Introduction to VO

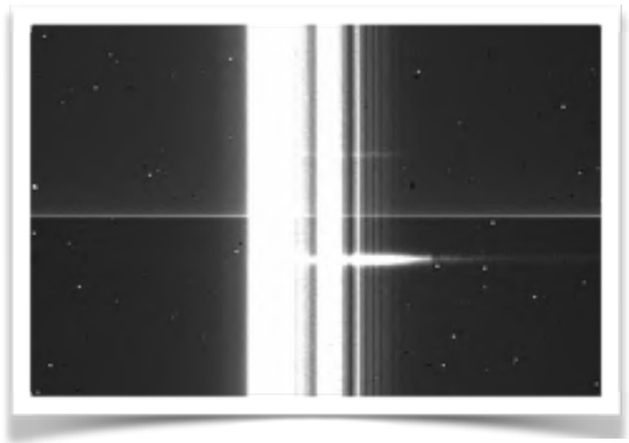
The google telescope? (Chris) Not so ambitious but in that direction...

Amelia Bayo

Disclaimer: decent amount of slides shamelessly stolen from E. Solano

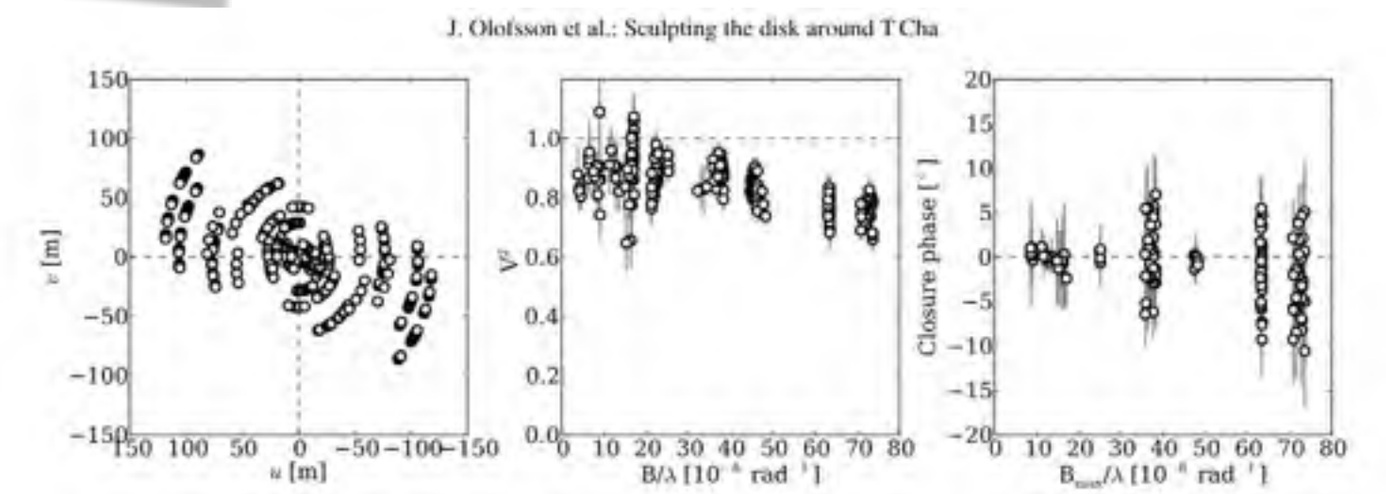
What are “Astronomical data”??

- Raw images (with no processing, B.A.B = before Andrew Becker)



- 2-D spectra

- A collection of visibilities from some interferometer?



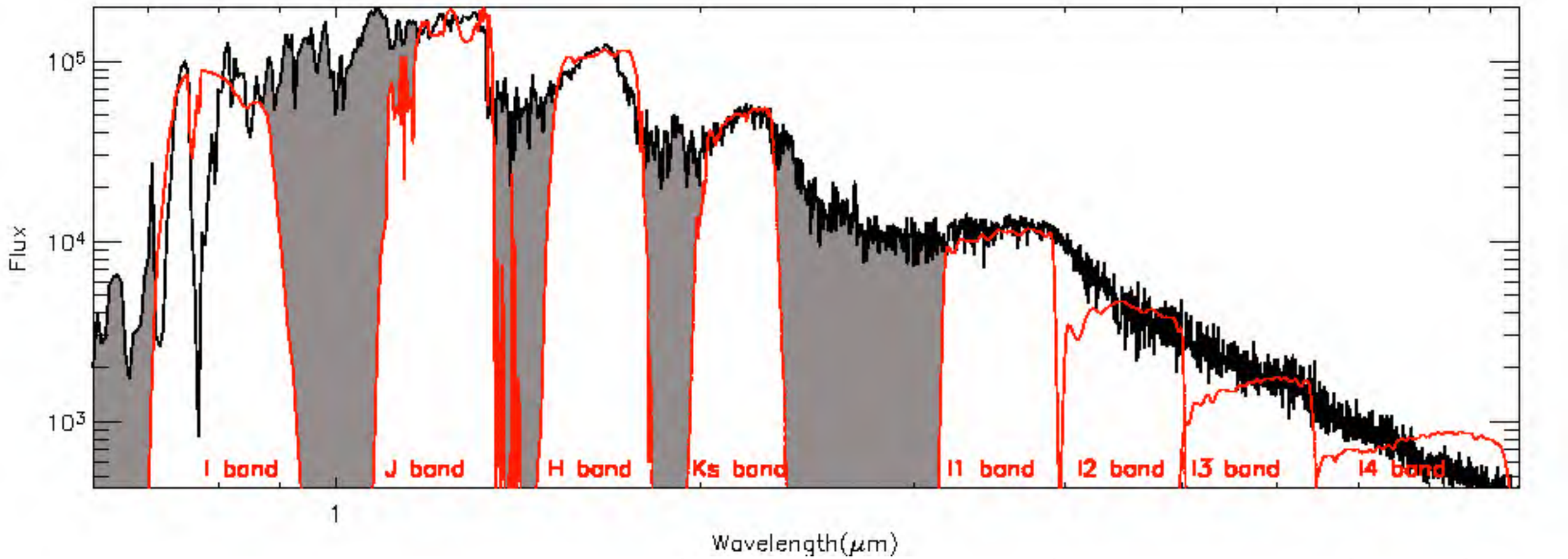
- Theoretical models: predicted images, fluxes, spectra, low or high resolution simulations of structures, etc.

What are “Astronomical data”??

- Calibrated images with all metadata concerning spatial and flux metadata
- 1D spectra (calibrated to what extent?)
- A data cube (again calibrate to what extent?)
- A catalog of observables
- A time series
- Theoretical predictions of stellar/population spectra (what resolution? high? extremely low, -SED-), of a functional form for the behavior of a multiple system, etc.

What are “Astronomical data”??

- Calibrated images with all metadata concerning spatial and flux metadata



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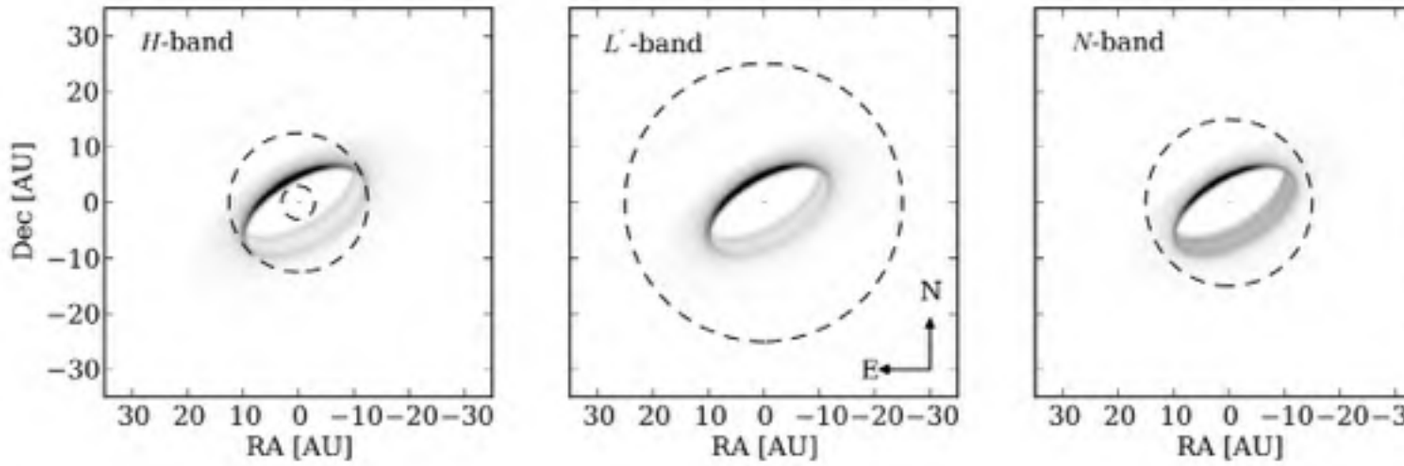
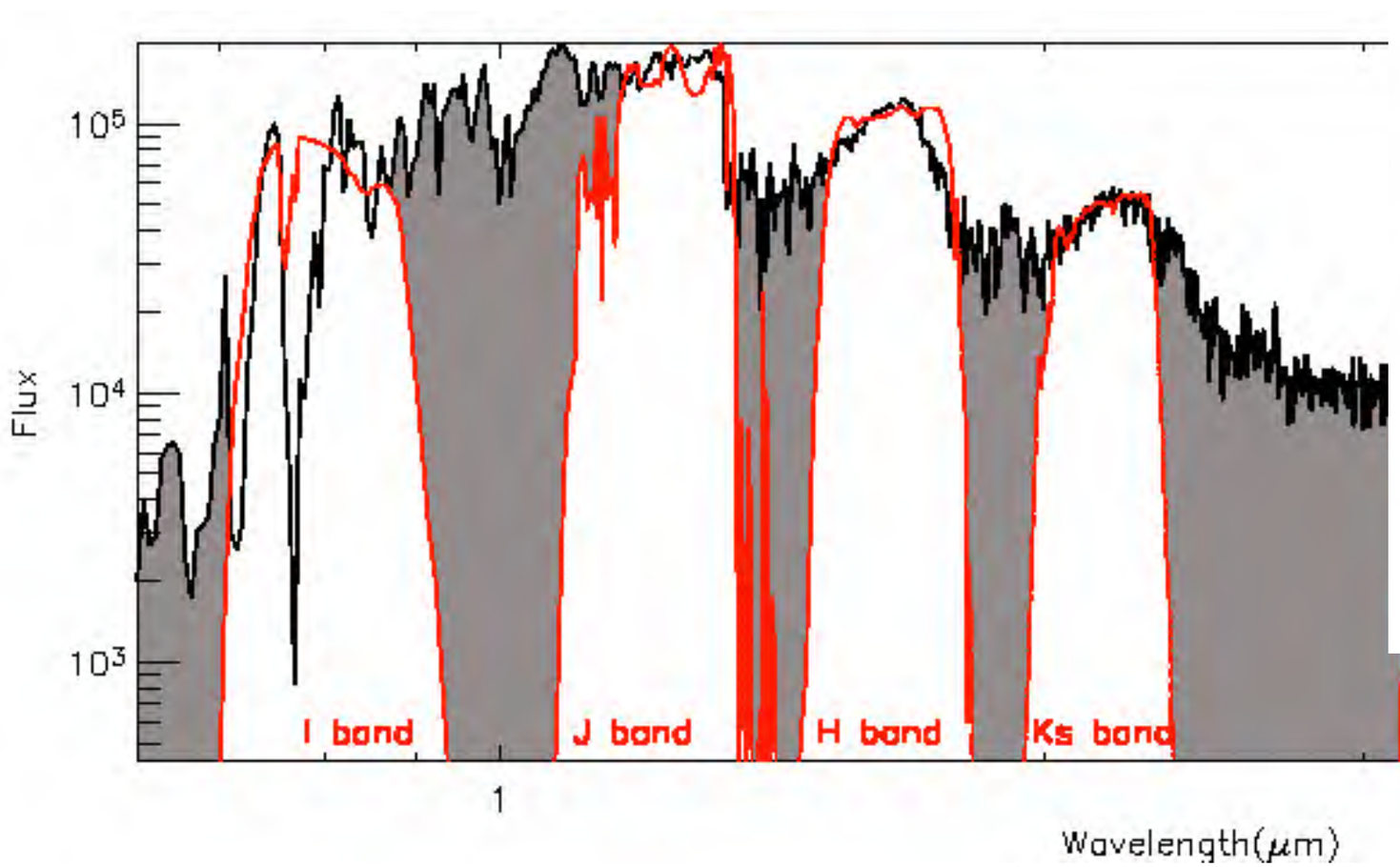
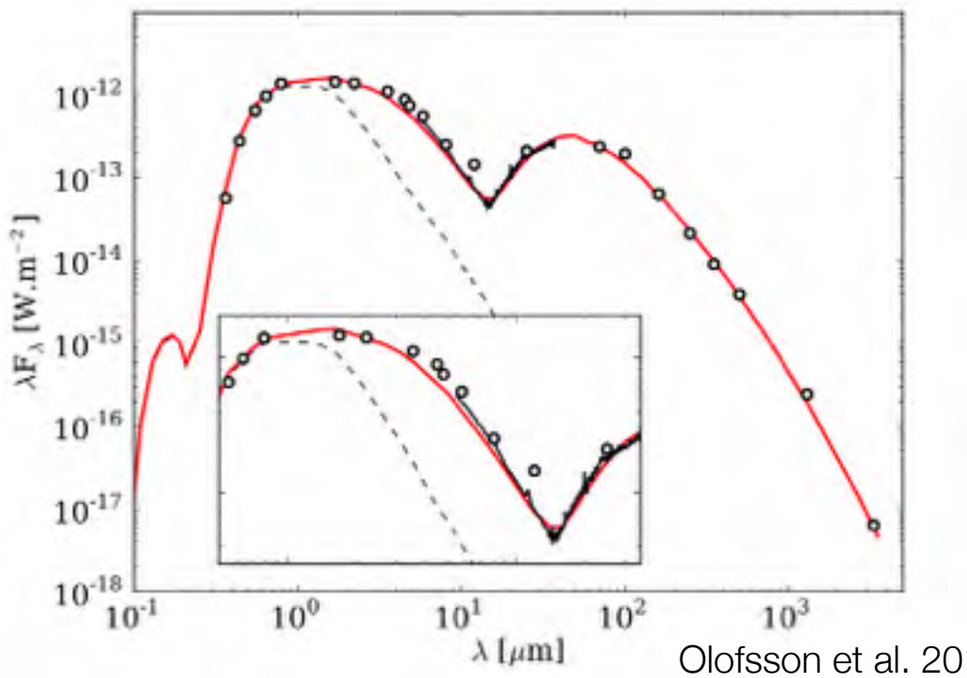
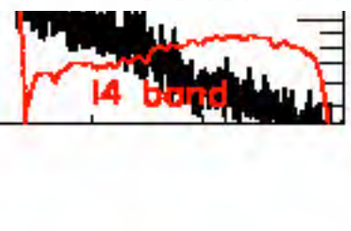






Olofsson et al. 2013



- Theoretical predictions of stellar/population spectra (what resolution? high? extremely low, -SED-), of a functional form for the behavior of a multiple system, etc.

What are “Astronomical data”??

- A catalog of parameters derived “directly” from one dataset, from several including literature, (line widths, velocities, strengths, integrated fluxes, periods, etc.).

- The results from some model fitting (not only derived parameters but goodness of the fit, etc.), some more “handwaving” or just general interpretation of the data in a broader context.

- Momentum maps, any kind of direct or “massaged” projections of a cube

- .....

All of the above!!!

How do we deal with this mess??

- One needs to know how to “ask” for data: to the different servers, for the different kinds of data

- Data providers need to “speak the same language” or at least interpret the questions in a compatible way

- Data providers need to “compile” and answer

- Provided it to the “demander” in a compatible way

Data needs to be defined with metadata and standardization is needed for this exchange to be efficient!

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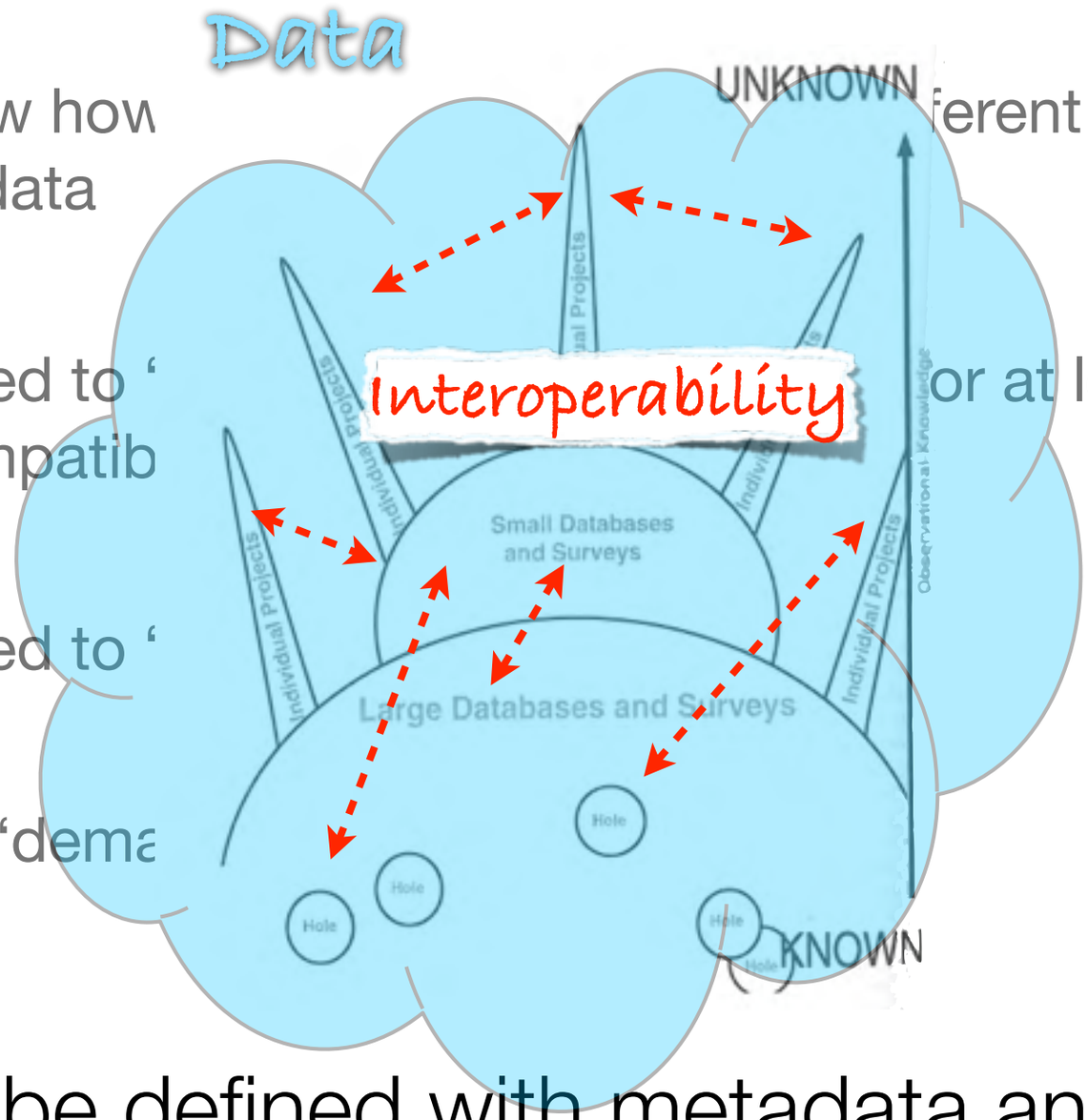


Data needs to be defined with metadata and standardization is needed for this exchange to be efficient!

Why do we need a “Virtual” Observatory?

“I want to know everything about Vega”

Why do we need a “Virtual” Observatory?

“I want to know everything about Vega”

Google alpha lyrae Buscar Búsqueda avanzada

Buscar en: la Web páginas en español páginas de España

La Web Resultados **1 - 10** de aproximadamente **239.000**

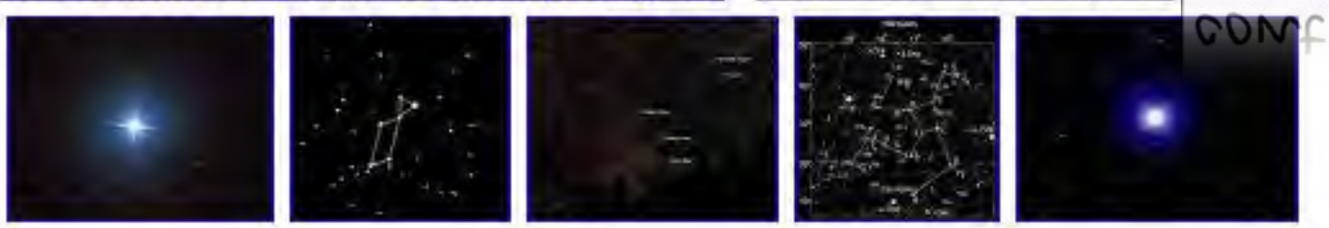
Sugerencia: Buscar sólo resultados en **español**. Puede especificar el idioma de búsqueda en Preferencias.

Vega (estrella) - Wikipedia, la enciclopedia libre
Vega (Alfa **Lyrae** / α Lyr) es una estrella de primera magnitud (en la clasificación de Ptolomeo) de la constelación de la Lira y la principal de la misma. **...**
es.wikipedia.org/wiki/Vega_(estrella) - En caché - Similares

Vega (**Alpha Lyrae**) - [Traducir esta página]
The brightest star in the constellation **Lyra**, the brightest star in the northern summer sky (forming the northwestern apex of the Summer Triangle), **...**
www.daviddarling.info/encyclopedia/V/Vega.html - En caché - Similares

*** Alpha Lyrae** - (Astronomy): Definition - [Traducir esta página]
Alpha Lyrae - Topic:Astronomy - Online Encyclopedia.
en.mimi.hu/astronomy/**alpha_lyrae**.html - En caché - Similares

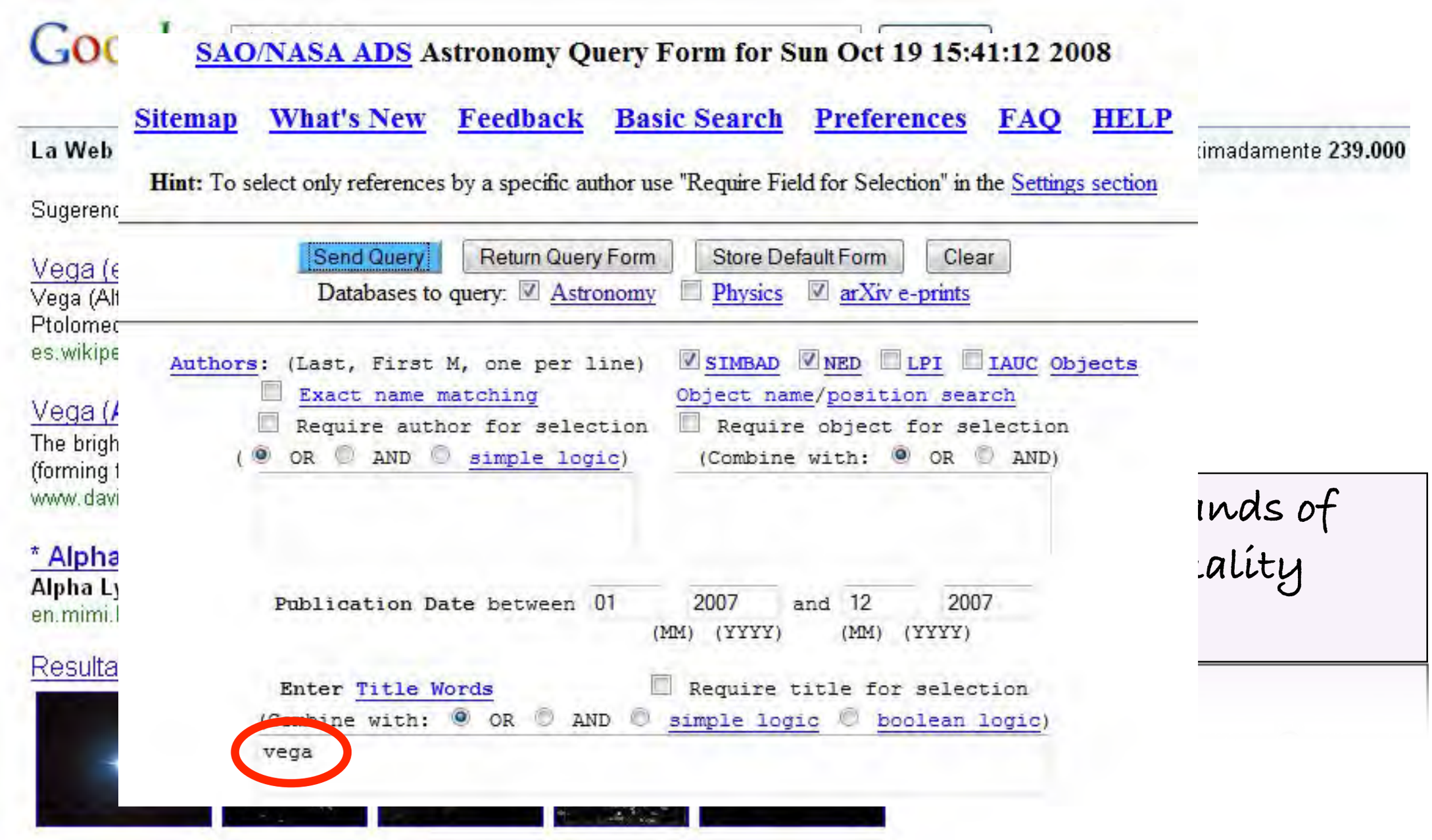
Resultados de imágenes de **alpha lyrae** - Informar sobre las imágenes



hundreds of thousands of results without “quality control”

Why do we need a “Virtual” Observatory?

“I want to know everything about Vega”



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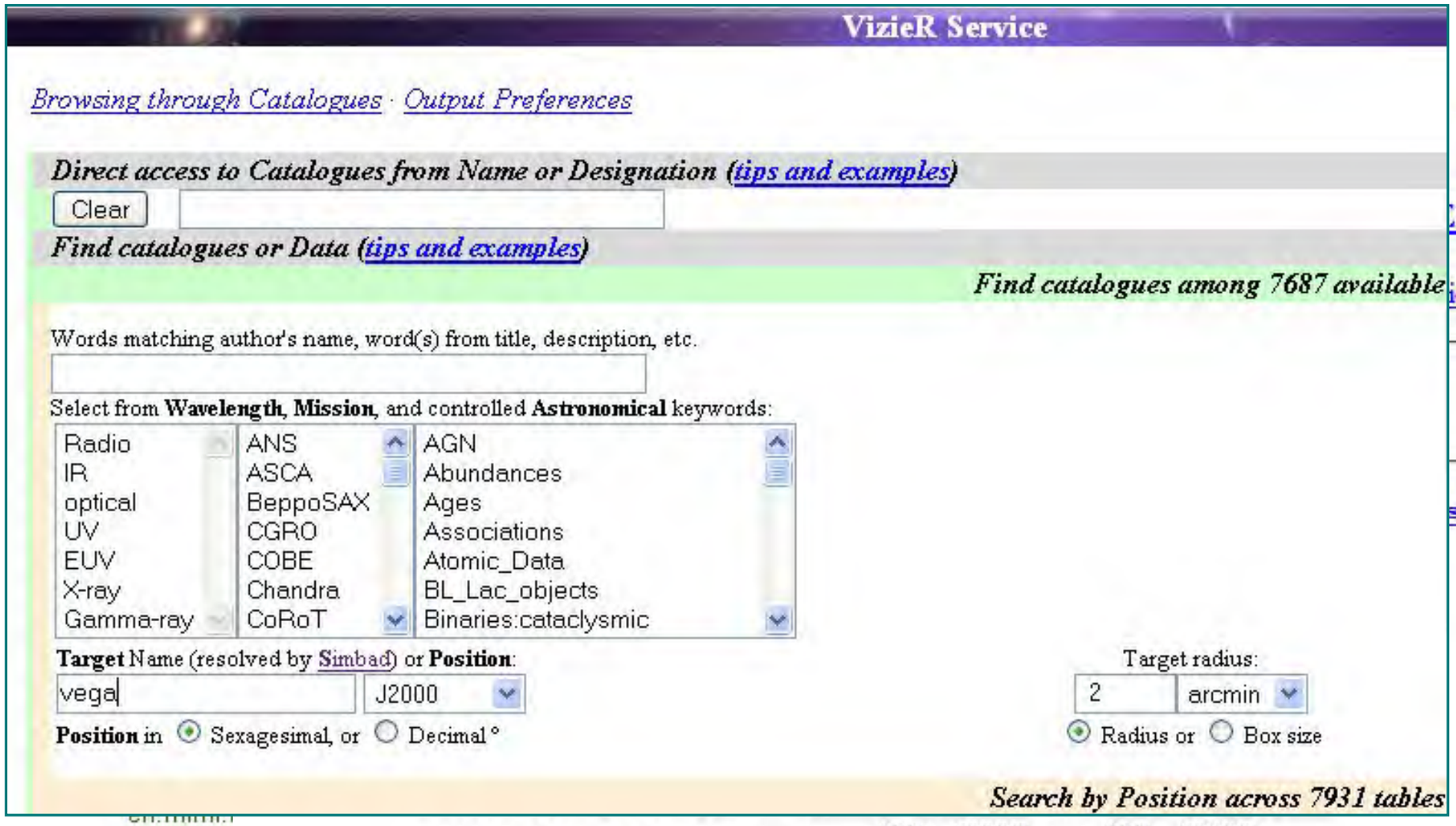
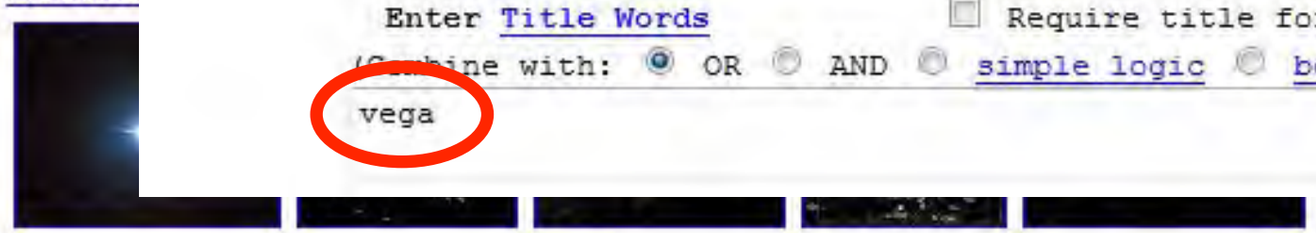
Why do we need a “Virtual” Observatory?

“I want to know everything about Vega”





Adding theoretical data: example

Robert L. Kurucz

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This is a combined Web/outgoing-FTP site, KURUCZ.HARVARD.EDU or CFAKU5.CFA.HARVARD.EDU. It provides up-to-date public access to my data and programs. These are the same programs and files that I use in my research. Many bugs and problems have been corrected but there are still many more errors remaining to be found. Programs and data that I would not use myself because they are still under development are not on this computer. Many of the files are large and are also available on CDs or DVDs, and I am willing to write DVDs on demand. Some files taken from Kurucz CD-ROMs 1-26 are given for historical checks although many have been replaced by new versions. Binary versions will eventually be replaced by (much larger) ASCII versions. I am willing to rewrite them in ASCII on demand. Neither the programs nor data are "black boxes". You should not be using them if you do not have some understanding of the physics and of the programming in the source code.

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Cambridge, MA 02138, USA

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Fax 617-495-7
Email RKURT

[1] Available via anonymous FTP from ftp://calvin.physast.uga.edu/pub/NextGen or via the WWW URL http://dilbert.physast.uga.edu/~yeti.

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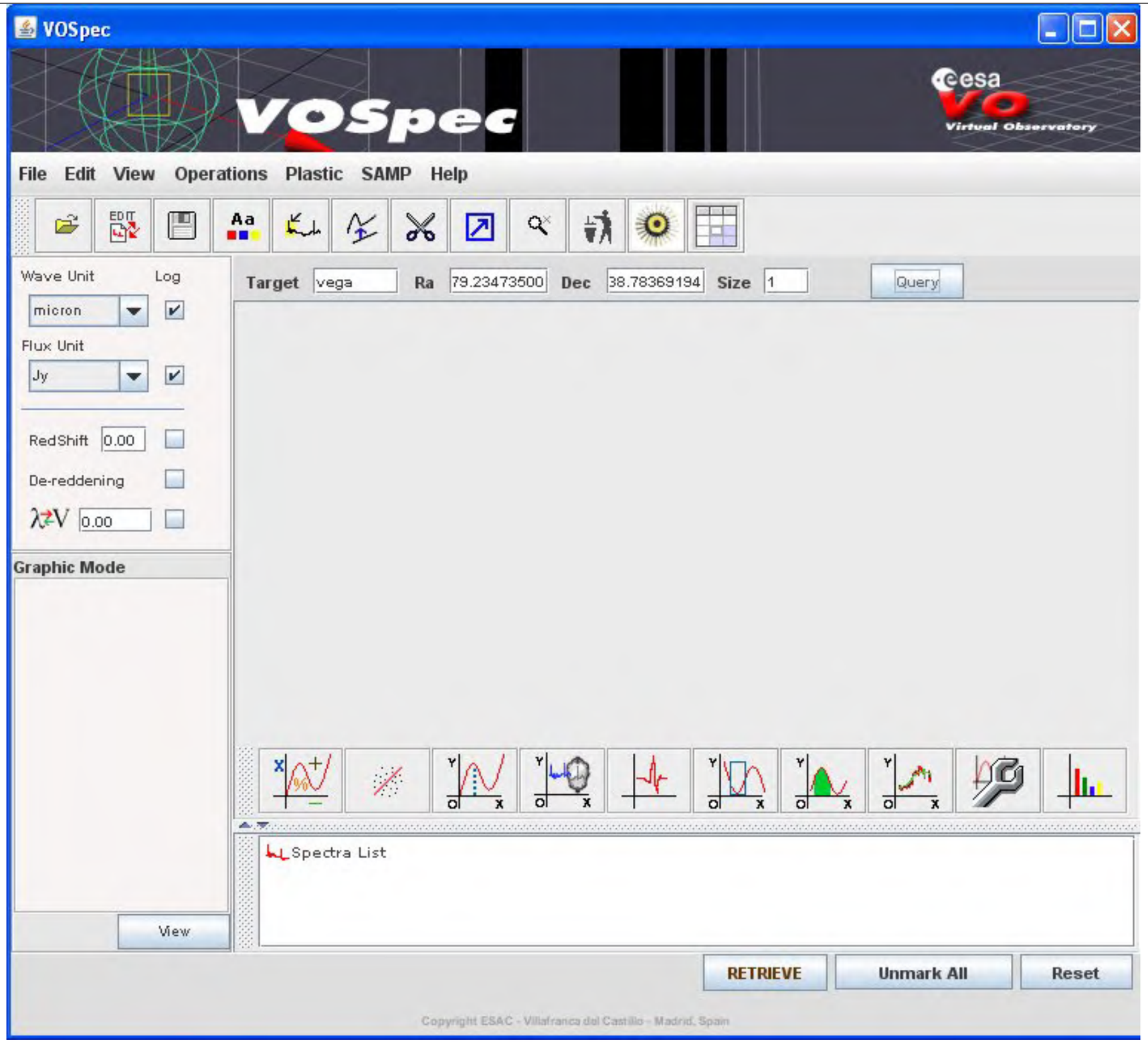
Adding theoretical data: example

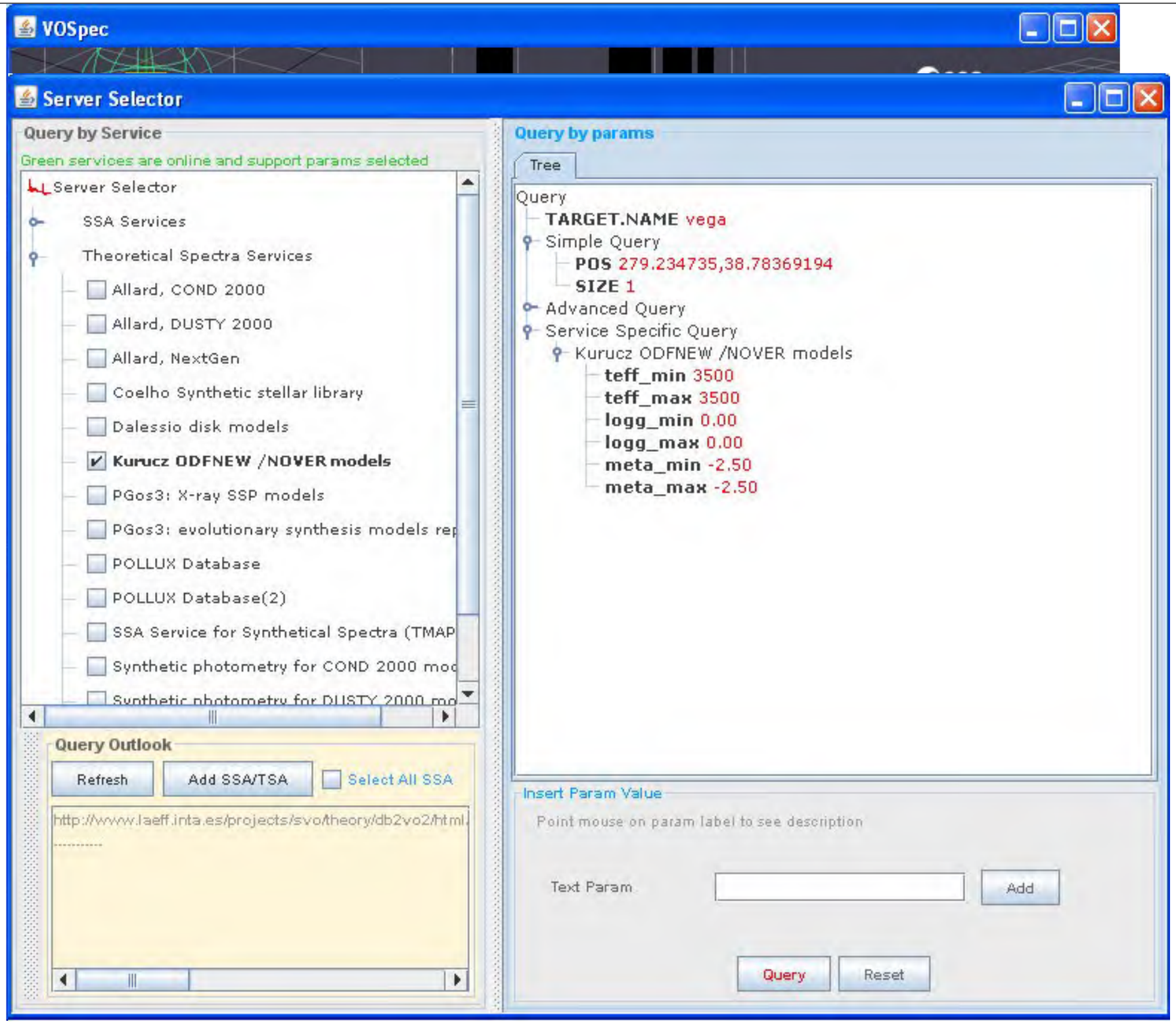
```
SDSC GRID  [+0.0]  VTURB 2.0 KM/S   L/H 1.25
      PROGRAM READFLUX
C     SAMPLE PROGRAM READS THIS FILE ON UNIT 1
      DIMENSION Hnu(1221),HnuCONT(1221),WAVE(1221)
      CHARACTER*80 TITLE
      DO 11 ISKIP=1,22
   11 READ(1,1)
C     wavelength in nm
      READ(1,1)WAVE
    1 FORMAT(10F10.2)
      DO 8 MODEL=1,500
C     ergs/cm**2/s/hz/ster
      READ(1,2,END=9)TITLE
    2 FORMAT(A80)
      PRINT 3,MODEL,TITLE
    3 FORMAT(I5,1X,A80)
      READ(1,4)Hnu
      READ(1,4)HnuCONT
    4 FORMAT(8E10.4)
    8 CONTINUE
    9 CALL EXIT
      END
      9.09      9.35      9.61      9.77      9.96     10.20     10.38     10.56
     10.77     11.04     11.40     11.78     12.13     12.48     12.71     12.84
     13.05     13.24     13.39     13.66     13.98     14.33     14.72     15.10
     15.52     15.88     16.20     16.60     17.03     17.34     17.68     18.02
     18.17     18.61     19.10     19.39     19.84     20.18     20.50     21.05
     21.62     21.98     22.30     22.68     23.00     23.40     24.00     24.65
```

