Spectroscopic Astronomy

David Aguado

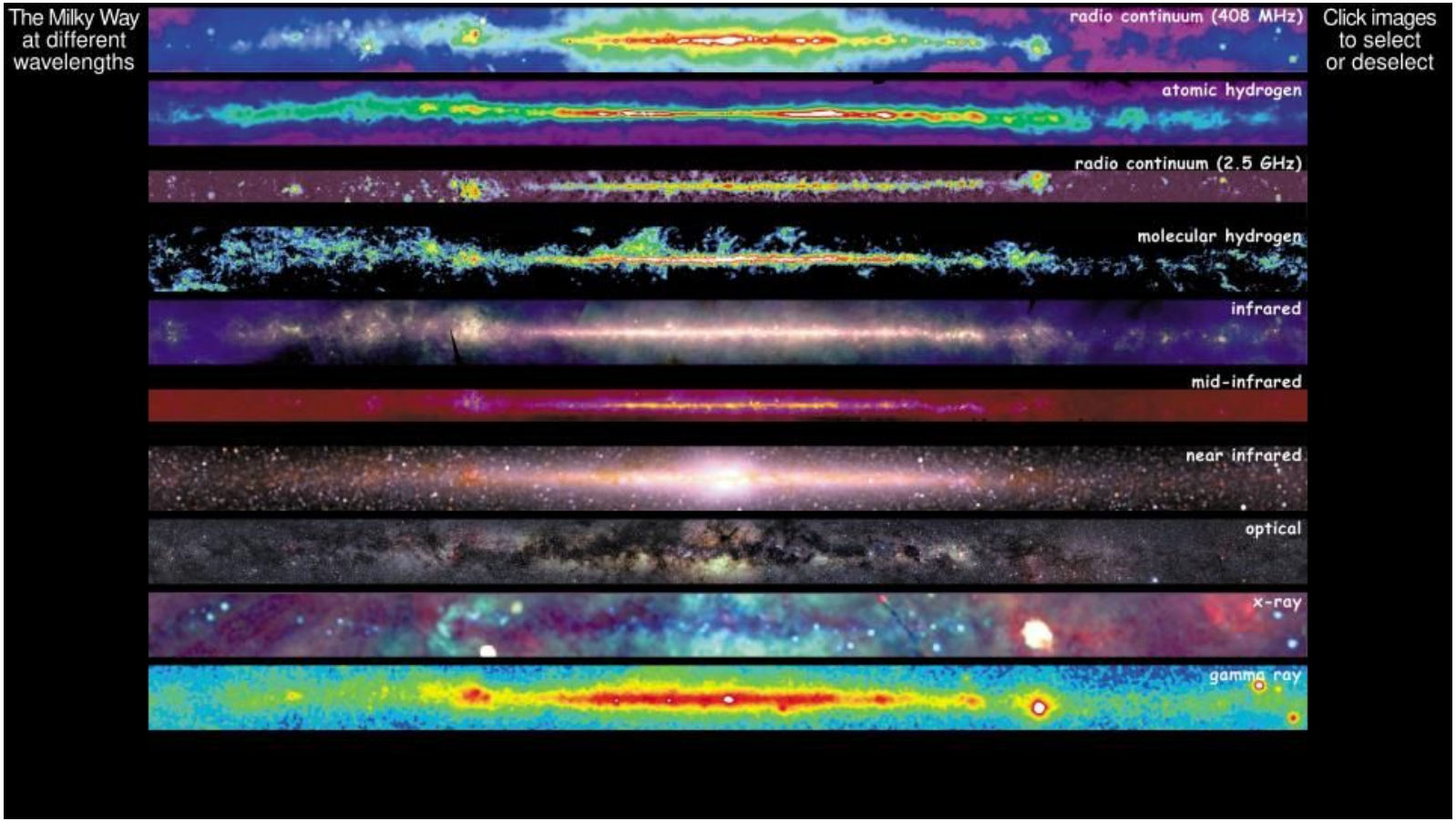
OECE 2026

BeiHang University



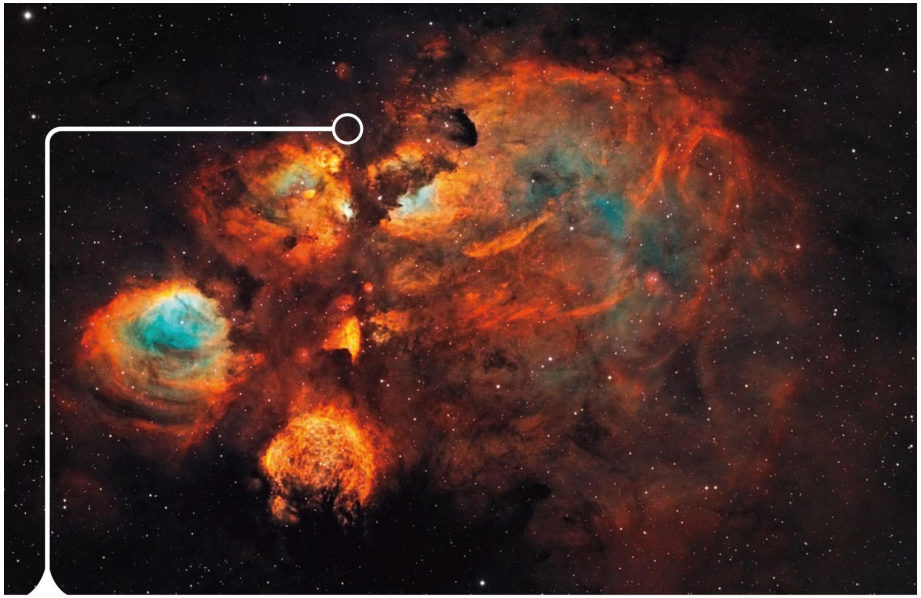
SESSION 2

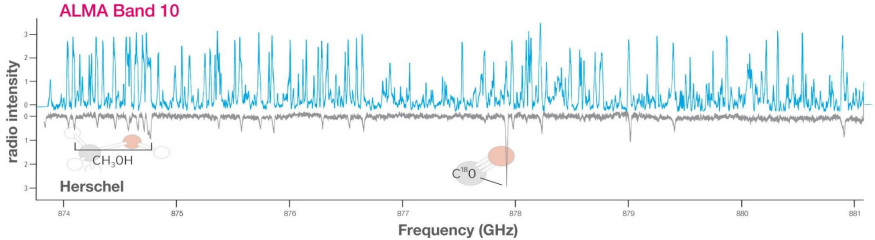
