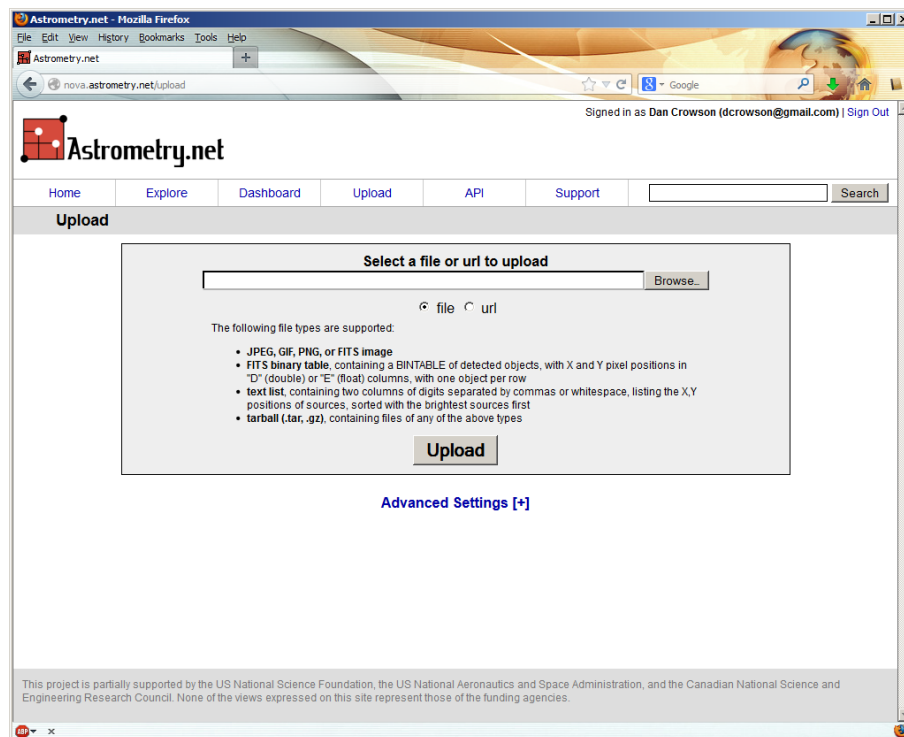


How to Identify objects in your images using plate-solving and the Aladin Sky Atlas

Dan Crowson – dcrowson at crowson dot com

While you probably select a single or group of targets to image, you will find that your result can have hundreds or even thousands of faint galaxies and other objects. The easiest way I know of to identify them is to use a plate-solving program and the Aladin Sky Atlas. This tutorial will show you how to do this using free software. Note that you must have an active connection to the Internet for Aladin to work.

1. Download the Aladin Sky Atlas. As of this tutorial, the current version is v8.040.
 - Official Site - <http://aladin.u-strasbg.fr/java/nph-aladin.pl?frame=downloading>
 - You may also use the online version - <http://aladin.u-strasbg.fr/java/nph-aladin.pl>
2. Solve your image to a [FITS](#) file with world coordinate system (WCS) keys in the header. I typically use an image that is the result of processing out of a paint program such as gimp or Adobe PhotoShop. Since these are usually [TIFF](#) or [JPEG](#) files, the easiest way to generate the FITS image with WCS coordinates is to use the online Astrometry.net blind plate-solving tool.
 - <http://nova.astrometry.net/>
 - I suggest logging in. You can use an [OpenID](#) provider such as your Google or Yahoo account



- Hit the **Browse** button to select your file

- Astrometry.net submission 46351 - Mozilla Firefox

File Edit View History Bookmarks Tools Help

nova.astrometry.net/status/46351


Signed in as Dan Crowson (dcrowson@gmail.com) | Sign Out

Astrometry.net

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Submission 46351

Submitter:	Dan Crowson (67)	Upload Settings	
Date Submitted:	2013-06-20T09:50:10Z	Parity:	try both simultaneously
Filename:	NGC 6819 - RGB.jpg	Scale Units:	width of the field (in degrees)
		Scale Type:	bounds
		Scale Lower Bound:	0.1
		Scale Upper Bound:	180.0
		Downsample Factor:	2



[Go to results page](#)

Job 69771:
Success

[Source extraction image \(fullsize\)](#)
[Log file tail \[-\]](#)
(full)

