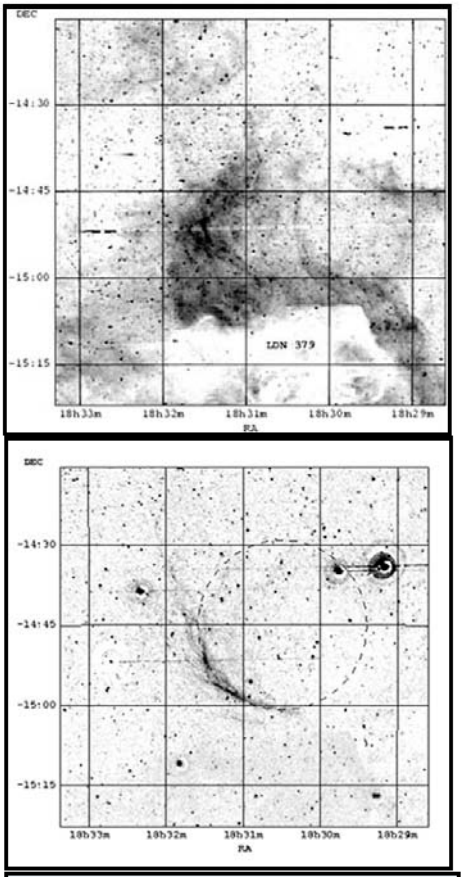

These are the first optical images of Supernova Remnant G17.4-2.3 in Scutum. Image subtraction yielded the OIII image at right that clearly shows the SNR shock front. (Boumis, et al, 2005)

quite crude. Can narrow band amateur imagers produce the first really high fidelity image of this object? The huge, dark wedge of **LDN 379**, just to the south, will help visual observers to pinpoint the location of the SNR, but the profusion of stars in the region will probably challenge even experienced observers with OIII filters. I had no luck with my 9 ¼" f/10 SCT. This remnant is centered at 18h 31m -15 00'.

To make your own finder charts for these remnants, go to www.wikisky.org or http://archive.stsci.edu/cgi-bin/dss_form and proceed to the object's location. With the simple contrast enhancement of MS Word, most of these SNRs become visible on the Palomar Sky Survey (POSS II). Professional publications occasionally show discovery images as well. To begin your own research, I recommend starting with Dave Green's Supernova Remnant web site http://www.mrao.cam.ac.uk/surveys/snrs

Will the "Real" NGC 4241 Please Stand Up?

by Dr. Wolfgang Steinicke and Dave Hofland

Many amateur astronomers enjoy finding and documenting their observations of objects using lists created by their club or from other sources. The Astronomical League's Herschel II list, originally created by the Rose City Astronomy Club, is one such list popular among those with relatively large aperture scopes, and those who pursue that list will find themselves targeting a 13th magnitude little galaxy ID'd as NGC 4241. Those not seeking the Herschel II award also may just happen to run across a pair of faint galaxies tucked away in Virgo about 3 degrees NNW of 5th magnitude 16 Virginis and find themselves seeking the IDs for them in order to document their observations. But depending on the sky chart of choice, be it a hard copy paper chart or a software program chart, the ID's of these two little galaxies are not universally agreed upon.

Most of us want to be "right" when we log an observation. We want to know that we're observing the object we think we are, and when we find a discrepancy we start checking the internet, a copy of Burnham's, or our Sky Atlas 200.0, or whatever other references we have available to nail down the "correct" object ID for the objects we log. But some riddles aren't so easily solved. NGC 4241's history is a case in point.

The photo accompanying this article is a DSS photo (north is up, west right) containing three identifiable galaxies and a few additional fainter unnamed galaxies. The bright star in the photo is 7.9 magnitude HD 106877 and the relatively bright lenticular galaxy (labeled A) about 5' N of that star is 13th magnitude IC 3102. About 8' to the ESE of IC 3102 is 14th magnitude IC 3115 (labeled B).

The listed coordinates for NGC 4241 as provided by the AL Herschel II list (RA 12:17:25.4 Dec +06:41:26) place it at the location of IC 3102. If the observer uses their Sky Atlas 2000 to locate this galaxy they will find that the galaxy NGC 4241 is charted consistent with the AL coordinates, just N of that 7.9 mag star (chart 14). If the observer targeting NGC 4241 pulls their copy of Uranometria 2000.0 off their bookshelf to locate NGC 4241 they find it (page 193) again right where the AL Herschel II book says it should be, just as Sky Atlas 2000 placed it. So where's the beef you ask? If the Herschel II list says NGC 4241 is IC 3102, and well known shelf references place it consistent with IC 3102, then the obvious conclusion is that NGC 4241 is that little lenticular galaxy also known as IC 3102, isn't it? But go on-line and take a look at a few images of NGC 4241 and a little ID issue becomes obvious pretty quickly. It seems that some photos of "NGC 4241" are photos of IC 3115, and some photos are IC 3102. What's going on, and what is right?