Astronomical spectroscopy extends across the electromagnetic spectrum!!!



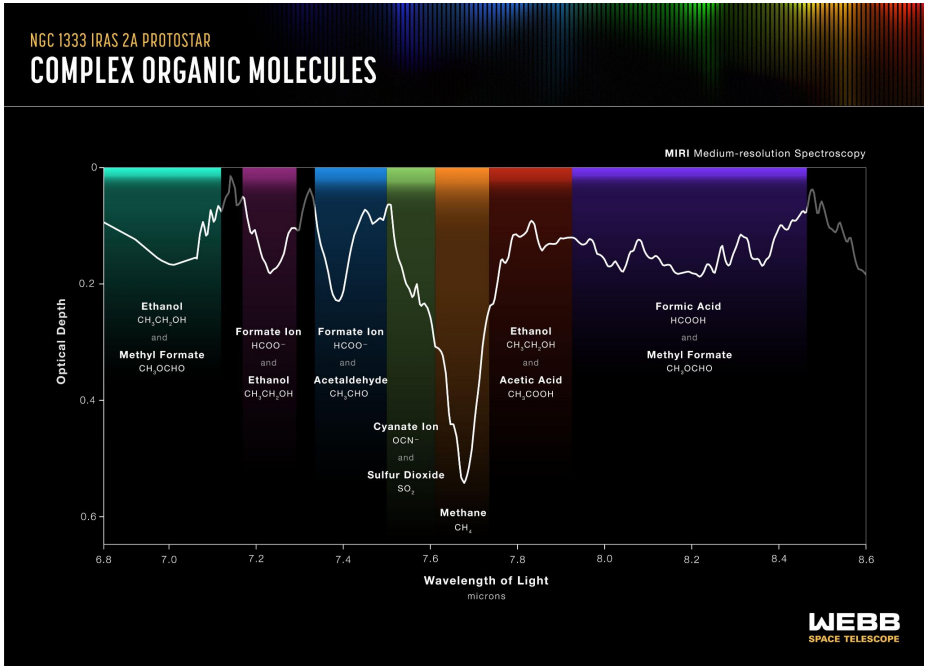
WIKIPEDIA

Astronomical spectroscopy extends across the electromagnetic spectrum!!!



