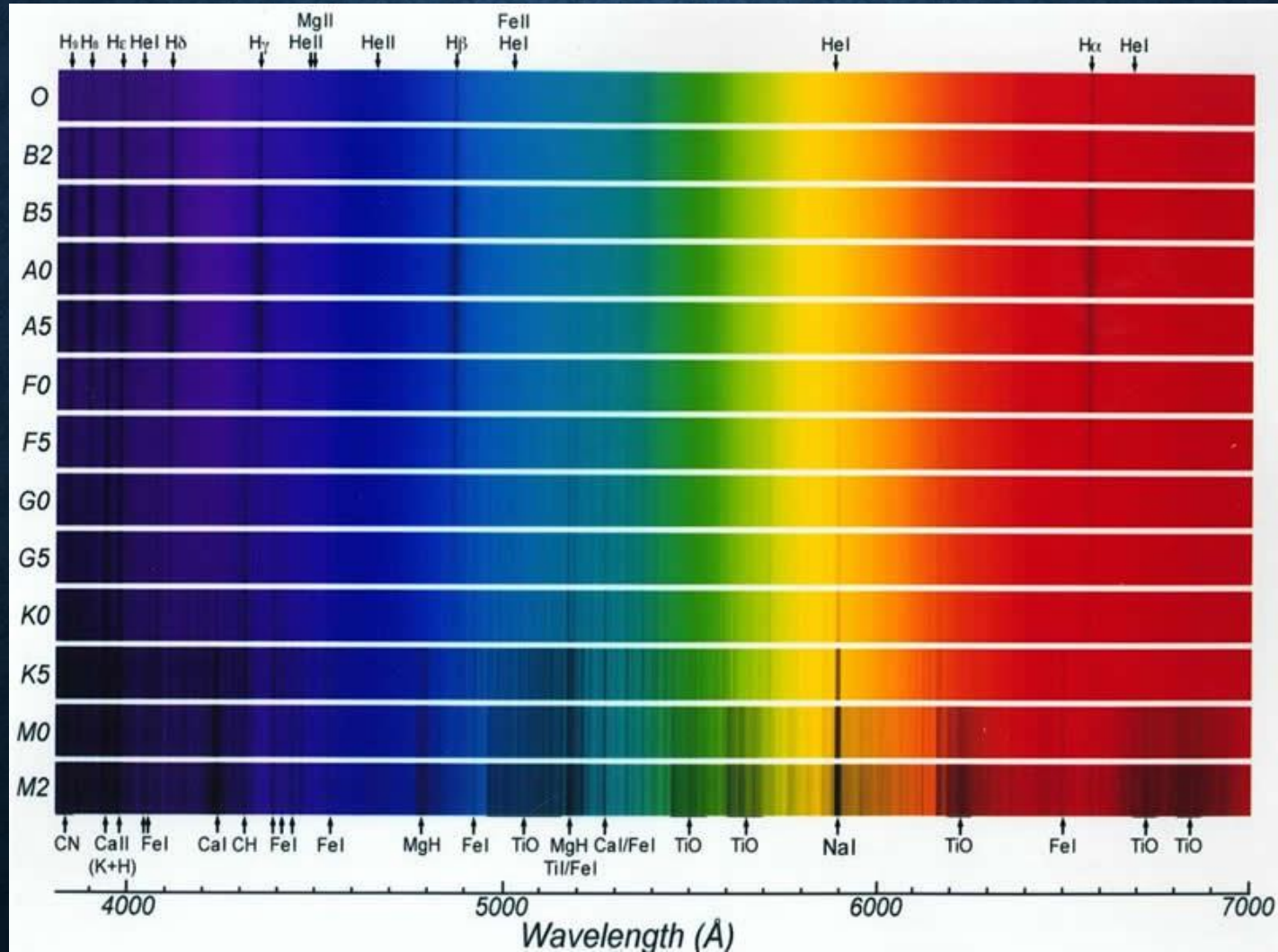
SPECTRAL CLASSIFICATION - A

Strongest
Hydrogen and
weak Helium
lines



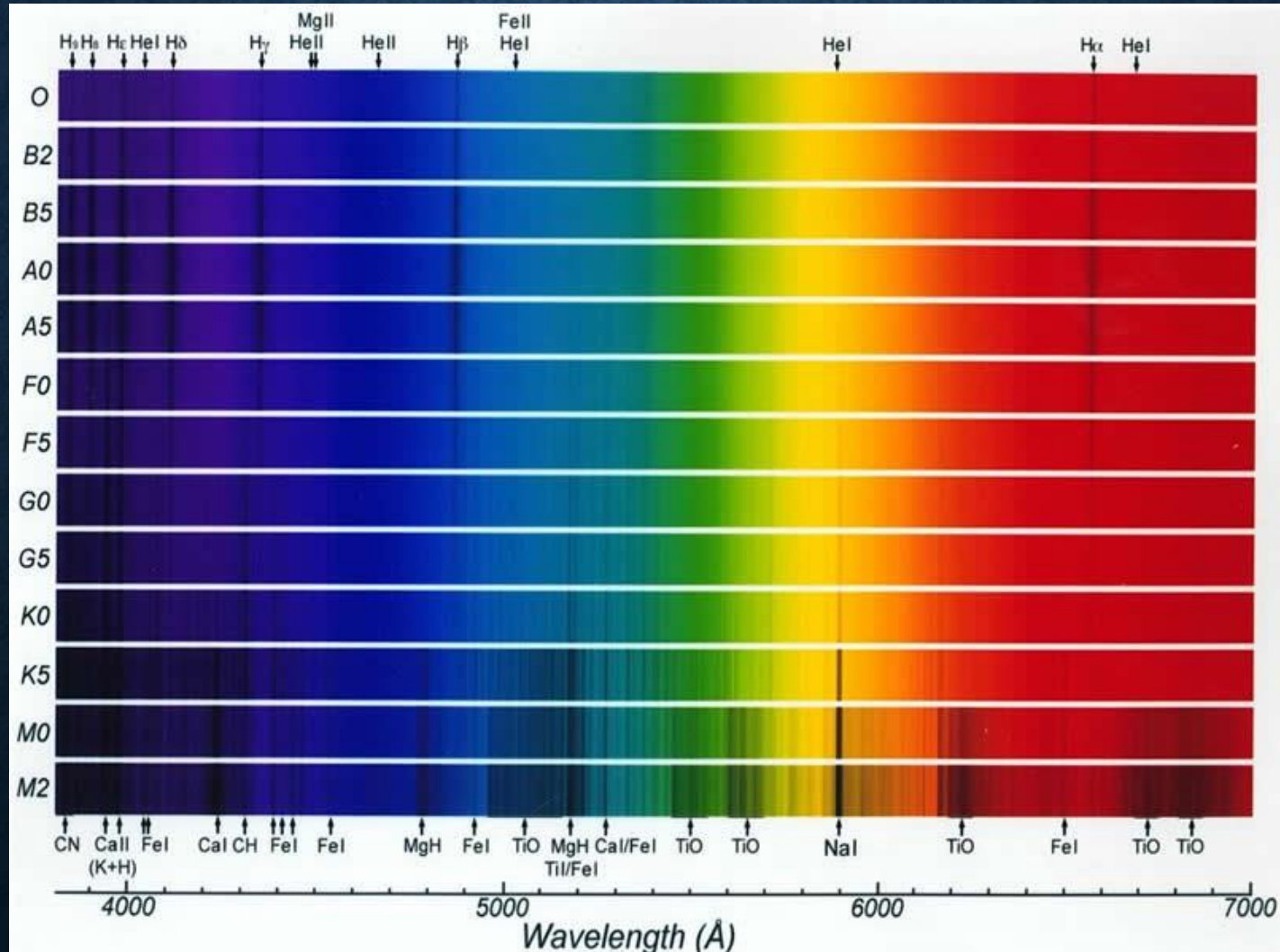
SPECTRAL CLASSIFICATION - F

Medium
Hydrogen lines,
strong ionized
Calcium (Ca)
lines and weak
Sodium (Na)
lines



