VOSA: A short introduction.

SEDs in the Virtual Observatory

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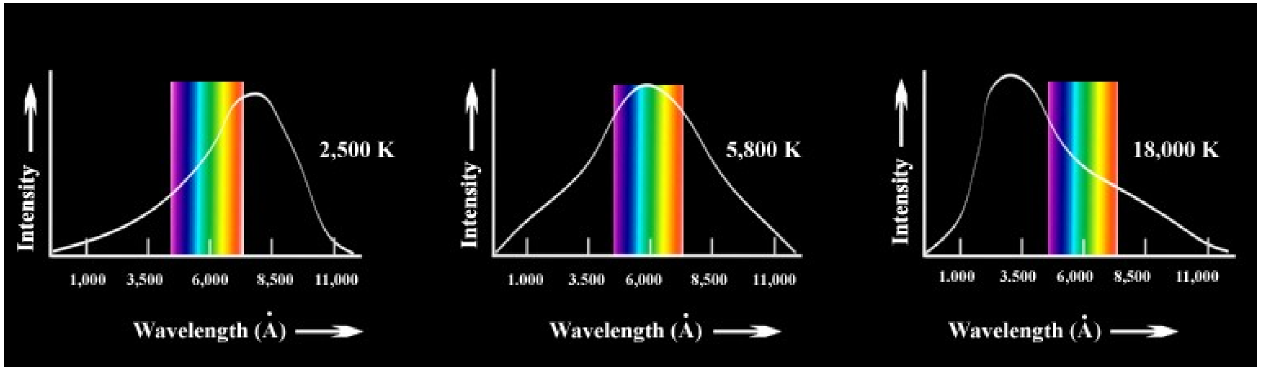
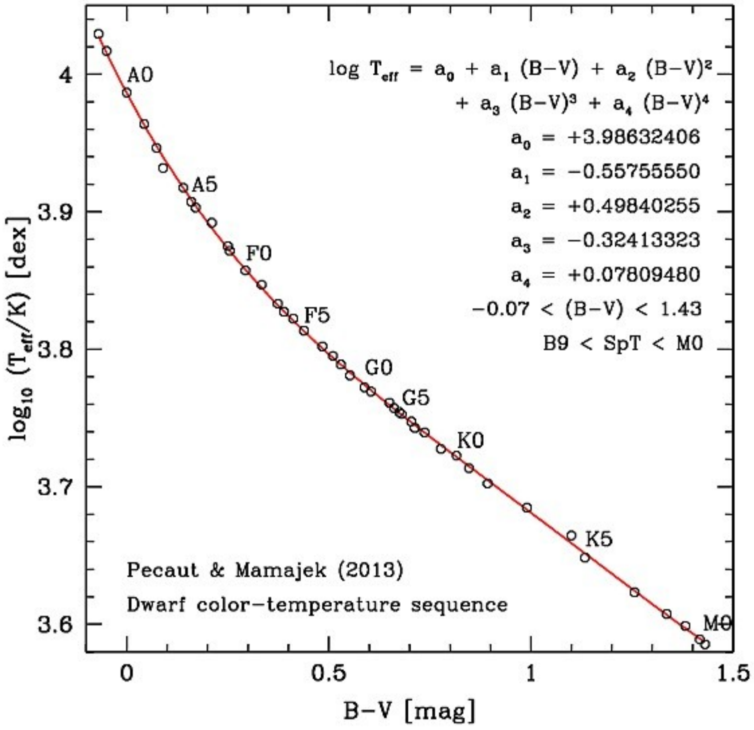
ASTERICS - 653477

Why SEDs (Spectral Energy Distributions)?





Why SEDs (Spectral Energy Distributions)?