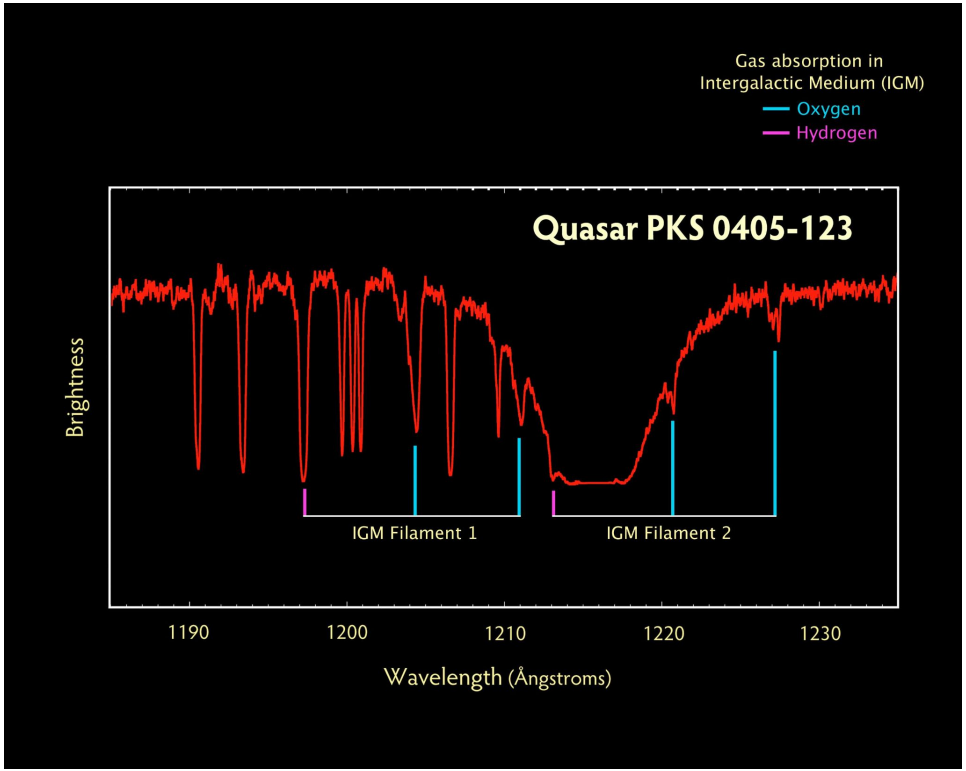


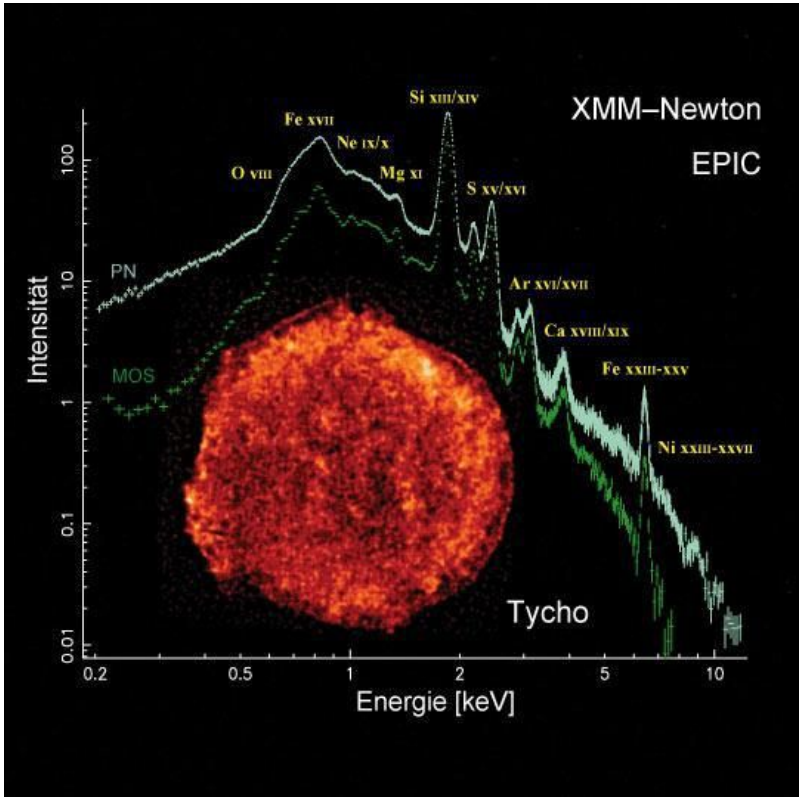
NASA & ESA



JWST

Astronomical spectroscopy extends across the electromagnetic spectrum!!!



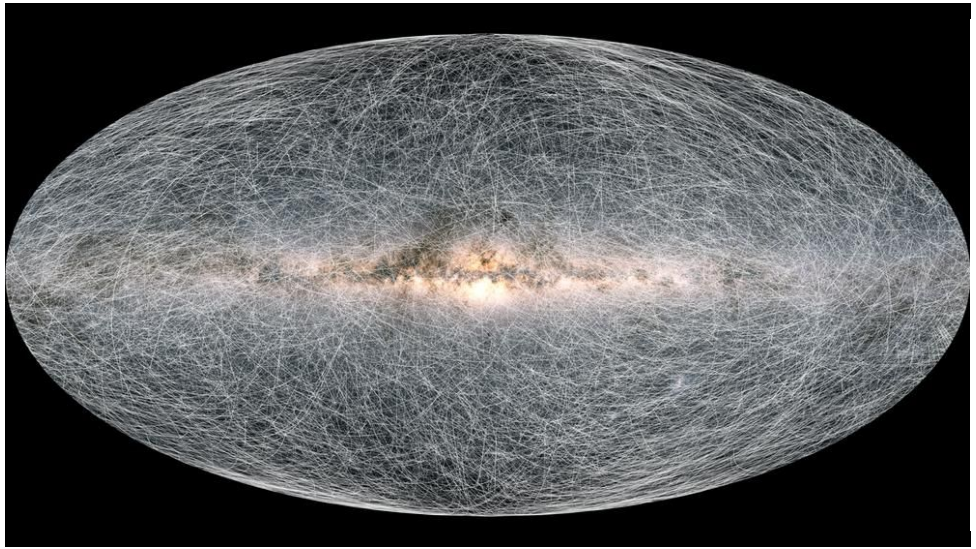


science.nasa.gov

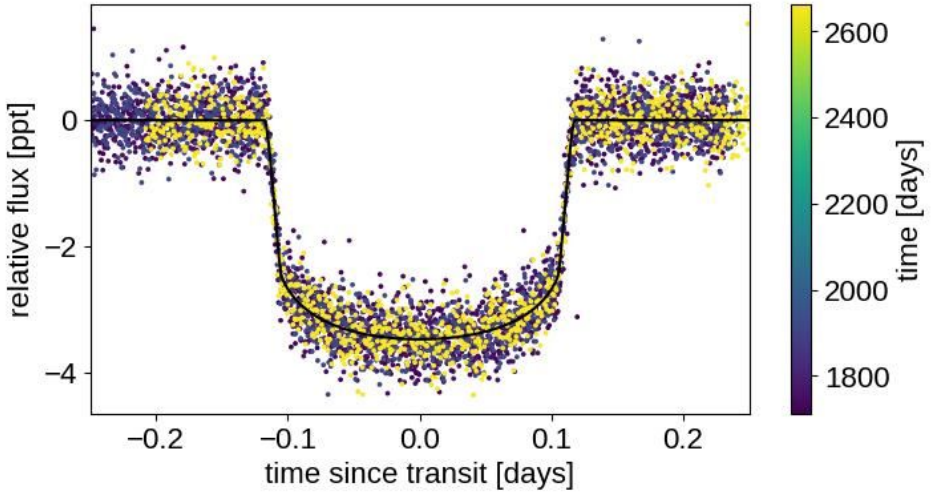
chandra.si.edu

Spectroscopy is the perfect complement to other Astronomical Techniques...

