

Arp Peculiar Galaxy

M101 and Supernova SN2011FE
Imaged: August 27, 2011
Comparison Image: May 29, 2006
Ken Sperber
Takahashi FS-102 (24 x 5min Exposures)

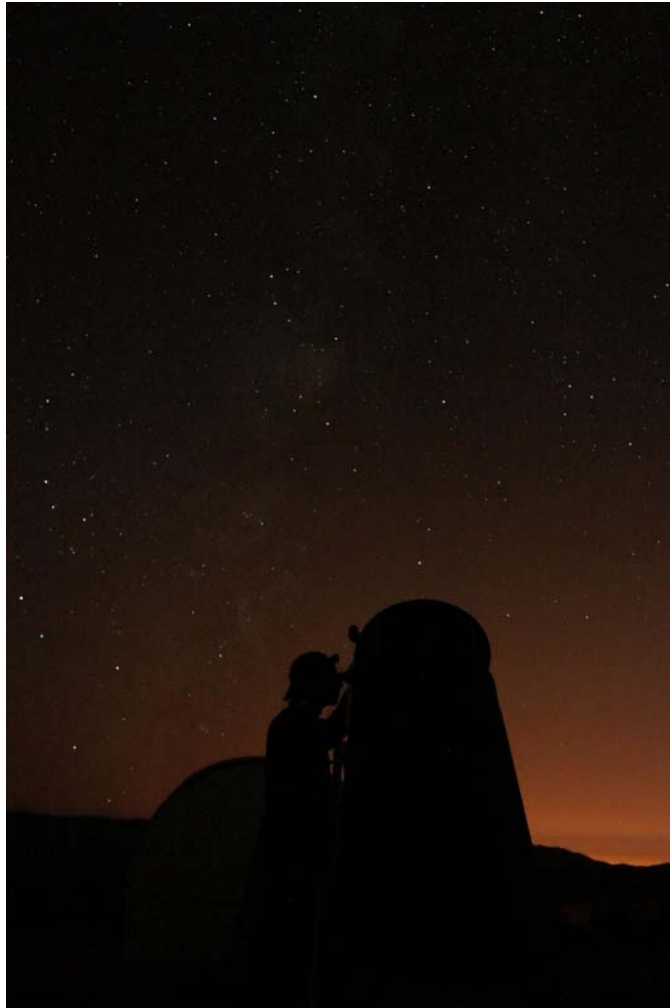


Observing Guide

Ken Sperber

Arp Peculiar Galaxy Observing Guide

By
Ken Sperber



Cover Image: Ken Sperber
Arp26/NGC5457/M101 with SN2011FE
Hidden Hill Observatory

Above Image Credit: Karen Harris

Preface

I have been observing celestial objects since the early 1970's, when I was a pre-teen growing up on Long Island, NY. My first telescope was a small refractor from Sears Roebuck & Co. My most pronounced memory with this department store telescope was looking at the Sun using the supplied smoke glass filter that screwed into the eyepiece. After walking away from the telescope for a few minutes, upon my return I noticed a strong glare as I was about to again look through the eyepiece. Luckily, I had the wherewithal not to look through the eyepiece; otherwise I'd surely have been blinded, as the smoke glass filter had cracked! My first "real" telescope was a circa 1980 Meade 826 8" f/6 Newtonian. I spent many an hour in my backyard observing deep-sky objects and the Moon. I remember observing the Orion Nebula one winter night when my dad came home from the late shift. He wondered what the heck I was doing out in the snow after midnight. I was having so much fun, the cold wasn't even a consideration. My observing took a hiatus while in college and graduate school, and resumed in 1989 when I moved to northern California. I upgraded to a 1992 Meade 10" f/10 LX-200 Schmidt-Cassegrain. Computerized access to the full NGC list was too much to pass up, after years of (mostly poor) star-hopping. Also, being in close proximity to Lumicon, where I could look and touch all of the latest equipment, and chat with such experts as Dr. Jack Marling, and the members of the Tri-Valley Stargazers was very inspirational. Around 1996 I began using this scope for astrophotography, but subsequently purchased a Takahashi FS-102 for wide-field astrophotography. In 2005 I switched from film to a Santa Barbara Instruments Group (SBIG) ST-2000XM CCD for imaging (www.trivalleystargazers.org/ken/ST-2000XM/ST-2000XM.html), and I also purchased an Obsession 20" f/5 for observing.

"What to observe and/or image?" is a question that is never far from my mind. My all-time favorite compilation is "*The Observer's Guide*" by George R. Kepple and Glen W. Sanner. These were a series of bi-monthly guides, organized by constellation, that were published in the late 1980's. These were later published by Willmann-Bell, Inc. as a two-volume set, "The Night Sky Observer's Guide," by the same authors. They are still available for purchase online. These guides provide for seeing a wide variety of objects during any given observing session. Additionally, there are many images, as well as eyepiece impression drawings, and included are notes from observers who have used telescopes both small and large.

I have taken observing notes on and off for many years. One of my most fun efforts was observing the Messier Objects with my 70mm TeleVue Pronto. More recently I thought it would be interesting to observe classes of objects to improve my appreciation of their diversity. My first foray into this organized approach is my ongoing effort to complete The Astronomical League Planetary Nebulae Program (only 7 more to go!). This project was greatly facilitated by the "*Planetary Nebulae Observing Guide*" by Ted Forte that is published through The Astronomical League (<http://www.astroleague.org/>). This publication facilitated my progress in completing this observing program, with the Planetary Nebulae listed by Right Ascension, including a picture and vital statistics for each object, information on the various classes of PN, and the guidelines for completing the program to qualify for the certificate and/or pin.

Lately, my interest had turned to Arp galaxies. The website <http://arpgalaxy.com/> is a wonderful resource to learn about peculiar galaxies, including getting online access to Halton C. Arp's 1966 publication that galvanized astronomers' attention to the diversity of galaxies. The online and .pdf versions of Dr. Arp's catalog provide links to a wealth of data on the Arp galaxies from the NASA/IPAC Extragalactic Database. In the preparation of this document I have also used "*The Arp Atlas of Peculiar Galaxies: A Chronicle and Observer's Guide*" by Jeff Kanipe and Dennis Webb, published by Willmann-Bell, Inc., that also provides newly scanned versions of Arp's images, as well

as observer notes, sketches, and challenging features to observe. Dennis Webb also has a nice website chronicling his effort to image 100 Arp galaxies: <http://arpgalaxy.com/arpgallery/arpgallery/index.htm>

In pondering an attempt to observe 100 Arp galaxies as part of The Astronomical League Arp Peculiar Galaxy Observing Program, I noticed that an observing guide, similar to that available for the Planetary Nebulae Observing Club, was not available. This prompted me to put together this observing guide in much the same fashion. My starting point was *AstroPlanner* by Paul Rodman (www.astroplanner.net). After generating an observing list with all 338 Arp objects, I sorted the list by magnitude, from brightest to dimmest. I then removed the secondary, tertiary, ..., (dimmer) components for multi-galaxy Arp objects, and most objects south of -15°S , given my Northern Hemisphere location (with the exception of some showpiece objects located further south). After some subjective rejections due to small size and/or low surface brightness, I selected the 129 comparatively brightest Arp galaxies. I settled on this number to provide extra candidates in case poor weather or other circumstances cause one to miss protracted periods of observing. Hopefully, this set will provide ample fodder to make rapid progress in completing the observation or imaging of 100 Arp objects to meet the criteria for completion of The Astronomical League Arp Peculiar Galaxy Observing Program.

In addition to providing the Arp object number, I provide additional catalog numbers. The first object listed is the galaxy centered in the accompanying red light image from The Second Palomar Observatory Sky Survey (POSS II). The field of view (FOV) for each image is 39 arc minutes (39') which corresponds to 127x for my 20" f/5 Obsession with a 20mm TeleVue Nagler Type 2 eyepiece. I chose this image scale since on most nights when I have good 2-star alignment the desired object is usually within this FOV, especially if I recalibrate the digital setting circles for the region of sky I am exploring. Using a uniform FOV for all objects provides a consistent expectation of what the scene should look like initially. In most cases the Arp galaxies are quite small at this scale, but this has the added benefit of not giving the observer additional visual information that might bias his/her own eyepiece impressions gleaned from using higher magnification. I have elected to present the POSS II images as negatives. The POSS II images were automatically downloaded by *AstroPlanner*, with the FOV images output manually by me, and converted to negatives using Photoshop. Use of a negative image is a personal preference derived from my experience of trying to discern positive images of small Planetary Nebulae presented in the *Planetary Nebulae Observing Guide* while using a dim red light at the observing site. For me, on a printed page, it is easier to see a dark object against a brighter background.

Additional information includes the Right Ascension (RA) and Declination (Dec), the size of the first listed galaxy (and sometimes for a companion), as well as the Transit Date, which indicates the day on which the first galaxy (centered in the image) crosses the meridian closest to midnight. While the basic premise of this list was to choose the brightest Arp galaxies for observing, I later found that in some cases the magnitudes in *AstroPlanner* were not consistent with those given in *The Arp Atlas of Peculiar Galaxies: A Chronicle and Observer's Guide*. I have also listed the value from the latter source when it is substantially different from that in *AstroPlanner*. Differences in magnitude estimates are not uncommon in the astronomical literature, and I make no claim as to which source has the most accurate estimate. Differences may arise because magnitudes are estimated over different areas of sky, or from plates/images taken with different filters, or from errors in transcription. One possibility is to revise the list using magnitudes from the NASA/IPAC Extragalactic Database, or based on my own experience. Suggested "Challenges" are included based on comments provided in *The Arp Atlas of Peculiar Galaxies: A Chronicle and Observer's Guide* and from my own examination of the POSS II images. Where applicable, I have included a "Note" to highlight other notable objects that are within or nearly within the POSS II FOV. The last page is a sample form for logging your observations.

Wishing you clear skies and dark nights; Enjoy!
Ken Sperber, March 20, 2014

Object	Page #	Date Observed	Object	Page #	Date Observed
Arp282	1		Arp165	12	
Arp127	1		Arp82	12	
Arp168	1		Arp6	12	
Arp331	2		Arp9	13	
Arp164	2		Arp268	13	
Arp227	2		Arp12	13	
Arp157	3		Arp89	14	
Arp158	3		Arp80	14	
Arp133	3		Arp167	14	
Arp308	4		Arp336	15	
Arp75	4		Arp225	15	
Arp166	4		Arp215	15	
Arp78	5		Arp283	16	
Arp318	5		Arp315	16	
Arp10	5		Arp285	16	
Arp276	6		Arp1	17	
Arp309	6		Arp307	17	
Arp333	6		Arp232/137	17	
Arp135	7		Arp245	18	
Arp37	7		Arp337	18	
Arp77	7		Arp316	18	
Arp200	8		Arp94	19	
Arp118	8		Arp263	19	
Arp41	8		Arp217	19	
Arp304	9		Arp270	20	
Arp279	9		Arp162	20	
Arp154	9		Arp206	20	
Arp213	10		Arp24	21	
Arp210	10		Arp205	21	
Arp123	10		Arp335	21	
Arp184	11		Arp16	22	
Arp25	11		Arp317	22	
Arp114	11		Arp27	22	

Object	Page #	Date Observed	Object	Page #	Date Observed
Arp155	23		Arp239	34	
Arp299	23		Arp84	34	
Arp214	23		Arp26	34	
Arp234	24		Arp271	35	
Arp280	24		Arp286	35	
Arp294	24		Arp178	35	
Arp83	25		Arp49	36	
Arp224	25		Arp136	36	
Arp289	25		Arp90	36	
Arp313	26		Arp91	37	
Arp305	26		Arp185	37	
Arp22	26		Arp30	37	
Arp244	27		Arp38	38	
Arp18	27		Arp81	38	
Arp160	27		Arp29	38	
Arp120	28		Arp226	39	
Arp134	28		Arp93	39	
Arp269	28		Arp319	39	
Arp152	29		Arp15	40	
Arp76	29		Arp13	40	
Arp23	29		Arp298	40	
Arp281	30		Arp99	41	
Arp116	30		Arp223	41	
Arp189	30		Arp212	41	
Arp163	31		Arp28	42	
Arp242	31		Arp216	42	
Arp159	31		Arp284	42	
Arp266	32		Arp222	43	
Arp176	32		Arp86	43	
Arp85	32		Arp68	43	
Arp104	33				
Arp288	33				
Arp240	33				

Arp282

NGC169 and IC1559

RA: 0h 36m 52s Dec: 23° 59.0'

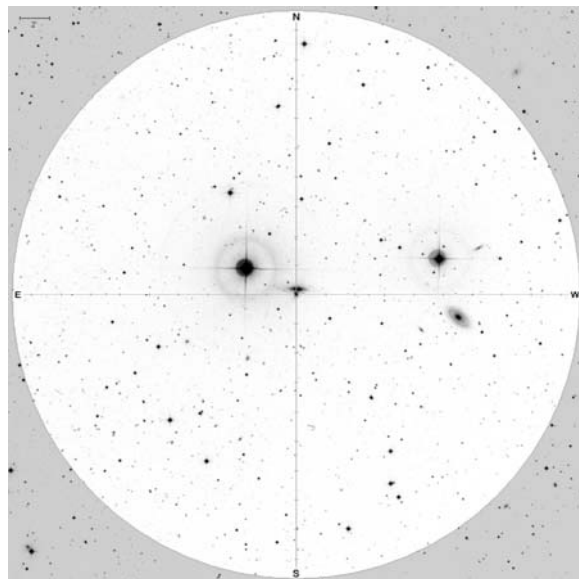
Size: 2.7' x 0.7' and 0.8' x 0.4'

Mag: 12.4 and 14.7

Transit Date: October 2

Challenge: The spirals in NGC169

Note: NGC160 (12.4mag) 11' east



Arp127

NGC191 and IC1563

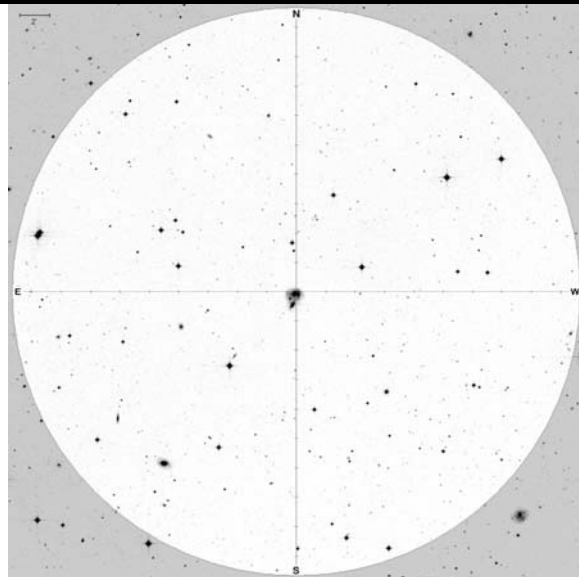
RA: 00h 38m 59s Dec: -09° 00.0'

Size: 1.5' x 1.2'

Mag: 12.5 and 13.6

Transit Date: October 2

Challenge: Faint arms in NGC191



Arp168

NGC221/M32

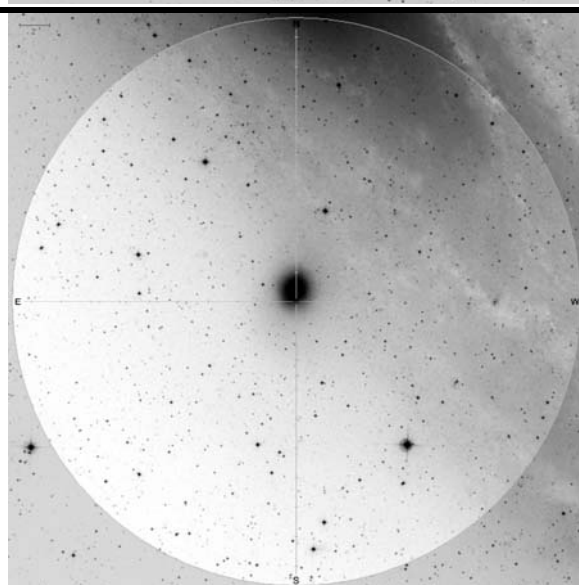
RA: 00h 42m 41s Dec: 40° 51.0'

Size: 8.8' x 6.5'

Mag: 9.0

Transit Date: October 3

Challenge: Plume extending south



Arp331

NGC383 brightest of 12 galaxies

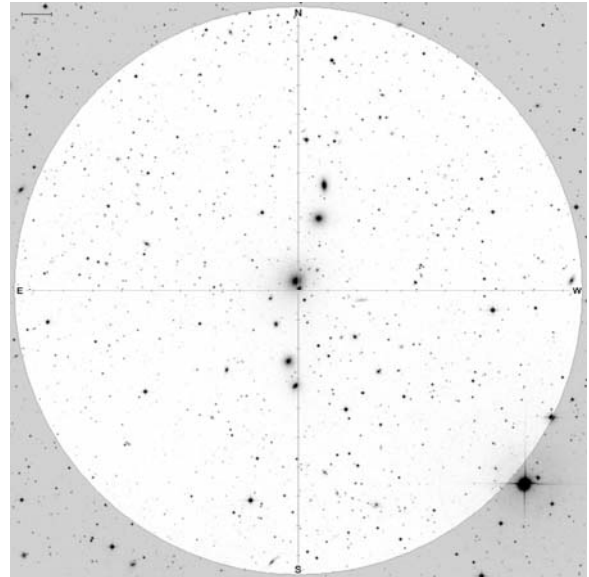
RA: 01h 07m 24s Dec: 32° 24.0'

Size: 1.6' x 1.4'

Mag: 11.9

Transit Date: October 9

Challenge: All 12 galaxies



Arp164

NGC455

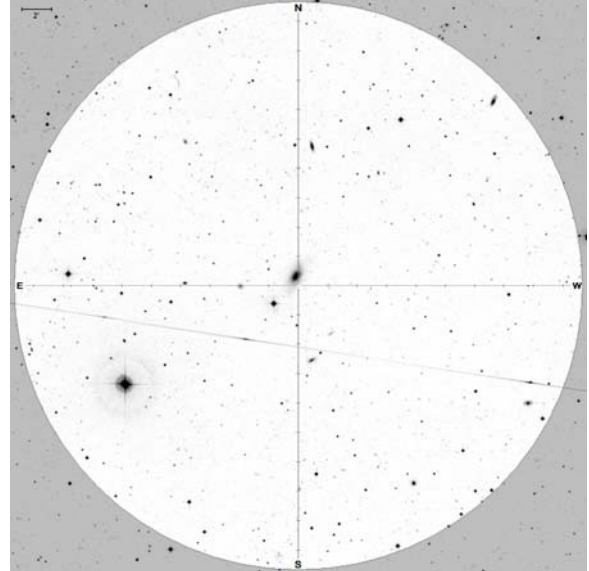
RA: 01h 15m 57s Dec: 05° 10.0'

Size: 2.0' x 1.2'

Mag: 12.6

Transit Date: October 12

Challenge: Faint filament to the north
and wisp to the south



Arp227

NGC474 and NGC470

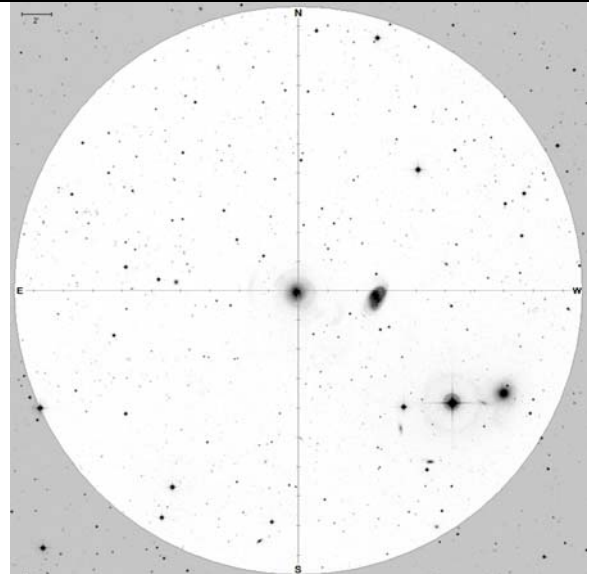
RA: 01h 20m 06s Dec: 03° 25.0'

Size: 7.1' x 6.3'

Mag: 11.5

Transit Date: October 13

Challenge: Detect faint rings or arms
around NGC474



Arp157

NGC520

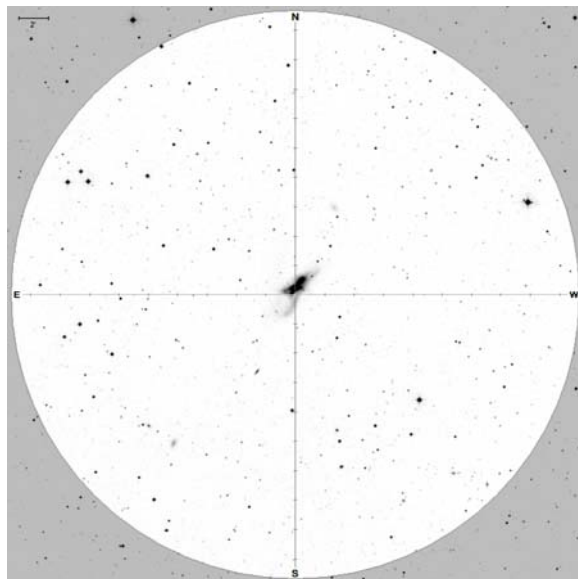
RA: 01h 24m 35s Dec: 04° 47.0'

Size: 4.5' x 1.8'

Mag: 11.5

Transit Date: October 14

Challenge: Faint tails to the north and south



Arp158

NGC523

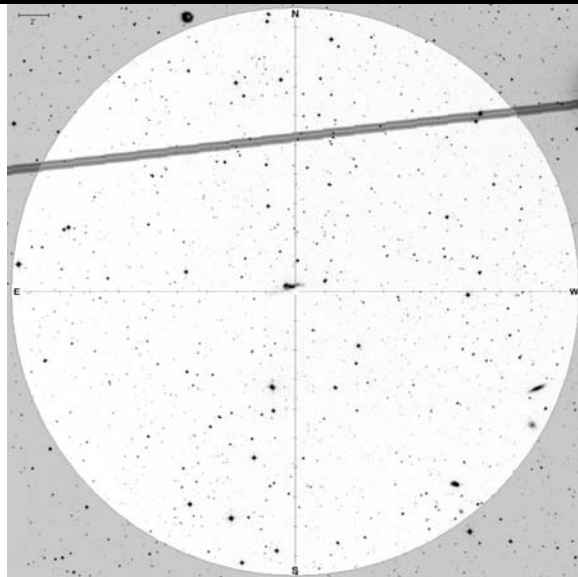
RA: 01h 25m 19s Dec: 34° 01.0'

Size: 2.5' x 0.7'

Mag: 13.5

Transit Date: October 14

Challenge: Faint ESE extension



Arp133 (Arp 308 is in the FOV)

NGC541

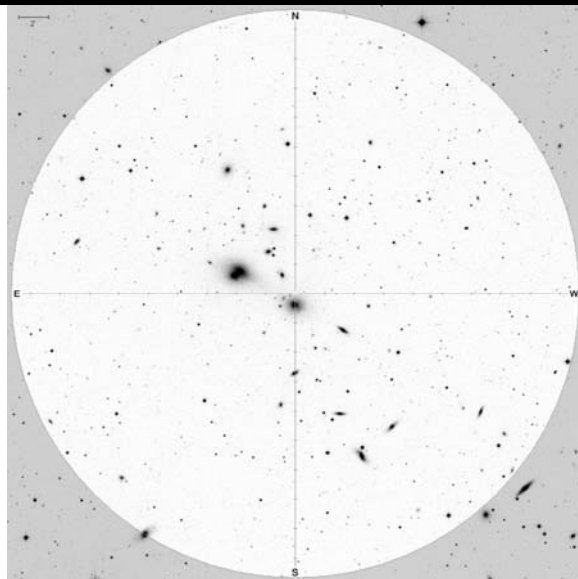
RA: 01h 25m 44s Dec: -01° 22.0'

Size: 1.8' x 1.8'

Mag: 12.1

Transit Date: October 14

Challenge: Three fragments including Minkowski's Object



Arp308 (Arp 133 is in the FOV)