Weighted RMS error of correspondences: 0.970591 arcsec
23 reference sources within the image.
RoR: 39356.3
Test stars in RoR: 1997 of 1997
Good bins: 108 / 108; effA 2.12182e+06 of 2.12182e+06
Ref stars in RoR: 23 of 23
Logodds: 187.56
23 matches, 48 distractors, 0 conflicts (at best log-odds); 1997 field sources,
23 matches, 1974 distractors, 0 conflicts (all sources)
Hit/miss: +++++++-----
Tweak2: final WCS:
Found tag-along columns from field: FLUX BACKGROUND

- Click on the **Go To results page** link once available

Astrometry.net - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Astrometry.net

nova.astrometry.net/user_images/57380#annotated

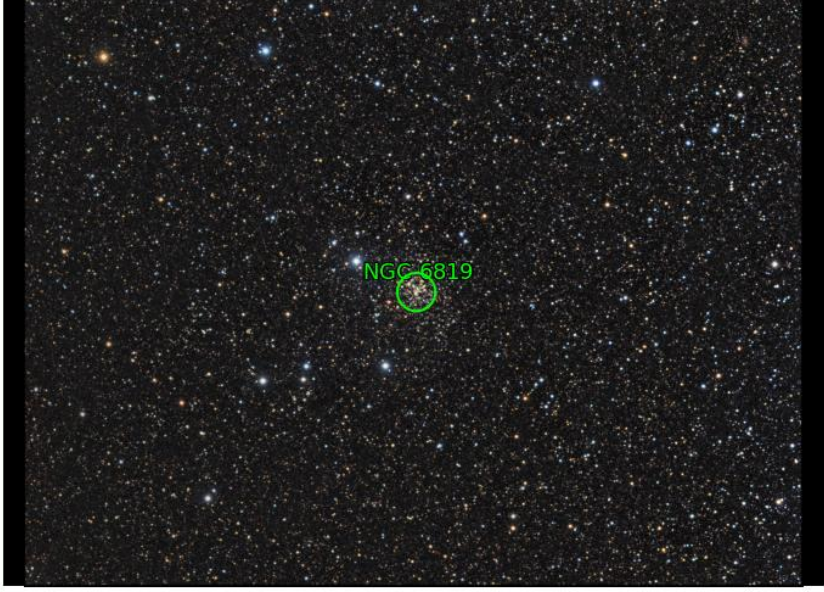
Google

Astrometry.net

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Images > NGC 6819 - RGB.jpg

Edit Image



Submitted by Dan Crowson (67)
on 2013-06-20T09:50:10Z
as "NGC 6819 - RGB.jpg" (Submission 46351)
under Attribution-NonCommercial-NoDerivs 3.0 Unported

publicly visible: [yes](#) | [no](#)