Adding theoretical data: example with VO

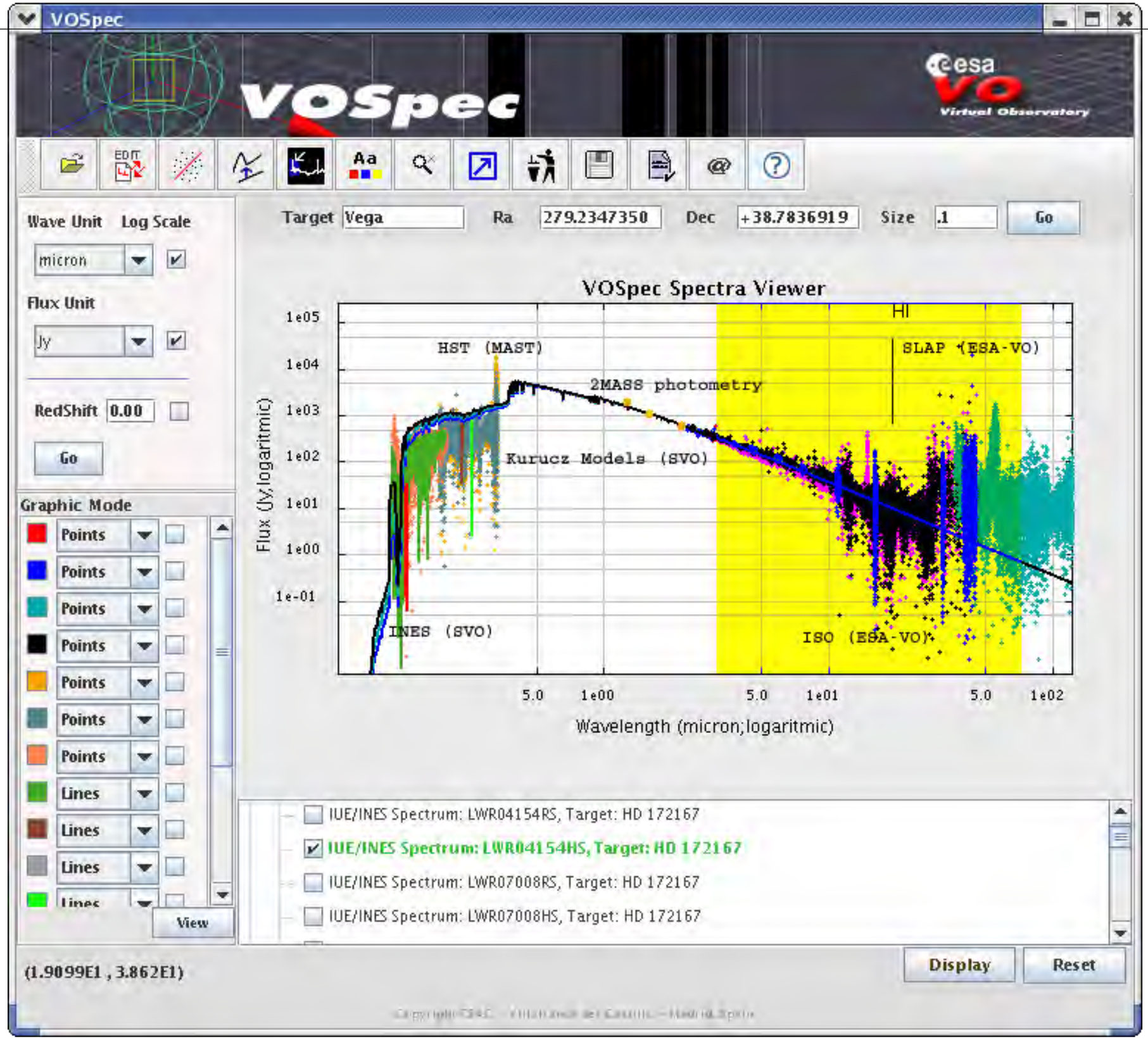
Adding theoretical data: example with VO



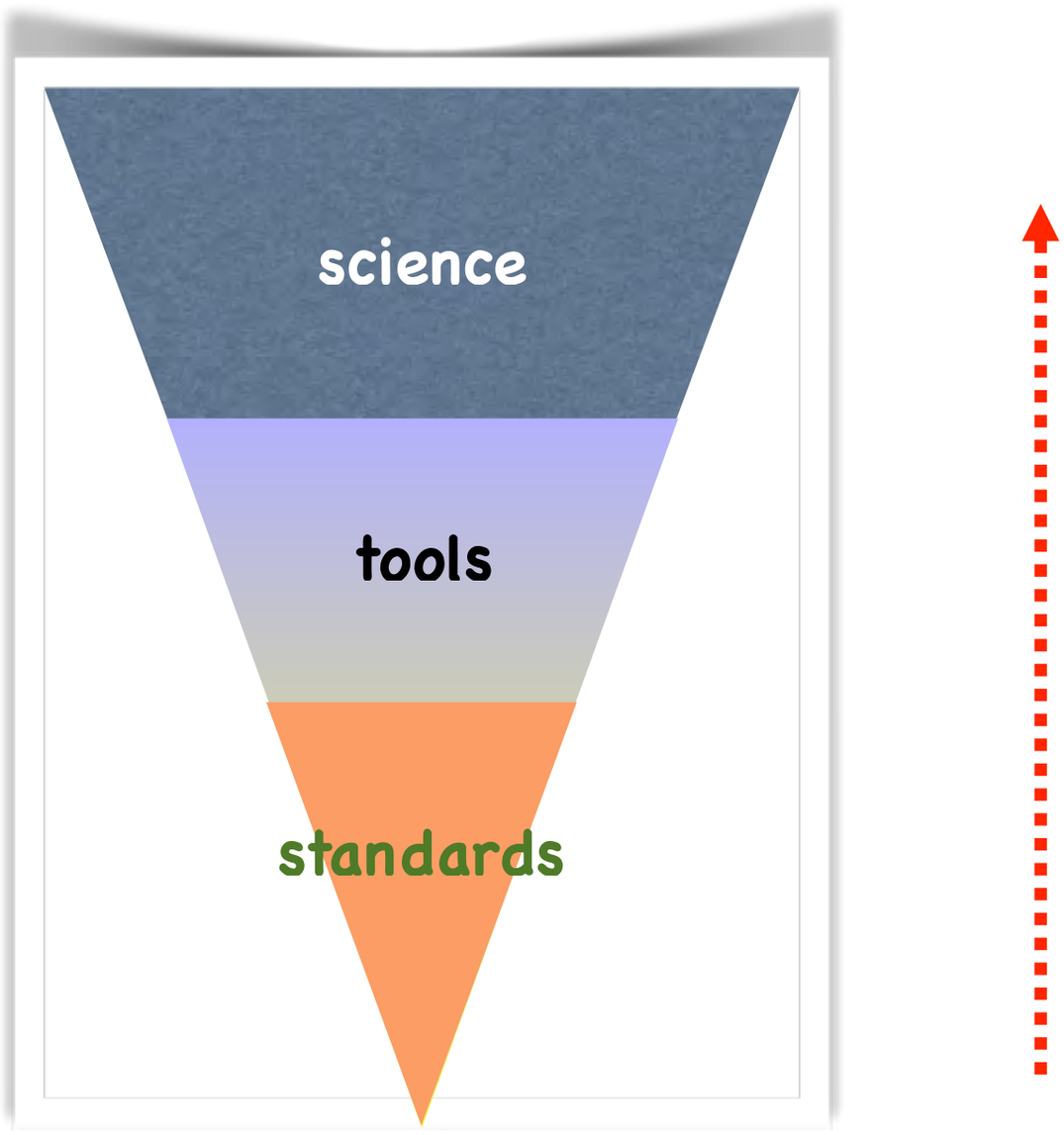
Adding theoretical data: example with VO



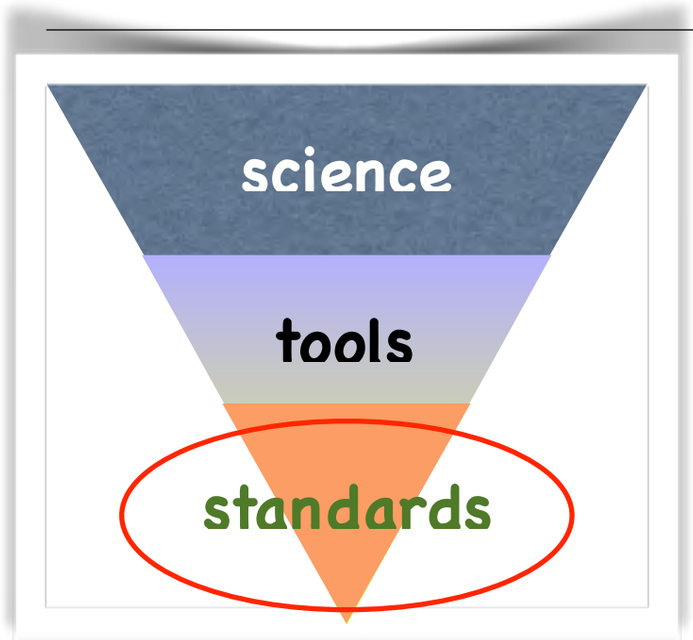
Adding theoretical data: example with VO



The VO approach



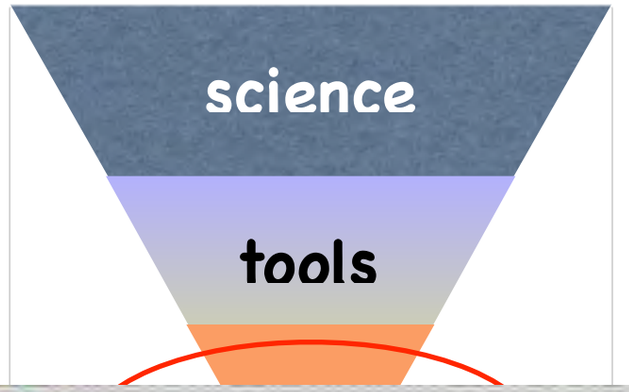
Principles of the philosophy behind the VO



Standards:

- fits format for imaging (established)

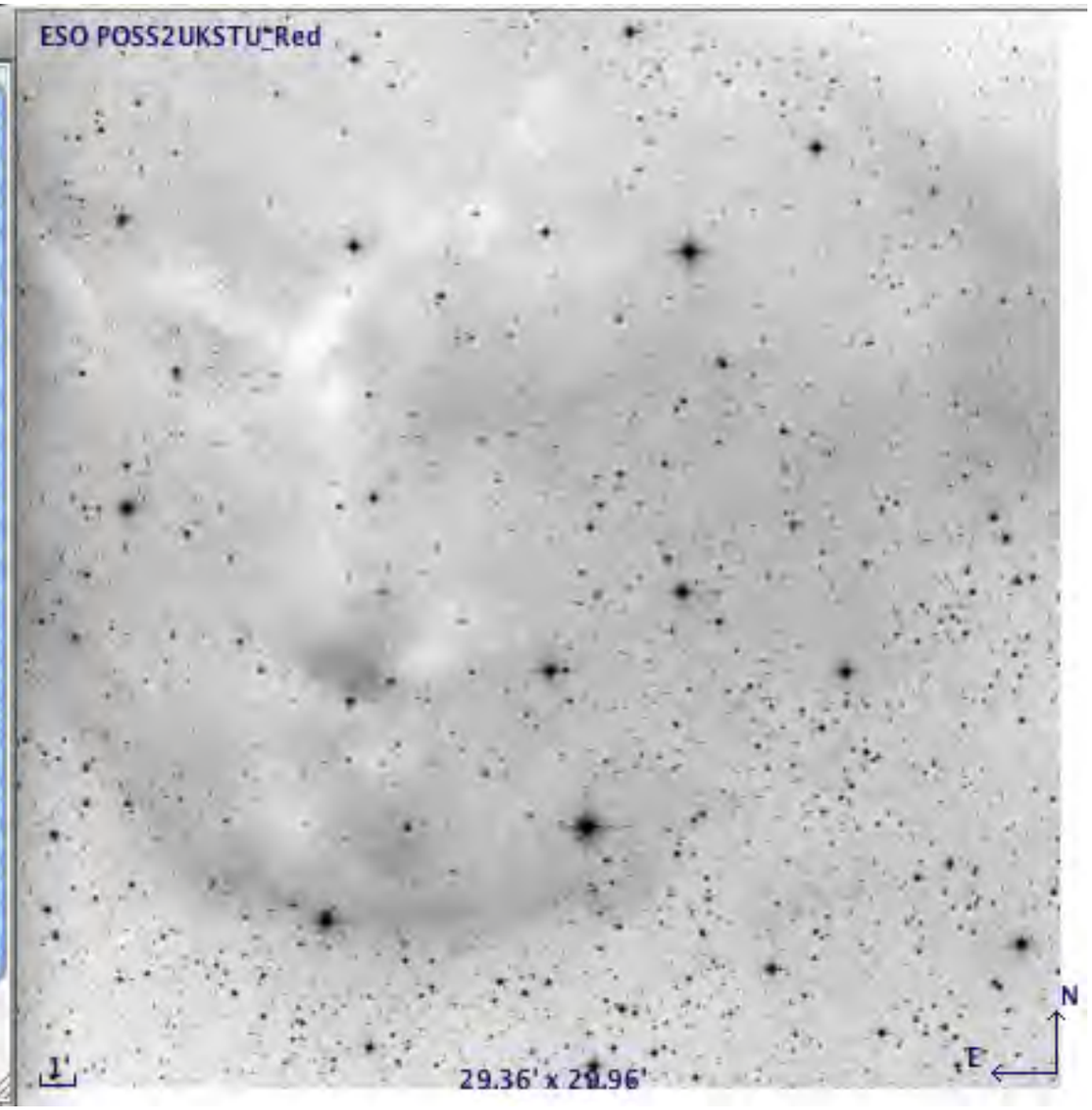
Principles of the philosophy behind the VO

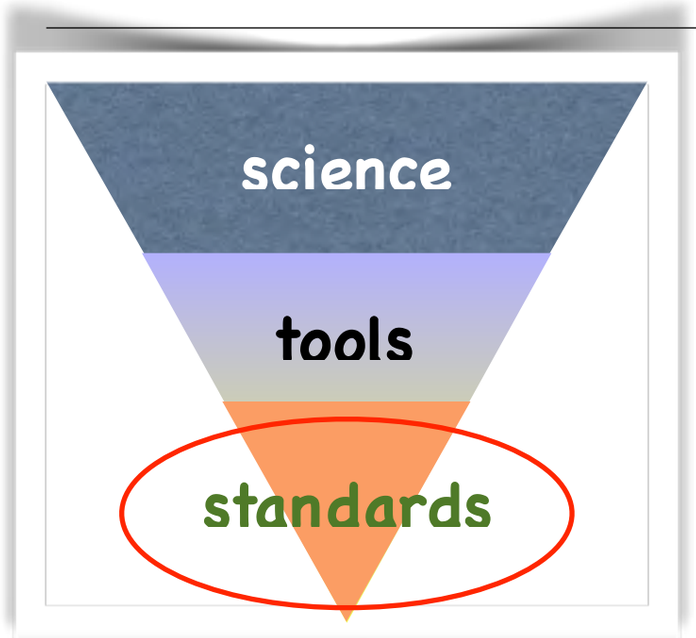


Standards:

FITS header

```
SIMPLE  =                    T /FITS header
BITPIX  =                   16 /No.Bits per pixel
NAXIS   =                    2 /No.dimensions
NAXIS1  =                 1782 /Length X axis
NAXIS2  =                 1786 /Length Y axis
EXTEND  =                    T /
DATE    = '21/03/12          ' /Date of FITS file creation
ORIGIN  = 'CASB -- STScI     ' /Origin of FITS image
PLTLABEL= 'SF02904           ' /Observatory plate label
PLATEID = 'A21Q              ' /GSSS Plate ID
REGION  = 'XP695             ' /GSSS Region Name
DATE-OBS= '1989/11/07        ' /UT date of Observation
UT      = '##################' /UT time of observation
EPOCH   =  1.9898502197270E+03 /Epoch of plate
PLTRAH  =                    5 /Plate center RA
PLTRAM  =                   22 /
PLTRAS  =  4.6105959333330E+01 /
PLTDECSN= '+                 ' /Plate center Dec
PLTDECD =                   10 /
PLTDECM =                    5 /
PLTDECS =  3.0591079999998E+01 /
EQUINOX =  2.0000000000000E+03 /Julian Reference frame equinox
EXPOSURE=  7.0000000000000E+01 /Exposure time minutes
BANDPASS=                   35 /GSSS Bandpass code
PLTGRADE=                    0 /Plate grade
PLTSCALE=  6.7199996948240E+01 /Plate Scale arcsec per mm
SITELAT =  '+33:24:24.00     ' /Latitude of Observatory
SITELONG= '-116:51:48.00     ' /Longitude of Observatory
TELESCOP= 'Palomar 48-in Schm' /Telescope where plate taken
CNPIX1  =                 3294 /X corner  (pixels)
CNPIX2  =                18277 /Y corner
DATATYPE= 'INTEGER*2         ' /Type of Data
SCANIMG =  'XP695_A21Q_01_00.PIM' /Name of original scan
SCANNUM =                    1 /Identifies scan of the plate
DCHOPPED=                    F /Image repaired for chopping effects
```

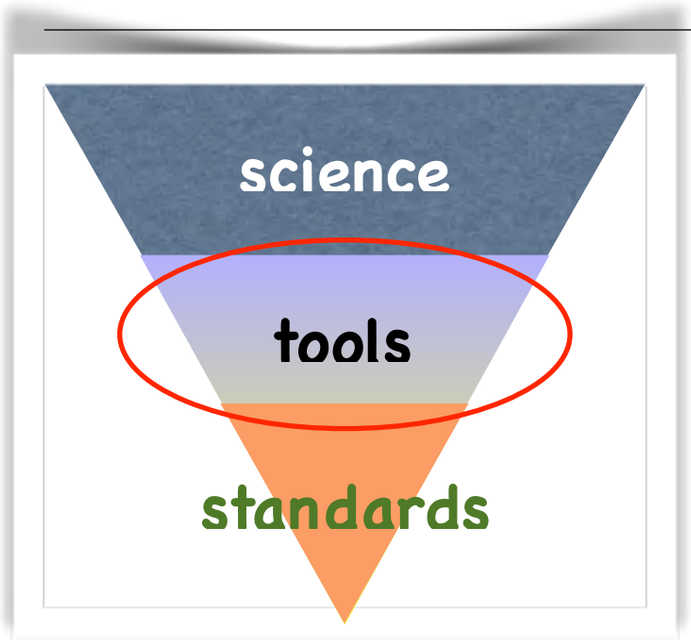




Standards:

- fits format for imaging (established)
- Table format?
- Photometric systems and how to mix data from different ones? + data coming in physical units?

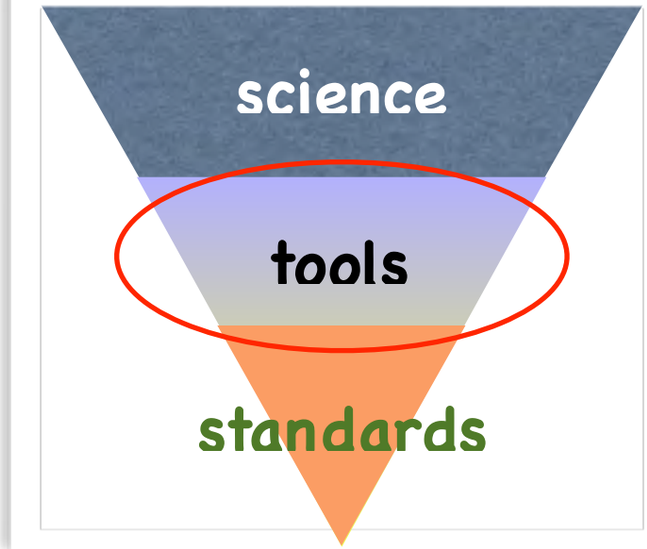
Principles of the philosophy behind the VO



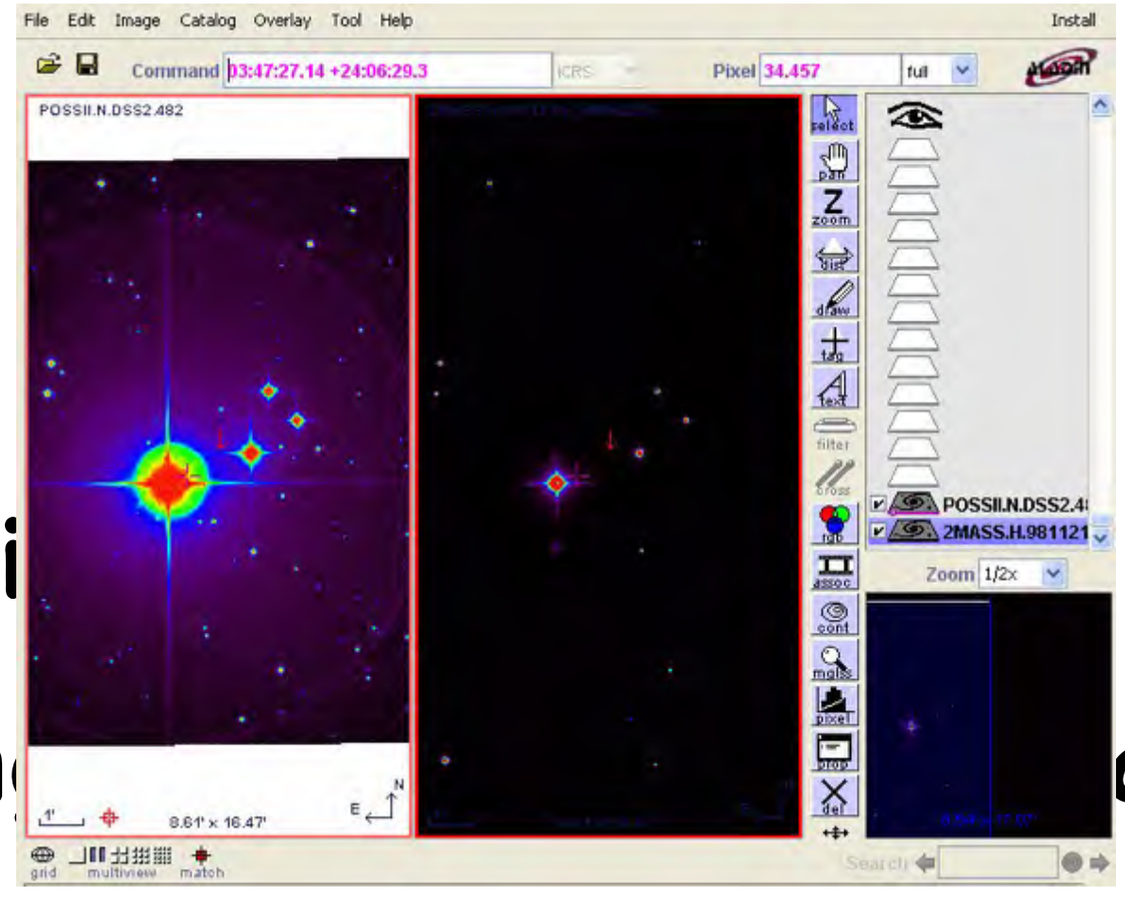
Tools:

- Aligning, rotating, scaling, arithmetics
- Combining local and archival data

Principles of the philosophy behind the VO

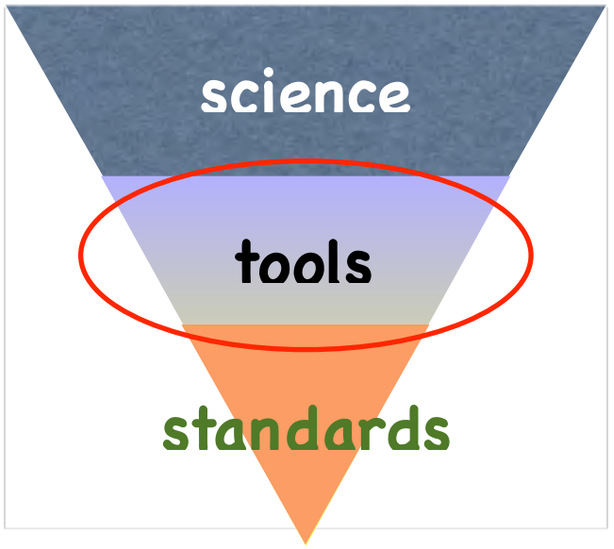


Tools:



- Aligning,
  arithmeti
- Combinin ata

Principles of the philosophy behind the VO



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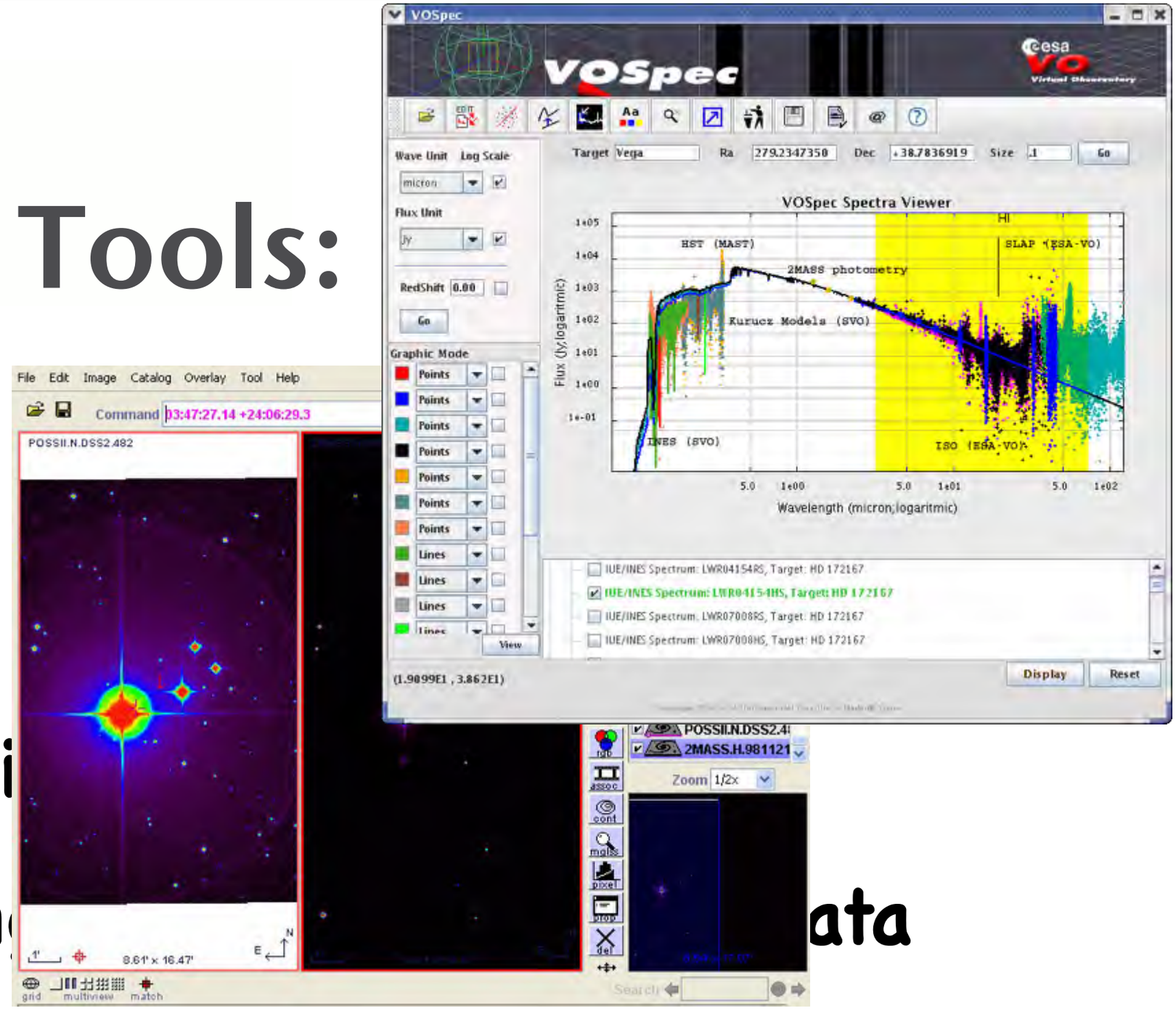

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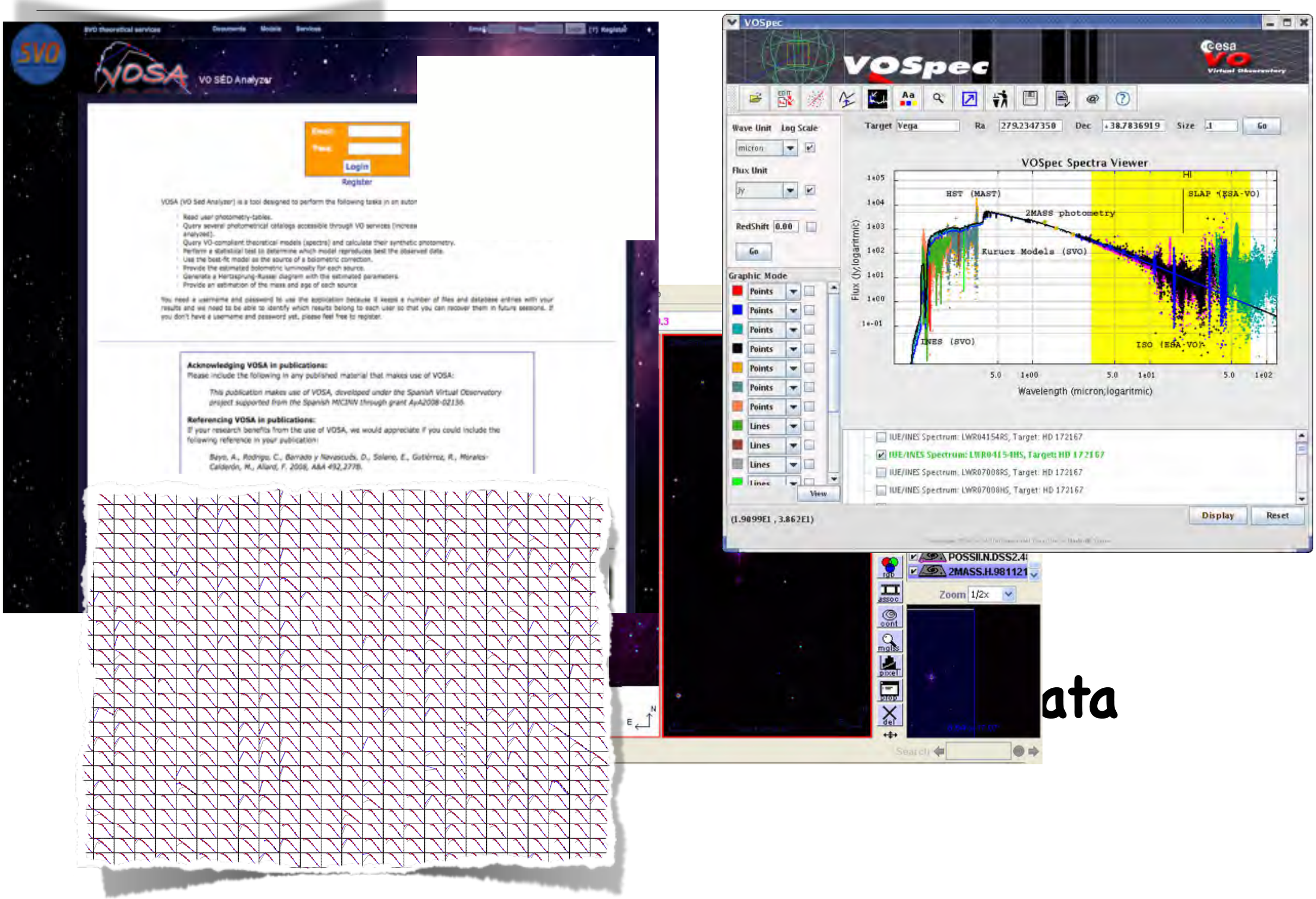

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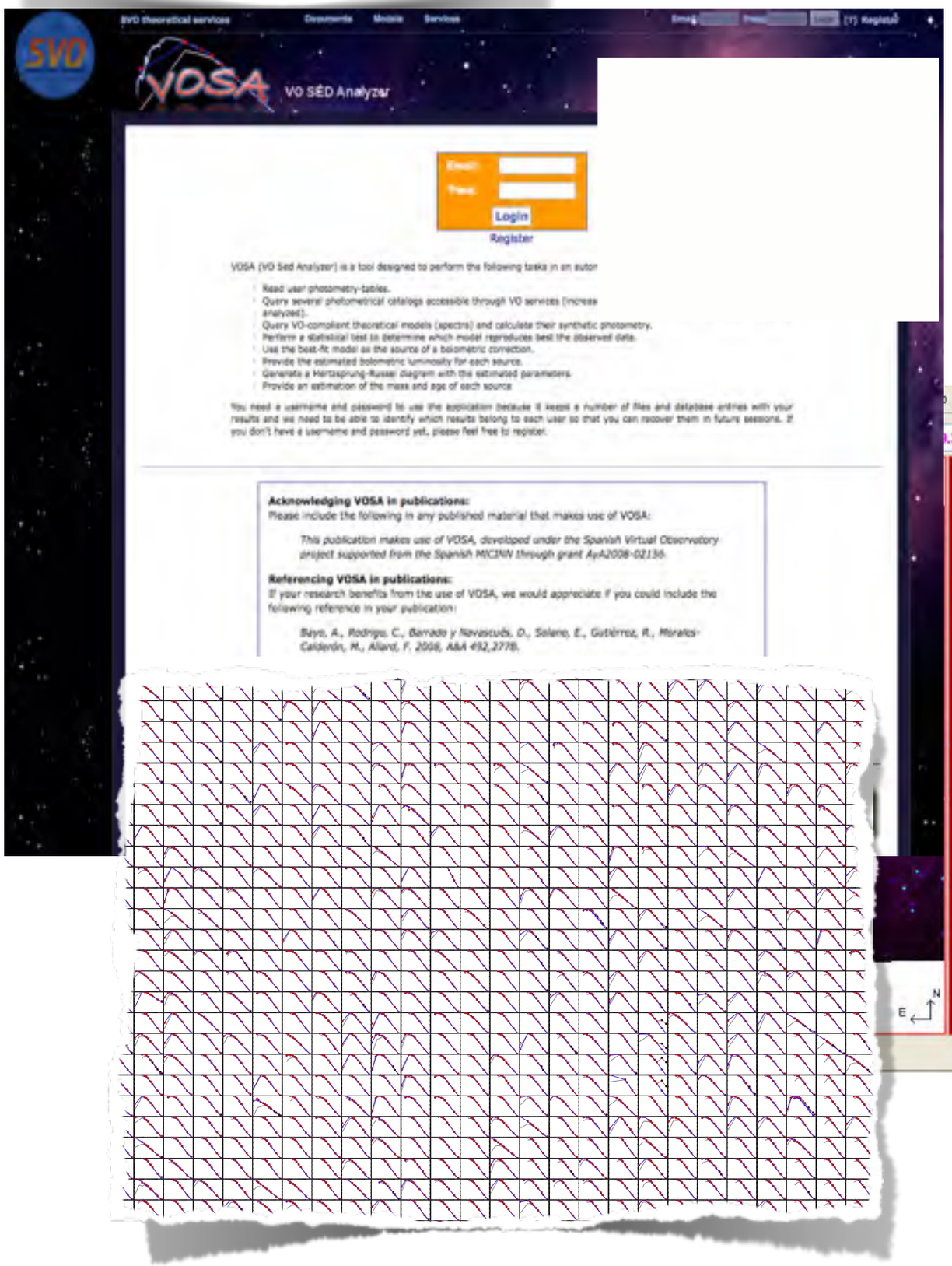
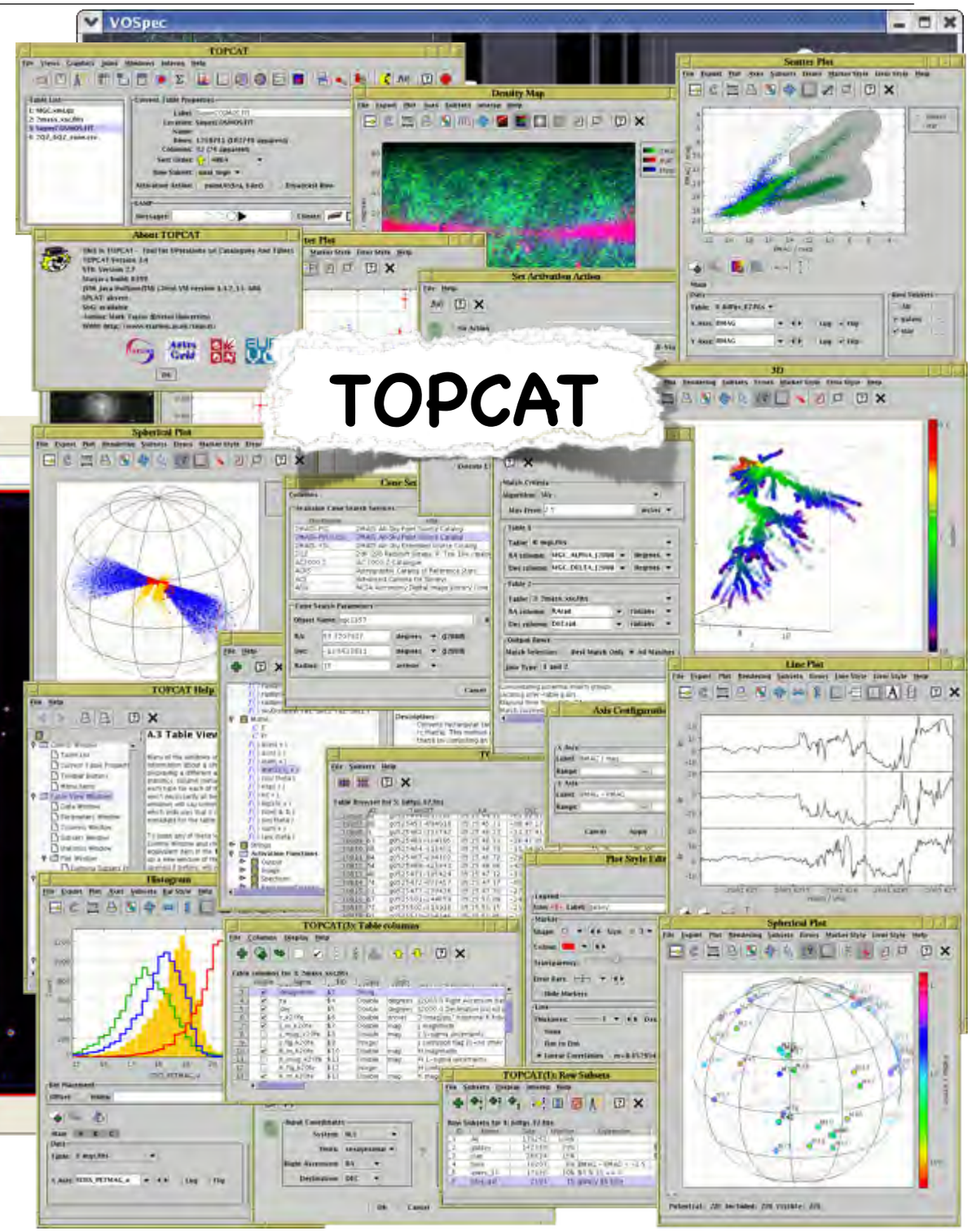
Principles of the philosophy behind the VO





Principles of the philosophy behind the VO: tools

Principles of the philosophy behind the VO: tools

Applications/Services (alphabetical)

- Aladin
- AstroStat
- CASSIS
- CDS Cross-Match Service
- Iris
- Seleste
- Skyview
- SIMBAD
- Specview
- SPLAT

Applications/Services (by function)

Search for Images: Aladin, Data Discovery Tool, TOPCAT

Search for Spectra: VOSpec, SPLAT, Aladin, Data Discovery Tool, TOPCAT, CASSIS

Search for Catalogues/Tables: Aladin, Data Discovery Tool, TOPCAT, VizieR, Xamin, TAPHandle

Image Visualisation: Aladin

Catalogue/Table Visualisation: TOPCAT, VOPlot

Catalogue Cross-matching: Aladin, CDS Cross-Match Service, TOPCAT/STILTS, Cross-Comparison Tool

