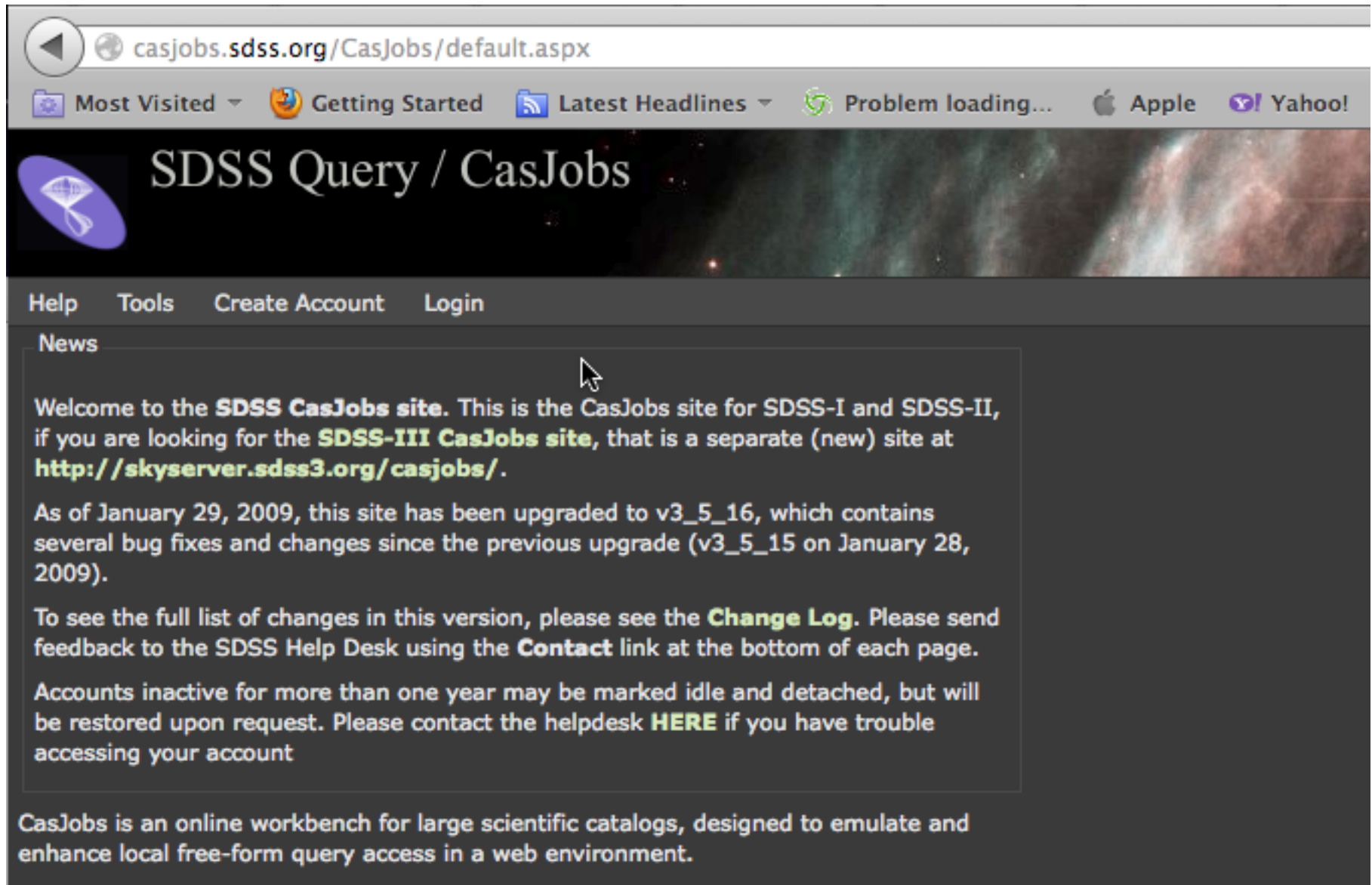


# CasJobs Step-by-Step Demo



The screenshot shows a web browser window with the address bar displaying `casjobs.sdss.org/CasJobs/default.aspx`. The browser's toolbar includes "Most Visited", "Getting Started", "Latest Headlines", "Problem loading...", "Apple", and "Yahoo!". The website header features the SDSS logo and the text "SDSS Query / CasJobs" against a background of a nebula. A navigation menu contains "Help", "Tools", "Create Account", and "Login". A "News" section is highlighted, containing the following text:

News

Welcome to the **SDSS CasJobs site**. This is the CasJobs site for SDSS-I and SDSS-II, if you are looking for the **SDSS-III CasJobs site**, that is a separate (new) site at <http://skyserver.sdss3.org/casjobs/>.

As of January 29, 2009, this site has been upgraded to v3\_5\_16, which contains several bug fixes and changes since the previous upgrade (v3\_5\_15 on January 28, 2009).

To see the full list of changes in this version, please see the **Change Log**. Please send feedback to the SDSS Help Desk using the **Contact** link at the bottom of each page.


Accounts inactive for more than one year may be marked idle and detached, but will be restored upon request. Please contact the helpdesk **HERE** if you have trouble accessing your account

CasJobs is an online workbench for large scientific catalogs, designed to emulate and enhance local free-form query access in a web environment.

# Log in (get an account)

casjobs.sdss.org/CasJobs/login.aspx

Most Visited Getting Started Latest Headlines Problem loading... Apple Yahoo!

 SDSS Query / CasJobs

Help Tools Create Account Login

User ID

Password

If you do not have a login please **create an account**.

**Contact**  
\$Name: v3\_5\_16 \$ , \$Revision: 1.11 \$, Last modified: Tuesday, April 24, 2007 at 6:52:23 PM

# The “Front-End”

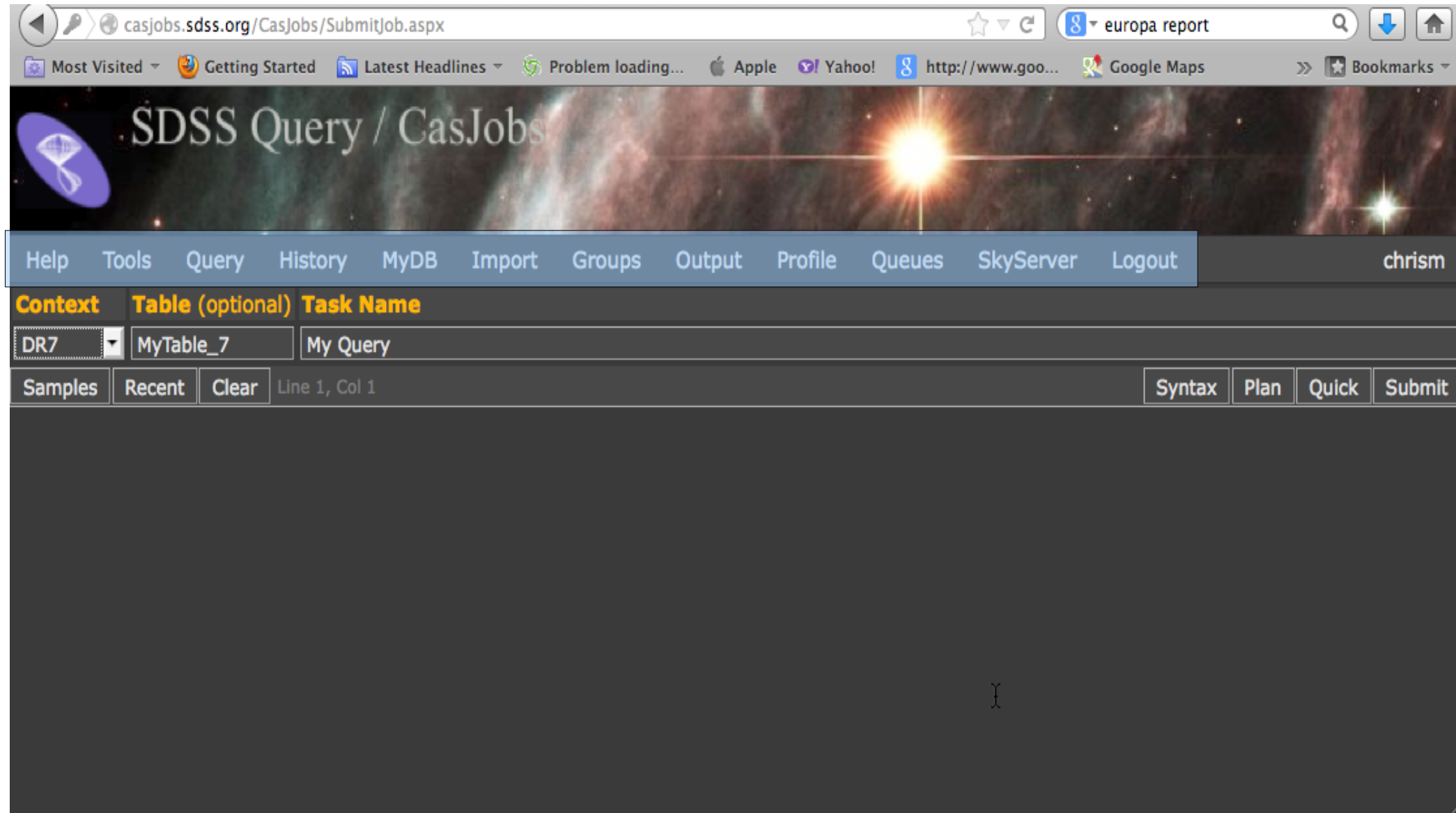
The image shows a screenshot of a web browser displaying the SDSS Query / CasJobs interface. The browser's address bar shows the URL `casjobs.sdss.org/CasJobs/SubmitJob.aspx`. The search bar contains the text "europa report". The browser's bookmark bar includes "Most Visited", "Getting Started", "Latest Headlines", "Problem loading...", "Apple", "Yahoo!", "http://www.goo...", "Google Maps", and "Bookmarks".

The main content area features a header with the SDSS logo and the text "SDSS Query / CasJobs" set against a background image of a star and nebula. Below the header is a navigation menu with the following items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and the user name "chrism".

The interface includes a form for submitting a query. It has three main sections: "Context" with a dropdown menu showing "DR7", "Table (optional)" with a text input field containing "MyTable\_7", and "Task Name" with a text input field containing "My Query". Below these fields are buttons for "Samples", "Recent", and "Clear", along with a status indicator "Line 1, Col 1". On the right side of the form, there are buttons for "Syntax", "Plan", "Quick", and "Submit".

The main body of the page is a large, dark gray area, likely intended for displaying query results or logs, which is currently empty.

# Tabs



The screenshot shows a web browser window with the URL `casjobs.sdss.org/CasJobs/SubmitJob.aspx`. The page title is "SDSS Query / CasJobs". The navigation menu includes the following items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and a user name "chrism". The "Query" tab is highlighted. Below the navigation menu, there are three input fields: "Context" (set to "DR7"), "Table (optional)" (set to "MyTable\_7"), and "Task Name" (set to "My Query"). At the bottom of the interface, there are buttons for "Samples", "Recent", "Clear", "Syntax", "Plan", "Quick", and "Submit". The main content area is currently empty, showing a cursor at "Line 1, Col 1".

# Context

casjobs.sdss.org/CasJobs/SubmitJob.aspx

europa report

Most Visited Getting Started Latest Headlines Problem loading... Apple Yahoo! http://www.goo... Google Maps Bookmarks

## SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout chrism

**Context** **Table (optional)** **Task Name**

Table (optional)	Task Name
DR7	My Query

Samples Recent Clear Line 1, Col 1 Syntax Plan Quick Submit

# Context

The screenshot shows a web browser window with the URL `casjobs.sdss.org/CasJobs/SubmitJob.aspx`. The page title is "SDSS Query / CasJobs". The browser's address bar shows "europa report" and "http://www.goo...". The page features a navigation menu with items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and a user name "chrism".

The main content area has a header with "Context", "Table (optional)", and "Task Name". Below this, there are input fields for "MyTable\_7" and "My Query". A "Recent" button and a "Clear" button are visible. The "Context" dropdown menu is open, showing a list of options: DR7, RunsDB, Stripe82, DR6, DR5, DR4, DR3, DR2, and MYDB. The "DR7" option is currently selected and highlighted in blue. To the right of the input fields, there are buttons for "Syntax", "Plan", "Quick", and "Submit".

Context	Table (optional)	Task Name
DR7	MyTable_7	My Query



# Context

The image shows a web browser window displaying the SDSS Query / CasJobs interface. The browser's address bar shows the URL `casjobs.sdss.org/CasJobs/SubmitJob.aspx`. The search bar contains the text "europa report". The browser's bookmark bar includes "Most Visited", "Getting Started", "Latest Headlines", "Problem loading...", "Apple", "Yahoo!", "http://www.goo...", "Google Maps", and "Bookmarks".

The main content area features a navigation bar with the following links: "history", "MyDB", "Import", "Groups", "Output", "Profile", "Queues", "SkyServer", "Logout", and "chrism". Below the navigation bar, there is a "Task Name" field containing the text "My Query". To the right of the task name field, there are four buttons: "Syntax", "Plan", "Quick", and "Submit".

A dropdown menu is open on the left side of the page, listing the following database instances: "Context", "DR7", "DR7", "RunsDB", "Stripe82", "DR6", "DR5", "DR4", "DR3", "DR2", and "MYDB". The "Context" option is highlighted in blue, and a mouse cursor is pointing at the second "DR7" option.

# YOUR Tables

casjobs.sdss.org/CasJobs/SubmitJob.aspx

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout chrism

**Context** **Table (optional)** **Task Name**

DR7 MyTable\_7 My Query

Samples Recent Clear Syntax Plan Quick Submit

Line 1, Col 1

Your results will get “stuffed” into a new table that you can then download, plot, share, etc.



# Example Queries

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout chrism

**Context** **Table (optional)** **Task Name**

DR7 MyTable\_7 Compare Photo-z's to Spectroscopic z's

Examples Recent Clear Line 1, Col 1 Syntax Plan Quick Submit

**Basic SELECT FROM WHERE**  
**Galaxies two criteria**  
**Unclassified spectra**  
**Galaxies multiple criteria**  
**Spatial unit vectors**  
**CVs using colors**  
**Data subsample**  
**Low z QSOs by colors**  
**Velocities and errors**  
**Using BETWEEN**  
**Moving asteroids**  
**Quasars in imaging**  
**Object counts and logic**  
**Galaxy star blends**

Actually, the example queries are really for “experts”

# Example Queries

casjobs.sdss.org/CasJobs/SubmitJob.aspx

europa report

Submit

Groups Output Profile Queues SkyServer Logout chrism

pic z's

Syntax Plan Quick Submit

**DR7** **MyTable\_7** **Compar**

**Examples** **Recent** **Clear** Line 1, Col 1

- Basic SELECT FROM WHERE**
- Galaxies two criteria**
- Unclassified spectra**
- Galaxies multiple criteria**
- Spatial unit vectors**
- CVs using colors**
- Data subsample**
- Low z QSOs by colors**
- Velocities and errors**
- Using BETWEEN**
- Moving asteroids**
- Quasars in imaging**
- Object counts and logic**
- Galaxy star blends**

Actually, the example queries are really for “experts”

# Example Queries

(in SQL created by the SDSS team)

The screenshot shows a web browser window with the URL `casjobs.sdss.org/dr7/en/help/docs/realquery.asp`. The page title is "Sample SQL Queries". The browser's address bar shows "europa report" in the search field. The page has a navigation menu with links: Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, Help. On the left, there is a "DR7 Help" section with a small image of a galaxy and a list of links: Site News, Introduction, Cooking with Sloan, FAQ, Search, Form Guide, SQL Tutorial, SQL in SkyServer, Sample SQL Queries (highlighted), Graphing, Query, Limits, Searching. The main content area is titled "Sample SQL Queries" and contains the following text:

The following is a selection of actual queries submitted by SDSS users, and some are in response to scientific questions posed by users. The queries are listed in increasing order of difficulty/complexity. Where applicable, query execution times for the latest SDSS data releases are noted.

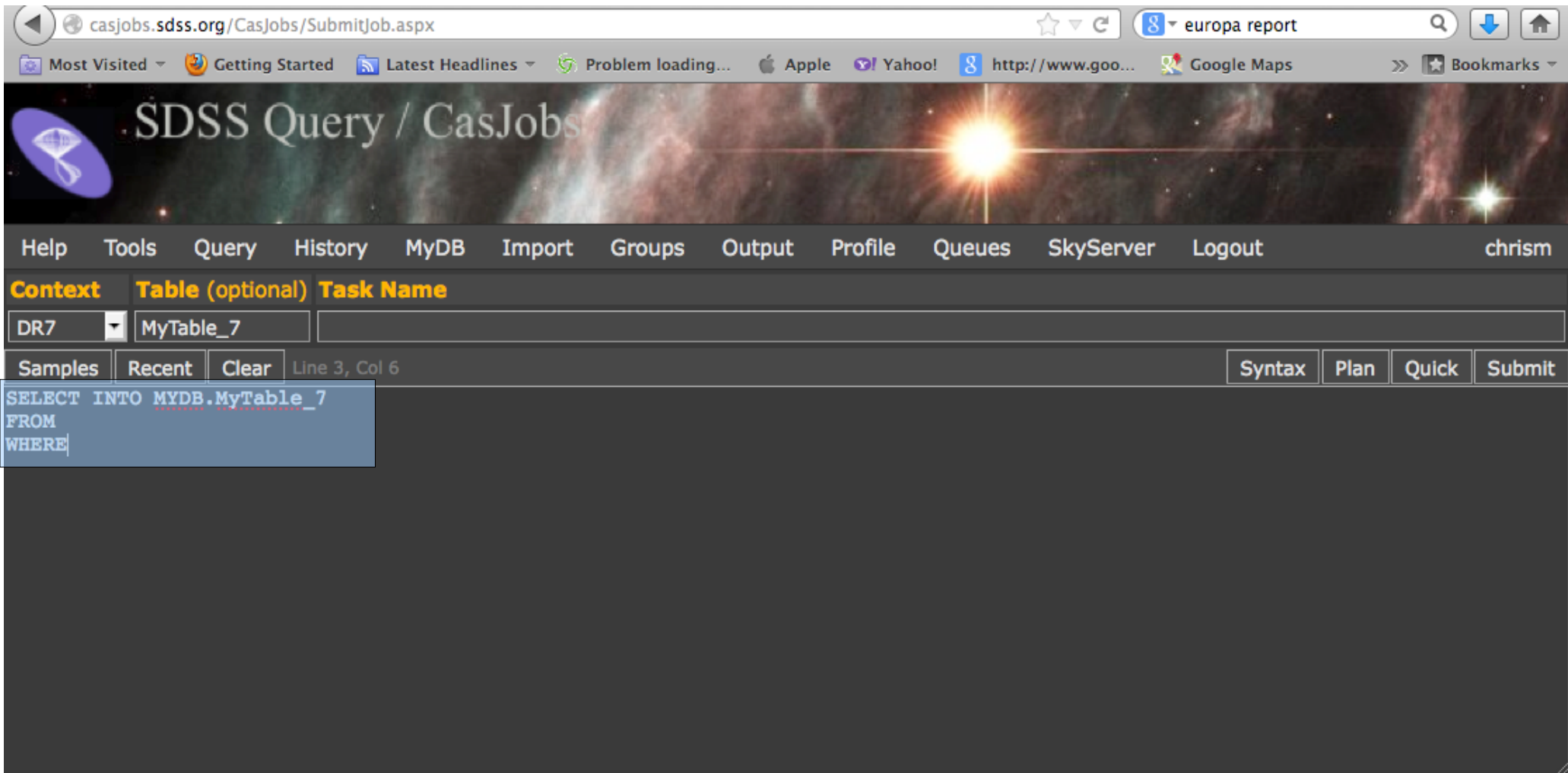
**NOTE:** Please also read the [Optimizing Queries](#) and [Bookmark Lookup Bug](#) sections of the [SQL Intro page](#) to learn how to run faster queries, and the [Query Limits](#) page to see the timeouts and row limits on queries.