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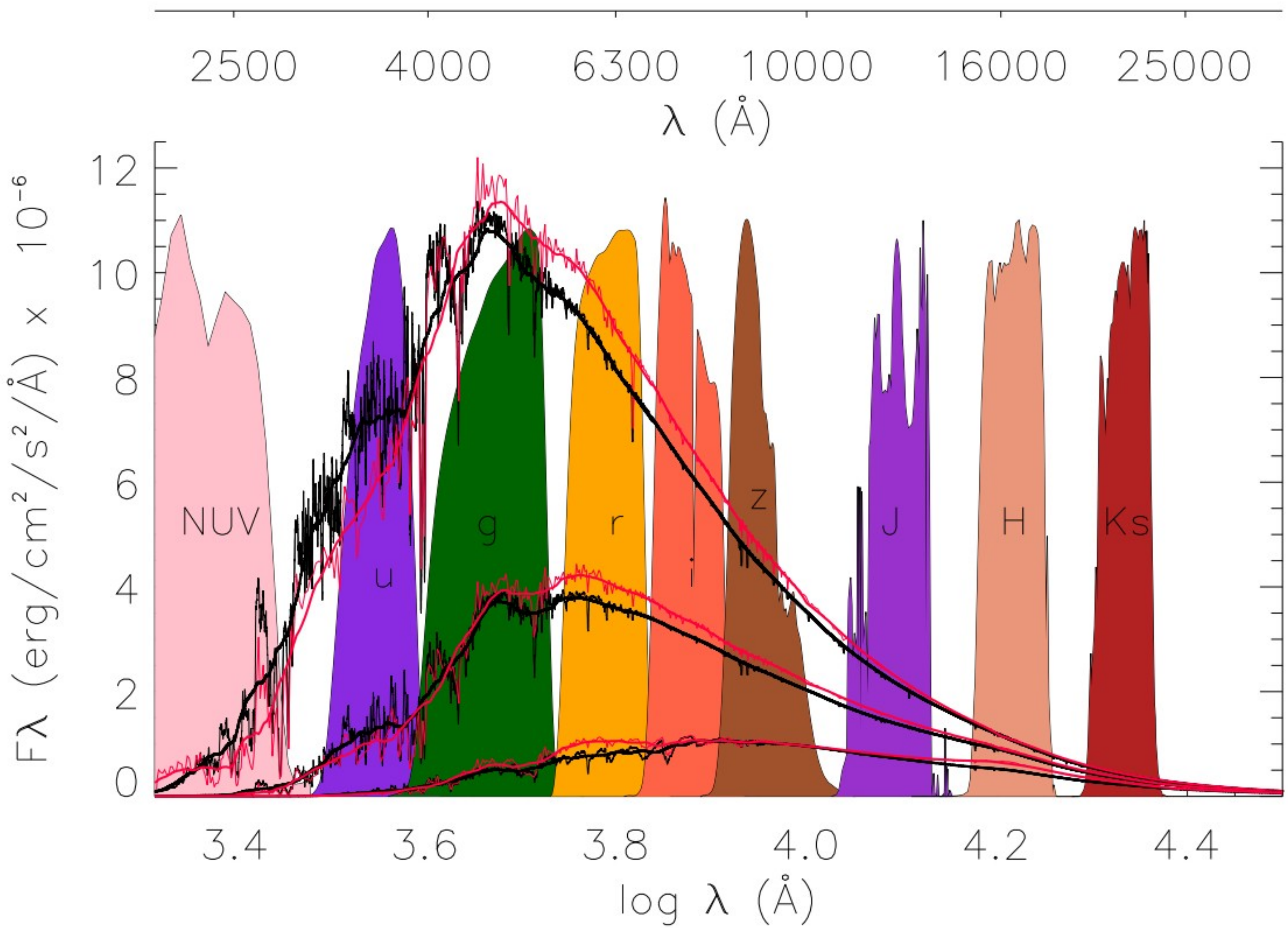


