CARNEGIE INSTITUTION OF WASHINGTON

MOUNT WILSON OBSERVATORY

PASADENA, CALIFORNIA

LIST OF LANTERN SLIDES AND PHOTOGRAPHS

1932
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LIST OF SLIDES AND PHOTOGRAPHS

SERIES A. INSTRUMENTS AND BUILDINGS

A  2  Snow telescope building from the southeast
3  Snow coelostat and second mirror from the southeast
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5  Interior of the Snow telescope showing concave mirror
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7  Five-foot spectroheliograph showing the optical train
10  Sixty-foot tower telescope from the northeast
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17  Diagram of the one-hundred-fifty-foot tower telescope
18  Diagram of the upper end of the one-hundred-fifty-foot tower telescope and dome
20  Sixty-foot dome from the east
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25  Sixty-inch reflecting telescope showing plate-holder attachment
26  Sixty-inch mirror on grinding machine tipped forward for testing
27  Sixty-inch reflecting telescope with Cassegrain spectrograph
*28  Dome of the one-hundred-inch Hooker reflector from the south showing shutter open
29  One-hundred-fifty-foot tower telescope from the sixty-foot tower telescope
*30  One-hundred-fifty-foot tower telescope from the northeast
31  Top of the seventy-five-foot spectrograph
32  One-hundred-foot dome from the one-hundred-fifty-foot tower
33  Model of top of Mt. Wilson showing buildings of the Observatory
34  View from the balcony of the Hooker telescope dome showing the sixty-inch telescope dome, the sixty-foot tower telescope and the one-hundred-fifty-foot tower telescope
35† Site for the telescope. Concrete footings for the building being put in. Photographed from the one-hundred-fifty-foot tower telescope
36  Pier for the telescope under construction. Photographed from the one-hundred-fifty-foot tower telescope.

† Nos. 35 to 76 and 79 all pertain to the one-hundred-inch Hooker telescope.
A 37 Pier for the telescope under construction. Forms for the floor and supporting brackets in place
38 Putting in the reinforcing rods for the concrete floor of the pier
39 Pier and a few columns for the building as seen from the southwest
40 Same as A 39, except as seen from the northeast. Also showing the one-hundred-fifty-foot tower telescope in the distance
41 Surfacing the rails for the dome by means of a motor-driven grinder, pushed along by a motor-driven truck and guided by a steel boom pivoted in the center
42 Erection of the building. Inner sheathing on lower part in place. Lower part of dome framework up
43 Detail view of rails, trucks, and framework of balcony of dome
44 Top section of main girder of the dome ready for hoisting
45 Top section of main girder being hoisted into place
46 Framework of the dome completed and inner sheathing begun
47 Putting on the inner sheathing, brackets and ribs for the outer sheathing
48 Near view of the building and dome completed, except the outer balcony, showing the shutter wide open
49 Dome completed, showing the fin used to balance the wind pressure on the shutter
50 Drawing of a section of the building and dome, the pier, and the telescope as seen from the west
51 North pedestal of the telescope, also showing the ten-ton crane used in the erection
52 West member of the fork for the telescope being swung into place
53 Lower section of the telescope tube placed in the fork
54 Second section of the tube in place, and third section ready to be hoisted
55 Driving clock of the telescope, set up in the shop for testing
56 Drawing showing the driving clock, worm wheel, south spherical bearing, mercury trough and steel float, also quick-motion drive in right ascension
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58 Driving clock, worm and part of the worm wheel
59 Mirror on the grinding machine ready for concaving the surface
60 Mirror on the grinding machine, with concave surface polished and ready for parabolizing, showing the full-sized polishing tool and the band for supporting the mirror when the turn-table was tipped forward for testing
LIST OF SLIDES AND PHOTOGRAPHS