Click on the name of the query from the list below to go directly to that sample query. The queries are roughly in order of increasing complexity. You can cut and paste queries from here into your favorite search tool.

<ul style="list-style-type: none"><li>• <a href="#">Basic SELECT-FROM-WHERE</a></li><li>• <a href="#">Galaxies with two criteria</a></li><li>• <a href="#">Unclassified spectra</a></li><li>• <a href="#">Galaxies with multiple criteria</a></li><li>• <a href="#">Spatial unit vectors</a></li><li>• <a href="#">CVs using colors</a></li><li>• <a href="#">Data subsample</a></li><li>• <a href="#">Low z QSOs by colors</a></li><li>• <a href="#">Velocities and errors</a></li><li>• <a href="#">Using BETWEEN</a></li><li>• <a href="#">Moving asteroids</a></li><li>• <a href="#">Quasars in imaging</a></li><li>• <a href="#">Selected neighbors in run</a></li><li>• <a href="#">Multiple OUTER JOINS</a></li><li>• <a href="#">Repeat spectra</a></li></ul>	<ul style="list-style-type: none"><li>• <a href="#">Repeated high-z objects</a></li><li>• <a href="#">Object counts and logic</a></li><li>• <a href="#">Galaxies blended with stars</a></li><li>• <a href="#">Stars in specific fields</a></li><li>• <a href="#">Using three tables</a></li><li>• <a href="#">Objects close pairs</a></li><li>• <a href="#">QSOs in spectroscopy</a></li><li>• <a href="#">Errors using flags</a></li><li>• <a href="#">Elliptical galaxies</a></li><li>• <a href="#">Galaxies with blue centers</a></li><li>• <a href="#">Diameter limited sample</a></li><li>• <a href="#">Extremely red galaxies</a></li><li>• <a href="#">LRG sample</a></li><li>• <a href="#">Brightness of closest source</a></li><li>• <a href="#">Multiple spectral lines</a></li></ul>	<ul style="list-style-type: none"><li>• <a href="#">Galaxies by spectra</a></li><li>• <a href="#">Clean photometry</a></li><li>• <a href="#">Binary stars colors</a></li><li>• <a href="#">QSO broadlines near galaxy</a></li><li>• <a href="#">Galaxies unsaturated</a></li><li>• <a href="#">Ellipticals with odd lines</a></li><li>• <a href="#">Broadest spectral lines</a></li><li>• <a href="#">Gridded galaxy counts</a></li><li>• <a href="#">Galaxy counts on HTM grid</a></li><li>• <a href="#">Stars multiply measured</a></li><li>• <a href="#">White Dwarf candidates</a></li><li>• <a href="#">More quasar queries</a></li><li>• <a href="#">Using LEFT OUTER JOIN</a></li><li>• <a href="#">Galaxy counts in North</a></li><li>• <a href="#">Counts by type and program</a></li></ul>
---	---	--

Look here BEFORE you start building queries

# Building Your Query (you type it)

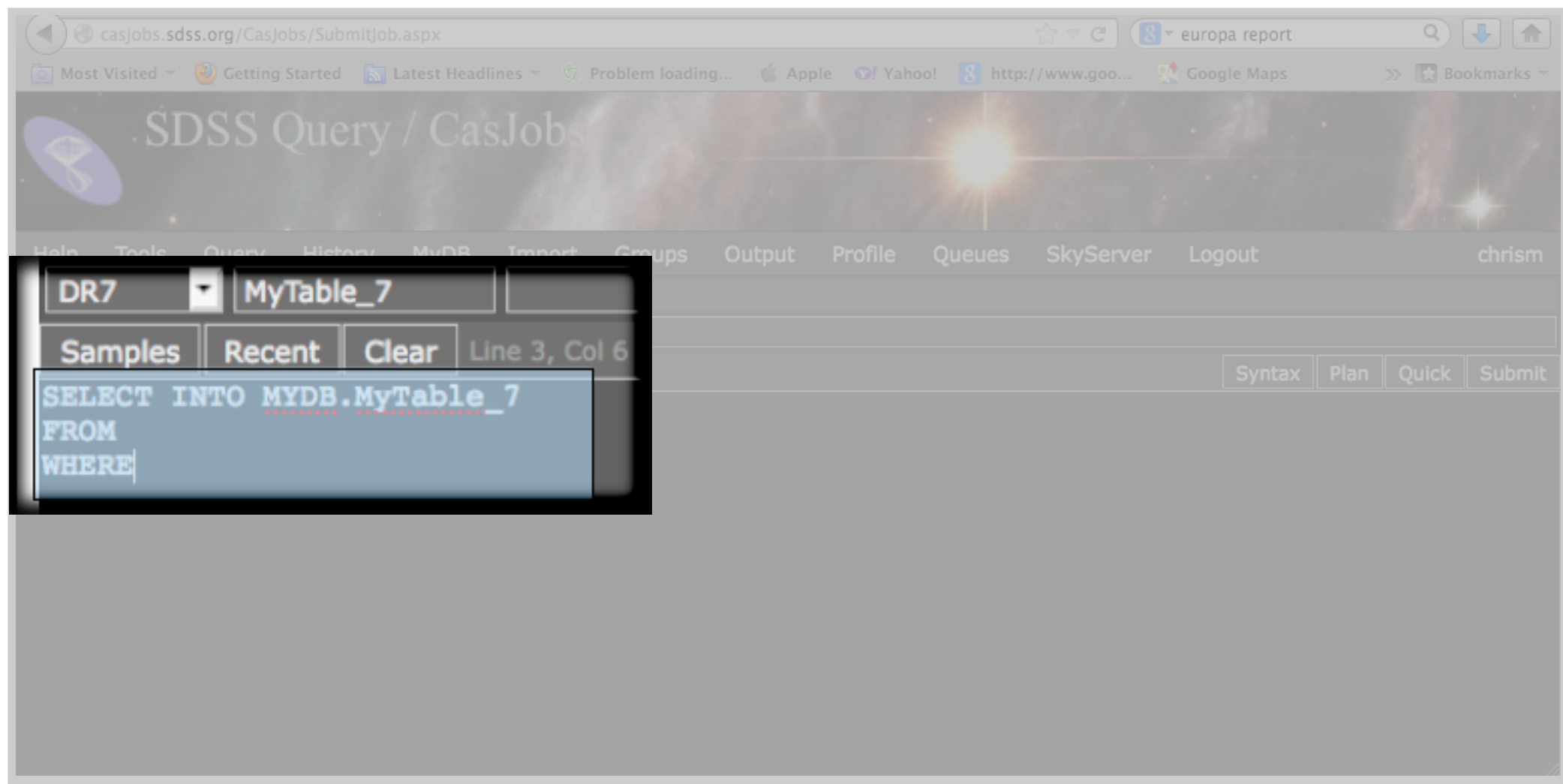


The screenshot shows the SDSS Query / CasJobs web interface. The browser address bar displays `casjobs.sdss.org/CasJobs/SubmitJob.aspx`. The page header includes the SDSS logo and the text "SDSS Query / CasJobs". A navigation menu contains links for Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and the user name "chrism". Below the navigation menu, there are three input fields: "Context" (set to "DR7"), "Table (optional)" (set to "MyTable\_7"), and "Task Name" (empty). A toolbar includes buttons for "Samples", "Recent", "Clear", "Syntax", "Plan", "Quick", and "Submit". The main query editor area contains the following SQL query:

```
SELECT INTO MYDB.MyTable_7
FROM
WHERE
```

The first step is decide FROM what tables you are going to query

# Building Your Query (you type it)



The screenshot shows the SDSS Query / CasJobs web interface. The browser address bar displays `casjobs.sdss.org/CasJobs/SubmitJob.aspx`. The page title is "SDSS Query / CasJobs". The navigation menu includes "Help", "Tools", "Query", "History", "MyDB", "Import", "Groups", "Output", "Profile", "Queues", "SkyServer", "Logout", and the user name "chrism".

The query editor is active, showing a dropdown menu for "DR7" and a text input field containing "MyTable\_7". Below the input field are buttons for "Samples", "Recent", and "Clear". The status bar indicates "Line 3, Col 6".

The SQL query being typed is highlighted in a blue box:

```
SELECT INTO MYDB.MyTable_7  
FROM  
WHERE
```

At the bottom right of the query editor, there are buttons for "Syntax", "Plan", "Quick", and "Submit".

The first step is decide FROM what tables you are going to query



# Learn Your Schema

The screenshot shows the Sloan Digital Sky Survey / SkyServer website. At the top, there is a navigation bar with the SDSS logo and the text "Sloan Digital Sky Survey / SkyServer". Below this, there are flags for the United States, Germany, Hungary, Spain, and Brazil. A secondary navigation bar contains links for Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, and Help. The main content area is titled "Schema Browser" in large green letters. On the left side, there is a sidebar with a search box and a "Go" button. Below the search box, there is a list of categories: Tables, Views, Functions, Procedures, Constants, and Indices, each with a plus sign icon. The main content area contains three paragraphs of text explaining the database structure. The first paragraph states that data is contained in **Tables**, organized in columns and rows, and that **Views** are defined over the tables. The second paragraph explains that most tables have one or more **Indices** defined on them to speed up searches. The third paragraph describes **Functions** and stored **Procedures**, which take parameters and execute a sequence of commands. The fourth paragraph mentions the **SDSSConstants** table, which contains most of the parameters relevant to the SDSS.

Glossary  
Algorithms

Search for

- + **Tables**
- + **Views**
- + **Functions**
- + **Procedures**
- + **Constants**
- + **Indices**

The data in the database is contained in **Tables**, organized in columns and rows. We have defined **Views** over the tables. These represent special subsets of the original table.

Most of the tables also have one or more **Indices** defined on them to speed up searches on them. Please see the **Archive Intro** Help page for more information on the types of indices.

**Functions** and stored **Procedures** take a number of parameters, and execute a previously defined sequence of commands. Usually, their names are prefixed by *f* or *sp*, like in *fPhotoStatus* or *spGetFiberList*.

The table **SDSSConstants** contains most of the parameters relevant to the SDSS.

The schema defines how the database is organized.



# Learn Your Schema

The screenshot shows the Sloan Digital Sky Survey / SkyServer website. At the top, there is a navigation bar with the SDSS logo and the text "Sloan Digital Sky Survey / SkyServer". Below this, there are flags for the United States, Germany, Hungary, Spain, and Brazil. The main navigation menu includes links for Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, and Help. The "Schema Browser" section is highlighted in green. On the left, there is a sidebar with links for Glossary, Algorithms, and a search box. The search box contains the text "Tables" and a "Go" button. Below the search box, a dropdown menu is open, showing a list of database tables: Algorithm, Ap7Mag, BestTarget2Sector, Chunk, DataConstants, and DBColumns. The main content area of the Schema Browser contains several paragraphs of text explaining the database structure. The first paragraph states that data is contained in **Tables**, organized in columns and rows, and that **Views** are defined over the tables. The second paragraph explains that most tables have one or more **Indices** defined on them to speed up searches. The third paragraph describes **Functions** and stored **Procedures**, which take parameters and execute a sequence of commands. The fourth paragraph mentions the **SDSSConstants** table, which contains most of the parameters relevant to the SDSS.

Sloan Digital Sky Survey / SkyServer

Home Tools Schema Projects Astronomy SDSS Contact Us Download Site Search Help

## Schema Browser

Glossary  
Algorithms

Search for

- Tables
  - Algorithm
  - Ap7Mag
  - BestTarget2Sector
  - Chunk
  - DataConstants
  - DBCColumns

The data in the database is contained in **Tables**, organized in columns and rows. We have defined **Views** over the tables. These represent special subsets of the original table.

Most of the tables also have one or more **Indices** defined on them to speed up searches on them. Please see the **Archive Intro** Help page for more information on the types of indices.

**Functions** and stored **Procedures** take a number of parameters, and execute a previously defined sequence of commands. Usually, their names are prefixed by *f* or *sp*, like in *fPhotoStatus* or *spGetFiberList*.

The table **SDSSConstants** contains most of the parameters relevant to the SDSS.

The tables contain the data.

# Learn Your Schema

Sloan Digital Sky Survey / SkyServer

Home Tools Schema Projects Astronomy SDSS Contact Us Download Site Search Help

## Schema Browser

Glossary

- Tables**
- Algorithm
- Ap7Mag
- BestTarget2Sector
- Chunk
- DataConstants
- DRColumns

The data in the database is contained in **Tables**, organized in columns and rows. We have defined **Views** over the tables. These represent special subsets of the original table.

Some of the tables also have one or more **Indices** defined on them to speed up searches on them. Please see the **Archive Intro** Help page for more information on the types of indices.

**Functions** and stored **Procedures** take a number of parameters, and execute a previously defined sequence of commands. Usually, their names are prefixed by *sp*, like in *fPhotoStatus* or *spGetFiberList*.

The table **SDSSConstants** contains most of the parameters relevant to the SDSS.

The tables contain the data.

# Learn Your Schema

The screenshot shows the Sloan Digital Sky Survey / SkyServer website. At the top, there is a navigation bar with links for Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, and Help. Below the navigation bar is a search bar with a "Go" button. The main content area is titled "Schema Browser" and features a sidebar on the left with a "Tables" section and a "Views" section. The "Views" section is expanded, showing a list of views: Columns, CoordType, FieldMask, FieldQuality, FramesStatus, Galaxy, GalaxyTag, HoleType, ImageMask, InsideMask, MaskType, ObjType, and PhotoAux. The main content area displays a description of a table, stating "Contains a record describing the attributes of each photometric object". Below this, it says "The table has views:" and lists several views: PhotoObj, PhotoPrimary, PhotoSecondary, and PhotoFamily. Each view is described with its purpose and classification.

Sloan Digital Sky Survey / SkyServer

Home Tools Schema Projects Astronomy SDSS Contact Us Download Site Search Help

## Schema Browser

Search for

**Tables**

**Views**

- Columns
- CoordType
- FieldMask
- FieldQuality
- FramesStatus
- Galaxy
- GalaxyTag
- HoleType
- ImageMask
- InsideMask
- MaskType
- ObjType
- PhotoAux

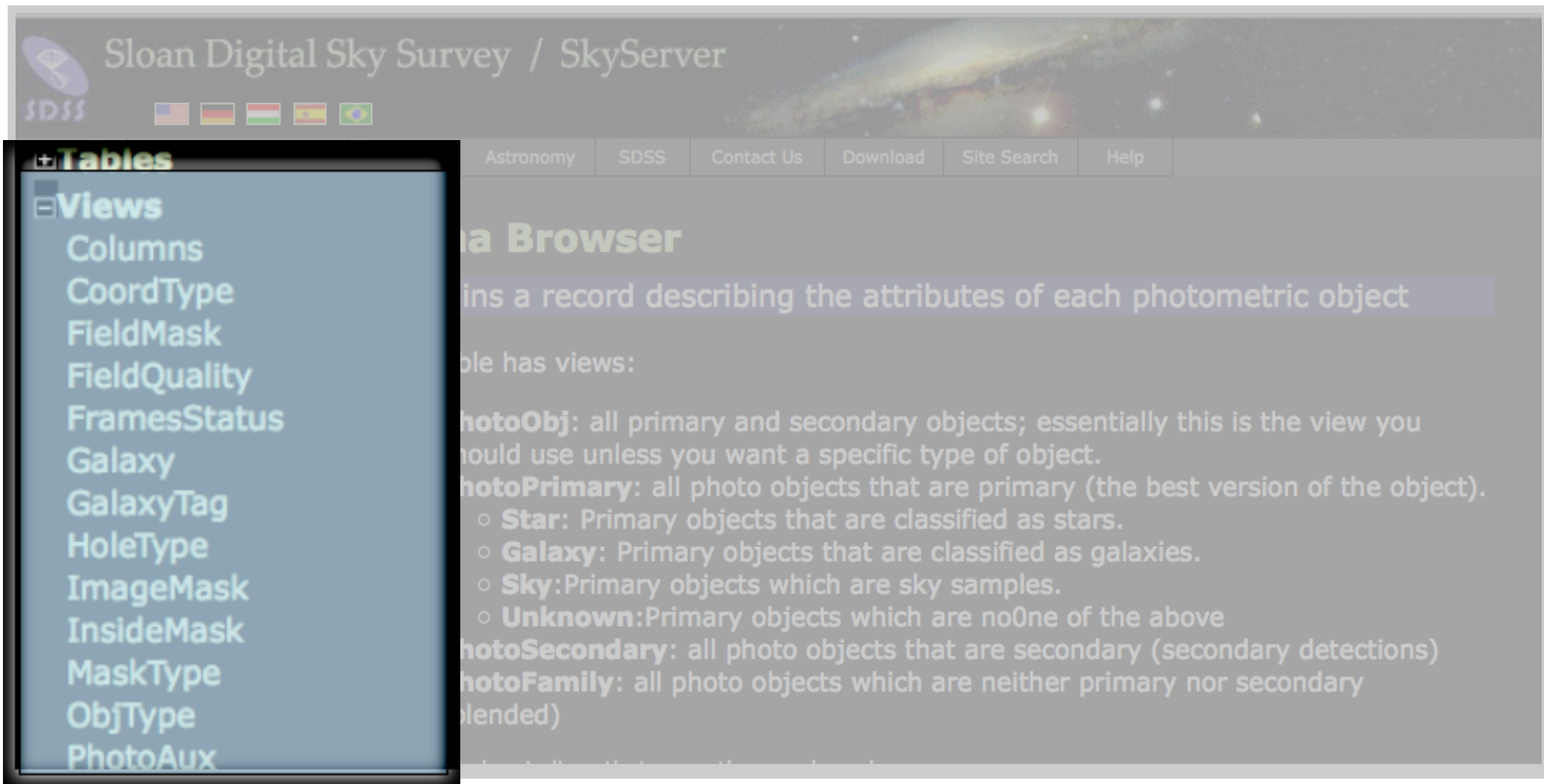
Contains a record describing the attributes of each photometric object