Scatter, 3D plots and histograms: TOPCAT, VOPlot

Statistics: AstroStat

Coverage Maps: Aladin

Table format conversion: TOPCAT/STILTS, VOConvert

SEDs: Iris, VOSA, VOSpec

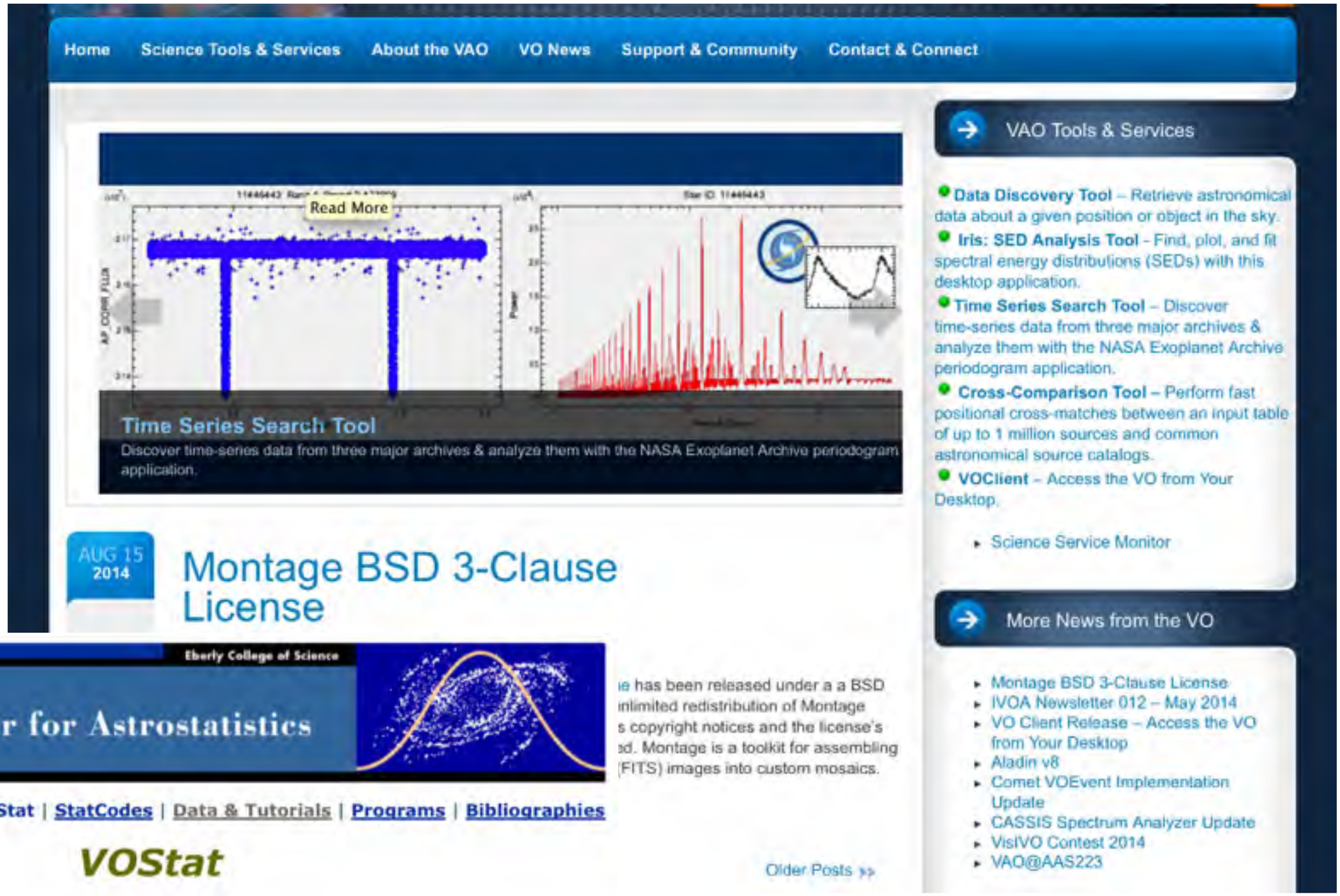
- TAPHandle
- TOPCAT/STILTS
- VAO Cross-Comparison Tool
- VAO Data Discovery Tool
- VAO Time Series Search Tool
- VisIVO
- VizieR
- VOConvert
- VOPlot
- VOSA
- VOSpec
- Xamin

Other VO Compliant Tools:

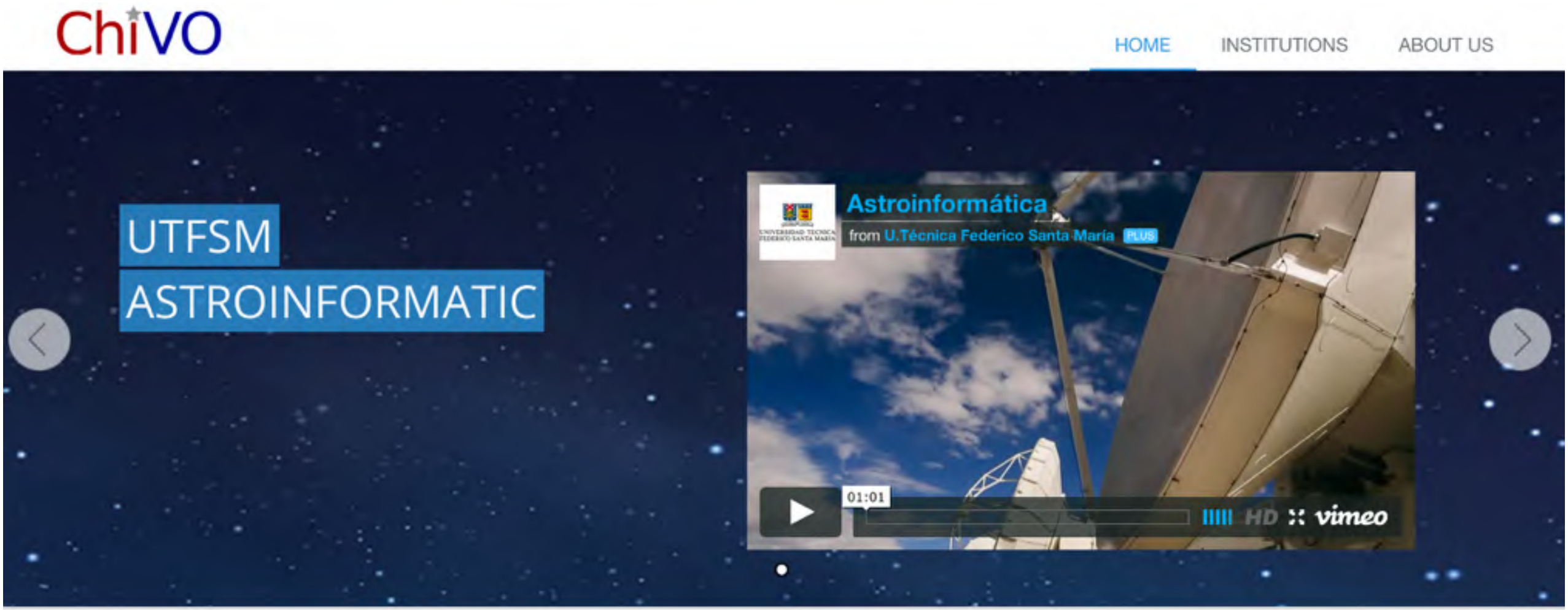
- IRAF, SAOImage DS9

- May 2014 IVOA Newsletter now available

Principles of the philosophy behind the VO: tools



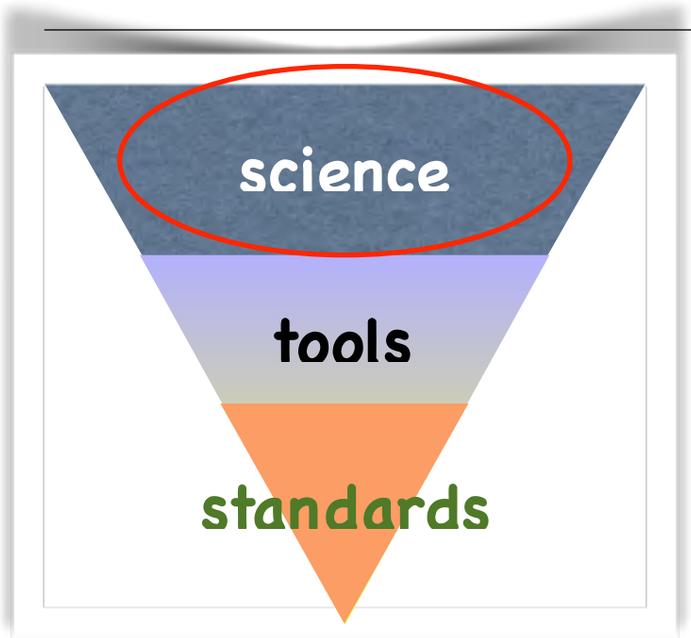
Chile is part of this effort



What is CHIVO?

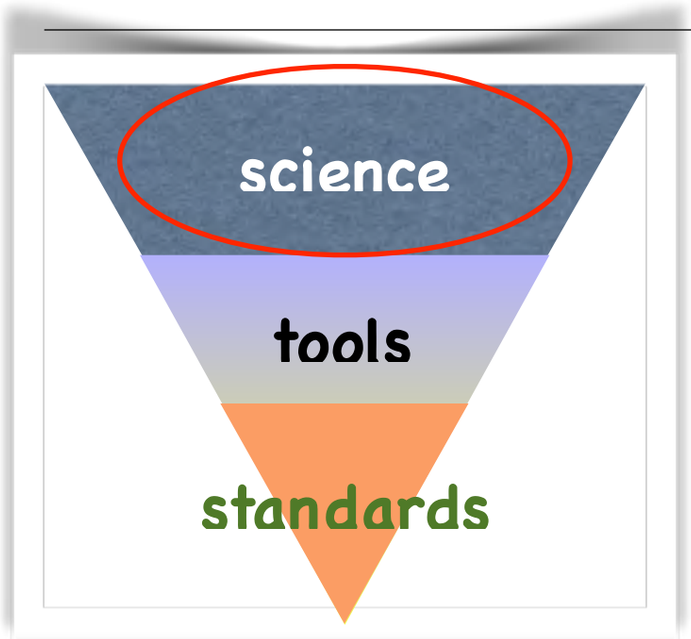
The Chilean Virtual Observatory (CHIVO) is a VO developed in Chile and it is one of many VO projects currently underway in the world. It was born out of the need to archive data that require large storage capacities and the need to develop new tools for the analyzing large volumes of data and better algorithms for intelligent processing of astronomical data, this due to the volumes of large scale data that will generate the astronomical observatories in Chile, mainly the ALMA project that will generate over 1TB of data per day, and in this form be to able to store the data in the

Principles of the philosophy behind the VO

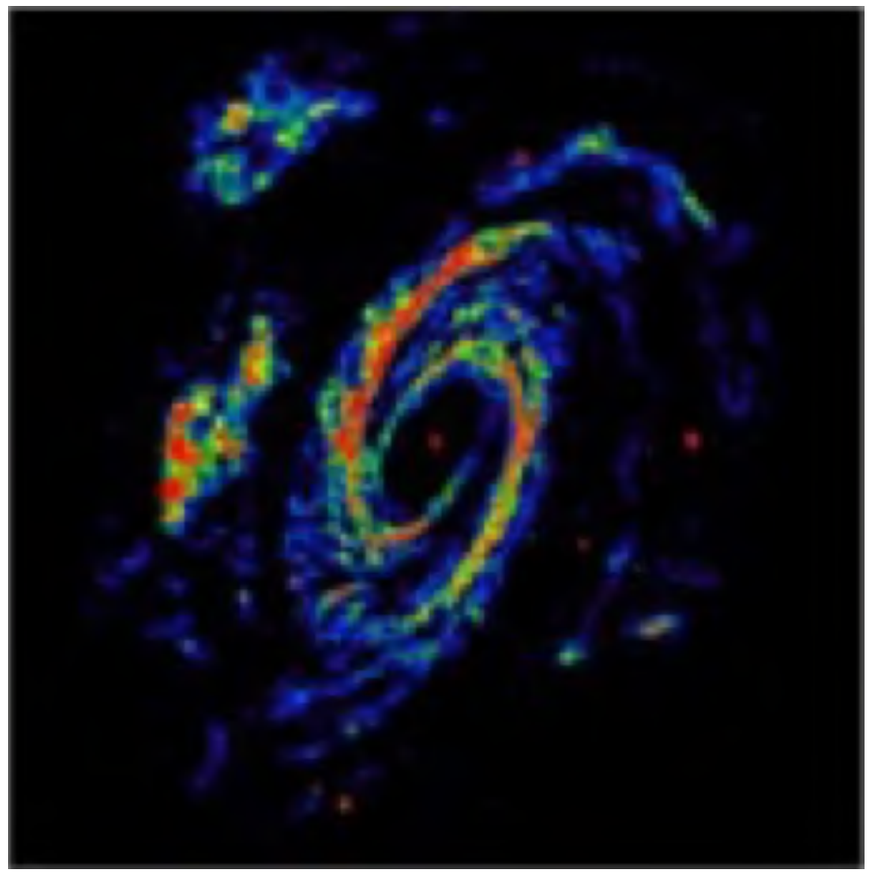


Science:

Principles of the philosophy behind the VO

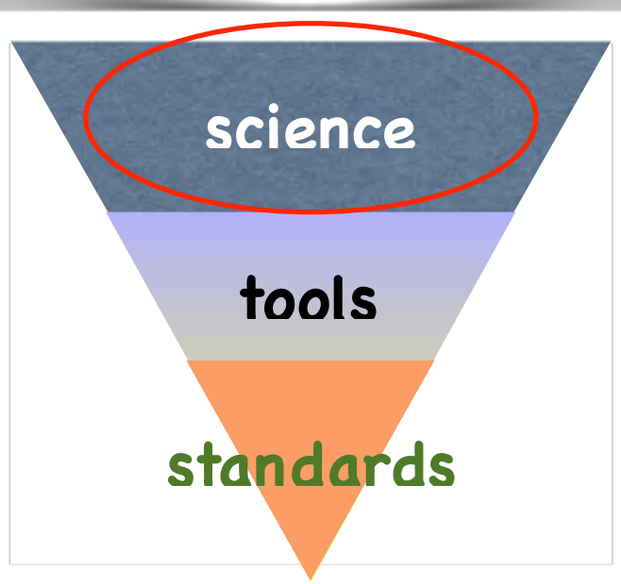


Science:

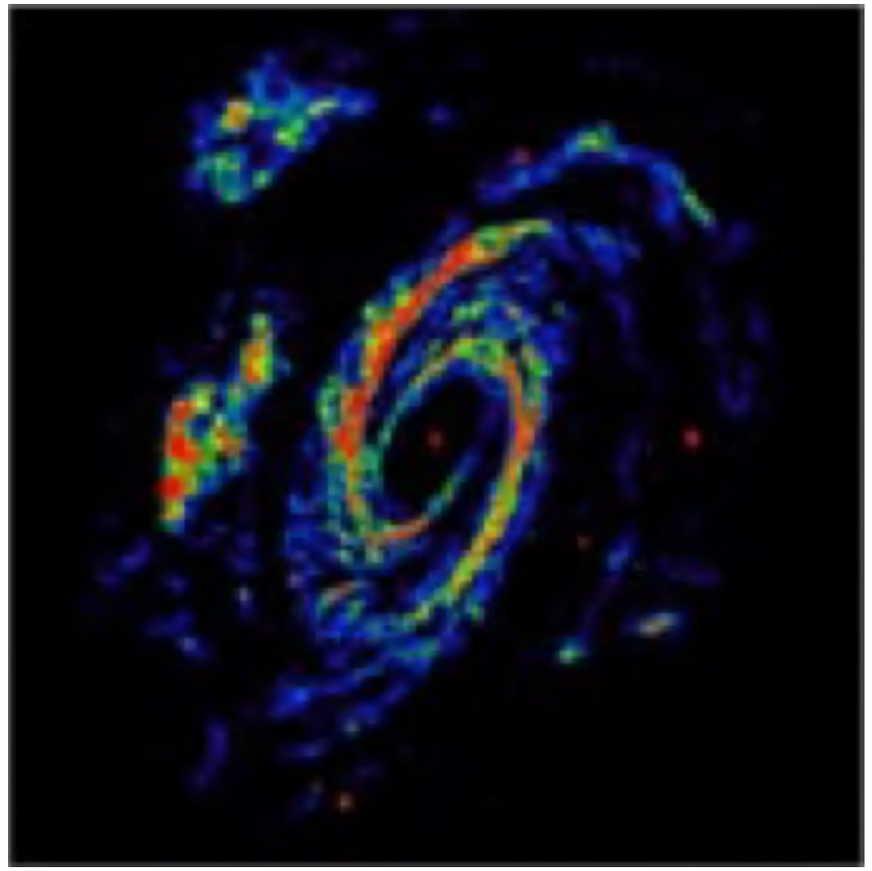


- Multiwavelength
- Exotic objects identification

Principles of the philosophy behind the VO



Science:



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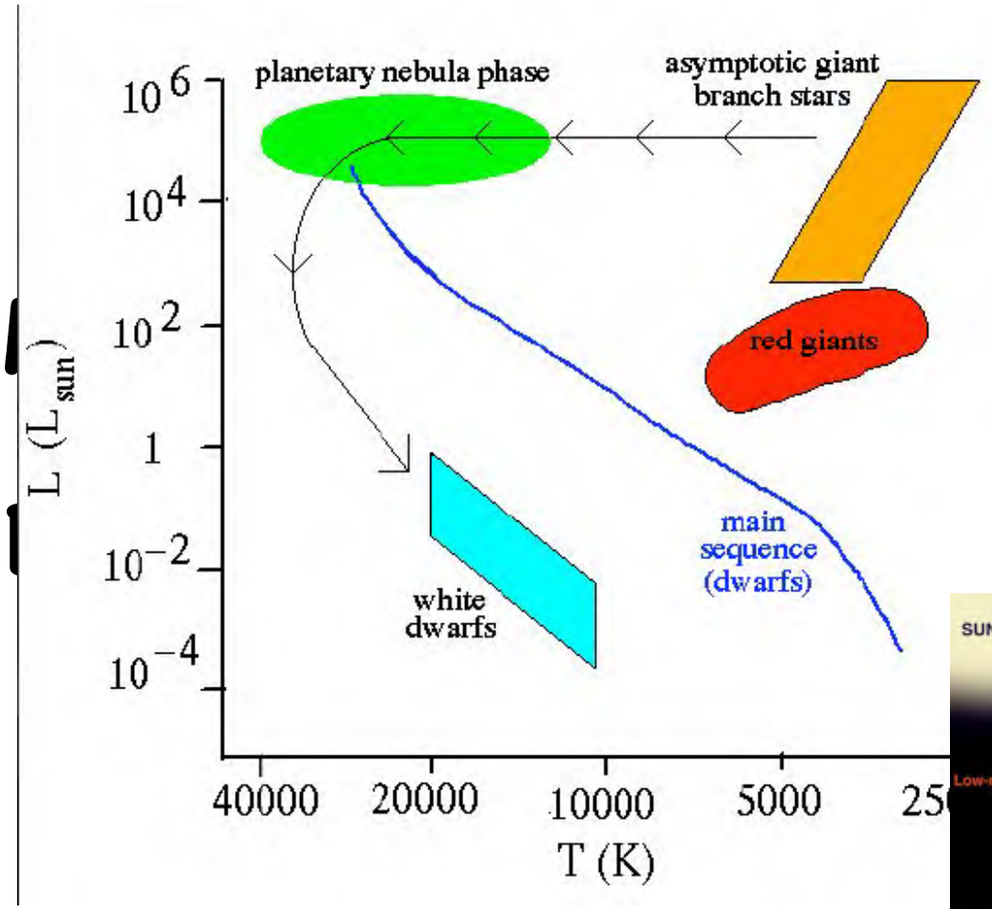

cation

Does really anybody use the VO??

Disclaimer: I am not claiming to be complete or unbiased, in fact quite some part is a collection of my own experiences

What do these papers “talk” about?

“H-index” of ~50 vs SDSS ~70 (to be taken with a pinch of salt,
and I personally believe these comparisons are… not too smart)

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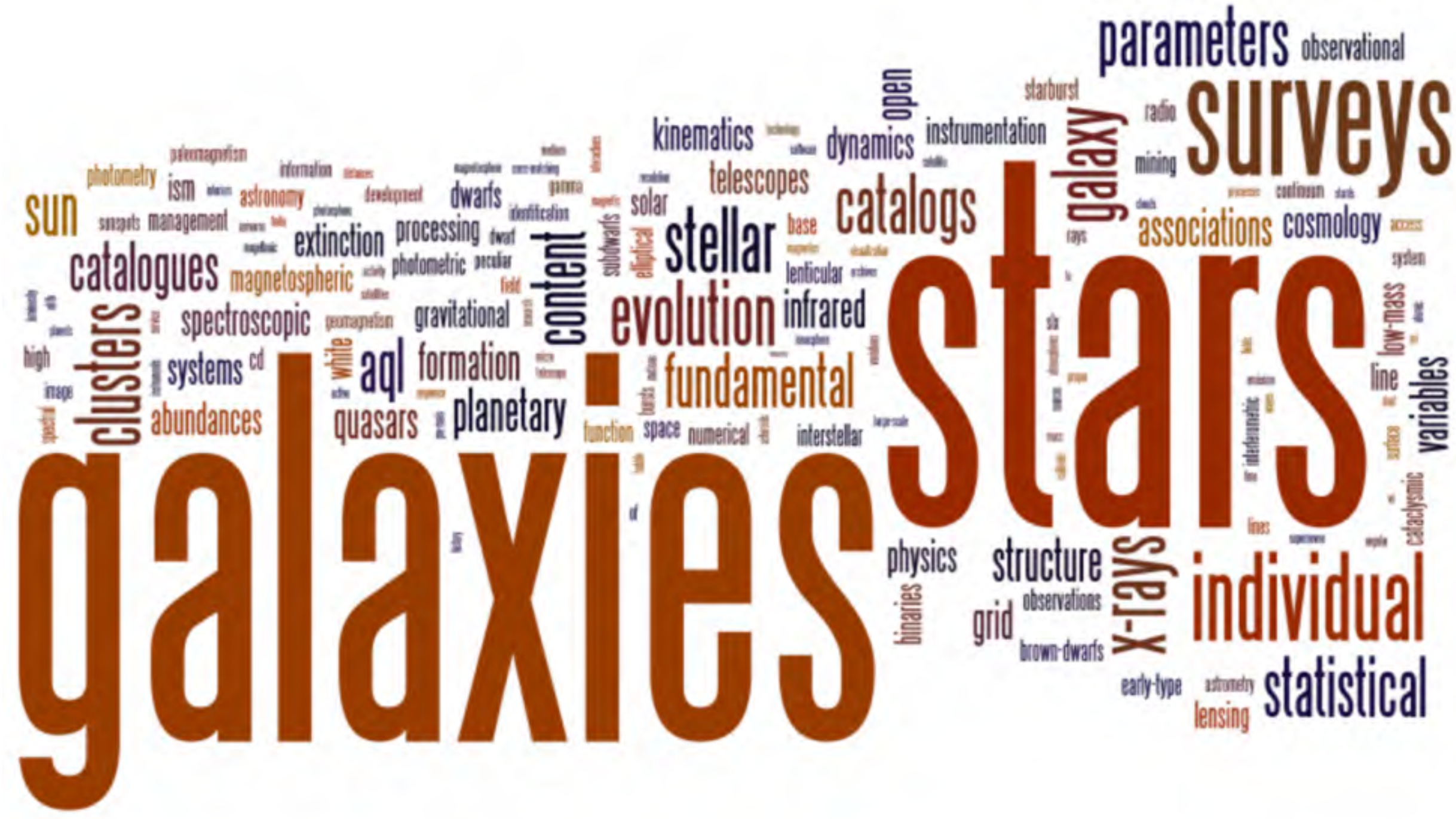
galaxies
stars
surveys
parameters
observational
galaxy
kinematics
dynamics
instrumentation
open
starburst
radio
mining
telescopes
catalogs
stellar
evolution
content
clusters
catalogues
sun
photometry
ism
astronomy
management
extinction
processing
dwarfs
solar
base
associations
cosmology
magnetospheric
spectroscopic
gravitational
infrared
lenticular
fundamental
formation
aql
white
systems
abundances
quasars
planetary
function
space
numerical
interstellar
low-mass
line
variables
cataclysmic
physics
structure
x-rays
individual
binaries
grid
observations
brown-dwarfs
early-type
astrometry
lensing
statistical

cross-matching
astrometry
paleomagnetism
interstellar
dwarfs
history
rays
photometry
research
grid
surface
telescope
micro
management
visualization
fundamental
cataclysmic
clouds
mass
dwarf
photometric
space geomagnetism
associations
abundances
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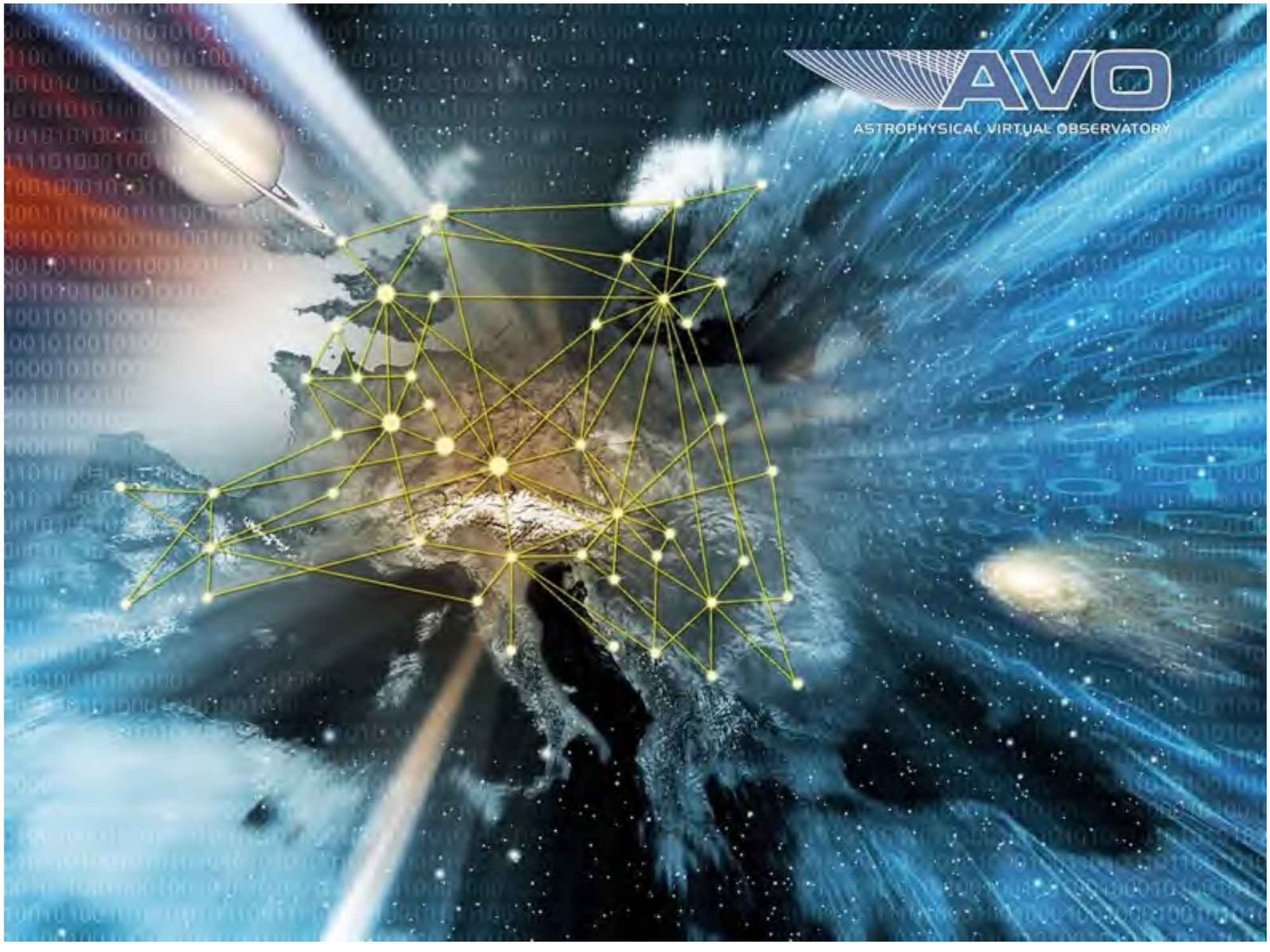
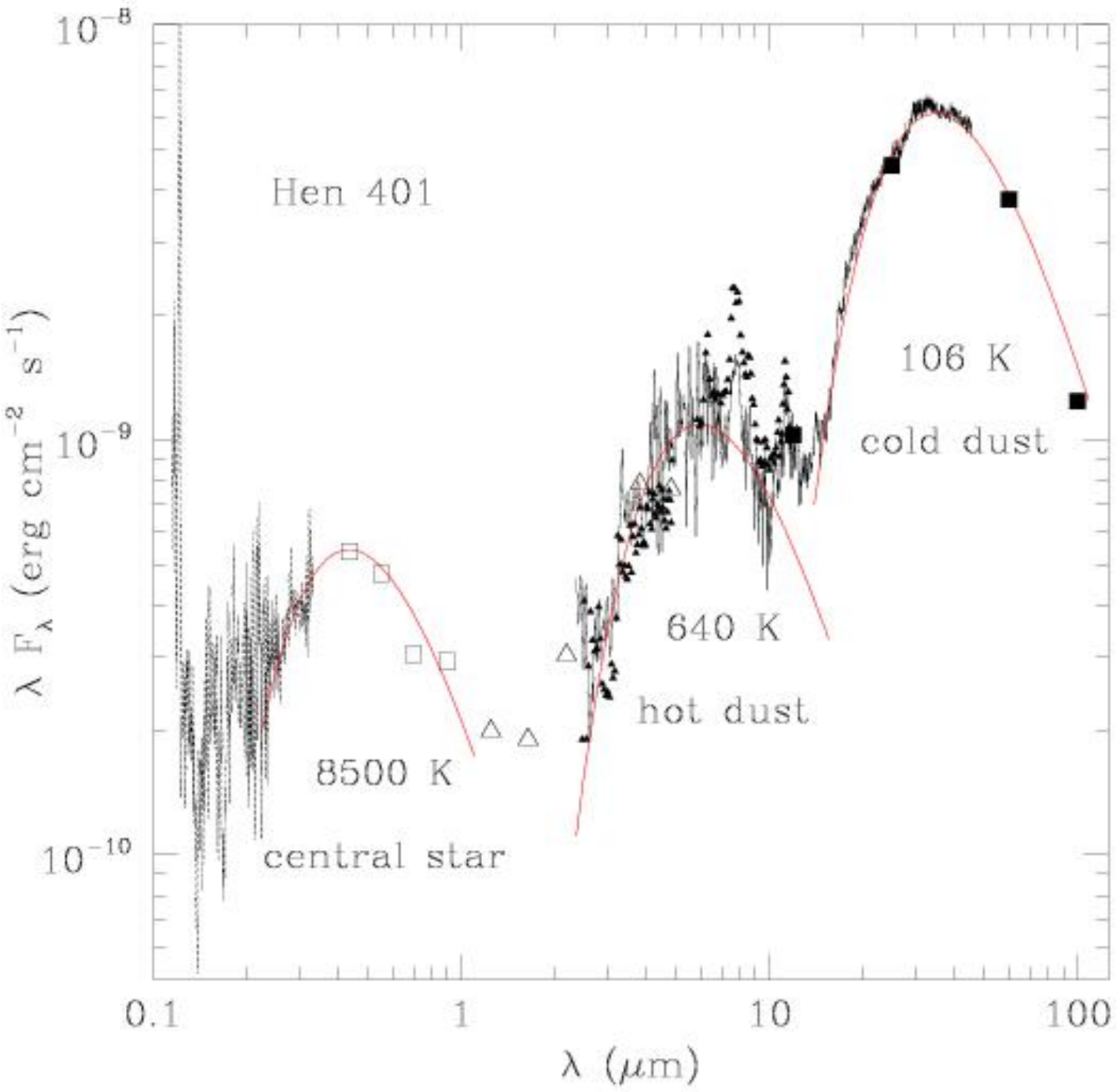
ism
elliptical
time
physics
dynamics
sources
processing
service
interiors
medium
instruments
collinder
early-type
subdwarfs
interferometric
continuum
open
variables
sun
stellar
ori
photosphere
observations
base
large-scale
distances
activity
active
luminosity
software
asteroids
astronomy
brown-dwarfs
magellanic
high
quasars
aql
motions
emission
interactions
ionosphere
variations
satellites
helio
gravitational
telescopes
content
cosmology
access
angular
parameters
magnetosphere
lenticular
waves
X-rays
sunspots
magnetospheric
cd
lensing
satellite
spectral
proper
lines
identification
to
line
function
dust
supernovae
structure
formation
gamma
peculiar
systems
of
binaries
atmospheres
stards
resolution
evolution
infrared
statistical
clusters
starburst
extinction
system
field
atomic
magnetics
vo
mining
development
fields
spectroscopic
kinematics
hubble
slx
image
planets
pre-main
processes
white
magnetic
planetary
information
archives
universe
observational
sequence
instrumentation
numerical
low-mass
radio
solar
technology
bursts

Some examples: 1.- Back in 2004-2005 the AVO



Some examples: 1.- Back in 2004-2005 the AVO

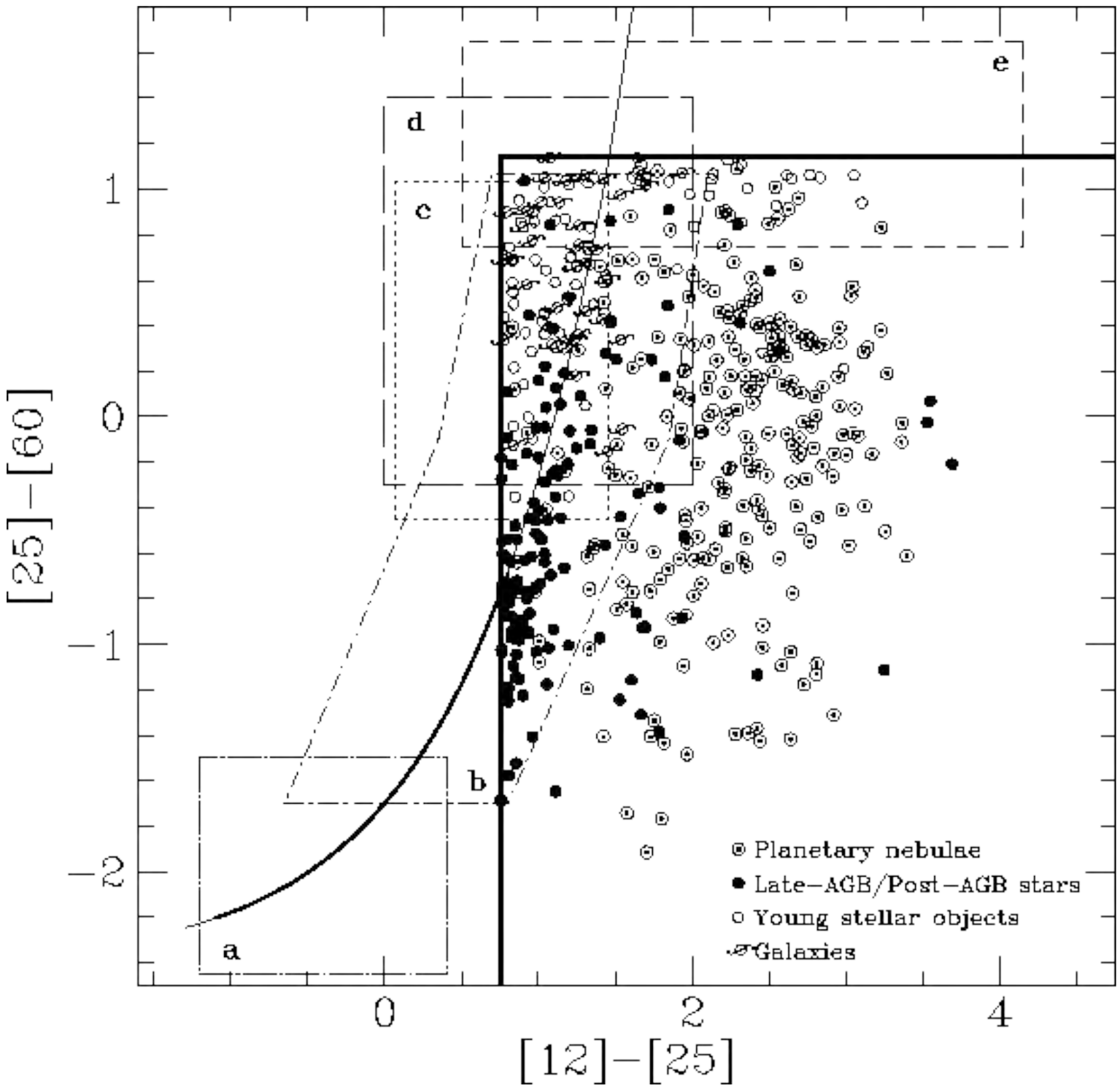


Transition phase

AGB -> PN

Multiple (and variable) components in their SEDs

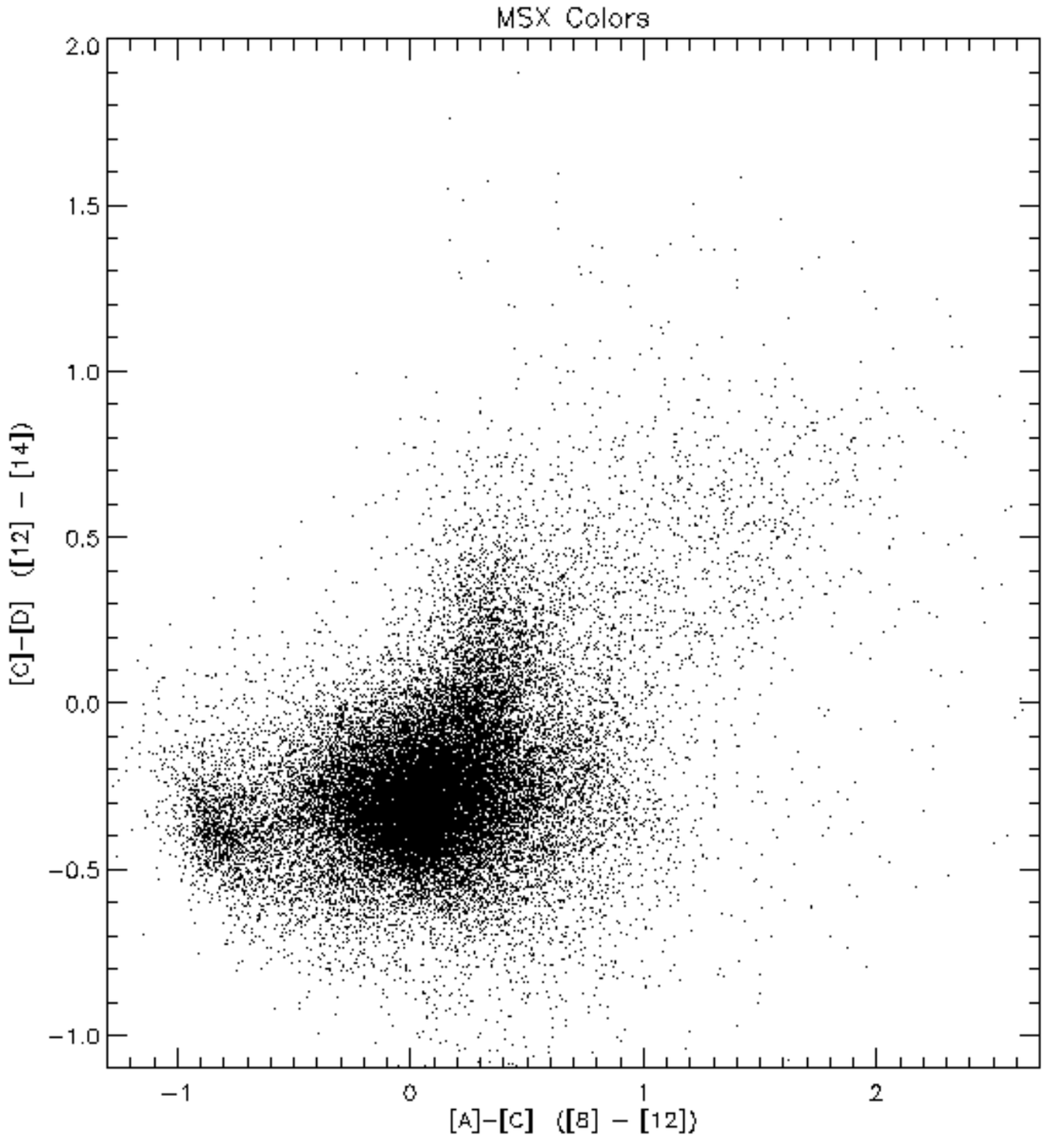
Some examples: 1.- Back in 2004-2005 the AVO