NGC545 and NGC547

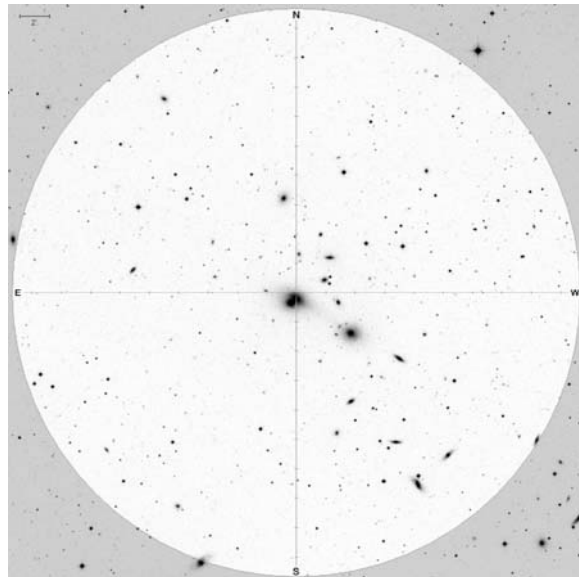
RA: 01h 25m 59s Dec: $-01^{\circ} 20.0'$

Size: 2.4' x 1.6'

Mag: 12.1 and 13.2

Transit Date: October 14

Challenge: Outer halo



Arp75

NGC702

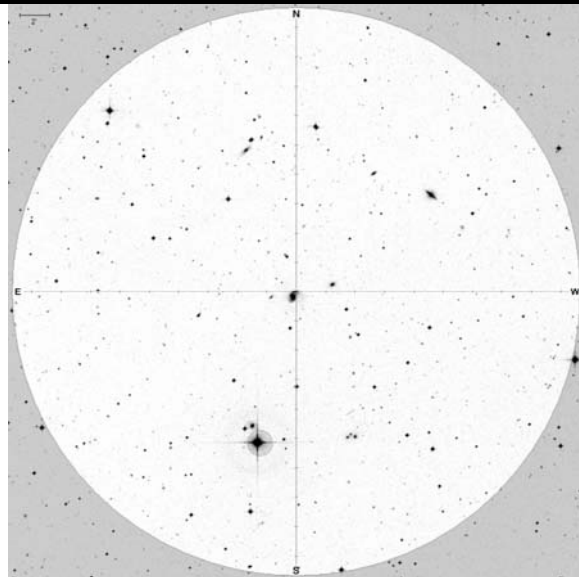
RA: 01h 51m 18s Dec: $-04^{\circ} 03.0'$

Size: 1.6' x 1.2'

Mag: 11.9

Transit Date: October 21

Challenge: Companion to the north
and asymmetry



Arp166

NGC750 and NGC751

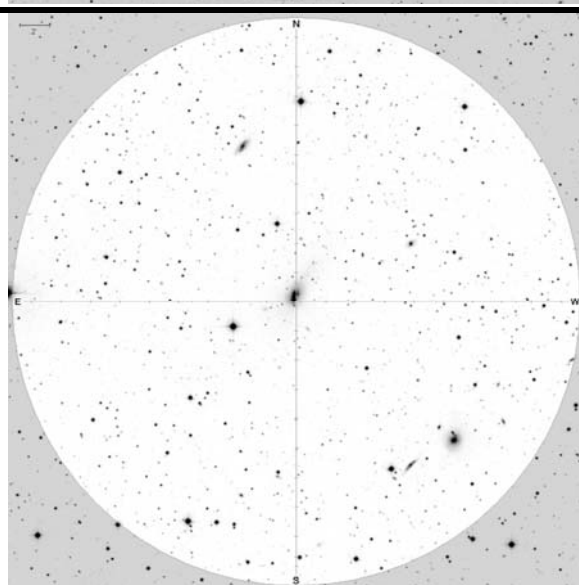
RA: 01h 57m 32s Dec: $33^{\circ} 12.0'$

Size: 1.7' x 1.3'

Mag: 12.9 and 13.5

Transit Date: October 22

Challenge: Elongation to the NE



Arp78

NGC772 and NGC770

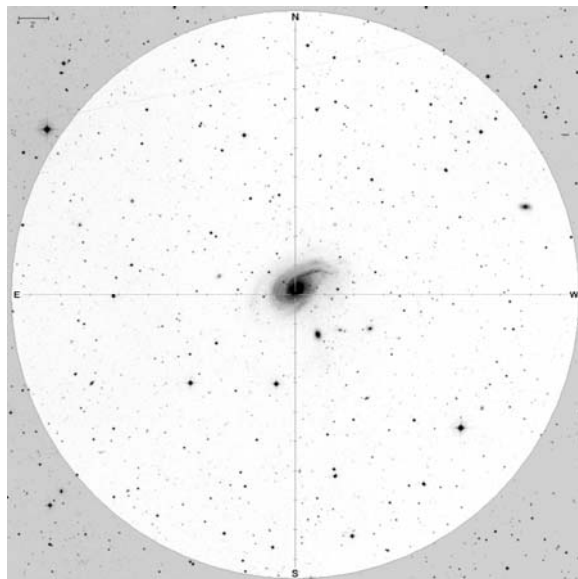
RA: 01h 59m 20s Dec: 19° 00.0'

Size: 7.3' x 4.3'

Mag: 10.3 and 13.9

Transit Date: October 23

Challenge: NGC772 asymmetric arms and eastern lobe



Arp318

NGC835, NGC833, NGC838, and NGC839

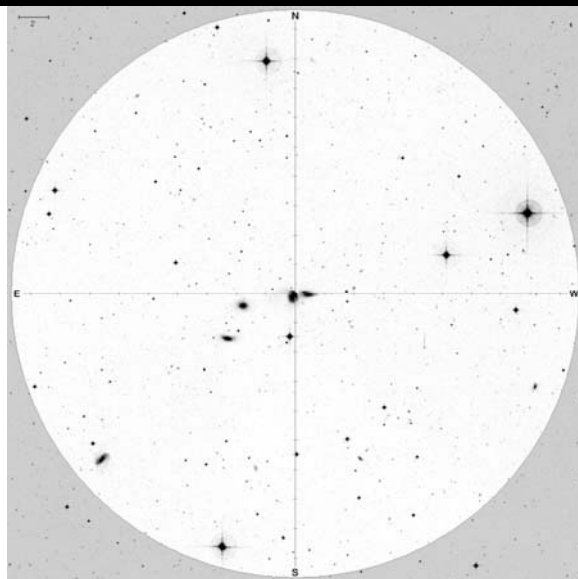
RA: 02h 09m 24s Dec: -10° 08.8'

Size: 1.3' x 1.1'

Mag: 12.1, 12.7, 13.0, and 13.1

Transit Date: October 25

Challenge: Tail extending from NGC835 toward NGC838



Arp10

UGC1775

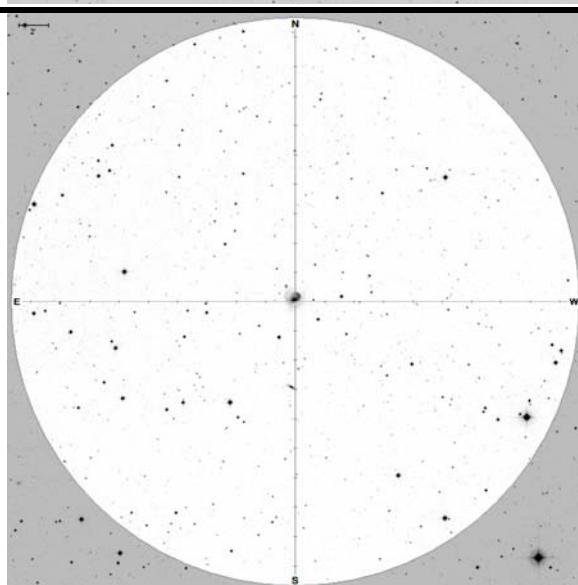
RA: 02h 18m 26s Dec: 05° 39.0'

Size: 1.5' x 1.5'

Mag: 13.8

Transit Date: October 27

Challenge: Ring and faint outer loop outside the ring



Arp276

NGC935 and IC1801

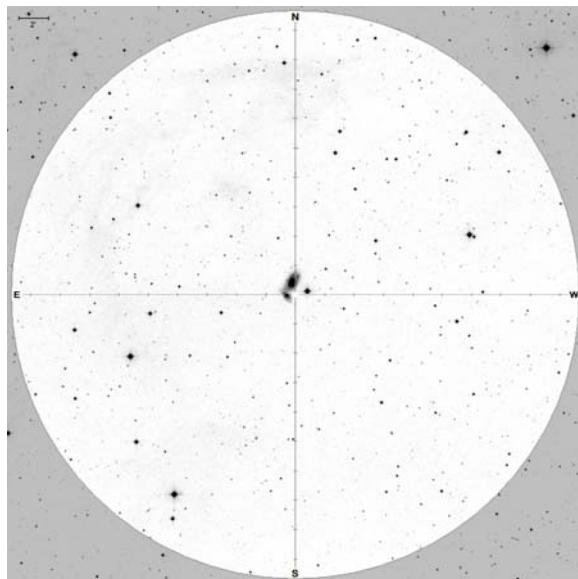
RA: 02h 28m 10s Dec: 19° 35.0'

Size: 1.7' x 1.1'

Mag: 12.9 and 14.6

Transit Date: October 30

Challenge: Asymmetric structure and knots in NGC935



Arp309

NGC942 and NGC943

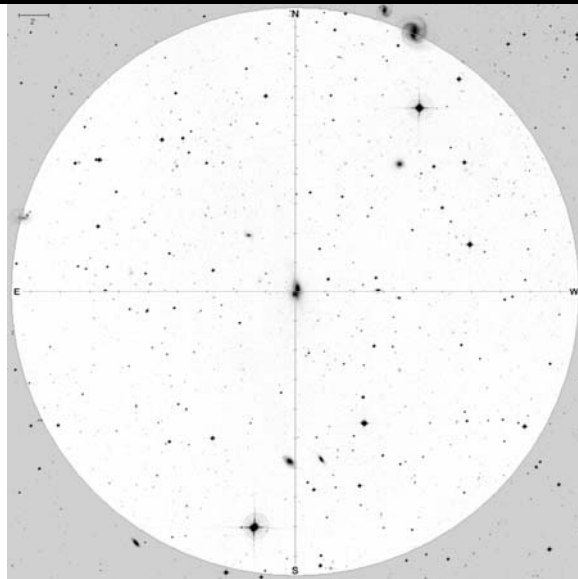
RA: 02h 29m 10s Dec: -10° 50.0'

Size: 3.4'

Mag: 11.2 and 11.4 (14.9 and 14.0 in *The Arp Atlas of Peculiar Galaxies*)

Transit Date: October 30

Challenge: NS elongation



Arp333

NGC1024

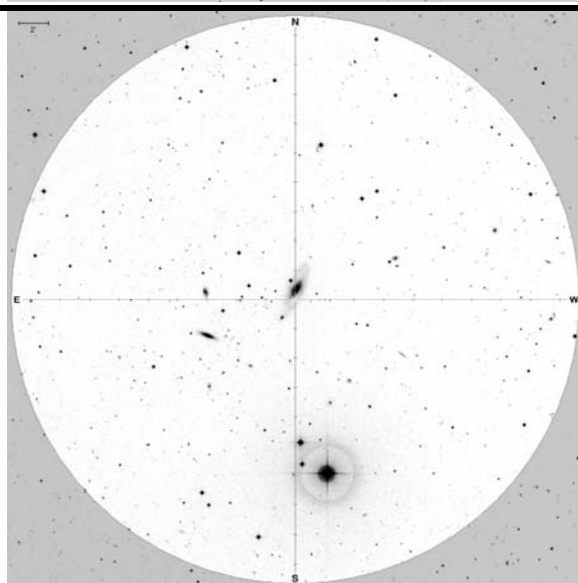
RA: 02h 39m 12s Dec: 10° 50.0'

Size: 3.9' x 1.4'

Mag: 12.1

Transit Date: November 2

Challenge: Thin circular arms



Arp135

NGC1023 and NGC1023A

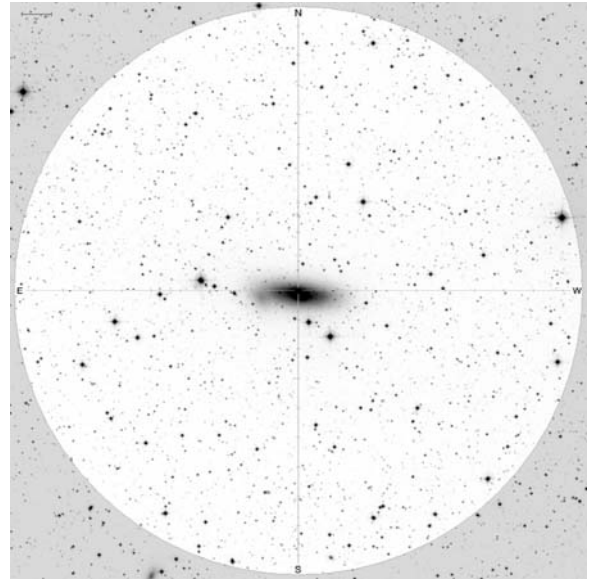
RA: 02h 40m 24s Dec: 39° 04.0'

Size: 8.8' x 3.0'

Mag: 9.3

Transit Date: November 2

Challenge: NGC1023A is a fragment on the west side of the envelop surrounding NGC1023



Arp37

NGC1068/M77

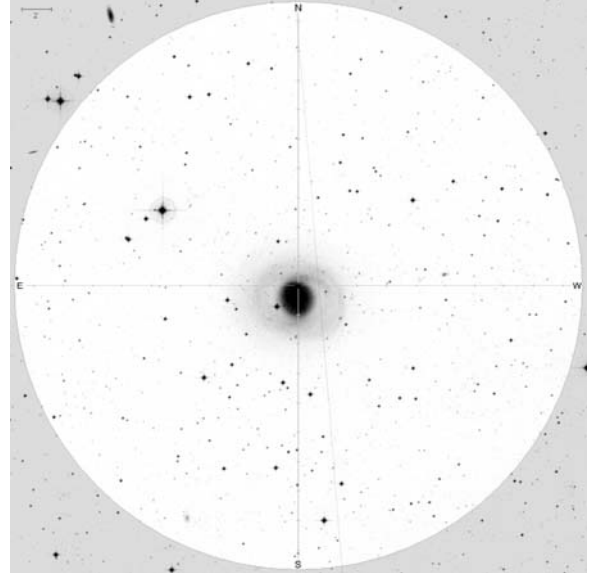
RA: 02h 42m 40s Dec: 00° 00.0'

Size: 7.1' x 6.1'

Mag: 8.9

Transit Date: November 11

Challenge: The highly textured arms and the knots on the ENE and SW arms. The faint outer arms



Arp77

NGC1097 and NGC1097A

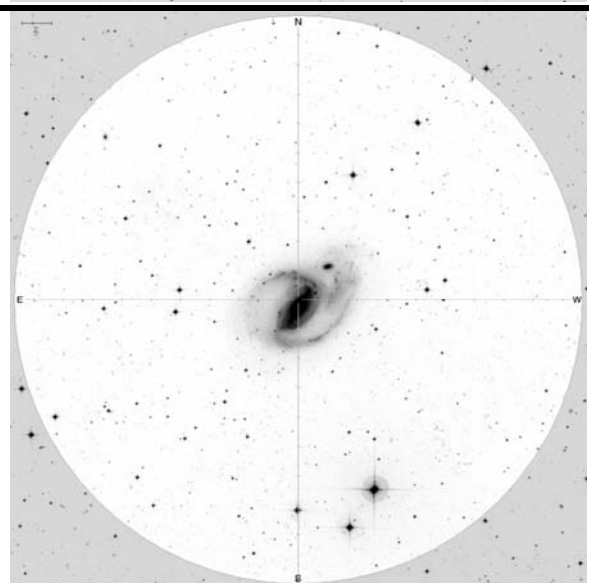
RA: 02h 46m 19s Dec: -30° 16.0'

Size: 9.4' x 6.3'

Mag: 9.2 and 13.8

Transit Date: November 4

Challenge: NGC1097A to the NW. Bright knots in the asymmetric arms



Arp200

NGC1134

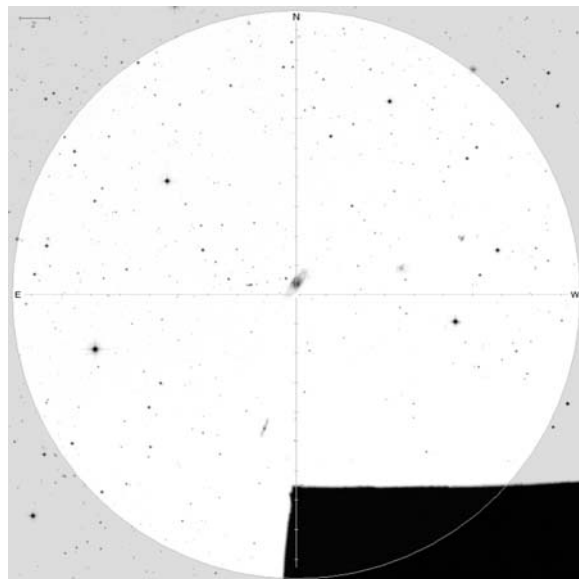
RA: 02h 53m 41s Dec: 13° 00.0'

Size: 2.5' x 0.9'

Mag: 12.1

Transit Date: November 5

Challenge: Asymmetric arms and emanations on the NW side



Arp118

NGC1144 and NGC1143

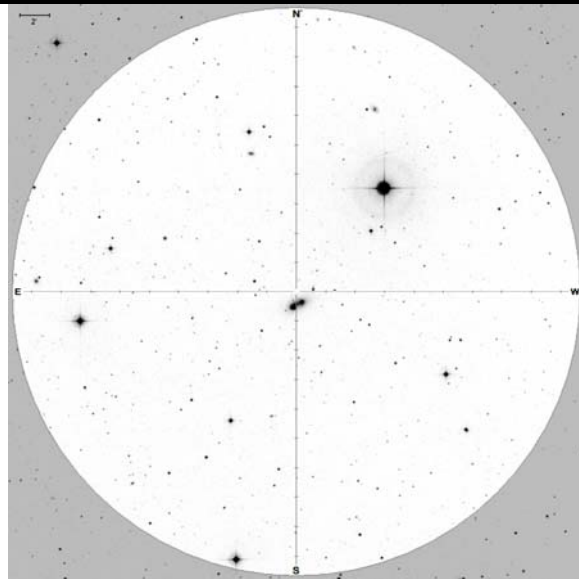
RA: 02h 55m 11s Dec: -00° 10.0'

Size: 1.1' x 0.7'

Mag: 12.9 and 13.2

Transit Date: November 6

Challenge: Knotty loop between the galaxies



Arp41

NGC1232 and NGC1232A

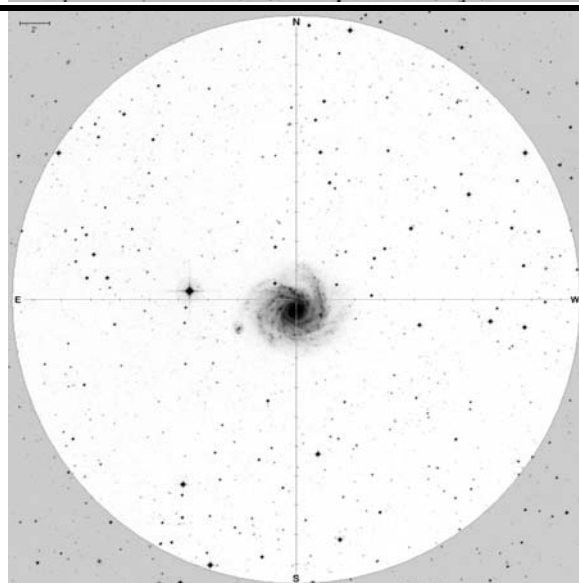
RA: 03h 09m 45s Dec: -20° 34.0'

Size: 7.5' x 6.5'

Mag: 10.1 and 15.2

Transit Date: November 10

Challenge: Texture in the arms and asymmetry of NGC1232A (located to the SE)



Arp304

NGC1241 and NGC1242

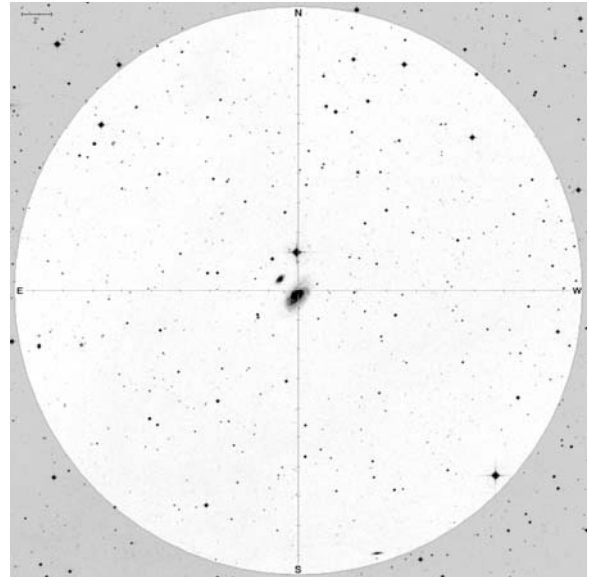
RA: 03h 11m 14s Dec: $-08^{\circ} 55.0'$

Size: 2.8' x 1.7'

Mag: 12.0 and 14.6

Transit Date: November 10

Challenge: Three arms in NGC1241



Arp279

NGC1253 and NGC1253A

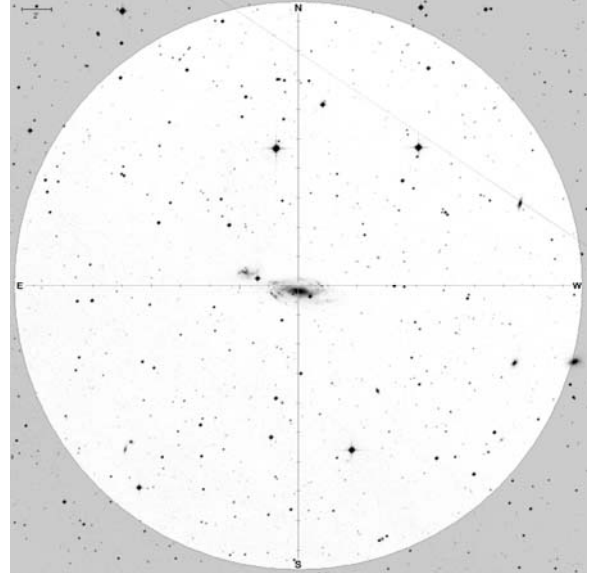
RA: 03h 14m 09s Dec: $-02^{\circ} 49.0'$

Size: 5.3' x 2.3'

Mag: 11.7 and 14.4

Transit Date: November 11

Challenge: Texture in both galaxies
an the arcing arm of NGC1253A that
extends to the west



Arp154

NGC1316

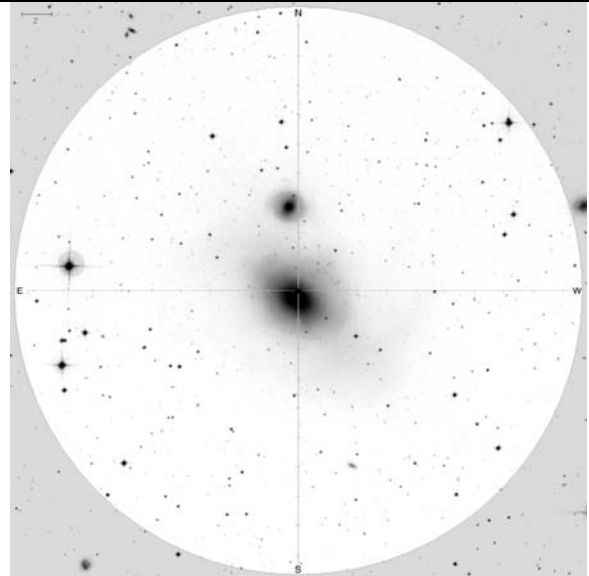
RA: 03h 22m 41s Dec: $-37^{\circ} 12.0'$

Size: 12.1' x 8.6' (incorrectly listed
as 2.1' x 8.6' in AstroPlanner)

Mag: 8.2

Transit Date: November 13

Challenge: Absorption features (dust
lanes) north and south of the nucleus.
NGC1317 is located to the north



Arp213

IC356

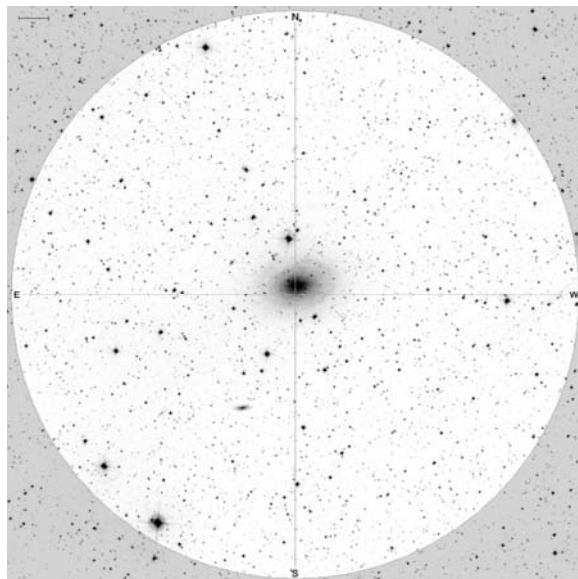
RA: 04h 07m 47s Dec: 69° 48.0'

