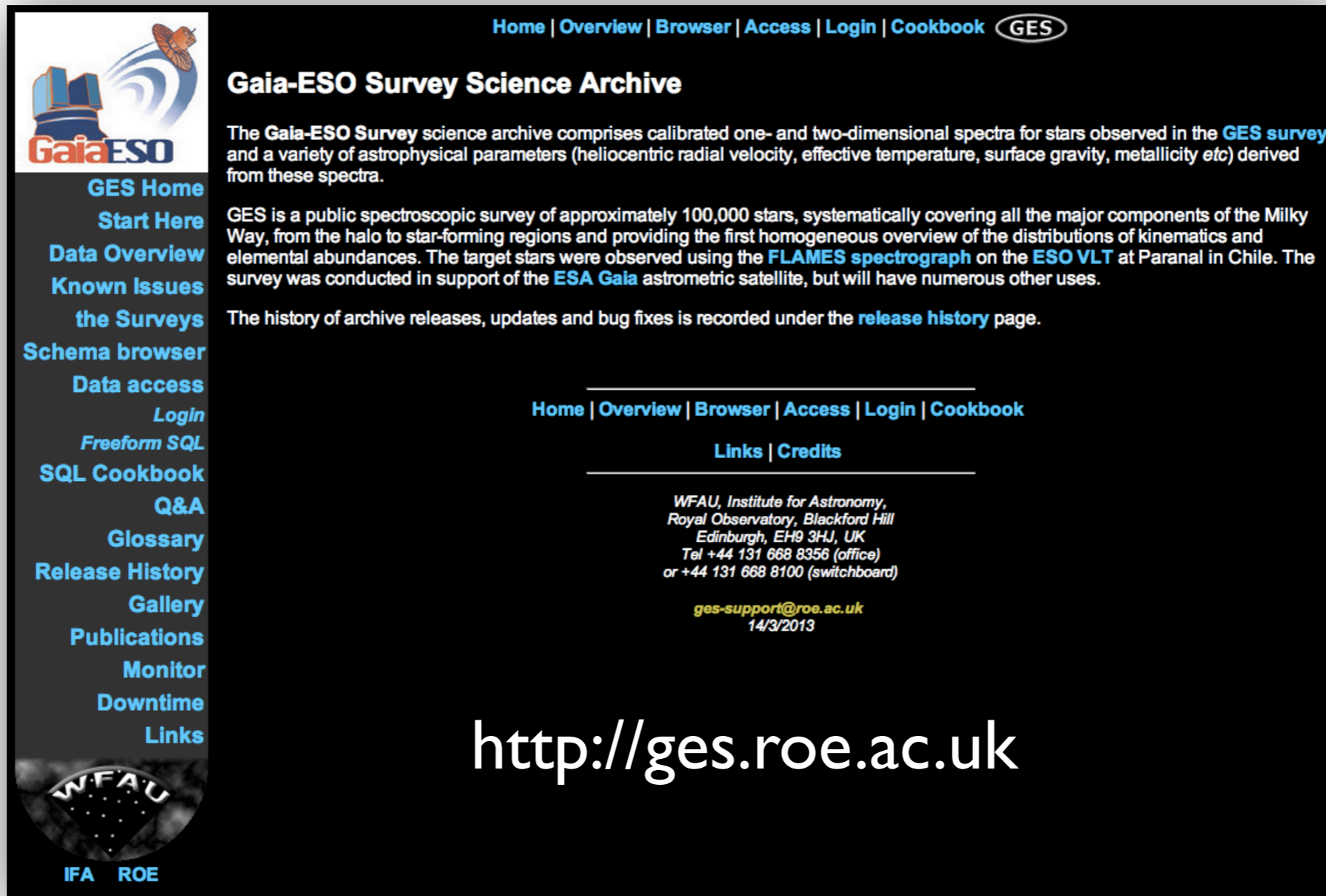


# The GES Science Archive

Ross Collins

Nigel Hambly, Clive Davenhall, Mike Read, Eckhard Sutorius  
WFAU, Institute for Astronomy, Royal Observatory Edinburgh



The screenshot shows the website interface for the Gaia-ESO Survey Science Archive. At the top right, there is a navigation menu with links: Home | Overview | Browser | Access | Login | Cookbook | GES. The main heading is "Gaia-ESO Survey Science Archive". Below this, there is a paragraph describing the archive: "The Gaia-ESO Survey science archive comprises calibrated one- and two-dimensional spectra for stars observed in the GES survey, and a variety of astrophysical parameters (heliocentric radial velocity, effective temperature, surface gravity, metallicity etc) derived from these spectra." This is followed by a paragraph about the survey: "GES is a public spectroscopic survey of approximately 100,000 stars, systematically covering all the major components of the Milky Way, from the halo to star-forming regions and providing the first homogeneous overview of the distributions of kinematics and elemental abundances. The target stars were observed using the FLAMES spectrograph on the ESO VLT at Paranal in Chile. The survey was conducted in support of the ESA Gaia astrometric satellite, but will have numerous other uses." A third paragraph states: "The history of archive releases, updates and bug fixes is recorded under the release history page." Below this, there is another navigation menu: Home | Overview | Browser | Access | Login | Cookbook. Underneath, there are links for "Links | Credits". The contact information is provided: "WFAU, Institute for Astronomy, Royal Observatory, Blackford Hill, Edinburgh, EH9 3HJ, UK, Tel +44 131 668 8356 (office) or +44 131 668 8100 (switchboard)". The email address "ges-support@roe.ac.uk" and the date "14/3/2013" are also shown. On the left side, there is a vertical sidebar with a list of links: GES Home, Start Here, Data Overview, Known Issues, the Surveys, Schema browser, Data access, Login, Freeform SQL, SQL Cookbook, Q&A, Glossary, Release History, Gallery, Publications, Monitor, Downtime, Links. At the bottom left, there is a logo for WFAU IFA ROE.

Home | Overview | Browser | Access | Login | Cookbook | GES

## Gaia-ESO Survey Science Archive

The **Gaia-ESO Survey** science archive comprises calibrated one- and two-dimensional spectra for stars observed in the **GES survey**, and a variety of astrophysical parameters (heliocentric radial velocity, effective temperature, surface gravity, metallicity *etc*) derived from these spectra.

GES is a public spectroscopic survey of approximately 100,000 stars, systematically covering all the major components of the Milky Way, from the halo to star-forming regions and providing the first homogeneous overview of the distributions of kinematics and elemental abundances. The target stars were observed using the **FLAMES spectrograph** on the **ESO VLT** at Paranal in Chile. The survey was conducted in support of the **ESA Gaia** astrometric satellite, but will have numerous other uses.

The history of archive releases, updates and bug fixes is recorded under the [release history](#) page.

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[Links](#) | [Credits](#)

WFAU, Institute for Astronomy,  
Royal Observatory, Blackford Hill  
Edinburgh, EH9 3HJ, UK  
Tel +44 131 668 8356 (office)  
or +44 131 668 8100 (switchboard)

[ges-support@roe.ac.uk](mailto:ges-support@roe.ac.uk)  
14/3/2013

<http://ges.roe.ac.uk>

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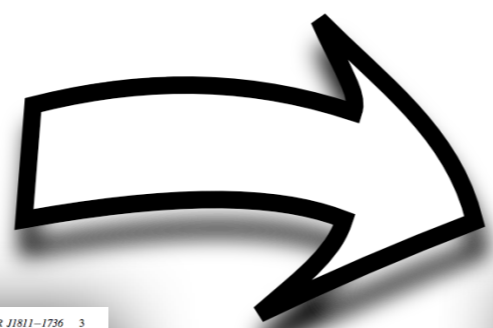
WFAU  
IFA ROE

# WFAU's Role

- Long-term collaboration between Cambridge's Astronomical Survey Unit (CASU) and WFAU led to the creation of the WFCAM & VISTA Science Archives (the VISTA Data Flow System or VDFS)
- Adopt similar model for GES:
  - WFAU mirrors data stored at Cambridge
  - Creates a rich, queryable database for easy data mining
  - Releases static, referencable databases with a web interface

# Release databases

- Static release databases are there to be referenced (no more data reconstruction by measuring figures in papers)



R. P. Mignani, et al.

However, it escaped detection so far, perhaps because of an unfavourable beaming or because it is no longer in its active radio phase. Alternatively, a conclusive piece of evidence would be the non-detection of the companion in deep optical/infrared (IR) observations. The pulsar companion is not detected in the Digitized Sky Survey (DSS) down to  $R = 22$  (Mignani 2000) and in the 2 Micron All Sky Survey (2MASS) down to  $K_s = 15$ , computed at the Lyne et al. (2000) and Corongia et al. (2007) radio positions, respectively, with the latter limit being quite uncertain owing to the much higher crowding at the pulsar field at IR wavelengths. Such limits would only rule out a giant companion but, for the allowed mass range they would still be compatible with a mid- to late-type main sequence (MS) star, a white dwarf, or a neutron star. No deep optical/near-IR observations of PSR J1811-1736 have ever been performed so far. As suggested in Mignani (2000), given the substantial interstellar extinction towards the pulsar near-IR observations are more suited than the optical ones to set constraints on the companion star.