Distribution of identified sources in the GLMP catalog

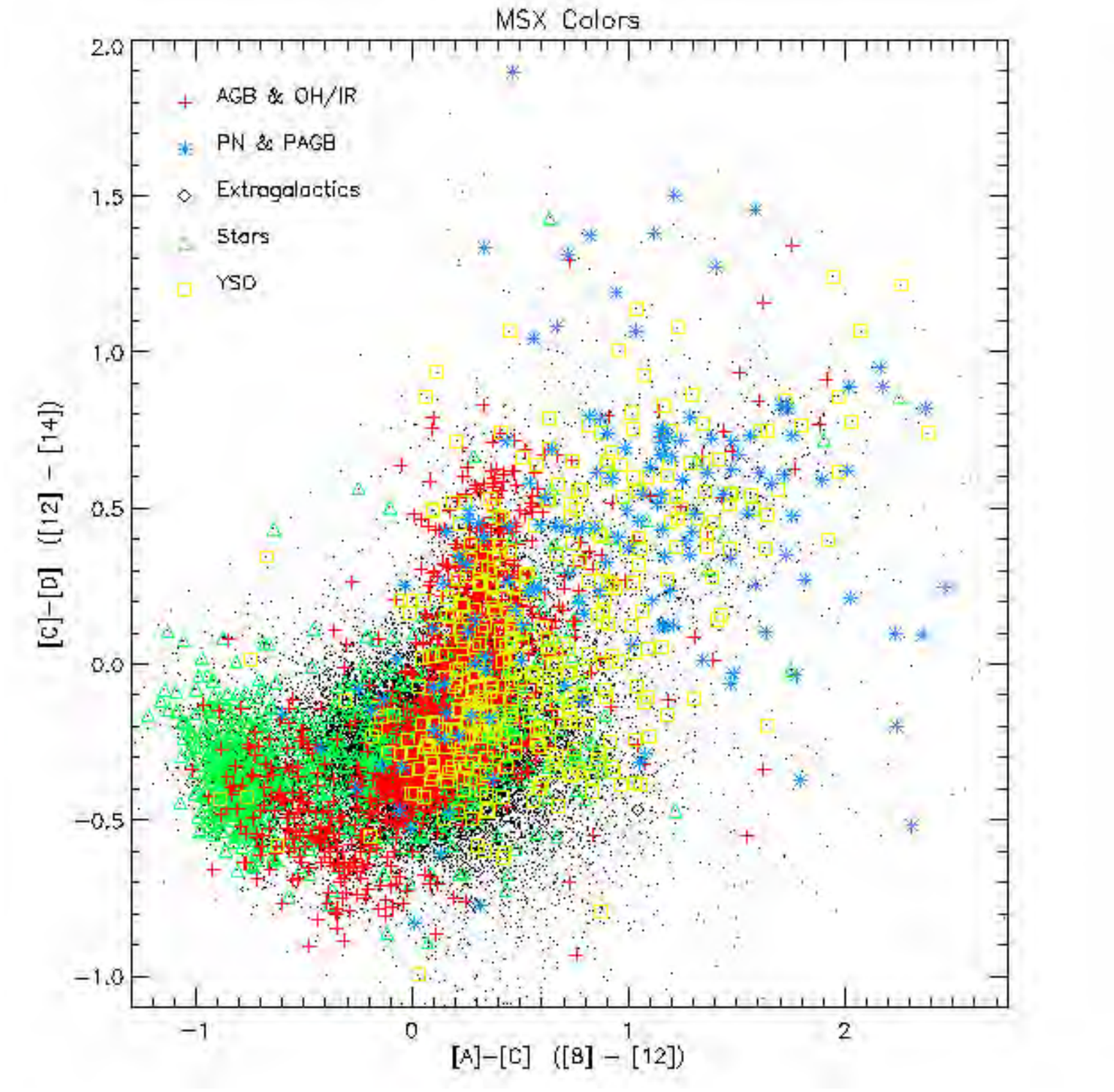
Garcia-Lario et al. (1997)

Some examples: 1.- Back in 2004-2005 the AVO



✓17657 sources
with good quality
MSX photometry
8-14 micron

Some examples: 1.- Back in 2004-2005 the AVO



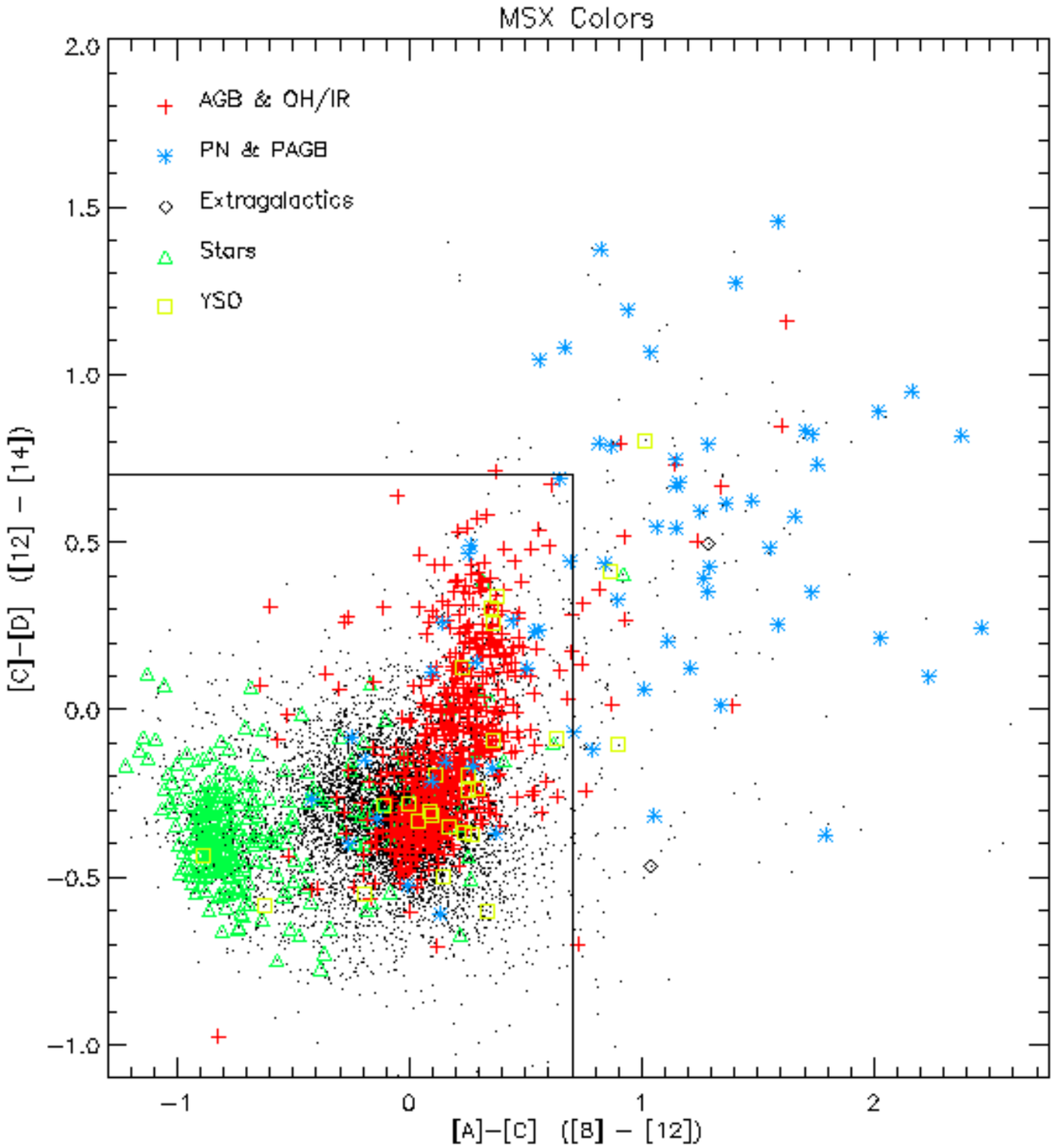
✓17657 sources with good quality MSX photometry 8-14 micron

✓3278 with SIMBAD class.

✓155 known PNe or Post-AGB stars

✓Confusion with other type of sources

Some examples: 1.- Back in 2004-2005 the AVO



If we harden our selection criteria:

✓|b| ≥ 2 degrees

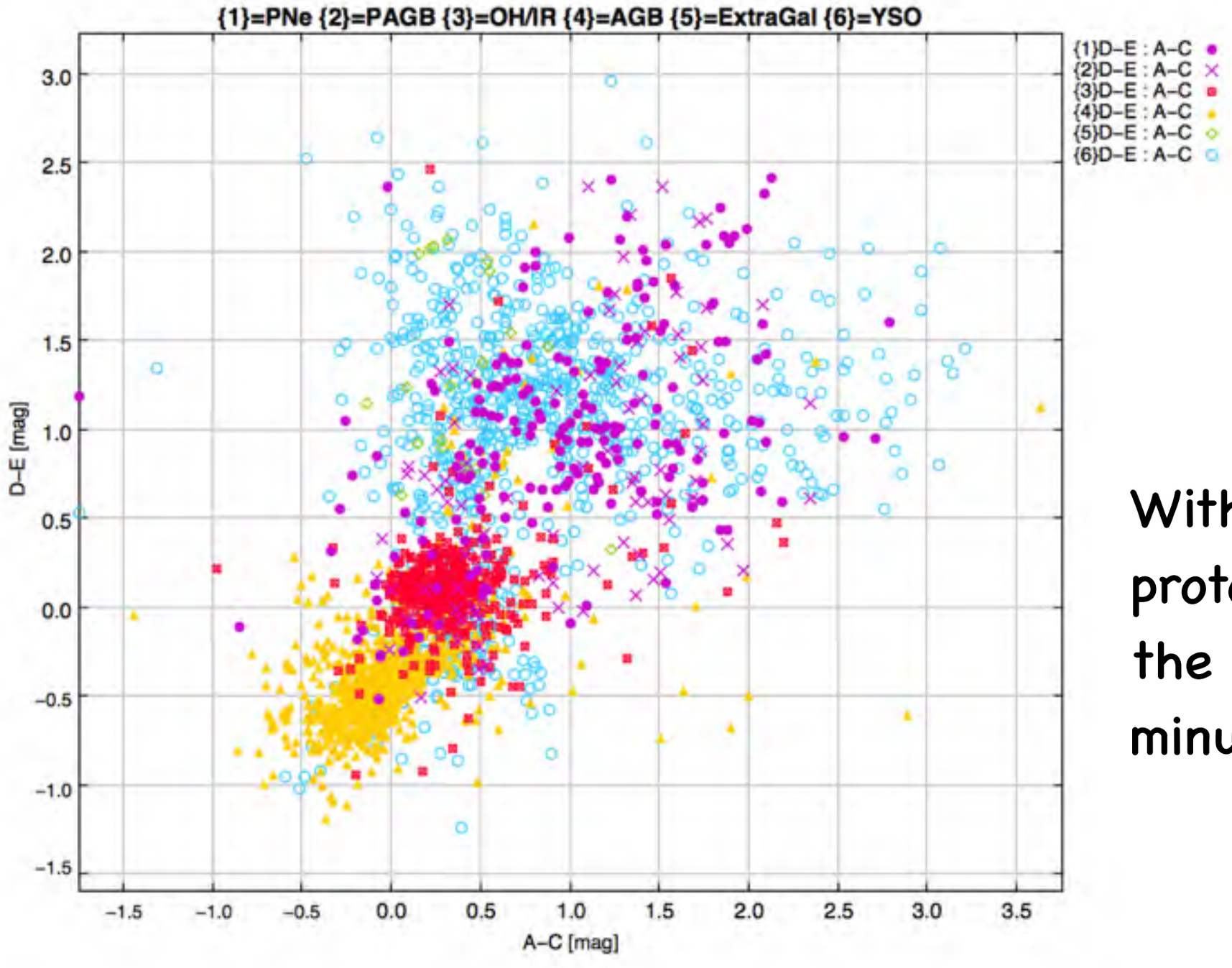
✓[A]-[C] ≥ 0.7

✓[C]-[D] ≥ 0.7

Large majority of PNe and Post-AGB stars...

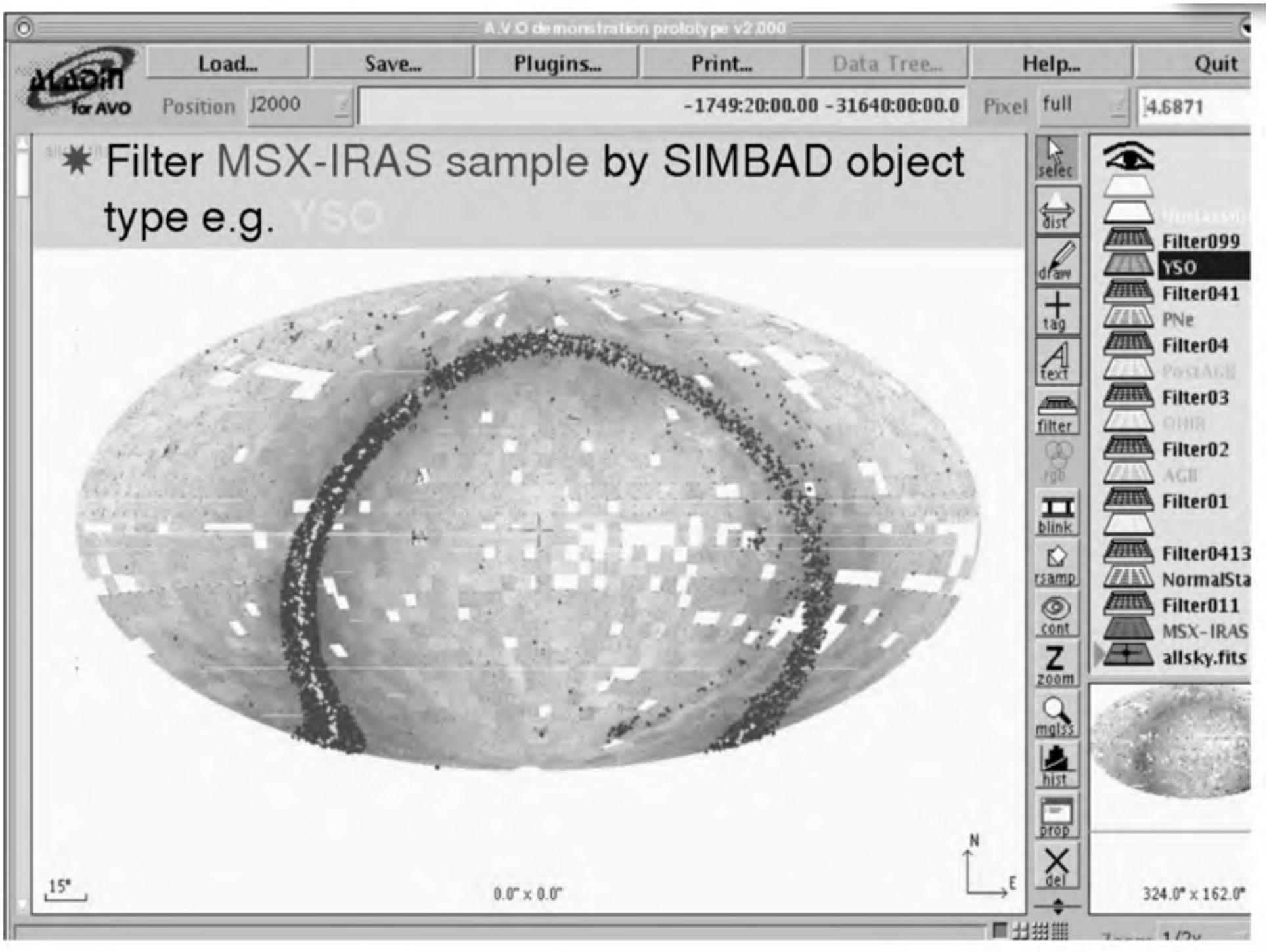
and many new candidates!

Some examples: 1.- Back in 2004-2005 the AVO



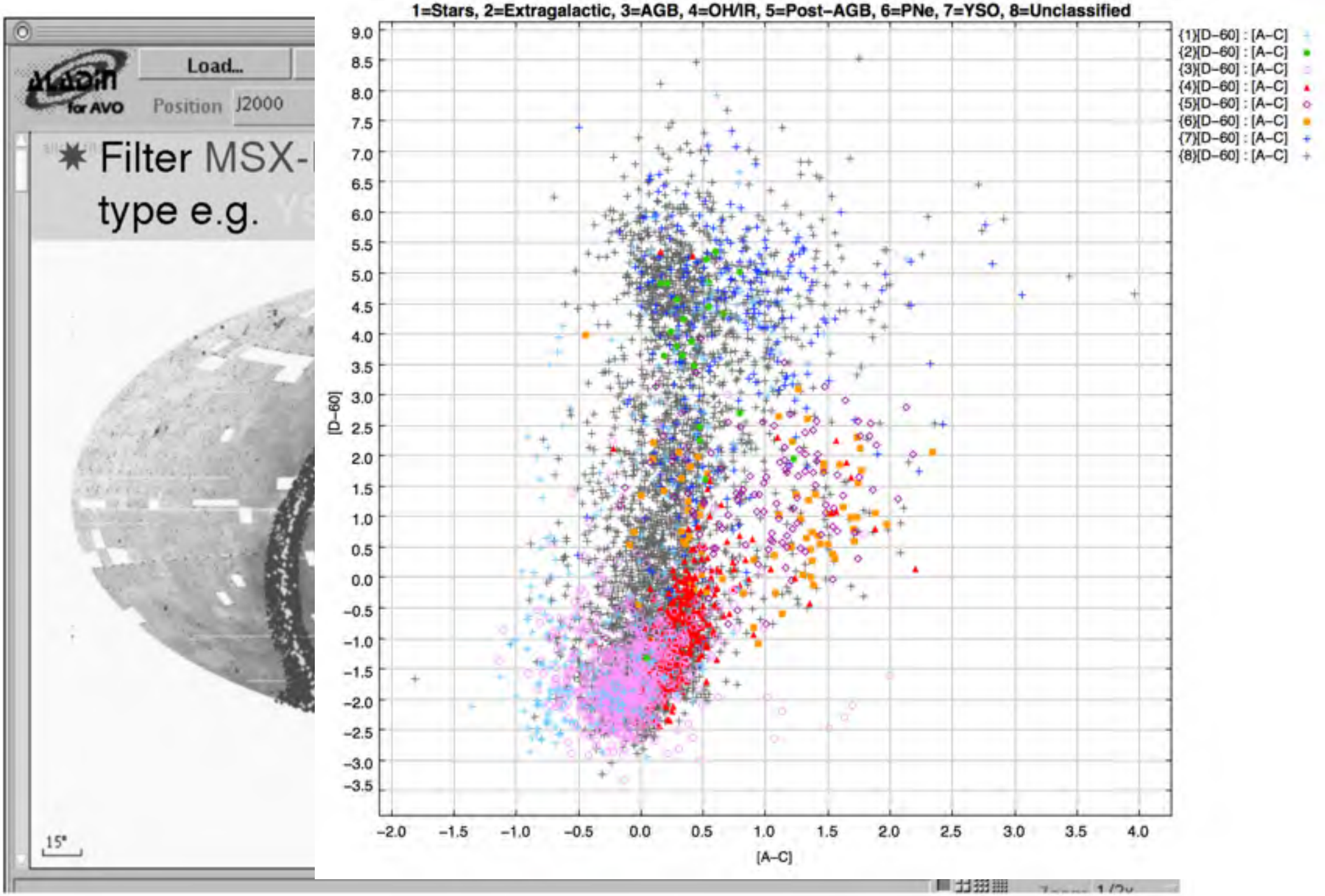
With the AVO prototype -> reach the same point in minutes...

Some examples: 1.- Back in 2004-2005 the AVO

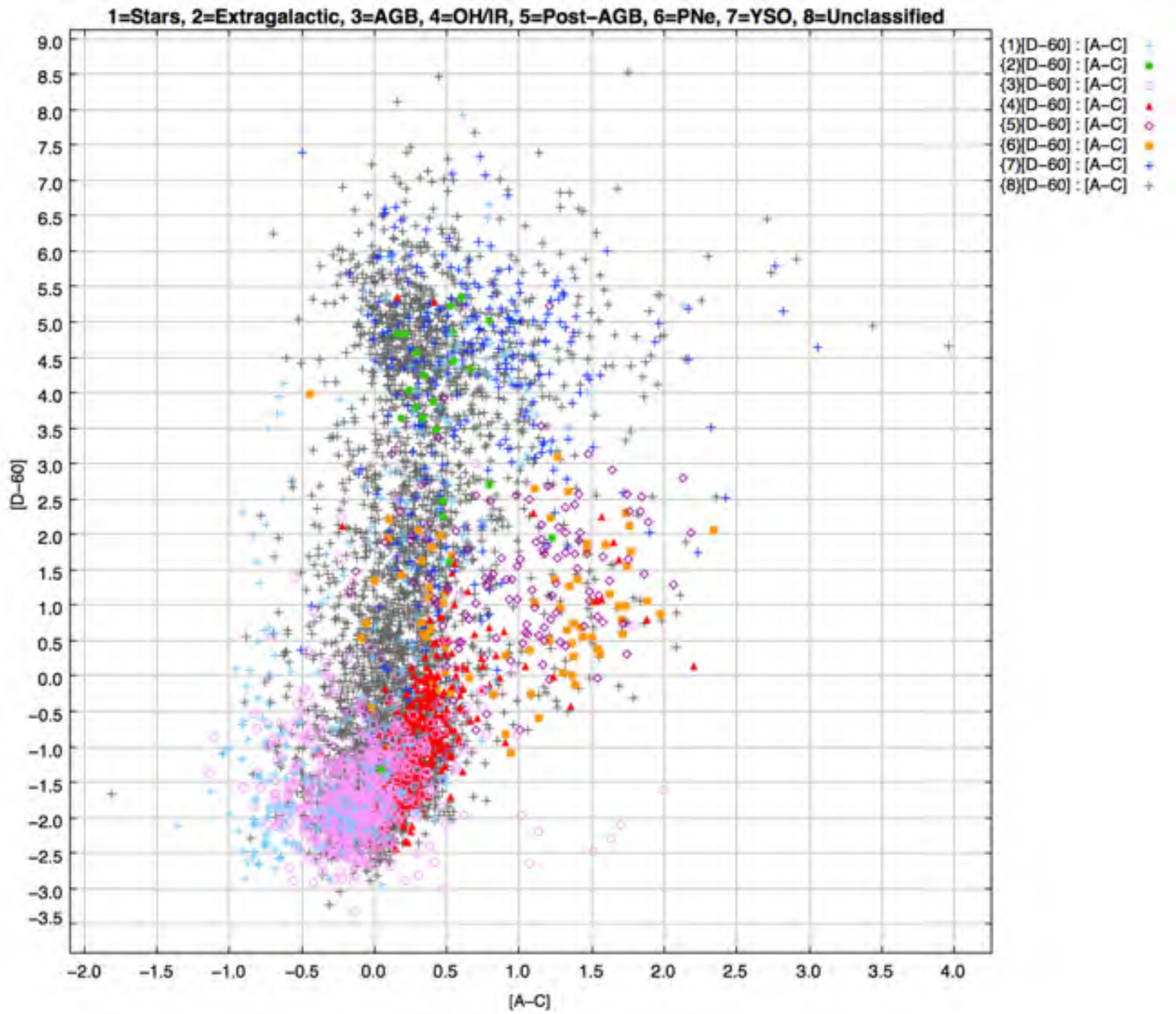


And go further...

Some examples: 1.- Back in 2004-2005 the AVO



And go further...


1=Stars, 2=Extragalactic, 3=AGB, 4=OH/IR, 5=Post−AGB, 6=PNe, 7=YSO, 8=Unclassified
{1}[D−60] : [A−C]
{2}[D−60] : [A−C]
{3}[D−60] : [A−C]
{4}[D−60] : [A−C]
{5}[D−60] : [A−C]
{6}[D−60] : [A−C]
{7}[D−60] : [A−C]
{8}[D−60] : [A−C]
[D−60]
[A−C]
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
−2.0
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−3.5
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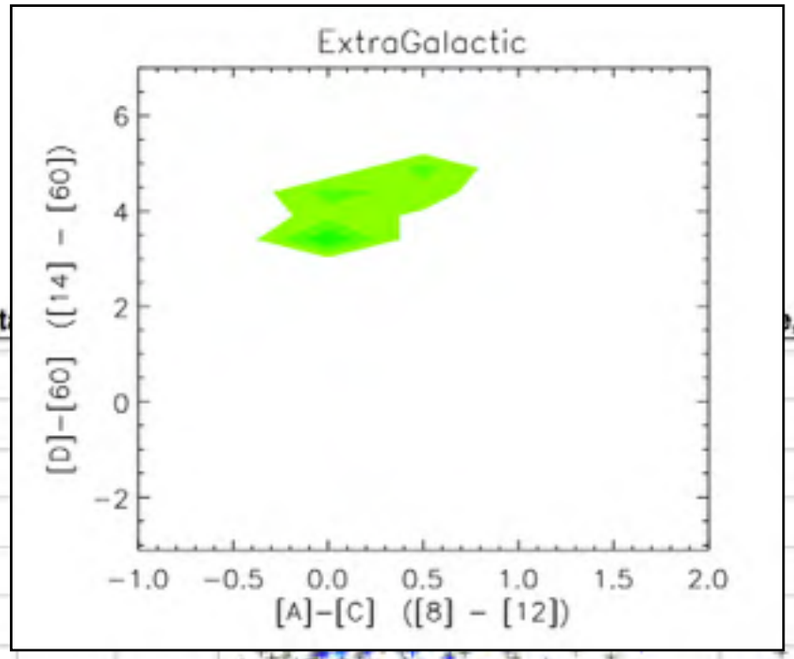
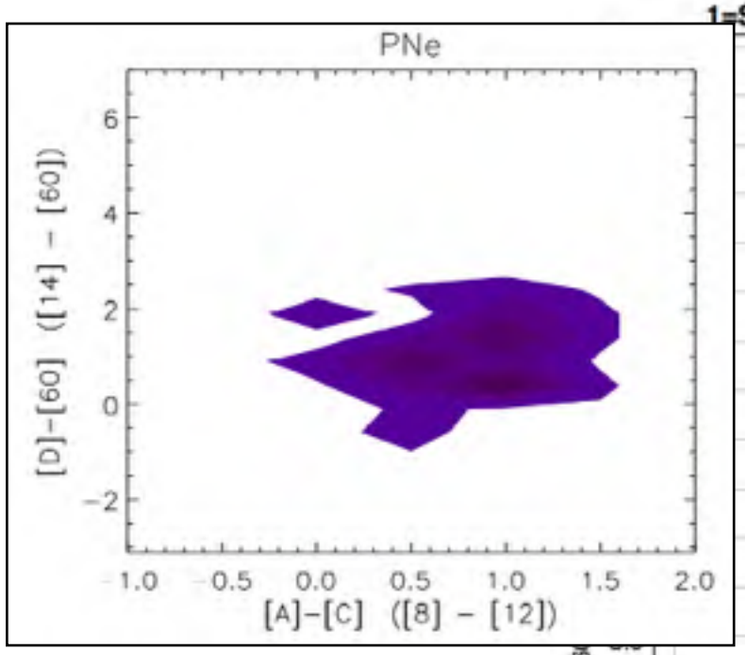
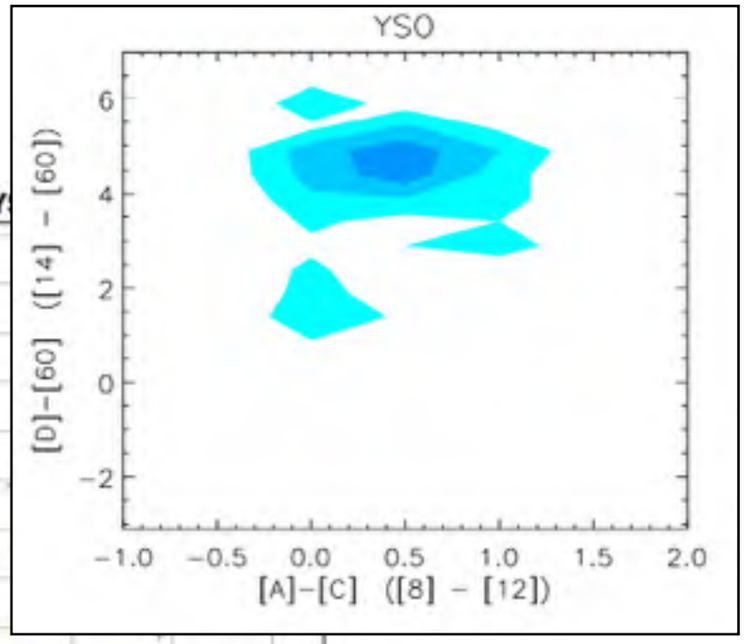
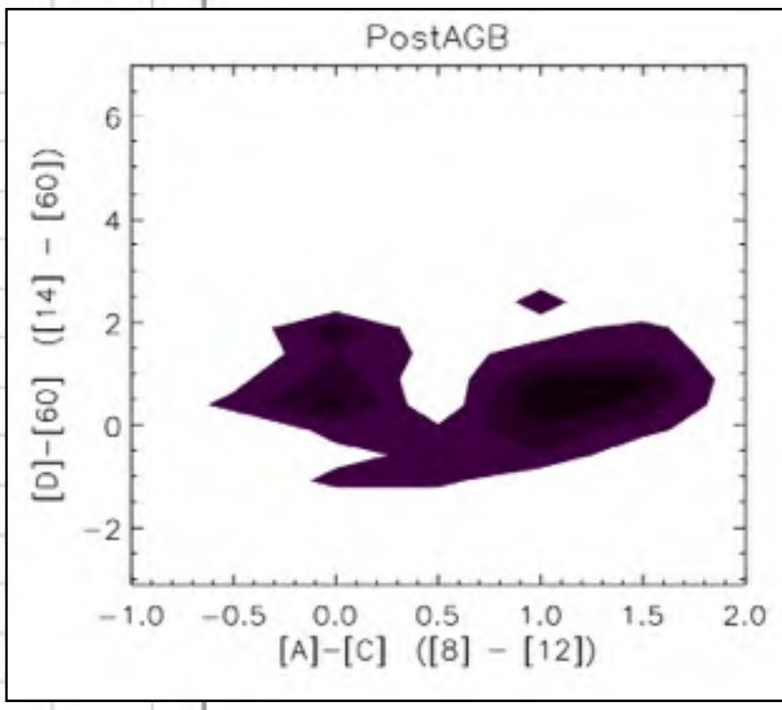
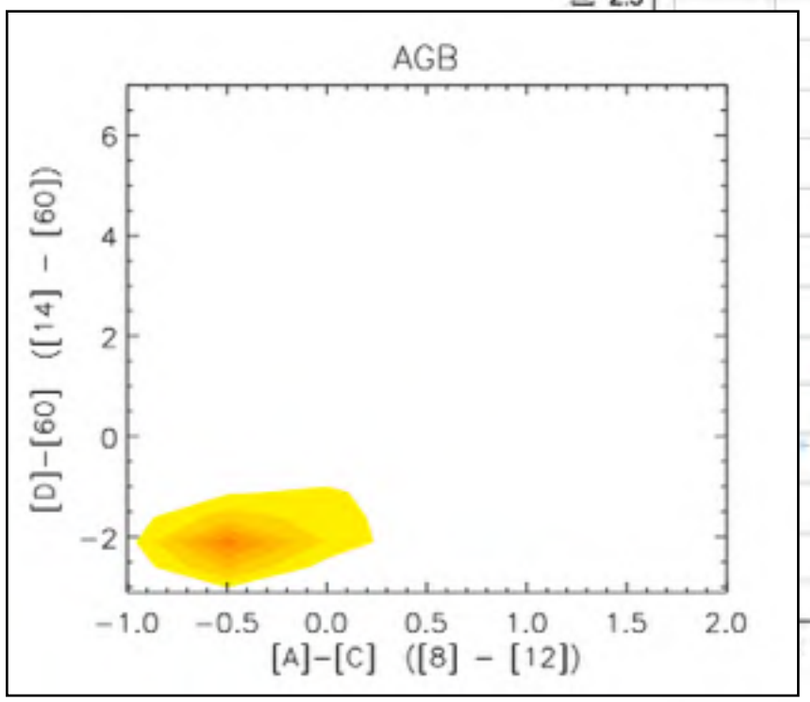
4.0

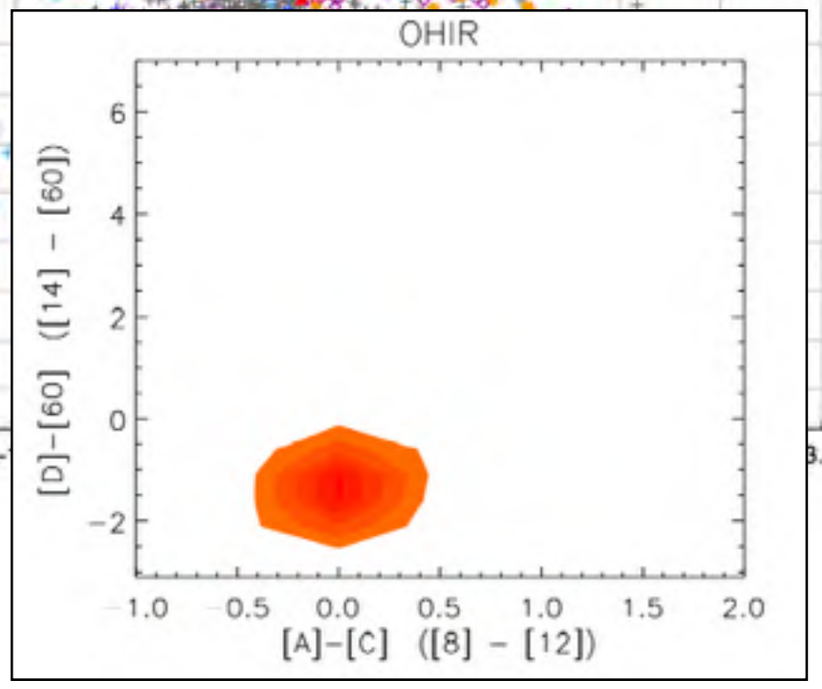

ExtraGalactic
[D]-[60] ([14] - [60])
[A]-[C] ([8] - [12])


PNe
[D]-[60] ([14] - [60])
[A]-[C] ([8] - [12])


YSO
[D]-[60] ([14] - [60])
[A]-[C] ([8] - [12])


PostAGB
[D]-[60] ([14] - [60])
[A]-[C] ([8] - [12])


AGB
[D]-[60] ([14] - [60])
[A]-[C] ([8] - [12])


OHIR
[D]-[60] ([14] - [60])
[A]-[C] ([8] - [12])

Warning! self-promotion

March 2007

Cool objects: From SED fitting to age estimation.

A. Bayo[1], D. Barrado y Navascués[1], M. Morales–Calderón[1], E. Solano[1,2], C. Rodrigo[1,2], R. Gutiérrez[1,2], F. Allard[3]

[1]Laboratorio de Astrofísica Espacial y Física Fundamental (LAEFF-INTA), P.O. 50727, E-28080 Madrid, Spain
[2]Spanish Virtual Observatory, Spain
[3]Centre de Recherche Astronomique de Lyon (CRAL), Ecole Normale Supérieure de Lyon, 69364, Lyon, France

Abstract

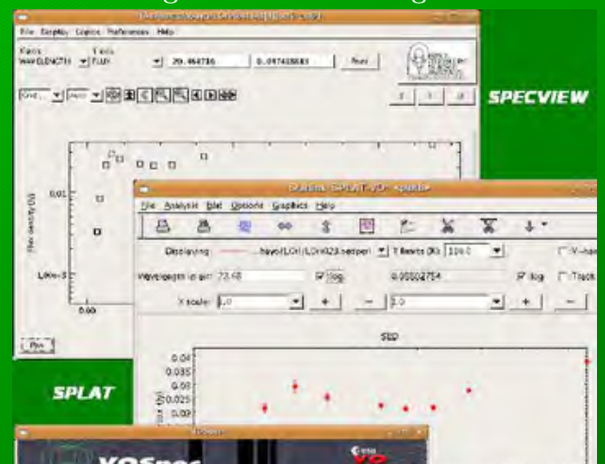
One of the typical tools to estimate physical parameters of almost any kind of astronomical object is to perform a fitting of synthetic spectra or photometry extracted from theoretical models to observational data. This process usually involves working with multiwavelength data, which is one of the cornerstones of the VO philosophy. From this kind of studies, when combining with theoretical isochrones one can even estimate ranges of ages. We present the results from a code designed to perform χ^2 tests following two different methodologies to fit observational data: using grids of models (on their synthetic photometry), and combinations of blackbodies (including modified blackbodies). In particular, we use the models by the Lyon group. Some steps in this process can already be done in a VO enviroment, and the rest are in the process of development. We must note that this kind of surveys in star forming regions, clusters, etc. produce a huge amount of data, very tedious to analyse using the traditional methodology. Therefore this is an ideal example of the VO capabilities.

Starting point:
Your own data (photometry or spectra)

Searching "non-spectroscopic" data:

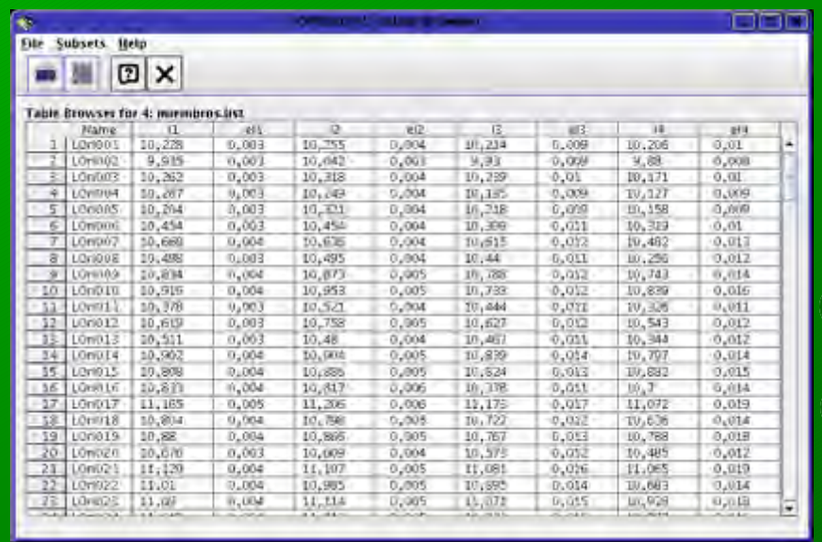
Photometric catalogues, radial velocities measurements

Building the multiwavelength SEDs



Warning! self-promotion

Starting point:
Your own data (photometry or spectra)



Photometric data in four bands.

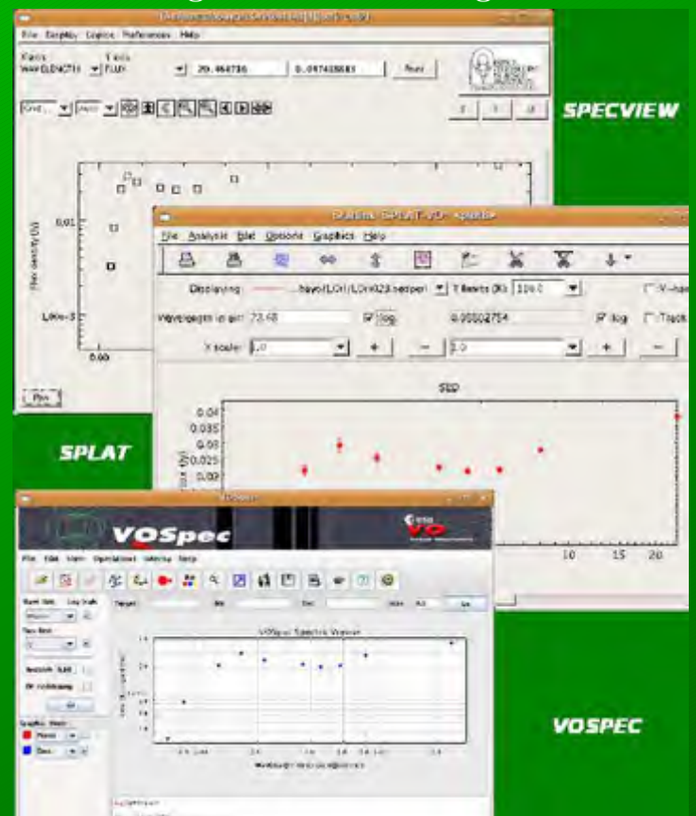
Searching "non-spectroscopic" data:

Photometric catalogues, radial velocities measurements, Simbad classification, ...

Searching spectroscopic data:
via batch mode query to VOSED.