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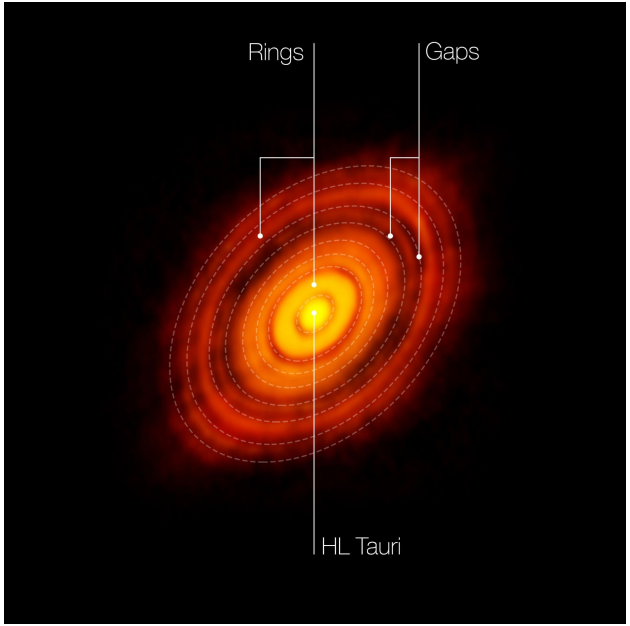