Job Status

Job 69771:
Success

Calibration

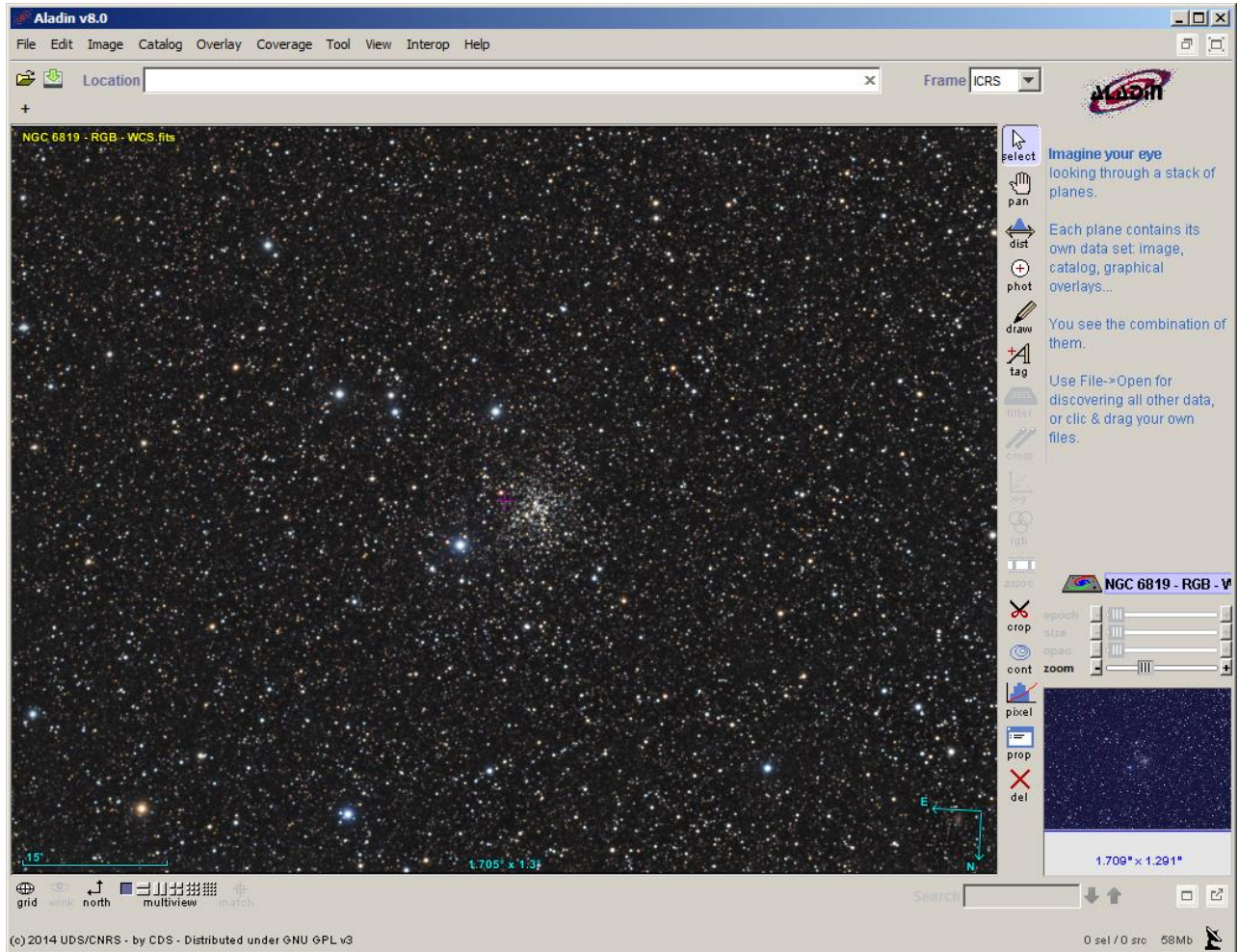
Center (RA, Dec): (295.330, 40.183)
Center (RA, hms): 19^h 41^m 19.133^s
Center (Dec, dms): +40° 10' 59.268"
Size: 1.71 x 1.29 deg
Radius: 1.072 deg
Pixel scale: 3.67 arcsec/pixel
Orientation: Up is 178 degrees E of N
WCS file: [wcs.fits](#)
New FITS image: [new-image.fits](#)
KMZ (Google Sky): [image.kmz](#)

Nearby Images ([View All](#))

- Click on the New FITS image **new-image.fits** link on the right side
- Save the file – this is the FITS image with the embedded WCS coordinates

3. Use Aladin Sky Atlas identify objects

- Open Aladin.exe
- File – Open local file and select the solved FITS image from step two
 - o You may also just drag the solved FITS image onto Aladin



- Image – Symmetry – Top/Bottom to flip it (assumes you want north up, east to the left)
- File – Load Catalog – Simbad database
 - o You may also select the NED database which will give you a lot more results but I would suggest starting with Simbad
- 8.x requires you to add a Radius
 - o Hit the Grab coord button and then click in the image or
 - o Use the larger number under the thumbnail image on the bottom right (1.709 deg for this example)

The screenshot shows a web-based interface titled "Server selector". At the top, there are several icons: "Others", "HIPS", "File", "all VO", "Watch", "Fov...", and "SExtractor". The interface is divided into three main sections: "Image servers" on the left, a central panel, and "Catalog servers" on the right.

Image servers (left): Includes icons for Aladin images, SkyView, Sloan, MAST, CADC, DSS..., VLA..., and Others...