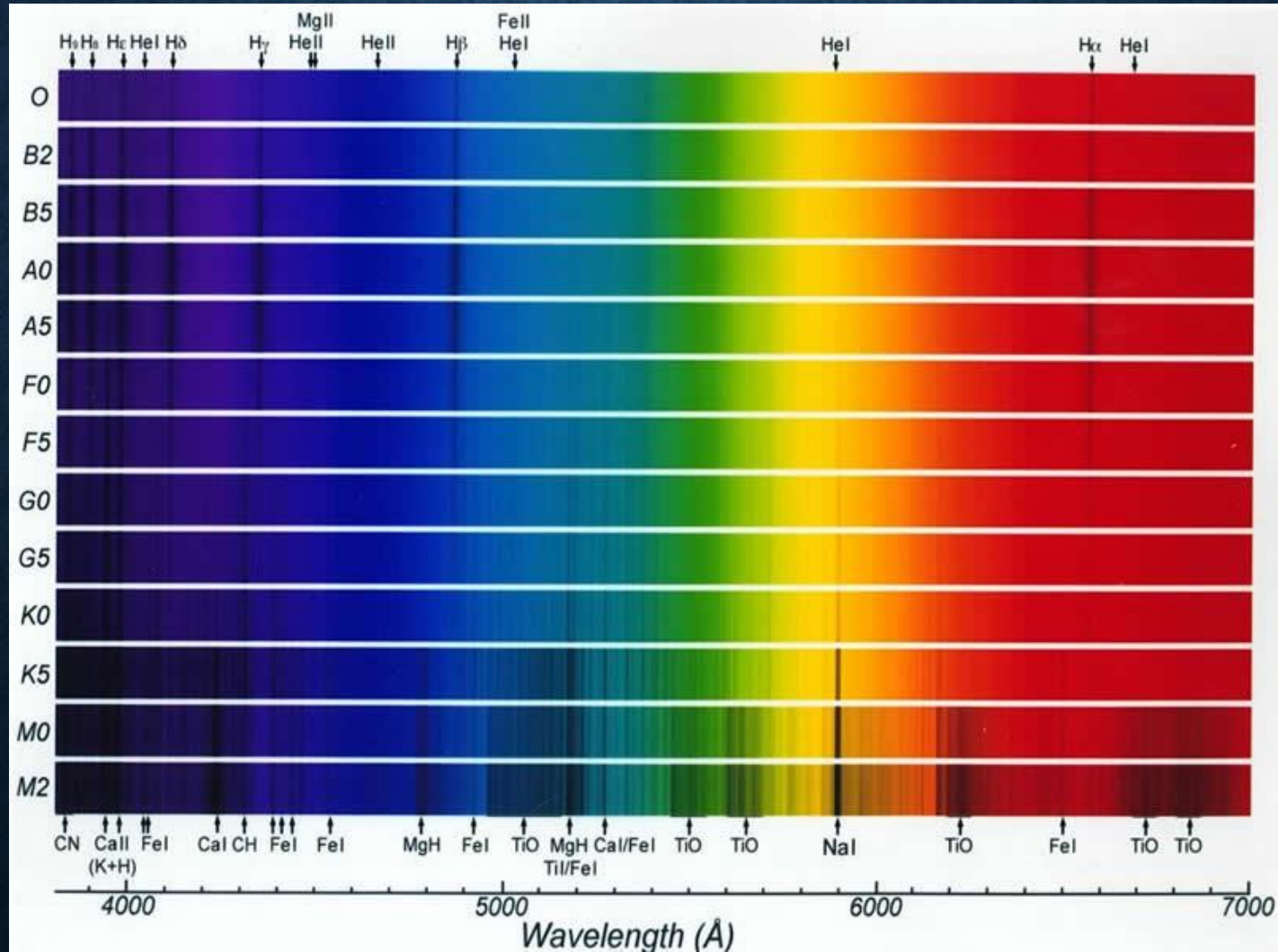
SPECTRAL CLASSIFICATION - G

Medium
Hydrogen lines,
strong ionized
Calcium (Ca)
lines and weak
Sodium (Na) and
Magnesium (Mg)
lines