Here, we present the results of a new investigation of the PSR J1811-1736 field using IR survey data much deeper than 2MASS. The observations and results are discussed in Section 2, while the implications for the PSR J1811-1736 companion are discussed in Section 3.

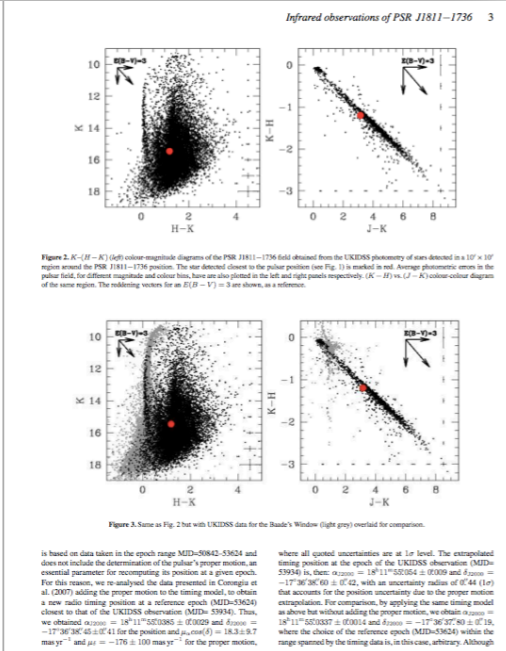
## 2 INFRARED OBSERVATIONS AND RESULTS

### 2.1 Observation description

No near-IR observations of the PSR J1811-1736 are available in either the ESO or the Gemini Science Data Archives. Thus, we searched for near-IR data of the PSR J1811-1736 field in the image archive of the UK Infrared Deep Sky Survey (UKIDSS) performed with the Wide Field Camera (WFCAM) at the UK Infrared Telescope (UKIRT) at the Mauna Kea Observatory (Hawaii). WFCAM (Casali et al. 2007) is a mosaic detector of nine 2048 × 2048 pixel Rockwell devices, with a pixel scale of 0.4 and covering a field-of-view of 0.21 square degrees. A general description of the UKIDSS survey is given in Lawrence et al. (2007). The UKIDSS survey covers several regions, with a different sky coverage, and sensitivity limits in the 22 JHK UKIRT photometric systems (Hevent et al. 2006). The field of PSR J1811-1736 is included in the Galactic Plane Survey (GPS; Law et al. 2008) which covers about 1800 square degrees in JHK, down to sensitivity limits which are more than a factor of ten deeper than 2MASS. Like all the UKIDSS data, the GPS images are processed through a dedicated pipeline (Hamblin et al. 2008) developed and operated at Cambridge Astronomical Survey Unit (CASU) which performs basic reduction steps (dark subtraction, flat fielding), image de-convolution, stacking, and mosaicing. The pipeline also runs a source detection algorithm and produces source catalogues. Astrometry and photometry calibrations are performed using 2MASS stars as a reference (Høg et al. 2009). We searched for the reduced science images of the PSR J1811-1736 field and associated object catalogues through the WFCAM Science Archive (WSA) interface accessible via the Royal Observatory Edinburgh. We queried the most recent UKIDSS Data Release (version 9.1a) made available on October 25th 2011. The field was observed on July 18 2006.

### 2.2 Pulsar astrometry

For the search for the companion star to PSR J1811-1736, we assumed as a reference its radio timing coordinates. We note that the pulsar radio timing solution presented by Corongia et al. (2007)



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Status: Logged in as - User: rsc Community: betatesters

## Freeform SQL Query

This form allows you to submit an SQL query to the GES database (notes and tips). An enhanced version of this form allows the upload of a file to a temporary database table. This table (#userTable) part of the query being executed.

Programme: GES (GAIA-ESO Survey)

Database release to use: gesv201303beta

Upload SQL query from file into this form:  No file chosen

or enter SQL statement:

```
SELECT FeH, logG FROM AllAstroAnalyses WHERE logG > 4 AND FeH > 0
```

ensure one of the file formats is selected below if you want to save your results.

Email Address:  the results of long running queries will be sent by email.

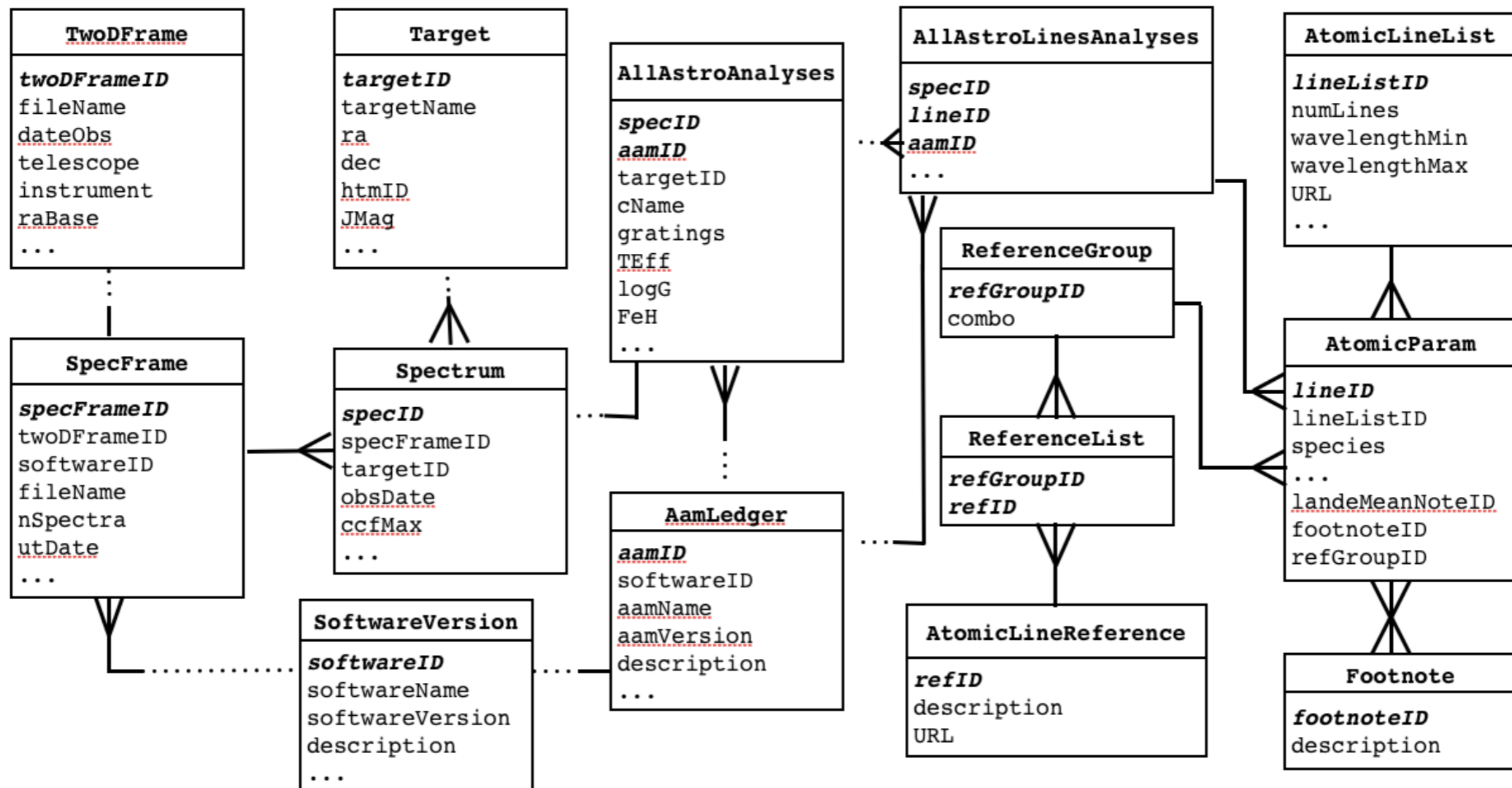
HTML table summary (results are NOT saved to file)