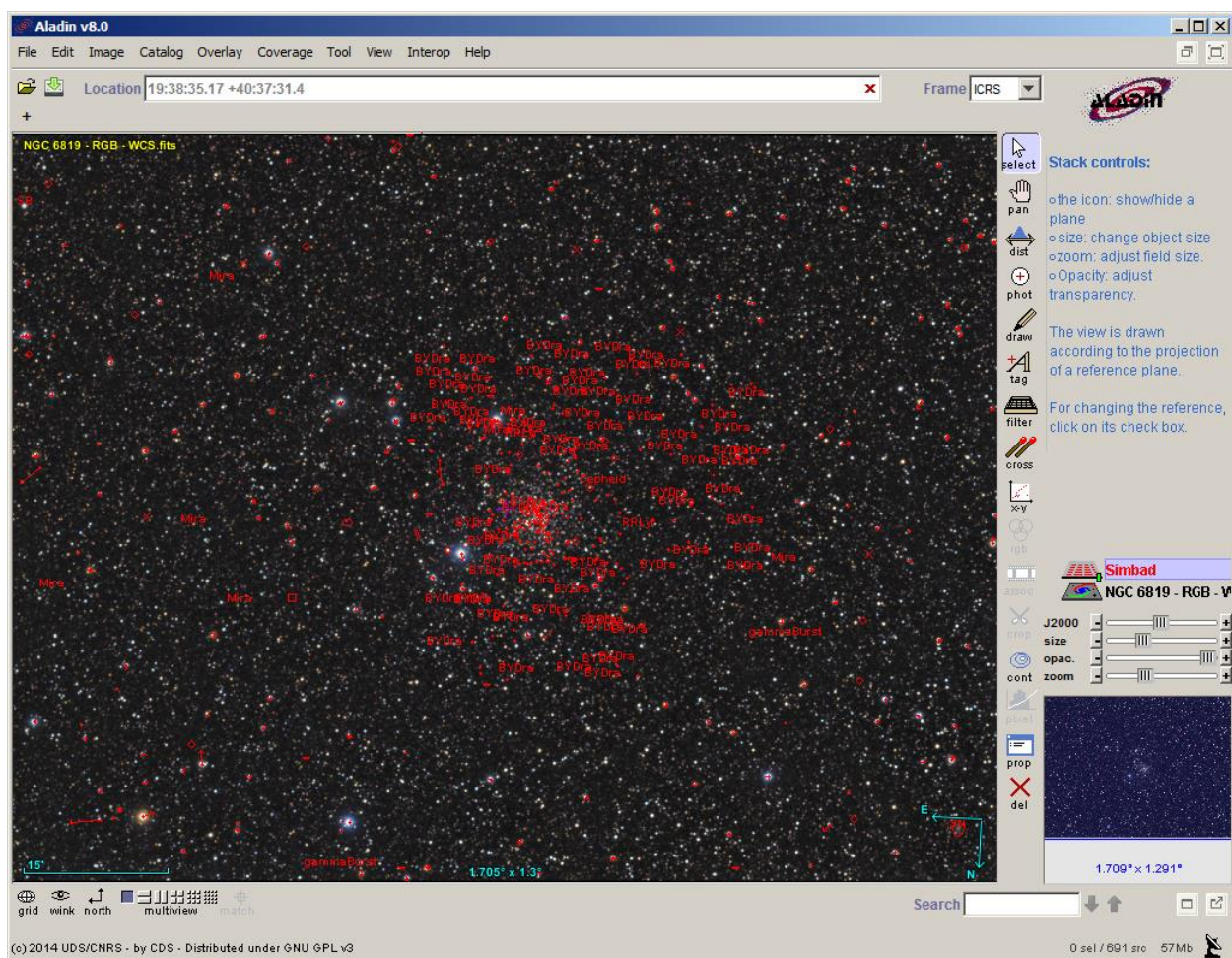
Catalog servers (right): Includes icons for All VizieR, Surveys, Missions, SIMBAD, NED, SkyBot, and Others..

Central panel:

- At the top, there is a radio button selection for "Simbad astronomical database" with a help icon (?).
- Below this, a text prompt says: "Specify a target and a field size and press the SUBMIT button".
- There are two input fields:
 - "Target (ICRS, name)" with the value "19 41 34.37 +40 10 30.5".
 - "Radius" with the value "14".
- To the right of the "Target" field is a button labeled "Grab coord".
- Below the input fields is a "Display filter" dropdown menu currently set to "All objects".