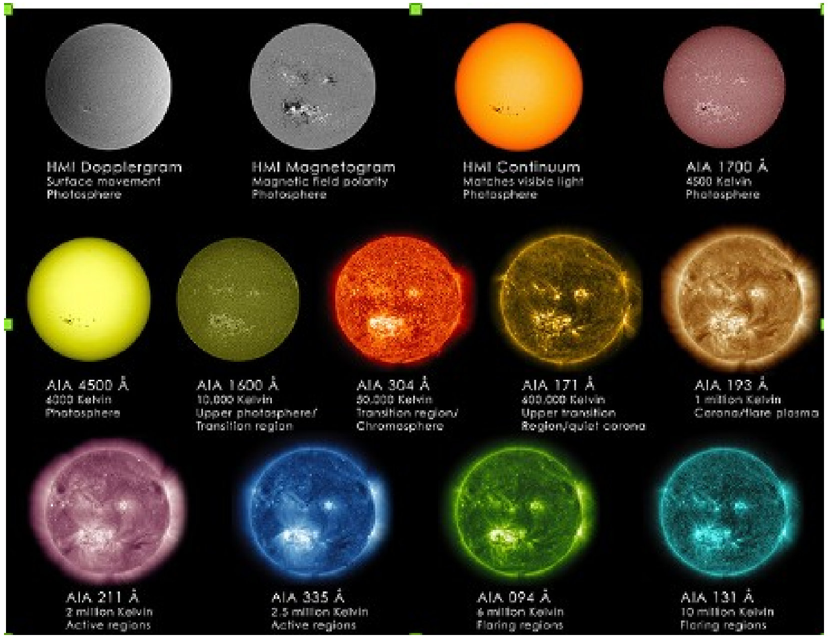
Building SEDs

How to build a Spectral Energy Distribution?

Ingredients

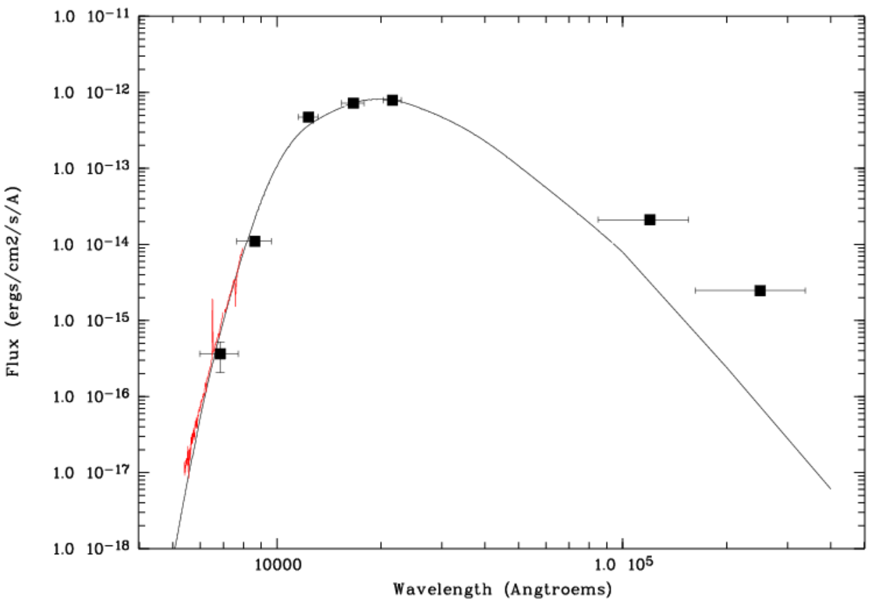
- Multiwavelength photometry (observational and theoretical)

Data discovery, gathering and manipulation.



