VOSA: A short introduction.

SEDs in the Virtual Observatory

Enrique Solano

CENTRO DE ASTROBIOLOGÍA
ASOCIADO AL NASA ASTROBIOLOGY INSTITUTE

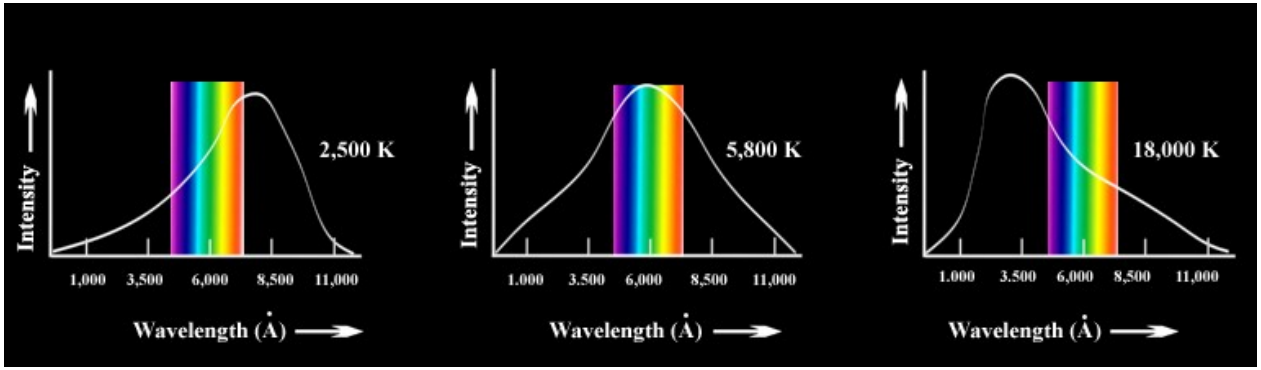
GOBIERNO DE ESPAÑA

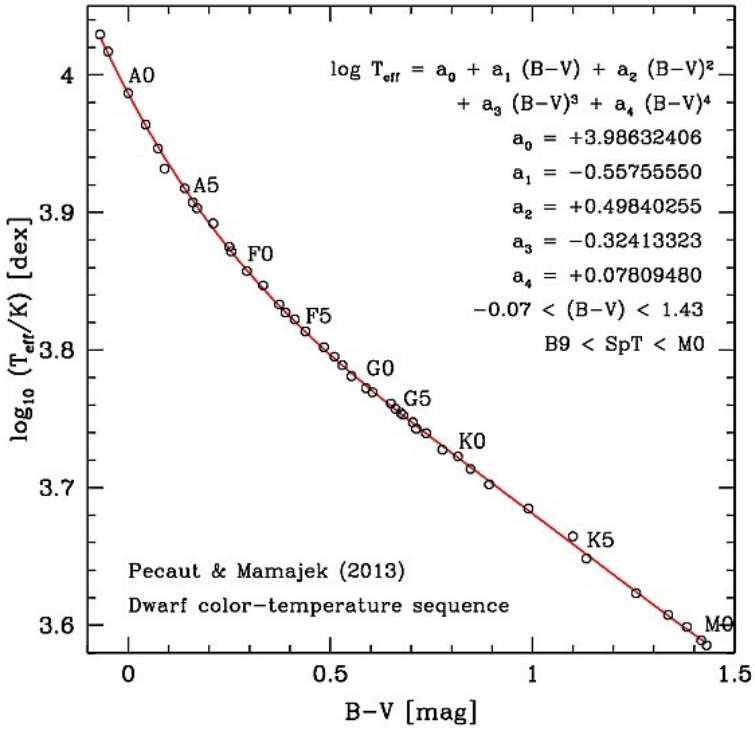
CSIC
CONSEJO SUPERIOR DE INVESTIGACIONES CIENTÍFICAS

Instituto Nacional de Técnica Aeroespacial

Astronomy ESFRI & Research Infrastructure Cluster
ASTERICS - 653477

Why SEDs (Spectral Energy Distributions)?





Why SEDs (Spectral Energy Distributions)?