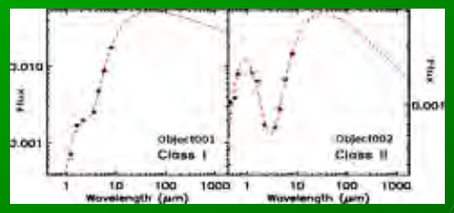
```
wget --save-cookies cookies.txt --load-cookies cookies.txt --keep-session-cookies
    http://sdc.laeff.inta.es/vosed/jsp/form_search.jsp
wget --save-cookies cookies.txt --load-cookies cookies.txt --keep-session-cookies
    http://sdc.laeff.inta.es/vosed/jsp/res_search.jsp?obj_id=&ra=83.446596&de=9.9273633
    &rad=0.01&ssap_services=all&src_uvbybeta=0&src_2mass=0&src_hip=0&teo_dalessio=on&submit
    =Submit+Query
wget --save-cookies cookies.txt --load-cookies cookies.txt --keep-session-cookies
    http://sdc.laeff.inta.es/vosed/jsp/res_search.jsp?submitGetData=Retrieve+Marked+Data
    &filas_ssap=all&filas_stromgren=0&filas_2mass=0 -O object1.zip
.....................................................
```

Building the multiwavelength SEDs



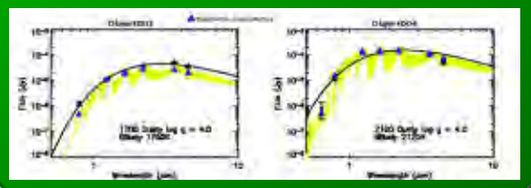
Warning! self-promotion

Blackbody fittings (combinations, modified by different β)



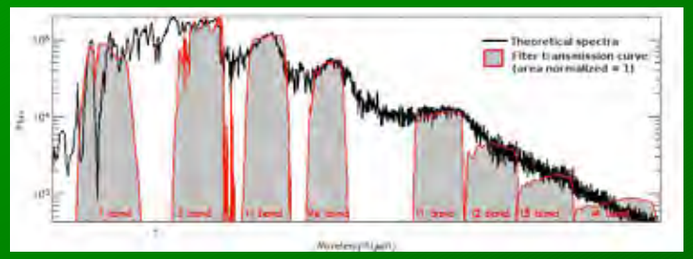
Under development

Synthetic photometry fittings

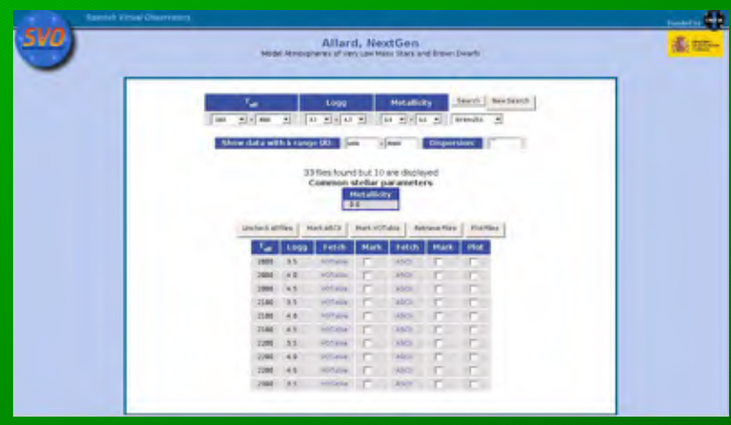


Filter selection.

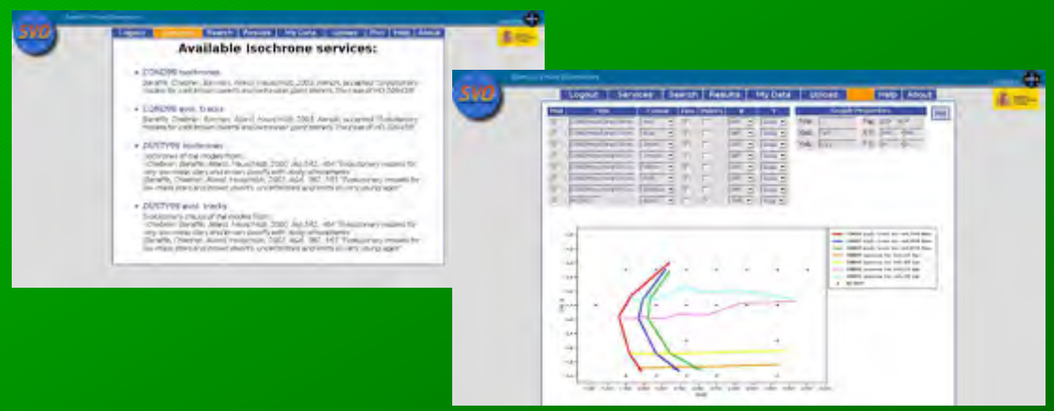
Filter+Synthetic spectra = Synthetic photometry.



Obtaining synthetic spectra.



Comparison with theoretical isochrones and evolutionary tracks.

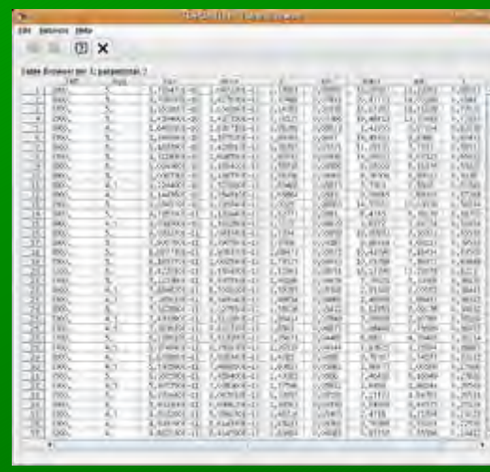


Estimation of physical parameters.

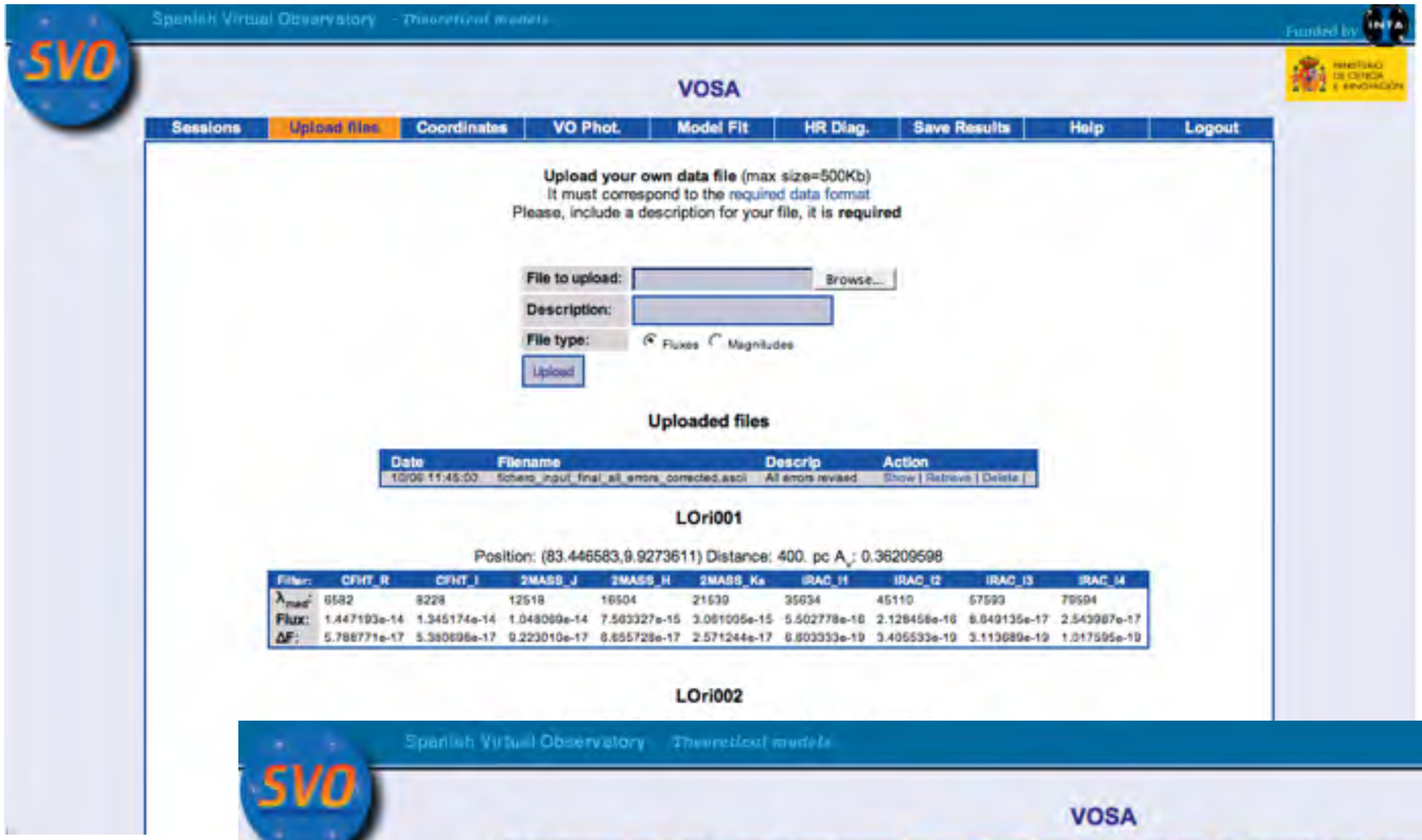
$$\log g = 4.44 + \log M(M_\odot) - 2\log R(R_\odot)$$

$$d(\mathrm{pc}) = 2.26 \times 10^{-8} R_*(R_\odot) \sqrt{\left(\frac{\mathbf{F}_{\mathrm{Model}}}{\mathbf{F}_{\mathrm{Obs}}}\right)}$$

$$\mathrm{F}_{\mathrm{Obs}} = \left(\frac{MG}{gd}\right)^2 \sigma \mathbf{T}_{\mathrm{eff}}{}^4$$

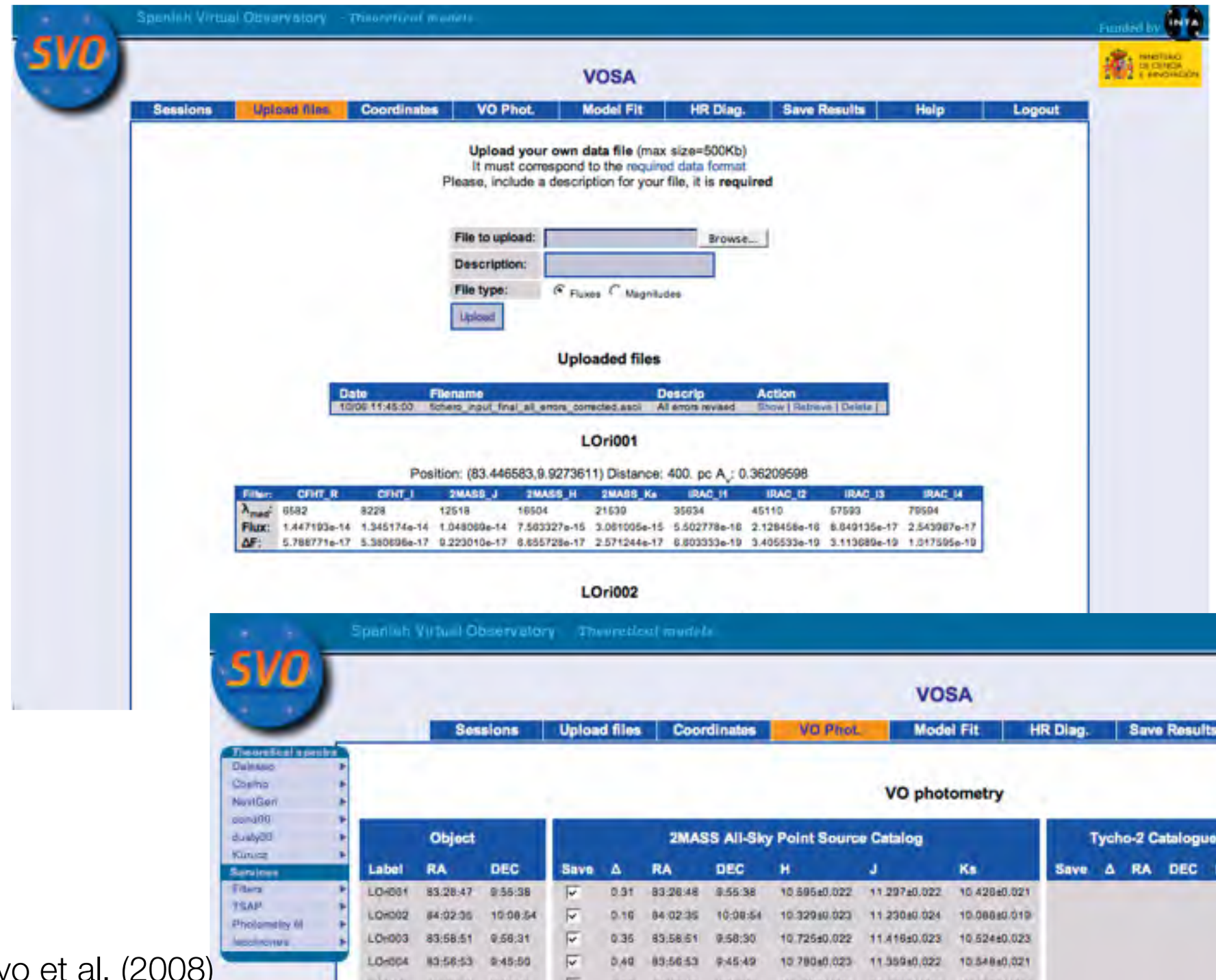


And VOSA came to life!



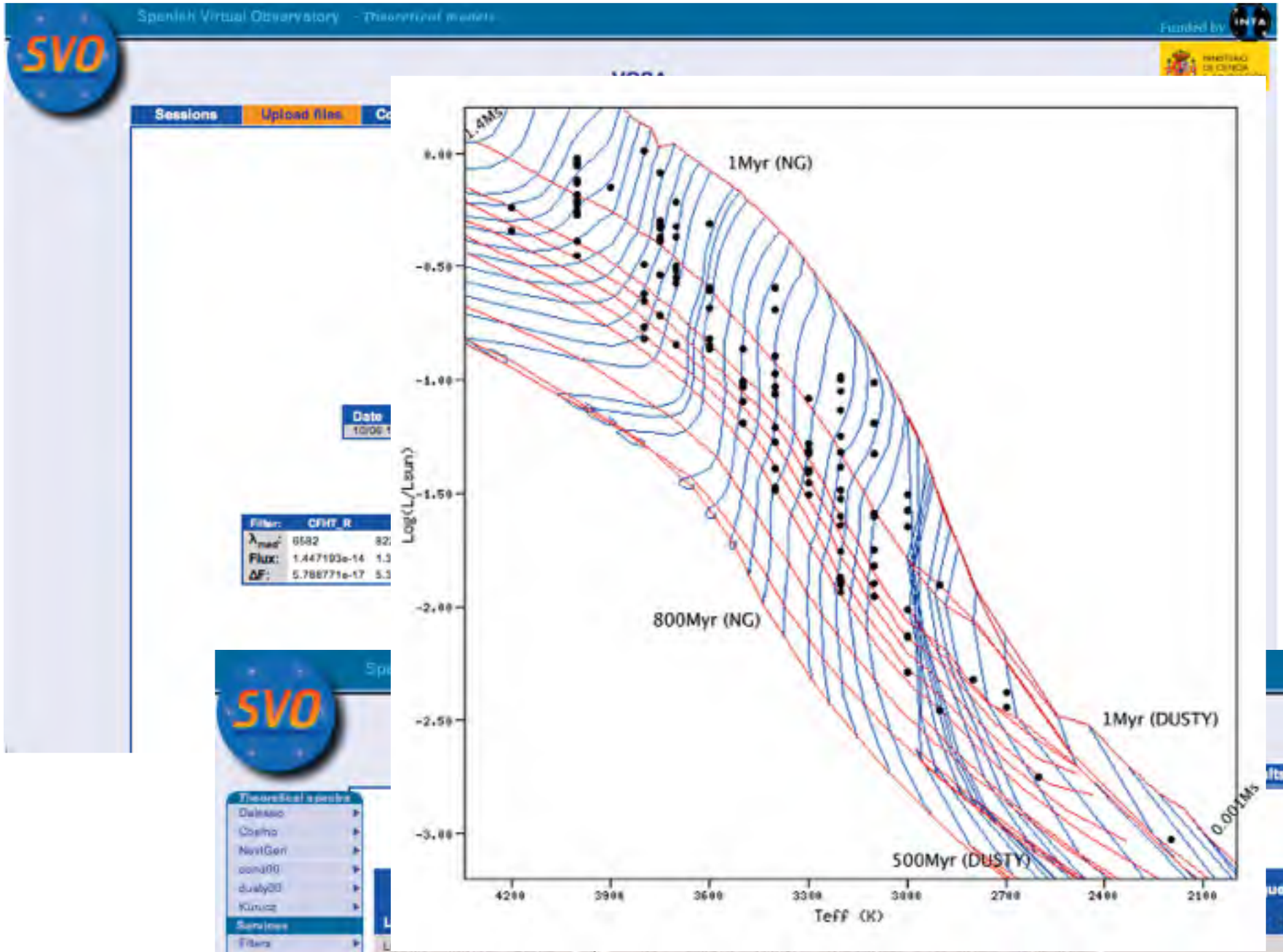
Bayo et al. (2008)

And VOSA came to life!



Bayo et al. (2008)

And VOSA came to life!

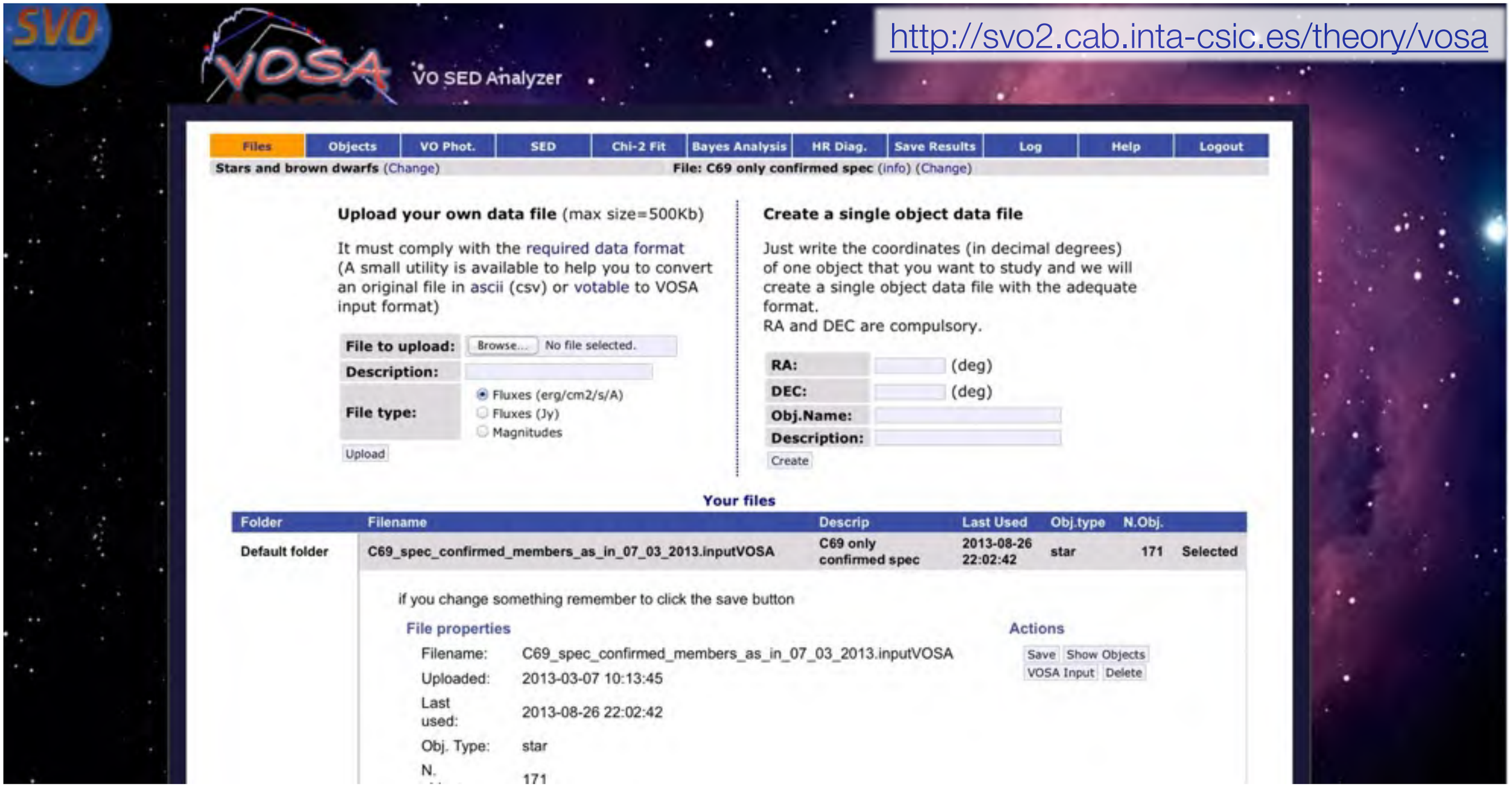


Bayo et al. (2008)

And there was room for improvement

- “Limited to” / “conceived for” stars and brown dwarfs, what about older sources? and more massive? and ~~science-fiction~~ uhmm extragalactic studies?
- Reflected in the available collections of models: Kurucz, NextGen, COND, DUSTY and not many more
- Brute force fitting but no study of the relevance of the individual parameters to the fit
- No A_V estimation
- Not design to work with a single object (input format)
- Variety of catalogs offered but you can always do better and also look for more than photometry
- No Isochrone interpolation, make it even more VO!
- Anything else in the wish-list?

VOSA 2: the new generation



~200 regular users, cited in ~ 50 papers

Bayo et al. (2008, 2014a subm.)

VOSA 2: the new generation

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

VO SED Analyzer

Files | Objects | VO Phot. | SED | Chi-2 Fit | Bayes Analysis | HR Diag. | Save Results | Log | Help | Logout

Stars and brown dwarfs (Change) **File: C69 only confirmed spec** (info) (Change)

Coordinates | Distances | Extinction

Object coordinates

This option allows you to query Sesame VO service to search for object coordinates using the object name.

Take a look to the corresponding Help Section and Credits Page for more information.

Search for Obj. Coordinates

Mark all: User

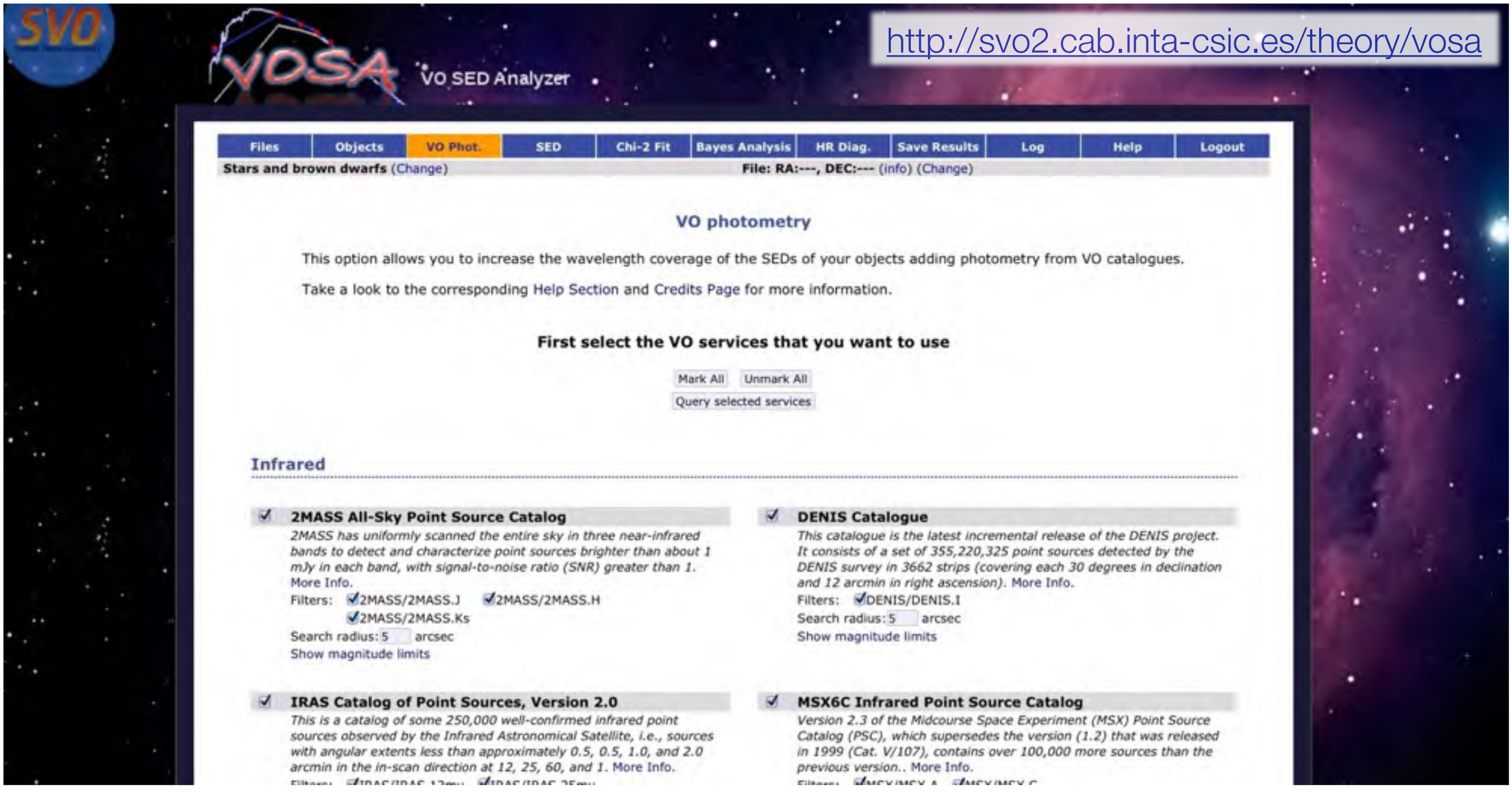
Unmark all: User

	Final		User Data			Sesame	
Object	RA (deg)	DEC (deg)	RA (deg)	DEC (deg)		RA (deg)	DEC (deg)
C69-IRAC-001	84.2339859	9.5229902	84.2339859	9.5229902	✓	??	??
C69-IRAC-002	84.230545	9.7799978	84.230545	9.7799978	✓	??	??
C69-IRAC-003	83.962204	9.6491137	83.962204	9.6491137	✓	??	??
C69-IRAC-004	83.8685303	10.0409756	83.8685303	10.0409756	✓	??	??
C69-IRAC-005	83.8555679	9.9132547	83.8555679	9.9132547	✓	??	??
C69-IRAC-006	83.7191086	9.9305677	83.7191086	9.9305677	✓	??	??
C69-IRAC-007	83.516304	9.8700848	83.516304	9.8700848	✓	??	??
C69-Sub-004	83.79483333333334	9.935138888888888	83.79483333333334	9.935138888888888	✓	??	??
C69-Sub-005	83.78791666666666	9.910027777777776	83.78791666666666	9.910027777777776	✓	??	??
C69-X-E-104	83.98154	9.869463	83.98154	9.869463	✓	??	??
C69XE-009	83.829475	9.9151335	83.829475	9.9151335	✓	??	??
C69XE-040	84.209405	9.9066	84.209405	9.9066	✓	??	??
C69XE-064	83.842427	9.8995644	83.842427	9.8995644	✓	??	??

~200 regular users, cited in ~ 50 papers

Bayo et al. (2008, 2014a subm.)

VOSA 2: the new generation



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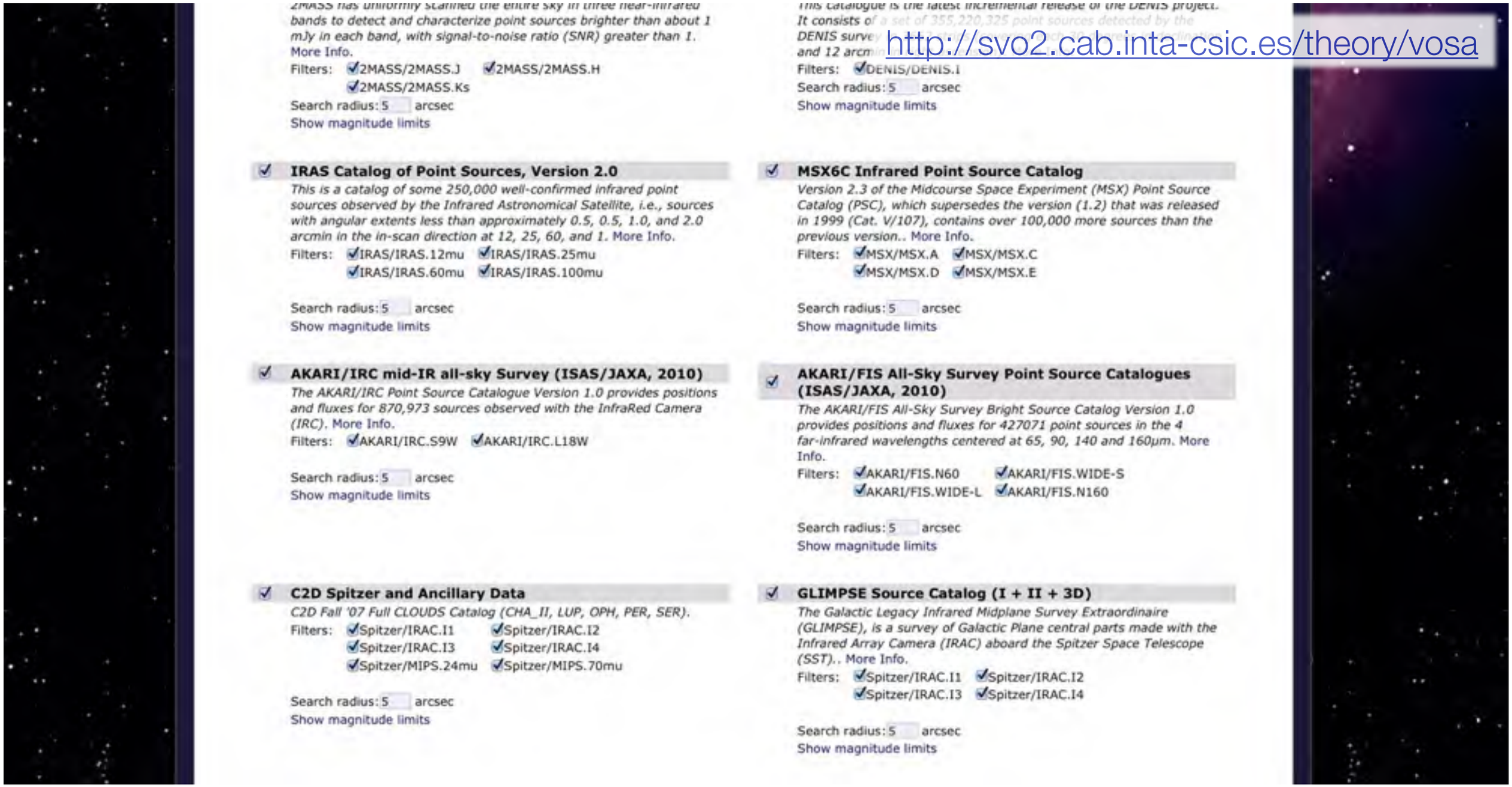
Bayo et al. (2008, 2014a subm.)

VOSA 2: the new generation

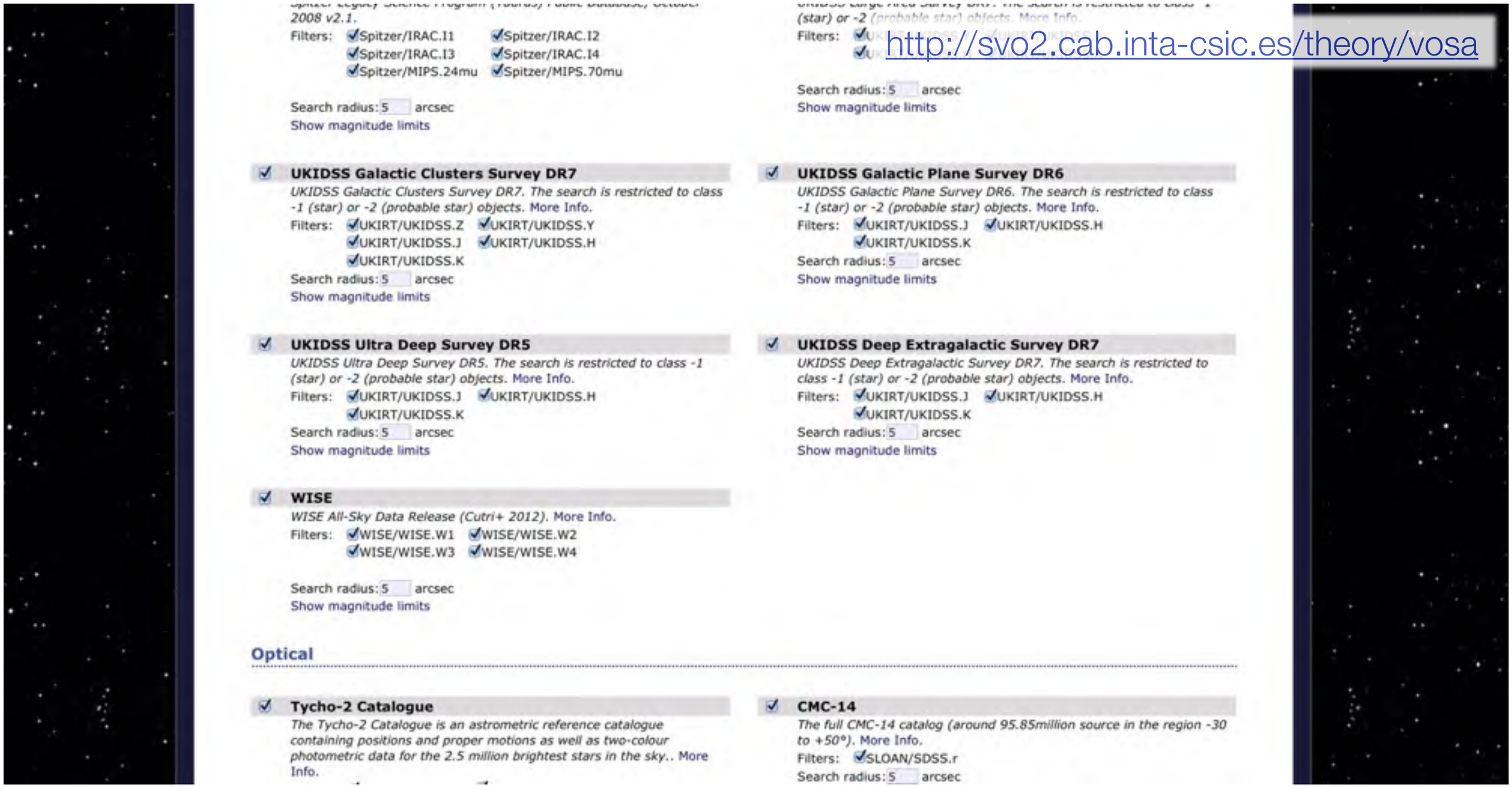


http://svo2.cab.inta-csic.es/theory/vosa

~200 regular users, cited in ~ 50 papers

Bayo et al. (2008, 2014a subm.)

VOSA 2: the new generation



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

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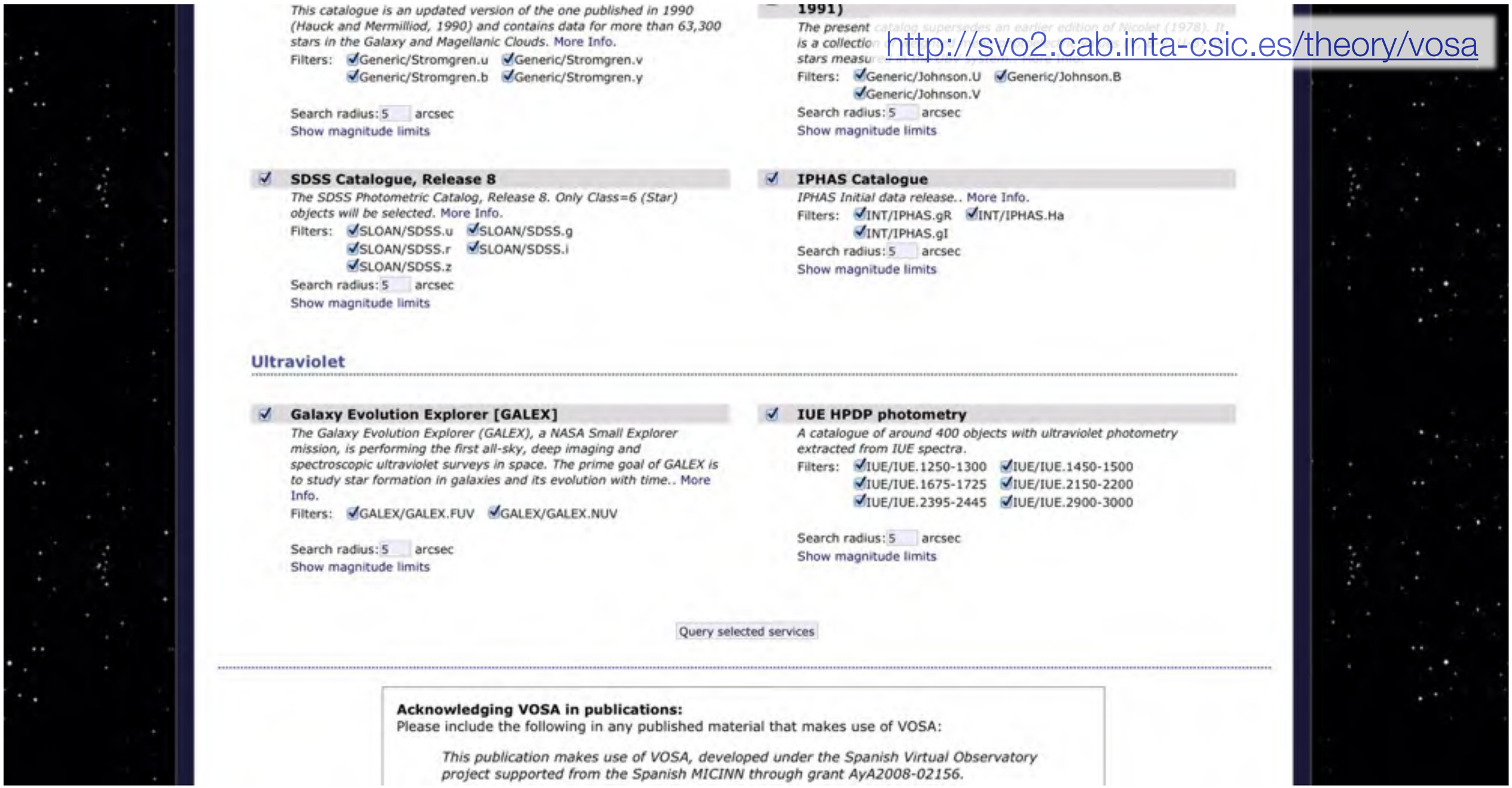
Bayo et al. (2008, 2014a subm.)