The table has views:

- **PhotoObj**: all primary and secondary objects; essentially this is the view you should use unless you want a specific type of object.
- **PhotoPrimary**: all photo objects that are primary (the best version of the object).
  - **Star**: Primary objects that are classified as stars.
  - **Galaxy**: Primary objects that are classified as galaxies.
  - **Sky**: Primary objects which are sky samples.
  - **Unknown**: Primary objects which are no one of the above
- **PhotoSecondary**: all photo objects that are secondary (secondary detections)
- **PhotoFamily**: all photo objects which are neither primary nor secondary (blended)

The tables contain the data. But in SQL, there are also VIEWS and FUNCTIONS

# Learn Your Schema



The screenshot shows the Sloan Digital Sky Survey / SkyServer website. The header includes the SDSS logo, the text "Sloan Digital Sky Survey / SkyServer", and several flags. Below the header is a navigation bar with links for "Astronomy", "SDSS", "Contact Us", "Download", "Site Search", and "Help". A sidebar on the left contains a "Tables" menu with a sub-menu "Views" listing various database views: Columns, CoordType, FieldMask, FieldQuality, FramesStatus, Galaxy, GalaxyTag, HoleType, ImageMask, InsideMask, MaskType, ObjType, and PhotoAux. The main content area is titled "Schema Browser" and contains a description of a table: "ins a record describing the attributes of each photometric object". Below this, it lists views available for the table: "PhotoObj", "PhotoPrimary", "PhotoSecondary", and "PhotoFamily".

Sloan Digital Sky Survey / SkyServer

SDSS

Astronomy SDSS Contact Us Download Site Search Help

**Tables**

**Views**

- Columns
- CoordType
- FieldMask
- FieldQuality
- FramesStatus
- Galaxy
- GalaxyTag
- HoleType
- ImageMask
- InsideMask
- MaskType
- ObjType
- PhotoAux

**Schema Browser**

ins a record describing the attributes of each photometric object

le has views:

- PhotoObj**: all primary and secondary objects; essentially this is the view you should use unless you want a specific type of object.
- PhotoPrimary**: all photo objects that are primary (the best version of the object).
  - Star**: Primary objects that are classified as stars.
  - Galaxy**: Primary objects that are classified as galaxies.
  - Sky**: Primary objects which are sky samples.
  - Unknown**: Primary objects which are no one of the above
- PhotoSecondary**: all photo objects that are secondary (secondary detections)
- PhotoFamily**: all photo objects which are neither primary nor secondary (blended)

The tables contain the data. But in SQL, there are also VIEWS and FUNCTIONS

# Learn Your Schema

The screenshot shows the Sloan Digital Sky Survey / SkyServer website. The header includes the SDSS logo, navigation links (Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, Help), and a list of flags. The main content area is titled "Schema Browser" and displays the "VIEW PhotoObj" section. A sidebar on the left lists various schema tables, with "PhotoObj" selected. The main content area provides a description of the PhotoObj view, stating it is derived from PhotoObjAll and contains all attributes of each photometric object. Below the description is a table with columns: name, type, length, unit, ucd, and description. The table lists attributes such as objID, skyVersion, and run.

**Schema Browser**

**VIEW PhotoObj**

**DERIVED FROM PhotoObjAll**

All primary and secondary objects in the PhotoObjAll table, which contains all the attributes of each photometric (image) object.

It selects PhotoObj with mode=1 or 2.

name	type	length	unit	ucd	description
objID	bigint	8		ID_MAIN	Unique SDSS identifier composed of [skyVersion, rerun, run, camcode]
skyVersion	tinyint	1		CODE_MISC	0 = OPDB target, 1 = OPDB
run	smallint	2		OPS_RUN	Run number

You will need to know the names of the attributes (columns) in the VIEW/TABLE



# Learn Your Schema

Sloan Digital Sky Survey / SkyServer

Home Tools Schema Projects Astronomy SDSS Contact Us Download Site Search Help

## Schema Browser

VIEW **PhotoObj**

DERIVED FROM **PhotoObjAll**

All primary and secondary objects in the PhotoObjAll table, which contains all the attributes of each photometric (image) object.

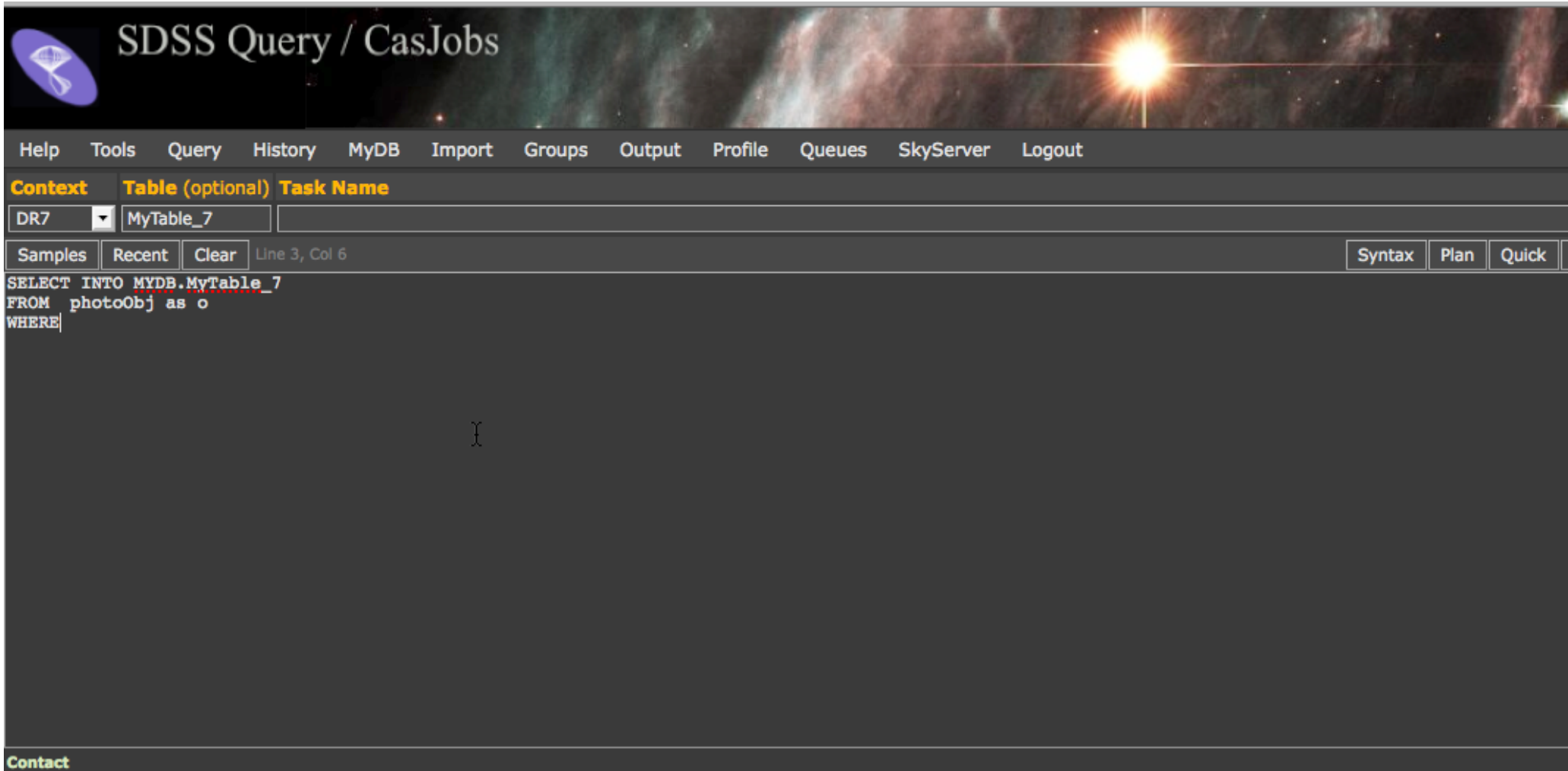
PhotoObj with mode=1 or 2.

	type	length	unit	ucd	description
objID	bigint	8		ID_MAIN	Unique SDSS identifier composed of [skyVersion, rerun, run, camcode]
skyVersion	tinyint	1		CODE_MISC	0 = OPDB target, 1 = OPDB
run	smallint	2		CODE_RUN	Run number

You will need to know the names of the attributes (columns) in the VIEW/TABLE



# Now I can tell CasJobs where to search for data: FROM



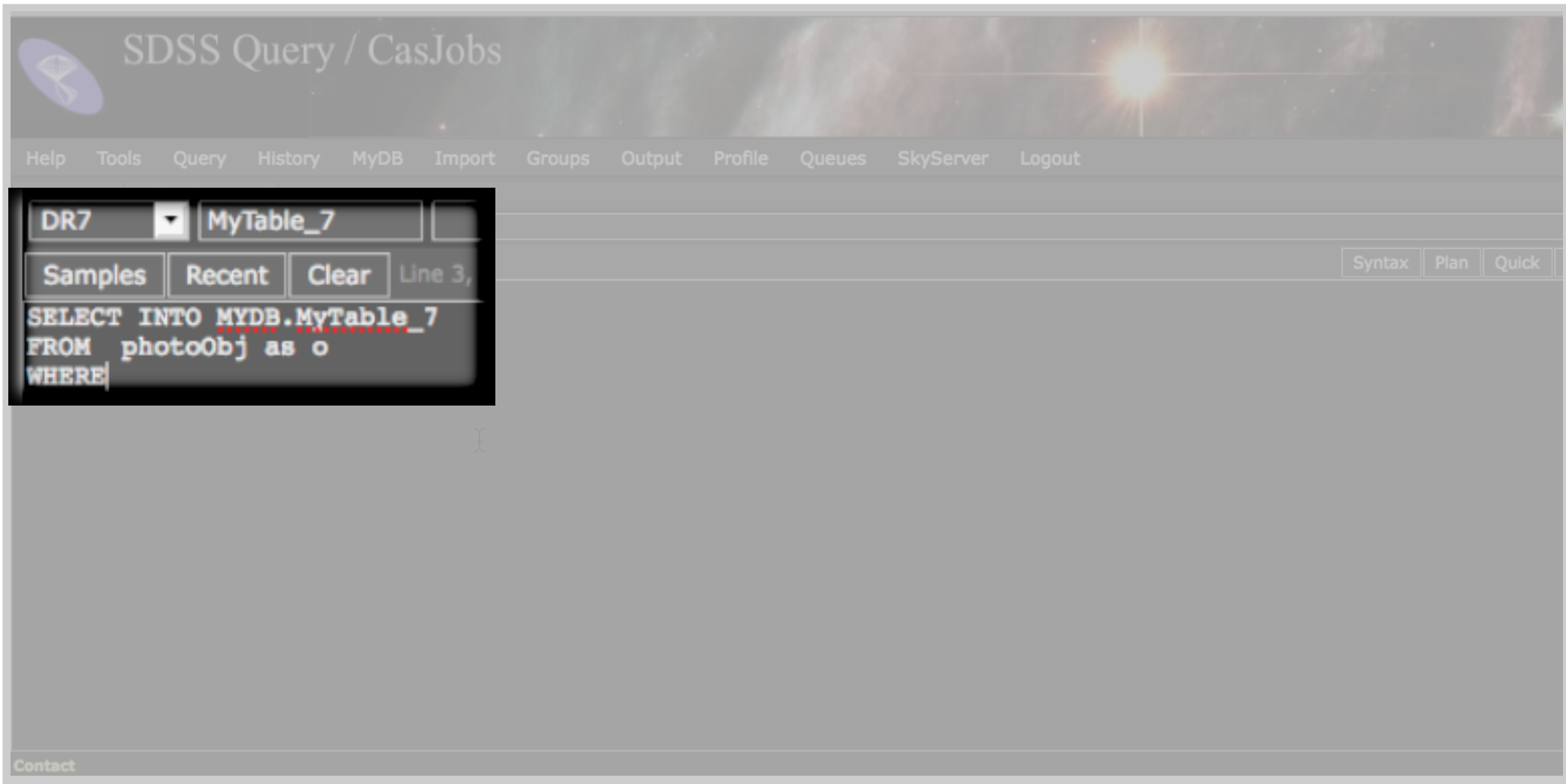
The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below this is a header section with a purple SDSS logo and the text "SDSS Query / CasJobs". The main interface is divided into several sections. On the left, there are tabs for "Context", "Table (optional)", and "Task Name". The "Context" tab is selected, showing a dropdown menu with "DR7" and a text input field containing "MyTable\_7". Below this, there are buttons for "Samples", "Recent", and "Clear", along with the text "Line 3, Col 6". On the right side, there are buttons for "Syntax", "Plan", and "Quick". The main area is a text editor containing the following SQL query:

```
SELECT INTO MYDB.MyTable_7
FROM photoObj as o
WHERE
```

The cursor is positioned at the end of the "WHERE" line. At the bottom left of the interface, there is a "Contact" link.

Names can be long and cumbersome, so use an alias (like "o")

# Now I can tell CasJobs where to search for data: FROM



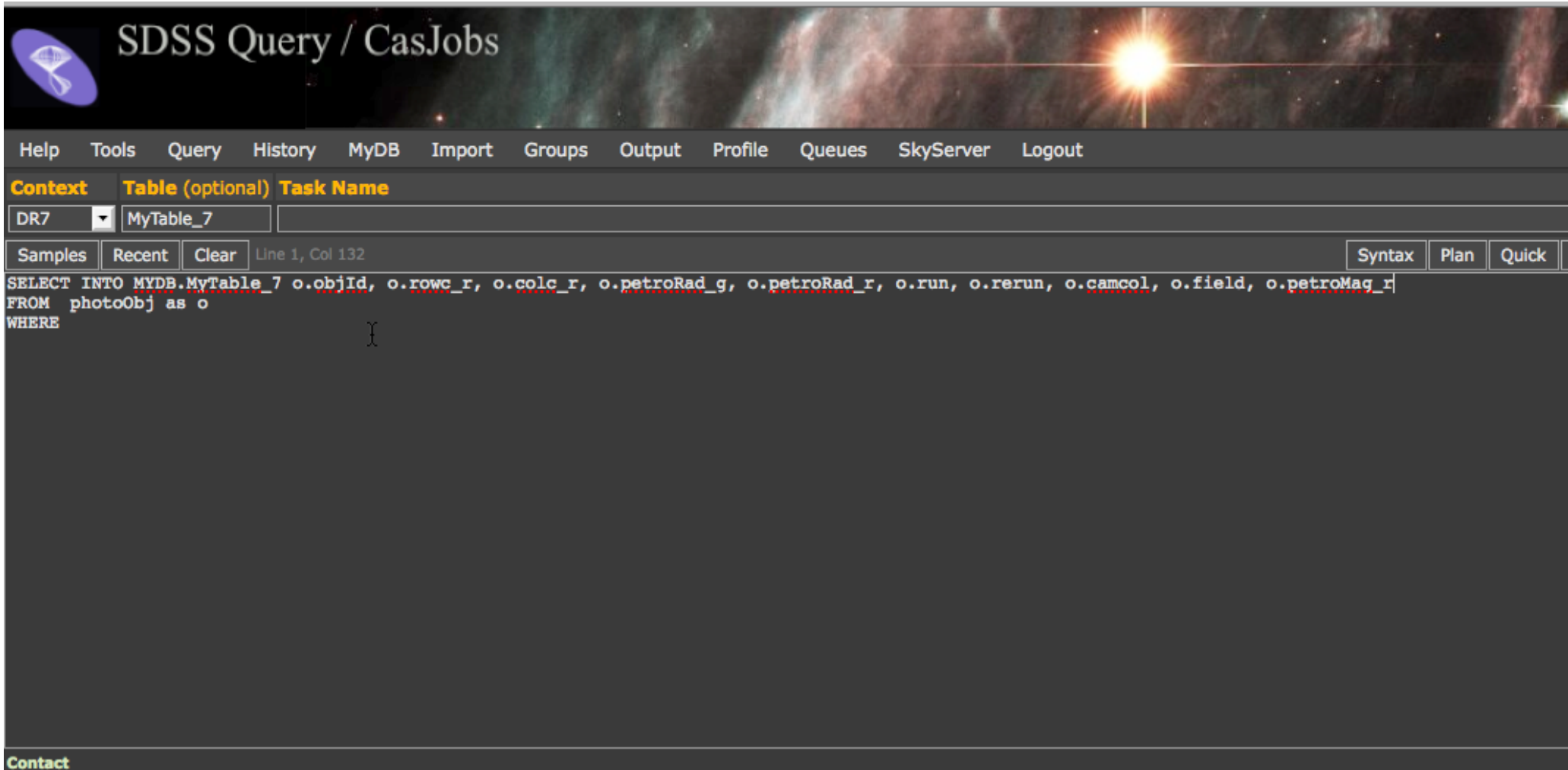
The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below the navigation bar, there is a dropdown menu for 'DR7' and a text input field containing 'MyTable\_7'. To the right of these fields are buttons for 'Samples', 'Recent', and 'Clear', along with the text 'Line 3,'. The main area of the interface is a SQL query editor with the following text: 

```
SELECT INTO MYDB.MyTable_7
FROM photoObj as o
WHERE
```

 The text 'MYDB.MyTable\_7' is highlighted with red dotted lines. At the bottom left of the interface, there is a 'Contact' link.