Gaia Consortium

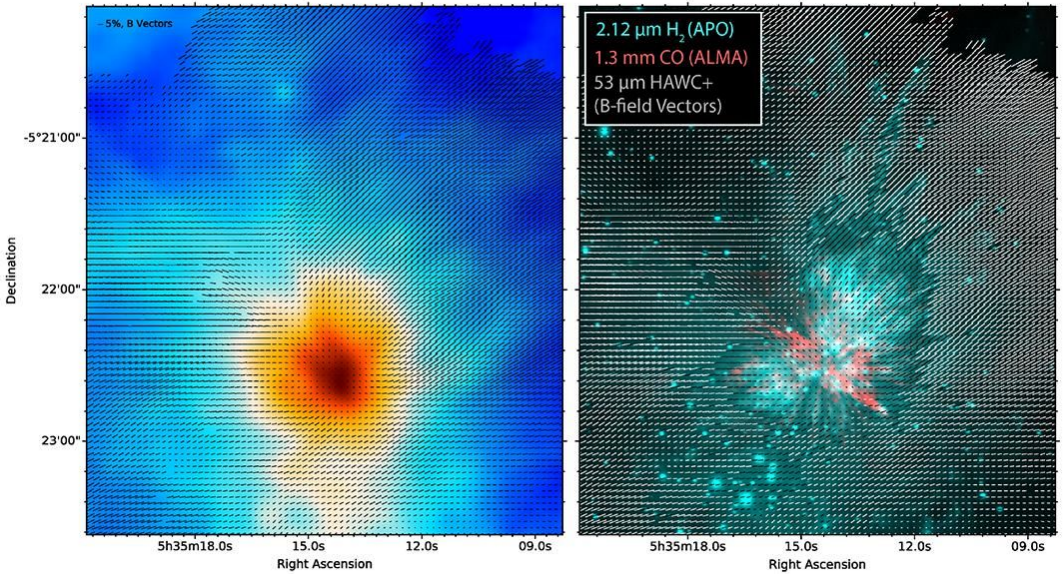


TESS collaboration

Spectroscopy is the perfect complement to other Astronomical Techniques…

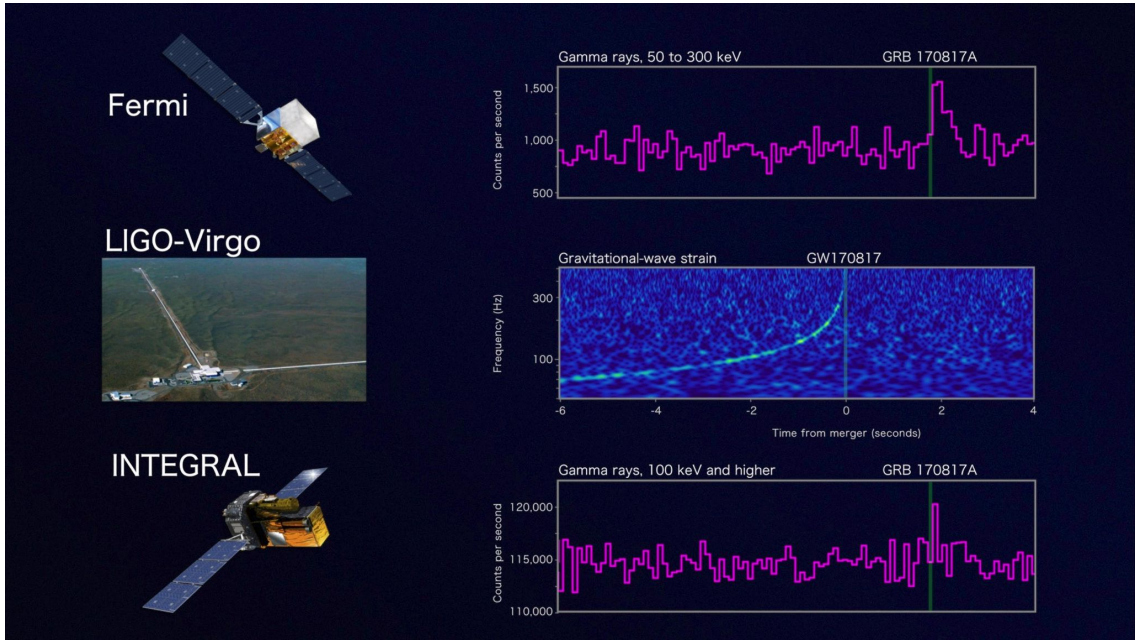


ALMA



Orion Molecular Cloud: Sofia Science Center

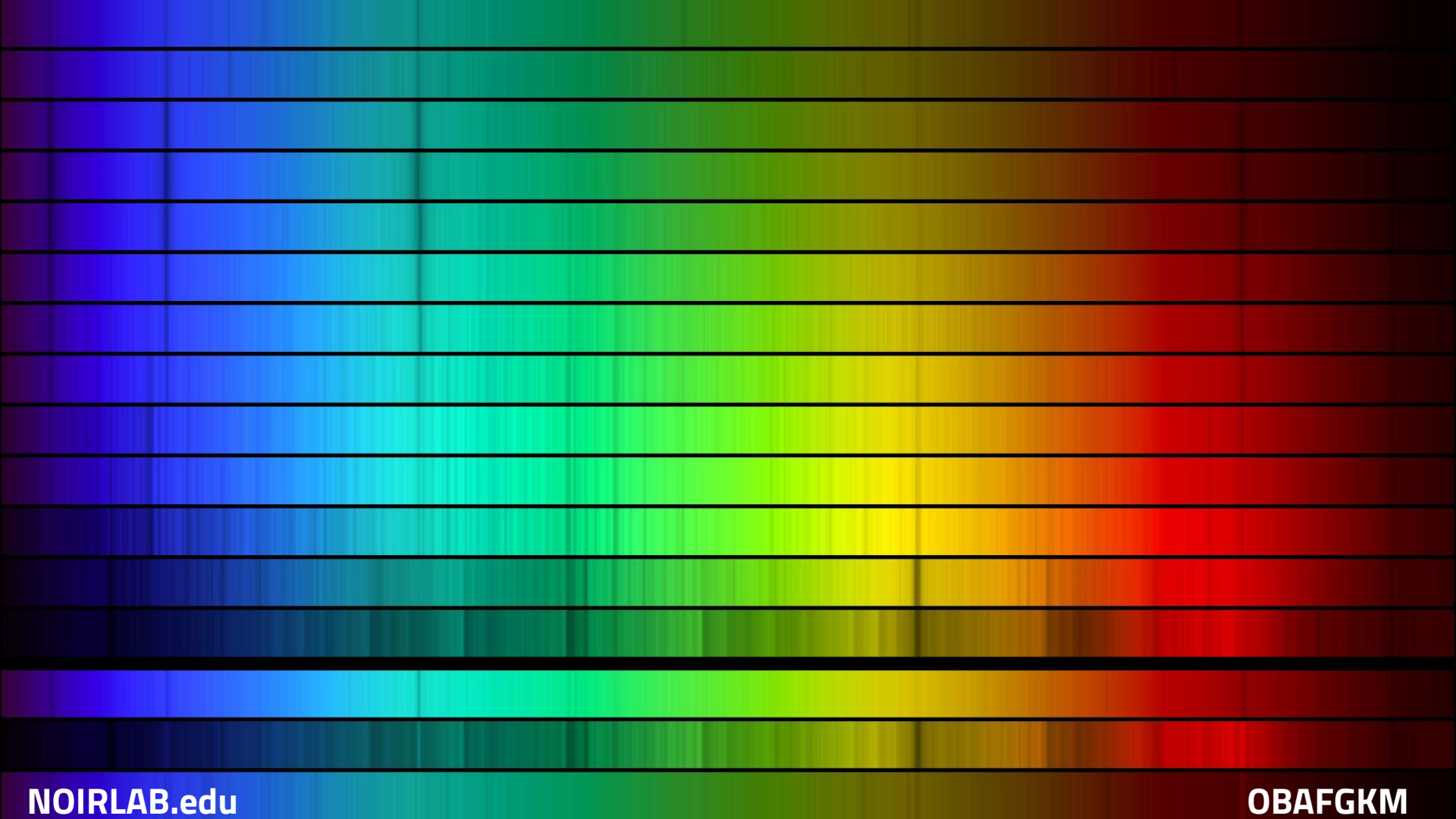
Spectroscopy is the perfect complement to other Astronomical Techniques…