Building SEDs: Difficulties

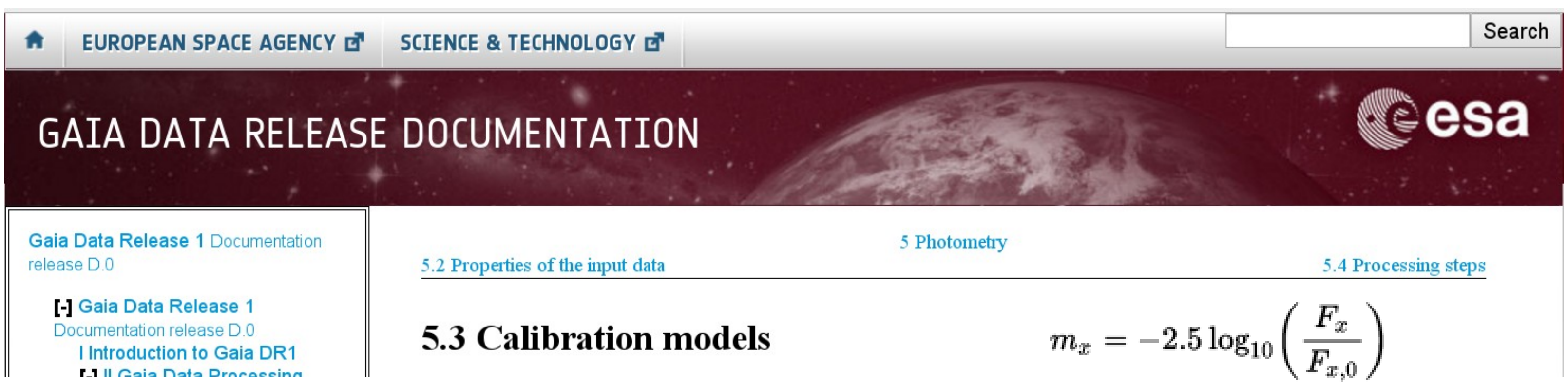
- **Data Manipulation: From magnitudes to fluxes**



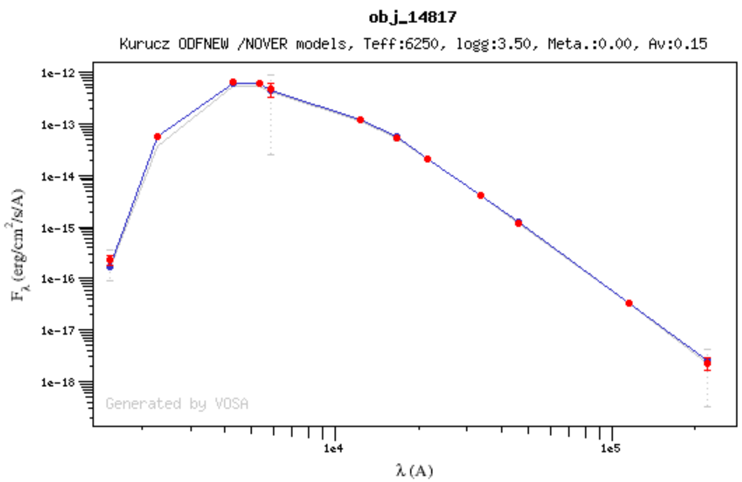
I/337/gaia — *Post annotation* — Gaia DR1 (Gaia Collaboration, 2016 — GaiaSource data (**Download** Gaia Sc

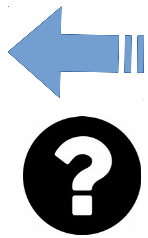
start AladinLite

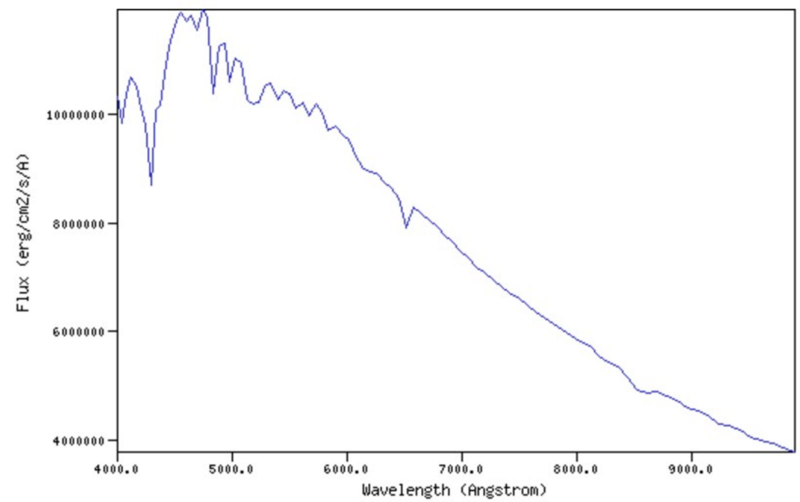
Full	RA_ICRS deg	DE_ICRS deg	<Gmag> mag
1	063.4107528711	-89.9888879972	17.965
2	037.5117084305	-89.9858176527	16.664
3	084.7593492719	-89.9781776713	18.553
4	081.5942616579	-89.9832765720	20.472
5	070.9024070024	-89.9715663343	19.829
6	060.8702751299	-89.9781334323	19.492
7	073.1733654732	-89.9817426647	20.019
8	027.3236159503	-89.9767950251	17.006
9	029.9573489468	-89.9759664621	18.649
10	020.0044580076	-89.9836077196	19.202