Names can be long and cumbersome, so use an alias (like “o”)

# Now I can tell CasJobs what to draw out of the table



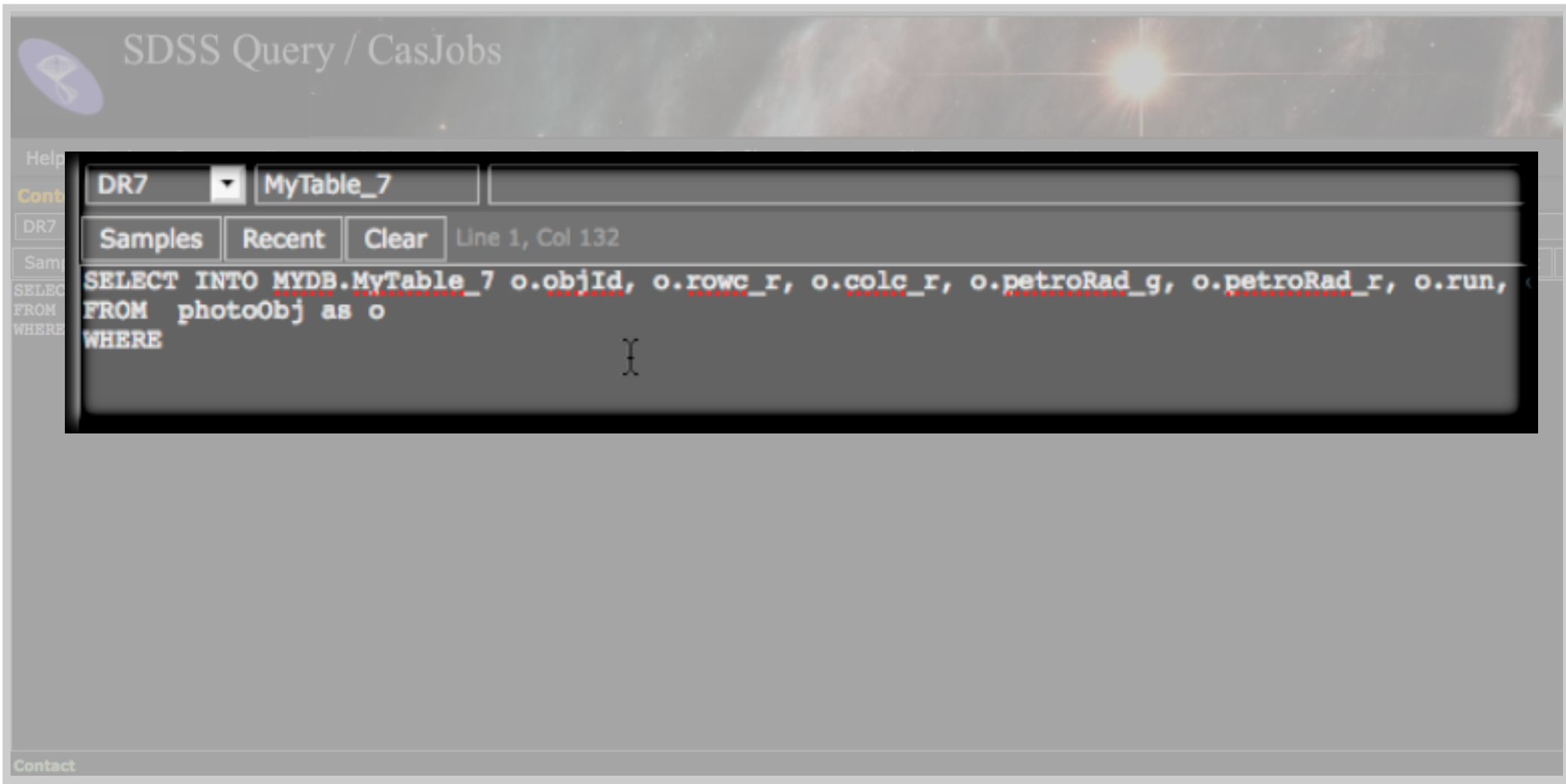
The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below this is a header section with a purple SDSS logo and the text "SDSS Query / CasJobs". The main content area is a text editor with a dark background. The editor contains the following SQL query:

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r
FROM photoObj as o
WHERE
```

The cursor is positioned at the end of the "WHERE" line. Above the query, there are several controls: a dropdown menu set to "DR7", a text input field containing "MyTable\_7", and buttons for "Samples", "Recent", and "Clear". To the right of the text area are buttons for "Syntax", "Plan", and "Quick".

Take advantage of the alias to make “cleaner” looking queries

# Now I can tell CasJobs what to draw out of the table



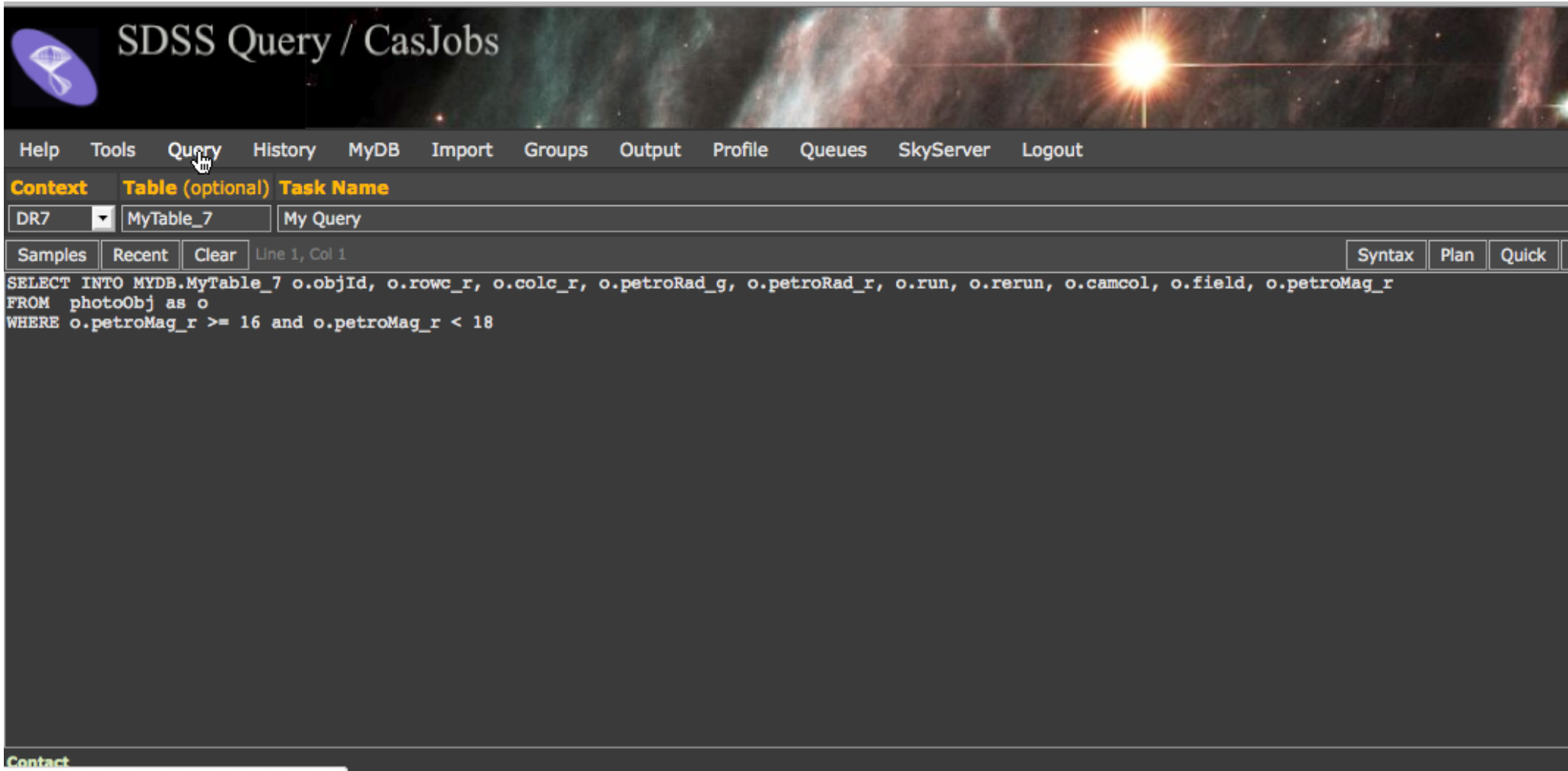
The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a header with the SDSS logo and the text "SDSS Query / CasJobs". Below the header, there is a navigation menu with "Help", "Contact", "DR7", "Samples", "SELECT", "FROM", and "WHERE". The main content area is a text editor with a dark background and a light border. The text editor contains the following SQL query:

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run,  
FROM photoObj as o  
WHERE
```

The text editor also has a toolbar with "Samples", "Recent", and "Clear" buttons. The cursor is positioned at the end of the "WHERE" line. The text editor is titled "Line 1, Col 132".

Take advantage of the alias to make “cleaner” looking queries

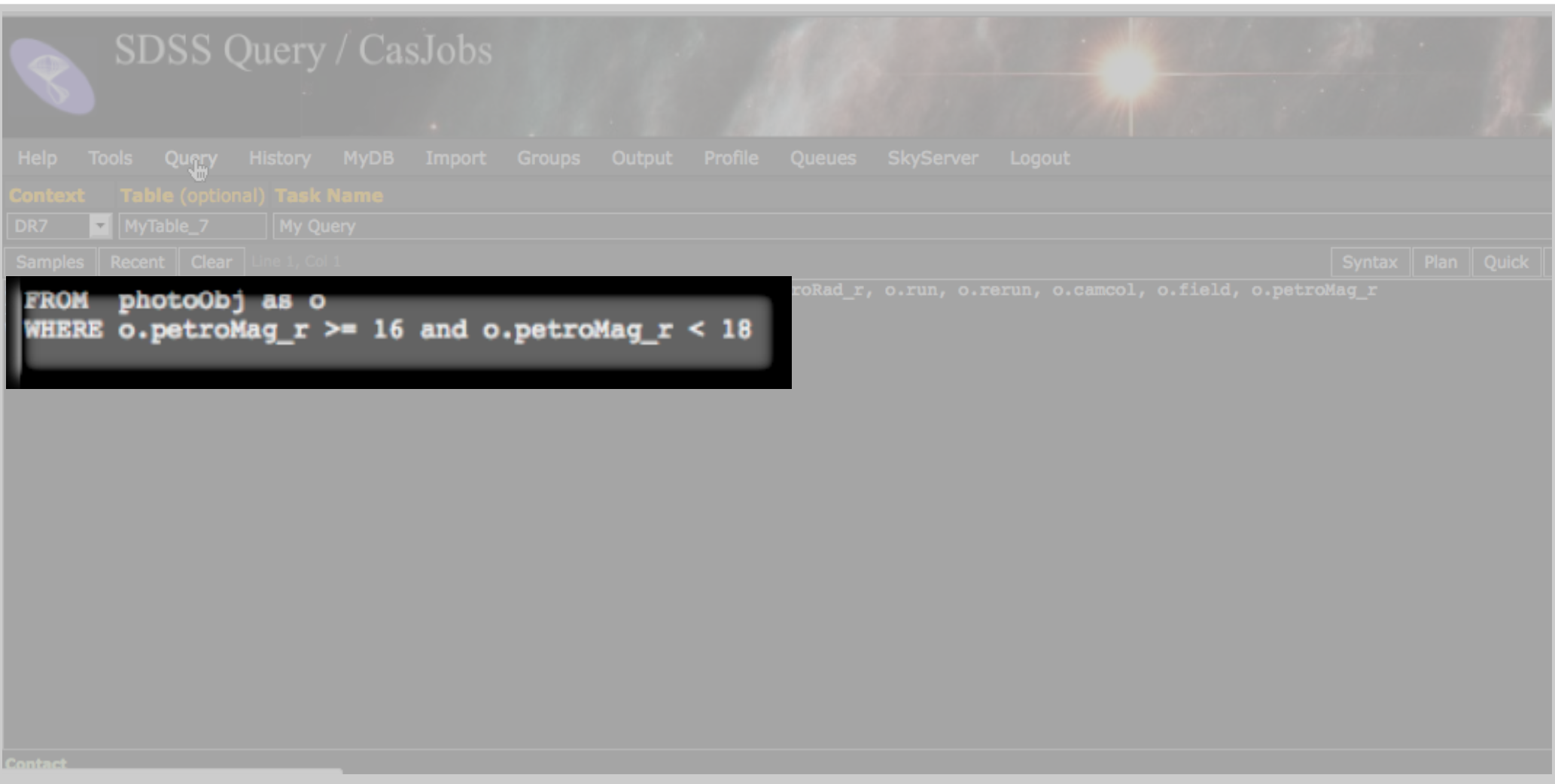
# Now tell CasJobs how to constrain your search



The screenshot displays the SDSS Query / CasJobs web interface. The header features the SDSS logo and the text "SDSS Query / CasJobs" against a background of a star and nebula. A navigation menu includes "Help", "Tools", "Query", "History", "MyDB", "Import", "Groups", "Output", "Profile", "Queues", "SkyServer", and "Logout". Below the menu, there are three input fields: "Context" (set to "DR7"), "Table (optional)" (set to "MyTable\_7"), and "Task Name" (set to "My Query"). A toolbar contains "Samples", "Recent", "Clear", "Syntax", "Plan", and "Quick" buttons. The main area shows a SQL query: 

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r
FROM photoObj as o
WHERE o.petroMag_r >= 16 and o.petroMag_r < 18
```

# Now tell CasJobs how to constrain your search



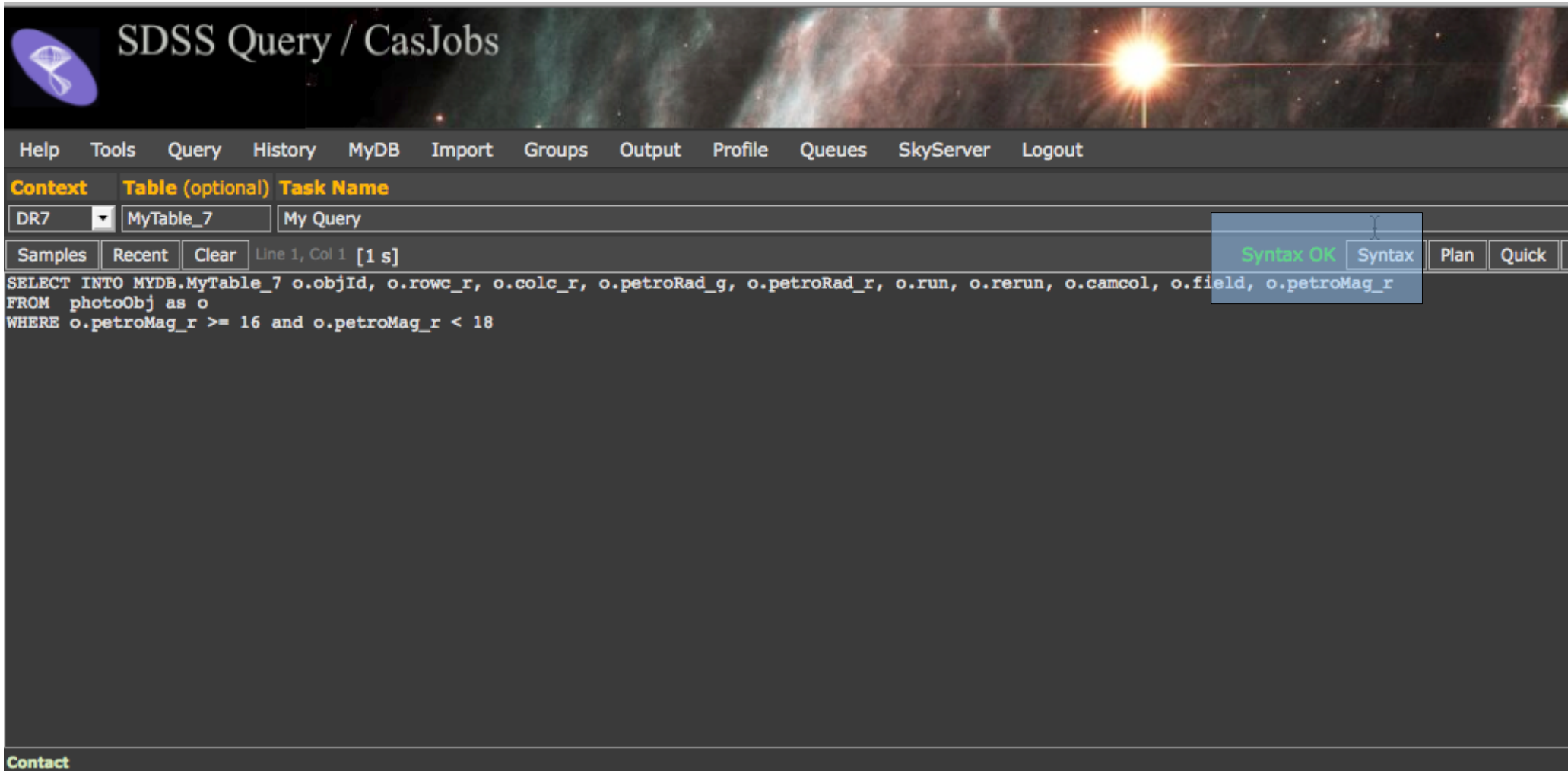
The screenshot shows the SDSS Query / CasJobs interface. The header includes the SDSS logo and the text "SDSS Query / CasJobs". Below the header is a navigation menu with items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. The "Query" menu item is highlighted with a mouse cursor. Below the navigation menu is a form with three fields: "Context" (set to DR7), "Table (optional)" (set to MyTable\_7), and "Task Name" (set to My Query). Below the form is a text area for entering a query. The text area contains the following SQL query:

```
FROM photoObj as o
WHERE o.petroMag_r >= 16 and o.petroMag_r < 18
```

The text area also shows a list of columns: o.roRad\_r, o.run, o.rerun, o.camcol, o.field, o.petroMag\_r. At the bottom left of the interface, there is a "Contact" link.



# Now I can ask CasJobs to check my spelling (or syntax)

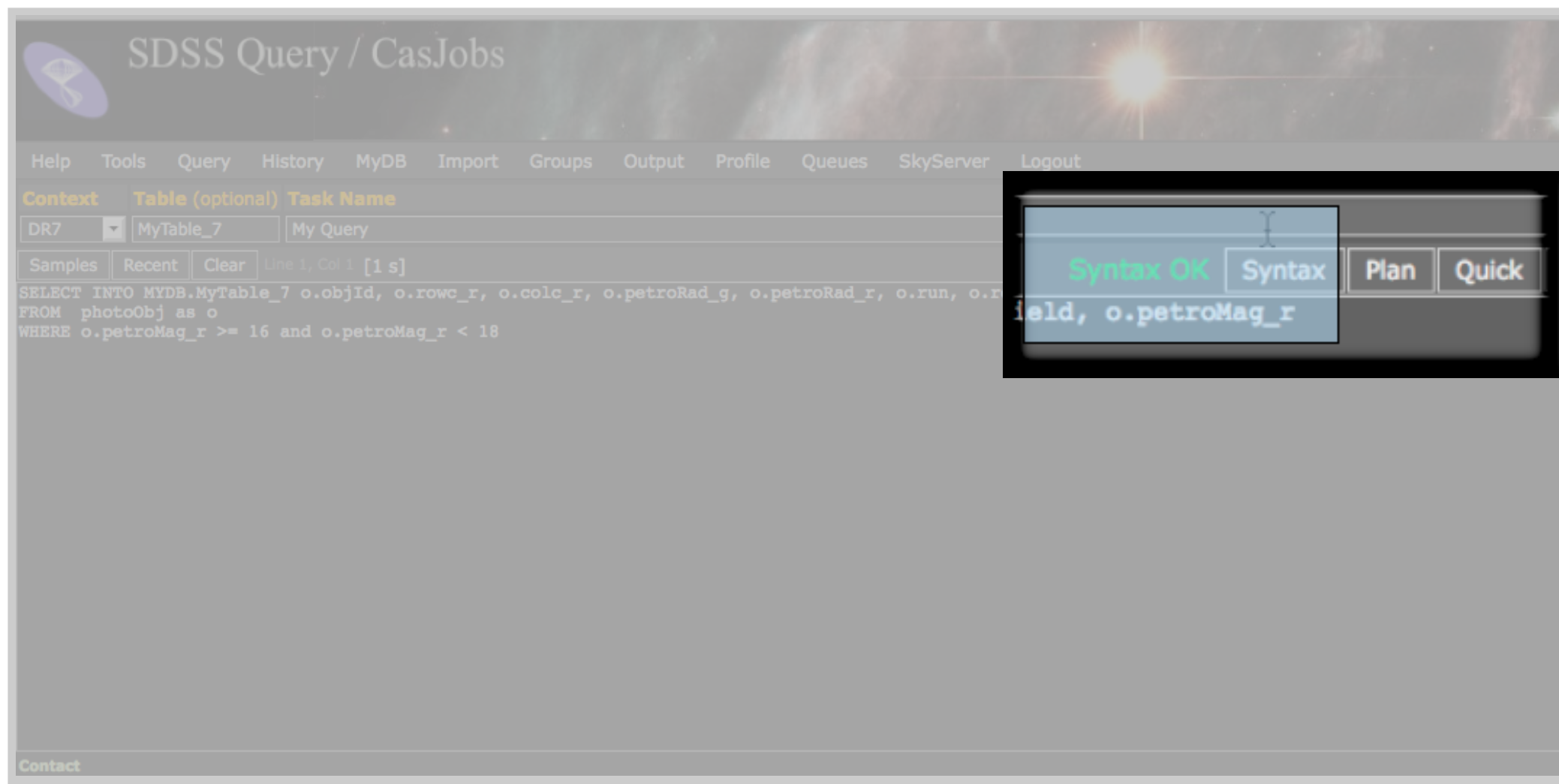


The screenshot shows the SDSS Query / CasJobs interface. At the top left is the SDSS logo. The main header is "SDSS Query / CasJobs". Below this is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout. The interface is divided into sections for Context, Table (optional), and Task Name. The Context section shows "DR7" selected. The Table section shows "MyTable\_7". The Task Name section shows "My Query". Below these are buttons for "Samples", "Recent", and "Clear". The main area contains a SQL query: 

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r
FROM photoObj as o
WHERE o.petroMag_r >= 16 and o.petroMag_r < 18
```

 A tooltip is visible over the "Syntax" button, showing "Syntax OK" in green text. Other buttons visible are "Plan" and "Quick". At the bottom left, there is a "Contact" link.

# Now I can ask CasJobs to check my spelling (or syntax)



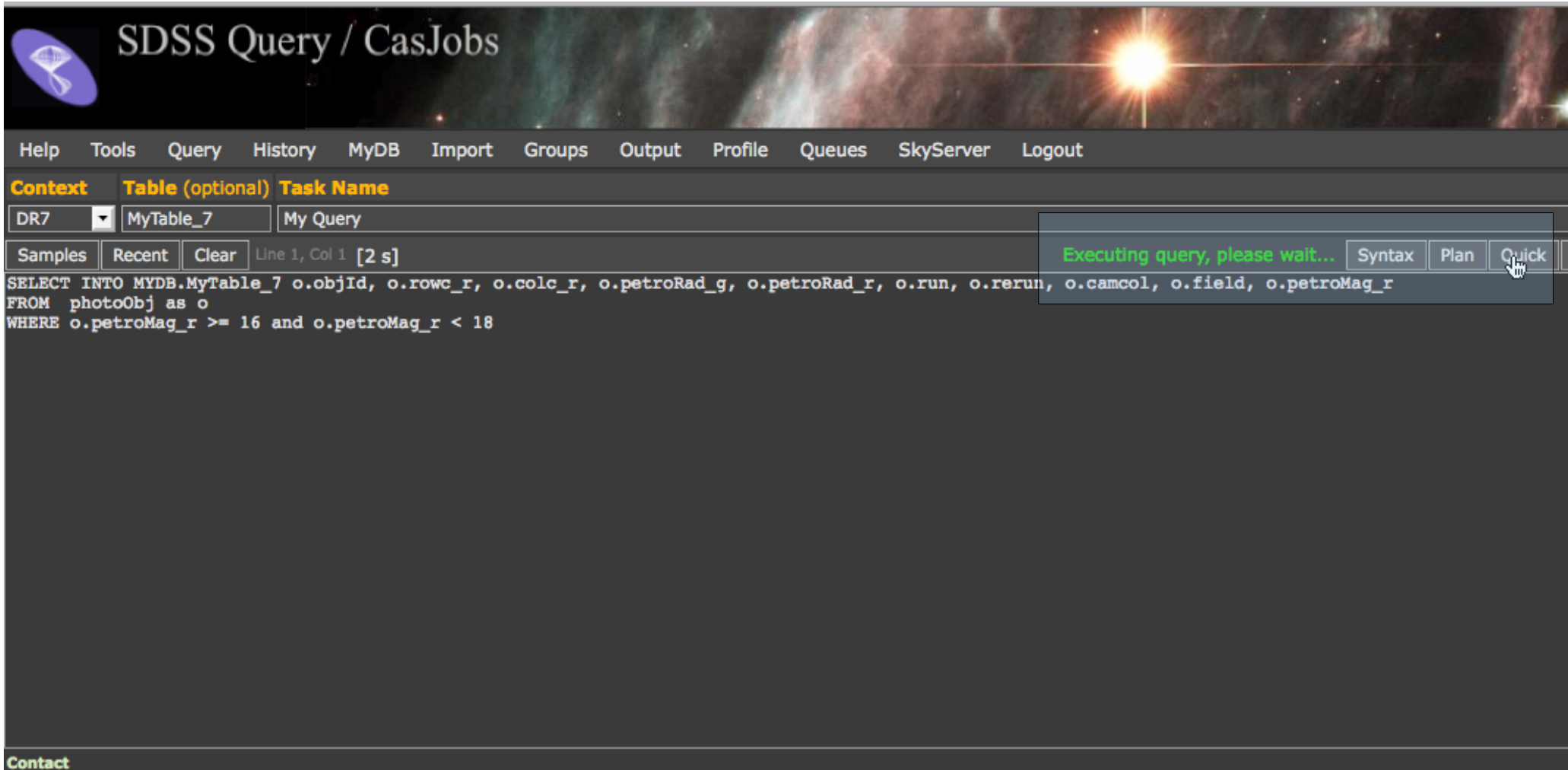
The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below this is a form with three fields: Context (DR7), Table (optional) (MyTable\_7), and Task Name (My Query). There are also buttons for Samples, Recent, and Clear, and a status indicator "Line 1, Col 1 [1 s]". The main area contains a SQL query:

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.r
FROM photoObj as o
WHERE o.petroMag_r >= 16 and o.petroMag_r < 18
```

Overlaid on the right side of the interface is a dark blue box containing a syntax check menu. The menu has a cursor pointing to the word "Syntax". The options are: Syntax OK (in green), Syntax, Plan, and Quick.

Contact

# Finally, I submit the job and wait



The screenshot shows the SDSS Query / CasJobs web interface. At the top left is the SDSS logo. The main header area features a dark background with a nebula and a bright star. Below the header is a navigation menu with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout.

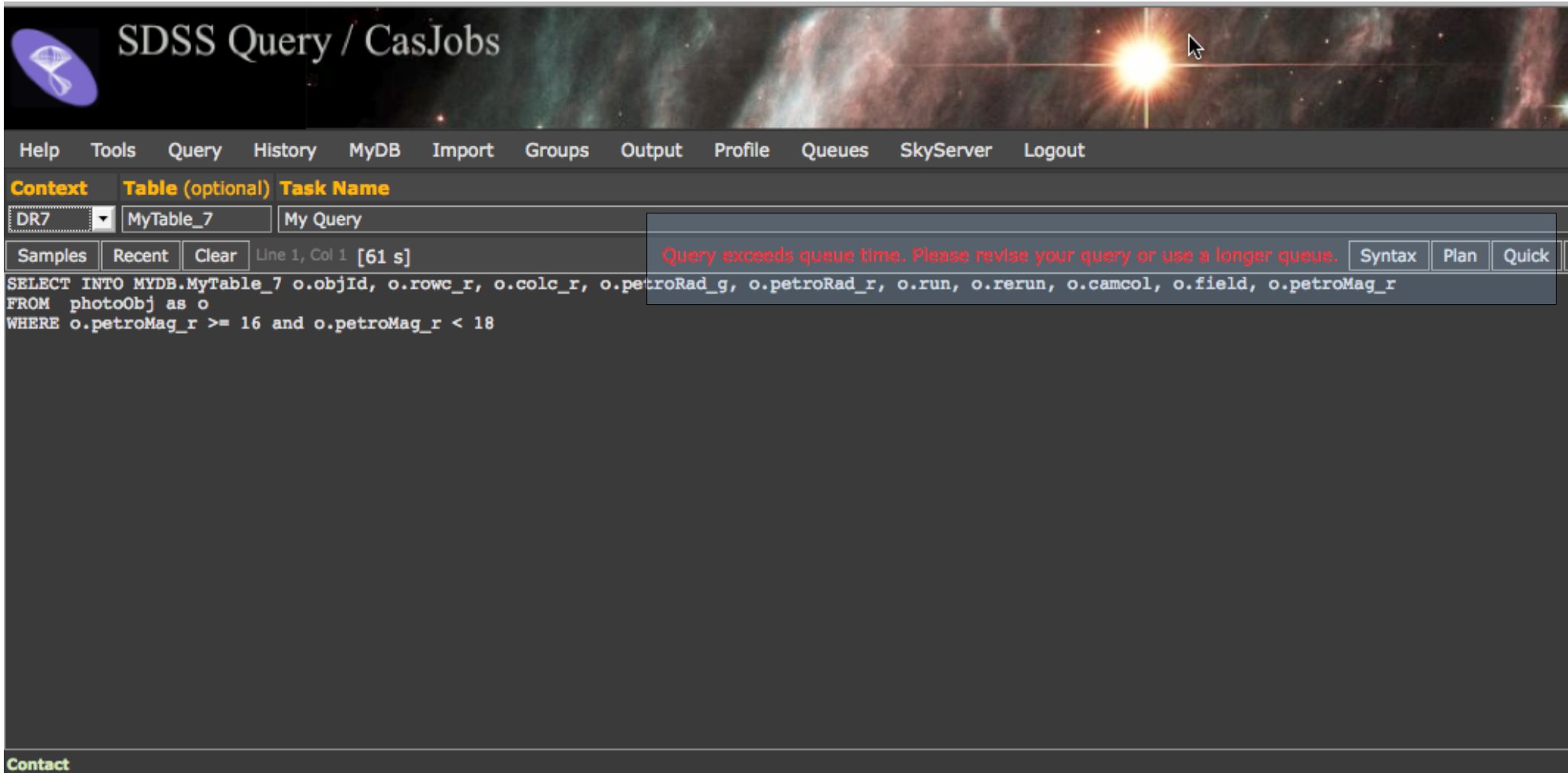
The main content area is divided into sections. On the left, there are input fields for 'Context' (set to DR7), 'Table (optional)' (set to MyTable\_7), and 'Task Name' (set to My Query). Below these are buttons for 'Samples', 'Recent', and 'Clear', along with a status indicator 'Line 1, Col 1 [2 s]'. The central part of the interface contains a SQL query:

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r
FROM photoObj as o
WHERE o.petroMag_r >= 16 and o.petroMag_r < 18
```

On the right side, a semi-transparent box displays the message 'Executing query, please wait...' in green text. To the right of this message are three buttons: 'Syntax', 'Plan', and 'Quick'. A mouse cursor is pointing at the 'Quick' button.

At the bottom left of the interface, there is a 'Contact' link.

# Timeouts are common



The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with the following items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below the navigation bar, there are three tabs: Context, Table (optional), and Task Name. The Context tab is selected, showing a dropdown menu with 'DR7' and a text input field containing 'MyTable\_7'. The Task Name field contains 'My Query'. Below the tabs, there are three buttons: Samples, Recent, and Clear. To the right of these buttons, it says 'Line 1, Col 1 [61 s]'. A red error message is displayed in a box: 'Query exceeds queue time. Please revise your query or use a longer queue.' To the right of the error message are three buttons: Syntax, Plan, and Quick. Below the error message, the SQL query is visible: 'SELECT INTO MYDB.MyTable\_7 o.objId, o.rowc\_r, o.colc\_r, o.petroRad\_g, o.petroRad\_r, o.run, o.rerun, o.camcol, o.field, o.petroMag\_r FROM photoObj as o WHERE o.petroMag\_r >= 16 and o.petroMag\_r < 18'. At the bottom left, there is a 'Contact' link.

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout

Context Table (optional) Task Name

DR7 MyTable\_7 My Query

Samples Recent Clear Line 1, Col 1 [61 s]

Query exceeds queue time. Please revise your query or use a longer queue. Syntax Plan Quick

```
SELECT INTO MYDB.MyTable_7 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r
FROM photoObj as o
WHERE o.petroMag_r >= 16 and o.petroMag_r < 18
```

Contact

# Timeouts are common

The screenshot shows the SDSS Query / CasJobs web interface. At the top left is the SDSS logo. The main header area contains the text "SDSS Query / CasJobs" and a navigation menu with items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below the menu is a "Context" section with a "Table (optional) Task Name" field. The main content area is titled "My Query" and displays a red error message: "Query exceeds queue time. Please revise your query or use a longer queue". Below the error message, the beginning of a SQL query is visible: "e 7 o.objId, o.rowc r, o.colc r, o.petroRad q, o.petroRad r, o.run, o.rerun, o.camcol, o.field, o.petr". At the bottom left of the interface is a "Contact" link.