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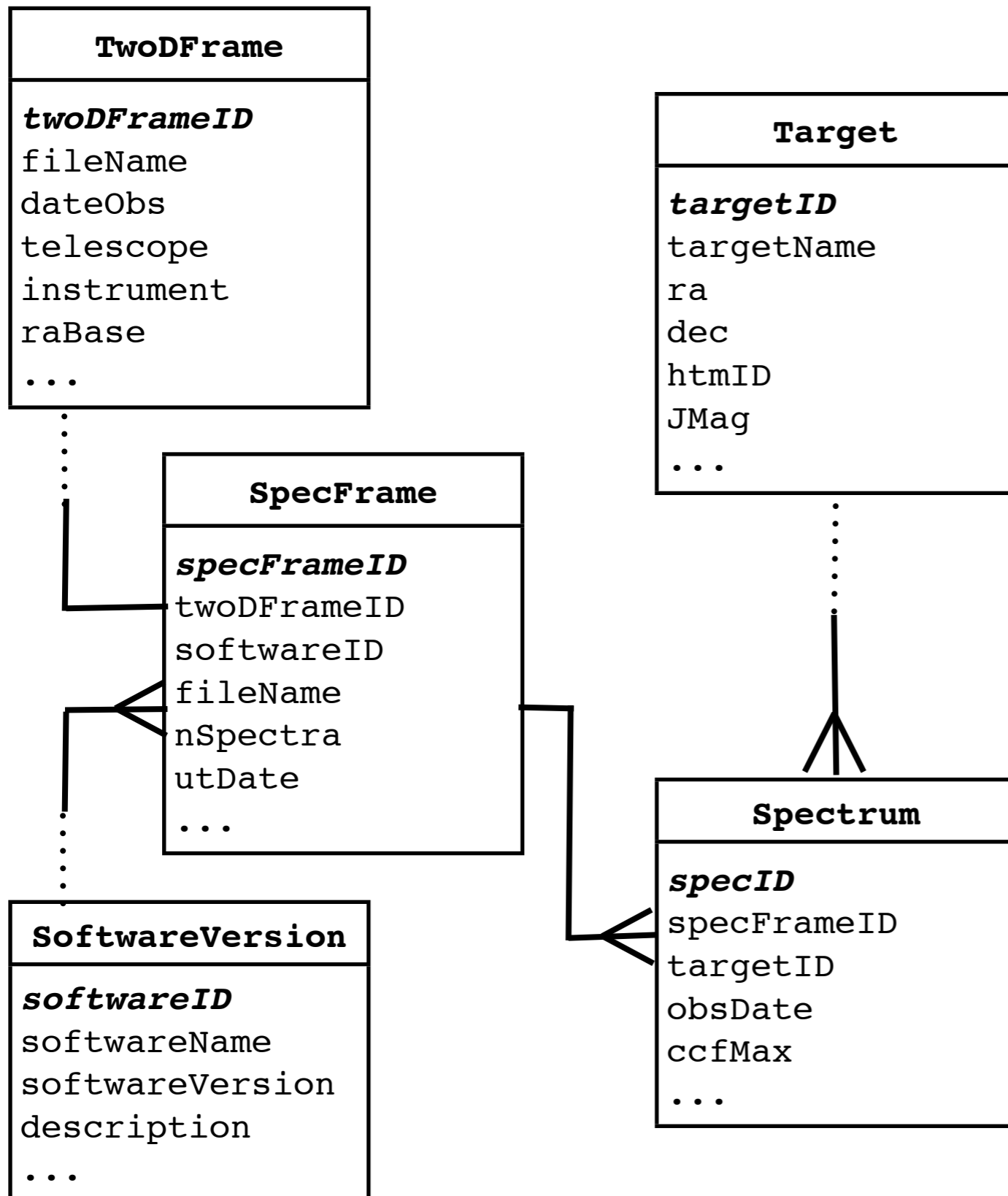
GAIA-ESO  
WFAU  
IFA ROE

# GES Data Model

- The key to a good database is a good data model
- The key to a good data model is to fully understand how all the data are related



# Spectra Observations Data Model



## TwoDFrame

raw observation image metadata

## SpecFrame

processed image metadata

## Spectrum

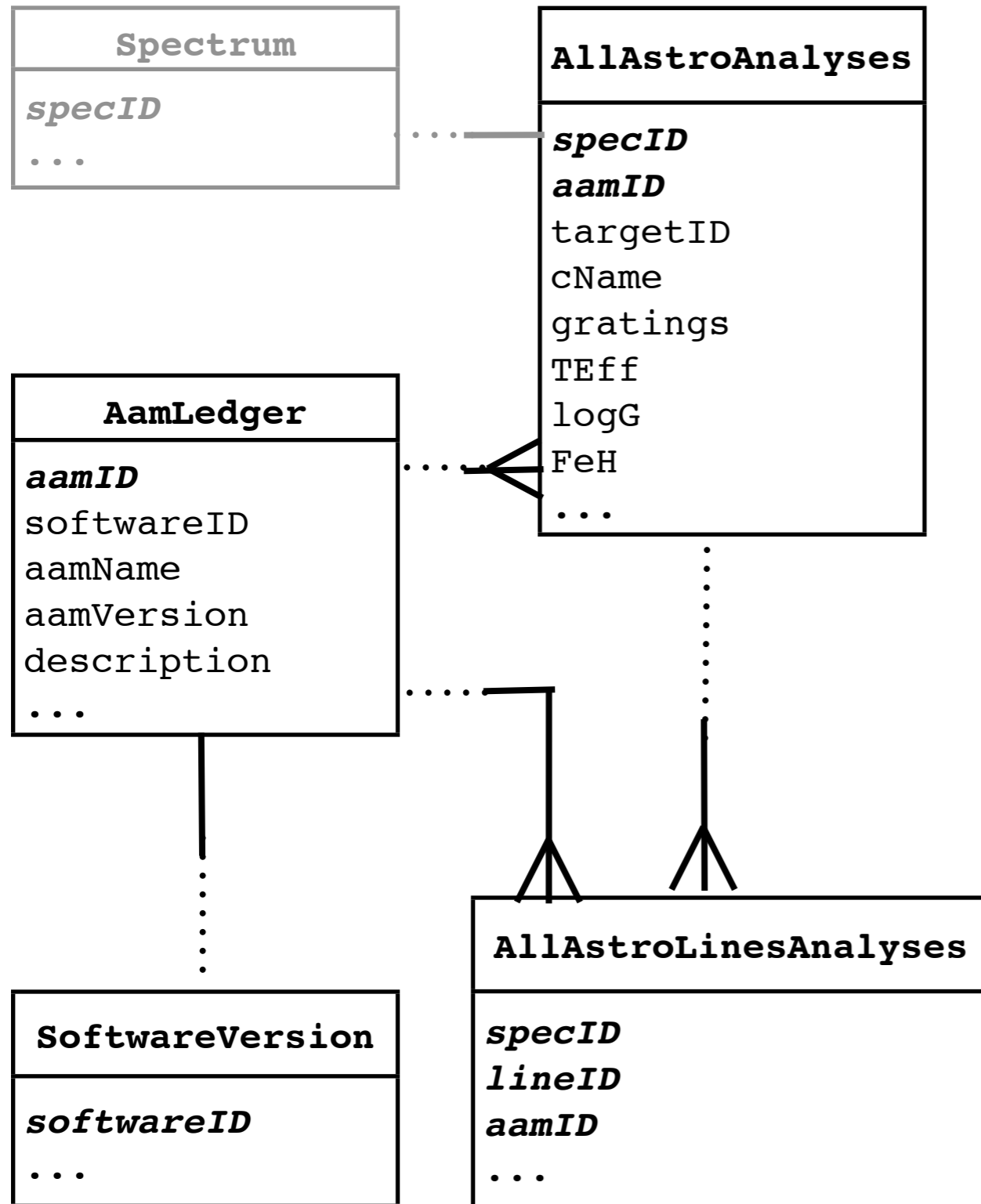
metadata of each spectrum  
extracted from image

## Target

Confusion in observation/  
analysis data between  
Targets/Objects:

Here we use Target in sense of  
the object for which a spectrum  
was taken, but in the data it is  
often used to mean the  
observation field target. May  
change this nomenclature.