The answer is that researchers with the NGC/IC Project have corrected an error that was made by William Herschel's son John Herschel over 100 years ago; an error that was then transcribed by Dreyer into the NGC. Because this error wasn't discovered until recently, even the most recent editions of hard copy sky charts and atlases still have the "proper" ID of NGC 4241 tied to IC 3102, but newer updates of on-line references now ID NGC 4241 as IC 3115.

First let's get to the bottom of "the error". In the photo, to keep this easier to understand we've simply labeled the galaxies A and B. The letters x, y, and z are added to indicate locations ascribed to objects here by John Herschel.

William Herschel discovered galaxy A originally in April 1784 and logged it as II 137. On December 28, 1785 he

observed this area of sky again, repeated his observation of II 137 and also discovered the fainter galaxy B which he logged as III 480. So far so good, but enter his son John about 45 years later.

On April 4, 1830 John Herschel (sweep 250) describes an object - listed as h 1165 - at location x as "vF, vgbM, a * 7m to south". Position and description perfectly fit to William Herschel's II 137 but John identifies it to III 480! This is the origin of the problem. John Herschel makes a second observation on April 25, 1830 (sweep 254) yielding two objects at locations y and z. John catalogues the object at y as h 1152 ("pB, R, AR estimated from III 480, which it precedes on same parallel") and identifies it as his father's II 137. The object at location z is catalogued by John as h 1165 ("vF") and identifies it as his father's III 480. John's descriptions fit the two William Herschel objects here, but the locations do not. Especially the two observations of h 1165 (at x and at z, both assigned as III 480) do not match. Obviously John Herschel made what appears to be an approximately 1 minute error in right ascension on the night of April 25, as the relative positions look correct. Shift the locations y and z one minute east (in time not arc) and everything gets cozy again. Although notes of subsequent observations of this area by John Herschel indicate he recognized something was amiss here, he never fully discovered what he did wrong and never adequately corrected the error.

Along comes Dreyer and the New General Catalog. Dreyer simply copied John Herschel's General Catalogue data, assigning NGC 4223 to John Herschel's object h 1152 at location y, and NGC 4241 to John's object h 1165 at location z. In Dreyer's notes to NGC 4223 he reports that it was "never seen by D'Arrest" - of course since there is no apparent object there! Strangely he states that "h 1152 = II 137", perhaps to point out the existence.

On October 30, 1899 William Herschel's II 137 and III 480 were independently rediscovered by Schwassmann at the correct locations for galaxies A and B. Dreyer listed both as IC 3102 and IC 3115 respectively in the Index Catalogue II of 1908. No cross ID with John Herschel's objects, or with the General Catalogue or New General Catalogue was included, probably to avoid dealing with the confusion.

Dreyer picked up the case of II 137 and III 480 one last time in the "Scientific Papers" but could not resolve it. He gives "II-137 = NGC 4241 = h 1165" and recommends to strike out h 1152 due to the "rough place". Thus we end up with III 480 identified with IC 3115 ("resulting place absolutely coincident"), and a missing NGC 4223.

Accordingly, the NGC/IC project solves the error by correcting John Herschel's error, shifting his objects to the east by about a minute in time in right ascension. Thus we get William Herschel's II 137 = John Herschel's 1152 = GC 2812 = NGC 4223 = IC 3102; and William Herschel's III 480 = John Herschel's 1165 = GC 2829 = NGC 4241 = IC 3115. Many web sites and other recently published references (Skyhound's Skytools-3 for example) that use the corrected NGC/IC object data do not agree with older references, such as the AL Herschel II list, Uranometria 2000, Sky Atlas 2000.0, and others that still use the uncorrected NGC data.

Its going to take a long time, perhaps many years, before the correction to these ID's and their corresponding galaxies works its way through amateur astronomy and becomes consistent among charts, atlases and other references. And some may disagree with the change and maintain that NGC 4241 = IC 3102 as Dreyer's New General Catalogue says it is. Perhaps, like the issue of M 101 and M 102, it may never be fully accepted or agreed upon. For now we're just going to have to live with NGC 4241 having a split personality of sorts, but at least now you know why.