Size: 5.3' x 3.9'

Mag: 10.5

Transit Date: November 24

Challenge: Absorption (dust) lane on the NW side



Arp210

NGC1569

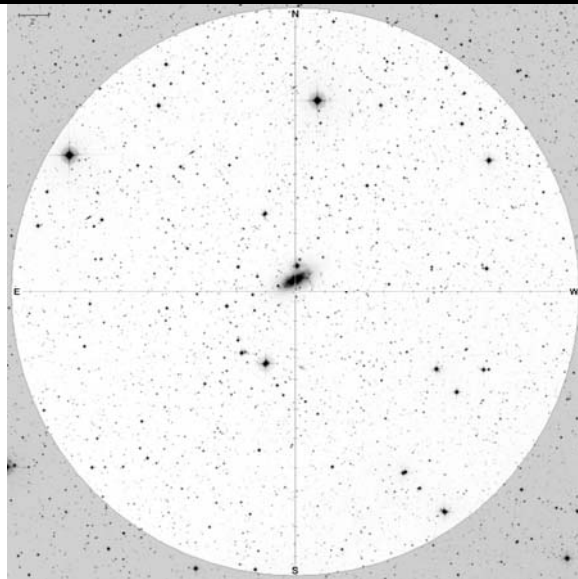
RA: 04h 30m 49s Dec: 64° 50.0'

Size: 3.7' x 1.8'

Mag: 11.0

Transit Date: November 30

Challenge: Mottling and absorption features to the NW and E



Arp123

NGC1888 and NGC1889

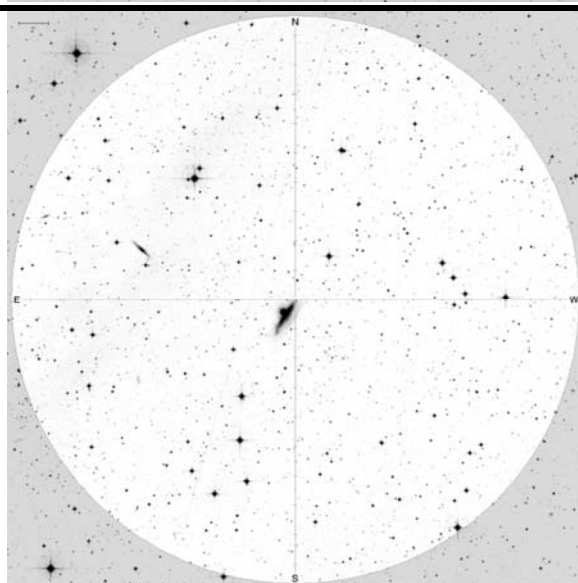
RA: 05h 22m 32s Dec: -11° 29.0'

Size: 3.0' x 0.8'

Mag: 12.0 and 14.1

Transit Date: December 13

Challenge: Kink at the SE end of NGC1888



Arp184

NGC1961

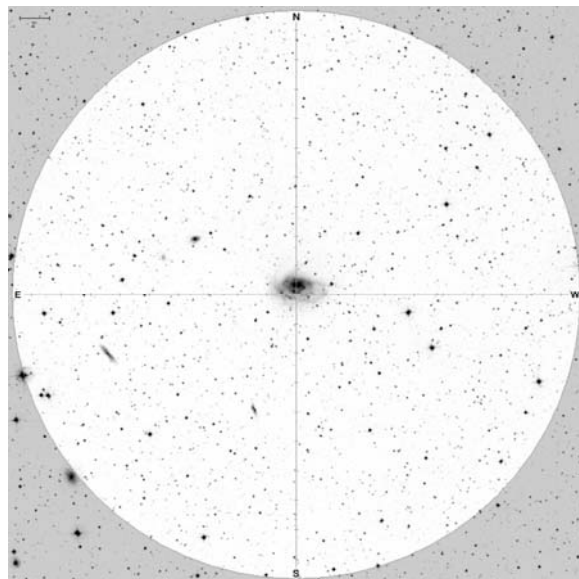
RA: 05h 42m 04s Dec: 69° 22.0'

Size: 4.6' x 3.0'

Mag: 11.0

Transit Date: December 18

Challenge: Filamentary arms



Arp25 (a subset of Arp 114)

NGC2276

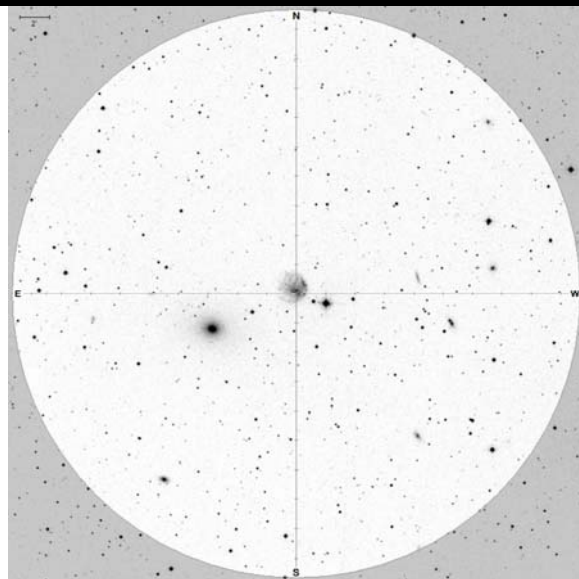
RA: 07h 27m 13s Dec: 85° 45.0'

Size: 2.8' x 2.7'

Mag: 11.4

Transit Date: January 14

Challenge: Asymmetric arm structure with mottling



Arp114 (Arp25 is located within)

NGC2300 and NGC2276

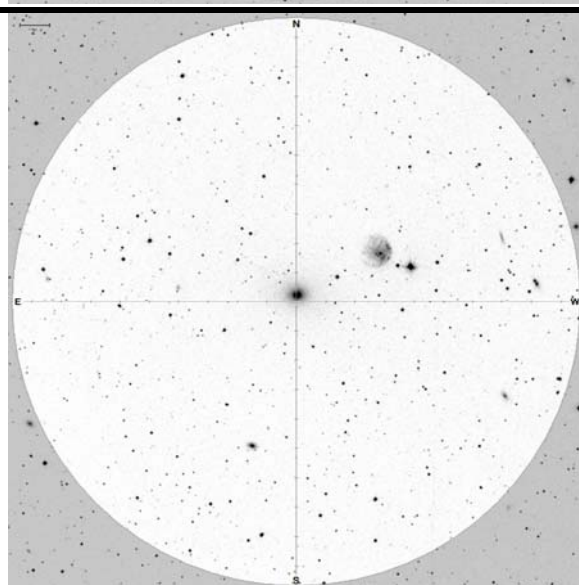
RA: 07h 32m 20s Dec: 85° 42.0'

Size: 2.8' x 2.0'

Mag: 12.1 and 11.4

Transit Date: January 15

Challenge: Asymmetric arm structure with mottling in NGC2276



Arp165

NGC2418

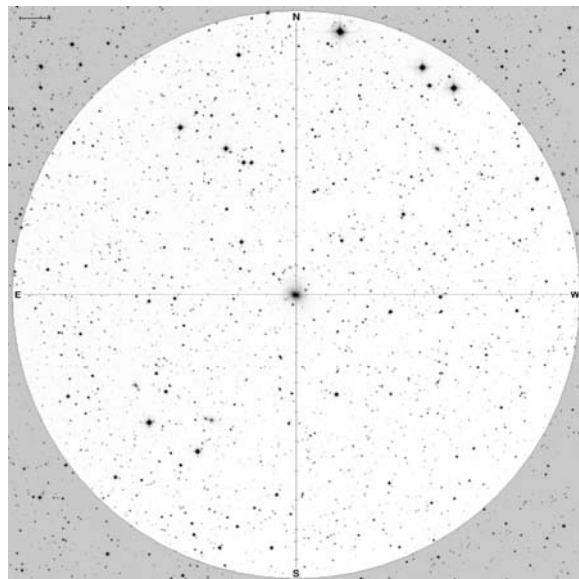
RA: 07h 36m 37s Dec: 17° 53.0'

Size: 1.8' x 1.4'

Mag: 12.2

Transit Date: January 16

Challenge: Plume to the north and looped streamer to the SE



Arp82

NGC2535 and NGC2536

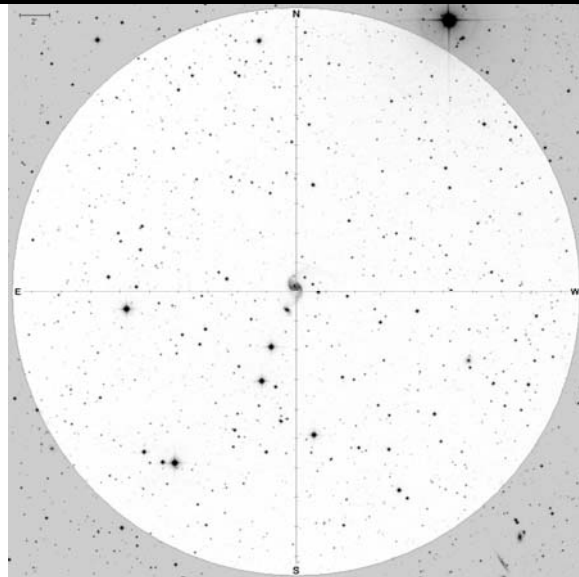
RA: 08h 11m 13s Dec: 25° 12.0'

Size: 2.5' x 1.2'

Mag: 12.8 and 14.6

Transit Date: January 25

Challenge: Extended spiral arms of NGC2535, and plumes of NGC2536



Arp6

NGC2537

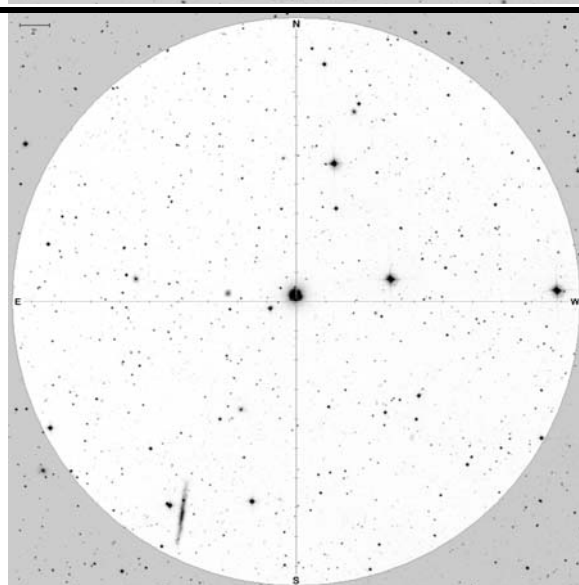
RA: 08h 13m 14s Dec: 45° 59.0'

Size: 1.7' x 1.5'

Mag: 12.3

Transit Date: January 25

Challenge: Knotty structure makes it look like a bear paw. See edge-on galaxy IC2233 to the SE



Arp9

NGC2523

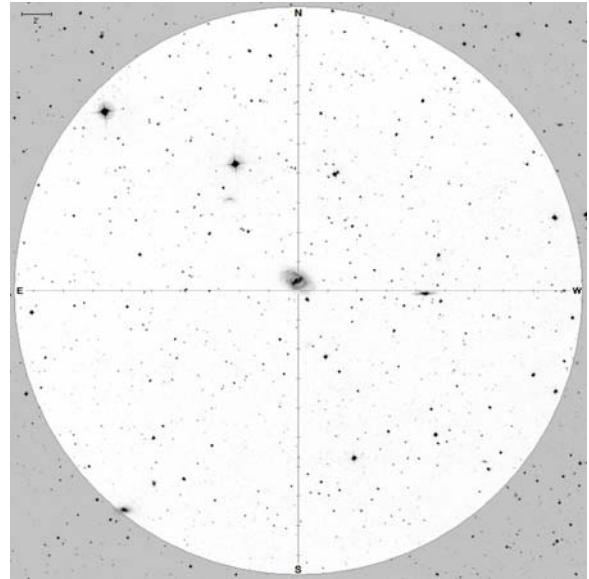
RA: 08h 14m 59s Dec: 73° 34.0'

Size: 3.0' x 1.8'

Mag: 11.9

Transit Date: January 26

Challenge: Ring structure with split arm extending to the NE. See 15.0mag galaxy MCG+12-08-030 to the west



Arp268

UGC4305/HolmbergII

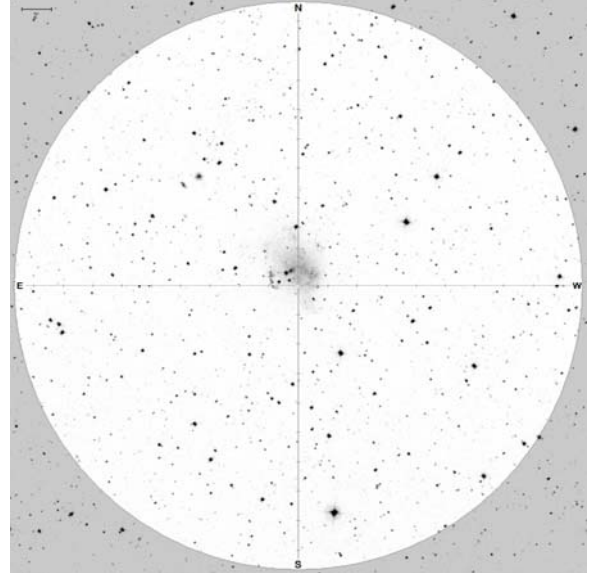
RA: 08h 19m 06s Dec: 70° 42.0'

Size: 8.0' x 6.3'

Mag: 10.7

Transit Date: January 27

Challenge: Most emission to the NW of the triangle of stars with multiple knots visible to the east



Arp12

NGC2608

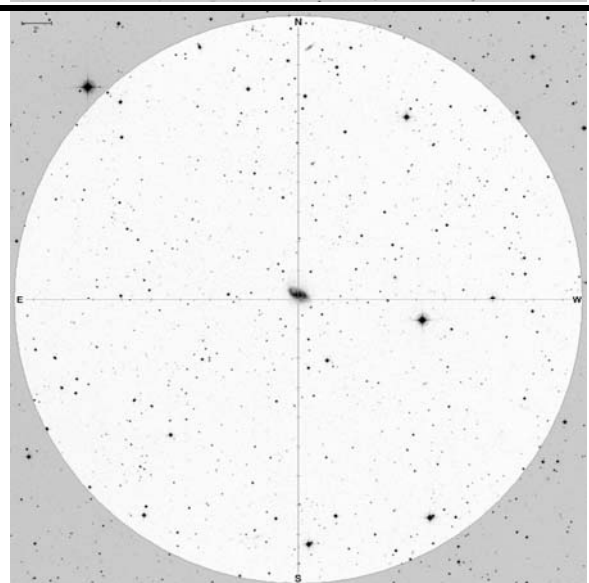
RA: 08h 35m 17s Dec: 28° 28.0'

Size: 2.3' x 1.4'

Mag: 12.2

Transit Date: January 31

Challenge: Asymmetry of the 2 arms



Arp89

NGC2648 and MCG+2-22-6

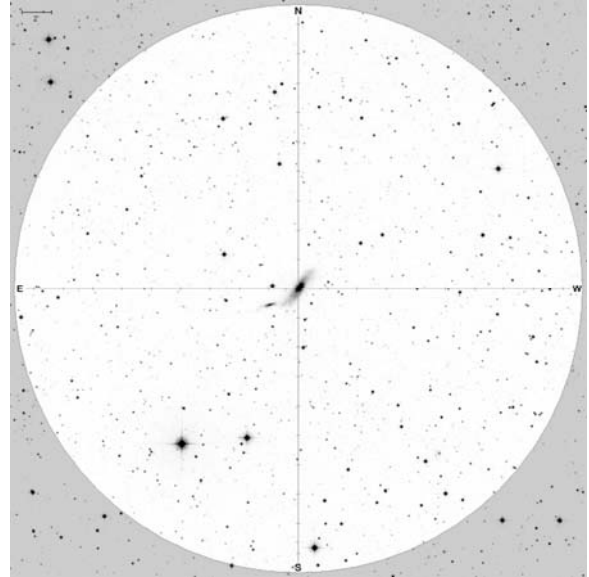
RA: 08h 42m 40s Dec: 14° 17.0'

Size: 3.3' x 1.1'

Mag: 12.7 and 15.4

Transit Date: February 2

Challenge: Faint companion galaxy to the SE



Arp80

NGC2633

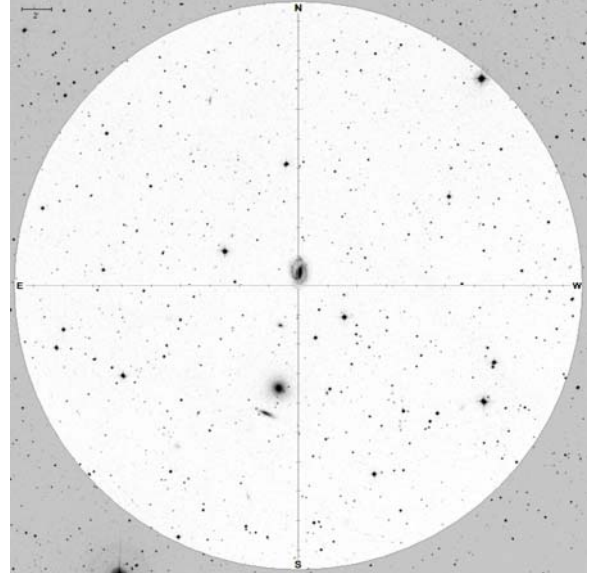
RA: 08h 48m 06s Dec: 74° 05.0'

Size: 2.5' x 1.6'

Mag: 12.2

Transit Date: February 2

Challenge: Knots at the end of the N spiral arm. See NGC2634 (13mag) 8' to the south



Arp167

NGC2672 and NGC2673

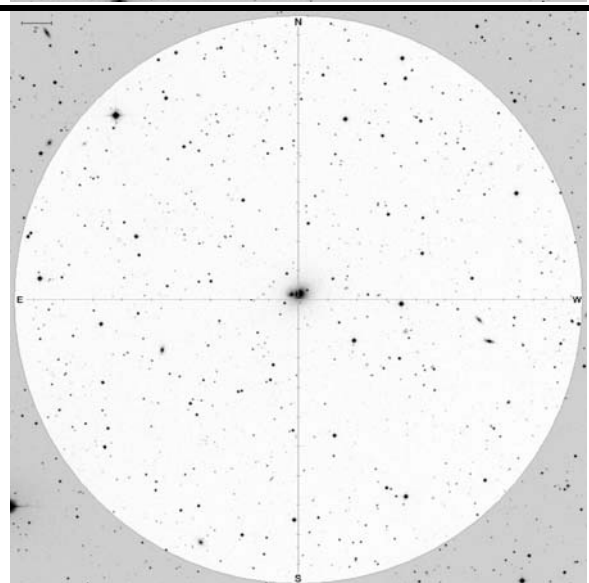
RA: 08h 49m 22s Dec: 19° 04.0'

Size: 3.0' x 2.8'

Mag: 11.6 (12.7 in *The Arp Atlas of Peculiar Galaxies*) and 14.4

Transit Date: February 4

Challenge: NGC2673 located in the plume of NGC2672



Arp336

NGC2685

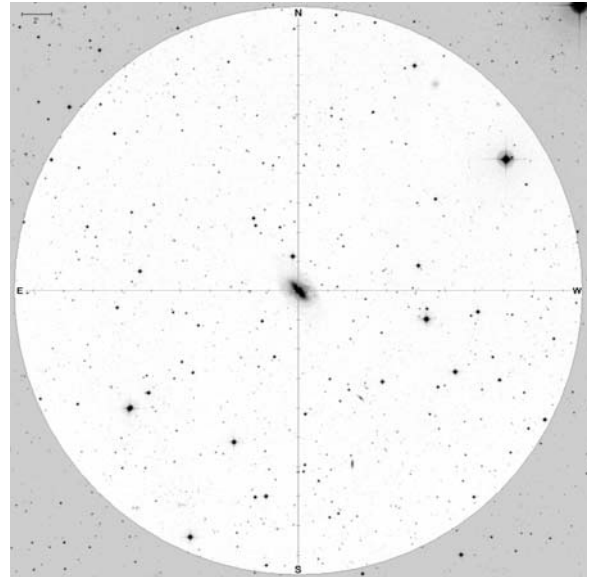
RA: 08h 55m 35s Dec: 58° 44.0'

Size: 4.5' x 2.4'

Mag: 11.2

Transit Date: February 5

Challenge: Polar (circumferential)
rings that encircle galaxy



Arp225

NGC2655

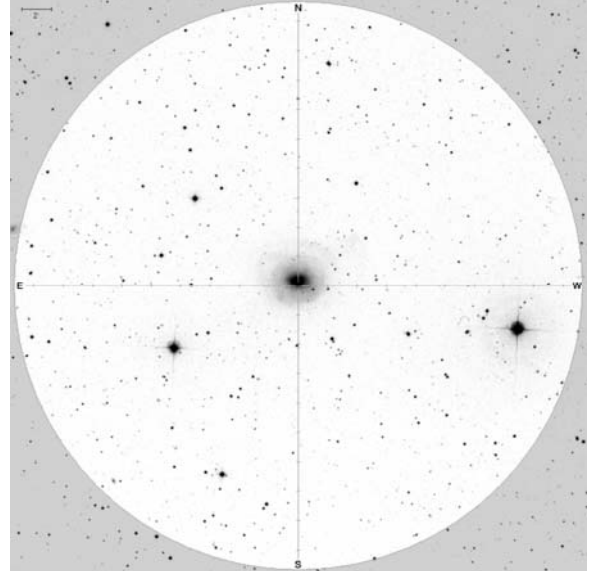
RA: 08h 55m 38s Dec: 78° 13.0'

Size: 4.9' x 4.1'

Mag: 10.1

Transit Date: February 5

Challenge: Faint arms and texture in
the SW part of the nucleus



Arp215

NGC2782

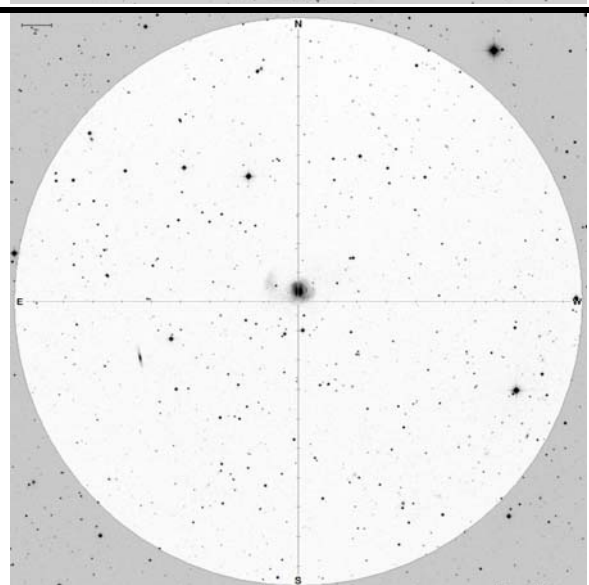
RA: 09h 14m 05s Dec: 40° 06.0'

Size: 3.5' x 2.6'

Mag: 11.7

Transit Date: February 10

Challenge: Large faint halo with
brighter area west of the core and a
wing to the east of the star that itself
is located east of the core



Arp283

NGC2798 and NGC2799

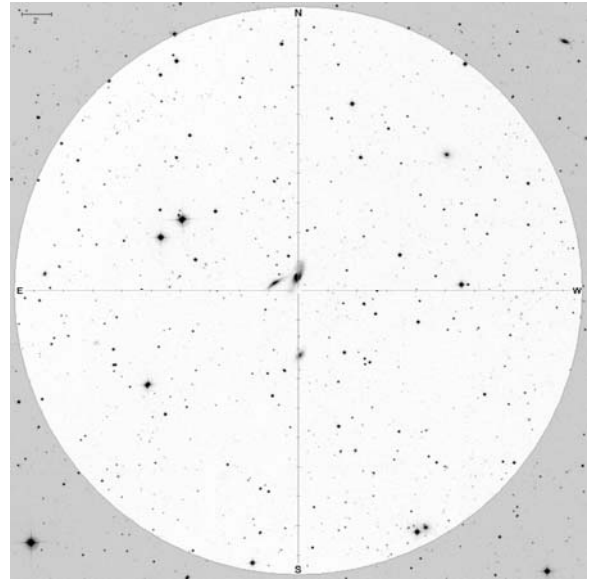
RA: 09h 17m 22s Dec: 41° 59.0'