VOSA 2: the new generation



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

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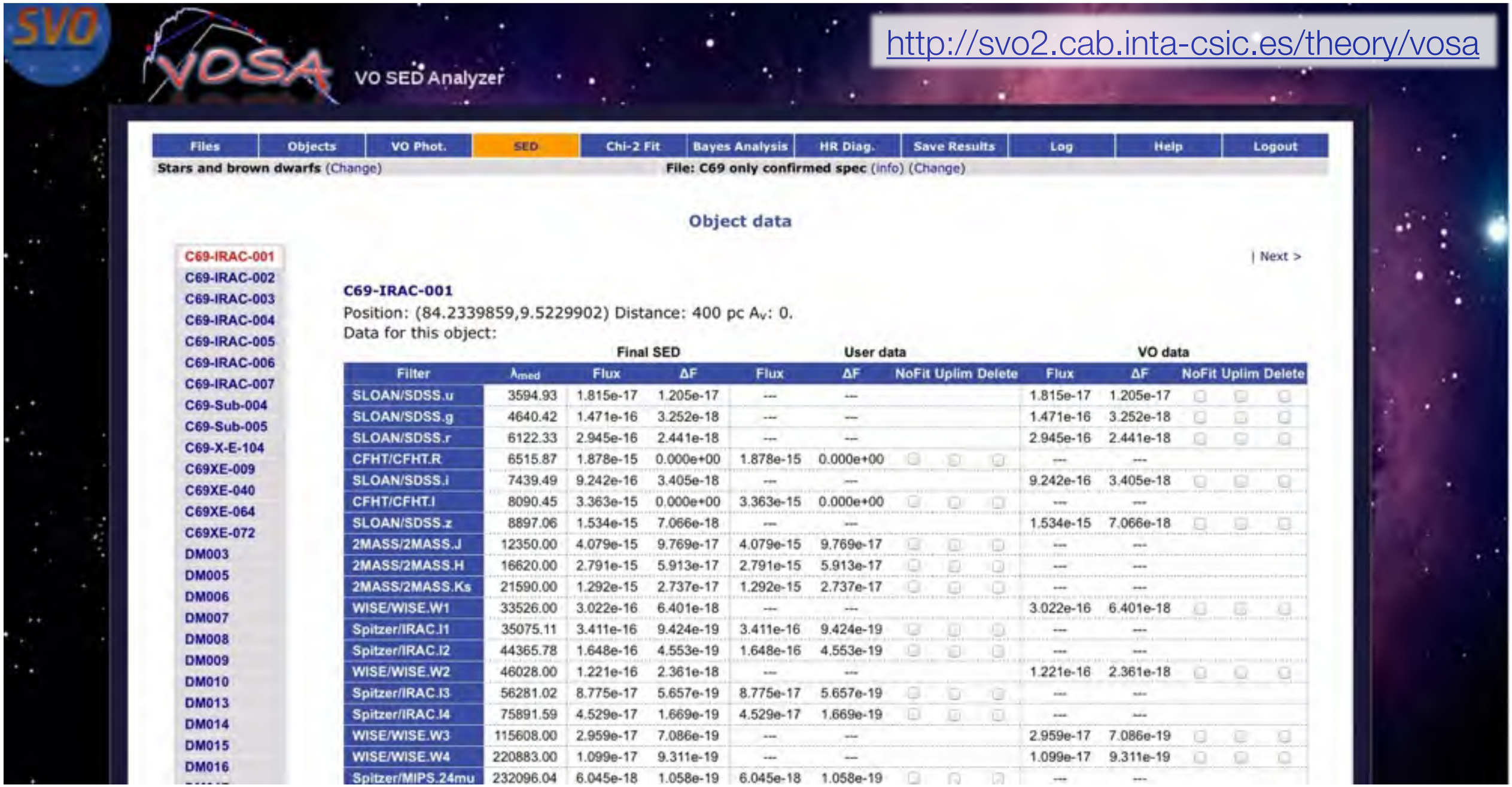
VOSA 2: the new generation



		Final SED		User data					VO data				
Filter	λ_{med}	Flux	ΔF	Flux	ΔF	NoFit	Uplim	Delete	Flux	ΔF	NoFit	Uplim	Delete
SLOAN/SDSS.u	3594.93	1.815e-17	1.205e-17	---	---				1.815e-17	1.205e-17			
SLOAN/SDSS.g	4640.42	1.471e-16	3.252e-18	---	---				1.471e-16	3.252e-18			
SLOAN/SDSS.r	6122.33	2.945e-16	2.441e-18	---	---				2.945e-16	2.441e-18			
CFHT/CFHT.R	6515.87	1.878e-15	0.000e+00	1.878e-15	0.000e+00				---	---			
SLOAN/SDSS.i	7439.49	9.242e-16	3.405e-18	---	---				9.242e-16	3.405e-18			
CFHT/CFHT.I	8090.45	3.363e-15	0.000e+00	3.363e-15	0.000e+00				---	---			
SLOAN/SDSS.z	8897.06	1.534e-15	7.066e-18	---	---				1.534e-15	7.066e-18			
2MASS/2MASS.J	12350.00	4.079e-15	9.769e-17	4.079e-15	9.769e-17				---	---			
2MASS/2MASS.H	16620.00	2.791e-15	5.913e-17	2.791e-15	5.913e-17				---	---			
2MASS/2MASS.Ks	21590.00	1.292e-15	2.737e-17	1.292e-15	2.737e-17				---	---			
WISE/WISE.W1	33526.00	3.022e-16	6.401e-18	---	---				3.022e-16	6.401e-18			
Spitzer/IRAC.I1	35075.11	3.411e-16	9.424e-19	3.411e-16	9.424e-19				---	---			
Spitzer/IRAC.I2	44365.78	1.648e-16	4.553e-19	1.648e-16	4.553e-19				---	---			
WISE/WISE.W2	46028.00	1.221e-16	2.361e-18	---	---				1.221e-16	2.361e-18			
Spitzer/IRAC.I3	56281.02	8.775e-17	5.657e-19	8.775e-17	5.657e-19				---	---			
Spitzer/IRAC.I4	75891.59	4.529e-17	1.669e-19	4.529e-17	1.669e-19				---	---			
WISE/WISE.W3	115608.00	2.959e-17	7.086e-19	---	---				2.959e-17	7.086e-19			
WISE/WISE.W4	220883.00	1.099e-17	9.311e-19	---	---				1.099e-17	9.311e-19			
Spitzer/MIPS.24mu	232096.04	6.045e-18	1.058e-19	6.045e-18	1.058e-19				---	---			

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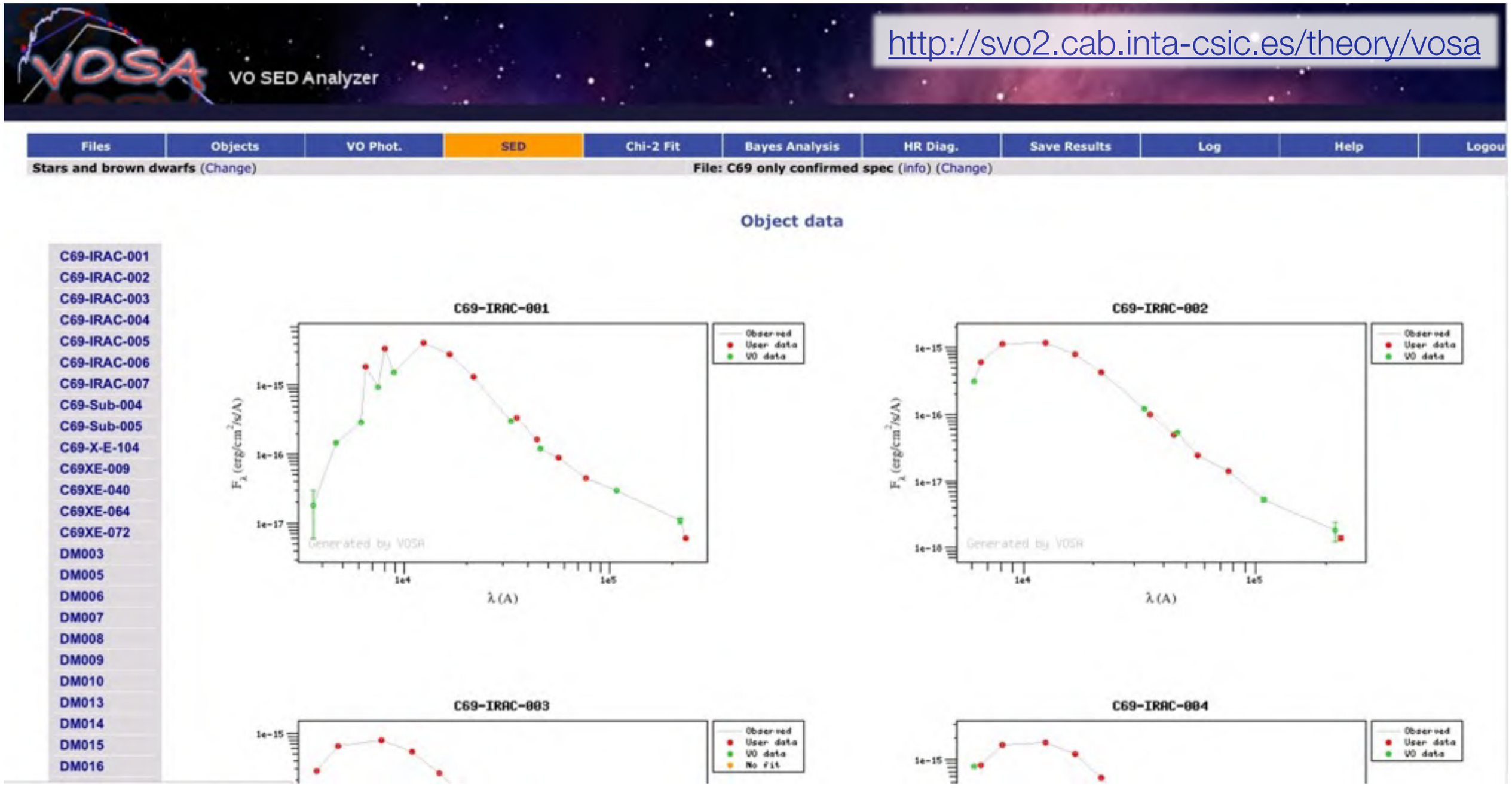
Bayo et al. (2008, 2014a subm.)

VOSA 2: the new generation



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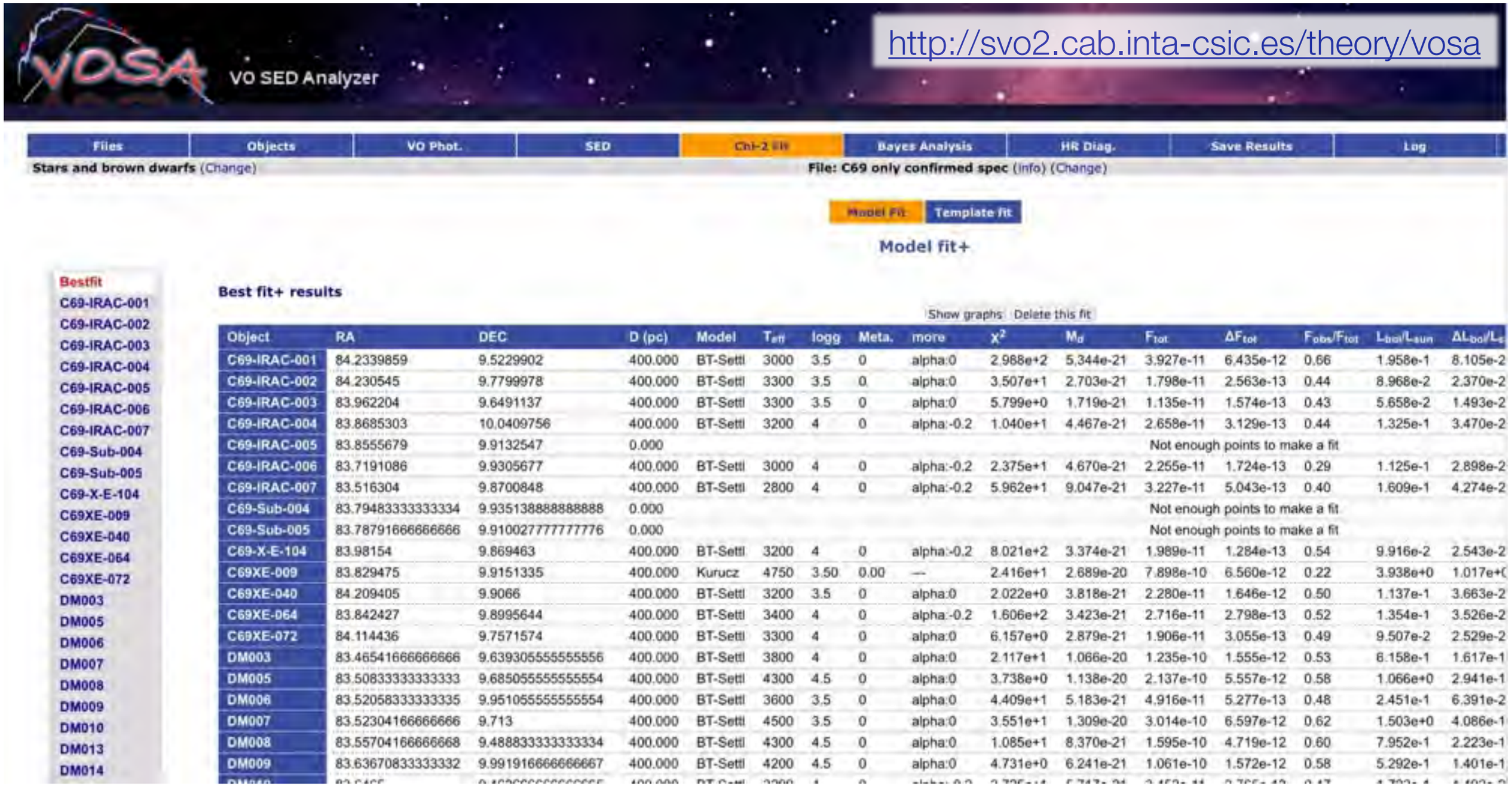
VOSA 2: the new generation



Object	RA	DEC	D (pc)	Model	T_{eff}	logg	Meta.	more	χ^2	M_d	F_{tot}	ΔF_{tot}	F_{obs}/F_{tot}	L_{bol}/L_{sun}	$\Delta L_{bol}/L_{\odot}$
C69-IRAC-001	84.2339859	9.5229902	400.000	BT-Settl	3000	3.5	0	alpha:0	2.988e+2	5.344e-21	3.927e-11	6.435e-12	0.66	1.958e-1	8.105e-2
C69-IRAC-002	84.230545	9.7799978	400.000	BT-Settl	3300	3.5	0	alpha:0	3.507e+1	2.703e-21	1.798e-11	2.563e-13	0.44	8.968e-2	2.370e-2
C69-IRAC-003	83.962204	9.6491137	400.000	BT-Settl	3300	3.5	0	alpha:0	5.799e+0	1.719e-21	1.135e-11	1.574e-13	0.43	5.658e-2	1.493e-2
C69-IRAC-004	83.8685303	10.0409756	400.000	BT-Settl	3200	4	0	alpha:-0.2	1.040e+1	4.467e-21	2.658e-11	3.129e-13	0.44	1.325e-1	3.470e-2
C69-IRAC-005	83.8555679	9.9132547	0.000								Not enough points to make a fit				
C69-IRAC-006	83.7191086	9.9305677	400.000	BT-Settl	3000	4	0	alpha:-0.2	2.375e+1	4.670e-21	2.255e-11	1.724e-13	0.29	1.125e-1	2.898e-2
C69-IRAC-007	83.516304	9.8700848	400.000	BT-Settl	2800	4	0	alpha:-0.2	5.962e+1	9.047e-21	3.227e-11	5.043e-13	0.40	1.609e-1	4.274e-2
C69-Sub-004	83.79483333333334	9.935138888888888	0.000								Not enough points to make a fit				
C69-Sub-005	83.78791666666666	9.910027777777776	0.000								Not enough points to make a fit				
C69-X-E-104	83.98154	9.869463	400.000	BT-Settl	3200	4	0	alpha:-0.2	8.021e+2	3.374e-21	1.989e-11	1.284e-13	0.54	9.916e-2	2.543e-2
C69XE-009	83.829475	9.9151335	400.000	Kurucz	4750	3.50	0.00	---	2.416e+1	2.689e-20	7.898e-10	6.560e-12	0.22	3.938e+0	1.017e+(
C69XE-040	84.209405	9.9066	400.000	BT-Settl	3200	3.5	0	alpha:0	2.022e+0	3.818e-21	2.280e-11	1.646e-12	0.50	1.137e-1	3.663e-2
C69XE-064	83.842427	9.8995644	400.000	BT-Settl	3400	4	0	alpha:-0.2	1.606e+2	3.423e-21	2.716e-11	2.798e-13	0.52	1.354e-1	3.526e-2
C69XE-072	84.114436	9.7571574	400.000	BT-Settl	3300	4	0	alpha:0	6.157e+0	2.879e-21	1.906e-11	3.055e-13	0.49	9.507e-2	2.529e-2
DM003	83.46541666666666	9.639305555555556	400.000	BT-Settl	3800	4	0	alpha:0	2.117e+1	1.066e-20	1.235e-10	1.555e-12	0.53	6.158e-1	1.617e-1
DM005	83.50833333333333	9.685055555555554	400.000	BT-Settl	4300	4.5	0	alpha:0	3.738e+0	1.138e-20	2.137e-10	5.557e-12	0.58	1.066e+0	2.941e-1
DM006	83.52058333333335	9.951055555555554	400.000	BT-Settl	3600	3.5	0	alpha:0	4.409e+1	5.183e-21	4.916e-11	5.277e-13	0.48	2.451e-1	6.391e-2
DM007	83.52304166666666	9.713	400.000	BT-Settl	4500	3.5	0	alpha:0	3.551e+1	1.309e-20	3.014e-10	6.597e-12	0.62	1.503e+0	4.086e-1
DM008	83.55704166666668	9.488833333333334	400.000	BT-Settl	4300	4.5	0	alpha:0	1.085e+1	8.370e-21	1.595e-10	4.719e-12	0.60	7.952e-1	2.223e-1
DM009	83.63670833333332	9.991916666666667	400.000	BT-Settl	4200	4.5	0	alpha:0	4.731e+0	6.241e-21	1.061e-10	1.572e-12	0.58	5.292e-1	1.401e-1

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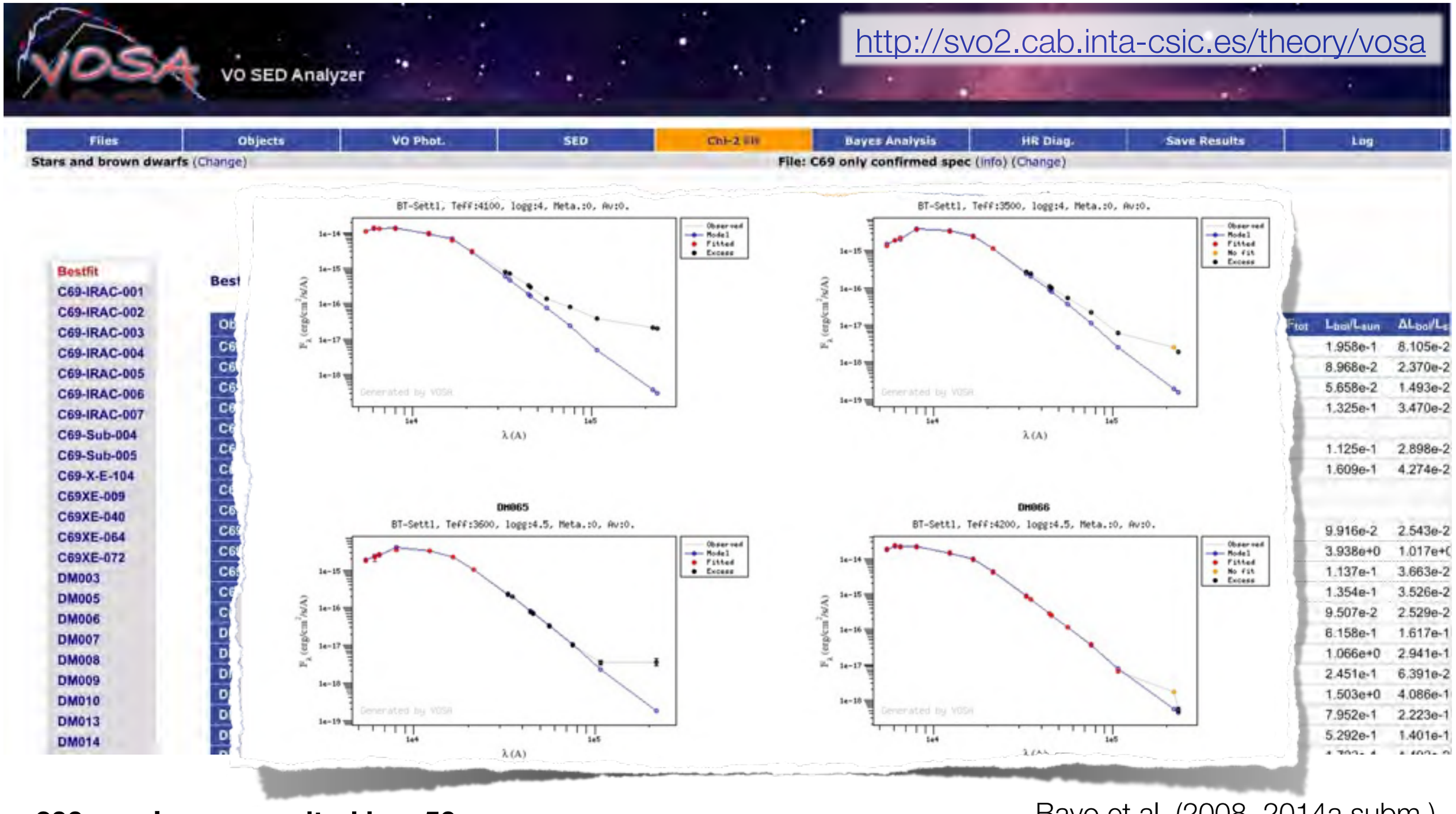
VOSA 2: the new generation



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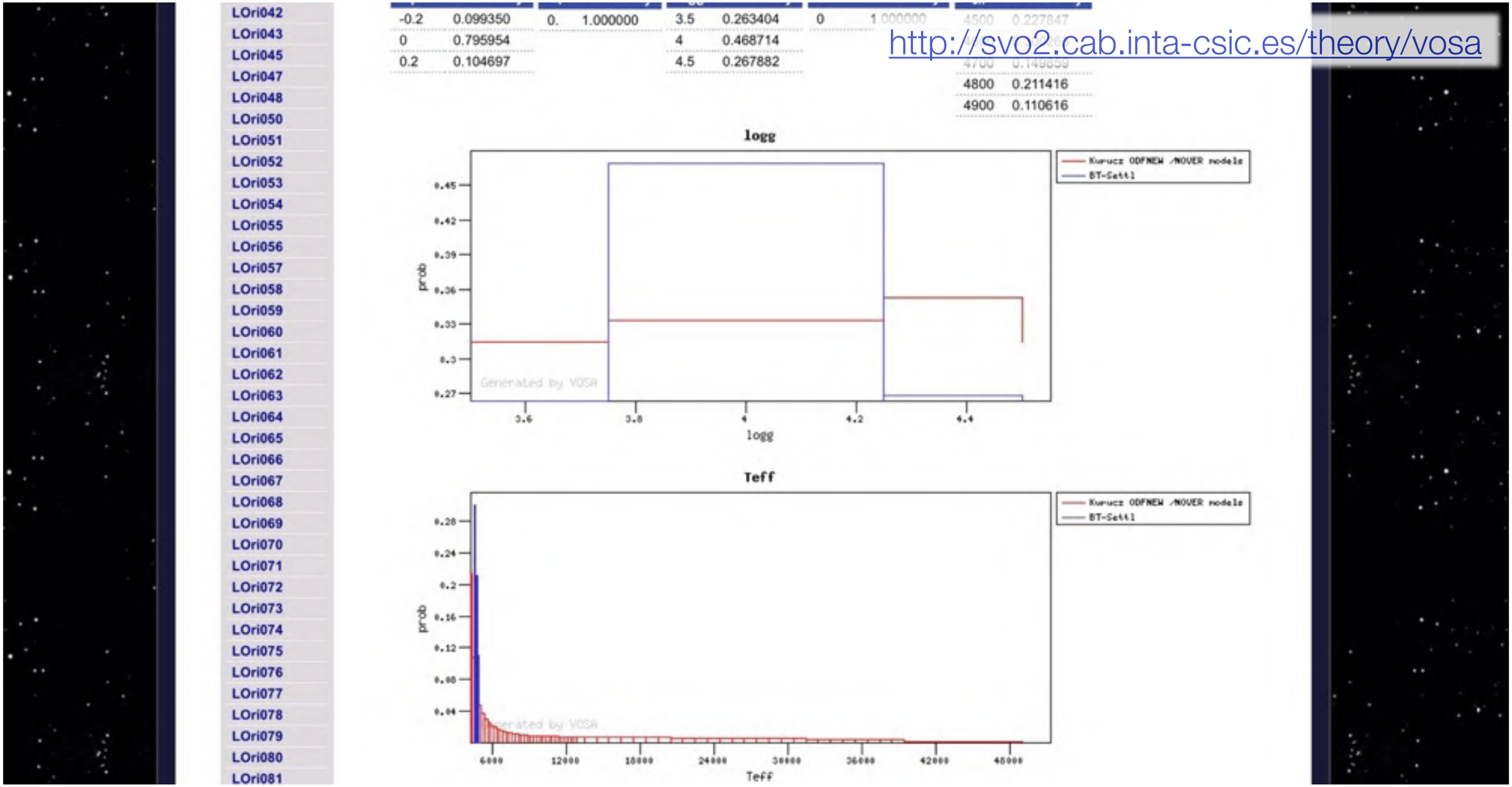
VOSA 2: the new generation



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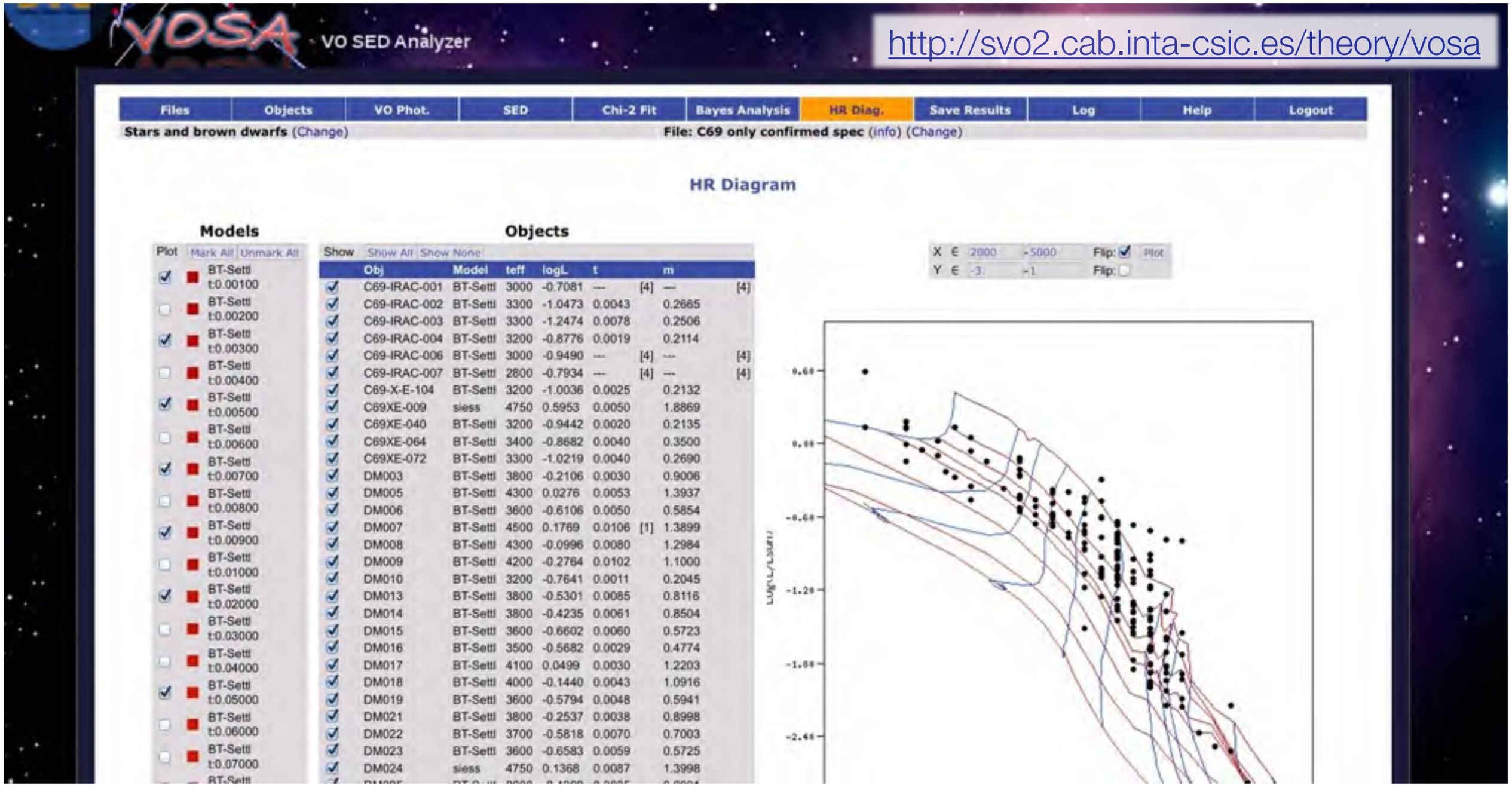

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Some examples: 2.-

Monthly Notices
of the
ROYAL ASTRONOMICAL SOCIETY

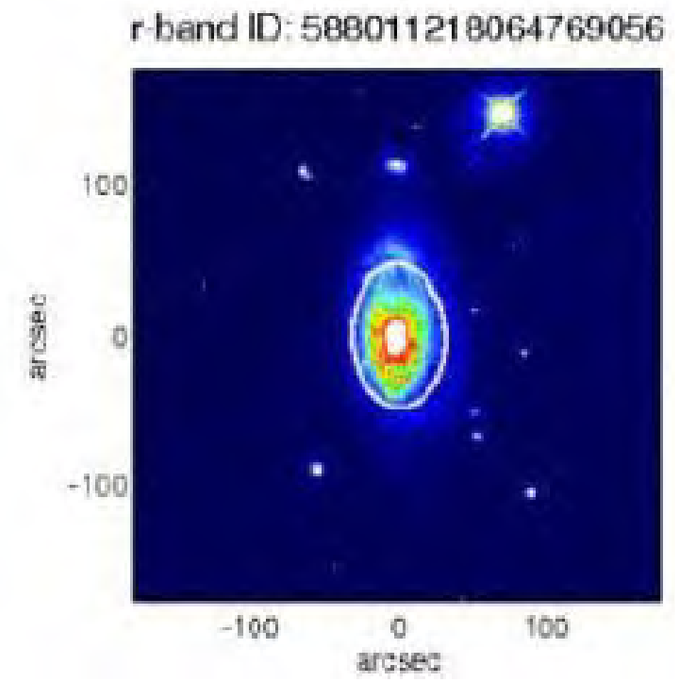
Mon. Not. R. Astron. Soc. **406**, 1595–1608 (2010) doi:10.1111/j.1365-29

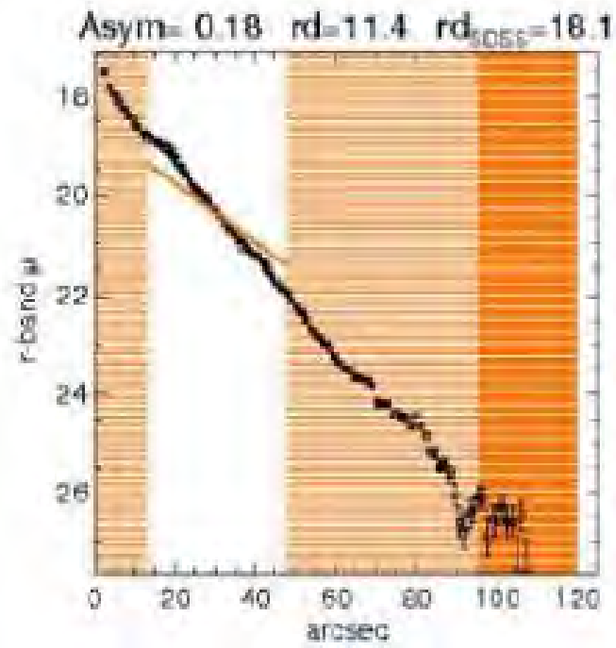
Scalelength of disc galaxies

Kambiz Fathi,[1,2]★ Mark Allen,[3] Thomas Boch,[3] Evanthia Hatziminaoglou[4] and Reynier F. Peletier[5]

✓ Scale-lengths for 30374 galaxies in all SDSS bands:
Unprecedented sample (at most few hundreds in previous studies).

✓ Scale-length:
Fundamental parameter in the study of the morphology and dynamic of galaxies





✓ Multi-wavelength study using SDSS:
Differences in scale-length as a function of lambda can be used to derive information about the structure and contents of galactic disks

Some examples: 2.-

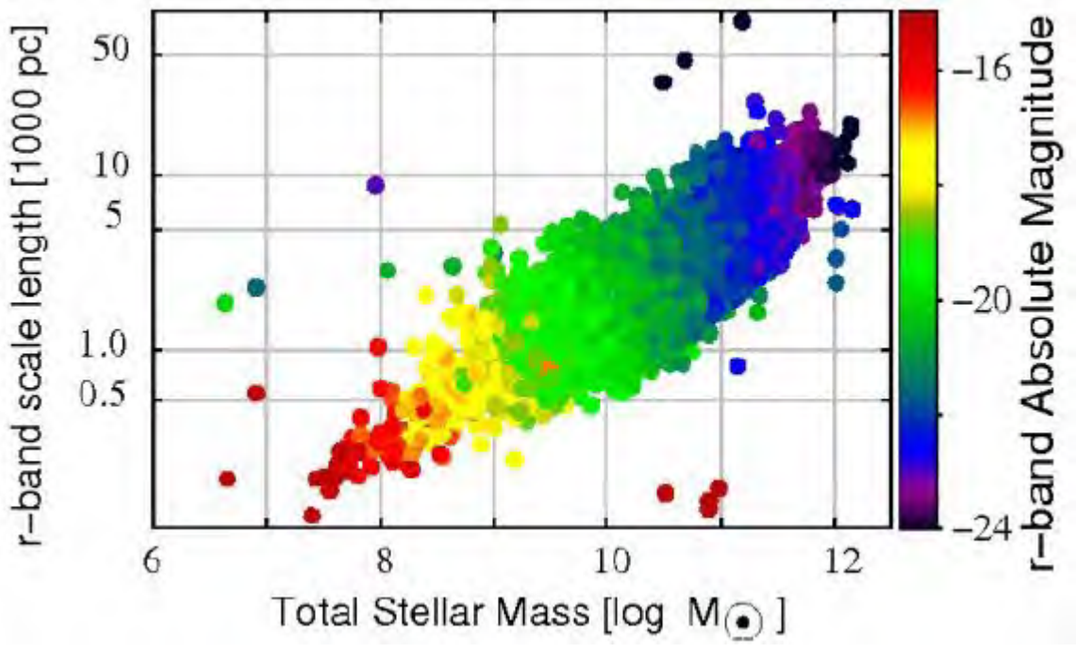
Monthly Notices
of the
ROYAL ASTRONOMICAL SOCIETY

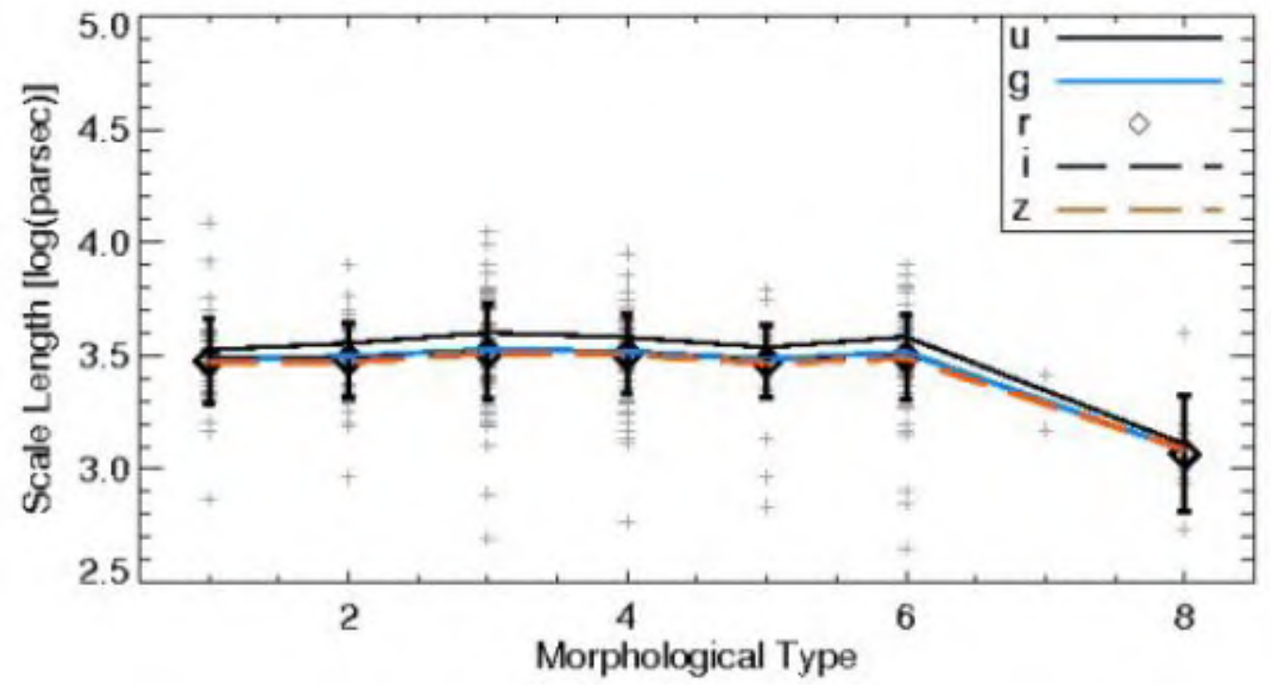
Mon. Not. R. Astron. Soc. **406**, 1595–1608 (2010) doi:10.1111/j.1365-29

Scalelength of disc galaxies

Kambiz Fathi,[1,2]★ Mark Allen,[3] Thomas Boch,[3] Evanthia Hatziminaoglou[4] and Reynier F. Peletier[5]

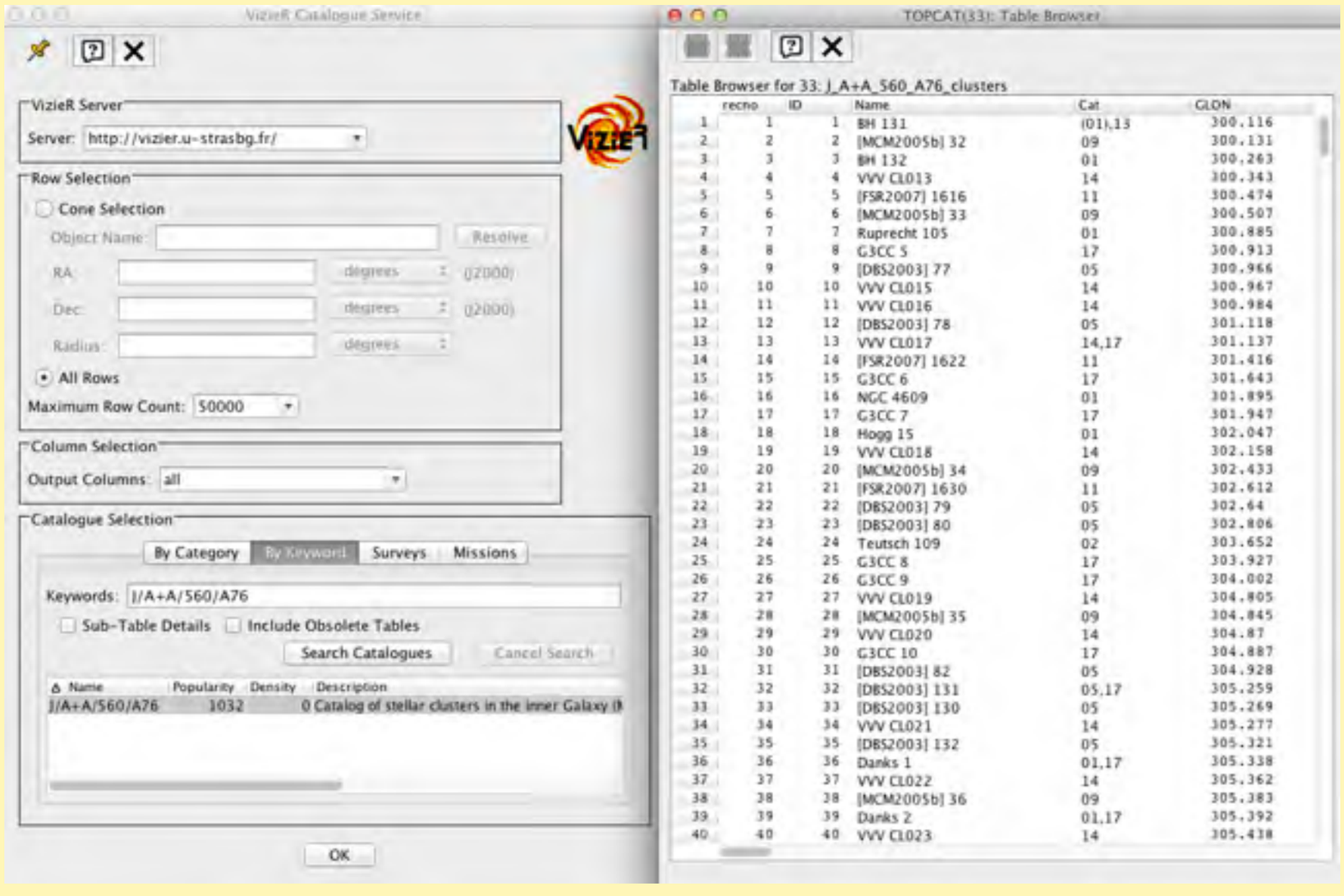
- ✓ Filtering (SDSS catalogue): 95735 galaxies
- ✓ Galaxy, low extinction (Ar < 1.0), z available , i < 70° (reliable scale lengths), 24" < diam < 80"
- ✓ X-match (LEDA) to get Hubble classification: 56096 classified as spirals
- ✓ Estimation of scale length and asymmetry parameters
- ✓ 30374 reliable determinations