A 61 Mirror silvered and tipped forward on turn-table for testing
62 Bottom of the cell with lever system and plates for supporting the mirror, also showing piping for temperature control
63 Lowering the mirror on to the support system
64 Lowering the ring of the cell over the mirror
65 Mirror in its cell in the silvering room under the main floor of the pier, showing the silvering band and spout in position
66 Mirror in its cell being raised above the pier floor after having been resilvered
67 Mirror in its cell back in the lower end of the tube ready to be bolted tight
68 Fork of the elevator descending after the cell has been bolted to the telescope
69 Switchboard for the dome drive, showing faces of the motor-driven rheostats and automatic switches
70 Drawing, showing assembly of the declination bearings, tube, mirror in its cell, and coils of pipes for temperature control
71 Drawing, showing assembly of the coude and Cassegrain convex mirror mountings and cages
72 Drawing, showing assembly of the Newtonian flat mirror mounting and cage
73 Interior of the dome, showing the telescope, Cassegrain observing platform, etc., as seen from the west
74 Cassegrain spectograph attached to the telescope; Cassegrain platform
75 Twenty-foot interferometer beam on the tube, showing mirrors 12 feet apart
76 Diagram of light path when the interferometer is used
77 Pasadena offices, laboratory and shop
78 Thermocouple used for stellar and planetary radiation
79 View of observer at Cassegrain focus of one-hundred-inch telescope
80 Hale Solar Laboratory in Pasadena
81 Top of large spectrohelioscope at Hale Laboratory
82 Drawing of optical parts of spectrohelioscope as adapted to general use
83§ Airplane view of Observatory from the southeast
84 Airplane view of Observatory from the south
85 Airplane view of Observatory from the southwest

§ Nos. 83 to 87 are available through the courtesy of E. R. Hoge, Fairchild Aerial Surveys, Los Angeles
A 86 Airplane view of Observatory from the northwest
87 Airplane view of Pasadena and Mount Wilson from the southwest
88 Fifty-foot interferometer from the south
89 Fifty-foot interferometer from the north showing shelter
90 Fifty-foot interferometer from the north
91 Fifty-foot interferometer, showing lower section

SERIES B. SOLAR PHENOMENA

B 2 Comparison photographs of the sun, taken with the calcium Hα line and direct image, July 30, 1906
3 Comparison photographs of part of the sun, taken with the hydrogen Hδ and the iron line λ 4045.9, November 13, 1907
4 Part of the sun photographed with the hydrogen Hα line, April 30, 1908
5 Part of the sun photographed with the calcium Hβ line, April 30, 1908
6 Part of the sun, direct photograph, April 30, 1908
*7 The sun photographed with the Hα line, October 7, 1908
8 Series of four photographs taken with the hydrogen Hα line, showing the motions of a very dark hydrogen flocculus near a spot, June 2 and 3, 1908
9 Part of the sun photographed with the hydrogen Hα line, showing right- and left-handed unipolar vortices, September 9, 1908
10 Part of the sun photographed with the hydrogen Hα line, showing a multipolar group of spots with fine stream lines, September 2, 1908
11 Same as No. 9, except photographed October 7, 1908
12 Series of twelve photographs of an eruptive prominence projected on the sun's disk, made with the Hα line, September 10, 1908
13 Series of four photographs of a spot group taken with the Hα line, showing motions of the flocculi, August 29, 1908
14 Series of four photographs of two spots, north and south of the equator, taken with the Hα line, October 4, 1908
*15 Prominence 80,000 miles high, photographed with the Hα line, August 21, 1909
16 Chromosphere and prominences photographed with the Hα line, August 20, 1909
*17 Photograph of spot group taken with the Hα line, showing bipolar type of solar vortices, September 10, 1909
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24 Large sun-spot group, June 17, 1907
*25 Series of four photographs of the southwest quarter of the sun, taken with the hydrogen Hα line on August 3, 5, 7 and 9, 1915
26 Part of the sun, photographed with the hydrogen Hα line, September 9, 1915. Two exposures showing large prominence (dark) on the disk
27 Combined photograph of the sun and prominences of May 22, 1916, taken with the K line of calcium
28 Two views of the prominence of May 22, 1916, photographed with the hydrogen Hα line; one showing prominence at limb; the other, projected on disk and running off, over and beyond limb
29 Five exposures on a portion of the sun taken with the Hα line, showing the appearance at different levels, May 29, 1916. Slit moved from center of line 0.33 A towards red between exposures
30 Remarkable twenty-four-hour development of sun-spot group, August 18 and 19, 1916
31 Northwest quarter of the sun photographed with the hydrogen Hα line showing a large spot group with beautiful stream lines, January 5, 1917
*32 The great sun-spot group of February 8, 1917
33 Large quiescent prominence, 110,000 miles high. Four views photographed with the Hα line, June 10, 1917
*34 Large active prominence, 140,000 miles high, photographed with the K line of calcium, July 9, 1917
35 The great sun-spot group of August 8, 1917
36 Comparison photographs of the sun, taken with the hydrogen Hα line, and direct image, August 12, 1917
*36a Photograph of sun showing direct image only, August 12, 1917
*36b Photograph of sun showing Hα image only, August 12, 1917
B 37 Series of exposures on four consecutive mornings, showing the western part of the sun, illustrating the way in which the (dark) prominences on the disk are carried over the limb by rotation. Photographed with the Hα line; June 27, 28, 29, 30, 1917