# Spectra Analyses Data Model



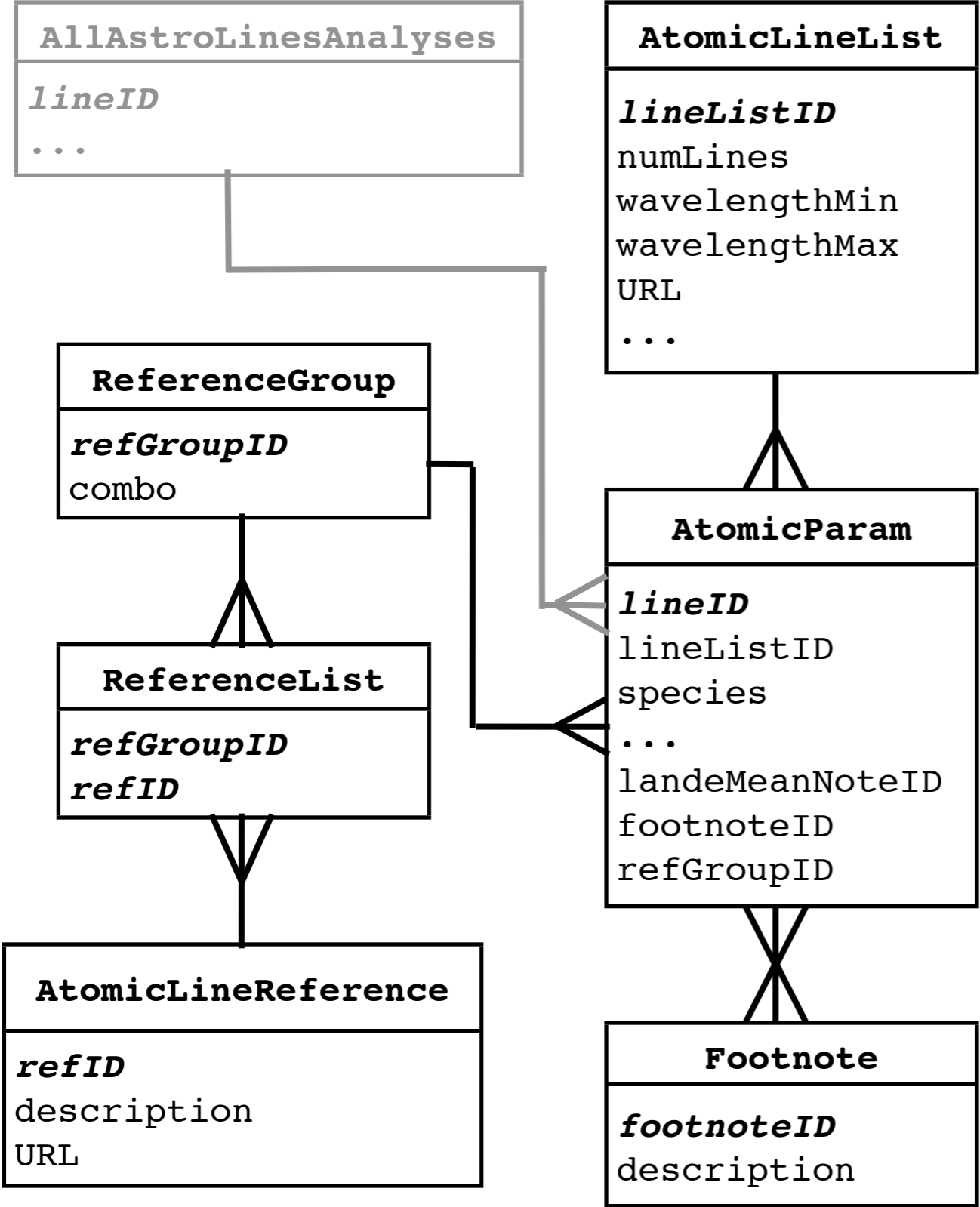
Best parameters and abundances for each spectrum in a single table, one per WG & instrument combination:

- **GiraffeAstroAnalysisWG10**
- **UvesAstroAnalysisWG11**
- **GiraffeAstroAnalysisWG12**
- **UvesAstroAnalysisWG12**
- **AstroAnalysisWG13**

Combined view of all best parameters and abundances:

- **AllAstroAnalyses**

# Atomic Line List Data Model



**AtomicLineList**  
Description of complete list

**AtomicParam**  
Individual atomic line data

**Footnote**  
Footnotes associated with line data

**ReferenceGroup**  
References used for line data

**AtomicLineReference**  
Individual bibliographical references

**ReferenceList**  
Links reference group to individual references

# Data Homogenisation

- We define the database *schema* from our data model
- Includes well described columns with consistent
  - names
  - data types
  - units
  - default values
- This makes it easy to query data from all of the WGs together in the `AllAstroAnalyses` table for science verification etc.
- Unfortunately, the data we have received to date from WGs has been highly inconsistent and is poorly described



# Plea to Working Groups

- Please send us the analysis data in self-describing [multi-extension] FITS table format
  - with unique column names
  - enforces consistent data types
  - encourages descriptions and units with the data (not in separate files) as well as clearly defined default values
  - quick & easy to program a computer to parse
- Even within a single WG we've had best parameters and best abundances variously split between files or in a single file (and with different column names for the same data in each case)

# Plea to Working Groups

- We received a multitude of different data formats from WGs:
  - FITS, tab-separated, comma-separated
  - Some had delimited strings, others not
  - Some files had column headers, others didn't.
  - Those with column headers sometimes had non-unique names and inconsistent column separations:

```
TARGET NAME      OBJECT      CNAME      Teff  dTeff  Num  eTeff  enum  logg  dlogg  Num  elogg
```

- Invalid values for data type (or inconsistent type) e.g. these “floats” even when proper defaults defined: 9.99.0, ---
- *Bottom-line:* Not difficult for the human eye to parse and understand, but takes more time and effort to program a computer to parse all data variations accurately

# Non-absolute Values

- Some data received so far has been a mixture of absolute values and some maximum values
- A mixture of floating point numbers and numbers like  $<2.109$  may be OK in a text file, but databases (and FITS files) aren't happy with this
- Suggestion: column of floating point values with an additional column to flag whether the value is absolute or a maximum (or minimum), e.g. 0 is an absolute value, 1 is a maximum value

# Default Values

- We define a single default value for each data type in the GES Science Archive database (defaults defined by individual WGs in their data are converted to our uniform default values):

<code>bigint</code>	<code>-999999999</code>	<code>float/real</code>	<code>-9.9999995e+08</code>
<code>int</code>	<code>-999999999</code>	<code>datetime</code>	<code>9999-12-31</code>
<code>smallint</code>	<code>-9999</code>	<code>varchar(&lt;4)</code>	<code>---</code>
<code>tinyint</code>	<code>0</code>	<code>varchar(&gt;3)</code>	<code>NONE</code>

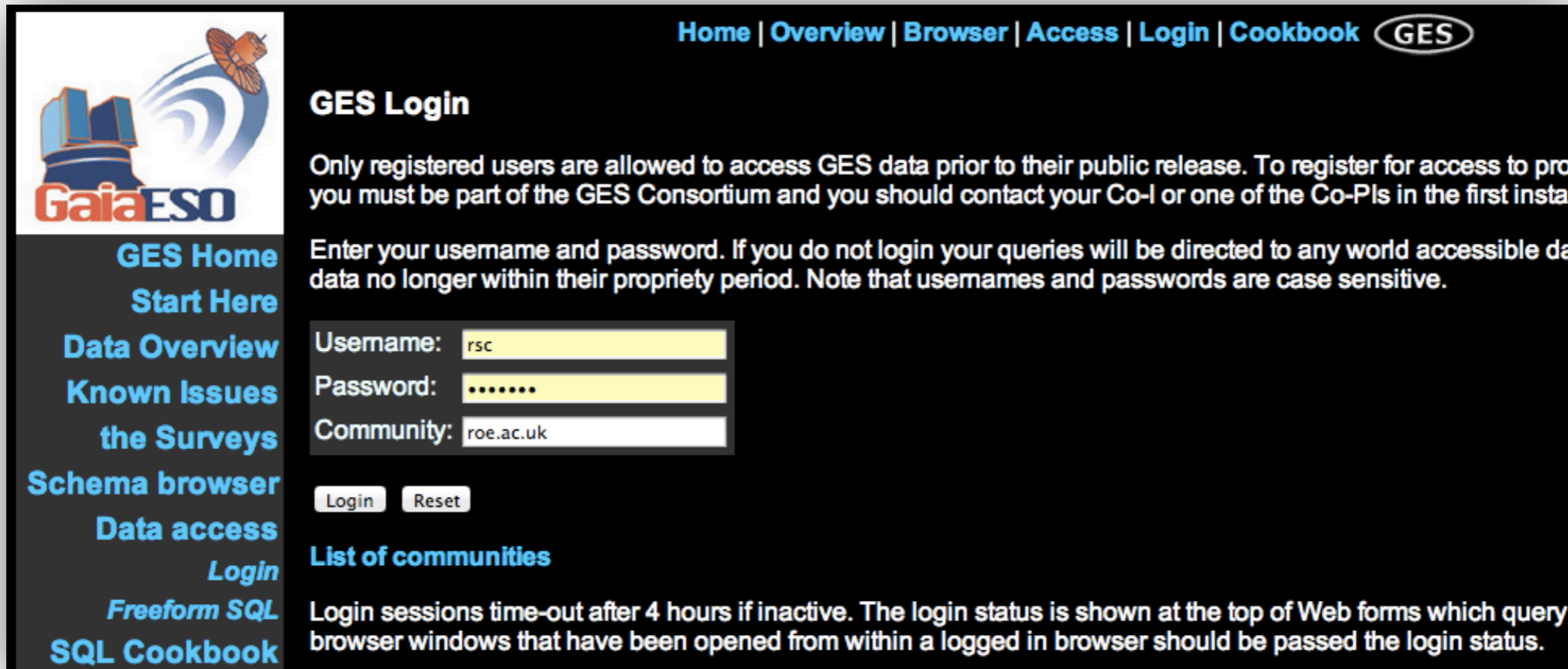
- This makes it easy to automatically always exclude default values when you select a range to query
- Most tables contain a row of default values to make joins between tables easier when value being joined is default