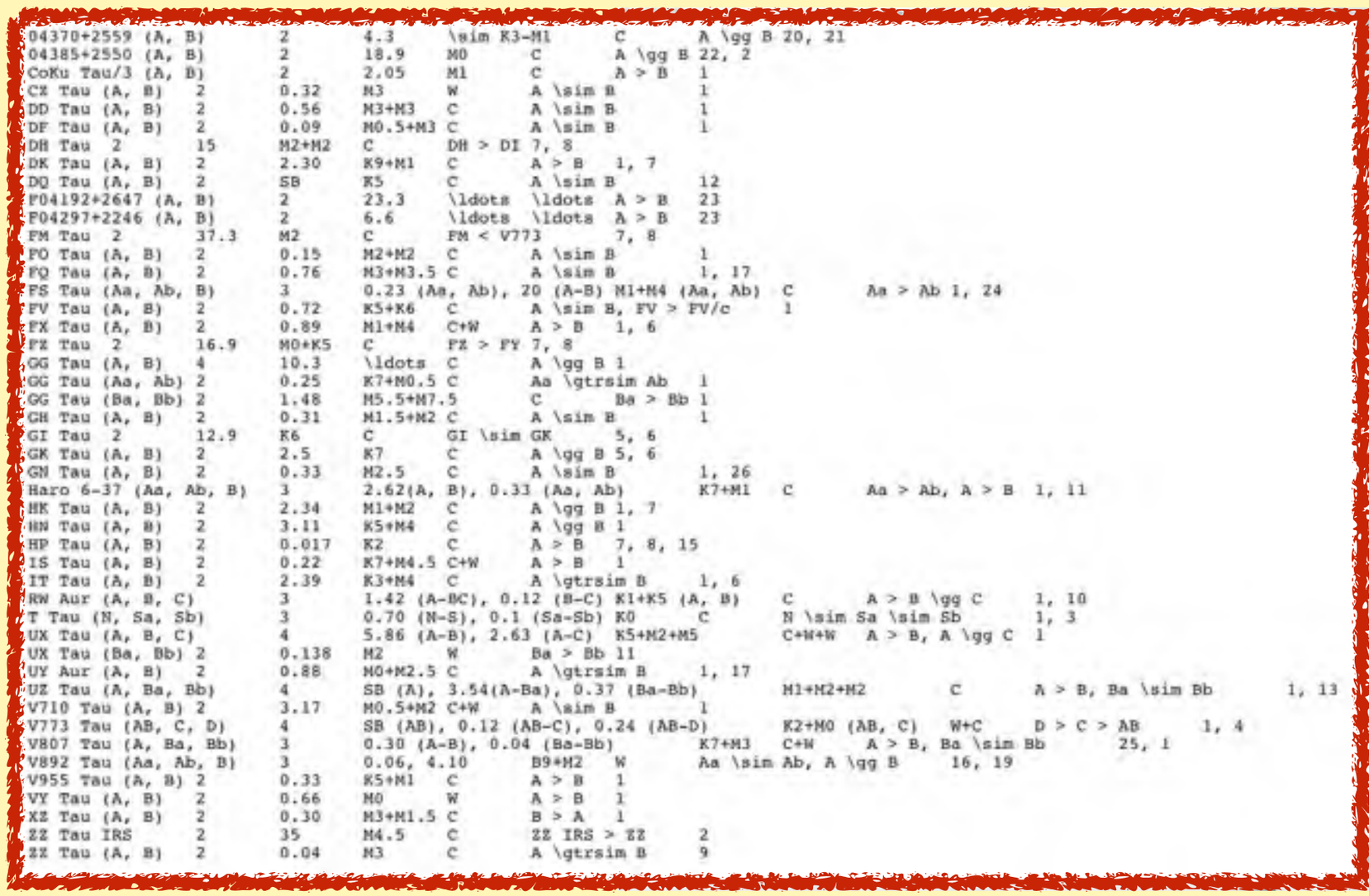
Some examples: 3.- A product from “YOU”

- Data related:
  - CDS wonders vs pain of getting, for example, IOP tables

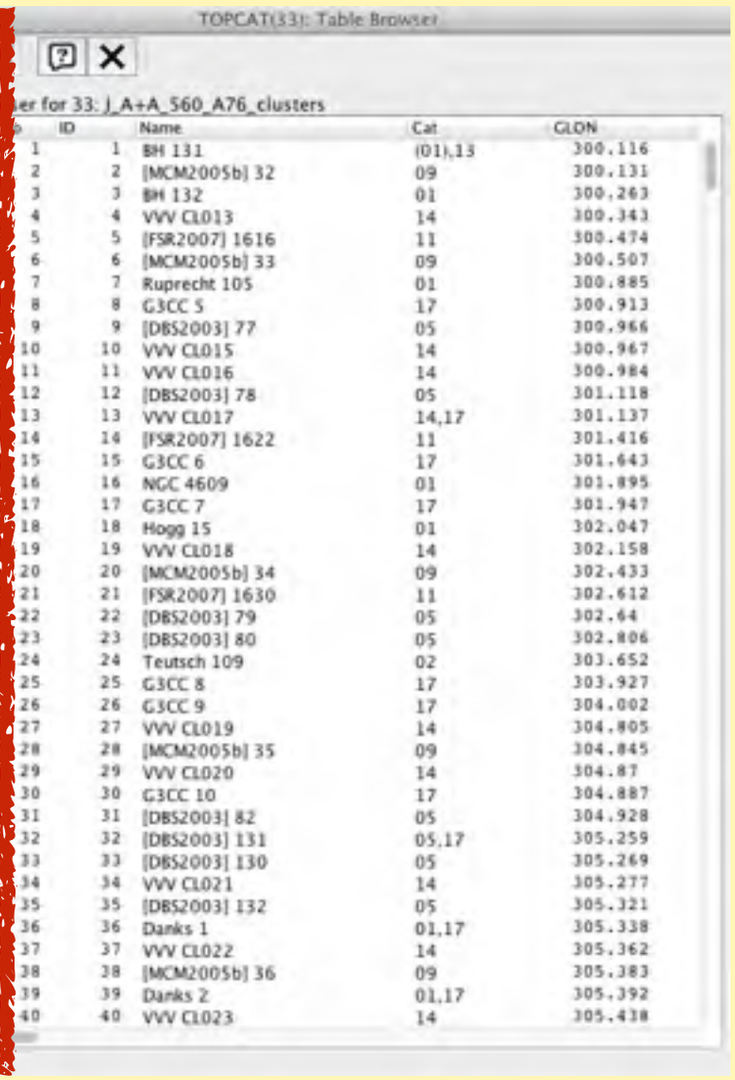


Some examples: 3.- A product from “YOU”

- Data related:
  - CDS wonders vs pain of getting, for example, IOP tables



04370+2559 (A, B)	2	4.3	\sim K3-M1	C	A \gg B 20, 21	
04385+2550 (A, B)	2	18.9	M0	C	A \gg B 22, 2	
CoKu Tau/3 (A, B)	2	2.05	M1	C	A > B	1
CX Tau (A, B)	2	0.32	M3	W	A \sim B	1
DD Tau (A, B)	2	0.56	M3+M3	C	A \sim B	1
DF Tau (A, B)	2	0.09	M0.5+M3	C	A \sim B	1
DH Tau 2	15	M2+M2	C	DH > DI 7, 8		
DK Tau (A, B)	2	2.30	K9+M1	C	A > B 1, 7	
DQ Tau (A, B)	2	SB	K5	C	A \sim B	12
F04192+2647 (A, B)	2	23.3	\ldots	\ldots	A > B	23
F04297+2246 (A, B)	2	6.6	\ldots	\ldots	A > B	23
FM Tau 2	37.3	M2	C	FM < V773	7, 8	
FO Tau (A, B)	2	0.15	M2+M2	C	A \sim B	1
FQ Tau (A, B)	2	0.76	M3+M3.5	C	A \sim B	1, 17
FS Tau (Aa, Ab, B)	3	0.23 (Aa, Ab), 20 (A-B)		M1+M4 (Aa, Ab)	C	Aa > Ab 1, 24
FV Tau (A, B)	2	0.72	K5+K6	C	A \sim B, FV > FV/c	1
FX Tau (A, B)	2	0.89	M1+M4	C+W	A > B 1, 6	
FZ Tau 2	16.9	M0+K5	C	FZ > FY 7, 8		
GG Tau (A, B)	4	10.3	\ldots	C	A \gg B 1	
GG Tau (Aa, Ab)	2	0.25	K7+M0.5	C	Aa \gtrsim Ab	1
GG Tau (Ba, Bb)	2	1.48	M5.5+M7.5	C	Ba > Bb 1	
GH Tau (A, B)	2	0.31	M1.5+M2	C	A \sim B	1
GI Tau 2	12.9	K6	C	GI \sim GK	5, 6	
GK Tau (A, B)	2	2.5	K7	C	A \gg B 5, 6	
GN Tau (A, B)	2	0.33	M2.5	C	A \sim B	1, 26
Haro 6-37 (Aa, Ab, B)	3	2.62(A, B), 0.33 (Aa, Ab)		K7+M1	C	Aa > Ab, A > B 1, 11
HK Tau (A, B)	2	2.34	M1+M2	C	A \gg B 1, 7	
HN Tau (A, B)	2	3.11	K5+M4	C	A \gg B 1	
HP Tau (A, B)	2	0.017	K2	C	A > B 7, 8, 15	
IS Tau (A, B)	2	0.22	K7+M4.5	C+W	A > B 1	
IT Tau (A, B)	2	2.39	K3+M4	C	A \gtrsim B	1, 6
RW Aur (A, B, C)	3	1.42 (A-BC), 0.12 (B-C)		K1+K5 (A, B)	C	A > B \gg C 1, 10
T Tau (N, Sa, Sb)	3	0.70 (N-S), 0.1 (Sa-Sb)		K0	C	N \sim Sa \sim Sb 1, 3
UX Tau (A, B, C)	4	5.86 (A-B), 2.63 (A-C)		K5+M2+M5	C+W+W	A > B, A \gg C 1
UX Tau (Ba, Bb)	2	0.138	M2	W	Ba > Bb 11	
UY Aur (A, B)	2	0.88	M0+M2.5	C	A \gtrsim B	1, 17
UZ Tau (A, Ba, Bb)	4	SB (A), 3.54(A-Ba), 0.37 (Ba-Bb)			M1+M2+M2	C A > B, Ba \sim Bb 1, 13
V710 Tau (A, B)	2	3.17	M0.5+M2	C+W	A \sim B	1
V773 Tau (AB, C, D)	4	SB (AB), 0.12 (AB-C), 0.24 (AB-D)			K2+M0 (AB, C)	W+C D > C > AB 1, 4
V807 Tau (A, Ba, Bb)	3	0.30 (A-B), 0.04 (Ba-Bb)			K7+M3	C+W A > B, Ba \sim Bb 25, 1
V892 Tau (Aa, Ab, B)	3	0.06, 4.10		B9+M2	W	Aa \sim Ab, A \gg B 16, 19
V955 Tau (A, B)	2	0.33	K5+M1	C	A > B 1	
VY Tau (A, B)	2	0.66	M0	W	A > B 1	
XZ Tau (A, B)	2	0.30	M3+M1.5	C	B > A 1	
ZZ Tau IRS	2	35	M4.5	C	ZZ IRS > ZZ 2	
ZZ Tau (A, B)	2	0.04	M3	C	A \gtrsim B 9	



	ID	Name	Cat	GLON
1	1	BH 131	(01),13	300.116
2	2	[MCM2005b] 32	09	300.131
3	3	BH 132	01	300.263
4	4	VVV CL013	14	300.343
5	5	[FSR2007] 1616	11	300.474
6	6	[MCM2005b] 33	09	300.507
7	7	Ruprecht 105	01	300.885
8	8	G3CC 5	17	300.913
9	9	[DBS2003] 77	05	300.966
10	10	VVV CL015	14	300.967
11	11	VVV CL016	14	300.984
12	12	[DBS2003] 78	05	301.118
13	13	VVV CL017	14,17	301.137
14	14	[FSR2007] 1622	11	301.416
15	15	G3CC 6	17	301.643
16	16	NGC 4609	01	301.895
17	17	G3CC 7	17	301.947
18	18	Hogg 15	01	302.047
19	19	VVV CL018	14	302.158
20	20	[MCM2005b] 34	09	302.433
21	21	[FSR2007] 1630	11	302.612
22	22	[DBS2003] 79	05	302.64
23	23	[DBS2003] 80	05	302.806
24	24	Teutsch 109	02	303.652
25	25	G3CC 8	17	303.927
26	26	G3CC 9	17	304.002
27	27	VVV CL019	14	304.805
28	28	[MCM2005b] 35	09	304.845
29	29	VVV CL020	14	304.87
30	30	G3CC 10	17	304.887
31	31	[DBS2003] 82	05	304.928
32	32	[DBS2003] 131	05,17	305.259
33	33	[DBS2003] 130	05	305.269
34	34	VVV CL021	14	305.277
35	35	[DBS2003] 132	05	305.321
36	36	Danks 1	01,17	305.338
37	37	VVV CL022	14	305.362
38	38	[MCM2005b] 36	09	305.383
39	39	Danks 2	01,17	305.392
40	40	VVV CL023	14	305.438

Some examples: 3.- A product from “YOU”

- Data related:
  - CDS wonders vs pain of getting, for example, IOP tables
  - The “sasmirala” atlas

Some examples: 3.- A product from “YOU”

Asmus et al 2014

TOPCAT(3.1): Table Browser

Table Browser for 31: TAP_1_sasmirala.objects

	name	raj2000	dej2000
1	3C 390.3	280.5375	79.77139
2	NGC 1275	49.95083	41.51167
3	NGC 6251	248.13333	82.53778
4	3C 305	222.33989	63.27055
5	NGC 5866	226.62292	55.76333
6	Mrk 266NE	204.57414	48.27806
7	Mrk 266SW	204.57213	48.27556
8	M51a	202.46958	47.19528
9	NGC 4258	184.73958	47.30389
10	Mrk 3	93.90167	71.0375
11	NGC 3147	154.22375	73.40083
12	4C +73.08	147.44108	73.23976
13	M81	148.88833	69.06528
14	UGC 5101	143.965	61.35306
15	NGC 3690E	172.14012	58.56294
16	NGC 3690W	172.12925	58.56131
17	NGC 3998	179.48375	55.45361
18	NGC 3982	179.11708	55.12528
19	NGC 3718	173.14542	53.06806
20	IRAS 08572+3915	135.10583	39.065
21	PKS 2158-380	330.32125	-37.77333
22	NGC 7130	327.08125	-34.95111
23	NGC 7172	330.50792	-31.86972
24	IC 1459	344.29417	-36.46222
25	NGC 7496	347.44708	-43.42806
26	NGC 7552	349.045	-42.58472
27	NGC 7582	349.59792	-42.37056
28	NGC 7590	349.72833	-42.23917
29	NGC 7314	338.9425	-26.05056
30	PKS 2354-35	359.25292	-34.75917
31	ESO 602-25	337.85625	-19.03444
32	MR 2251-178	343.52417	-17.58194
33	Mrk 915	339.19375	-12.54528
34	3C 445	335.95625	-2.10361
35	Mrk 926	346.18125	-8.68583
36	NGC 7592W	349.59084	-4.41574
37	ESO 297-18	24.655	-40.01139

Description

PKS 2158-380/MCG-6-48-13 is a radio-loud lenticular galaxy at a redshift of z = 0.0334 (D ~149 Mpc) with a Sy 2 nucleus [veron-cetty_catalogue_2010] and was first studied in detail by [fosbury_very_1982]. HST observations revealed three compact but resolved sources in the nucleus instead of one central source (total extend ~ 1arcsec ~ 0.7 kpc; PA~ 90°; [boyce_faint_1996, zirbel_ultraviolet_1998]). In addition, water maser emission was detected in this object [kondratko_discovery_2006]. No *Spitzer* data are available for PKS 2158-380, which was imaged with VISIR in the SIC filter in 2006 [van_der_wolk_dust_2010]. A compact MIR nucleus is weakly detected in the image. The low S/N prevents a quantitative analyses of the source morphology but the latter seems different than that seen in HST, as only one source was detected. Our nuclear photometry is consistent with the value in [van_der_wolk_dust_2010].

[boyce_faint_1996] P. J. Boyce, M. J. Disney, F. Macchetto, A. Boksenberg, J. C. Blades, and C. D. Mackay. Faint object camera observations of complex nuclear structure in PKS 2158-380. *A&A*, **305** pp. 715, January 1996.

[fosbury_very_1982] R. A. E. Fosbury, A. Boksenberg, M. A. J. Snijders, I. J. Danziger, M. J. Disney, W. M. Goss, M. V. Penston, W. Wamsteker, K. J. Wellington, and A. S. Wilson. Very extended ionized gas in radio galaxies. i - a radio, optical and ultraviolet study of PKS 2158-380. *MNRAS*, **201** pp. 991–1008, December 1982.

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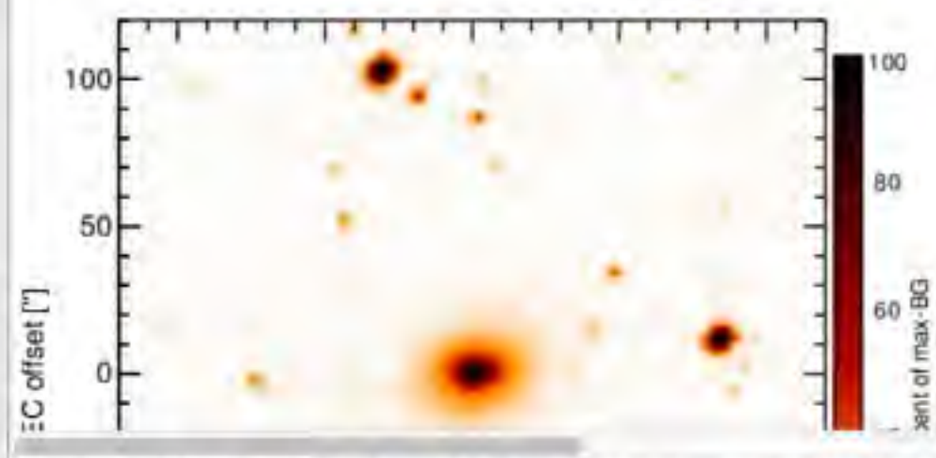
[van_der_wolk_dust_2010] G. van der Wolk, P. D. Barthel, R. F. Peletier, and J. W. Pel. Dust tori in radio galaxies. *A&A*, **511** pp. 64, February 2010.

[veron-cetty_catalogue_2010] M.-P. Véron-Cetty and P. Véron. A catalogue of quasars and active nuclei: 13th edition. *A&A*, **518** pp. 10, July 2010.

[zirbel_ultraviolet_1998] Esther L. Zirbel and Stefi A. Baum. The ultraviolet continuum emission of radio galaxies. i. description of sources from the hubble space telescope archives. *ApJS*, **114** pp. 177, February 1998.

Images



URL: http://dc.zah.uni-heidelberg.de/sasmirala/q/prod/qp/PKS%202158-380

Some examples: 4.-

A&A 525, A29 (2011)
DOI: 10.1051/0004-6361/201015223
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Astronomy & Astrophysics

Identification of blue high proper motion objects in the Tycho-2 and 2MASS catalogues using Virtual Observatory tools

F. M. Jiménez-Esteban[1,2,3], J. A. Caballero[4], and E. Solano[1,2]

✓ Bright objects with blue colors and high proper motions are rare on the sky

The "usual suspects": Nearby white dwarfs, hot subdwarfs, runaway stars or early type stars in nearby young moving groups

Important in many fields

✓ WDs are used as spectrophotometric standards

✓ Early-type stars in young moving groups are fundamental to understand the evolution of star-forming regions (closer -> studies in greater detail)

Some examples: 4.-

A&A 525, A29 (2011)
DOI: 10.1051/0004-6361/201015223
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Astronomy & Astrophysics

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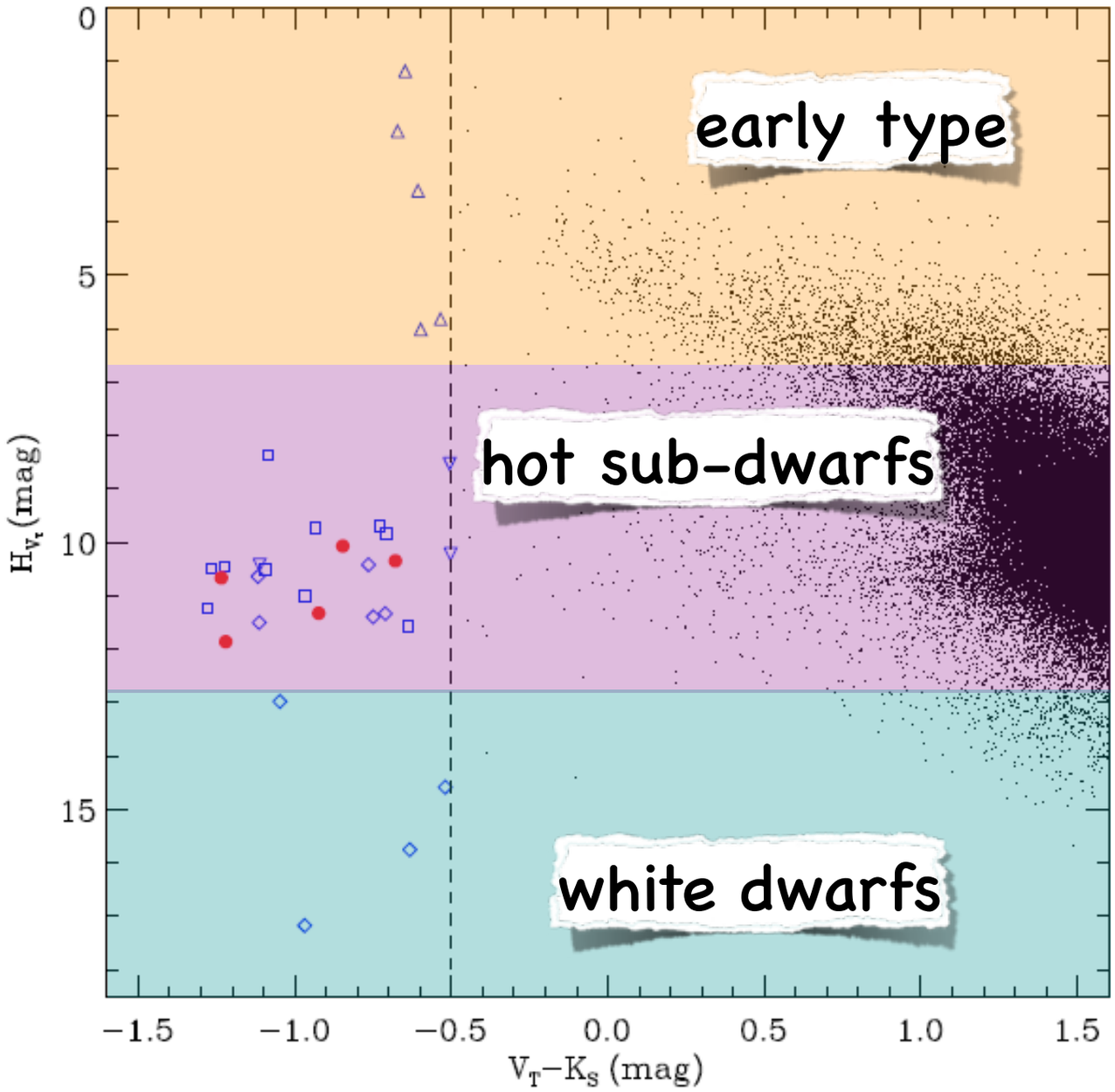
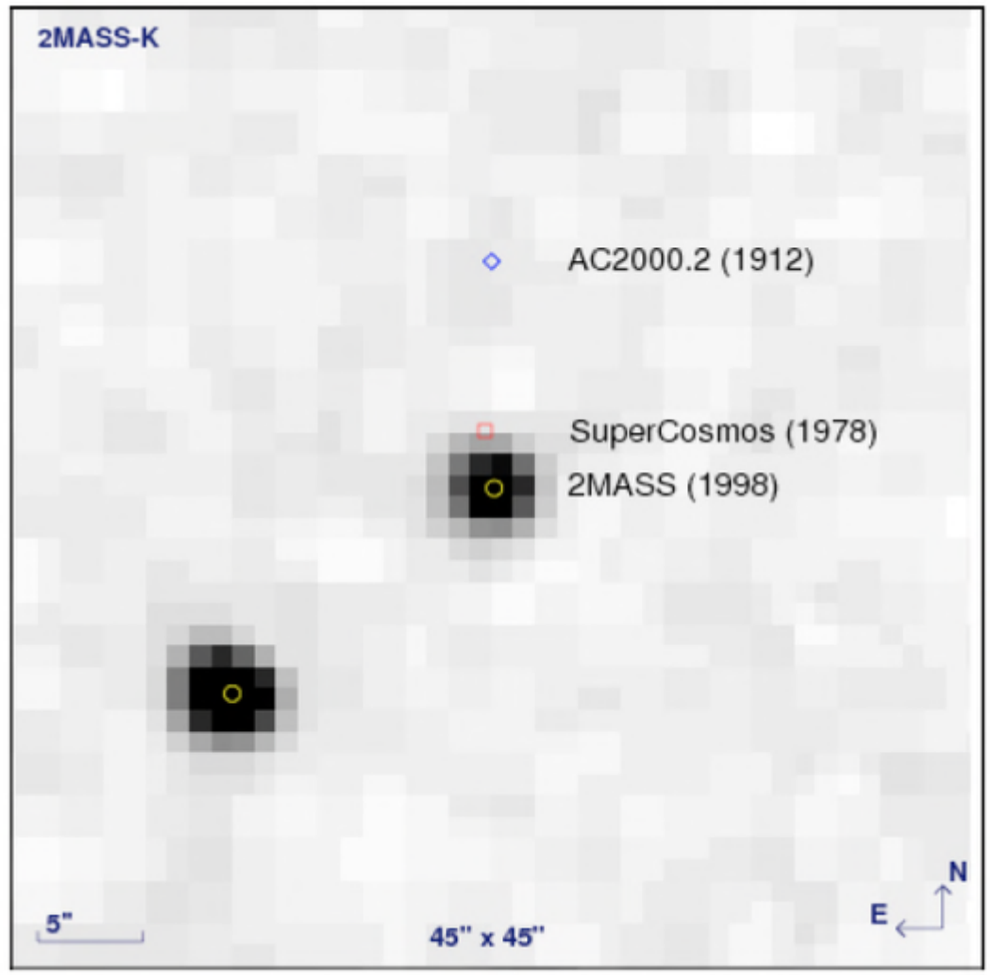
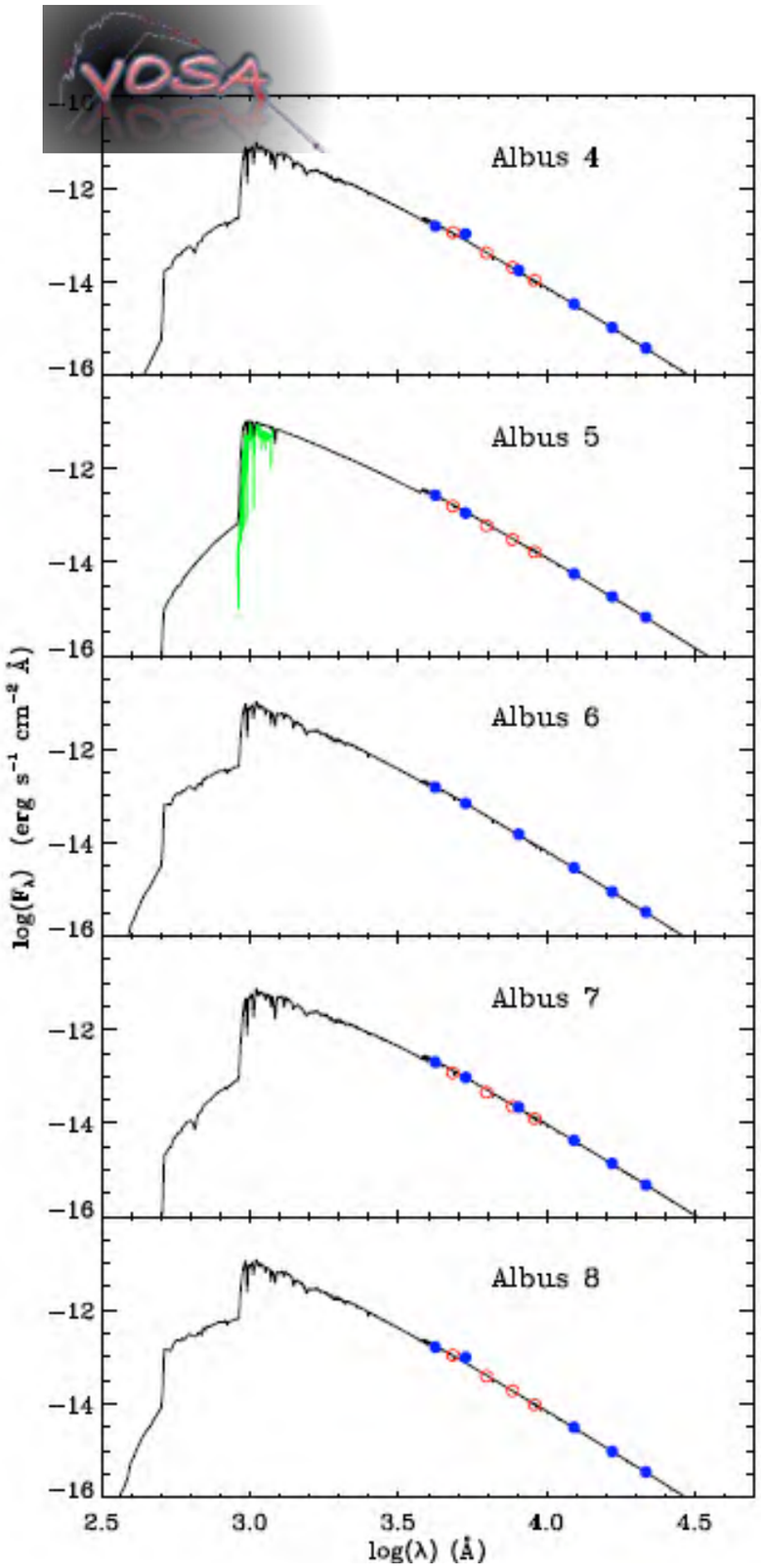
Reduced ppm diagram





Some examples: 4.-



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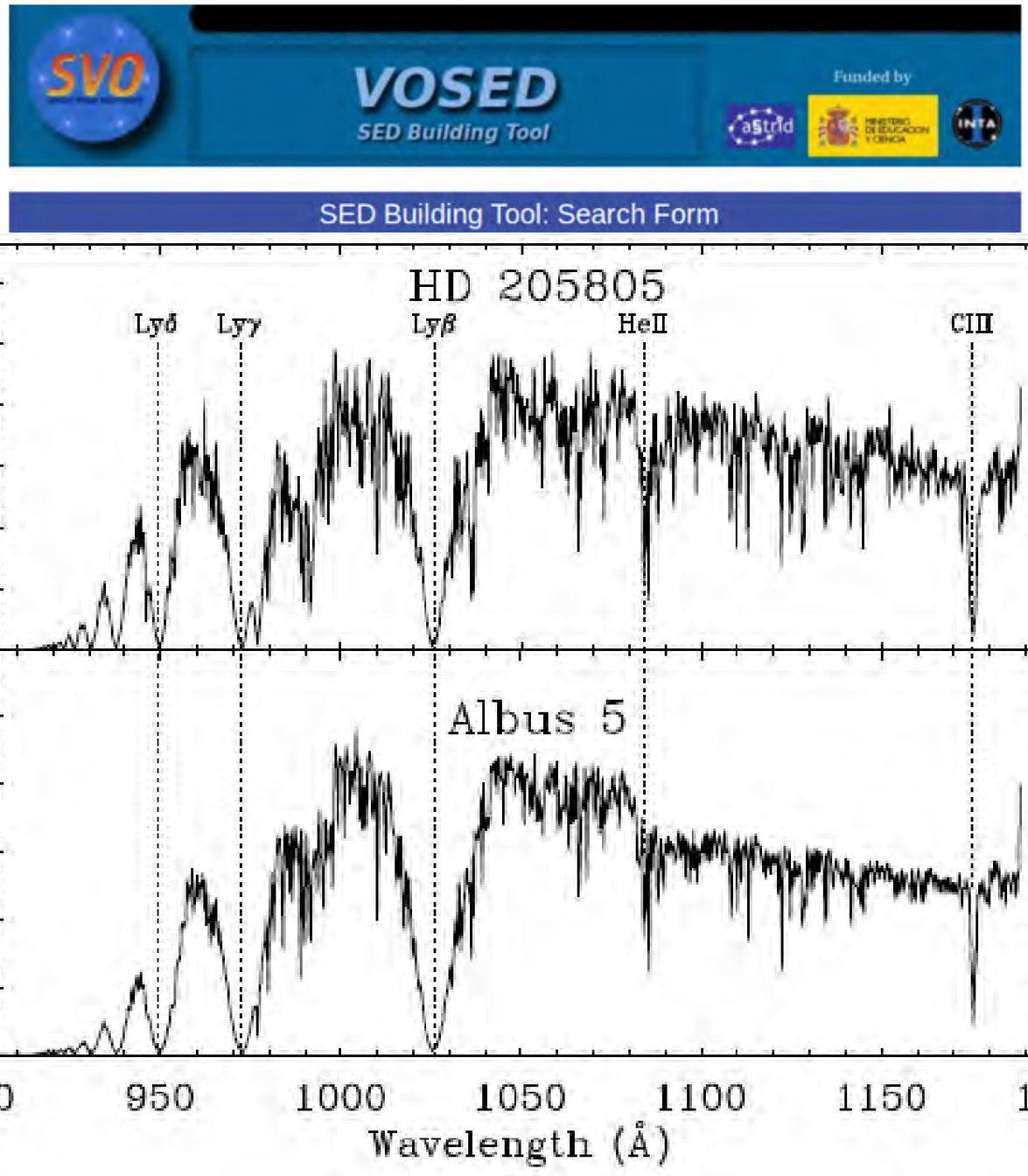

Some examples: 5.- The DUNES prep. work

DUNES: DUst around NEarby Stars

A Herschel Key Programme

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- Public Outreach
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Username: *

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Cold Disks around Nearby Stars. A Search for Edgeworth-Kuiper Belt Analogues

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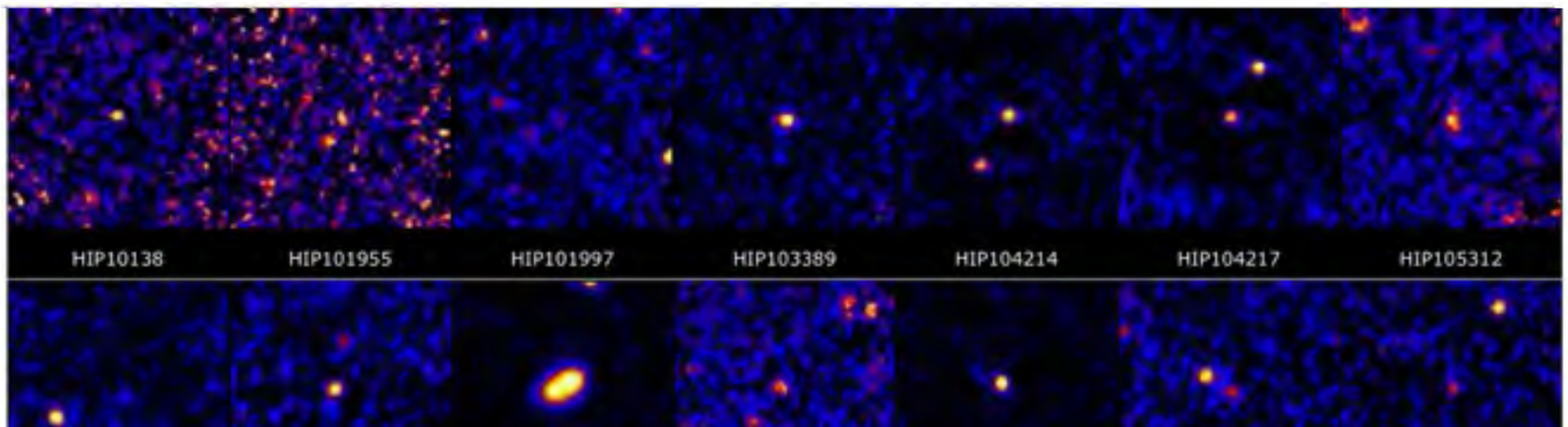
nd unique
/planetary

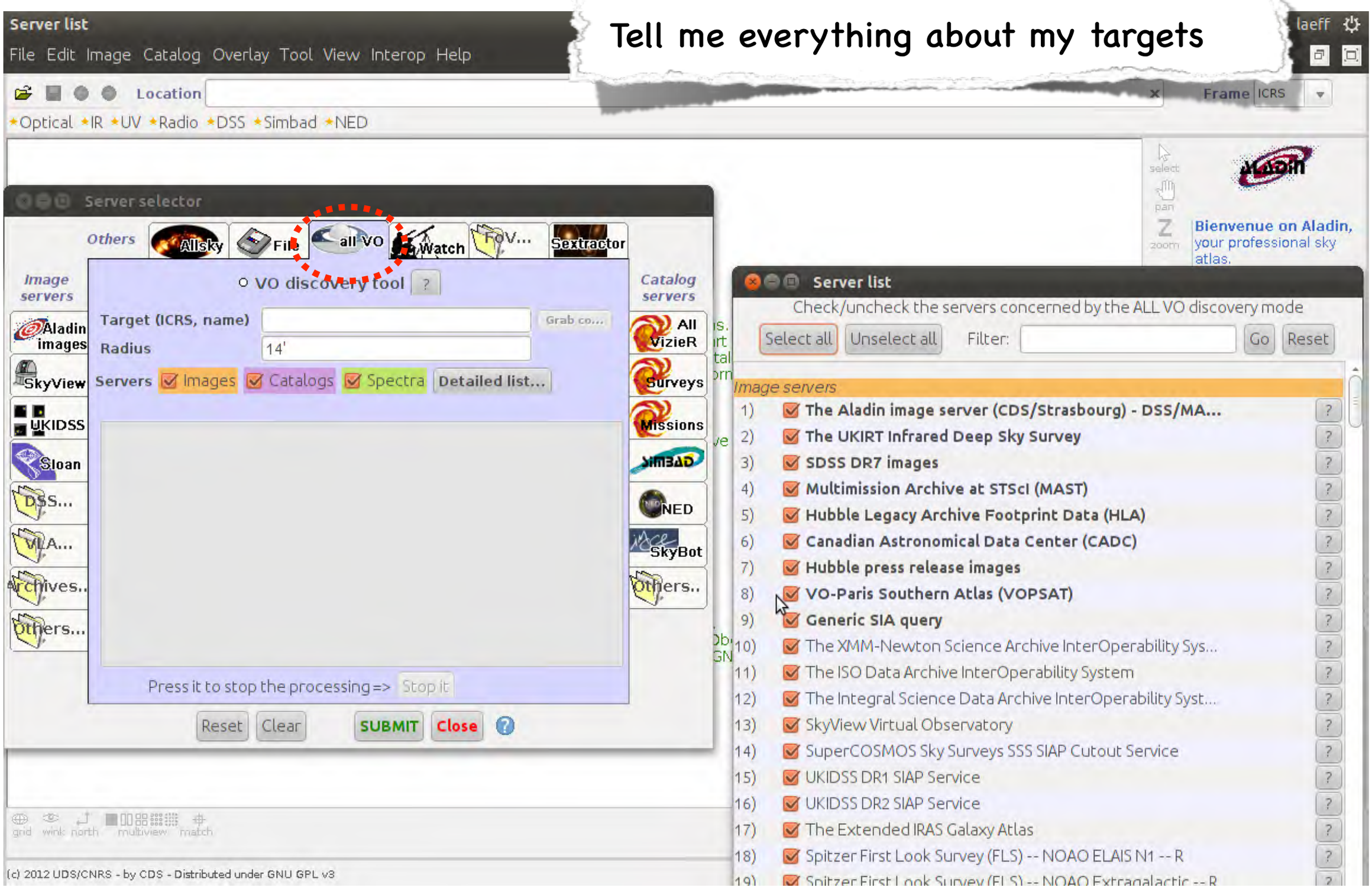
✓ System. survey for faint, cold debris disks (EKB)

✓ Around 133 (up to 250) stars. Volume-limited sample (distances 25 pc)

✓ Detecting extremely faint excesses requires a very detailed knowledge of the photospheric level -> fundamental parameters



Some examples: 5.- The DUNES prep. work



Some examples: 5.- The DUNES prep. work

DUNES

DUst around NEarby Stars

A Herschel Key Programme

SVO

astrid

VO Discovery Tool

Developed in the framework of the DUNES and GASPS projects, this Virtual Observatory tool allows accessing, visualizing, filtering and retrieving relevant information already available in astronomical archives and services.