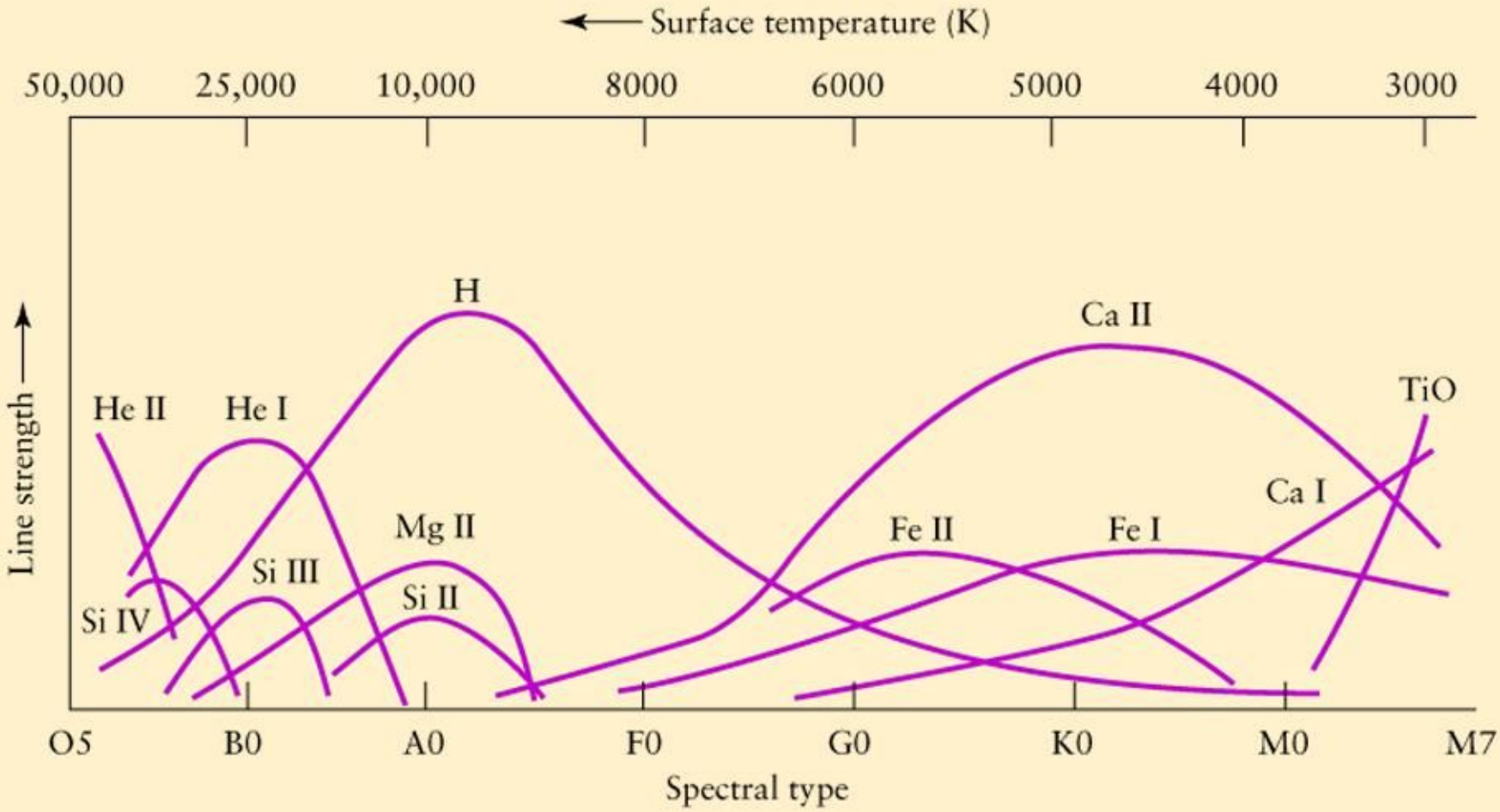


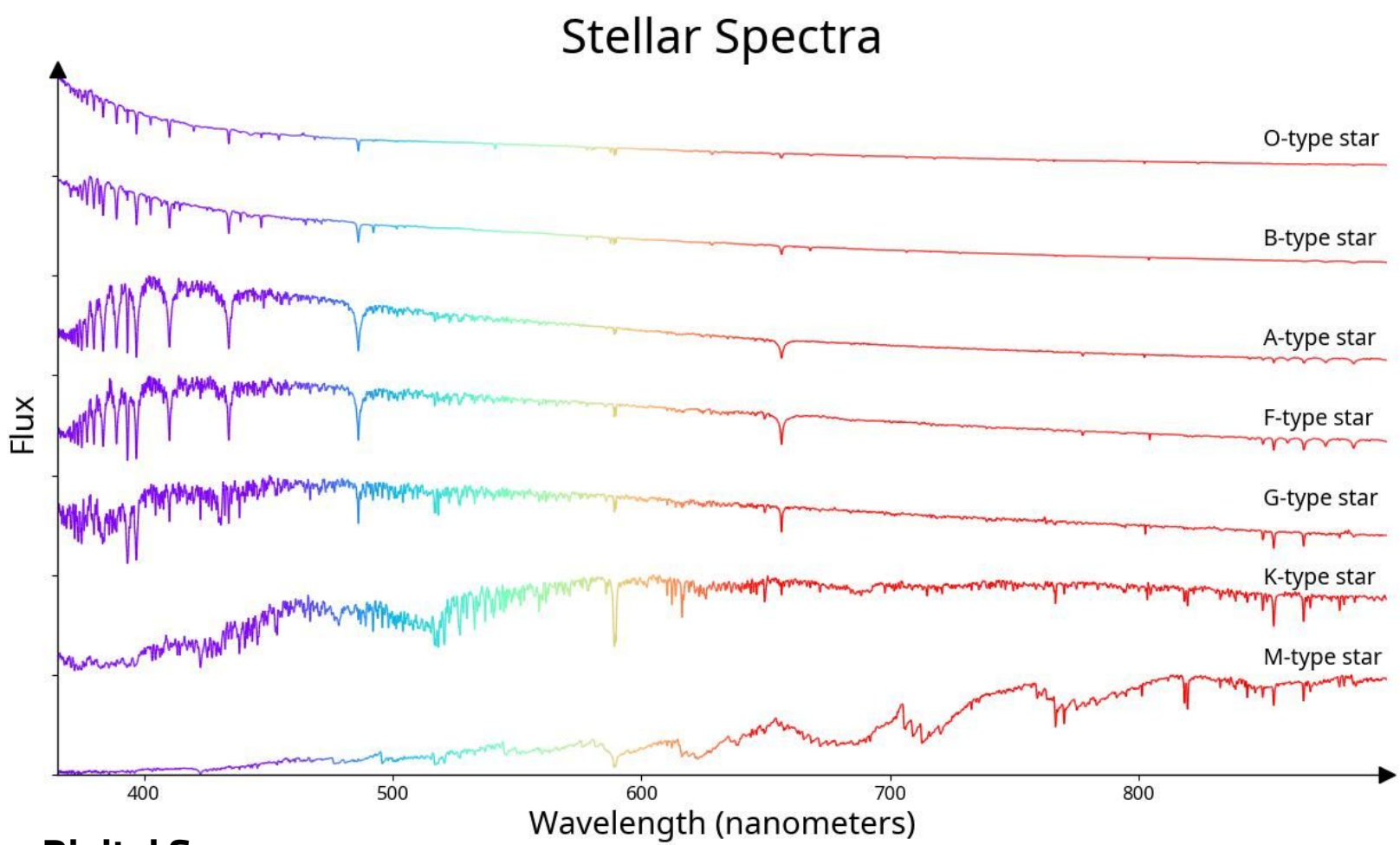
GW170817: NASA/GSFC, LIGO/Virgo, Fermi and INTEGRAL

… And we love it!!