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout

Context Table (optional) Task Name

My Query

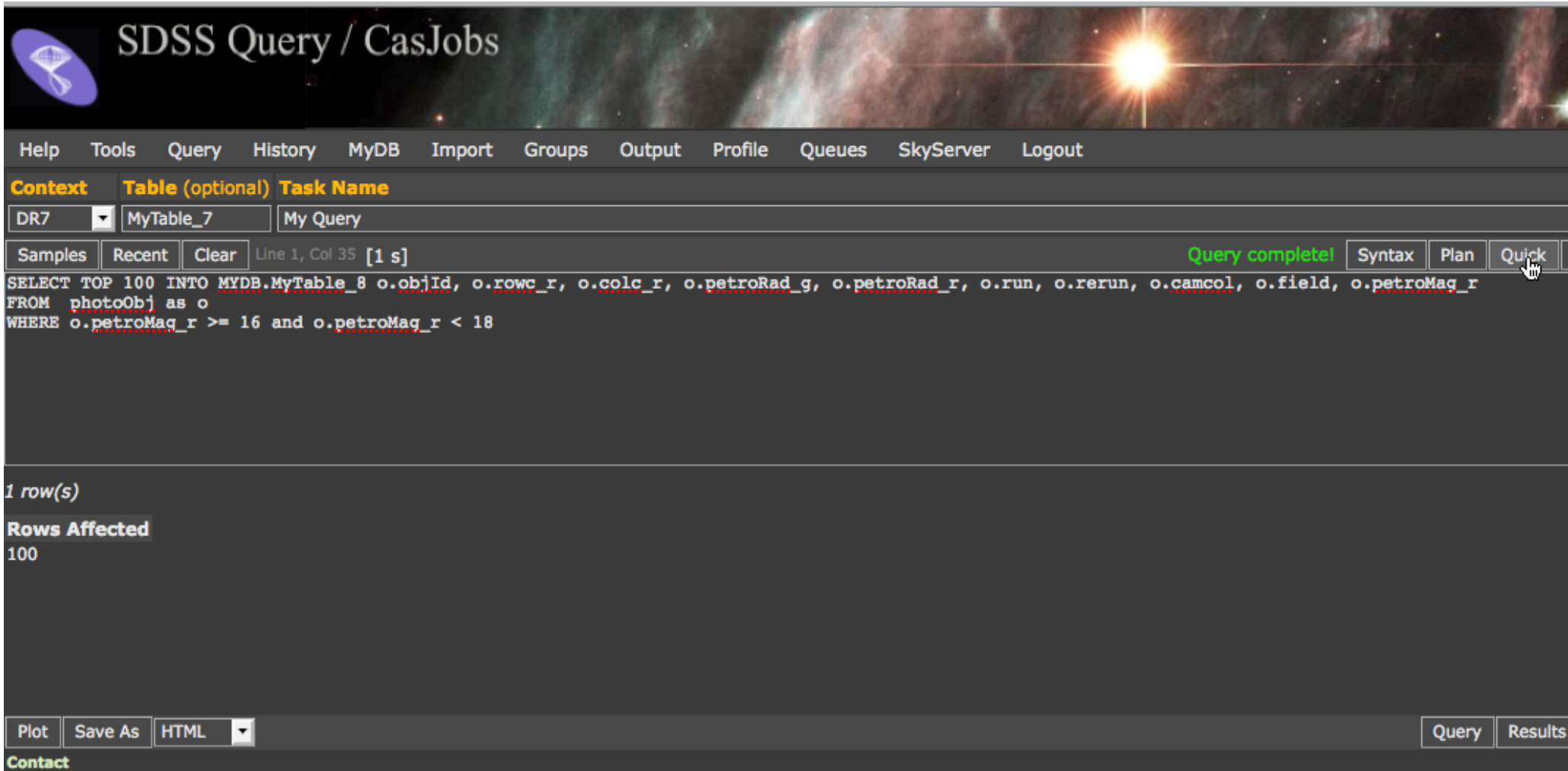
Line 1, Col 1 [61 s]

Query exceeds queue time. Please revise your query or use a longer queue

e 7 o.objId, o.rowc r, o.colc r, o.petroRad q, o.petroRad r, o.run, o.rerun, o.camcol, o.field, o.petr

Contact

# Use controls, like TOP



The screenshot displays the SDSS Query / CasJobs web interface. At the top left is the SDSS logo. The main header area features a navigation menu with items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. Below the menu, there are input fields for 'Context' (set to DR7), 'Table (optional)' (set to MyTable\_7), and 'Task Name' (set to My Query). A status bar shows 'Query complete!' in green text, along with buttons for 'Syntax', 'Plan', and 'Quick'. The main area contains a SQL query: `SELECT TOP 100 INTO MYDB.MyTable_8 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r FROM photoObj as o WHERE o.petroMag_r >= 16 and o.petroMag_r < 18`. Below the query, it indicates '1 row(s)' and 'Rows Affected: 100'. At the bottom, there are buttons for 'Plot', 'Save As', and 'HTML', and a 'Query Results' button.

# Use controls, like TOP



The screenshot shows the SDSS Query / CasJobs web interface. At the top left is the SDSS logo and the text "SDSS Query / CasJobs". Below this is a navigation menu with items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, and Logout. The main interface has three tabs: "Context" (selected), "Table (optional)", and "Task Name". Under "Context", there is a dropdown menu showing "DR7" and a text input field containing "MyTable\_7". Under "Task Name", there is a text input field containing "My Query". Below the tabs is a status bar showing "Samples" and "Rows" with a value of "135 [1 s]". To the right of the status bar are buttons for "Query complete!", "Syntax", "Plan", and "Quick". The main area contains a SQL query editor with the following text: 

```
SELECT TOP 100 o.objId, o.rowc_r, o.colc_r, o.petroRad_g, o.petroRad_r, o.run, o.rerun, o.camcol, o.field, o.petroMag_r  
FROM photoObj  
WHERE .petroMag_r < 18
```

 The text "SELECT TOP 100" is highlighted in a black box with a mouse cursor pointing to it. Below the query editor, there is a section for "1 row(s)" and "Rows Affected" showing "100". At the bottom of the interface, there are buttons for "Plot", "Save As", and "HTML" (with a dropdown arrow). On the right side of the bottom bar are buttons for "Query" and "Results". At the very bottom left, there is a "Contact" link.



# Examining your new Tables

The screenshot shows the SDSS Query / CasJobs interface. The top navigation bar includes: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and chr. Below the navigation bar, there are dropdown menus for 'MyDB' (set to 'Local Only') and 'Views'. The main content area is titled 'MyTable\_8' and indicates it 'Contains ~100 rows (~16 kB)'. A row of action buttons is visible: Notes, Sample, Job, Plot,  $\beta$ Plot, Download, Publish, Neighbors, Rename, and Drop. Below this is the 'Table Schema' section, which lists the columns and their data types and sizes: objId (bigint [8]), rowc\_r (float [8]), colc\_r (float [8]), petroRad\_g (float [8]), petroRad\_r (float [8]), run (smallint [2]), and rerun (smallint). A table of data is displayed below the schema, with columns corresponding to the schema. The table shows several rows of data, with the last row highlighted in red. The table has a scrollbar at the top.

objId	rowc_r	colc_r	petroRad_g	petroRad_r	run	rerun
588848900971364428	574.6474609375	1732.50231933594	1.43800842761993	1.41112554073334	756	
588848900971364430	676.861877441406	1066.66284179688	1.43827617168427	1.38989293575287	756	
588848900971364446	951.965454101563	1969.89990234375	1.40652942657471	1.39517557621002	756	
588848900971364451	1208.68225097656	354.982269287109	1.45332682132721	1.28232669830322	756	
588848900971364457	1270.63232421875	1098.47229003906	1.60993552207947	2.19223928451538	756	
588848900971364482	1289.84619140625	891.37158203125	1.456547498703	1.32002675533295	756	
588848900971364484	1327.46728515625	593.164672851563	1.48056638240814	1.29461860656738	756	
588848900971364492	149.330581665039	1614.99694824219	1.41921055316925	1.45908033847809	756	
588848900971364505	248.261627107266	1172.0452125	1.4200502528601	1.42573240105044	756	

Make sure you look what is INSIDE the table

# Examining your new Tables

The screenshot shows the SDSS Query / CasJobs interface. The 'MyDB' menu item is highlighted. Below it, the 'MyTable\_8' details are shown, including a table schema and a list of rows.

**MyDB**

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout chr

MyDB Local Only

**MyTable\_8**

Contains ~100 rows (~16 kB)

Notes Sample Job Plot  $\beta$ Plot Download Publish Neighbors Rename Drop

**Table Schema** type [size]

objId	rowc_r	colc_r	petroRad_g	petroRad_r	run	rerun
bigint [8]	float [8]	float [8]	float [8]	float [8]	smallint [2]	smallint
588848900971364428	574.6474609375	1732.50231933594	1.43800842761993	1.41112554073334	756	
588848900971364430	676.861877441406	1066.66284179688	1.43827617168427	1.38989293575287	756	
588848900971364446	951.965454101563	1969.89990234375	1.40652942657471	1.39517557621002	756	
588848900971364451	1208.68225097656	354.982269287109	1.45332682132721	1.28232669830322	756	
588848900971364457	1270.63232421875	1098.47229003906	1.60993552207947	2.19223928451538	756	
588848900971364482	1289.84619140625	891.37158203125	1.456547498703	1.32002675533295	756	
588848900971364484	1327.46728515625	593.164672851563	1.48056638240814	1.29461860656738	756	
588848900971364492	149.330581665039	1614.99694824219	1.41921055316925	1.45908033847809	756	

Make sure you look what is INSIDE the table

# Examining your new Tables

SDSS Query / CasJobs

Help Tools Query History MyDB Import Groups Output Profile Queues SkyServer Logout chr

MyDB Local Only

**MyTable\_8**

Contains ~100 rows (~16 kB)

Notes Sample Job Plot  $\beta$ Plot Download Publish Neighbors Rename Drop

**Table Schema** type [size]

objId	rowc_r	colc_r	petroRad_g	petroRad_r	run	rerun
bigint [8]	float [8]	float [8]	float [8]	float [8]	smallint [2]	smallint
objId	rowc_r	colc_r	petroRad_g	petroRad_r	run	
588848900971364428	574.6474609375	1732.50231933594	1.43800842761993	1.41112554073334	756	
588848900971364429	576.861877411406	1066.66284179688	1.43827617168427	1.38989293575287	756	
222	48	1969.89990234375	1.40652942657471	1.39517557621002	756	
426,000	27,528	354.982269287109	1.45332682132721	1.28232669830322	756	
100	16	1098.47229003906	1.60993552207947	2.19223928451538	756	
588848900971364491	149.330581665039	1614.99694824219	1.41921055316925	1.45908033847809	756	
588848900971364492	149.330581665039	1614.99694824219	1.41921055316925	1.45908033847809	756	

Sort by... All selected...

Rows	kB	Name
2,403	456	MyTable
0	0	MyTable_0
148,685	15,688	MyTable_1
2,358	520	MyTable_10
1,139,373	115,656	MyTable_2
444,220	45,000	MyTable_3
266,749	27,080	MyTable_4
0	0	MyTable_5
222	48	MyTable_6
426,000	27,528	MyTable_7
100	16	MyTable_8

Make sure you look what is INSIDE the table



# Examining your new Tables

The screenshot shows the SDSS Query / CasJobs interface. The top navigation bar includes: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and chr. The left sidebar contains: MyDB (Local Only), Views, Tables, Functions, and Procedures. Below the sidebar is a table with columns: Rows, kB, and Name. The main content area shows 'MyTable\_2' with 'Contains ~100' rows. A 'Sample' button is highlighted with a black box. Below the table name are buttons: Notes, Sample, Job, Plot,  $\beta$ Plot, Download, Publish, Neighbors, Rename, and Drop. The 'Table Schema' section shows columns: objId (bigint [8]), rowc\_r (float [8]), colc\_r (float [8]), petroRad\_g (float [8]), petroRad\_r (float [8]), run (smallint [2]), and rerun (smallint). Below the schema is a table with columns: objId, rowc\_r, colc\_r, petroRad\_g, petroRad\_r, and run. The table contains 10 rows of data.

objId	rowc_r	colc_r	petroRad_g	petroRad_r	run
588848900971364428	574.6474609375	1732.50231933594	1.43800842761993	1.41112554073334	756
588848900971364430	676.861877441406	1066.66284179688	1.43827617168427	1.38989293575287	756
588848900971364446	951.965454101563	1969.89990234375	1.40652942657471	1.39517557621002	756
588848900971364451	1208.68225097656	354.982269287109	1.45332682132721	1.28232669830322	756
588848900971364457	1270.63232421875	1098.47229003906	1.60993552207947	2.19223928451538	756
588848900971364482	1289.84619140625	891.37158203125	1.456547498703	1.32002675533295	756
588848900971364484	1327.46728515625	593.164672851563	1.48056638240814	1.29461860656738	756
588848900971364492	149.330581665039	1614.99694824219	1.41921055316925	1.45908033847809	756
588848900971364505	248.261627107266	1172.0452125	1.4200502528601	1.42573240105044	756

Make sure you look what is INSIDE the table

# Downloading your new Tables

The screenshot shows the SDSS Query / CasJobs interface. The main content area displays details for 'MyTable\_8', including its schema and download options. A dropdown menu is open, showing various file formats for download.

**Table Schema** type [size]

Field	Type	Size
objId	bigint	[8]
rowc_r	float	[8]
colc_r	float	[8]
petroRad_g	float	[8]
petroRad_r	float	[8]
run	smallint	[2]
rerun	smallint	

**Table Download**

From here you may download your table in a particular format. First choose the file format you'd like, then click 'Go'.

- Comma Separated Values
- Comma Separated Values
- XML - DataSet
- Flexible Image Transfer System(FITS Binary)

Use a format that keeps metadata. Do't forgot your provenance (query)



# Membership within an Galaxy Cluster

The screenshot displays the SDSS DR7 web interface. The central panel shows a field of galaxies with a grid overlay. A specific galaxy is highlighted with a green box and labeled with its coordinates: 208.28, 5.15. A scale bar in the top left of the field indicates 1 arcminute. The interface includes a left sidebar with navigation links, a 'Parameters' section for RA, DEC, and filter (G), a 'Get Image' button, and drawing options. The right sidebar shows the 'Selected object' details and a list of actions like 'Quick Look' and 'Explore'.

**SDSS DR7**  
| Home | Help | Tutorial |  
Chart | List | Explore |

**Parameters**

ra	208.25172	deg
dec	5.15	deg
opt	G	

**Get Image**

**Drawing options**

- Grid
- Label
- Photometric objects
- Objects with spectra
- Invert Image

**Advanced options**

- Spectroscopic Targets
- Outlines
- Bounding Boxes
- Fields
- Masks
- Plates

**Selected object**

ra	208.28190
dec	5.14869
type	GALAXY
u	24.96
g	23.50
r	24.77
i	22.66
z	20.21

**Quick Look**

- Quick Look
- Explore
- Recenter
- Add to notes
- Show notes

**Click to open Sky Maps ?**  
To see Sky Maps, install the latest [Flash](#) and [Shockwave](#)



# Membership within an Galaxy Cluster

The screenshot displays the SDSS DR7 web interface. The central panel shows a star field with a grid and a selected galaxy at coordinates (208.28, 5.15). The interface includes a left sidebar with navigation links, a parameters table, drawing options, and a right sidebar with object details and interactive buttons.

**SDSS DR7**  
| Home | Help | Tutorial |  
Chart | List | Explore |

Parameters	
ra	208.28 deg
dec	5.15 deg
opt	G

**Get Image**

**Drawing options**

- Grid
- Label
- Photometric objects
- Objects with spectra
- Invert Image

**Advanced options**

- Spectroscopic Targets
- Outlines
- Bounding Boxes
- Fields
- Masks
- Plates

**Selected object**

ra	208.28190
dec	5.14869
type	GALAXY
u	24.96
g	23.50
r	24.77
i	22.66
z	20.21

**Quick Look**

- Quick Look
- Explore
- Recenter
- Add to notes
- Show notes

**Click to open Sky Maps ?**  
To see Sky Maps, install the latest [Flash](#) and [Shockwave](#)



# Membership within an Galaxy Cluster: Spectroscopy

The screenshot displays the SDSS DR7 web interface. The central panel shows a field of galaxies with a grid overlay. A specific galaxy is highlighted with a green box and labeled with its coordinates, 208.28, 5.15. The interface includes a left sidebar with navigation links, a parameters table, a 'Get Image' button, and drawing options. The right sidebar shows the selected object's photometric and spectroscopic data, a thumbnail image of the object, and a list of interactive actions.

**SDSS DR7**  
|Home |Help |Tutorial |  
Chart | List | Explore |

Parameters	
ra	208.28 deg
dec	5.15 deg
opt	GS

**Get Image**

Grid  
 Label  
 Photometric objects  
 Objects with spectra  
 Invert Image

**Advanced options**  
 Spectroscopic Targets  
 Outlines  
 Bounding Boxes  
 Fields  
 Masks  
 Plates

**Selected object**

ra	208.28190
dec	5.14869
type	GALAXY
u	24.96
g	23.50
r	24.77
i	22.66
z	20.21

**Quick Look**  
**Explore**  
**Recenter**  
**Add to notes**  
**Show notes**

Click to open Sky Maps ?  
To see Sky Maps, install the latest [Flash](#) and [Shockwave](#)



# Membership within an Galaxy Cluster: Photometry

**DR7**  
SDSS

| Home | Help | Tutorial |  
Chart | List | Explore |

**Parameters**

ra	208.28	deg
dec	5.15	deg
opt	GSP	

**Get Image**

**Drawing options**

- Grid
- Label
- Photometric objects
- Objects with spectra
- Invert Image

**Advanced options**

- Spectroscopic Targets
- Outlines
- Bounding Boxes
- Fields
- Masks
- Plates

**Selected object**

ra	208.28190
dec	5.14869
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i	22.66
z	20.21

**Quick Look**

- Quick Look
- Explore
- Recenter
- Add to notes
- Show notes

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# A more complex example

- Research: remove most foreground and background galaxies around a galaxy cluster so that I can study the cluster “member” galaxies and target those galaxies w/o spectra for additional spectroscopic observations.
  - Problem: The SDSS spectroscopic survey is not complete.
  - Answer: Use the spectroscopic data when available. When no spectrum is available use the photometrically determined redshift.

# Ingredients to a complex query

- Which attributes?
  - positions, magnitudes, z, or photo-z
- Which tables?
  - SpecObj (z), Photoz (photo-z), Galaxy (mags/position)
- How do I constrain to a circle on the sky?
  - fGetNearbyObjEq(208.28,5.15,58.31)
- How do I “join” the results?
  - three joins
- How do I handle “nulls values”



# Select Your Attributes (since you are no an expert on the SDSS schema)



The screenshot displays the SDSS Query / CasJobs web interface. The header features the SDSS logo and the text "SDSS Query / CasJobs". Below the header is a navigation menu with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and a user name "chrism".

The main interface is divided into sections:

- Context:** A dropdown menu set to "DR10".
- Table (optional):** A text input field containing "MyTable".
- Task Name:** A text input field containing "My Query".

Below these fields are buttons for "Samples", "Recent", and "Clear". To the right are buttons for "Syntax", "Plan", "Quick", and "Submit".

The central area is a SQL query editor with the following text:

```
1 SELECT INTO MYDB.MyTable_3 s.specobjid, p.ra, p.dec,p.Petromag_u-p.extinction_u,  
2   p.Petromag_g-p.extinction_g, p.Petromag_r-p.extinction_r,  
3   p.Petromag_i-p.extinction_i,p.Petromag_z-p.extinction_z, p.z, pz.z
```

Below the query editor, the text "1 row(s)" is visible. Under the heading "Rows Affected", the number "0" is displayed.

The bottom of the interface has a footer with buttons for "RESULTS", "Plot", "Save As", and a dropdown menu set to "HTML". On the right side of the footer are buttons for "DISPLAY", "Query", "Results", and "Both".