Bottom buttons: "Reset", "Clear", "SUBMIT" (in green), "Close" (in red), and a help icon (?).

- Hit **SUBMIT**
- Hit **Close**



- Each of the red annotations is an object that you can select by highlighting with the mouse
 - o Note that you can select multiple objects including everything in the image

Aladin v8.0

File Edit Image Catalog Overlay Coverage Tool View Interop Help

Location: 19:41:47.68 +40:10:20.6 Frame: ICRS

NGC 6819 - RGB - WCS.fits

Stack controls:

- the icon: show/hide a plane
- size: change object size
- zoom: adjust field size
- Opacity: adjust transparency

Simbad

NGC 6819 - RGB - V

epoch size epoch zoom

1.709" x 1.291"

Search

MAIN ID	OTYPE	RA	DEC	COO ...	COO ...	C...	PMRA	PMDEC	B	V	R	J
NGC 6819 227	*inCl	19 41 10.05	+40 13 08.3	60	60	0			15.27	14.1		12.218
NGC 6819 670	*inCl	19 41 08.91	+40 09 33.1	60	60	0			14.15	13.55		12.484
NGC 6819 964	*inCl	19 41 00.19	+40 13 50.7						11.55	11		
NGC 6819 965	*inCl	19 41 13.20	+40 14 56.8	60	60	92			13.25	11.83		9.082
NGC 6819 966	*inCl	19 41 11.03	+40 11 11.7	60	60	0			12.78	11.65		9.645
NGC 6819 967	*inCl	19 41 11.15	+40 11 42.3	60	60	104			12.92	11.65	10.3	9.393
NGC 6819 970	*inCl	19 41 11.84	+40 13 30.1	60	60	0			13.16	11.54		7.878

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129 sel / 691 src 63Mb

- For more information on the object(s), click on the MAIN ID to pull up a more detailed SIMBAD web page

SIMBAD query result

other query modes : [Identifier query](#) [Coordinate query](#) [Criteria query](#) [Reference query](#) [Basic query](#) [Script submission](#) [Output options](#) [Help](#)

Object query : HD 225464 C.D.S. - SIMBAD4 rel 1.207 - 2013.07.02CEST20:58:14

Available data : [Basic data](#) • [Identifiers](#) • [Plot & images](#) • [Bibliography](#) • [Measurements](#) • [External archives](#) • [Notes](#) • [Annotations](#)

Basic data :
HD 225464 -- Star query around with radius arcmin

Other object types: * (HD, CSI, GSC, TYC) , IR (2MASS)

ICRS coord. (ep=J2000) : 19 42 23.2706 +40 09 21.319 (~) [36.48 34.29 89] B
[1998A&A...335L..65H](#)

FK5 coord. (ep=J2000 eq=2000) : 19 42 23.271 +40 09 21.32 (~) [36.48 34.29 0] B
[1998A&A...335L..65H](#)

FK4 coord. (ep=B1950 eq=1950) : 19 40 40.36 +40 02 12.7 (~) [87.93 87.04 0] B
[1998A&A...335L..65H](#)

Gal coord. (ep=J2000) : 074.0511 +08.2837 (~) [36.48 34.29 0] B
[1998A&A...335L..65H](#)

Proper motions mas/yr [error ellipse]: -10.7 -18.9 [1.6 1.6 32] B [2000A&A...355L..27H](#)

Fluxes (5) :
 B 11.14 [0.07] D [2000A&A...355L..27H](#)
 V 10.14 [0.04] D [2000A&A...355L..27H](#)
 J 8.194 [0.032] C [2003yCat.2246....0C](#)
 H 7.623 [0.031] C [2003yCat.2246....0C](#)
 K 7.808 [0.020] C [2003yCat.2246....0C](#)

4. Tips and Tricks

- If you end up getting an error with <http://nova.astrometry.net> (such as file type not supported), try again later. This website tends to have issues at times.
- You can also find all of a type of object by selecting the whole image and then sorting on the **OTYPE** tab. You could also type in the OTYPE in the search box. This is good for looking for all galaxies, quasars, planetaries or other objects.
- Play with the Zoom. It is very useful for finding smaller objects or ones in very 'busy' fields.
- Aladin Sky Atlas can be used as a planetarium program without loading an image by just going to File – Load catalog – Simbad database. From here, type in an object name and field size.