# Quality Control & Versioning

- All earlier data remains in the main database
- As new processing versions of earlier observations / analyses arrive, the earlier ones are marked deprecated with the `deprecated` column of all relevant tables
- Where `deprecated` column exists: ensure to select on `deprecated=0`
- Can exclude earlier data versions from subsequent static release databases
- `deprecated` column can be used to mark data of poor quality with specific code values
- This allows for either clean selections (`deprecated=0`) or more specific selections that include certain quality issues

# Using the Archive

- Access restricted via login accounts
- Currently only available to beta testers, will be available to the GES community shortly
- Remember to always login first



The screenshot shows the GaiaESO GES Login page. At the top right, there is a navigation menu with links: Home | Overview | Browser | Access | Login | Cookbook, followed by the GES logo. On the left side, there is a vertical menu with links: GES Home, Start Here, Data Overview, Known Issues, the Surveys, Schema browser, Data access, Login, Freeform SQL, and SQL Cookbook. The main content area is titled "GES Login" and contains the following text: "Only registered users are allowed to access GES data prior to their public release. To register for access to pro you must be part of the GES Consortium and you should contact your Co-I or one of the Co-PIs in the first insta". Below this text is a login form with three input fields: "Username:" with the value "rsc", "Password:" with masked characters "\*\*\*\*\*", and "Community:" with the value "roe.ac.uk". There are "Login" and "Reset" buttons below the form. At the bottom, there is a section titled "List of communities" with the text: "Login sessions time-out after 4 hours if inactive. The login status is shown at the top of Web forms which query browser windows that have been opened from within a logged in browser should be passed the login status."

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## GES Login

Only registered users are allowed to access GES data prior to their public release. To register for access to pro you must be part of the GES Consortium and you should contact your Co-I or one of the Co-PIs in the first insta

Enter your username and password. If you do not login your queries will be directed to any world accessible de data no longer within their propriety period. Note that usernames and passwords are case sensitive.

Username:

Password:

Community:

Login Reset

### List of communities

Login sessions time-out after 4 hours if inactive. The login status is shown at the top of Web forms which query browser windows that have been opened from within a logged in browser should be passed the login status.

**GaiaESO**

**GES Home**  
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**Data access**  
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**Freeform SQL**  
**SQL Cookbook**

# Login Accounts

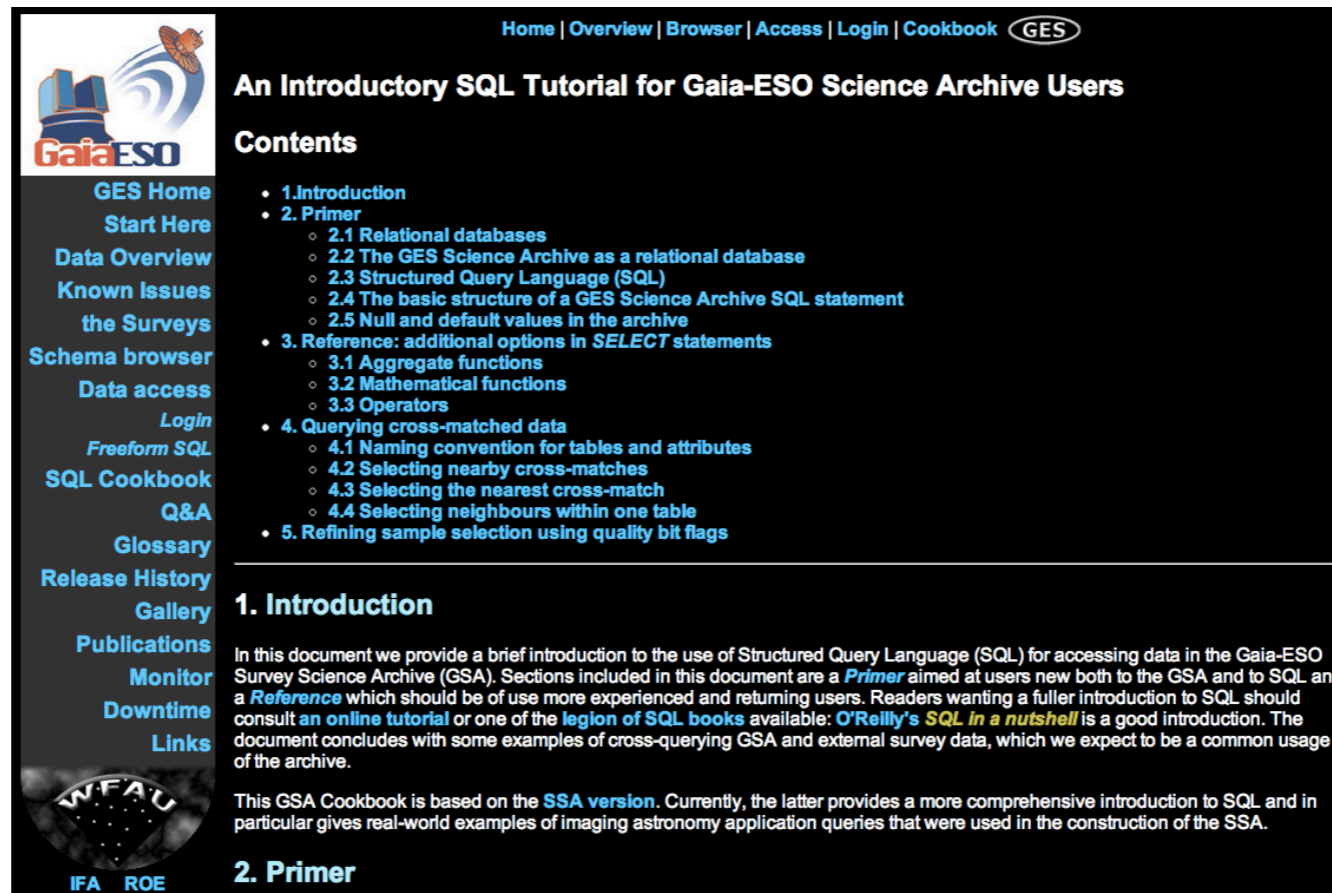
- User account administration delegated to a “community contact” for each of the communities listed on our website
- They arrange accounts for everyone in their institution that requires one
- Database access restricted by community (currently only betatesters have an accessible database), normally all communities will be able to access the same set of databases

Example communities:

betatesters	community for initial archive testing
cam.ac.uk	IoA, Cambridge, UK
eso.org	ESO
oca.eu	Observatoire de la Cote d'Azur, Nice, France

# SQL Cookbook

- Interface is only freeform SQL at present: providing direct access to the database
- Will provide some quick access forms later if helpful
- We give a tutorial in the use of SQL for beginners on the website with some example queries to play with



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## An Introductory SQL Tutorial for Gaia-ESO Science Archive Users

### Contents

- 1. Introduction
- 2. Primer
  - 2.1 Relational databases
  - 2.2 The GES Science Archive as a relational database
  - 2.3 Structured Query Language (SQL)
  - 2.4 The basic structure of a GES Science Archive SQL statement
  - 2.5 Null and default values in the archive
- 3. Reference: additional options in *SELECT* statements
  - 3.1 Aggregate functions
  - 3.2 Mathematical functions
  - 3.3 Operators
- 4. Querying cross-matched data
  - 4.1 Naming convention for tables and attributes
  - 4.2 Selecting nearby cross-matches
  - 4.3 Selecting the nearest cross-match
  - 4.4 Selecting neighbours within one table
- 5. Refining sample selection using quality bit flags

### 1. Introduction

In this document we provide a brief introduction to the use of Structured Query Language (SQL) for accessing data in the Gaia-ESO Survey Science Archive (GSA). Sections included in this document are a *Primer* aimed at users new both to the GSA and to SQL and a *Reference* which should be of use more experienced and returning users. Readers wanting a fuller introduction to SQL should consult an [online tutorial](#) or one of the [legion of SQL books](#) available: *O'Reilly's SQL in a nutshell* is a good introduction. The document concludes with some examples of cross-querying GSA and external survey data, which we expect to be a common usage of the archive.

This GSA Cookbook is based on the [SSA version](#). Currently, the latter provides a more comprehensive introduction to SQL and in particular gives real-world examples of imaging astronomy application queries that were used in the construction of the SSA.