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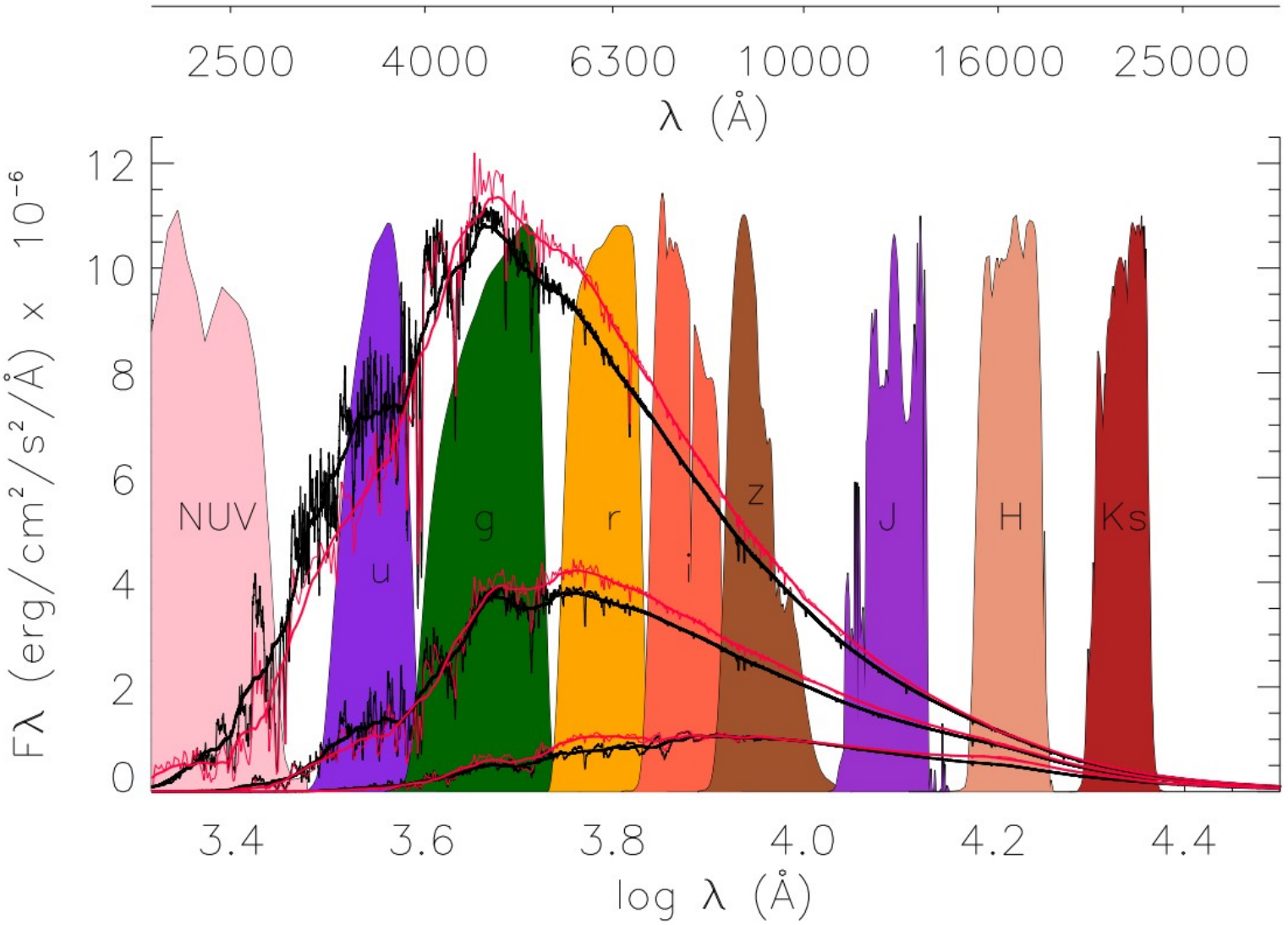