# Use the example queries to help you find a solution

## Galaxies unsaturated near given location Top

```
-- Find galaxies without saturated pixels within 1' of a given point (ra=185.0, dec=-0.5).
-- This query uses a function fGetNearbyObjEq, which takes 3 arguments (ra, dec,
-- distance in arcmin); this function uses the Neighbors table. The Neighbors and Galaxy
-- tables have in common the objID, so we have to select objects from both where the
-- objIDs are the same. The output of the function is a table with the Galaxy Object ID
-- and distance in arcmin from the input. This query introduces the use of a JOIN to
-- combine table contents. We also use the 'ORDER BY' syntax, which sorts the output.
```

```
SELECT TOP 100 G.objID, GN.distance
FROM Galaxy as G
JOIN dbo.fGetNearbyObjEq(185.,-0.5, 1) AS GN -- this function outputs a table, so we have to do a
join
      on G.objID = GN.objID -- get objects from neighbors table GN with desired ObjID
WHERE (G.flags & dbo.fPhotoFlags('saturated')) = 0 -- and the object is not saturated. f.PhotoFlags is a
function that interprets the flag bits.
ORDER BY distance -- sort these by distance
```

## Ellipticals odd lines Top

```
-- Find all elliptical galaxies with spectra that have an anomalous emission line.
-- This query introduces the SQL syntax DISTINCT, which will return only one instance
-- of the requested parameter (ObjID, in this case), because our query may return the
-- same object more than once. This is also the first nested query, where we use one
-- SELECT (the inner one) to get a group of objects we are not interested in. The outer
-- SELECT includes the new syntax 'not in', which is used to perform the exclusion.
```

```
SELECT DISTINCT G.ObjID
FROM
  JOIN Galaxy as G
  JOIN SpecObj as S ON G.ObjID = S.bestObjID -- the galaxy has a spectrum
  JOIN SpecLine as L ON S.SpecObjID = L.SpecObjID -- L is a spectral line
  JOIN XCRedshift as XC ON S.SpecObjID = XC.SpecObjID -- cross-correlation redshift
```

In this case, to the circular range query

# Use the example queries to help you find a solution

## Galaxies unsaturated near given location Top

```
-- Find galaxies without saturated pixels within 1' of a given point (ra=185.0, dec=-0.5).
-- This query uses a function fGetNearbyObjEq, which takes 3 arguments (ra, dec,
-- distance in arcmin); this function uses the Neighbors table. The Neighbors and Galaxy
-- tables have in common the objID, so we have to select objects from both where the
-- objIDs are the same. The output of the function is a table with the Galaxy Object ID
-- and distance in arcmin from the input. This query introduces the use of a JOIN to
-- combine table contents. We also use the 'ORDER BY' syntax, which sorts the output.
```

```
FROM Galaxy as G
JOIN dbo.fGetNearbyObjEq(185.,-0.5, 1) AS GN -- so we have to do a
join -- join on ObjID
```

```
WHERE (G.flags & dbo.fnPhotoFlags(saturated)) = 0 -- and the object is not saturated. f.PhotoFlags is a
function that interprets the flag bits.
ORDER BY distance -- sort these by distance
```

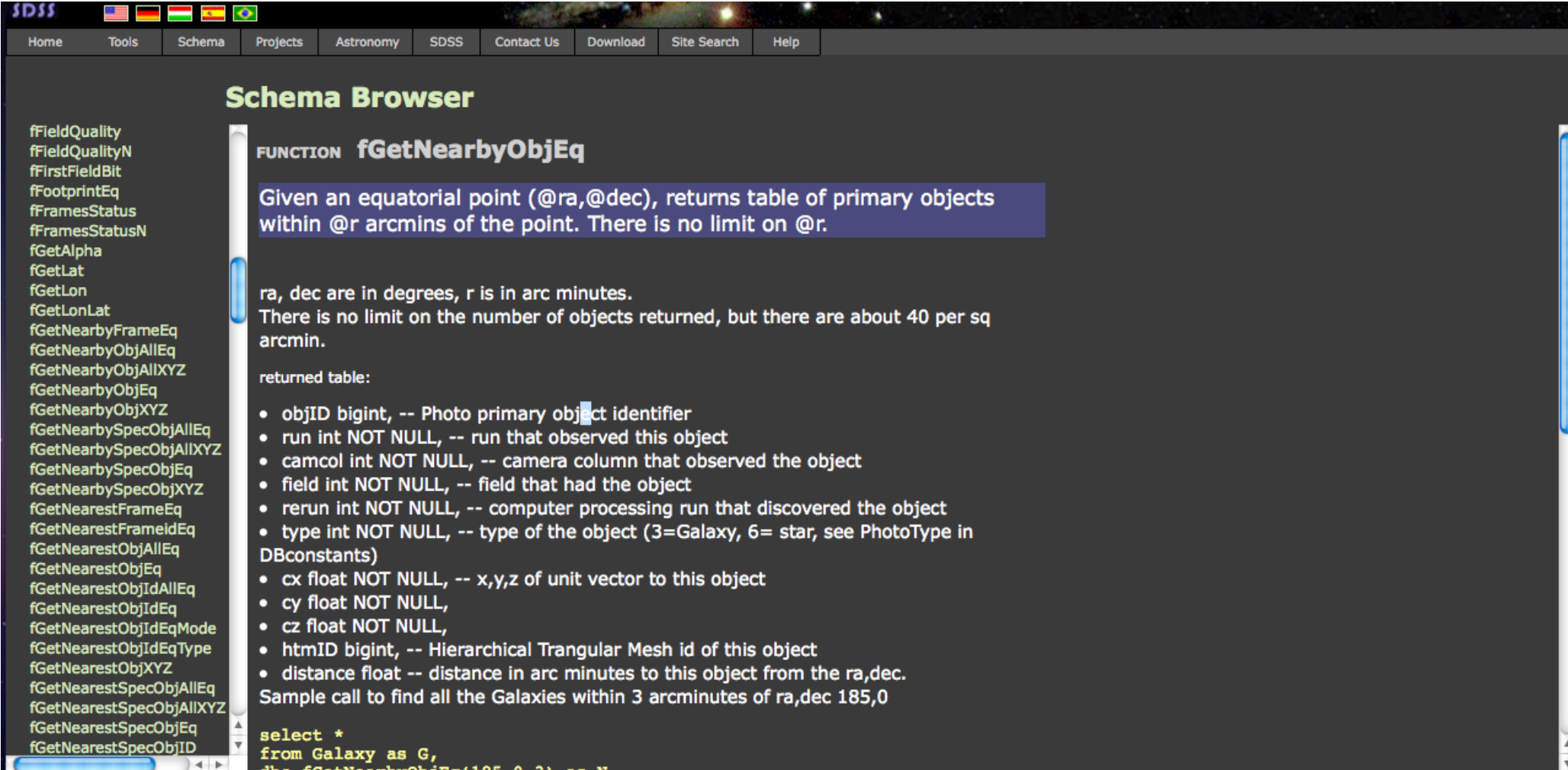
## Ellipticals odd lines Top

```
-- Find all elliptical galaxies with spectra that have an anomalous emission line.
-- This query introduces the SQL syntax DISTINCT, which will return only one instance
-- of the requested parameter (ObjID, in this case), because our query may return the
-- same object more than once. This is also the first nested query, where we use one
-- SELECT (the inner one) to get a group of objects we are not interested in. The outer
-- SELECT includes the new syntax 'not in', which is used to perform the exclusion.
```

```
SELECT DISTINCT G.ObjID
FROM
  JOIN Galaxy as G
  JOIN SpecObj as S ON G.ObjID = S.bestObjID -- the galaxy has a spectrum
  JOIN SpecLine as L ON S.SpecObjID = L.SpecObjID -- L is a spectral line
  JOIN XCRedshift as XC ON S.SpecObjID = XC.SpecObjID -- cross-correlation redshift
```

In this case, to the circular range query

# We are using a new function. Spend some time to learn it and others.



The screenshot shows the SDSS Schema Browser interface. At the top, there are navigation tabs: Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, and Help. The main content area is titled "Schema Browser" and displays the details for the function `fGetNearbyObjEq`.

**FUNCTION `fGetNearbyObjEq`**

Given an equatorial point (`@ra,@dec`), returns table of primary objects within `@r` arcmins of the point. There is no limit on `@r`.

`ra, dec` are in degrees, `r` is in arc minutes.  
There is no limit on the number of objects returned, but there are about 40 per sq arcmin.

returned table:

- `objID` bigint, -- Photo primary object identifier
- `run` int NOT NULL, -- run that observed this object
- `camcol` int NOT NULL, -- camera column that observed the object
- `field` int NOT NULL, -- field that had the object
- `rerun` int NOT NULL, -- computer processing run that discovered the object
- `type` int NOT NULL, -- type of the object (3=Galaxy, 6= star, see `PhotoType` in `DBconstants`)
- `cx` float NOT NULL, -- x,y,z of unit vector to this object
- `cy` float NOT NULL,
- `cz` float NOT NULL,
- `htmID` bigint, -- Hierarchical Trangular Mesh id of this object
- `distance` float -- distance in arc minutes to this object from the `ra,dec`.

Sample call to find all the Galaxies within 3 arcminutes of `ra,dec 185,0`

```
select *
from Galaxy as G,
dbo.fGetNearbyObjEq(185,0,3) as N
```

# We are using a new function. Spend some time to learn it and others.

The screenshot shows the SDSS Schema Browser interface. At the top, there are navigation tabs: Home, Tools, Schema, Projects, Astronomy, SDSS, Contact Us, Download, Site Search, and Help. The main content area is titled "Schema Browser". On the left side, there is a vertical list of function names, including fFieldQuality, fFieldQualityN, fFirstFieldBit, fFootprintEq, fFramesStatus, fFramesStatusN, fGetAlpha, fGetLat, fGetLon, fGetLonLat, fGetNearbyFrameEq, fGetNearbyObjAllEq, fGetNearbyObjAllXYZ, fGetNearbyObjEq, fGetNearbyObjXYZ, fGetNearbySpecObjAllEq, fGetNearbySpecObjAllXYZ, fGetNearbySpecObjEq, fGetNearbySpecObjXYZ, fGetNearestFrameEq, fGetNearestFrameIdEq, fGetNearestObjAllEq, fGetNearestObjEq, fGetNearestObjIdAllEq, fGetNearestObjIdEq, fGetNearestObjIdEqMode, fGetNearestObjIdEqType, fGetNearestObjXYZ, fGetNearestSpecObjAllEq, fGetNearestSpecObjAllXYZ, fGetNearestSpecObjEq, and fGetNearestSpecObjID.

In the center, there is a SQL query:

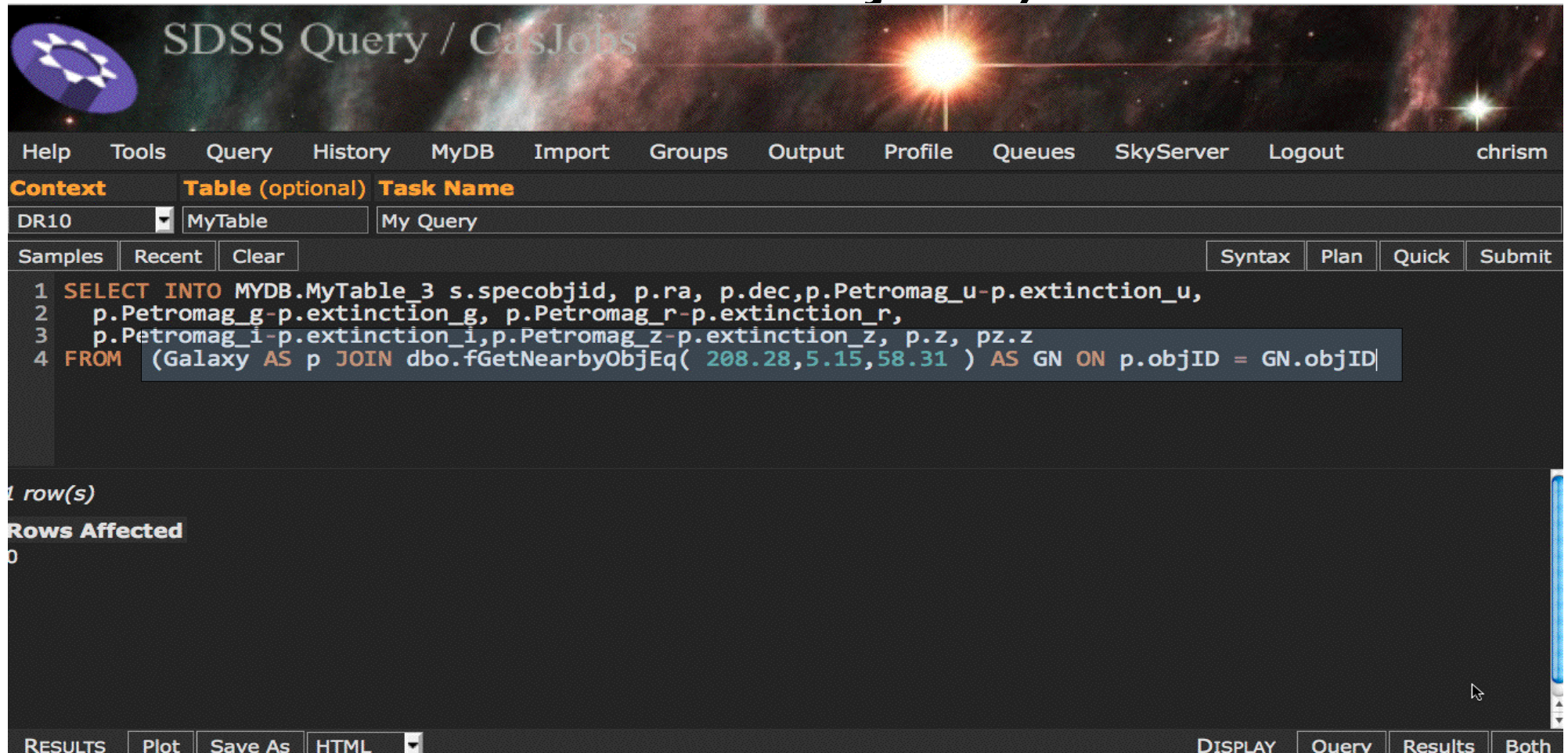
```
select *
from Galaxy as G,
dbo.fGetNearbyObjEq(185,0,3) as N
where G.objID = N.objID
see also fGetNearestObjEq, fGetNearbyObjXYZ, fGetNearestObjXYZ
```

Below the query, there is a section titled "Input and output parameters" which contains a table with the following data:

name	type	length	inout	pnum
@ra	float	8	input	1
@dec	float	8	input	2
@r	float	8	input	3
run	int	4	output	2
camcol	int	4	output	3
field	int	4	output	4
rerun	int	4	output	5
type	int	4	output	6
cx	float	8	output	7
cy	float	8	output	8
cz	float	8	output	9
distance	float	8	output	11
objID	bigint	8	output	1
htmID	bigint	8	output	10



# Now, we apply the function (which is an inner join)



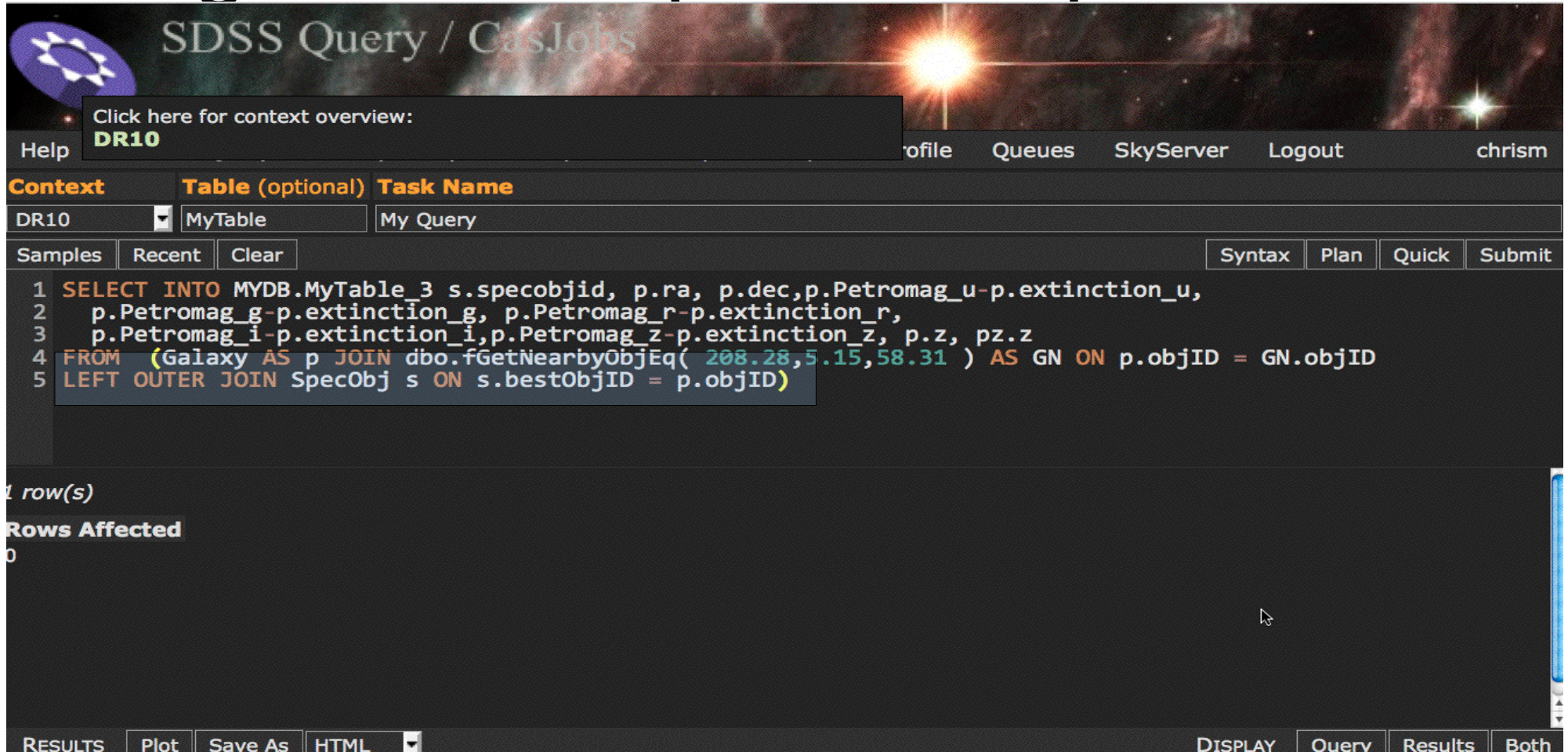
The screenshot shows the SDSS Query / CasJobs interface. The header includes the SDSS logo and the text "SDSS Query / CasJobs". Below the header is a navigation menu with items: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and chrism. The main interface is divided into sections: Context (DR10, MyTable, My Query), Table (optional) (MyTable), and Task Name (My Query). Below these are buttons for Samples, Recent, Clear, Syntax, Plan, Quick, and Submit. The main area contains a SQL query:

```
1 SELECT INTO MYDB.MyTable_3 s.specobjid, p.ra, p.dec,p.Petromag_u-p.extinction_u,  
2 p.Petromag_g-p.extinction_g, p.Petromag_r-p.extinction_r,  
3 p.Petromag_i-p.extinction_i,p.Petromag_z-p.extinction_z, p.z, pz.z  
4 FROM (Galaxy AS p JOIN dbo.fGetNearbyObjEq( 208.28,5.15,58.31 ) AS GN ON p.objID = GN.objID)
```

Below the query, it shows "1 row(s)" and "Rows Affected: 0". At the bottom, there are buttons for RESULTS, Plot, Save As, HTML, DISPLAY, Query, Results, and Both.