Size: 2.6' x 1.0'

Mag: 12.3 and 14.3

Transit Date: February 11

Challenge: Faint arcing wisp to the north of NGC2798, and knots in NGC2799



Arp315

NGC2832, NGC2831, and NGC2830

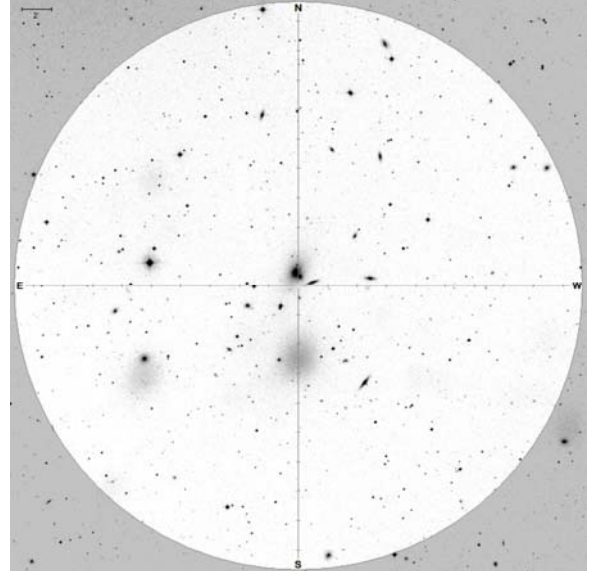
RA: 09h 19m 46s Dec: 33° 44.0'

Size: 2.4' x 1.9'

Mag: 11.9 (12.3 in *The Arp Atlas of Peculiar Galaxies*), 14.7, and 15.3

Transit Date: February 11

Challenge: Separate NGC2831 (SW) from NGC2832. NGC2830 is located further to the SW. Amorphous clouds located to the S and SE



Arp285 (Arp1 within the FOV)

NGC2854 and NGC2856

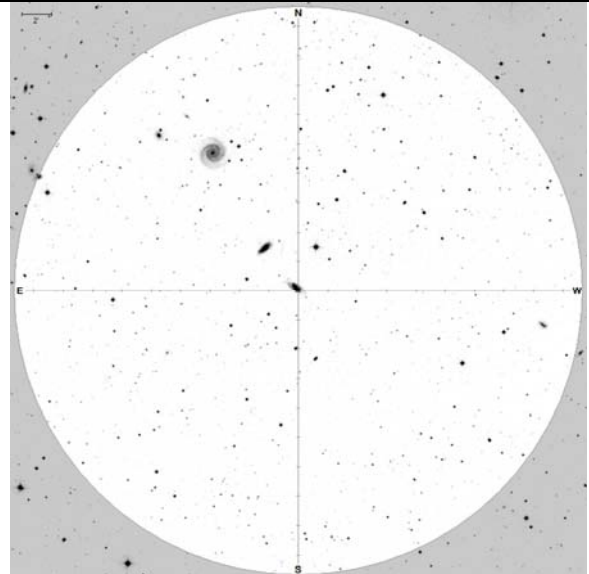
RA: 09h 24m 02s Dec: 49° 12.0'

Size: 1.7' x 0.6'

Mag: 13.0 and 14.1

Transit Date: February 12

Challenge: Spiral arms in NGC2854 and jet extending to the NE of NGC2856



Arp1

NGC2857

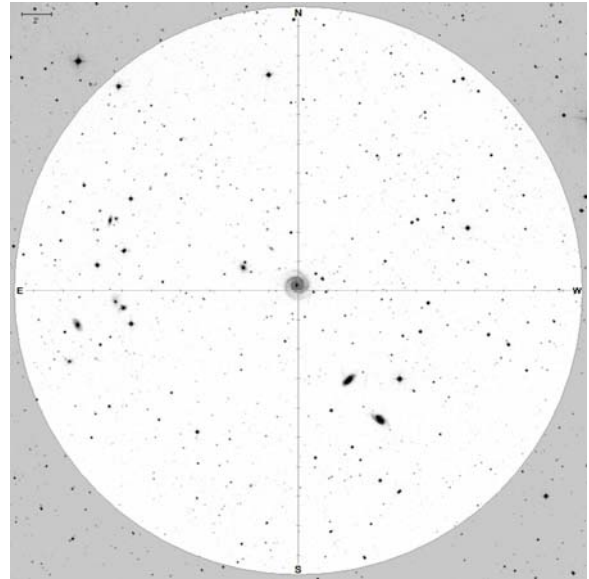
RA: 09h 24m 37s Dec: 49° 21.0'

Size: 2.3' x 2.0'

Mag: 12.2

Transit Date: February 13

Challenge: Trace both spiral arms of this face-on galaxy. Small loop within the SW spiral arm



Arp307

NGC2872, NGC2874, and NGC2873

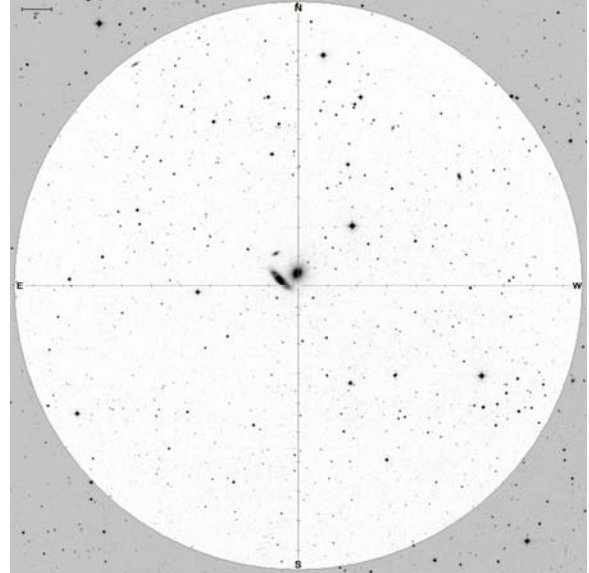
RA: 09h 25m 42s Dec: 11° 25.0'

Size: 2.1' x 1.8'

Mag: 11.9 (12.9 in *The Arp Atlas of Peculiar Galaxies*), 13.4, and 15.3

Transit Date: February 13

Challenge: The spiral arms in the nearly edge-on NGC2874 (located SE of NGC2872). NGC2873 is located NE of NGC2872



Arp232 and Arp137

NGC2911 and NGC2914

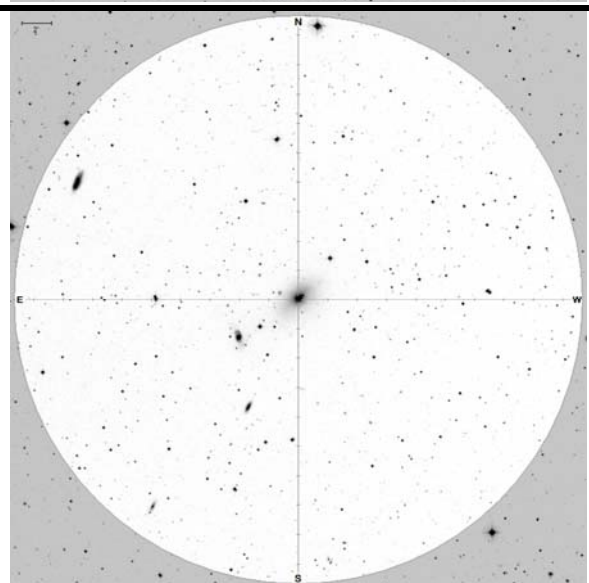
RA: 09h 33m 46s Dec: 10° 09.0'

Size: 4.1' x 3.2' and 0.8' x 0.6'

Mag: 11.5 and 13.7

Transit Date: February 15

Challenge: Arp232 (NGC2911) absorption (dust) lane to the NW. Arp137 (NGC2914) is located SE of Arp 232



Arp245

NGC2992 and NGC2993

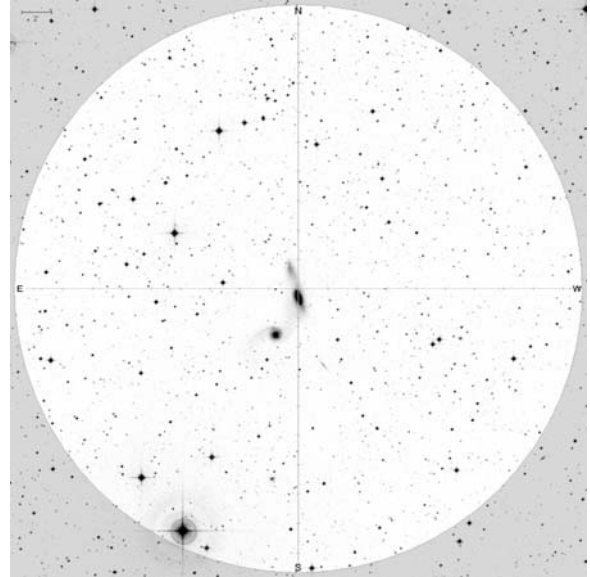
RA: 09h 45m 42s Dec: $-14^{\circ} 19.0'$

Size: $3.6' \times 1.1'$

Mag: 12.2 and 12.6 (13.2 and 13.1 in *The Arp Atlas of Peculiar Galaxies*)

Transit Date: February 18

Challenge: Northward extension from NGC2992 and SE extension from NGC2993



Arp337

NGC3034

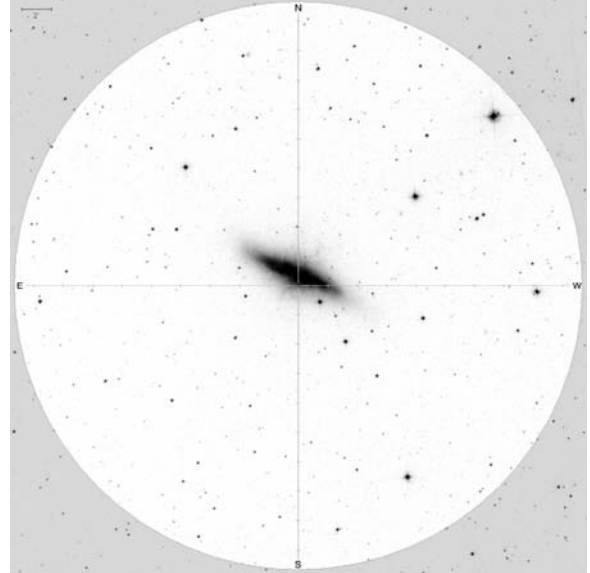
RA: 09h 55m 51s Dec: $69^{\circ} 40.0'$

Size: $11.4' \times 4.3'$ (incorrectly listed in AstroPlanner)

Mag: 8.4

Transit Date: February 21

Challenge: The filaments extending from the center that are perpendicular to the long axis



Arp316

NGC3190, NGC3193, and NGC3187

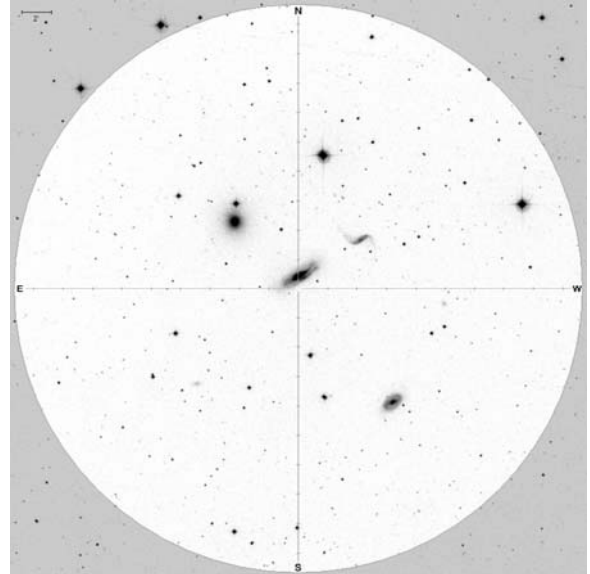
RA: 10h 18m 52s Dec: $21^{\circ} 45.6'$

Size: $4.3' \times 1.5'$

Mag: 11.2, 10.9, and 13.4 (U-metria)

Transit Date: February 26

Challenge: Dust lane in NGC3190, and spiral arms of NGC3187 (NW of NGC3190). NGC3193 is NE of NGC3190, whereas NGC3185 is located to the SW (not part of Arp)



Arp94

NGC3227 and NGC3226

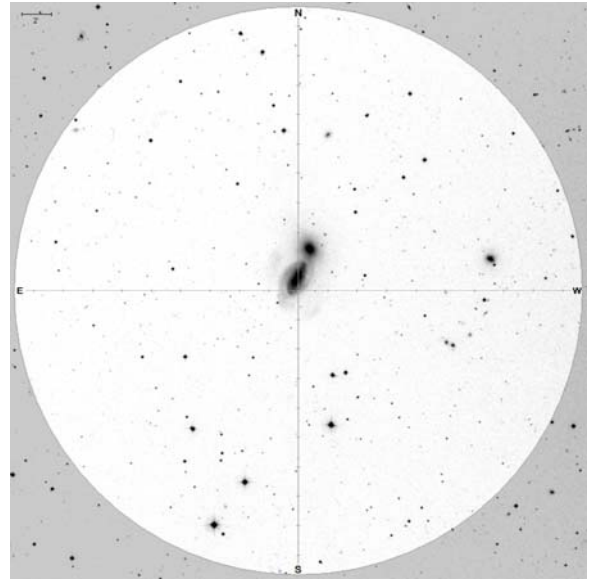
RA: 10h 23m 30s Dec: 19° 51.0'

Size: 5.4' x 3.7'

Mag: 10.3 and 11.4 (11.1 and 12.3 in
The Arp Atlas of Peculiar Galaxies)

Transit Date: February 28

Challenge: Spiral arms in NGC3227



Arp263

NGC3239

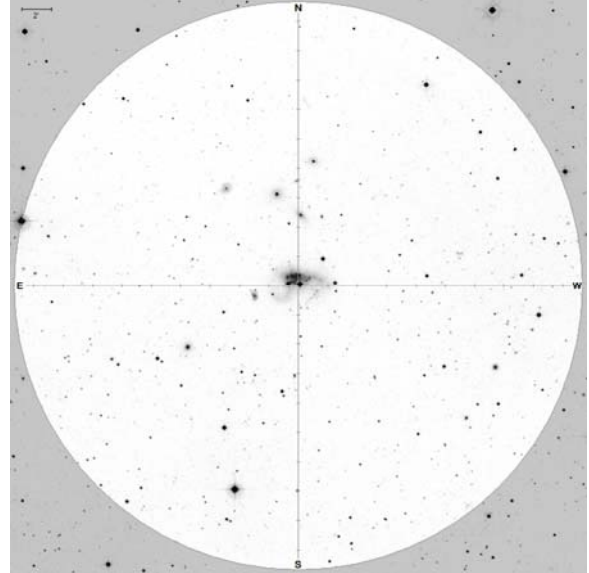
RA: 10h 25m 05s Dec: 17° 09.0'

Size: 5.0' x 3.3'

Mag: 11.4

Transit Date: February 28

Challenge: Knots and hook to SE
from the E edge



Arp217

NGC3310

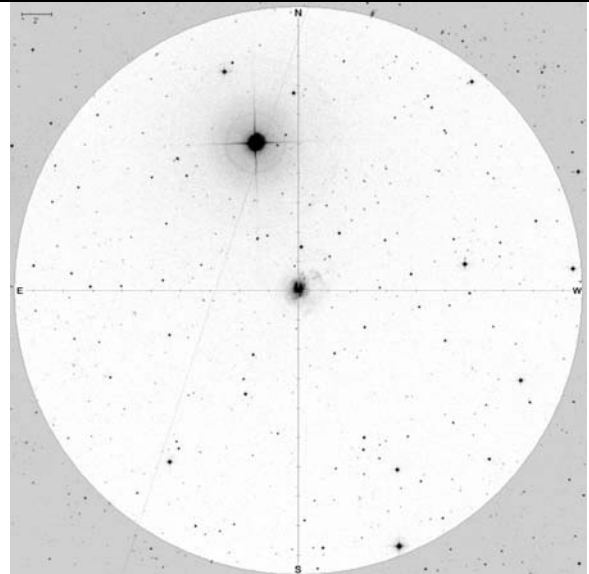
RA: 10h 38m 46s Dec: 53° 30.0'

Size: 3.1' x 2.4'

Mag: 10.8

Transit Date: March 3

Challenge: Knots to N and NE of
nucleus



Arp270

NGC3395 and NGC3396

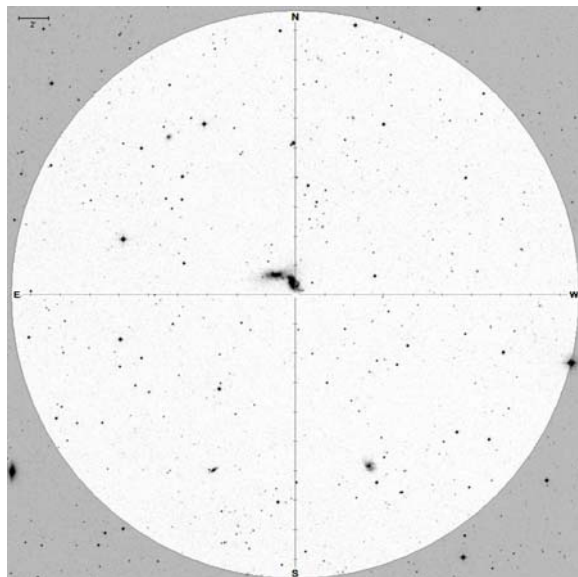
RA: 10h 49m 49s Dec: 32° 58.0'

Size: 2.1' x 1.2'

Mag: 12.1 and 12.6

Transit Date: March 6

Challenge: Knots and an arcing arm to the SW in NGC3395



Arp162

NGC3414

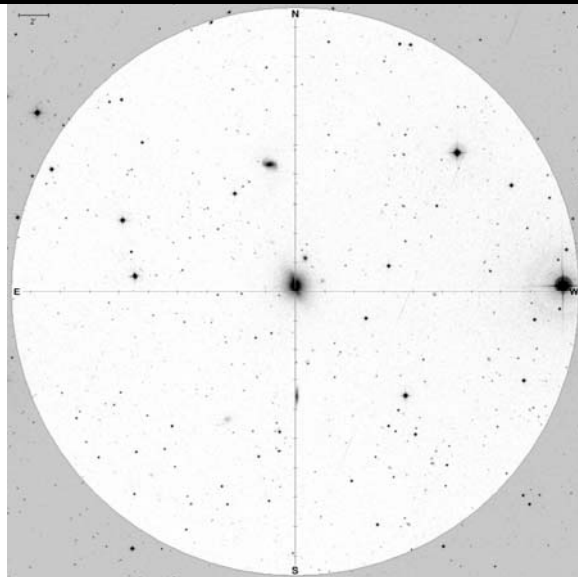
RA: 10h 51m 16s Dec: 27° 58.0'

Size: 3.6' x 2.6'

Mag: 10.8

Transit Date: March 7

Challenge: Diagonal filament that runs NE to SW



Arp206

NGC3432 and UGC5983

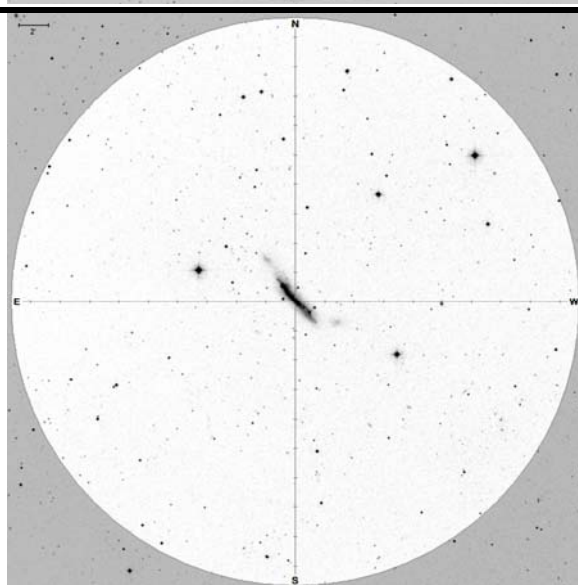
RA: 10h 52m 31s Dec: 36° 37.0'

Size: 6.8' x 1.5'

Mag: 11.3 and 17.0

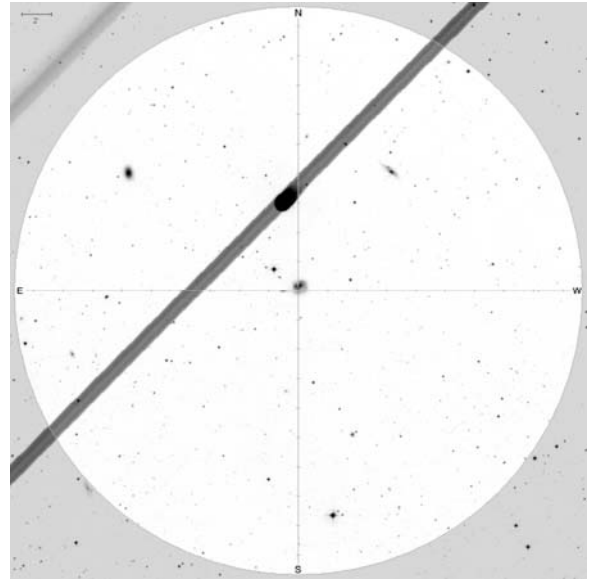
Transit Date: March 7

Challenge: UGC5983 to the SW and the faint detachment to the NE



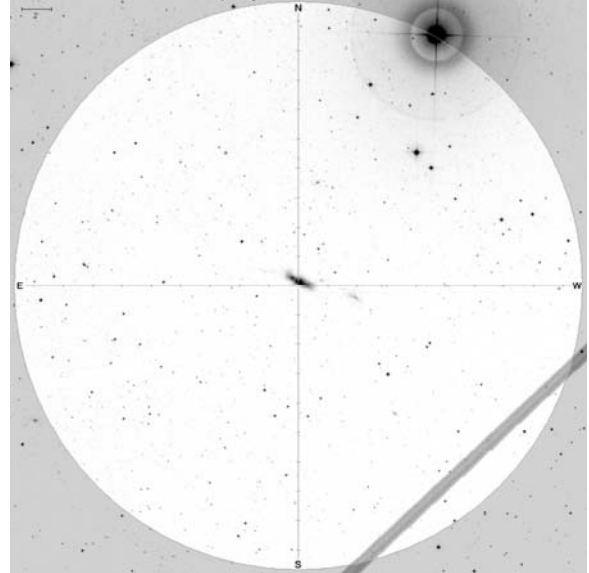
Arp24

NGC3445 and 2 companions
RA: 10h 54m 36s Dec: 56° 59.0'
Size: 1.6' x 1.5'
Mag: 12.6, 15.0, and 17.6
Transit Date: March 7
Challenge: Absorption band in
NGC3445, and both companions.
MCG+10-16-24 is due east of
NGC3445, while 2MASX
J10544552+5659588 is to the NE



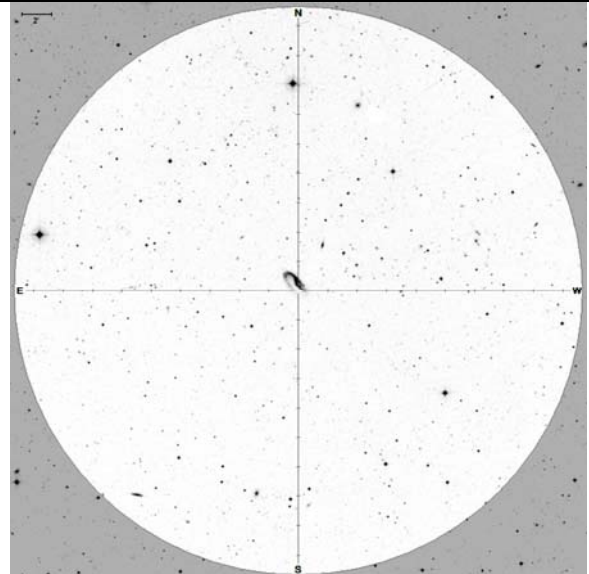
Arp205

NGC3448 and MCG+9-19-52
RA: 10h 54m 39s Dec: 54° 18.0'
Size: 5.7' x 1.8'
Mag: 12.0 and 17.0
Transit Date: March 7
Challenge: Wisps extending to the
east and west of NGC3448, and
companion located to the SW