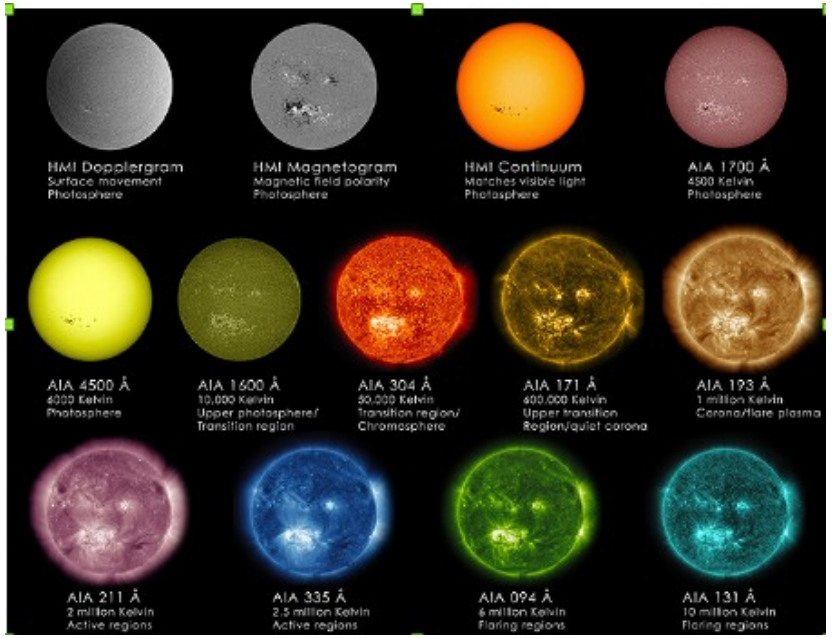
Building SEDs

How to build a Spectral Energy Distribution?

Ingredients

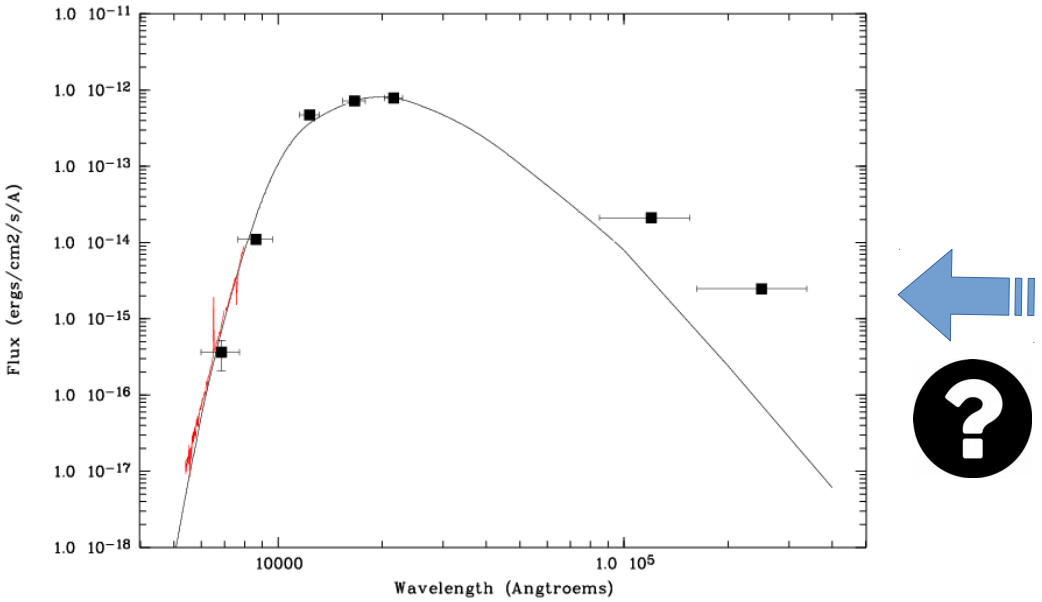
- Multiwavelength photometry (observational and theoretical)

Data discovery, gathering and manipulation.



Building SEDs: Difficulties

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



I/337/gaia Gaia DR1 (Gaia Collaboration, 2016
Post annotation 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