### 2. Primer

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IFA ROE



# Schema Browser



## GES

### GES

#### Database Objects

#### Tables

- AstroAnalysisWG13
- GiraffeAstroAnalysisWG10
- GiraffeAstroAnalysisWG12
- UvesAstroAnalysisWG11
- UvesAstroAnalysisWG12
- AamLedger
- AllAstroAnalyses
- ArchiveCurationHistory
- AtomicLineList
- AtomicLineReference**
- AtomicParam
- CatalogueLedger
- CurationTask
- Footnote
- InstrumentConfig
- InstrumentConfigParameter
- ManySpec
- MolFeature
- OneDPProvenance
- Programme
- ProgrammeTarget
- ReferenceGroup
- ReferenceList
- Release
- RoleGes
- SingleSpec
- SoftwareVersion
- SpecFrame
- SpecFrameFitsKey
- Spectrum

## TABLE GiraffeAstroAnalysisWG10

WG10 merged and recommended results from analysis of Giraffe spectra

This table contains the best recommended astrophysical parameters provided by WG10 (Giraffe FGK stars) from their combined analysis of Giraffe spectra.

Required constraints:

- **Primary key** is (specID, aamID)
- (specID) references Spectrum(specID)
- (aamID) references AamLedger(aamID)

Name	Type	Length	Unit	Description
specID	bigint	8		Spectrum identifier: unique identifier for each spectrum
aamID	bigint	8		Astrophysical analysis method (AAM) identifier; unique identifier for each astrophysical analysis method
cName	varchar	32		Name derived from co-ordinates {catalogue TType keyword: Col1.name_f}
TEff	real	4	Kelvin	Effective temperature {catalogue TType keyword: Col2.teff_f}
TEffErr	real	4	Kelvin	Error on effective temperature {catalogue TType keyword: Col3.eteff_f}
logG	real	4	cgs	Logarithmic surface gravity {catalogue TType keyword: Col4.logg_f}
logGErr	real	4	cgs	Error on logarithmic surface gravity {catalogue TType keyword: Col5.elogg_f}
FeH	real	4	dex	Metallicity [Fe/H] {catalogue TType keyword: Col6.met_f}
FeHErr	real	4	dex	Error on metallicity {catalogue TType keyword: Col7.emet_f}

# Query Interface



Status: Logged in as - User: rsc Community: betatesters

## Freeform SQL Query

This form allows you to submit an SQL query to the GES database ([notes and tips](#)).

An [enhanced version of this form](#) allows the upload of a file to a temporary database table. This table part of the query being executed.

---

Programme: GES (GAIA-ESO Survey)

Database release to use:

Upload SQL query from file into this form:  No file chosen

or enter SQL statement:

```
SELECT TEff, logG FROM AllAstroAnalyses WHERE TEff > 0 AND logG > 0
```

ensure one of the file formats is selected below if you want to save your results.

Email Address:  the results of long running queries will be sent by email.

Data Format:

- HTML table summary (results are NOT saved to file)
- ASCII FILE (downloadable with HTML table summary on-screen)
- FITS FILE (downloadable with HTML table summary on-screen)

One good use of the archive in these early days is science verification tests.

Here we query the **AllAstroAnalyses** table in the archive to produce a plot of T\_Eff vs. log G

Select to save as FITS file for option to view results directly in TOPCAT

# Query Results

## GES Database - SQL Query Results

Data file generating queries can take a bit longer to execute as they write to a file ALL rows returned by the query.

A web link to your generated output file will appear at the bottom of this page.

**Connecting to gesv201303beta database**

**QUERY STARTED:** Sat Apr 06 17:15:31 BST 2013 [1 active, 29 total]

Please keep this browser window open and wait for your results or further information to appear below...

timeout: 3600


Connected to database


Submitted query: SELECT TEff, logG FROM AllAstroAnalyses WHERE TEff > 0 AND logG > 0

... OK

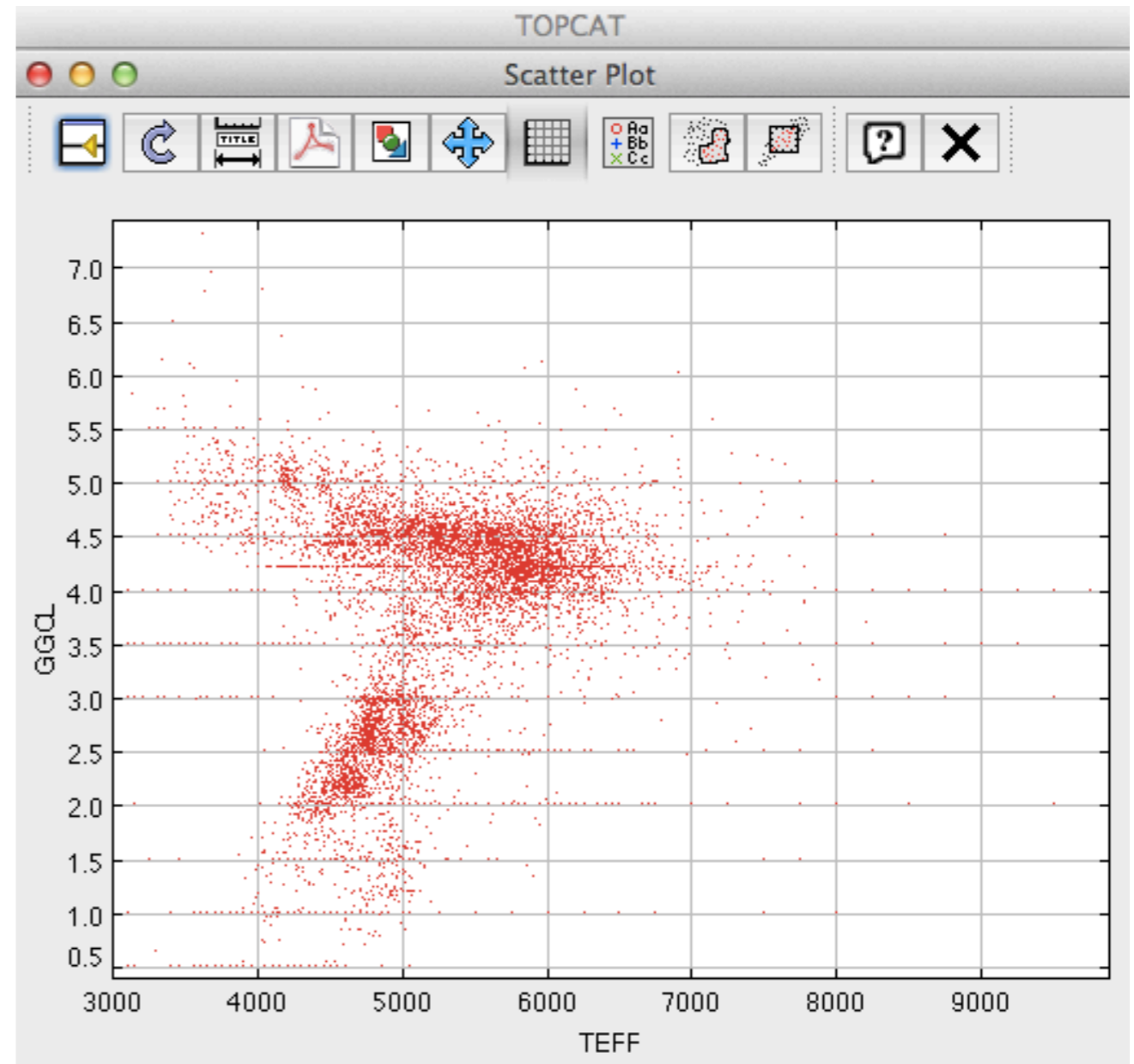
	TEff	logG
1	+4528.000000	+1.900000
2	+4470.000000	+2.530000
3	+4538.000000	+2.420000
26	+4111.000000	+1.830000
27	+4280.000000	+1.890000
28	+4138.000000	+1.550000
29	+4398.000000	+2.100000
30	+4360.000000	+2.100000

(Query returned 10260 result rows, only the first 30 rows are shown in the displayed table.)