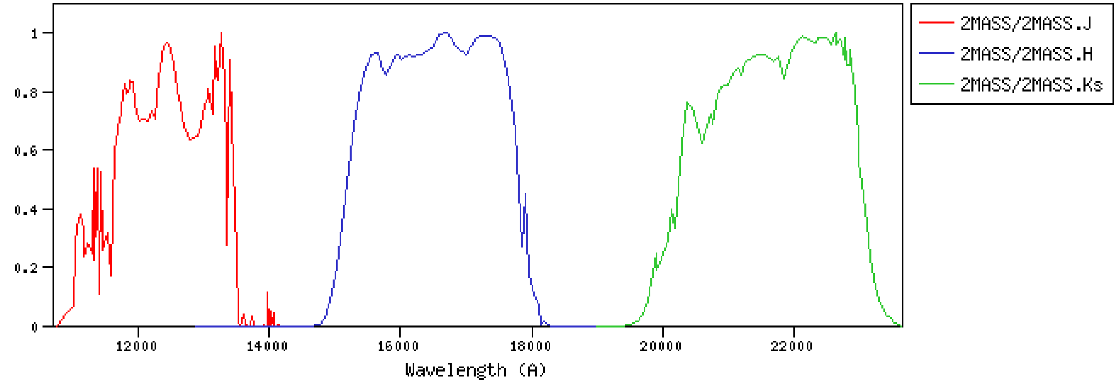


- **Data Manipulation: From theoretical spectra to synthetic photometry**





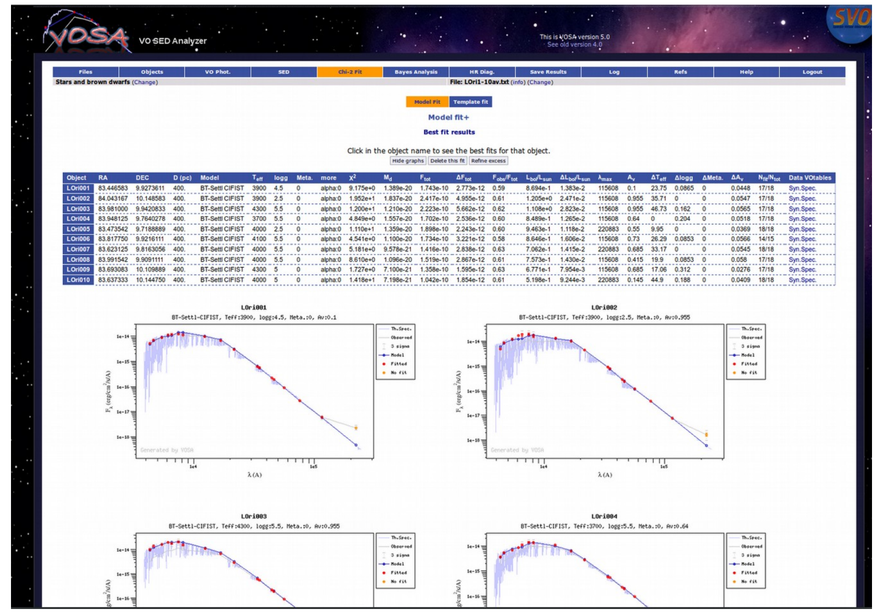




VOSA to the rescue

VOSA VO SED Analyzer

http://svo2.cab.inta-csic.es/theory/vosa/



- Available since 2008.
- More than 1000 users.
- More than 1.600.000 objects.
- 84 refereed papers.