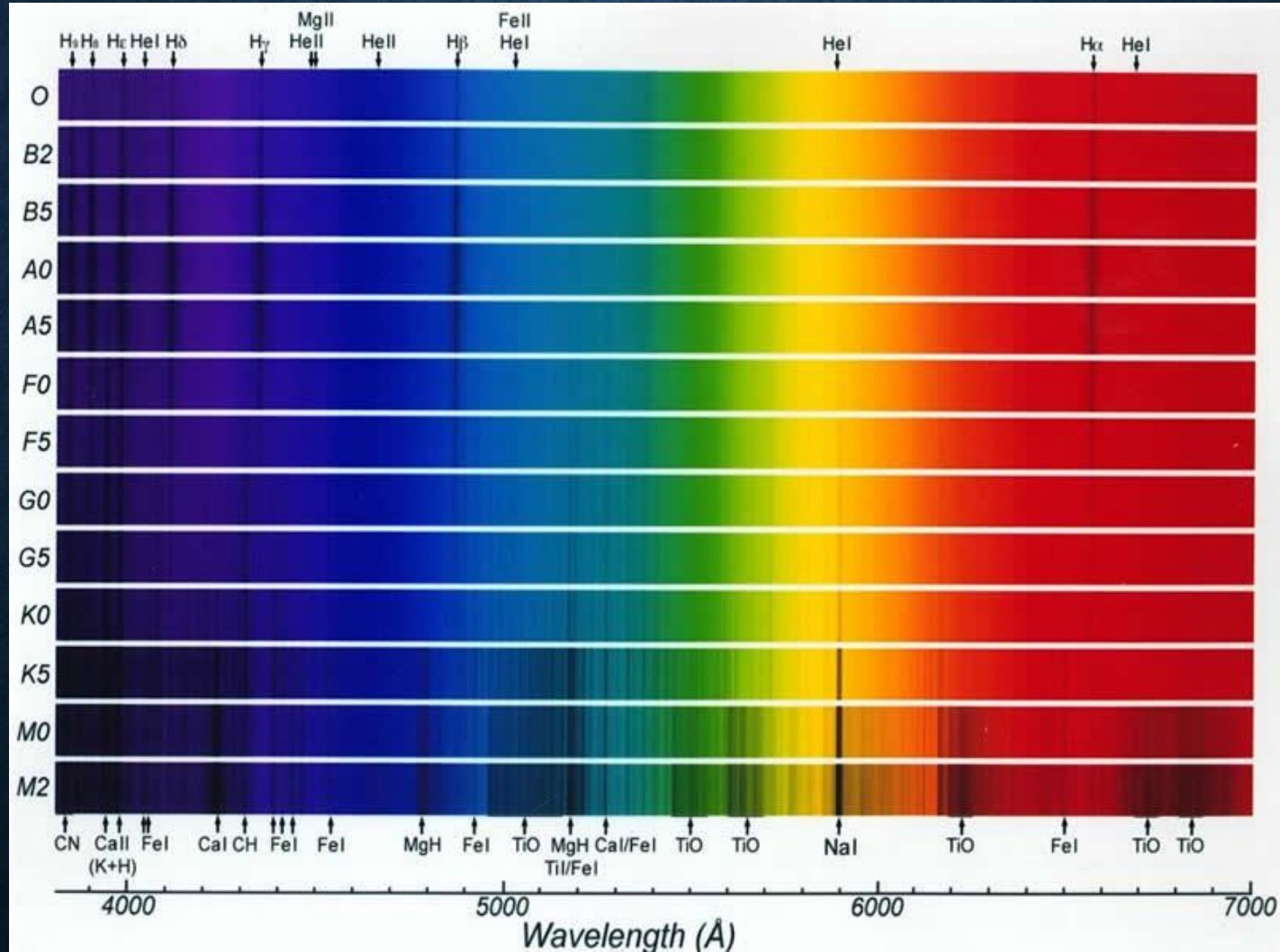
SPECTRAL CLASSIFICATION - K

Weak Hydrogen lines, strong ionized Calcium (Ca) lines and many lines of metals.



SPECTRAL CLASSIFICATION - M

Strong lines of neutral metals

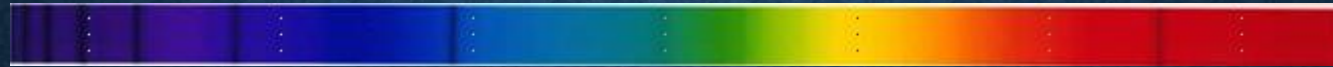


WHAT IS THIS STAR'S SPECTRAL CLASS?



O – Really no lines at all

WHAT IS THIS STAR'S SPECTRAL CLASS?



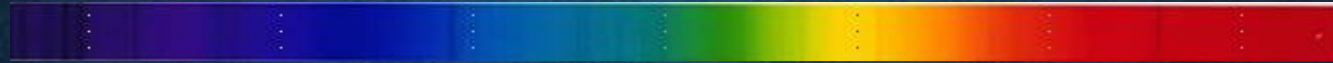
B – Strong Hydrogen and Helium – no other metals

WHAT IS THIS STAR'S SPECTRAL CLASS?



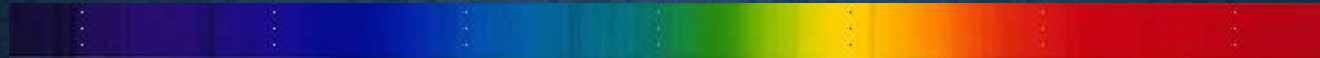
A – Strongest Hydrogen and Helium

WHAT IS THIS STAR'S SPECTRAL CLASS?



F – Weaker Hydrogen and Helium, more Calcium on left side

WHAT IS THIS STAR'S SPECTRAL CLASS?



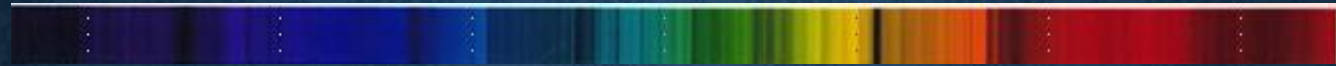
G – Weaker Hydrogen, more Calcium on left side, traces of Magnesium

WHAT IS THIS STAR'S SPECTRAL CLASS?



K – Weaker Hydrogen, more Calcium and lots of trace metals

WHAT IS THIS STAR'S SPECTRAL CLASS?



M – strongest lines of metals