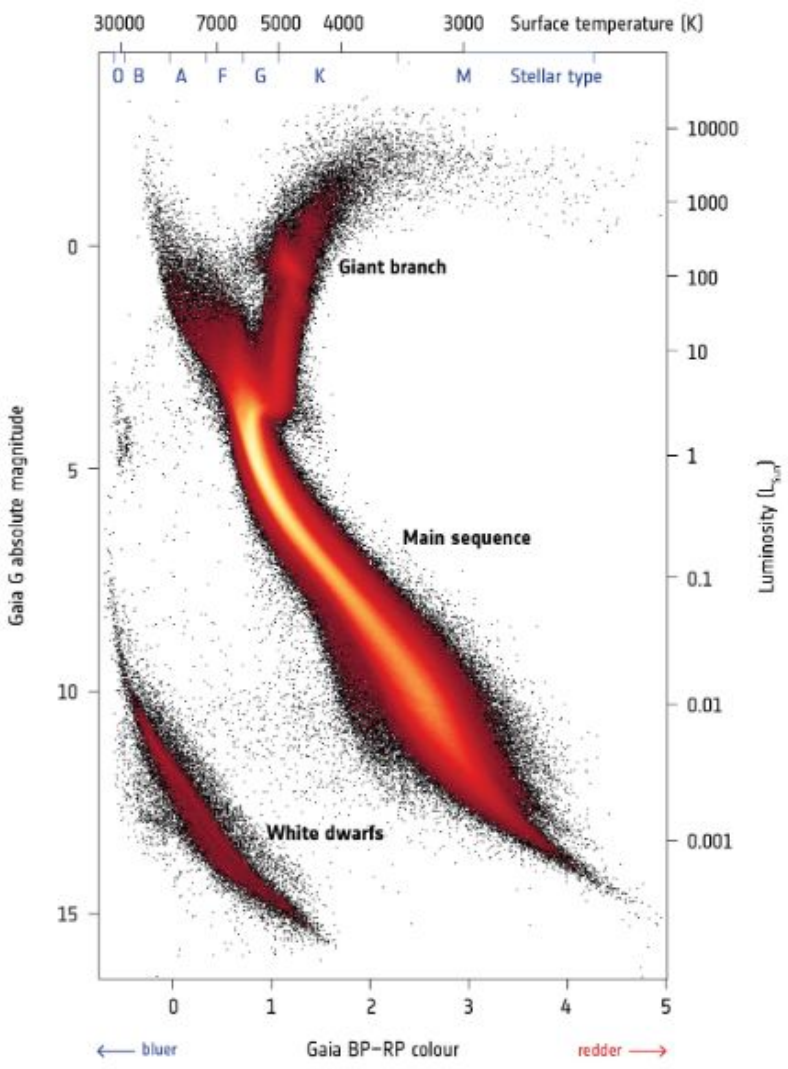



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OBAFGKM


Surface temperature (K)
50,000
25,000
10,000
8000
6000
5000
4000
3000
Line strength
H
Ca II
TiO
He II
He I
Ca I
Mg II
Fe II
Fe I
Si III
Si II
Si IV
O5
B0
A0
F0
G0
K0
M0
M7
Spectral type