Arp335

NGC3509
RA: 11h 04m 23s Dec: 04° 49.0'
Size: 2.1' x 1.0'
Mag: 12.7
Transit Date: March 10
Challenge: Full extent of large spiral
arm and nuclear structure



Arp16 (part of Arp 317)

NGC3627/M66

RA: 11h 20m 14s Dec: 12° 59.0'

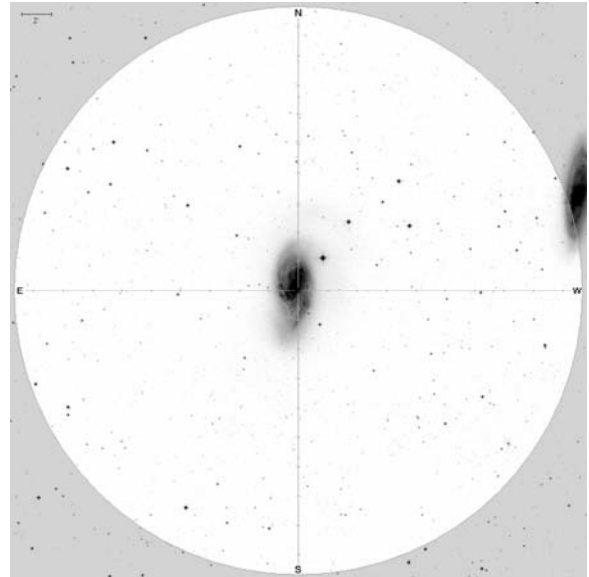
Size: 9.1' x 4.2'

Mag: 8.9

Transit Date: March 14

Challenge: M66 asymmetry

Note: M65 is located to the NE, and NGC3628 is located to the north about 0.5°



Arp317

NGC3628, NGC3627 (M66), and NGC3623 (M65)

RA: 11h 20m 16s Dec: 13° 35.0'

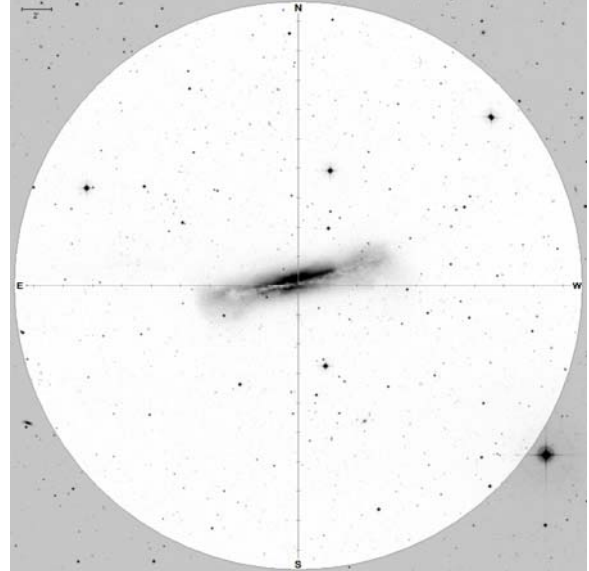
Size: 4.8' x 3.0'

Mag: 9.5

Transit Date: March 14

Challenge: Dust lane in NGC3628

Note: The coordinates and image are centered on NGC3628. M66 and M65 are located due south about 0.5°



Arp27

NGC3631

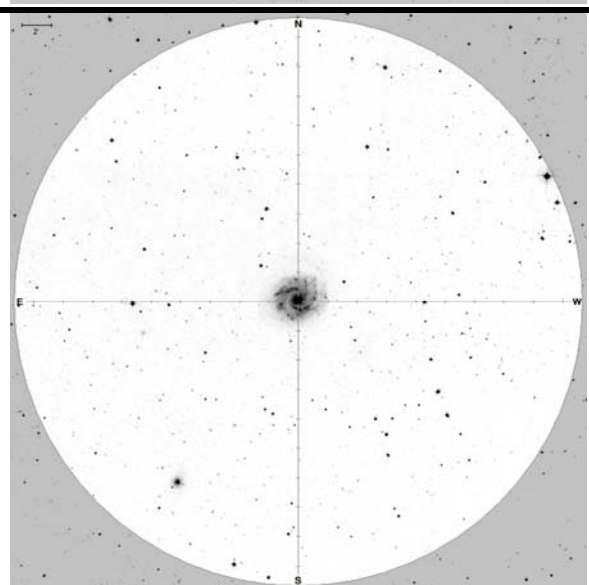
RA: 11h 21m 02s Dec: 53° 10.0'

Size: 5.0' x 4.8'

Mag: 10.4

Transit Date: March 14

Challenge: Straight spiral arm on the north side that seems to cut E across a dimmer arm that curves southward. An absorption tube that runs N-S just E of the nucleus



Arp155

NGC3656

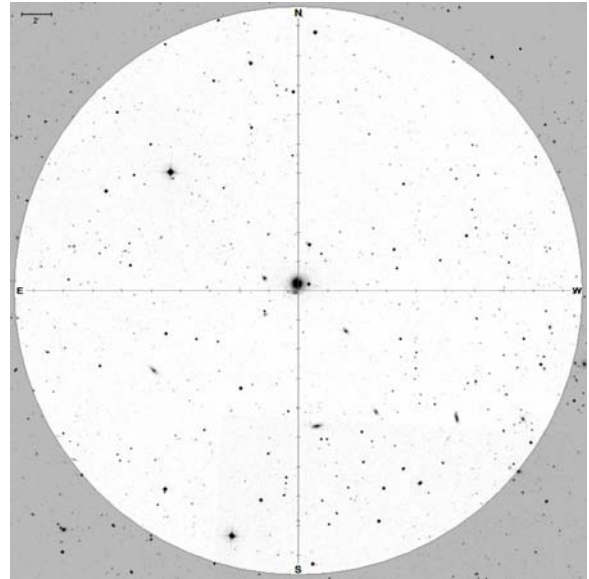
RA: 11h 23m 38s Dec: 53° 50.0'

Size: 1.6' x 1.6'

Mag: 12.5

Transit Date: March 15

Challenge: Split nucleus and bump to the south



Arp299

NGC3690 group

RA: 11h 28m 37s Dec: 58° 33.0'

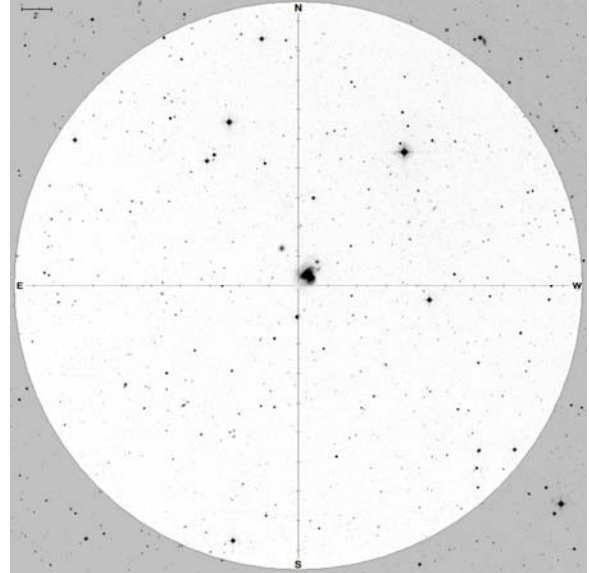
Size: 1.2' x 1.0'

Mag: 11.3

Transit Date: March 16

Challenge: Dual nuclei of interacting galaxies with knots and plumes. Tails that extend NE-SW

Note: Arp296 is located about 2' to the NE, but it is 15.7mag



Arp214

NGC3718

RA: 11h 32m 35s Dec: 53° 03.0'

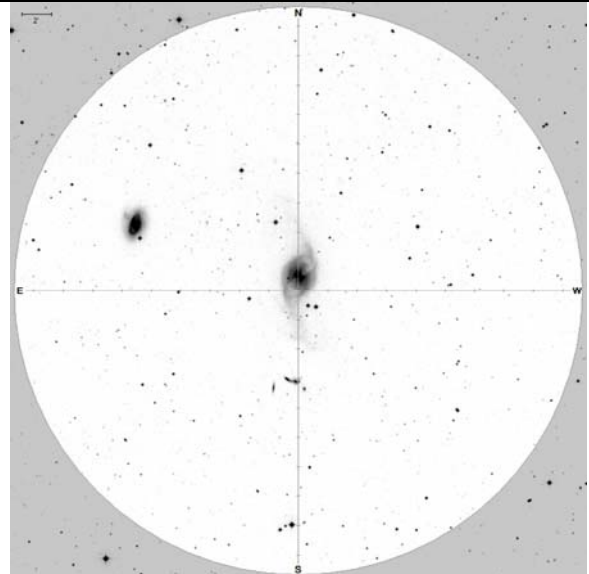
Size: 8.2' x 4.0'

Mag: 10.7

Transit Date: March 17

Challenge: Absorption lane that runs NW-SE across the nucleus, and long tails that extend N and S

Note: NGC3729 is 12' to the NE, and Arp322 is 6' to the S (15.7mag)



Arp234

NGC3738

RA: 11h 35m 48s Dec: 54° 31.0'

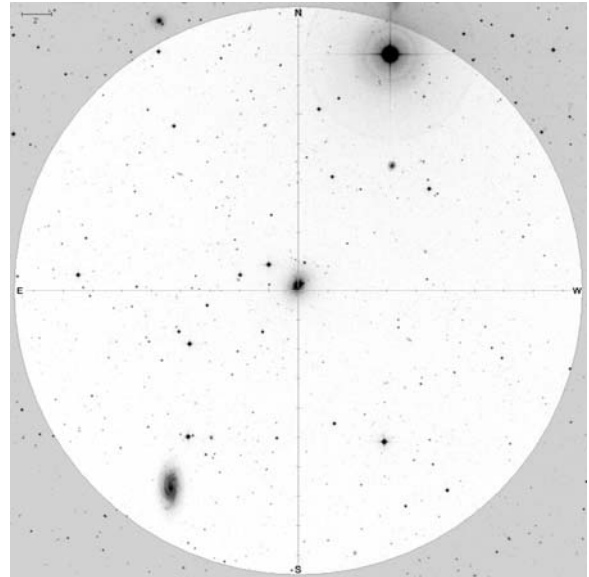
Size: 2.5' x 1.9'

Mag: 11.9

Transit Date: March 18

Challenge: Line of knots S of the nucleus

Note: NGC3756 (11.5mag) is located 16' to the SE



Arp280

NGC3769 and NGC3769A

RA: 11h 37m 44s Dec: 47° 53.0'

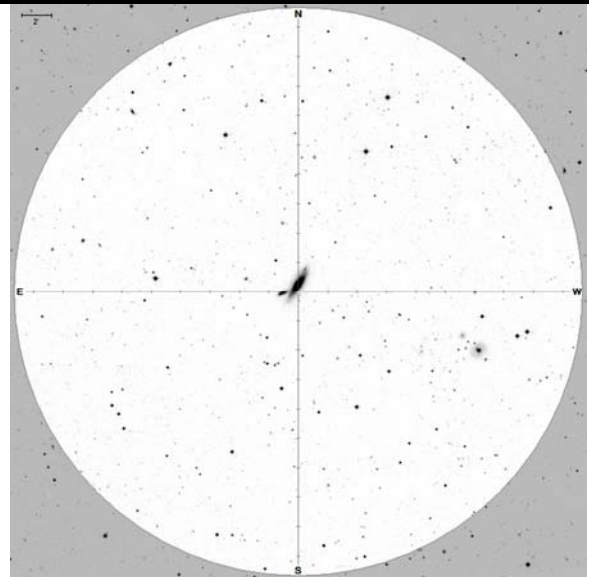
Size: 3.1' x 1.0'

Mag: 11.8 (12.6 in *The Arp Atlas of Peculiar Galaxies*) and 14.7

Transit Date: March 18

Challenge: Structure in both galaxies and knot N of NGC3769.

NGC3769A is 1' to the W and angled southward



Arp294

NGC3786 and NGC3788

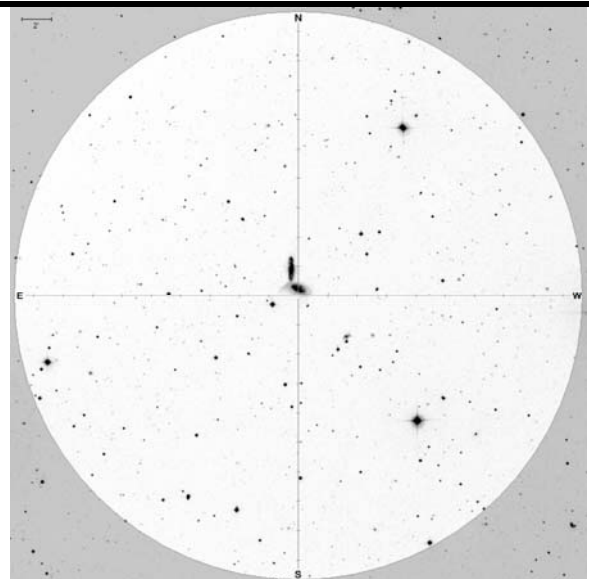
RA: 11h 39m 42s Dec: 31° 54.0'

Size: 2.2' x 1.3'

Mag: 12.3 (13.5 in *The Arp Atlas of Peculiar Galaxies*) and 13.5

Transit Date: March 19

Challenge: Outer halo to NGC3786 and backward S-shape spiral arms in NGC3788



Arp83

NGC3800 and NGC3799

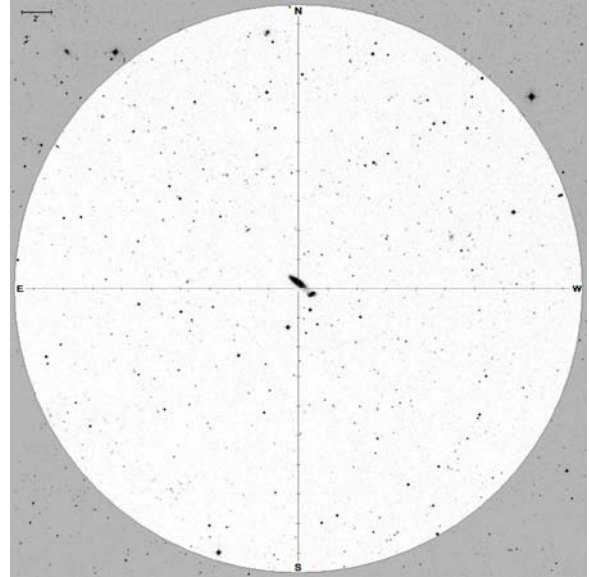
RA: 11h 40m 13s Dec: 15° 20.0'

Size: 2.0' x 0.6'

Mag: 12.7 (13.5 in *The Arp Atlas of Peculiar Galaxies*) and 14.7

Transit Date: March 19

Challenge: Spiral structure in both galaxies



Arp224

NGC3921 and 2 companions

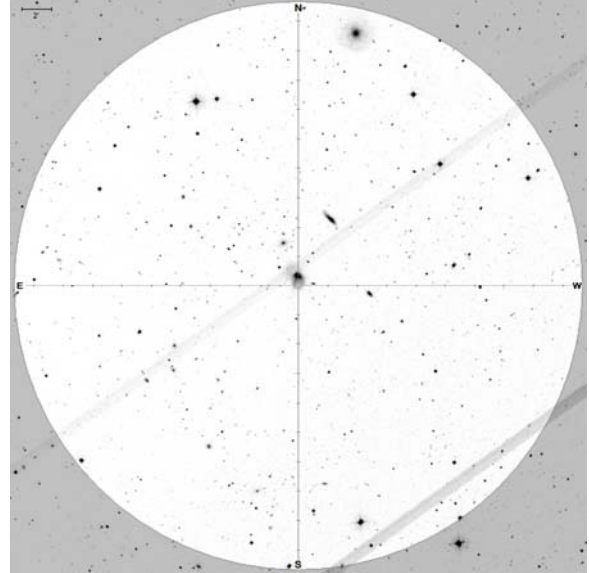
RA: 11h 51m 06s Dec: 55° 04.0'

Size: 2.1' x 1.3'

Mag: 12.4 and ~16

Transit Date: March 22

Challenge: Loop to the south (north) is brightest (dimpest). Companion 1 is 1' SW (west of loop), and Companion 2 is 3' to the NNE. NGC3916 is 5' to the NNW



Arp289

NGC3981

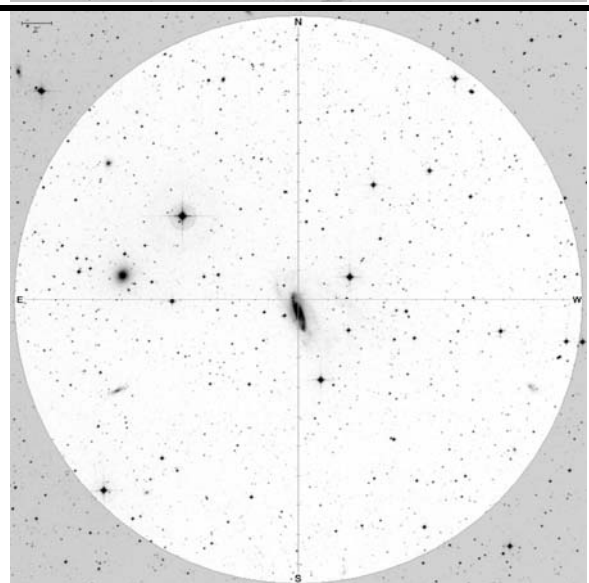
RA: 11h 56m 07s Dec: -19° 53.0'

Size: 5.3' x 2.3'

Mag: 11.0 (12.1 in *The Arp Atlas of Peculiar Galaxies*)

Transit Date: March 23

Challenge: Asymmetry of the spiral arms, and their filamentary extensions



Arp313

NGC3995, NGC3994, and NGC3991

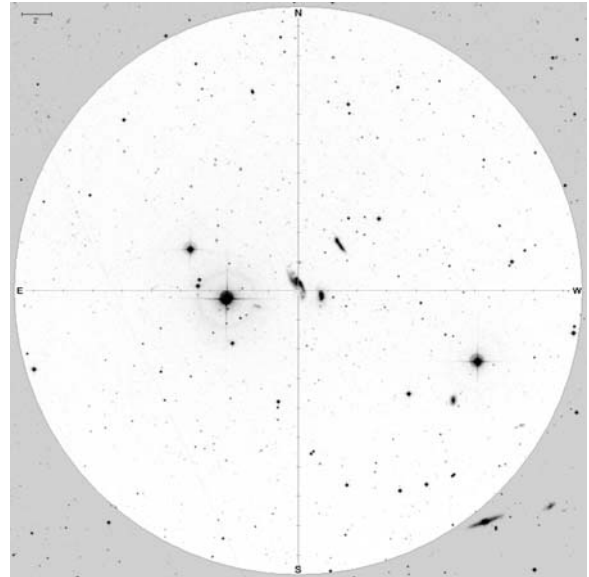
RA: 11h 57m 44s Dec: 32° 17.0'

Size: 2.8' x 1.1'

Mag: 12.4, 13.3, and 13.5

Transit Date: March 23

Challenge: String of knots in the SW arm of NGC3995, and the lumps in NGC3991, located to the NW



Arp305

NGC4017 and NGC4016

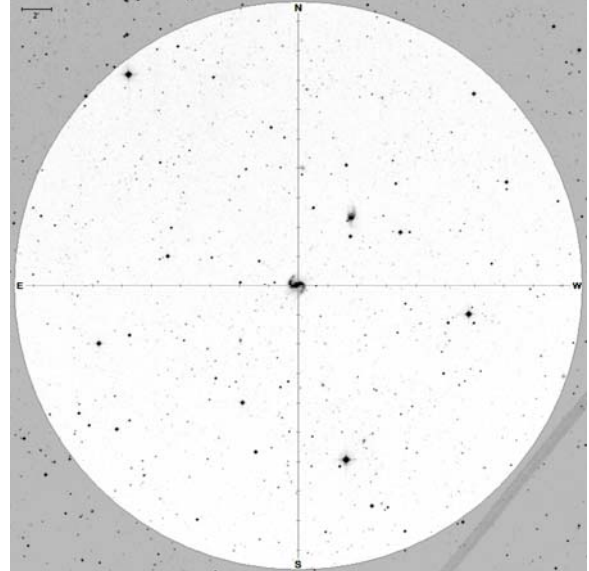
RA: 11h 58m 45s Dec: 27° 27.0'

Size: 1.8' x 1.4'

Mag: 12.2

Transit Date: March 24

Challenge: Loop running NE-SW in NGC4016. The loop is perpendicular to the 2 stars that are on either side of the core



Arp22

NGC4027 and NGC4027A

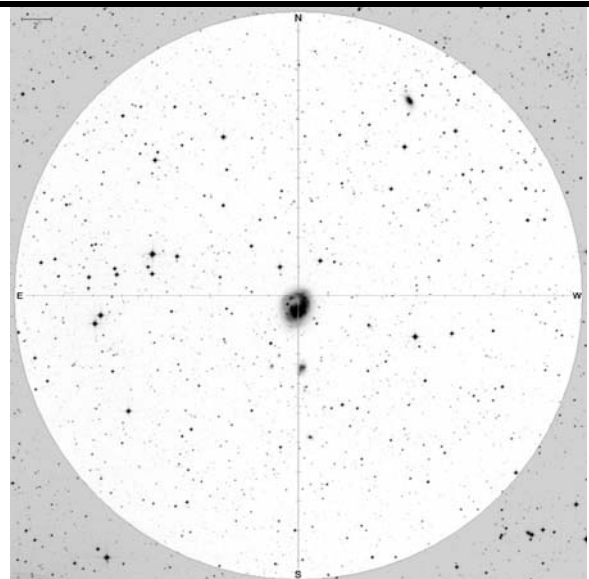
RA: 11h 59m 30s Dec: -19° 15.0'

Size: 3.2' x 2.4'

Mag: 11.2 and 14.9

Transit Date: March 24

Challenge: The spiral arm on the north side of NGC4027, and its mottled core. The linear core of NGC4027A, located 4' S



Arp244 (The Antennae Galaxies)

NGC4039 and NGC4038

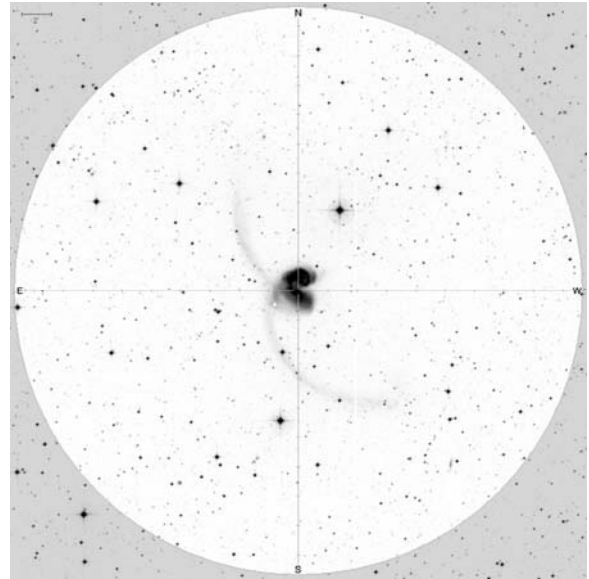
RA: 12h 01m 53s Dec: $-18^{\circ} 53.0'$

Size: 3.1' x 1.6'

Mag: 10.3 (11.1 in *The Arp Atlas of Peculiar Galaxies*) and 11.2

Transit Date: March 24

Challenge: "Lasso" of knots in NGC4038 (north of NGC4039). The full extent of the antennae that extend 8'-10' from the galaxies (NE-SW)



Arp18

NGC4088

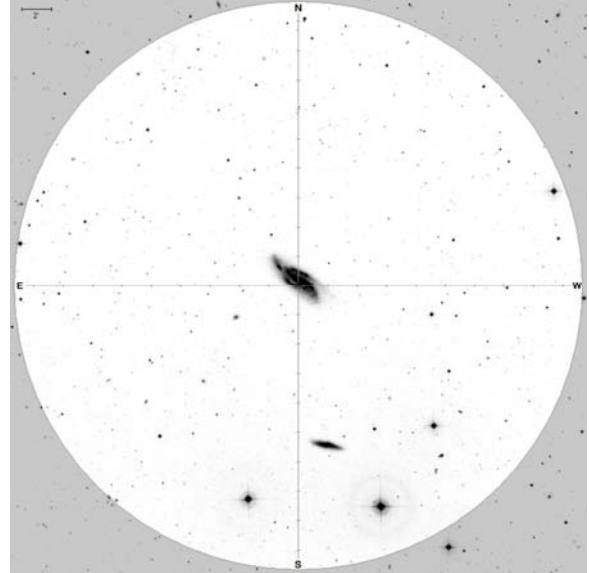
RA: 12h 05m 35s Dec: $50^{\circ} 32.0'$

Size: 5.8' x 2.3'

Mag: 10.5

Transit Date: March 25

Challenge: Discern the fainter arm on the NW side, and the rich mottling throughout



Arp160

NGC4194

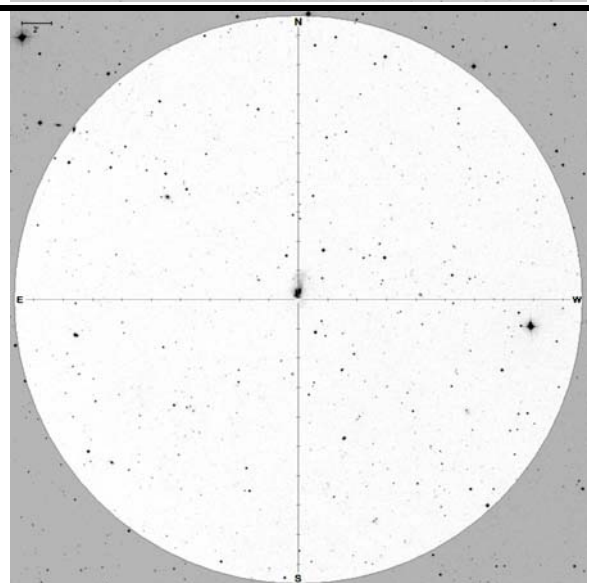
RA: 12h 14m 10s Dec: $54^{\circ} 31.0'$

Size: 1.8' x 1.1'

Mag: 12.5

Transit Date: March 28

Challenge: Absorption structure to the south of the nucleus with a bright curved edge adjacent. The faint wide spray to the north



Arp120 (The Eyes)

NGC4438 and NGC4435

RA: 12h 27m 45s Dec: 13° 00.0'

Size: 8.6' x 3.2'

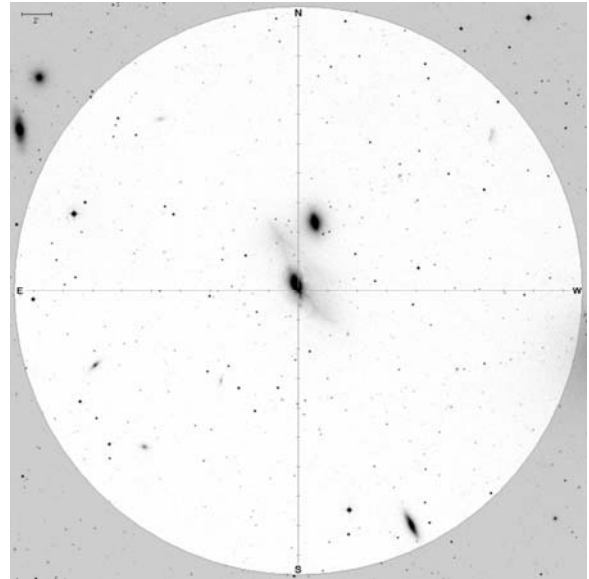
Mag: 10.1 and 11.7

Transit Date: March 31

Challenge: NGC4438: triple structure of the nucleus and absorption feature on the NW side of the nucleus

Note: NGC4425 (11.9mag) 18' SW.