42 Solar corona photographed at Green River, Wyoming, June 8, 1918, exposure 65 sec. through clouds

43 Solar corona photographed at Middletown, Connecticut, exposure 2 sec., January 24, 1925

44 Solar corona photographed at Middletown, Connecticut, exposure 15 sec., January 24, 1925

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46 Large bi-polar spot group photographed with the hydrogen line Hα, showing stream lines, August 30, 1924

47 Large prominence, July 9, 1926

48 Comparison of prominence in hydrogen Hα and calcium K light, March 10, 1926

49 Comparison photographs of the sun, taken with the hydrogen Hα line, and direct image, June 16, 1926

50 Comparison photographs of the sun, taken with the calcium K line, and direct image, January 11, 1926

51 Prominence of March 21, 1928, six exposures

52 Prominences of May 4 and 5, 1928, six exposures

53 Prominences of August 19, 20, 1927. Exposures at limb and disk with curve of magnetic variations on May 12, 1927 and August 20, 1927

54 Prominences. Whole sun taken with calcium K line, December 9, 1929

55 Prominence series. Twelve exposures, June 18, 1929

56 Classification of solar prominences. Three views each of five types of prominences

57 Prominences of August 6, 1931. Comparison Hα and K. Three exposures

58 Comparison of direct, Ks, and Hα images of the sun, October 10 and 14, 1926. Six exposures

59 Comparison of direct photographs of whole sun at maximum and minimum spot activity. June 22, 1931 (min.), no spots; November 30, 1929 (max.), many spots

60 Direct photograph of whole sun showing the largest group ever photographed, January 24, 1926
LIST OF SLIDES AND PHOTOGRAPHS

B 61 Large spot group photographed with the hydrogen Hα line, August 14, 1929
62 Large spot group photographed with the hydrogen Hα line, May 12, 1931
63 Curve of sun-spot activity showing the frequency of sun-spots from 1750-1930
64 Curve of a single sun-spot cycle with four calcium spectropheliograms showing typical appearance of sun at different phases of the cycle

SERIES C. SOLAR SPECTRA

C 5 Comparison of titanium oxide fluting in sun-spot and electric furnace λ 7100
6 Iron triplet λ 6302.7 in spectrum of spot near sun's limb, with nicol and compound half-wave plate, showing plane polarization across lines of force
7 Iron triplet λ 6302.7 in spectrum of spot near center of sun, with nicol and compound quarter-wave plate, showing circular polarization along lines of force
8 Iron triplet λ 6173 in spectrum of sun-spot, March 9, 1916, showing right- and left-handed circular polarization by transmission of red and violet components of the line on same strip of quarter-wave mica, thus demonstrating the presence of two overlapping fields of opposite sign. Slit placed as shown on photograph of spot
9 Iron triplet λ 6173 in spectra of sun-spots, a and b, plane polarized light of spot near sun's limb, taken with nicol and (a, single; b, compound) half-wave plate; c and d, circularly polarized light of spot near center of sun, taken with nicol and (c, single; d, compound) quarter-wave plate; c shows reversal of sign of charge of adjacent spots
10 Iron triplet λ 6302.7, showing different strengths of field in two sun-spots
11 Iron triplet λ 6173 in spectrum of sun-spot near limb, showing plane polarization compared with laboratory spectra of iron lines. Taken with nicol and half-wave plate
12 Iron triplet λ 6173 in spectrum of S. preceding spot of the great group of August 8, 1917, showing reversal of circularly polarized light. Taken with nicol and (a, single; b, compound) quarter-wave plate
13 Spectrum of sun-spot showing the lines λλ 6145.2 and 6145.5 weakened in the spot spectrum. Taken with nicol and compound quarter-wave plate
14 Spectrum of the “flash” (lower chromosphere) showing magnesium lines, green carbon fluting, etc.
C 15 Spectra of opposite points on the sun's limb, latitude 0° to 90°, showing displacements of lines due to solar rotation
16-26 Sun spot spectrum map. Five strips on each photograph. Scale of 8x10 prints is 3.7 mm per A