An “equi-join”, which means only “matches” are returned (no nulls)

# Now, we use a left outer join (why?) against the spectroscopic table



The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links for Help, Profile, Queues, SkyServer, Logout, and a user name 'chrism'. Below this is a 'Context' section with a dropdown menu set to 'DR10', a text input for 'Table (optional)' containing 'MyTable', and a text input for 'Task Name' containing 'My Query'. There are buttons for 'Samples', 'Recent', and 'Clear', along with 'Syntax', 'Plan', 'Quick', and 'Submit' buttons. The main area contains a SQL query:

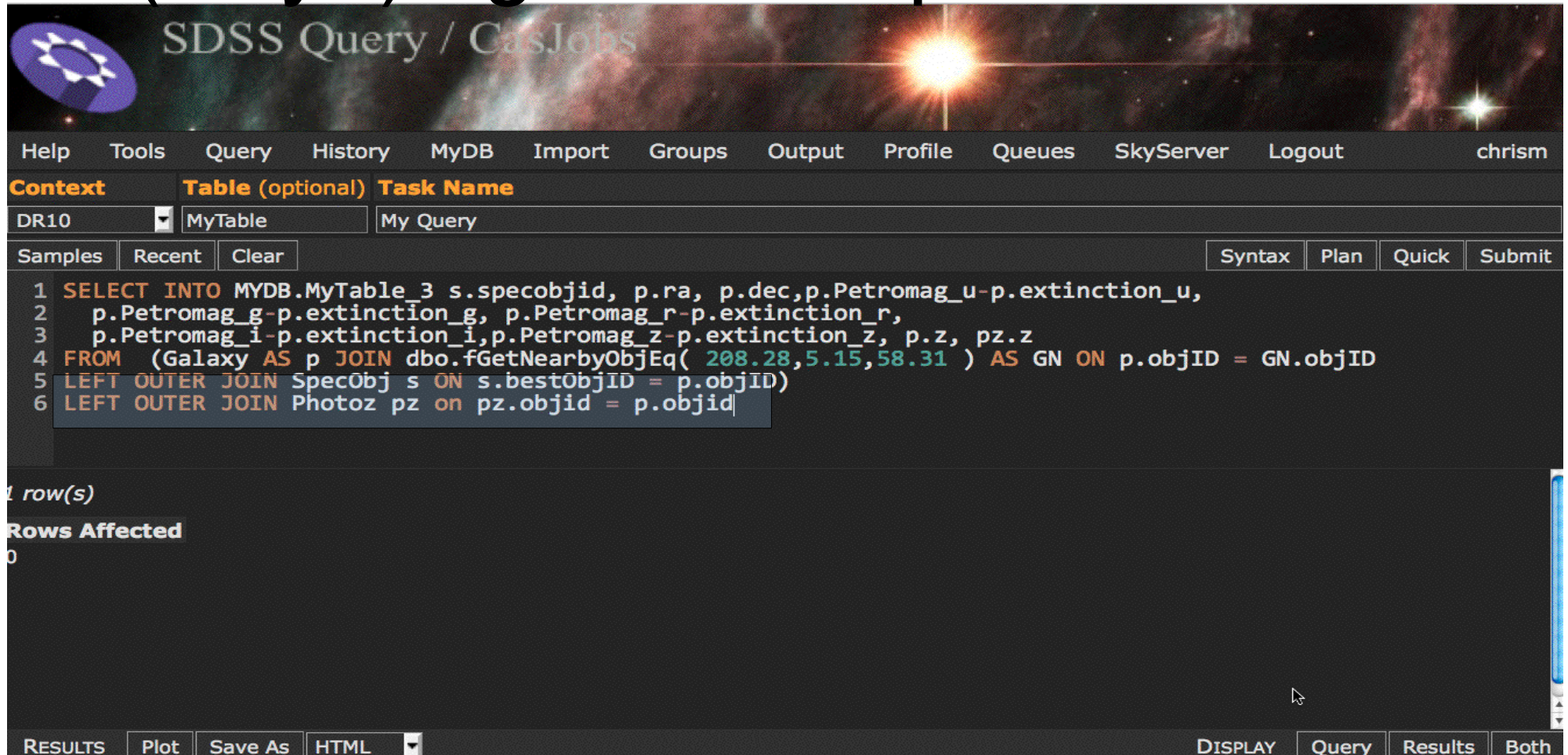
```
1 SELECT INTO MYDB.MyTable_3 s.specobjid, p.ra, p.dec, p.Petromag_u-p.extinction_u,  
2   p.Petromag_g-p.extinction_g, p.Petromag_r-p.extinction_r,  
3   p.Petromag_i-p.extinction_i, p.Petromag_z-p.extinction_z, p.z, pz.z  
4 FROM (Galaxy AS p JOIN dbo.fGetNearbyObjEq( 208.28, 5.15, 58.31 ) AS GN ON p.objID = GN.objID)  
5 LEFT OUTER JOIN SpecObj s ON s.bestObjID = p.objID)
```

Below the query, it shows '1 row(s)' and 'Rows Affected' with the value '0'. At the bottom, there is a 'RESULTS' section with buttons for 'Plot', 'Save As', and 'HTML', and a 'DISPLAY' section with buttons for 'Query', 'Results', and 'Both'.

A left outer join: where all objects on the “left” are returned. There will be nulls.



# We use another left outer join (why?) against the photo-z table



The screenshot shows the SDSS Query / CasJobs interface. The header includes a logo and the text "SDSS Query / CasJobs". Below the header is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and a user name "chrism".

The main interface has a "Context" section with a dropdown menu set to "DR10", a "Table (optional)" field set to "MyTable", and a "Task Name" field set to "My Query". Below this are buttons for "Samples", "Recent", and "Clear". On the right side of this section are buttons for "Syntax", "Plan", "Quick", and "Submit".

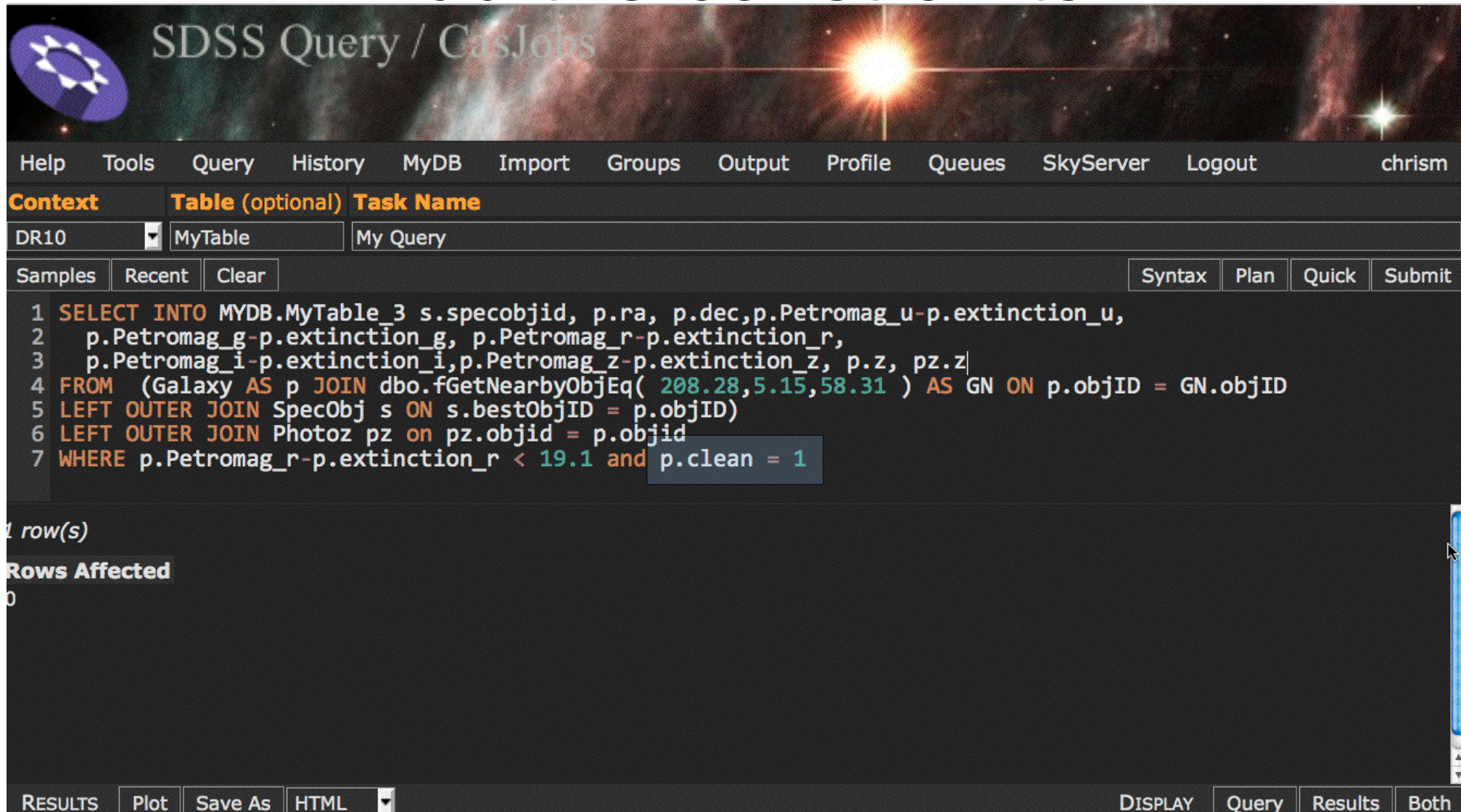
The central area contains a SQL query:

```
1 SELECT INTO MYDB.MyTable_3 s.specobjid, p.ra, p.dec, p.Petromag_u-p.extinction_u,  
2   p.Petromag_g-p.extinction_g, p.Petromag_r-p.extinction_r,  
3   p.Petromag_i-p.extinction_i, p.Petromag_z-p.extinction_z, p.z, pz.z  
4 FROM (Galaxy AS p JOIN dbo.fGetNearbyObjEq( 208.28,5.15,58.31 ) AS GN ON p.objID = GN.objID  
5 LEFT OUTER JOIN SpecObj s ON s.bestObjID = p.objID)  
6 LEFT OUTER JOIN Photoz pz on pz.objid = p.objid
```

Below the query, it shows "1 row(s)" and "Rows Affected" with the value "0".

The bottom of the interface has a navigation bar with buttons: RESULTS, Plot, Save As, HTML (with a dropdown arrow), DISPLAY, Query, Results, and Both.

# Add the constraints



The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and a user name 'chrism'. Below this is a header section with 'Context', 'Table (optional)', and 'Task Name'. The 'Context' dropdown is set to 'DR10', 'Table' is 'MyTable', and 'Task Name' is 'My Query'. There are buttons for 'Samples', 'Recent', and 'Clear'. On the right side of this section are buttons for 'Syntax', 'Plan', 'Quick', and 'Submit'. The main area contains a SQL query:

```
1 SELECT INTO MYDB.MyTable_3 s.specobjid, p.ra, p.dec, p.Petromag_u-p.extinction_u,  
2   p.Petromag_g-p.extinction_g, p.Petromag_r-p.extinction_r,  
3   p.Petromag_i-p.extinction_i, p.Petromag_z-p.extinction_z, p.z, pz.z  
4 FROM (Galaxy AS p JOIN dbo.fGetNearbyObjEq( 208.28,5.15,58.31 ) AS GN ON p.objID = GN.objID  
5 LEFT OUTER JOIN SpecObj s ON s.bestObjID = p.objID)  
6 LEFT OUTER JOIN Photoz pz on pz.objid = p.objid  
7 WHERE p.Petromag_r-p.extinction_r < 19.1 and p.clean = 1
```

Below the query, it shows '1 row(s)' and 'Rows Affected' with the value '0'. At the bottom, there is a footer with buttons for 'RESULTS', 'Plot', 'Save As', and a dropdown menu set to 'HTML'. On the right side of the footer are buttons for 'DISPLAY', 'Query', 'Results', and 'Both'.



# Clean up and replace NULLS



The screenshot shows the SDSS Query / CasJobs interface. The header includes a logo and the text "SDSS Query / CasJobs". Below the header is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and chrism. The main interface has a "Context" section with a dropdown menu set to "DR10", a "Table (optional)" field set to "MyTable", and a "Task Name" field set to "My Query". There are buttons for "Samples", "Recent", and "Clear". On the right side, there are buttons for "Syntax", "Plan", "Quick", and "Submit". The main area contains a SQL query:

```
1 SELECT INTO MYDB.MyTable_3 ISNULL(s.specobjid,0) AS specobjid, p.ra, p.dec,p.Petromag_u-p.extinction_u,  
2 p.Petromag_g-p.extinction_g, p.Petromag_r-p.extinction_r,  
3 p.Petromag_i-p.extinction_i,p.Petromag_z-p.extinction_z, ISNULL(s.z, 0) AS z, ISNULL(pz.z, 0) AS pz  
4 FROM (Galaxy AS p JOIN dbo.fGetNearbyObjEq( 208.28,5.15,58.31 ) AS GN ON p.objID = GN.objID  
5 LEFT OUTER JOIN SpecObj s ON s.bestObjID = p.objID)  
6 LEFT OUTER JOIN Photoz pz on pz.objid = p.objid  
7 WHERE p.Petromag_r-p.extinction_r < 19.1 and p.clean = 1
```

Below the query, it shows "1 row(s)" and "Rows Affected" with a value of "0". At the bottom, there is a navigation bar with buttons: RESULTS, Plot, Save As, HTML, DISPLAY, Query, Results, and Both.

# Execute and examine output

The screenshot shows the SDSS Query / CasJobs interface. At the top, there is a navigation bar with links: Help, Tools, Query, History, MyDB, Import, Groups, Output, Profile, Queues, SkyServer, Logout, and a user name 'chrism'. Below the navigation bar, there are dropdown menus for 'MyDB' and 'Local Only'. The main content area is titled 'MyTable\_9' and indicates it contains approximately 1,794 rows (~200 kB). A row of action buttons is visible: Notes, Sample, Job, Plot,  $\beta$ Plot, Download, Publish, Neighbors, Rename, and Drop. Below this is the 'Table Schema' section, which shows the column names and their data types and sizes. The columns are: specobjid (bigint [8]), ra (float [8]), dec (float [8]), Column1 (float [8]), Column2 (float [8]), Column3 (float [8]), Column4 (float [8]), and Column5 (float [8]). A data table is displayed below the schema, showing the first few rows of data. The table has columns: specobjid, ra, dec, Column1, Column2, Column3, and Column4. The data rows are as follows:

specobjid	ra	dec	Column1	Column2	Column3	Column4
241167375930490880	208.27667003	5.14973383	17.2587356567383	15.1472616195679	14.2139387130737	1
240886056126251008	208.27979335	5.15536519	20.2446670532227	18.6610240936279	17.3314437866211	1
0	208.25718222	5.13258105	22.317663192749	19.8535823822021	19.0550956726074	1
240886056176582656	208.26550426	5.13823054	20.2244052886963	18.1599826812744	17.2801704406738	1
0	208.27811781	5.16382357	20.6172733306885	19.0770931243896	18.2137279510498	1
0	208.29332179	5.15213626	20.9984893798828	19.6005725860596	18.7281188964844	1
0	208.25989373	5.1122044	16.8910331726074	16.4524879455566	17.7618350982666	1
0	208.23797543	5.13827877	20.1577739715576	18.1115188598633	17.2124805450439	1

On the left side of the interface, there is a sidebar with a 'Sort by...' dropdown and an 'All selected...' dropdown. Below these are several sections: 'Views', 'Tables', 'Functions', and 'Procedures'. A table lists various tables with columns for 'Rows', 'kB', and 'Name'. The table is as follows:

Rows	kB	Name
2,403	456	MyTable
0	0	MyTable_0
148,685	15,688	MyTable_1
2,358	520	MyTable_10
1,139,373	115,656	MyTable_2
444,220	45,000	MyTable_3
266,749	27,080	MyTable_4
0	0	MyTable_5
222	48	MyTable_6
426,000	27,528	MyTable_7
100	16	MyTable_8
1,794	200	MyTable_9





# Plot your results

The screenshot shows the SDSS Query / CasJobs interface. The main content area displays the details for 'MyTable\_9', which contains approximately 1,794 rows (~200 kB). A 'Plot' button is highlighted in the top navigation bar. Below the table name, a 'Table Schema' section shows columns: Column1, Column2, Column3, and Column4, all of type float [8].

A configuration dialog is overlaid on the right side, showing settings for plotting the 'z' and 'pz' columns. The dialog includes fields for 'Upper Limit' and 'Lower Limit' for both columns, and radio buttons to select the X and Y axes.

z	pz
float [8]	float [8]
Upper Limit	Upper Limit
1.0	1.0
Lower Limit	Lower Limit
0.0	0.0
<input checked="" type="radio"/> X	<input type="radio"/> X
<input type="radio"/> Y	<input checked="" type="radio"/> Y



# Plot your results