List of object names (one line each)

List of object coordinates (one line each)

Format allowed:

350.123456 -17.33333

20 54 05.689 37 01 17.38

10:12:45.3 -45:17:50

Radius: 2

arcmin

arcsec

Some examples: 5.- The DUNES prep. work

DUNES
DUst around NEarby Stars
A Herschel Key Programme

VO Discovery Tool

Developed in the framework of the DUNES and GASPS projects, this Virtual Observatory tool allows accessing, visualizing, filtering and retrieving relevant information already available in astronomical archives and services.

Filters:

- **Exclude CCDM sources:**
  - CCDM astrometric binaries.
  - CCDM sources with known orbit.
  - CCDM sources with rho < ____ arcsec.
  - All CCDM sources.
- **Exclude stars in SB9**
- **Exclude stars in Catalogue of Eclipsing Binaries (Malkov+,2006)**
- **Exclude stars in WDS**

Services:

- **Photometric Data**

uvbyß Strömgren photometry	Hauck - Mermilliod	Radius: 10	arcmin / arcsec
JHK photometry	2MASS	Radius: 5	arcmin / arcsec
IRAS photometry	Point Source Catalogue	Radius: 20	arcmin / arcsec
	Faint Source Catalogue	Radius: 20	arcmin / arcsec
Tycho-2 photometry	The Tycho-2 Catalogue of the 2.5 Million Brightest Stars	Radius: 5	arcmin / arcsec

Some examples: 5.- The DUNES prep. work

VO Discovery Tool

Developed in the framework of the DUNES and GASPS projects, this Virtu
visualizing, filtering and retrieving relevant information already available in

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  - CCDM sources with known orbit.
  - CCDM sources with rho < arcse
  - All CCDM sources.
- Exclude stars in SB9
- Exclude stars in Catalogue of Eclipsing Binari
- Exclude stars in WDS

Services:

- Photometric Data

- VO Services
  - Catalogs
  - Images
  - Spectra
- Physical Parameters (search radius 30 arcsec)

Teff , logg , [Fe/H] , E(B-V)	Explore Vizier:	Teff	logg	[M/H]	E(B-V)
Vsini	Gleboki (2000)	Reiners - Schmitt (2003)	Explore vizier
Period	Explore vizier		
Spec. Type	Explore vizier		
Age	Explore vizier		
Radial Velocity	Explore vizier		
Proper Motion	Hipparcos	Tycho-2	Explore vizier
Space Velocity	Explore vizier		
Parallax	Hipparcos	Explore vizier	

uvbyß Strömgren photometry	Hauck - Mermilliod	Radius: 10	arcsec
JHK photometry	2MASS	Radius: 5	arcmin / arcsec
IRAS photometry	Point Source Catalogue	Radius: 20	arcmin / arcsec
	Faint Source Catalogue	Radius: 20	arcmin / arcsec
Tycho-2 photometry	The Tycho-2 Catalogue of the 2.5 Million Brightest Stars	Radius: 5	arcmin / arcsec

Some examples: 5.- The DUNES prep. work

DUNES: Results

Total results: 1

Mark ☑	Images	OBJName	HIP	HD	_RAJ2000	_DEJ2000	CCDM	SB9	Malkov	WDS	Exo	Photometry	VO Services	Physical Parameters
☑	View	HIP 171	171	224930	0.542318	27.082258	2			1		View	Catalogs Spectra Images	View

Retrieve/Display Marked Data In VOTable format and notify me at this e-mail address: when they are available.

JHK photometry	2MASS	Radius: 5	arcsec
IRAS photometry	Point Source Catalogue	Radius: 20	arcmin / arcsec
	Faint Source Catalogue	Radius: 20	arcmin / arcsec
Tycho-2 photometry	The Tycho-2 Catalogue of the 2.5 Million Brightest Stars	Radius: 5	arcmin / arcsec

Some examples: 5.- The DUNES prep. work

OBJ	HIP
HIP 171	171

Photometry

OBJ	HIP
HIP 171	171

Source	distance (arcmin)
Strömgren (II/215)	
Strömgren (II/215)	
Strömgren (II/215)	
Strömgren (II/215)	
2MASS (II/246)	0.01517
2MASS (II/246)	0.01517
2MASS (II/246)	0.01517
IRAS/PSC (II/125)	
IRAS/PSC (II/125)	
IRAS/PSC (II/125)	
IRAS/PSC (II/125)	
IRAS/FSC (II/156A)	
IRAS/FSC (II/156A)	
IRAS/FSC (II/156A)	
IRAS/FSC (II/156A)	
Tycho-2 (I/259 /tyc2)	
Tycho-2 (I/259 /tyc2)	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
NStED	
Spitzer/FEPS	
Spitzer/FEPS	
Spitzer/FEPS	

Teff

Catalog Name	Catalog Code	Distan (deg
Thevenin, 1998	III/193	0.0000
Prugniel+ 2007	III/251	0.0000

logg

Catalog Name	Catalog Code	Distanc (deg)
Thevenin, 1998	III/193	0.00000
Prugniel+ 2007	III/251	0.00000

[M/H]

Catalog Name	Catalog Code	Dist (d
Thevenin, 1998	III/193	0.00
Prugniel+ 2007	III/251	0.00

E(B-V))

Catalog Name	Catalog Code	D
CPIRSS	I/270	
Casagrande+, 2011	J/A+A/530/A138	

Vsini

Catalog Name	Catalog Code	Dista (de
Glebocki+ 2005	III/244	0.00
Glebocki+ 2005	III/244	0.00

Sptype

Catalog Name	Catalog Code	Distance (deg)	Sptype	Sptype error	NomCol	Units	UCD
Luyten 1979	I/87B	0.0007	G1		Sp		src.spType
Roeser+, 1988	I/146	0.000536	G0		Sp		src.spType

Age

Catalog Name	Catalog Code	Distance (deg)	Age	Age error	NomCol	Units	UCD
Holmberg+, 2009	V/130	0.00038	14.7		age	Gyr	time.age
XHIP	V/137D	0.002928	14.7		age	Gyr	time.age
Casagrande+, 2011	J/A+A/530/A138	0.00038	7.24		ageER	Gyr	time.age

Space Velocity

Catalog Name	Catalog Code	Distance (deg)	SpaceV	SpaceV error	NomCol	Units	UCD
XHIP	V/137D	0.002928	74.4		vT	km/s	phys.veloc
XHIP	V/137D	0.002928	82.8		UVW	km/s	phys.veloc

Proper Motion

Catalog Name	Catalog Code	Distance (deg)	ProperM	ProperM error	NomCol	Units	UCD
Luyten 1979	I/87B	0.0007	1.295		pm	arcsec/yr	pos.pm
Bakos+ 2002	I/279	0.000215	1.29		pm	arcsec/yr	pos.pm

Parallax

Catalog Name	Catalog Code	Distance (deg)	Parallax	Parallax error	NomCol	Units	UCD
Turon+ 1993	I/196	0.000577	86	4	Plx	mas	pos.parallax.trig
ESA 1997	I/239	0.002928	80.63	3.03	Plx	mas	pos.parallax.trig
Kharchenko+	I/280B	0.002928	80.63	3.01	Plx	mas	pos.parallax.trig

Bolometric Luminosity

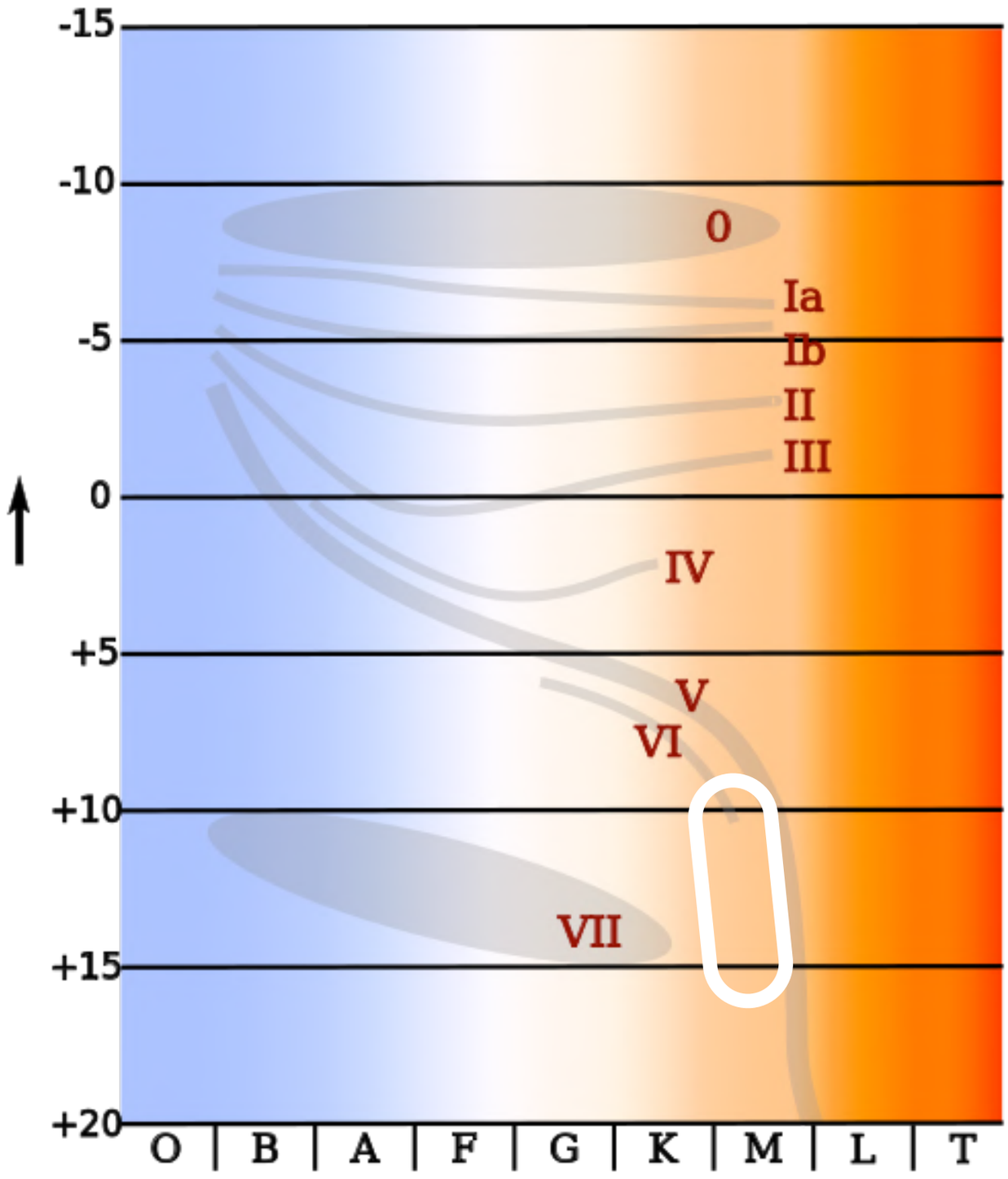
Catalog Name	Catalog Code	Distance (deg)	BolomLumin	BolomLumin error	NomCol	Units	UCD
XHIP	V/137D	0.002928	0.67		Lum	Lsun	phys.luminosity
Takeda+, 2007	J/PASJ /59/335	0.002925	-0.16		logL	[solLum]	phys.luminosity

Some examples: 6.-

New ultracool subdwarfs identified in large-scale surveys using Virtual Observatory tools ⋆ ⋆⋆

Part I: UKIDSS LAS DR5 vs SDSS DR7

N. Lodieu[1,2], M. Espinoza Contreras[1], M. R. Zapatero Osorio[3], E. Solano[4,5], M. Aberasturi[4,5], and E. L. Martín[3]



✓Metal-poor dwarfs with spectral types later than M7

✓Less lum. (act. hotter) than their solar met. counterparts

✓Population II. Tracers of the galact. chem. history

✓Rare objects: around 50 in 2011

Some examples: 6.-

New ultracool subdwarfs identified in large-scale surveys using Virtual Observatory tools ⋆ ⋆⋆

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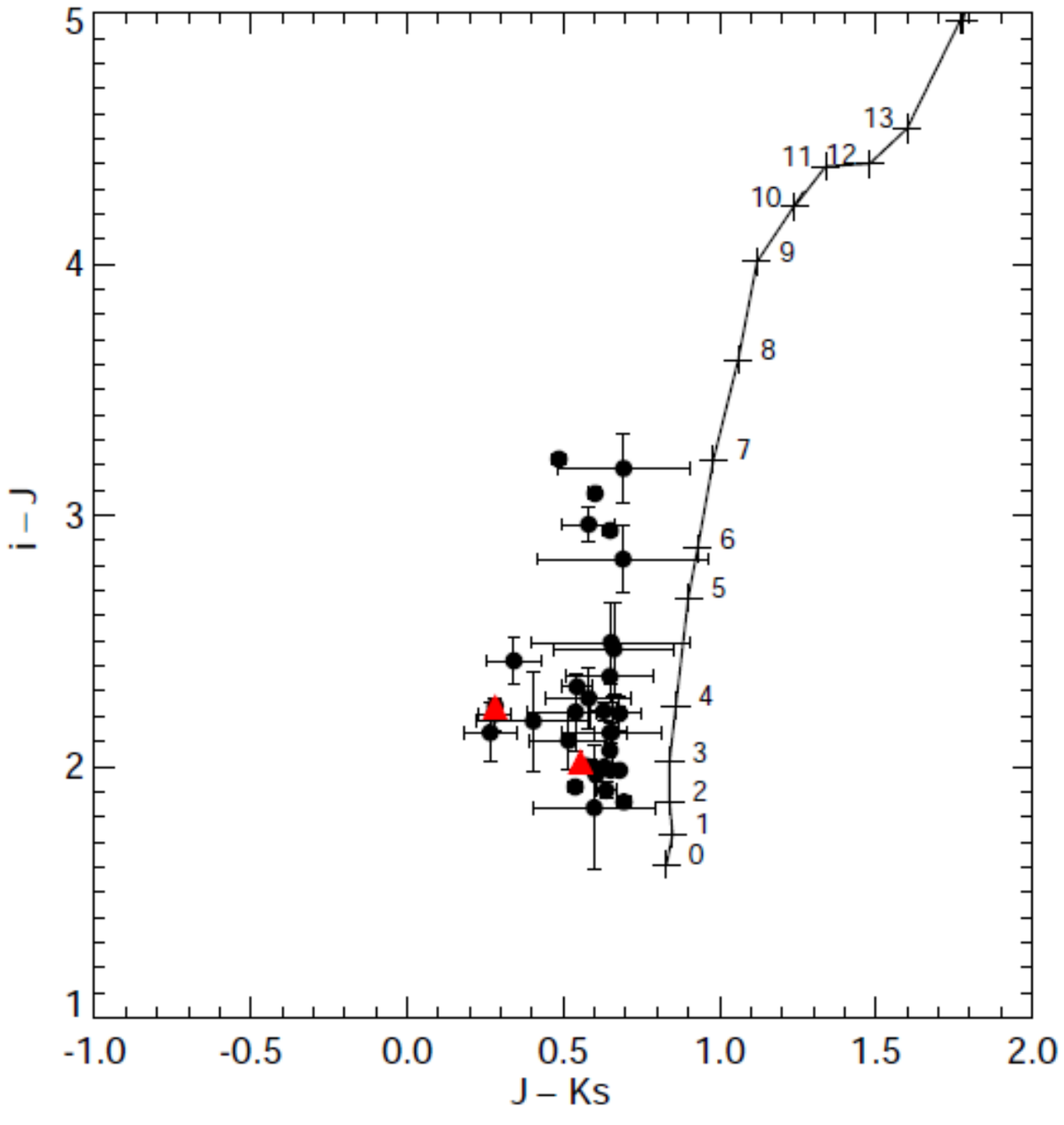

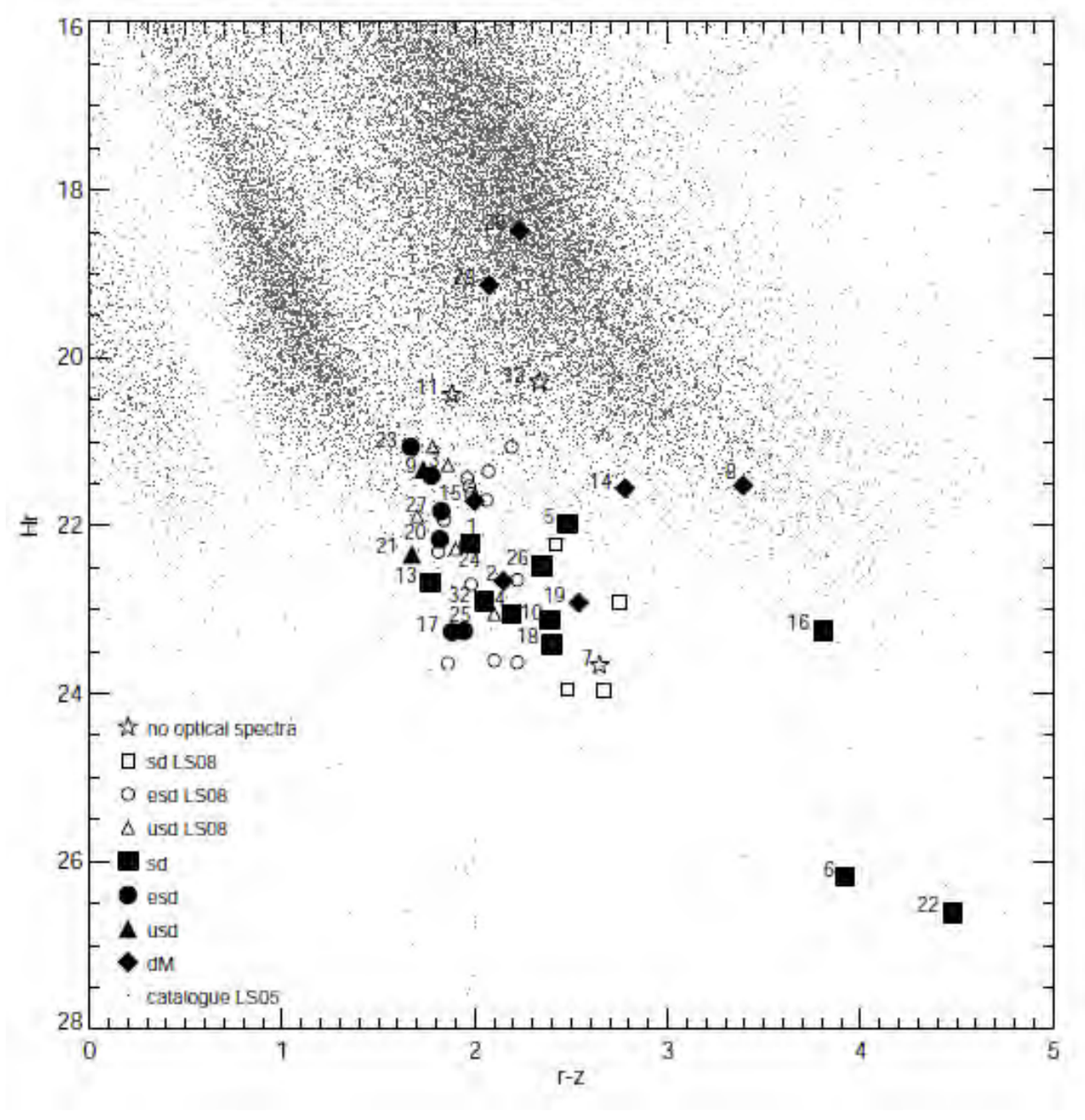

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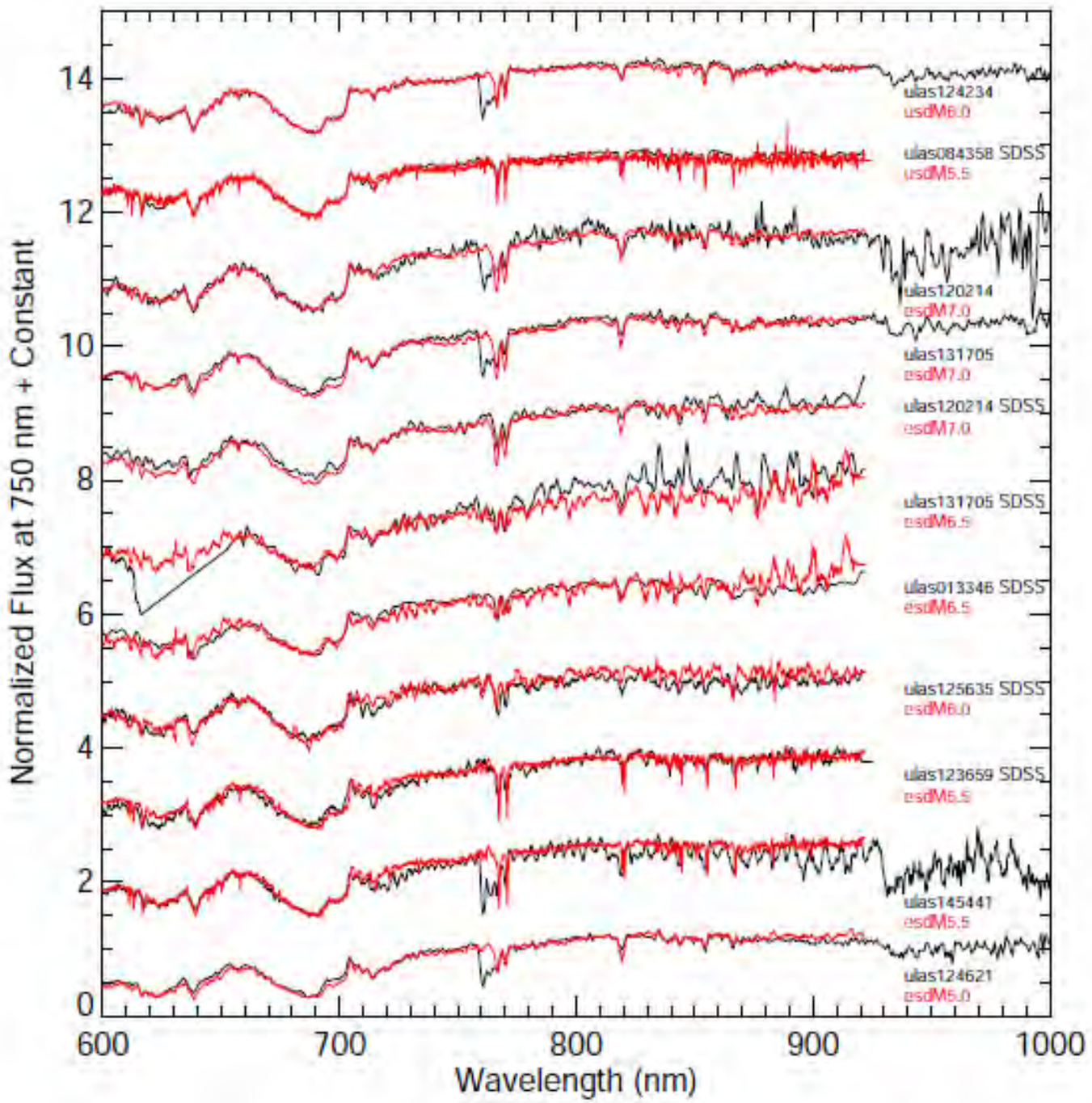

✓ 20 new spectroscopically confirmed UCSDs

✓ > 80% success rate after proper motion refinement

Some examples: 7.-

A&A 530, A2 (2011)
DOI: 10.1051/0004-6361/201016324
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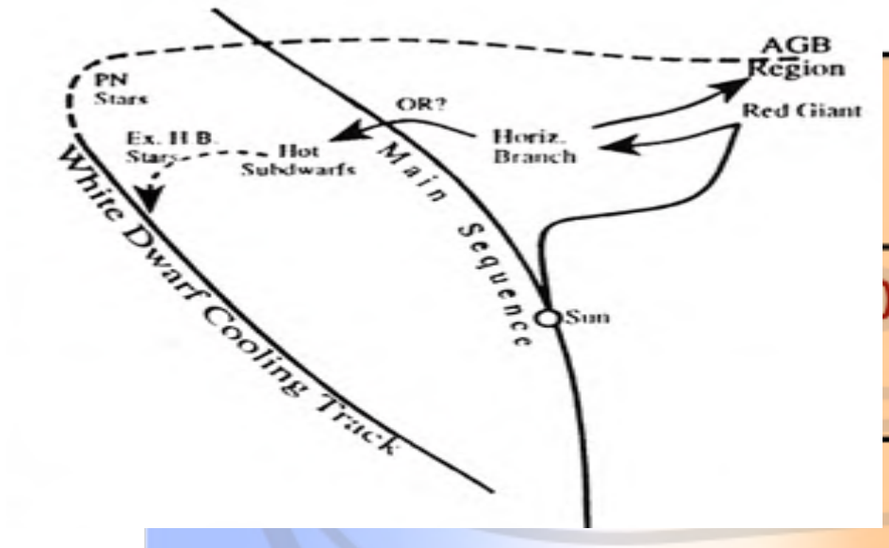
Astronomy & Astrophysics

A search for new hot subdwarf stars by means of Virtual Observatory tools

R. Oreiro[1], C. Rodríguez-López[2,3], E. Solano[4], A. Ulla[3], R. Østensen[5], and M. García-Torres[6]



✓Uncertain origin

✓Need of significant number of "bona-fide" hot sds. to perform statistical studies

✓Problems to identify them: High degree of contamination (WDs, CVs, OBs,...)

Some examples: 7.-

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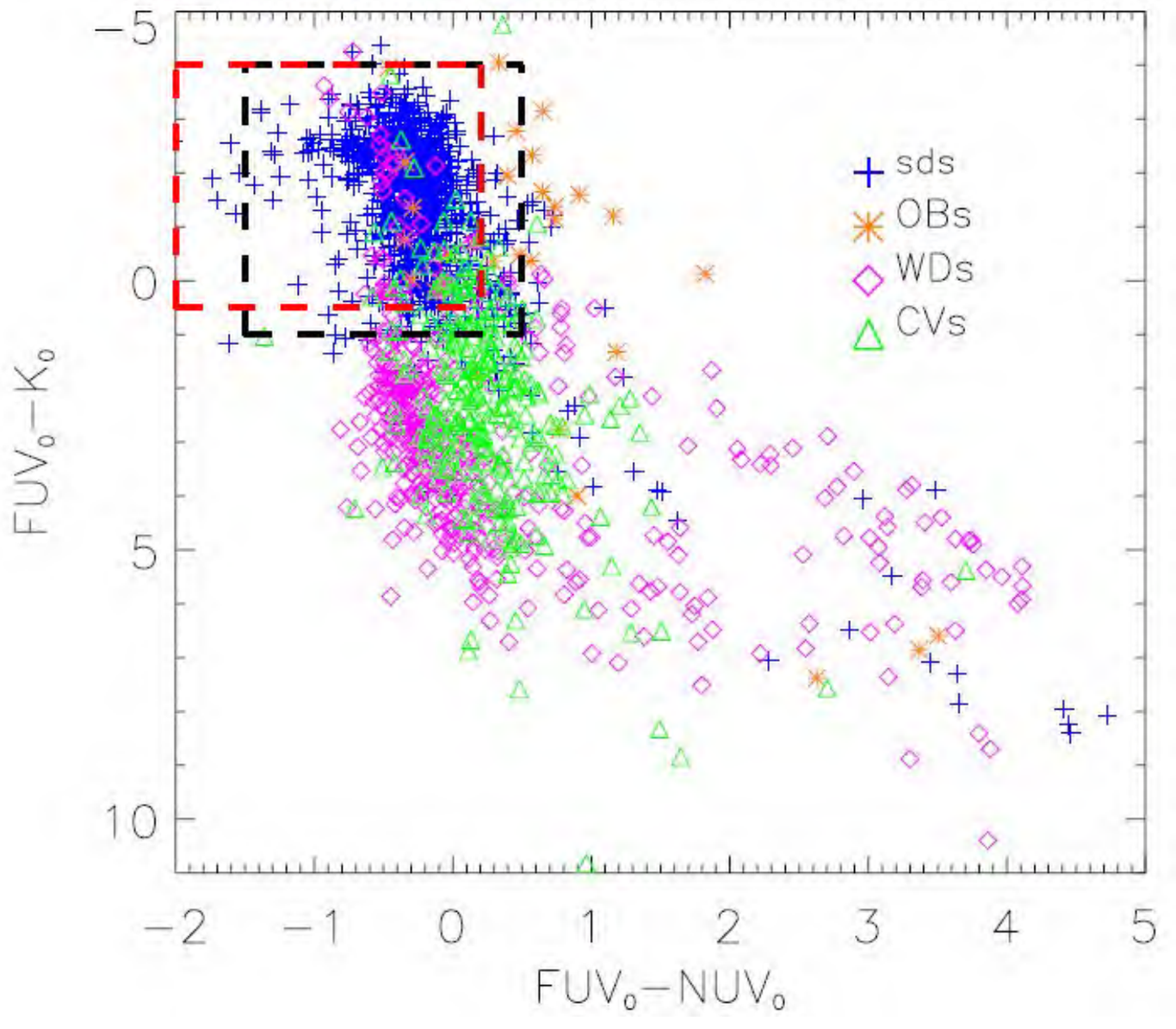

Looking for blue targets?

X-match: GALEX-2MASS

Some examples: 7.-

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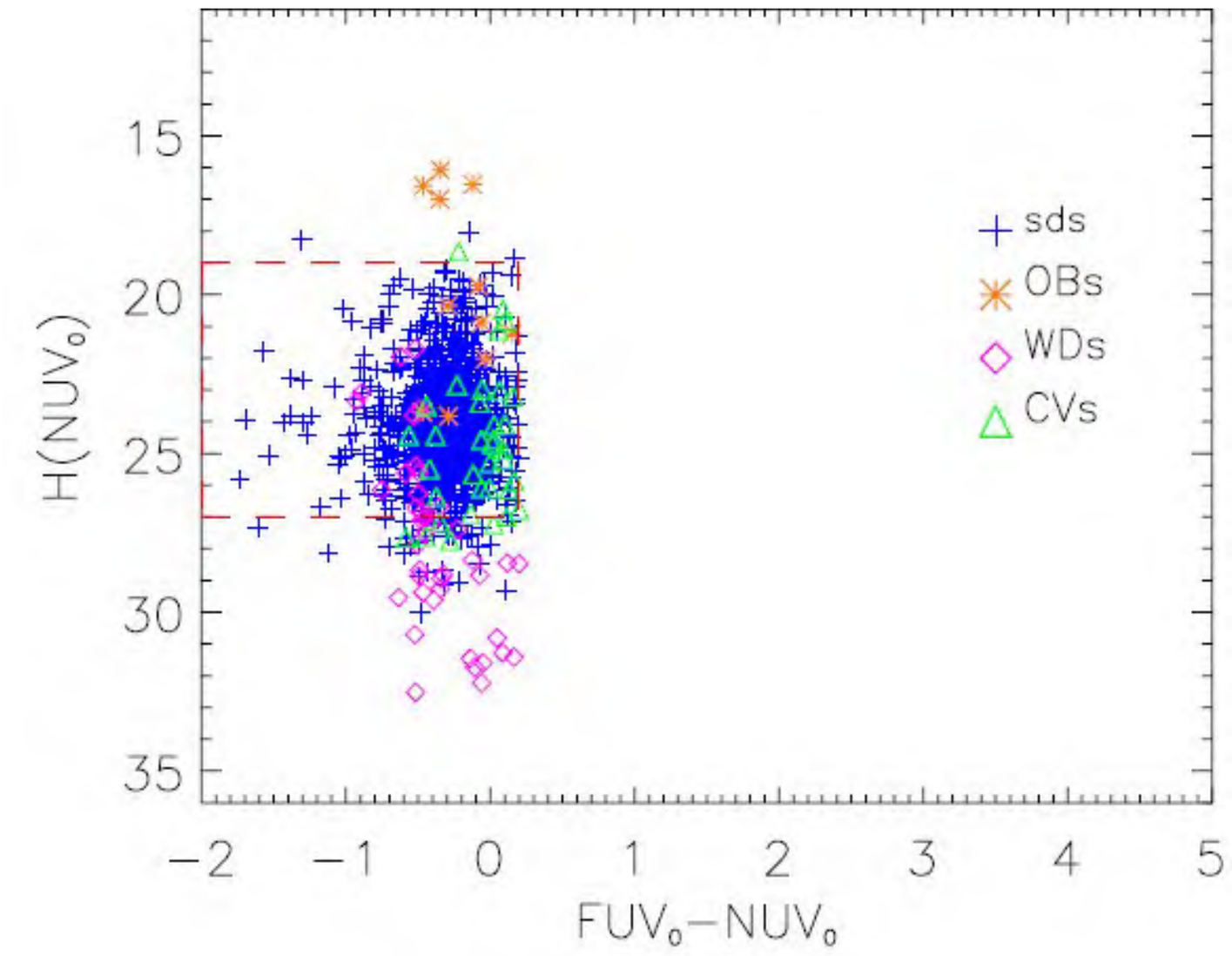
Add SuperCosmos for ppm...



Remember the reduced ppm diagram?

Some examples: 7.-

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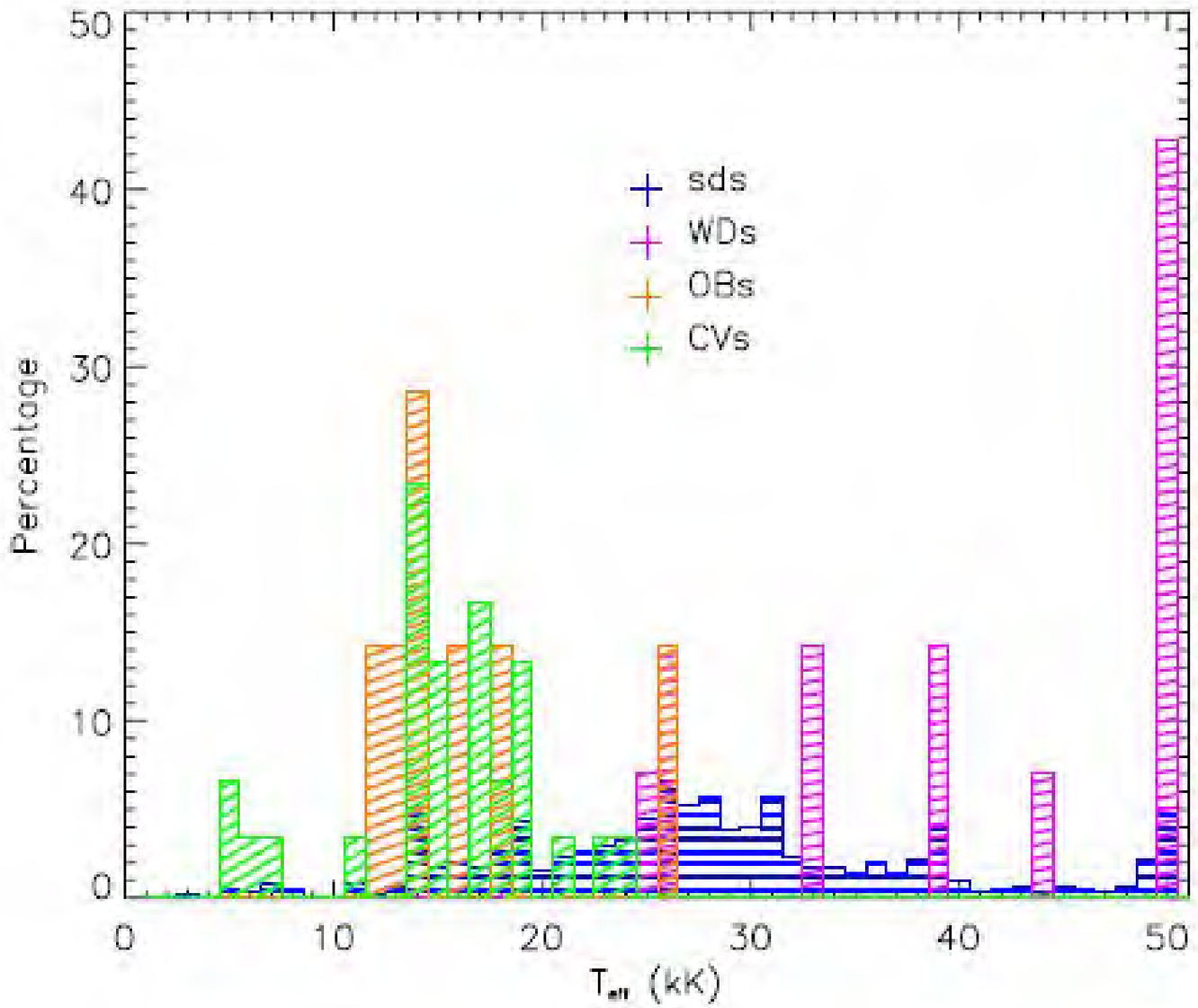

Filter temperature: multi-wavelength photometry -> SED fit

Some examples: 7.-

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Astronomy & Astrophysics

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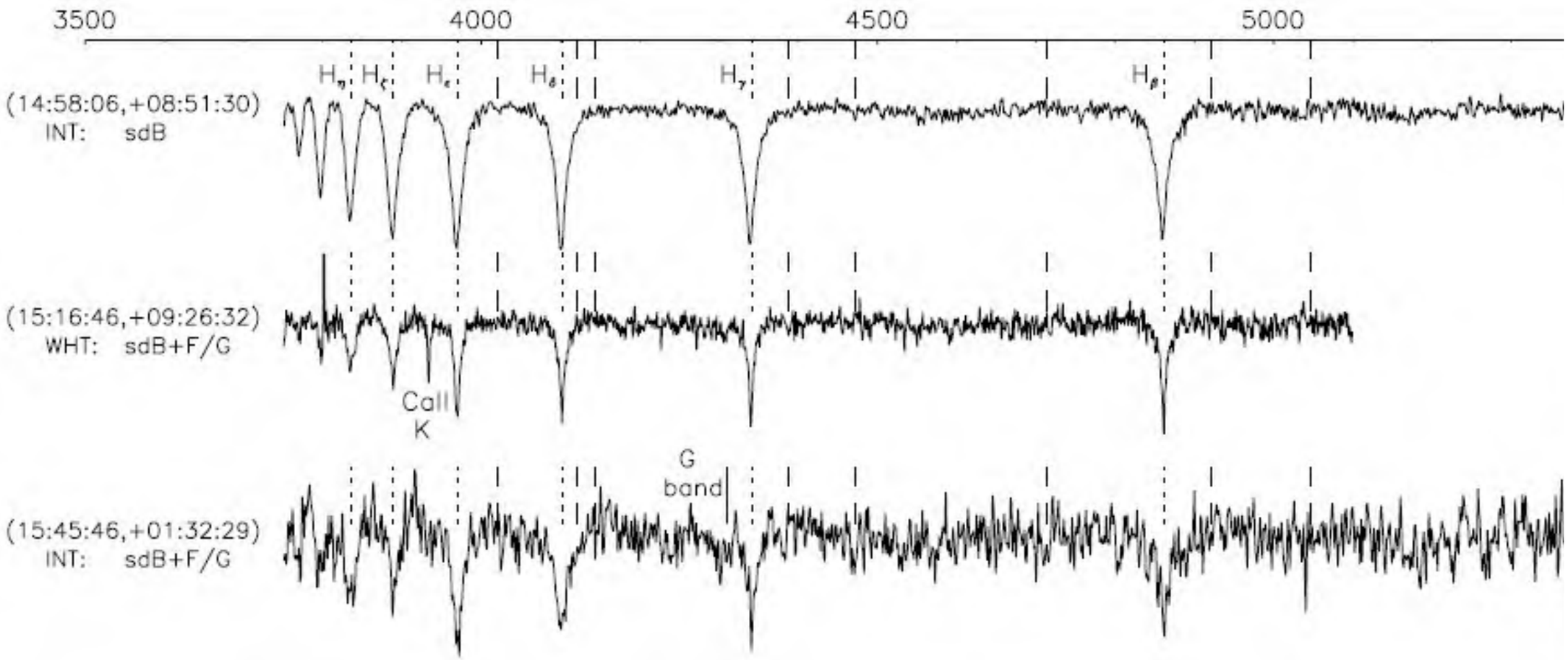

87% success rate!!

Thank you!...

... let's play in the VO!

from Chirs talk fo the hands-on

- overpolot 2MASS over an image, for example

Hands on: lets explore Trumpler 20

- Trumpler 20 is an old open cluster (OC) located toward the Galactic centre, at about 3 kpc from the Sun and ~7 kpc from the Galactic centre