NGC4461 (11.2mag) 20' NE



Arp134

NGC4472/M49 and UGC7636

RA: 12h 29m 46s Dec: 07° 59.0'

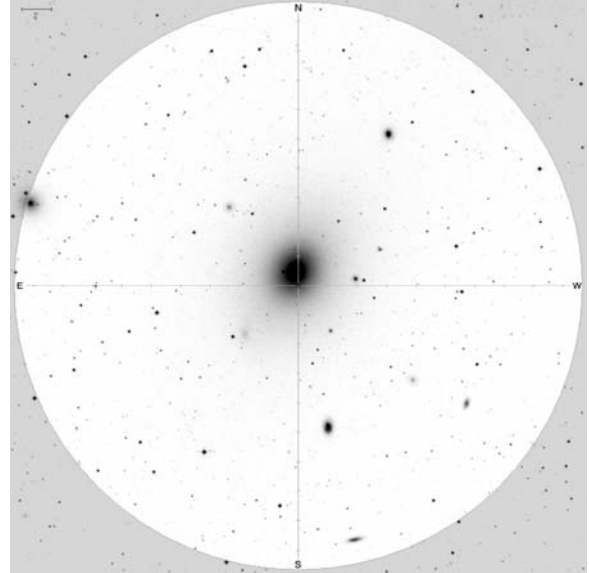
Size: 10.2' x 8.3'

Mag: 8.4 (9.3 in *The Arp Atlas of Peculiar Galaxies*) and 14.8

Transit Date: April 1

Challenge: UGC7636 4' to the SE

Note: M49 is situated within a triad of NGC objects (12.5-13.0mag) that are to the NW, SSW, and ENE



Arp269

NGC4490 and NGC4485

RA: 12h 30m 36s Dec: 41° 38.0'

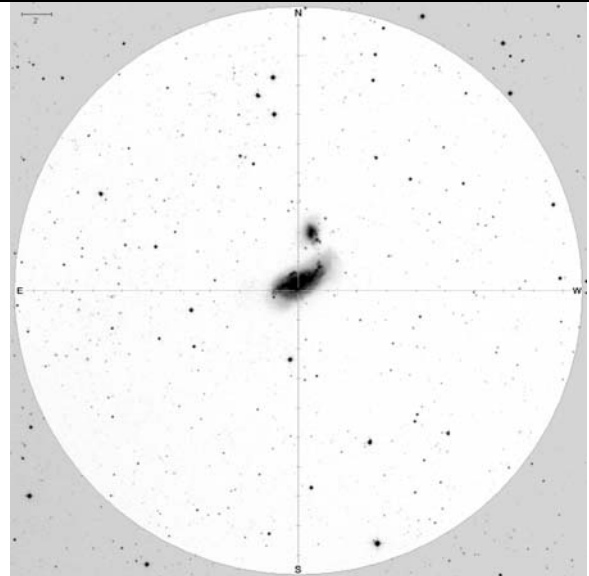
Size: 6.4' x 3.1'

Mag: 9.8 and 12.3

Transit Date: April 1

Challenge: NGC4490: multiple knots and asymmetry. NGC4485:

Absorption lane (SE-NW) on the SW side



Arp152

NGC4486/M87

RA: 12h 30m 49s Dec: 12° 23.0'

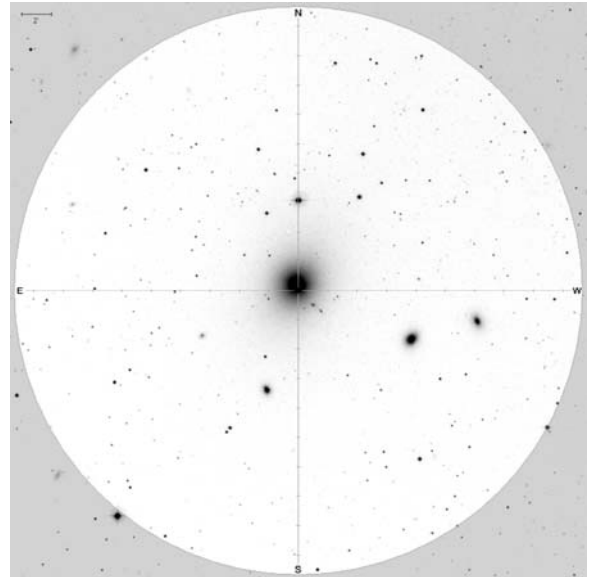
Size: 8.4' x 6.7'

Mag: 8.6

Transit Date: April 1

Challenge: Three jet components
~0.5' NW of the core. Two UGC's
~2' SW of the core

Note: NGC4478 and NGC4476 to the
WSW and UGC7658 SSE



Arp76

NGC4569/M90 and IC3583

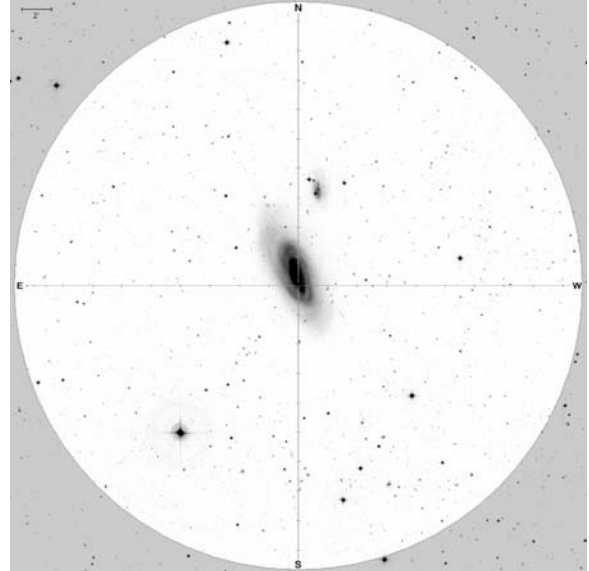
RA: 12h 36m 49s Dec: 13° 09.0'

Size: 9.7' x 4.4'

Mag: 9.5 and 13.3

Transit Date: April 2

Challenge: M90: absorption structure
near the core. IC3583: linear core



Arp23

NGC4618 and NGC4625

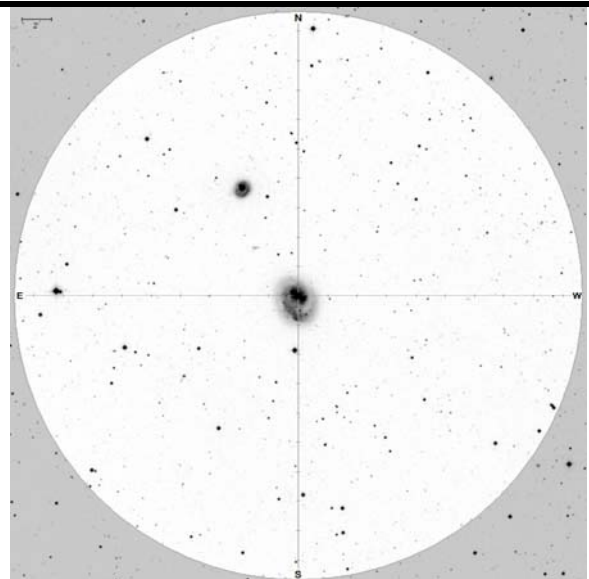
RA: 12h 41m 32s Dec: 41° 09.0'

Size: 4.2' x 3.4'

Mag: 10.8 and 12.9

Transit Date: April 4

Challenge: NGC4618: pronounced
southern arm with knots. NGC4625:
heavier southern arm



Arp281

NGC4631 and NGC4627

RA: 12h 42m 05s Dec: 32° 32.0'

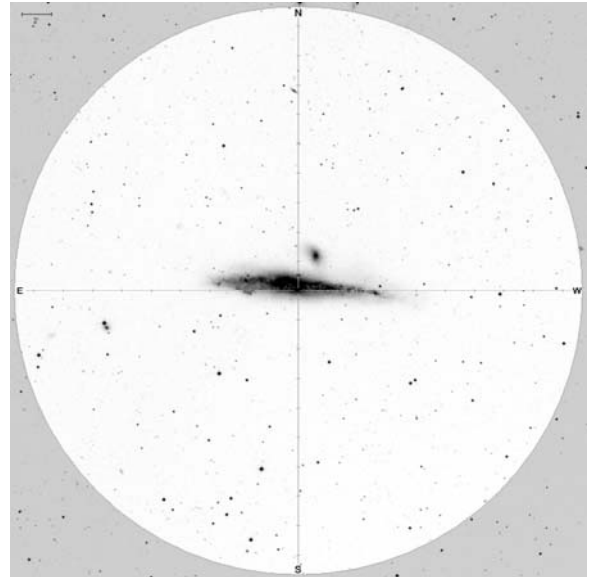
Size: 5.5' x 2.7'

Mag: 9.3 and 13.1

Transit Date: April 4

Challenge: Absorption features lining
NGC4631

Note: NGC4656: ~30' to the SE,
edge-on irregular galaxy that is tilted
NE-SW. NE brighter w/curved end



Arp116

NGC4649/M60 and NGC4647

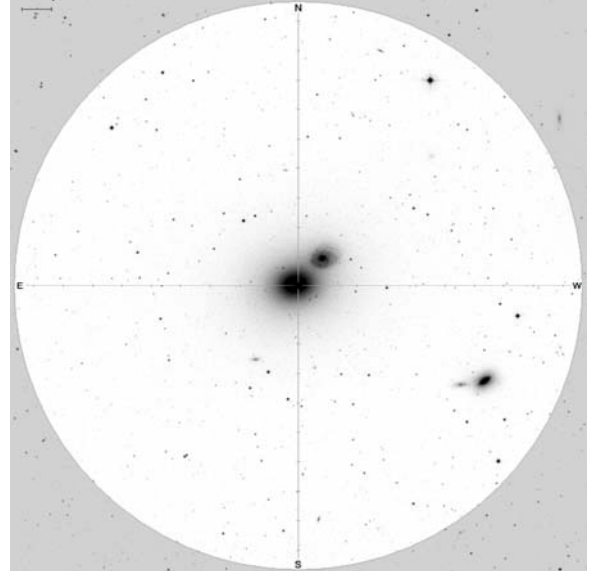
RA: 12h 43m 39s Dec: 11° 33.0'

Size: 7.5' x 6.1'

Mag: 8.8 (9.8 in *The Arp Atlas of Peculiar Galaxies*) and 11.9

Transit Date: April 4

Challenge: NGC4647: absorption
band on NW side



Arp189

NGC4651

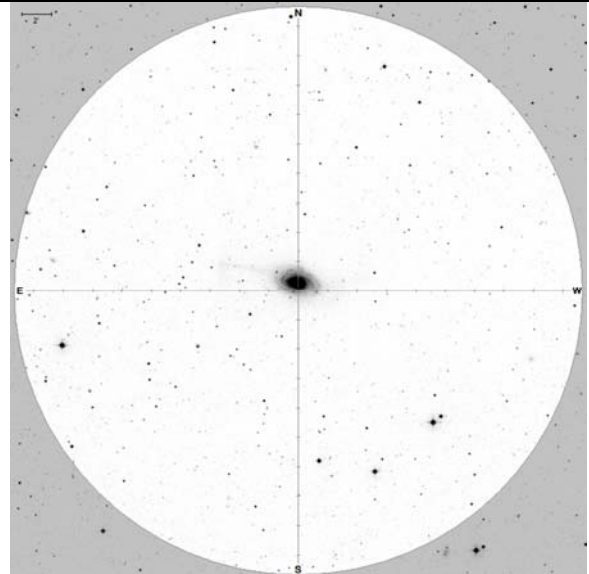
RA: 12h 43m 42s Dec: 16° 23.0'

Size: 4.0' x 2.7'

Mag: 10.8

Transit Date: April 4

Challenge: Tail extending to the east
and its hook to the south. Short tail
on the west



Arp163

NGC4670

RA: 12h 45m 17s Dec: 27° 07.0'

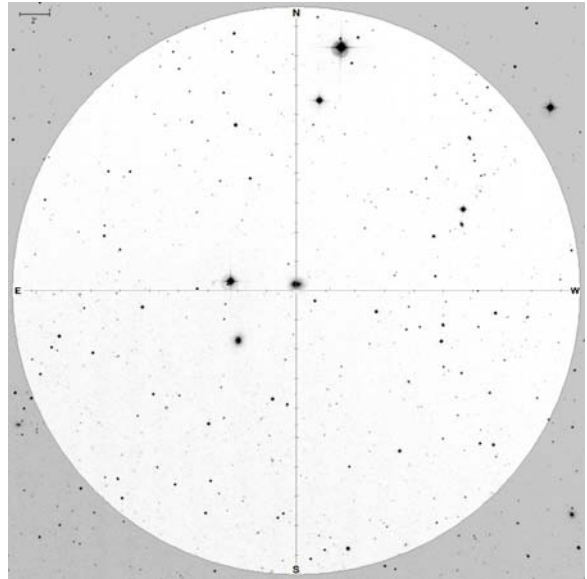
Size: 1.5' x 1.1'

Mag: 12.7

Transit Date: April 4

Challenge: Curved filament to the west that extends to the north

Note: NGC4673 (14.0mag) 4' to the SE



Arp242 (The Mice)

NGC4676A and NGC4676B

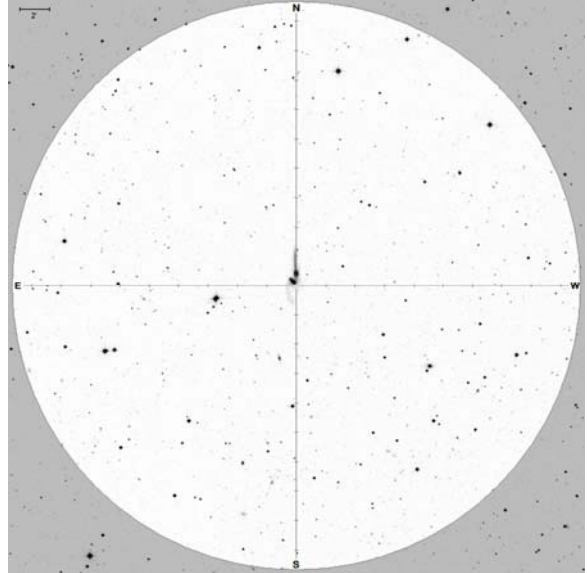
RA: 12h 46m 10s Dec: 30° 43.0'

Size: 2.3' x 0.7'

Mag: 13.0 and 13.2 (14.4 and 14.7 in *The Arp Atlas of Peculiar Galaxies*)

Transit Date: April 5

Challenge: Both tails and the different core structure



Arp159

NGC4747

RA: 12h 51m 45s Dec: 25° 46.0'

Size: 3.5' x 1.2'

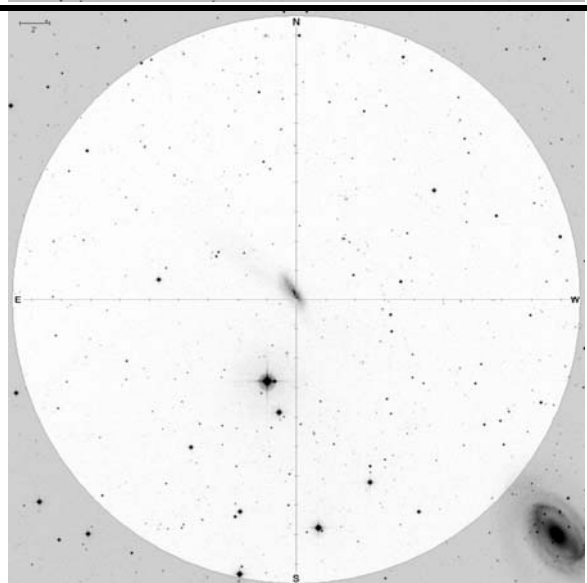
Mag: 12.4

Transit Date: April 6

Challenge: Absorption features along the core and extension to the NE

Note: NGC4725 (9.2mag) located ~22' to the SW

Note: NGC4725 (9.2mag) 25' SW



Arp266

NGC4861

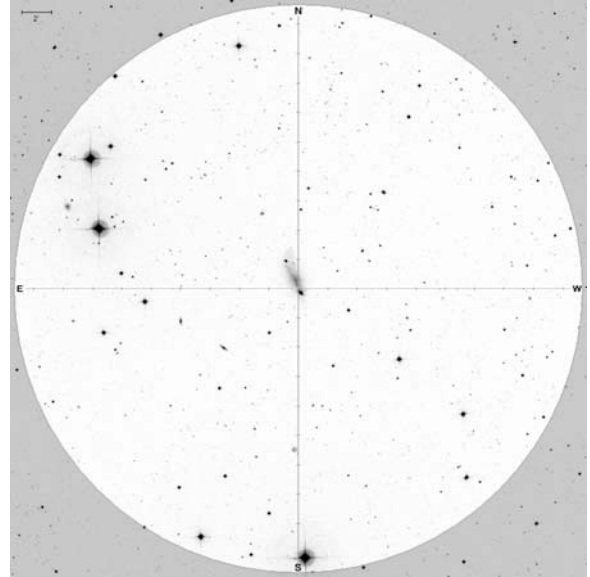
RA: 12h 59m 01s Dec: 34° 51.0'

Size: 4.0' x 1.5'

Mag: 12.3

Transit Date: April 8

Challenge: Knots and asymmetry



Arp176

NGC4933B, NGC4933A, and
NGC4933C

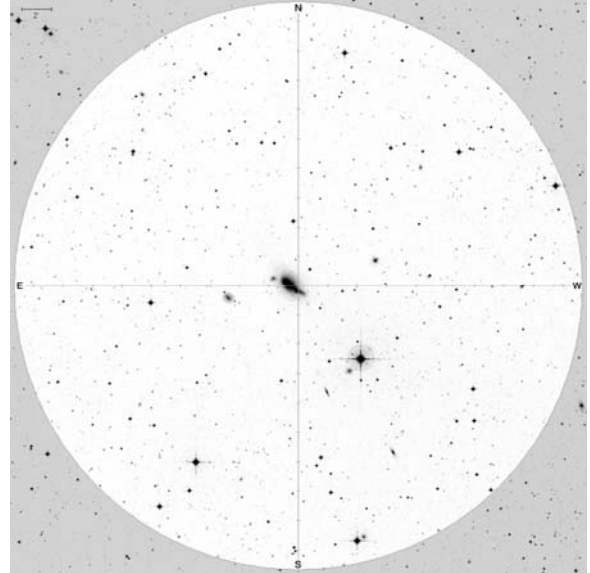
RA: 13h 03m 54s Dec: -11° 30.0'

Size: 1.8' x 1.1'

Mag: 11.7 (12.7 in *The Arp Atlas of Peculiar Galaxies*), 15.2, and 15.3

Transit Date: April 9

Challenge: ABC runs SW-NE; tail from A extending SW, absorption in B



Arp85

NGC5194/M51 and NGC5195

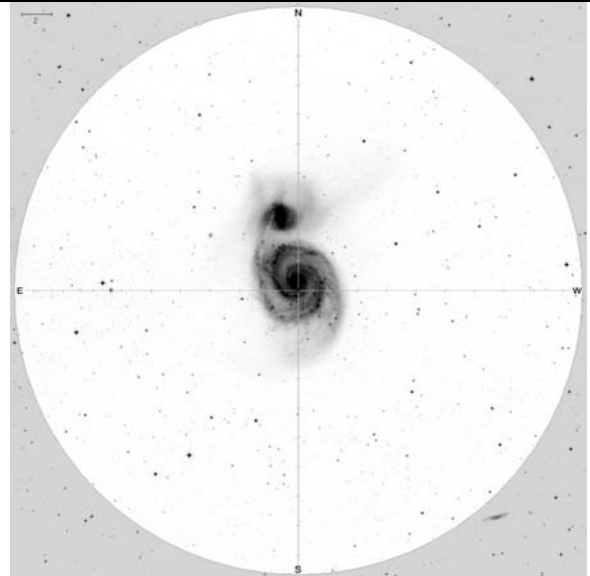
RA: 13h 29m 52s Dec: 47° 11.0'

Size: 11.4' x 7.0'

Mag: 8.4 and 10.5

Transit Date: April 16

Challenge: The absorption structures and spiral arms in NGC5194, and the arm connecting to NGC5195. The faint horns extending N from NGC5195



Arp104

NGC5218 and NGC5216

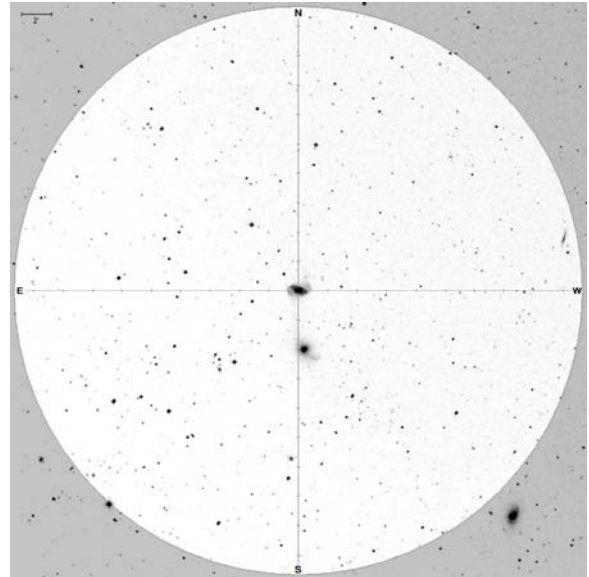
RA: 13h 32m 10s Dec: 62 46.0'

Size: 1.8' x 1.3'