C 16 Region \( \lambda \lambda 3900-4150 \)
17 " 4150-4400
18 " 4400-4650
19 " 4650-4900
20 " 4900-5150
21 " 5150-5400

C 22 Region \( \lambda \lambda 5400-5650 \)
23 " 5650-5900
24 " 5900-6150
25 " 6150-6400
26 " 6350-6600

27 Spectrum of the “flash” at second and third contacts, and spectrum of the corona, taken at Middletown, Connecticut, January 24, 1925
28 Spectrum of the sun \( \lambda \lambda 3900-6900 \) taken with 13-foot spectograph
29-38 Sun-Fe arc spectrum map. Scale, Nos. 29 to 36, 2 mm per A; Nos. 37-38, 1 mm per A

C 29 Region \( \lambda \lambda 3000-3300 \)
30 " 3300-3600
31 " 3600-3900
32 " 3900-4200
33 " 4200-4500

C 34 Region \( \lambda \lambda 4500-4800 \)
35 " 4800-5100
36 " 5100-5400
37 " 5400-6000
38 " 6000-6600

SERIES D. STELLAR SPECTRA

D 2 Spectrum of the Wolf-Rayet star B.D.+30°3639 having an atmosphere of hydrogen, showing the hydrogen series from H\( \beta \) to H\( \epsilon \), made with the focal plane spectrograph
3 Spectrum of \( \alpha \) Tauri \( \lambda 4320 \) to \( \lambda 4430 \), iron comparison, made with the Cassegrain spectrograph
4 Types of stellar spectra. Nine types from B to N
5 Absolute magnitude effect: 61 Cygni and \( \beta \) Ursae Minoris
6 Spectra of stars of high and low radial velocity: Lal. 1966, velocity -325 km/sec., and a second star, -10 km/sec.
7 Spectrum of a spectroscopic binary, showing shifts of lines toward V and R on two exposures
9 Spectrum of the star cluster Messier 13, Hercules
10 Spectrum of the central part of the nebula in Andromeda
11 Spectrum of the spiral nebula N.G.C.4595
12 Spectrum of the nebula in Orion
13 Spectra of Wolf-Rayet stars B.D.-21°4864 and +35°4013. These are extreme types of these stars
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D 14 Spectrum of the star Boss 5650, showing peculiar character of Hβ and Hγ
15 Spectrum of the Cepheid variable star TU Cassiopeiae at maximum, October 7, 1917, and at minimum, September 30, 1917
16 Spectrum of the Cepheid variable star RT Aurigae at maximum and minimum
17 Spectra of the N-type stars 19 Piscium, B.D. +25°205, +57°702 and +38°1539. Blue region
18 Spectra of Omicron Ceti (Mira), October 5 and November 23, 1917, January 23, 1918, and January 18, 1919
19 Spectra of Omicron Ceti (Mira), large scale, November 1, 1917
20 Spectrum of λ Cygni, showing enhanced lines
Spectrum of λ Aurigae, showing normal lines
21 Seven stars having unusual spectra, B.D. +23°123, o Ceti, R Aquarii, B.D. -1°4673, T Tauri, NovaAquilae, Nova Ophiuchi
22 Spectrum of Omicron Ceti, taken 9, 53, 87, 130, 144, 174 and 188 days after maximum
23 Typical spectra of giant stars of types F to M
24 Typical spectra of dwarf stars of types F to M
25 Spectrum of the companion to Sirius, λλ 4400-4900
26 Prismatic coude spectra
Region λλ 4308-4481, 1.1 A per mm, α Lyrae, α Cygni, α Persei, sun, α Boötis, α Tauri, α Orionis
Region λλ 4737-4960, 1.7 A per mm, α Persei, α Boötis, α Tauri, α Orionis
Region λλ 5880-6575, 5 A per mm, α Lyrae, α Tauri, α Orionis
27 Widened prismatic coude spectra of stars of different spectral types
Region λλ 4300-4600, 1.4 A per mm, α Canis Majoris, α Cygni, α Canis Minoris, α Persei, Sun, α Boötis, α Tauri, α Orionis
28 Spectra of M-, N-, and S-type stars
Region λλ 4000-5000, R Boötis, R Cassiopeiae, R Geminorum, R Andromedae, 19 Piscium, TT Cygni
29 Ultra-violet spectra of α Lyrae, α Cygni, γ Cygni, and α Boötis. Region λλ 3600-4150
30 Widened low-dispersion spectra with direct photographs of distant extra-galactic nebulae showing large red shift
N.G.C. 385, 3,000 miles per second
N.G.C. 4884, 4,200 miles per second
Ursa Major Nebula, 7,300 miles per second
Leo Nebula, 12,000 miles per second
31 Coude spectrum of 61 Cygni. Regions λλ 4380-4960 and 5160-6600
D 32 Spectra of \textit{Mizar} showing single and double lines
33 Enlarged spectra of four early-type stars showing different forms of emission of Ha: \textit{c Persei}, H.D. 50138, H.D. 142983, P \textit{Cygni}
34 Display of stellar spectra taken with increasing dispersion from 835 A per mm to 0.7 A per mm