EUROPEAN SPACE AGENCY SCIENCE & TECHNOLOGY Search

GAIA DATA RELEASE DOCUMENTATION esa

Gaia Data Release 1 Documentation release D.0

[-] Gaia Data Release 1
Documentation release D.0
I Introduction to Gaia DR1

5 Photometry

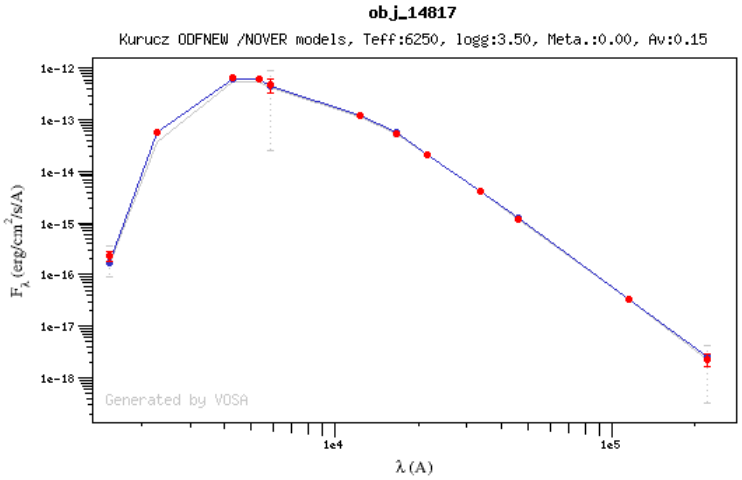
5.2 Properties of the input data 5.4 Processing steps

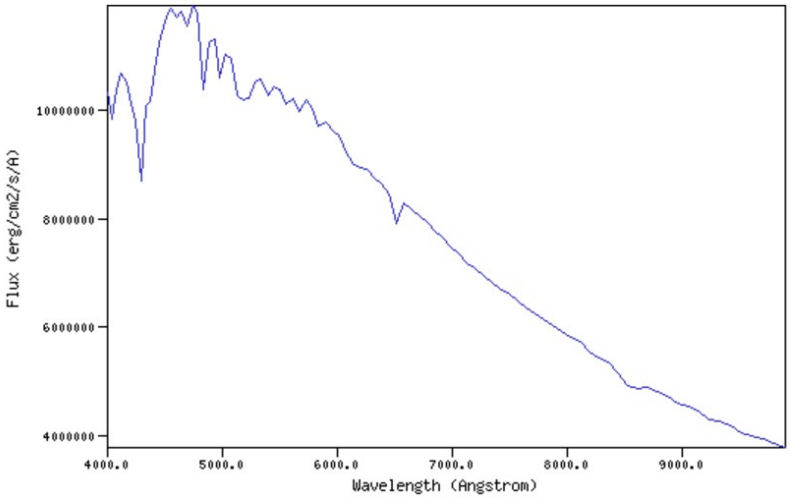
5.3 Calibration models

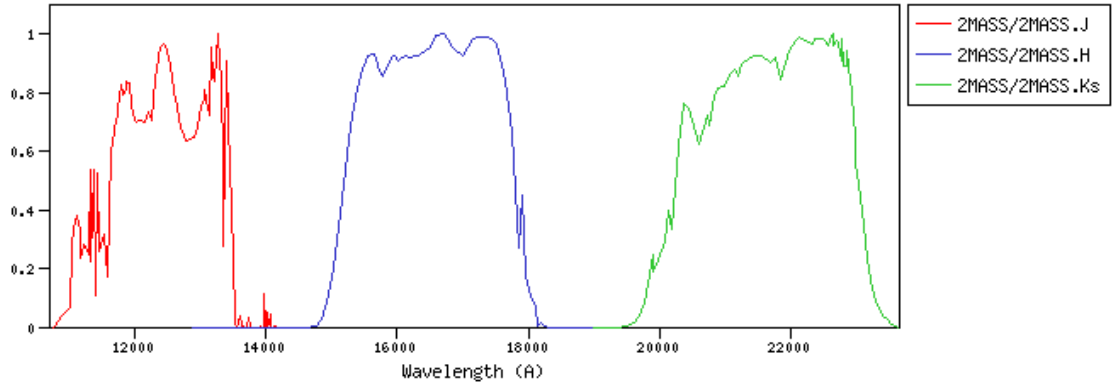
$$m_x = -2.5 \log_{10}\left(\frac{F_x}{F_{x,0}}\right)$$