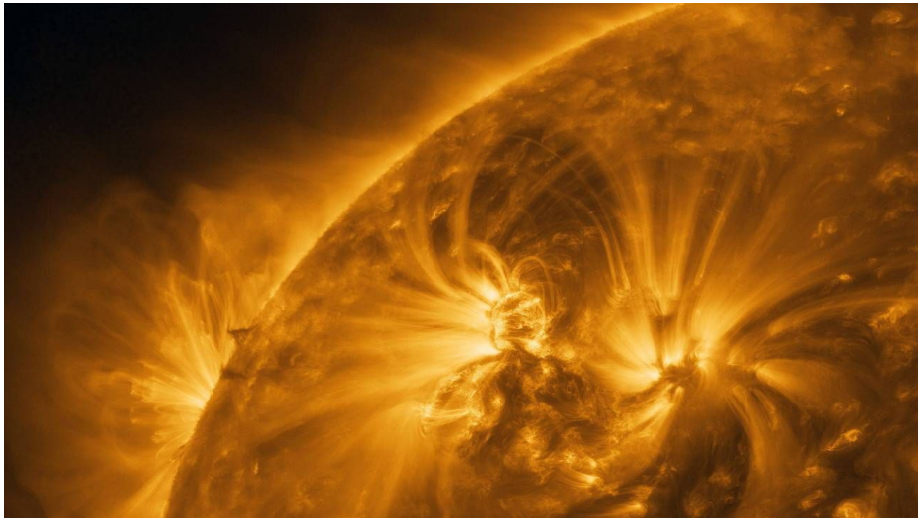
Sloan Sky Digital Survey



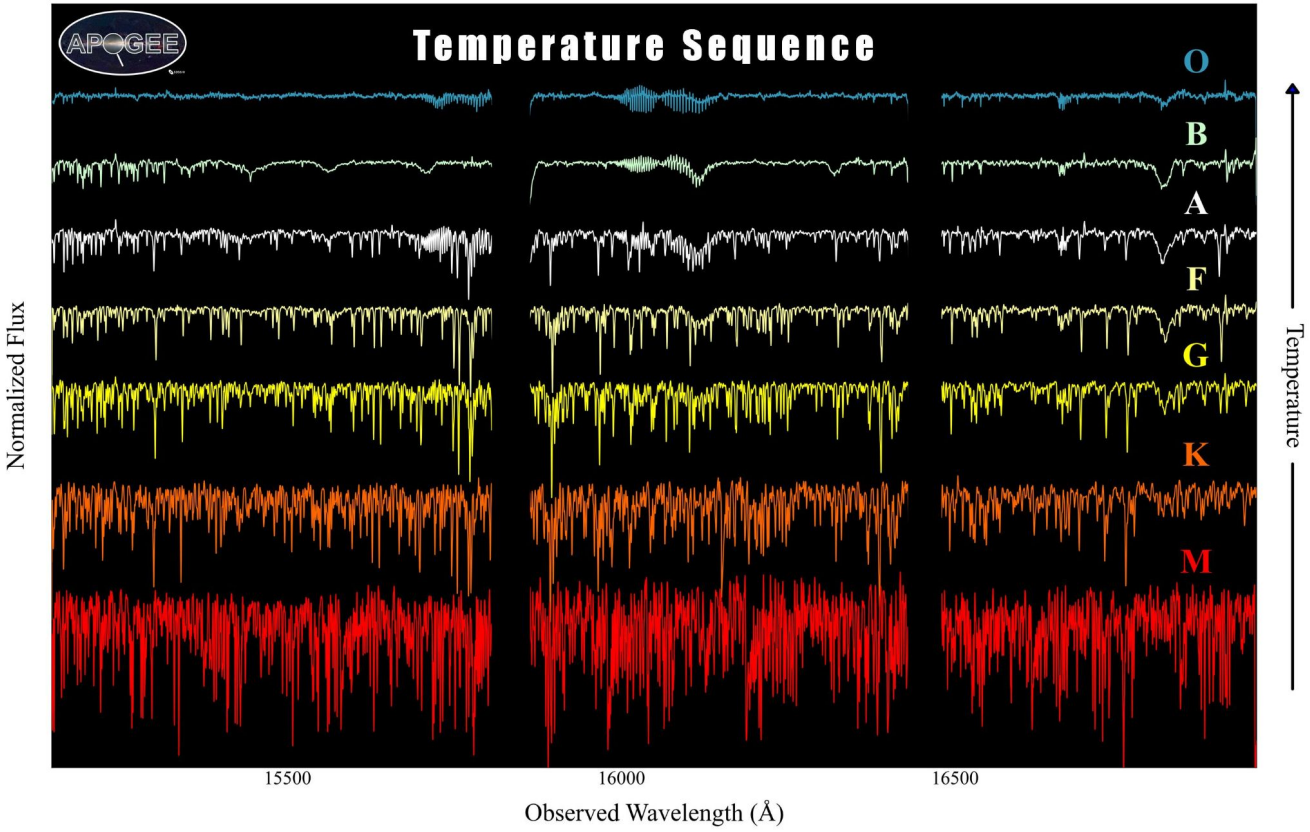
Gaia Consortium

Main Stellar Parameters

Effective Temperature	Teff
Surface Gravity	log*g*
Overall Metallicity	[Fe/H]
Rotational Velocity	$v \sin i$
Macroturbulence	ζ
Microturbulence	ξ
Others	Mass, Age, α-ratios, activity,...

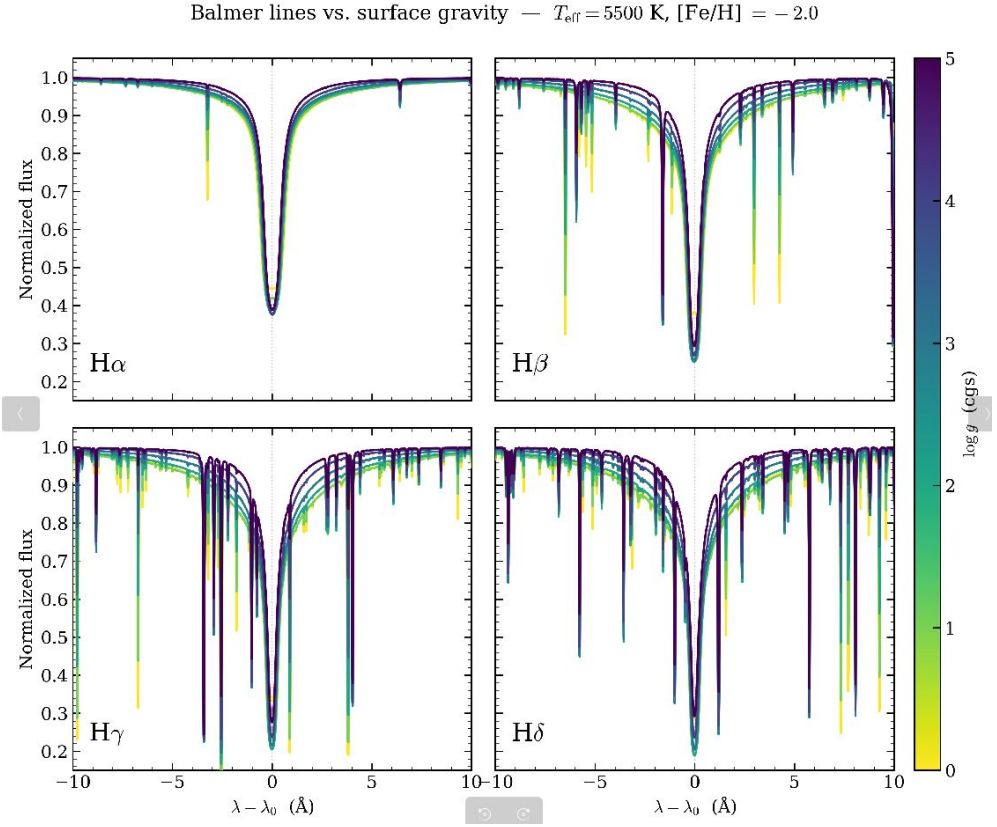


Main Stellar Parameters



Gaia Consortium

Main Stellar Parameters



Made with the SYNPLE code (Allende et al.)