Mag: 12.3 and 13.6

Transit Date: April 16

Challenge: NGC5218: Wisps to the E and W, connection between both galaxies



Arp288

NGC5221 and NGC5222

RA: 13h 34m 56s Dec: 13° 49.0'

Size: 2.4' x 0.8'

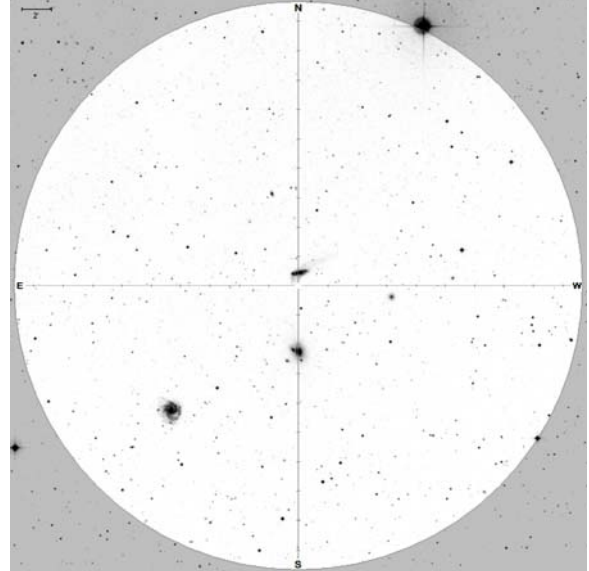
Mag: 13.0 and 14.1

Transit Date: April 17

Challenge: NGC5221: inner spiral arms and extension to the NW;

NGC5222: Faint wisps to the SW

Note: NGC5230 12' to the SE



Arp240

NGC5258 and NGC5257

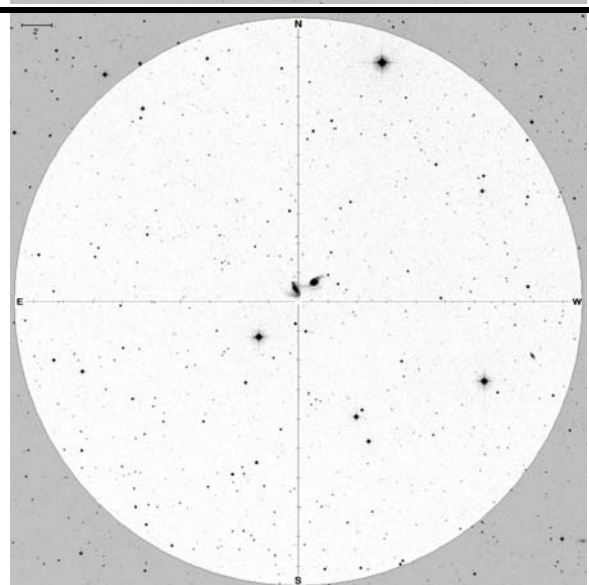
RA: 13h 39m 57s Dec: 00° 49.0'

Size: 1.7' x 1.1'

Mag: 12.9 and 12.9

Transit Date: April 18

Challenge: The spiral arms in each galaxy and the bridge connecting them



Arp239

NGC5278 and NGC5279

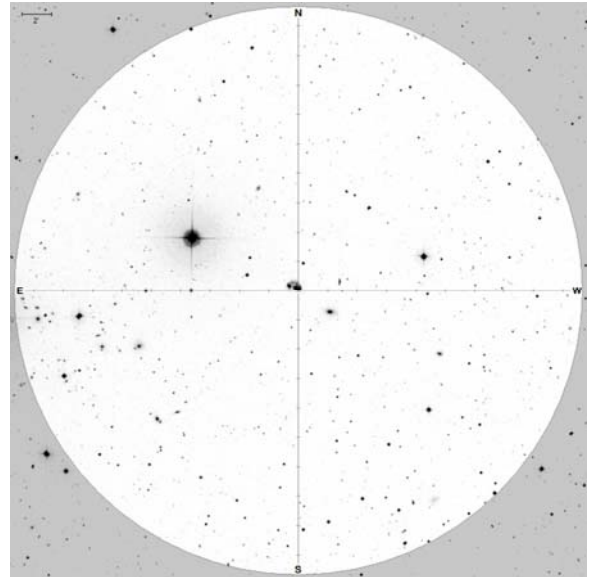
RA: 13h 41m 39s Dec: 55° 40.0'

Size: 1.4' x 1.0'

Mag: 12.7 and 15.0

Transit Date: April 19

Challenge: Connecting arm on the north side



Arp84

NGC5395 and NGC5394

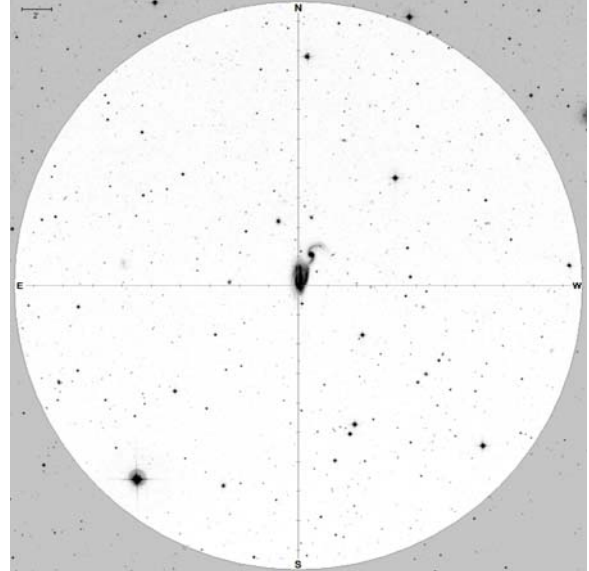
RA: 13h 58m 38s Dec: 37° 25.0'

Size: 2.9' x 1.6'

Mag: 11.4 and 12.1

Transit Date: April 23

Challenge: NGC5395: asymmetrical arm (heavy to the E) and texture within; NGC5394: Loosely wound spiral arms



Arp26

NGC5457/M101

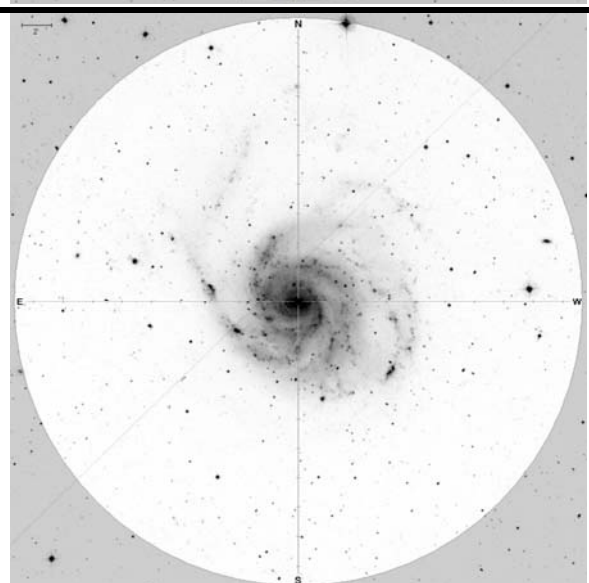
RA: 14h 03m 12s Dec: 54° 21.0'

Size: 29.0' x 27.0'

Mag: 7.9

Transit Date: April 24

Challenge: Straight arm extending NE from the western arm. 10 NGC objects within the spiral arms



Arp271

NGC5427

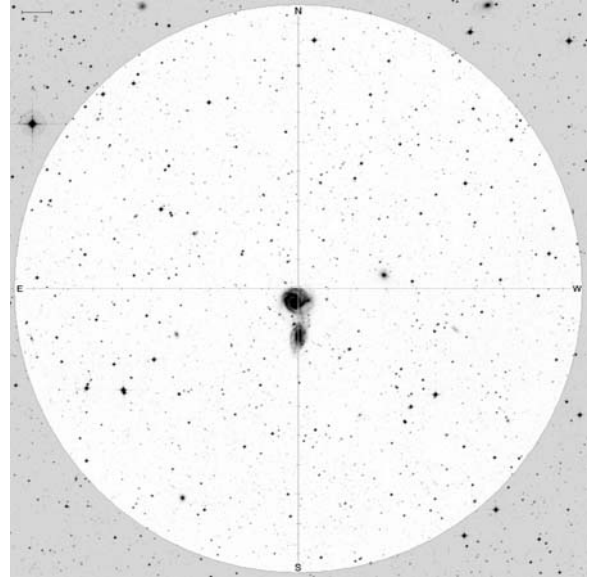
RA: 14h 03m 25s Dec: -06° 01.0'

Size: 2.8' x 2.4'

Mag: 11.4 (12.0 in *The Arp Atlas of Peculiar Galaxies*) and 12.7

Transit Date: April 24

Challenge: NGC5427: bifurcated arm on NE side, and connection between galaxies. Knots in both galaxies



Arp286

NGC5566, NGC5560, and NGC5569

RA: 14h 20m 20s Dec: 03° 55.0'

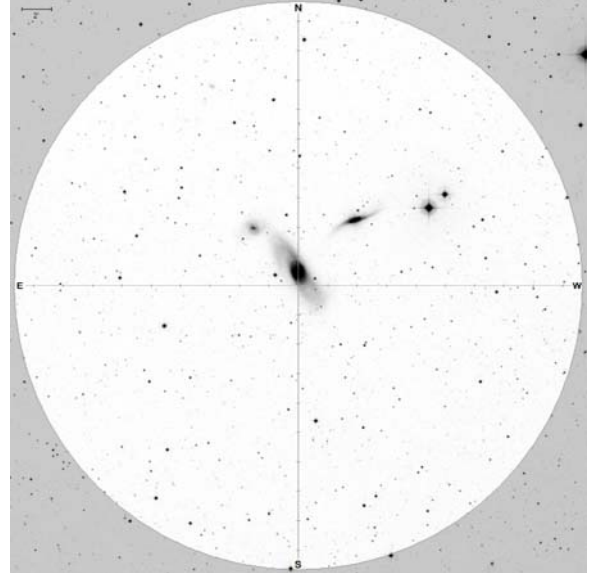
Size: 6.6' x 2.2'

Mag: 10.5 (11.5 in *The Arp Atlas of Peculiar Galaxies*), 13.2, and 13.9

Transit Date: April 28

Challenge: NGC5566: Ring-shaped SW arm and bifurcated NE arm.

NGC5560: Warped spiral arms (S-shaped)



Arp178

NGC5614 and NGC5613

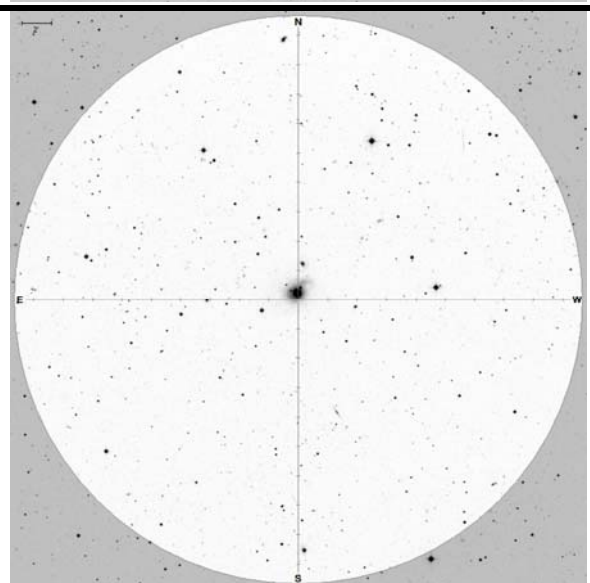
RA: 14h 24m 07s Dec: 34° 51.0'

Size: 2.5' x 2

Mag: 11.7 (12.5 in *The Arp Atlas of Peculiar Galaxies*) and 15.5

Transit Date: April 30

Challenge: NGC5614: Off-center ring and plume extending to the NW.
NGC5613: encircling ring



Arp49

NGC5665

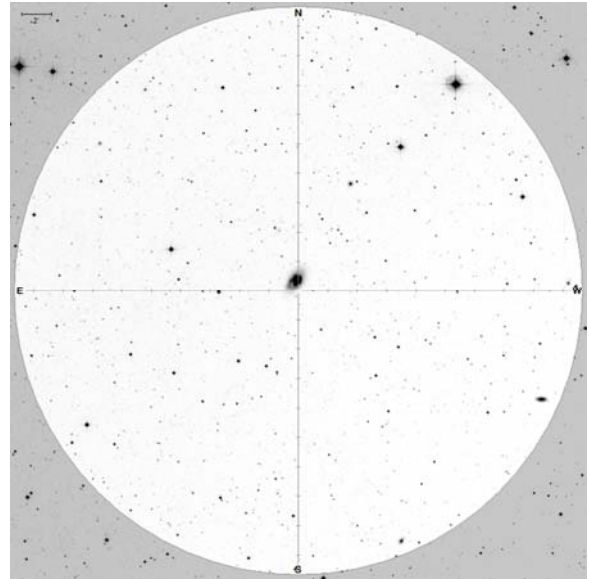
RA: 14h 32m 25s Dec: 08° 04.0'

Size: 1.9' x 1.4'

Mag: 12.0

Transit Date: May 1

Challenge: Asymmetry of the spiral structure



Arp136

NGC5820

RA: 14h 58m 39s Dec: 53° 53.0'

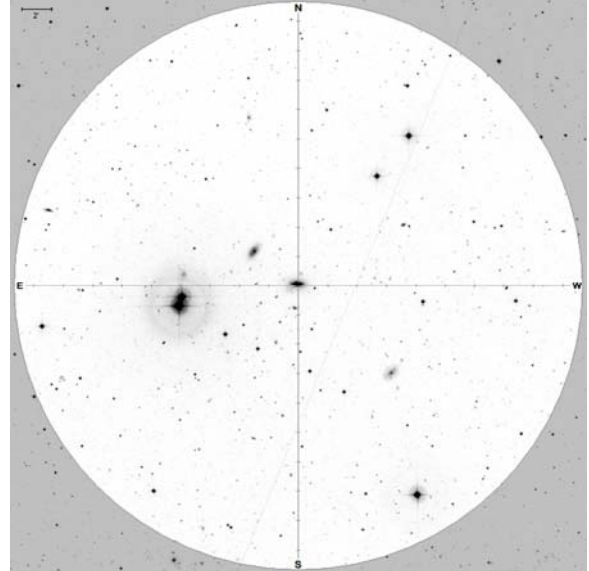
Size: 1.7' x 1.1'

Mag: 12.5

Transit Date: May 8

Challenge: Streamer extending to the SE.

Note: UGC9648 (14.9mag) located 4' NE, and UGC9632 (15.3mag) located 8' SW



Arp90

NGC5930 and NGC5929

RA: 15h 26m 07s Dec: 41° 40.0'

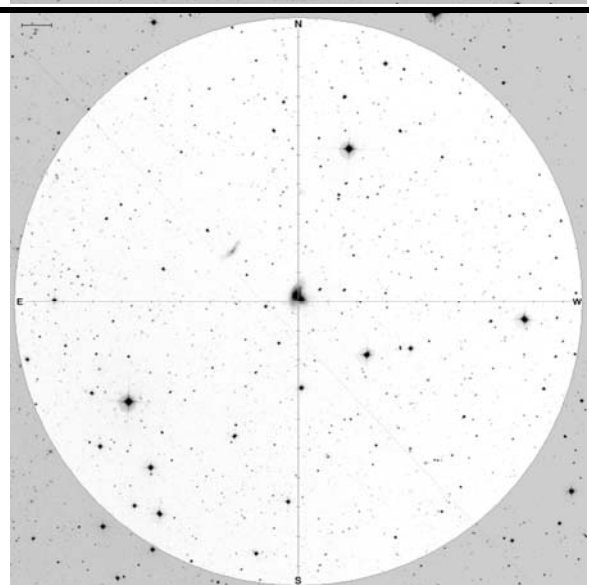
Size: 1.7' x 0.9'

Mag: 12.2 (13.6 in *The Arp Atlas of Peculiar Galaxies*) and 14.1

Transit Date: May 15

Challenge: NGC5960: Trace arm from NE side S to NGC5929

Note: UGC9857 (16.0mag) 6' to the NE



Arp91

NGC5954 and NGC5953

RA: 15h 34m 34s Dec: 15° 12.0'

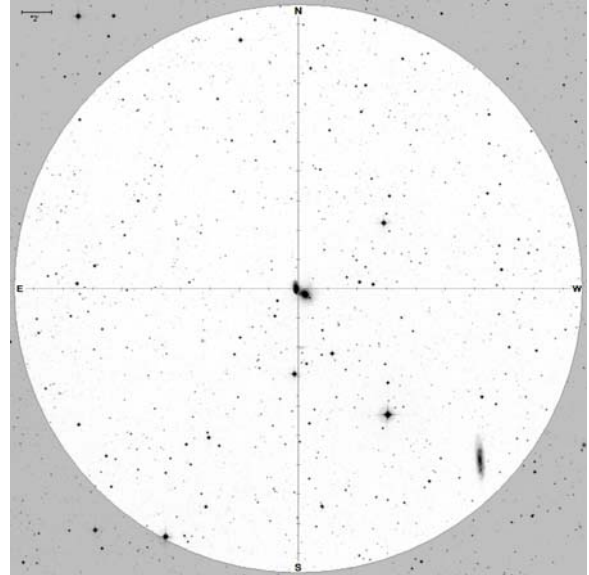
Size: 1.3' x 0.6'

Mag: 12.2 (13.7 in *The Arp Atlas of Peculiar Galaxies*) and 13.3

Transit Date: May 17

Challenge: Absorption I both galaxies, and arm on the S side of NGC5954 connecting to NGC5953

Note: NGC5951 (13.0mag) 18' SW



Arp185

NGC6217

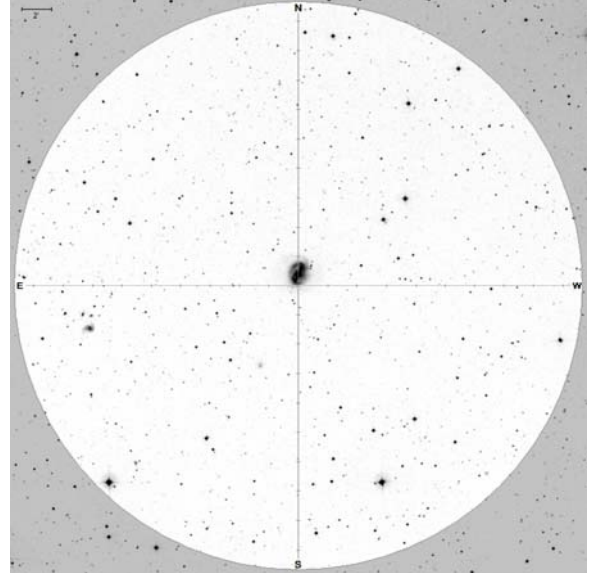
RA: 16h 32m 40s Dec: 78° 11.0'

Size: 3.0' x 2.5'

Mag: 11.2

Transit Date: June 1

Challenge: Asymmetric spiral arms (that to the NE is dominant)



Arp30

NGC6365A and NGC6365B

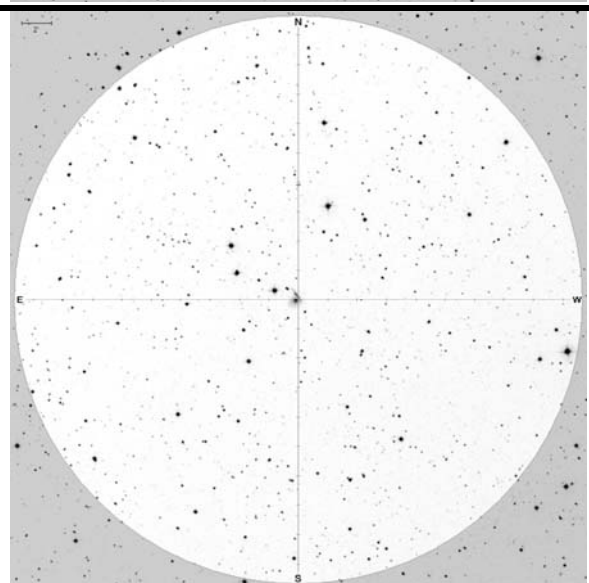
RA: 17h 22m 42s Dec: 62° 10.0'

Size: 1.2' x 0.8'

Mag: 12.2 (14.7 in *The Arp Atlas of Peculiar Galaxies*) and 14.8

Transit Date: June 14

Challenge: NE-SW arm on the north side



Arp38

NGC6412

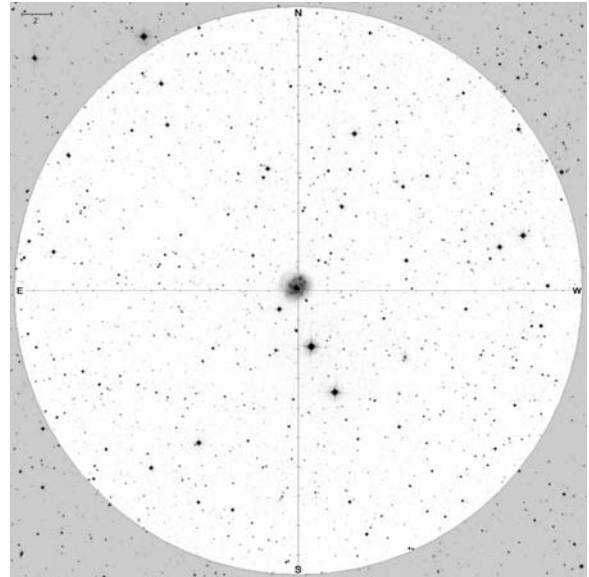
RA: 17h 29m 36s Dec: 75° 42.0'

Size: 2.5' x 2.2'

Mag: 11.7

Transit Date: June 15

Challenge: Absorption dust lane curving clockwise from N around to the SE. Bright component to the N



Arp81

NGC6621 and NGC6622

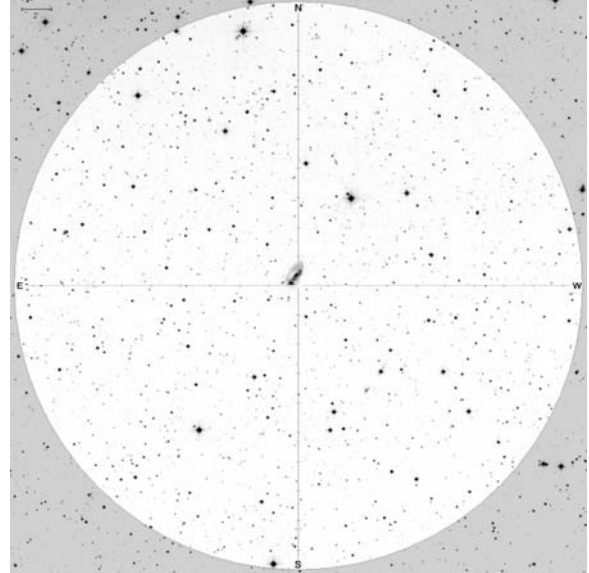
RA: 18h 12m 54s Dec: 68° 21.0'

Size: 2.1' x 0.8'

Mag: 12.8 and 13.0 (13.7 and 16.0 in *The Arp Atlas of Peculiar Galaxies*) and 16.0

Transit Date: June 26

Challenge: Dimmer outer arm running CCW from the N (mostly NW-SE) as far south as NGC6622



Arp29

NGC6946

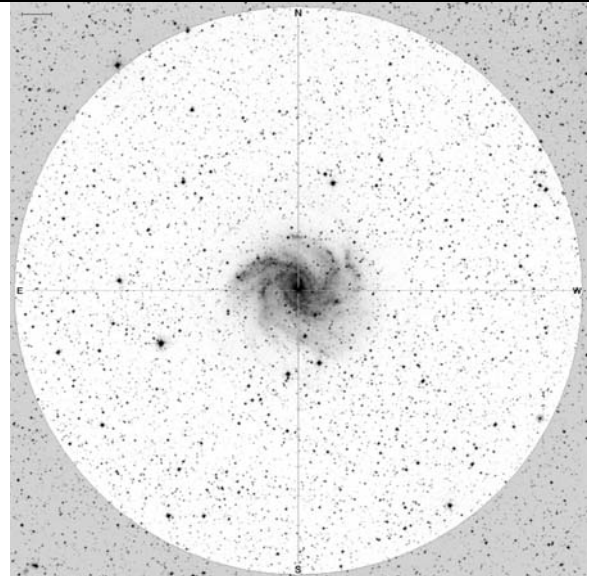
RA: 20h 34m 52s Dec: 60° 09.0'

Size: 11.6' x 9.9'