Building SEDs: Difficulties

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

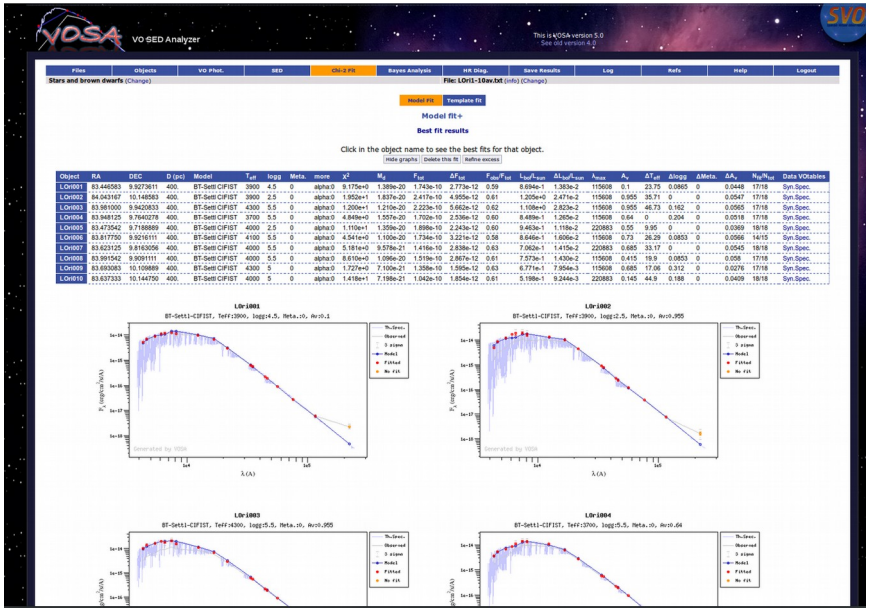






VOSA to the rescue

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]

Published 2017 March 2 •

The Astronomical Journal, Volume 153, Number 3

Science case

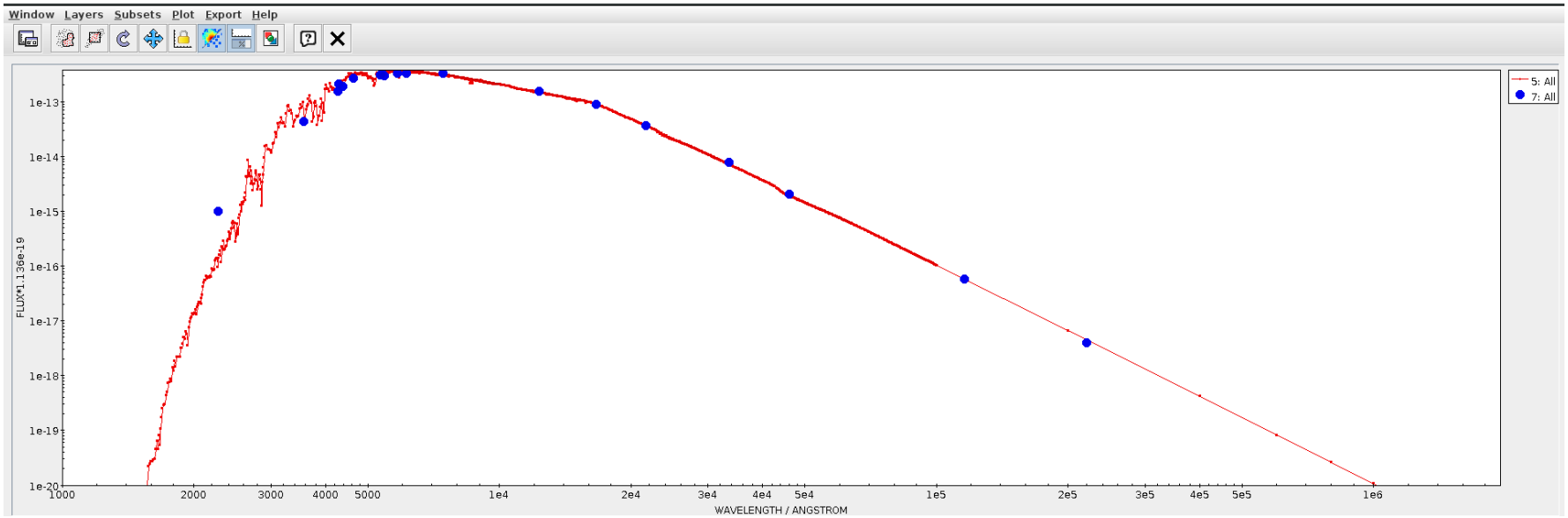
- Masses and radii of planets are necessary to:
  - Shed light on inflated hot-Jupiters.
    - 0.2-2.1MJup. Radii larger than predicted by models.
    - Internal heating.

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

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

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

Science case



- Empirical determination (model independent) of the radii and masses of stars hosting planets.
- Fbol → empirical
- Lbol=$4\pi D^2$Fbol (D from TGAS parallaxes)
- R=sqrt(Lbol/($4\pi\sigma$Teff^4))
- g= G M / R^2