 [Download Results File](#), your results in a gzipped FITS file (Contains **10260 rows**, 35.1 KB)

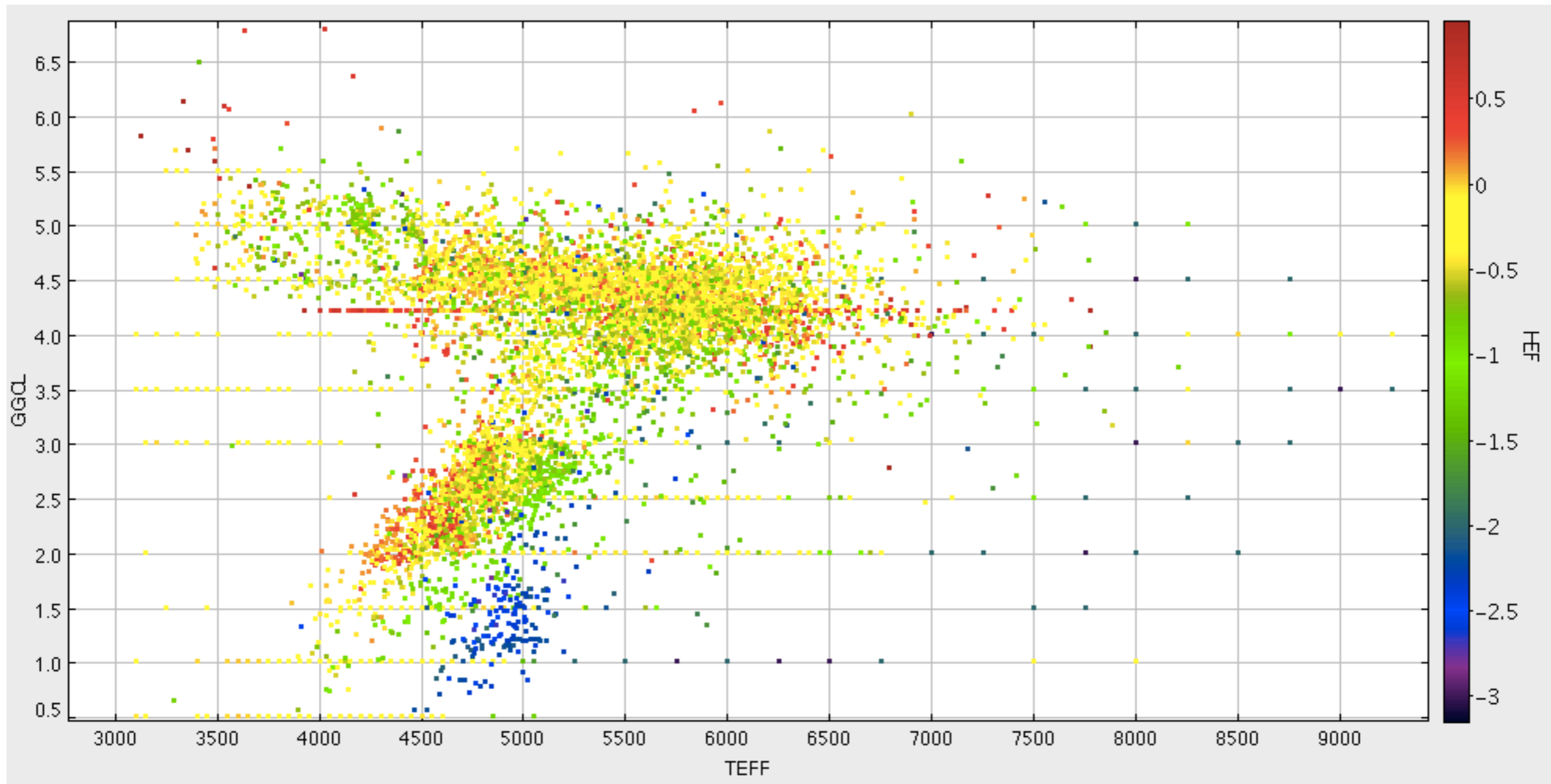
 [Launch file in Topcat](#) (requires Java 1.5 and Java Web Start, approx 12Mb download for Topcat application)

**QUERY FINISHED:** Sat Apr 06 17:15:34 BST 2013



# Query Results

- Additional columns, e.g. FeH, can be included in the results



# Spectrum Browser

- Any queries that contain both `Spectrum.nSpec` and `SpecFrame.fileName` columns in the results (*hint: join on both `Spectrum.specID` & `SpecFrame.specFrameID`*) offer a link to a preview of the spectrum

**GES Database - SQL Query Results**

Data file generating queries can take a bit longer to execute as they write to a file ALL rows returned by the query.  
 A web link to your generated output file will appear at the bottom of this page.

**Connecting to GES database**  
**QUERY STARTED:** Sat Apr 06 11:06:25 BST 2013 [1 active, 27 total]

Please keep this browser window open and wait for your results or further information to appear...

timeout: 3600  
 Connected to database


Submitted query: `SELECT TOP 10 * FROM Spectrum S, SpecFrame F WHERE S.specFrameID=F.specFrameID`


••• OK

The sLink column can be used to display the spectrum.

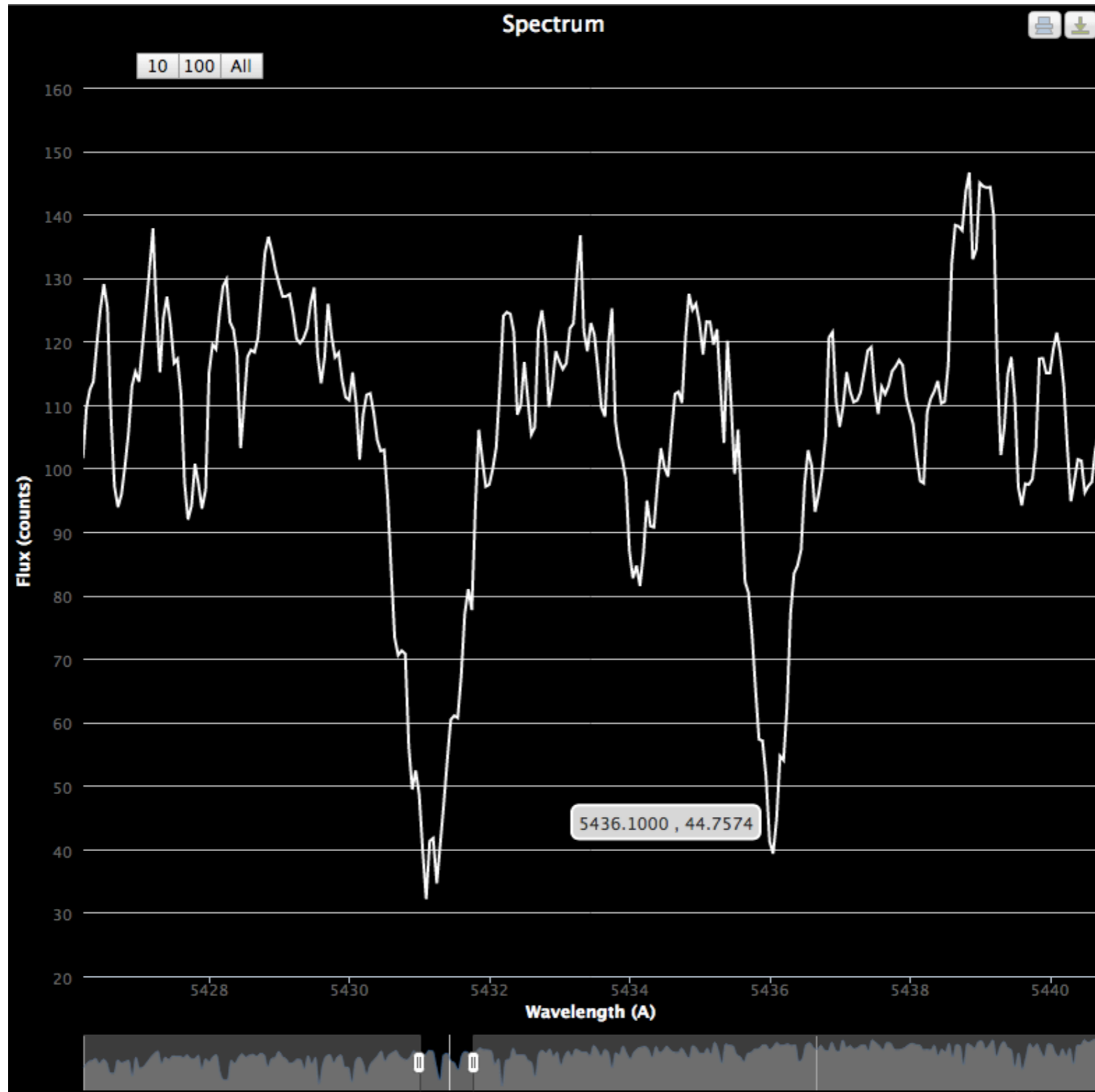
	sLink	specID	specFrameID	nSpec	nSpecOld	targetID	targetName	object	ra	dec	htmID	cx	cy
1	<a href="#">view</a>	4294967331	1	35	40	-99999999	NONE	Sr_0_218	+44.1216000	-0.3806583	8933772630748	+0.7178481	+0.6961681
2	<a href="#">view</a>	4294967332	1	36	42	-99999999	NONE	Se_0_122	+44.0726125	-0.4338944	8933788168714	+0.7184383	+0.6955495
3	<a href="#">view</a>	4294967333	1	37	43	-99999999	NONE	Se_0_214	+44.0908958	-0.3679306	8933771514337	+0.7182221	+0.6957843
4	<a href="#">view</a>	4294967334	1	38	44	-99999999	NONE	Sb_0_213	+44.0921000	-0.3785417	8933771528574	+0.7182066	+0.6957986
5	<a href="#">view</a>	4294967335	1	39	45	-99999999	NONE	Sb_0_192	+44.1145875	-0.5064306	8933796841061	+0.7179211	+0.6960684
6	<a href="#">view</a>	4294967336	1	40	46	-99999999	NONE	Se_0_96	+44.0052500	-0.5038417	8933745836685	+0.7192483	+0.6946974
7	<a href="#">view</a>	4294967337	1	41	47	-99999999	NONE	Se_0_210	+44.1569250	-0.4778472	8933798674646	+0.7174096	+0.6966017
8	<a href="#">view</a>	4294967338	1	42	48	-99999999	NONE	Sb_0_97	+44.0161792	-0.5082417	8933745280413	+0.7191153	+0.6948341
9	<a href="#">view</a>	4294967339	1	43	49	-99999999	NONE	sky_134	+44.0524542	-0.4418833	8933788294689	+0.7186822	+0.6952960
10	<a href="#">view</a>	4294967340	1	44	50	-99999999	NONE	Sb_0_209	+44.1301292	-0.4361361	8933790593192	+0.7177395	+0.6962702

(Query returned 10 result rows, all rows are shown in the displayed table.)