Mag: 8.8

Transit Date: August 1

Challenge: See all 5 arms



Arp226 “Atoms for Peace” Galaxy

NGC7252

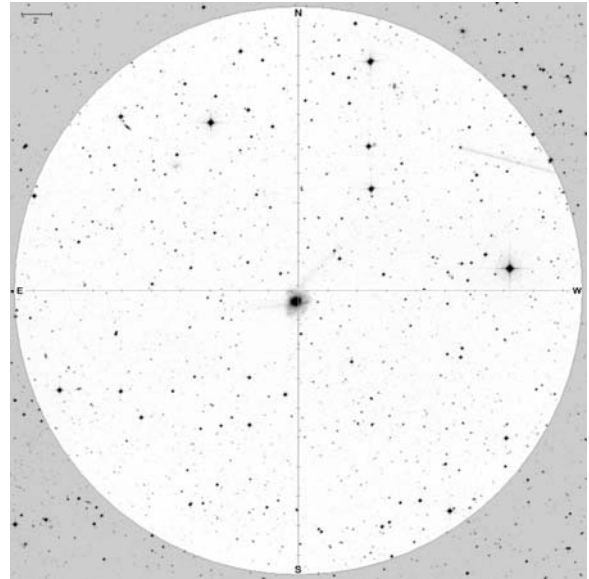
RA: 22h 20m 44s Dec: $-24^{\circ} 40.0'$

Size: 2.0' x 1.6'

Mag: 11.4

Transit Date: August 28

Challenge: Three loops and 2 tails, one extending W and the other to the NW



Arp93

NGC7285 and NGC7284

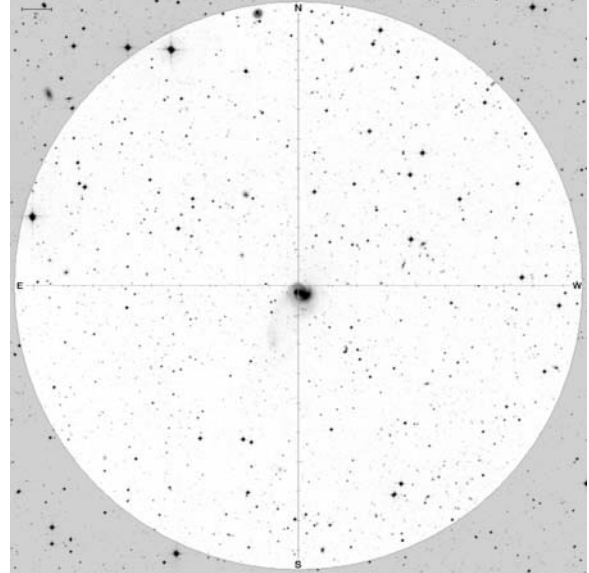
RA: 22h 28m 38s Dec: $-24^{\circ} 50.0'$

Size: 2.4' x 1.4'

Mag: 11.9 (12.9 in *The Arp Atlas of Peculiar Galaxies*) and 12.9)

Transit Date: August 30

Challenge: Bifurcation to the SE with the outer plume 4' long



Arp319 (Stephan's Quintet)

NGC7320, 7318AB, 7319, and 7317

RA: 22h 36m 04s Dec: $33^{\circ} 56.0'$

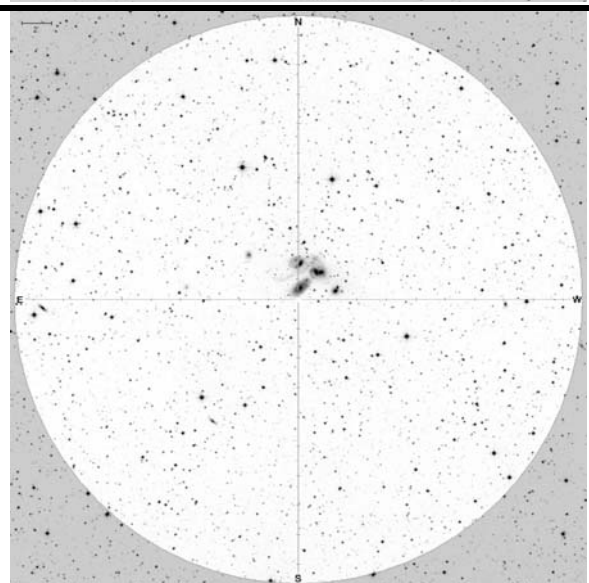
Size: 2.2' x 1.1'

Mag: 12.6, 13.1, 13.1, and 13.6

Transit Date: September 1

Challenge: NGC7318 A and B: spiral arms; NGC7319: NE loop and SE spiral arm extension; NGC7320: ring structure

Note: NGC7331 (10.3mag) 30' NNE



Arp15

NGC7393

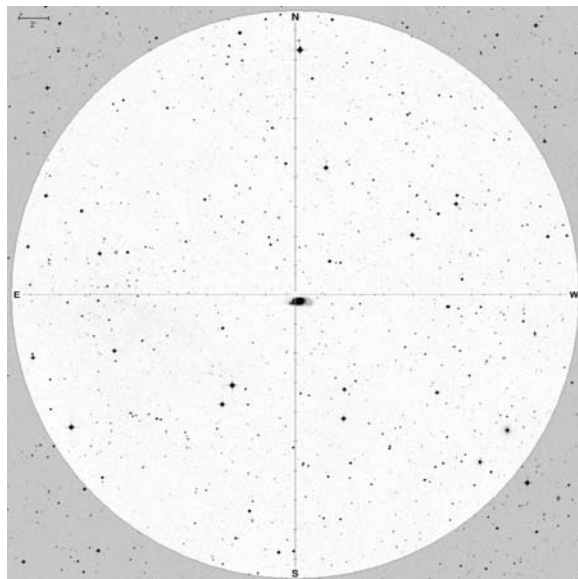
RA: 22h 51m 39s Dec: $-05^{\circ} 33.0'$

Size: 2.0' x 0.9'

Mag: 12.6

Transit Date: September 9

Challenge: Ring structure with extension to the W



Arp13

NGC7448

RA: 23h 00m 02s Dec: $15^{\circ} 59.0'$

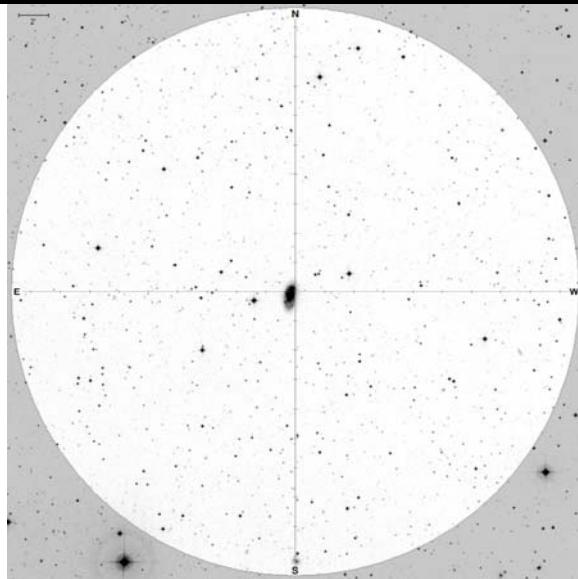
Size: 2.7' x 1.2'

Mag: 11.6

Transit Date: September 7

Challenge: Asymmetry

Note: NGC7463 (13.0mag) 28' E



Arp298

NGC7469 and IC5283

RA: 23h 03m 15s Dec: $08^{\circ} 52.0'$

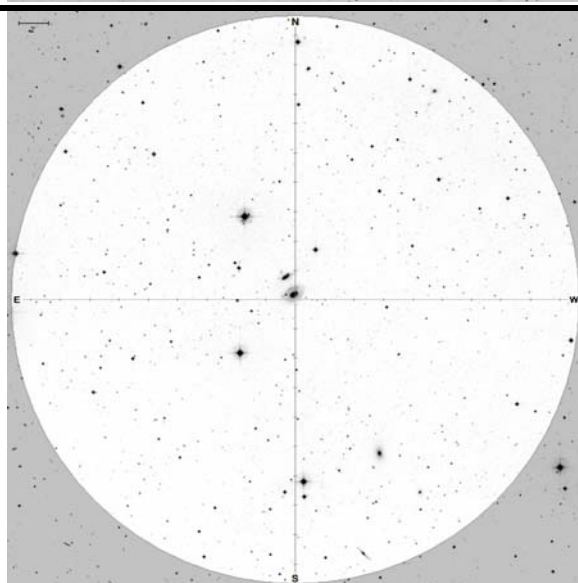
Size: 1.5' x 1.1'

Mag: 12.3 and 14.8

Transit Date: September 8

Challenge: NGC7469: ring structure;

IC5283: Asymmetry and extension to the NW



Arp99 (Hickson 93)

NGC7550, NGC7549, and NGC7547

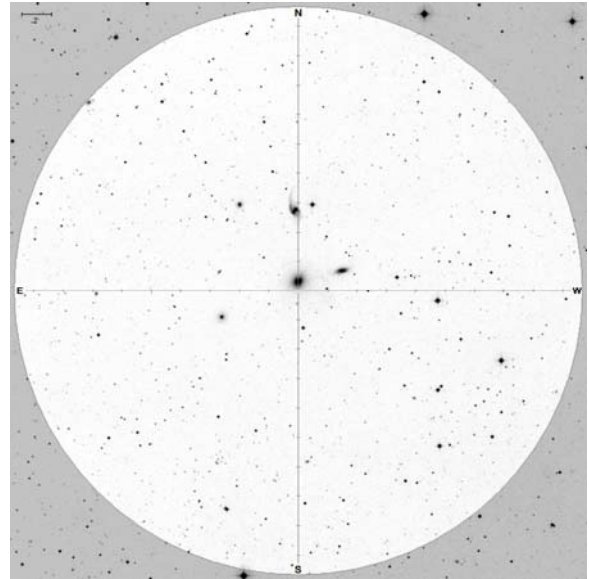
RA: 23h 15m 16s Dec: 18° 57.0'

Size: 1.4' x 1.2'

Mag: 12.2, 13.7, and 14.7

Transit Date: September 11

Challenge: NGC7549: Extended spiral arms the run N-S as opposed to core which is oriented SE-NW



Arp223

NGC7585

RA: 23m 18 02s Dec: -04° 38.0'

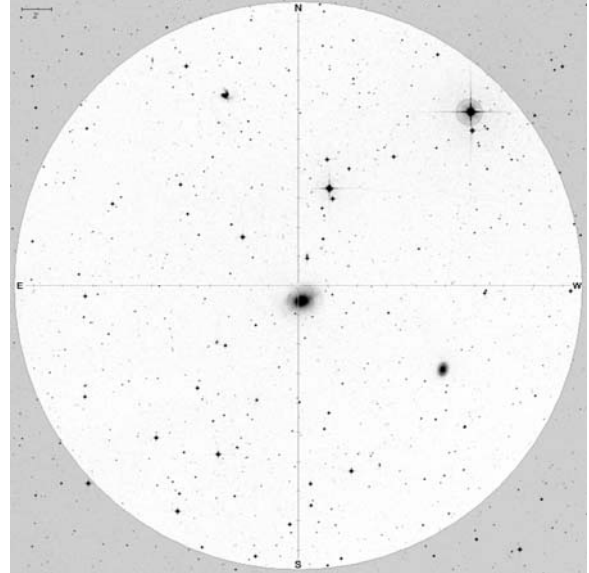
Size: 2.3' x 2.0'

Mag: 11.4

Transit Date: September 12

Challenge: Diffuse ring structure

Note: NGC7576 (13.0mag) 11' SW,
NGC7592 (14.0mag) 14' NNE



Arp212

NGC7625

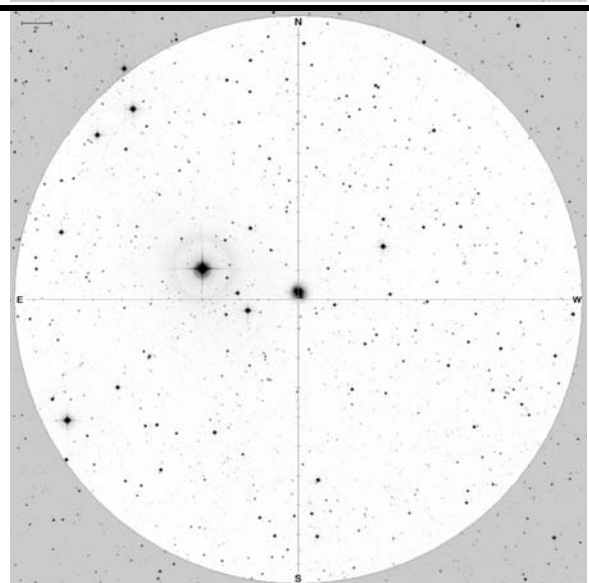
RA: 23h 20m 30s Dec: 17° 13.0'

Size: 1.6' x 1.5'

Mag: 12.1

Transit Date: September 12

Challenge: Two absorption features on the SW



Arp28

NGC7678

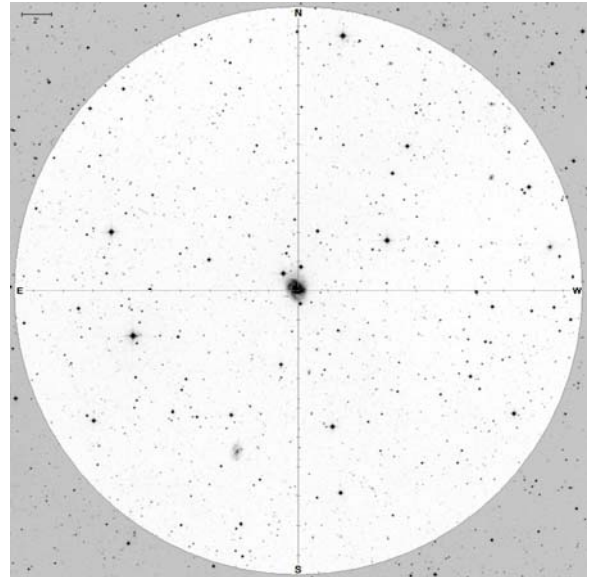
RA: 23h 28m 27s Dec: 22° 25.0'

Size: 2.4' x 1.7'

Mag: 11.8

Transit Date: September 14

Challenge: Right angle direction change on the NE side, and its extension toward the SW



Arp216

NGC7679 and NGC7682

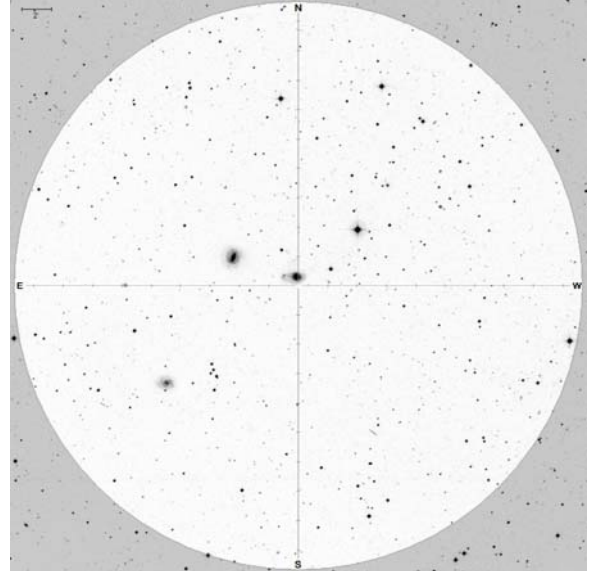
RA: 23h 28m 46s Dec: 03° 30.0'

Size: 1.4' x 0.9'

Mag: 12.9 and 14.1

Transit Date: September 14

Challenge: NGC7679: loop on the east side; NGC7682: bar and ring structure



Arp284

NGC7714 and NGC7715

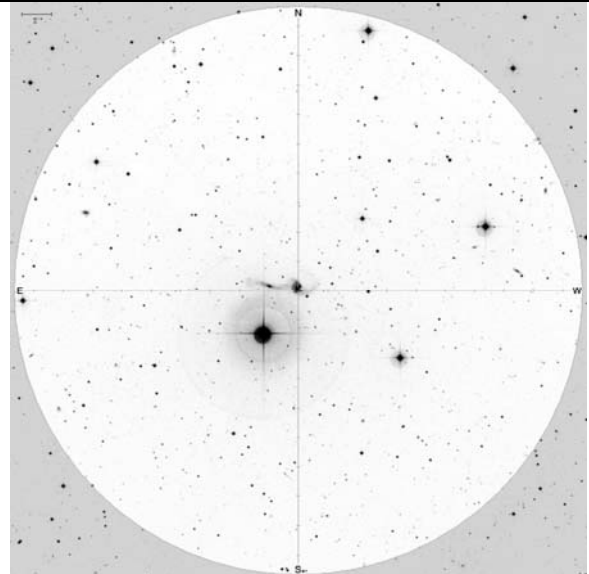
RA: 23h 36m 14s Dec: 02° 09.0'

Size: 1.9' x 1.4'

Mag: 12.5 and 14.5

Transit Date: September 16

Challenge: NGC7714: asymmetry and bridge to NGC7715



Arp222

NGC7727

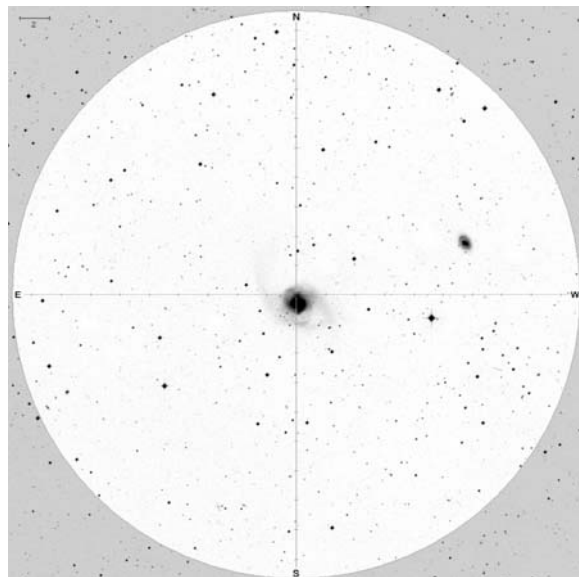
RA: 23h 39m 54s Dec: $-12^{\circ} 17.0'$

Size: 4.7' 3.6'

Mag: 10.6

Transit Date: September 17

Challenge: Amorphous spiral arms



Arp86

NGC7753 and NGC7752

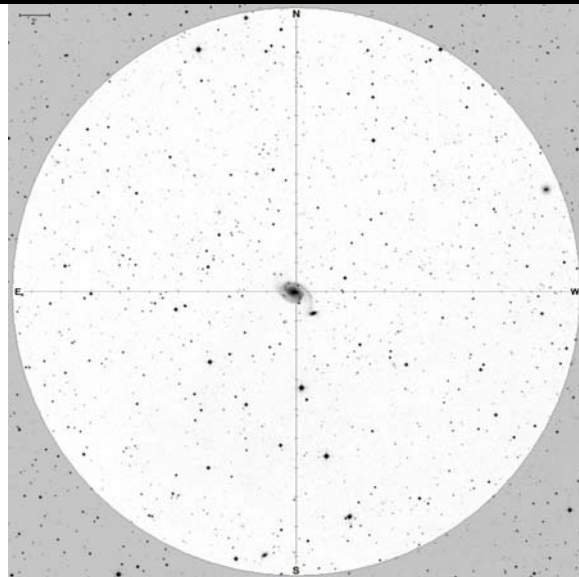
RA: 23h 47m 04s Dec: $29^{\circ} 29.0'$

Size: 3.3' x 2.1'

Mag: 12.0 and 14.3

Transit Date: September 19

Challenge: Spiral arm connecting both galaxies



Arp68

NGC7757

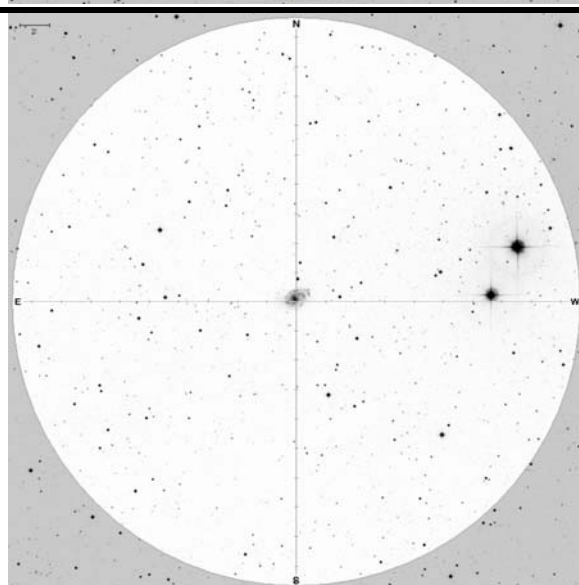
RA: 23h 48m 45s Dec: $04^{\circ} 10.0'$

Size: 2.5' x 1.8'

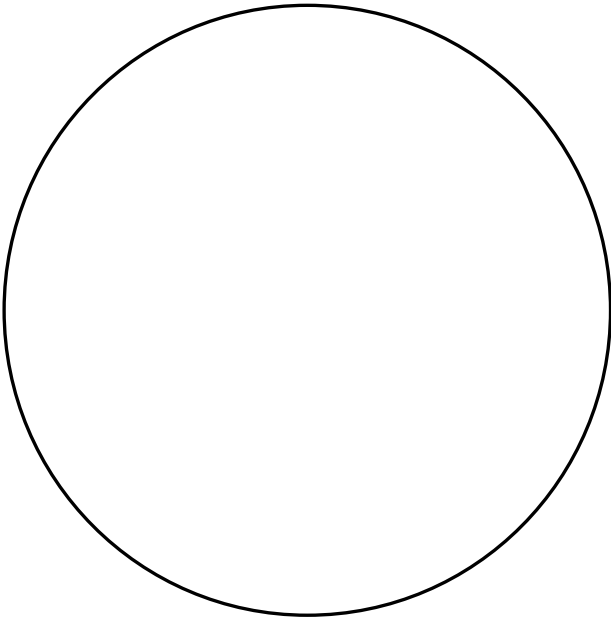
Mag: 12.7

Transit Date: September 20

Challenge: Knots in the spiral arms and companion extending to the SSW from the E end of the N arm



Arp Galaxy Observing Log

Observer's Name:	
Object:	Location:
Date:	Time:
Seeing:	Transparency:
Darkness of the site:	Moon phase:
Aperture and focal ratio:	Filters used:
Description:	
	

Object	Page #	Object	Page #	Object	Page #	Object	Page #
Arp1	17	Arp86	43	Arp178	35	Arp276	6
Arp6	12	Arp89	14	Arp184	11	Arp279	9
Arp9	13	Arp90	36	Arp185	37	Arp280	24
Arp10	5	Arp91	37	Arp189	30	Arp281	30
Arp12	13	Arp93	39	Arp200	8	Arp282	1
Arp13	40	Arp94	19	Arp205	21	Arp283	16
Arp15	40	Arp99	41	Arp206	20	Arp284	42
Arp16	22	Arp104	33	Arp210	10	Arp285	16
Arp18	27	Arp114	11	Arp212	41	Arp286	35
Arp22	26	Arp116	30	Arp213	10	Arp288	33
Arp23	29	Arp118	8	Arp214	23	Arp289	25
Arp24	21	Arp120	28	Arp215	15	Arp294	24
Arp25	11	Arp123	10	Arp216	42	Arp298	40
Arp26	34	Arp127	1	Arp217	19	Arp299	23
Arp27	22	Arp133	3	Arp222	43	Arp304	9
Arp28	42	Arp134	28	Arp223	41	Arp305	26
Arp29	38	Arp135	7	Arp224	25	Arp307	17
Arp30	37	Arp136	36	Arp225	15	Arp308	4
Arp37	7	Arp152	29	Arp226	39	Arp309	6
Arp38	38	Arp154	9	Arp227	2	Arp313	26
Arp41	8	Arp155	23	Arp232	17	Arp315	16
Arp49	36	Arp157	3	Arp234	24	Arp316	18
Arp68	43	Arp158	3	Arp239	34	Arp317	22
Arp75	4	Arp159	31	Arp240	33	Arp318	5
Arp76	29	Arp160	27	Arp242	31	Arp319	39
Arp77	7	Arp162	20	Arp244	27	Arp331	2
Arp78	5	Arp163	31	Arp245	18	Arp333	6
Arp80	14	Arp164	2	Arp263	19	Arp335	21
Arp81	38	Arp165	12	Arp266	32	Arp336	15
Arp82	12	Arp166	4	Arp268	13	Arp337	18
Arp83	25	Arp167	14	Arp269	28		
Arp84	34	Arp168	1	Arp270	20		
Arp85	32	Arp176	32	Arp271	35		