Science case

THE ASTRONOMICAL JOURNAL

Accurate Empirical Radii and Masses of Planets and Their Host Stars with *Gaia* Parallaxes

Keivan G. Stassun[1,2], Karen A. Collins[1,2], and B. Scott Gaudi[3,4]

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Science case

- Masses and radii of planets are necessary to:

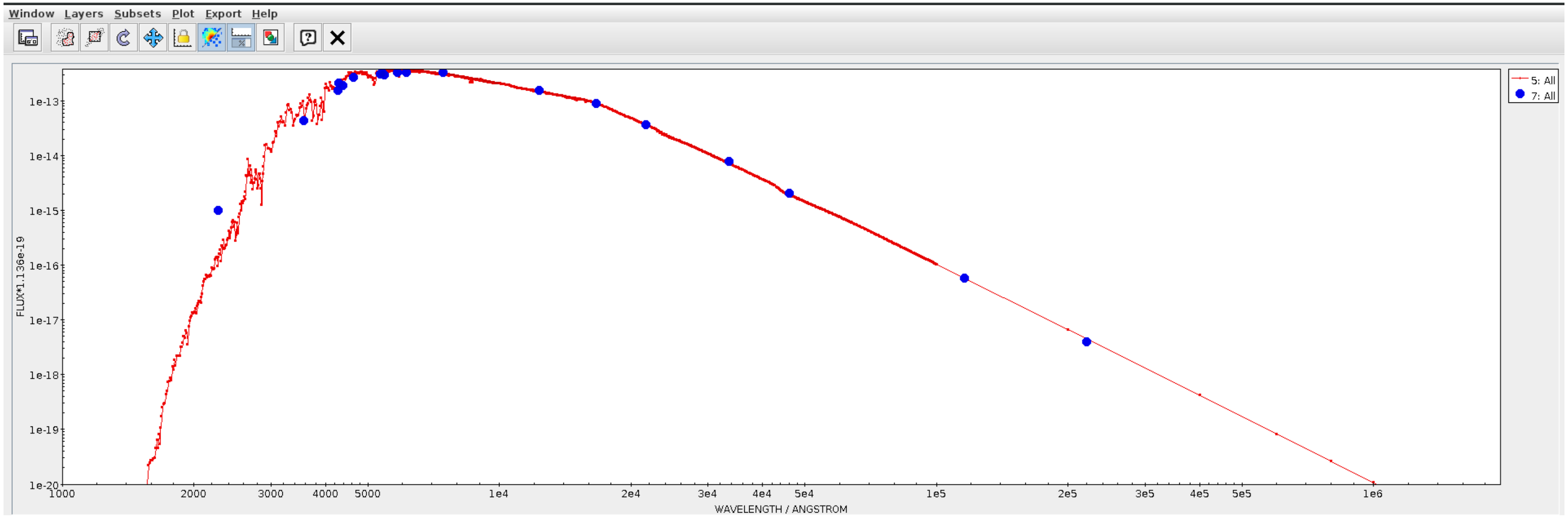
    - Shed light on inflated hot-Jupiters.
        - 0.2-2.1MJup. Radii larger than predicted by models.
        - Internal heating.

        → Planet radius as a function of irradiation, age, magnetic fields, winds,...

$$\Delta \mathrm{F} = \left(\frac{R_{planet}}{R_{star}} \right)^2$$

$$M_p = \frac{K_{\mathrm{RV}}\sqrt{1-e^2}}{\sin i} \left(\frac{P}{2\pi G} \right)^{1/3} M_\star^{2/3}$$

Science case



- Empirical determination (model independent) of the radii and masses of stars hosting planets.
- Fbol → empirical
- Lbol=4πD^{2}Fbol (D from TGAS parallaxes)
- R=sqrt(Lbol/(4πσTeff^4))
- g= G M / R^2