 [Download Results File](#), your results in a gzipped FITS file (Contains **10 rows**, 7 KB)

 [Launch file in Topcat](#) (requires Java 1.5 and Java Web Start, approx 12Mb download for Topcat application)

# Spectrum Browser



# FITS Spectra Download

- Any queries that contain the `SpecFrame.fileName` column in the results (*hint*: join on `SpecFrame.specFrameID`) offer a link to download the VO-compliant FITS file of the spectra that can be viewed in SPLAT etc.

**GES Database - SQL Query Results**

Data file generating queries can take a bit longer to execute as they write to a file ALL rows returned by the query.  
A web link to your generated output file will appear at the bottom of this page.

**Connecting to gesv201303beta database**  
**QUERY STARTED:** Mon Apr 08 12:53:58 BST 2013 [1 active, 9 total]

Please keep this browser window open and wait for your results or further information to appear below...

timeout: 3600  
Connected to database


Submitted query: `SELECT TOP 10 fileName, nSpec FROM Spectrum S, SpecFrame F WHERE S.specFrameID=F.specFrameID`


••• OK

The sLink column can be used to display the spectrum.  
The getFLink column can be used to download the referenced FITS file.

	sLink	getFLink	fileName	nSpec
1	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	35
2	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	36
3	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	37
4	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	38
5	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	39
6	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	40
7	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	41
8	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	42
9	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	43
10	<a href="#">view</a>	<a href="#">download</a>	/disk40/ges/ingest/fits/tests/May2012/C20111231_H548.8_MW_0255555-002846_1.fit	44

(Query returned 10 result rows, all rows are shown in the displayed table.)

 [Download Results File](#), your results in a gzipped FITS file (Contains **10 rows**, 628 bytes)

 [Launch file in Topcat](#) (requires Java 1.5 and Java Web Start, approx 12Mb download for Topcat application)

# Cross-matches

- Cross-match targets with other survey catalogues also hosted/mirrored at WFAU:
  - VISTA PS - ESO infrared photometry
  - VST PS - ESO visible photometry
  - 2MASS - all sky infrared photometry
  - SSS - all sky visible photometry
  - SDSS - Sloan Digital Sky Survey
- *And many more...*
- Data model allows joins with these catalogues enabling a single query to retrieve for any targets in the GES archive the observation measurements from all surveys



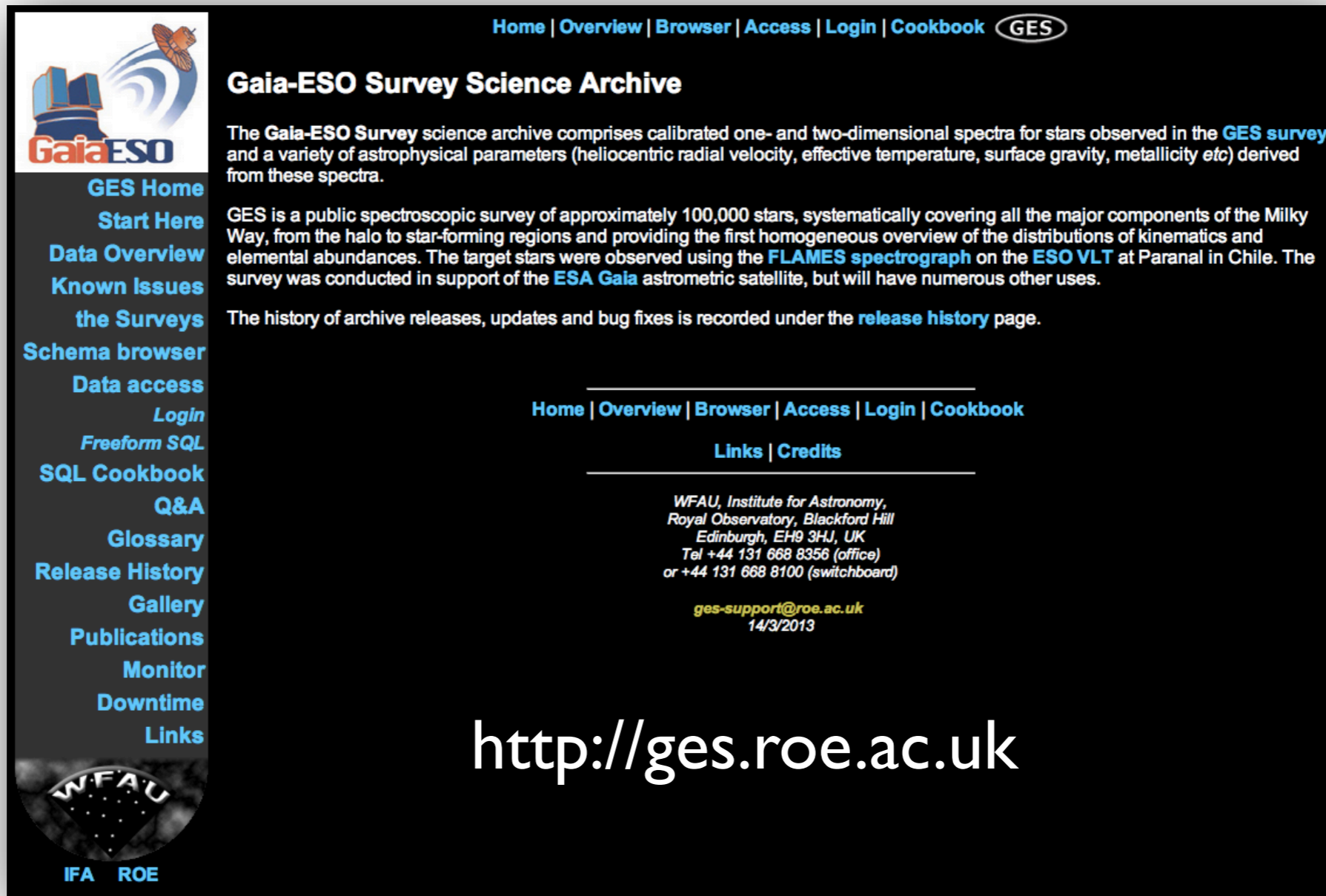
# What's next?

- Tidying up the data schema
  - from beta testing feedback
- Implementing all links in the data model
  - key missing links are Spectrum & Target table data
  - need latest processed spectra from Cambridge
- Produce a consortium-wide release database
- Eventually this data will be publicly accessible (inc.VO) and *referencable*: can include SQL queries used against specific data releases in your papers for reproducibility


# The GES Science Archive

Ross Collins

Nigel Hambly, Clive Davenhall, Mike Read, Eckhard Sutorius  
WFAU, Institute for Astronomy, Royal Observatory Edinburgh



The screenshot shows the website's navigation menu on the left, a main content area with a header and two paragraphs of text, and a footer with contact information. The navigation menu includes links for Home, Overview, Browser, Access, Login, Cookbook, and a GES logo. The main content area features a title 'Gaia-ESO Survey Science Archive' and two paragraphs describing the survey and its data. The footer contains contact details for WFAU, including an email address and a date.

[Home](#) | [Overview](#) | [Browser](#) | [Access](#) | [Login](#) | [Cookbook](#) 

## Gaia-ESO Survey Science Archive

The **Gaia-ESO Survey** science archive comprises calibrated one- and two-dimensional spectra for stars observed in the **GES survey**, and a variety of astrophysical parameters (heliocentric radial velocity, effective temperature, surface gravity, metallicity *etc*) derived from these spectra.

GES is a public spectroscopic survey of approximately 100,000 stars, systematically covering all the major components of the Milky Way, from the halo to star-forming regions and providing the first homogeneous overview of the distributions of kinematics and elemental abundances. The target stars were observed using the **FLAMES spectrograph** on the **ESO VLT** at Paranal in Chile. The survey was conducted in support of the **ESA Gaia** astrometric satellite, but will have numerous other uses.

The history of archive releases, updates and bug fixes is recorded under the [release history](#) page.

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