SERIES E. LABORATORY SPECTRA

E 1 Photographs of spectrum of titanium: \textit{a, b, and c}, given by carbon resistance furnace, temperatures approximately 2000°, 2400° and 2600° C., respectively; \textit{d}, given by the arc (lines in furnace not given by arc for the most part due to impurities)
2 Photographs of spectrum of iron and vanadium: \textit{a}, without magnetic field; \textit{b}, with magnetic field, light vibrations perpendicular to lines of force; \textit{c}, with magnetic field, light vibrations parallel to lines of force
3 Three sets of triplets in the spark spectrum of iron
4 Zeeman effect for chromium (31,700 gauss) $\lambda$ 4613 to $\lambda$ 4626
5 Stark effect for chromium and hydrogen line Hy. Three groups. Regions $\lambda\lambda$ 4098-4111-4129, $\lambda\lambda$ 5006-5028-5056, $\lambda\lambda$ 5275-5297-5329

SERIES G. NEBULAE AND STAR CLUSTERS

PHOTOGRAPHS TAKEN WITH THE 60-INCH REFLECTOR

G 1 M42 N.G.C. 1976 \textit{Orion}, Great Nebula (central portion), exposure 45 min., September 16, 1909
*2 31 224 \textit{Andromeda}, Great Nebula (central portion), exposure 2 hrs., October 13, 1909
*3 20 6514 \textit{Sagittarius}, Trifid Nebula, exposure 2 hrs. 26 min., June 4 and 5, 1910
*4 51 5194 \textit{Canes Venatici}, Spiral Nebula, exposure 10 hrs. 45 min., April 7 and 8, 1910
*5 33 598 \textit{Triangulum}, Spiral Nebula, exposure 8 hrs. 30 min., August 5, 6, 7, 1910
6 6960 \textit{Cygnus}, Slender Network Nebula (north part), exposure 6 hrs. 30 min., July 4 and 5, 1910
7 6992 \textit{Cygnus}, Larger Network Nebula, exposure 10 hrs. 15 min., July 2, 3, 4, 1910
*8 1432 \textit{Pleiades}, Diffuse Nebula around \textit{Merope}, exposure 5 hrs., October 9, 1909
*9 101 5457 \textit{Ursa Major}, Spiral Nebula, exposure 7 hrs. 30 min., March 10 and 11, 1910
<table>
<thead>
<tr>
<th>No.</th>
<th>Reference</th>
<th>Name</th>
<th>Description</th>
<th>Dates</th>
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<tbody>
<tr>
<td>*10 M81</td>
<td>N.G.C. 3031</td>
<td>Ursa Major, Spiral Nebula</td>
<td>Exposure 4 hrs. 15 min., February 5, 1910</td>
<td></td>
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<tr>
<td>*11</td>
<td>4565</td>
<td>Coma Berenices, Spiral Nebula on edge, H V 24</td>
<td>Exposure 5 hrs., March 6 and 7, 1910</td>
<td></td>
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<tr>
<td>*12</td>
<td>1952</td>
<td>Taurus, Crab Nebula</td>
<td>Exposure 3 hrs., October 13, 1909</td>
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<tr>
<td>*13</td>
<td>3587</td>
<td>Ursa Major, Owl Nebula</td>
<td>Exposure 4 hrs., February 9, 1910</td>
<td></td>
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<tr>
<td>*14</td>
<td>6205</td>
<td>Hercules, Star Cluster</td>
<td>Exposure 11 hrs., June 6, 7, 8, 1910</td>
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<td>15</td>
<td>5055</td>
<td>Canes Venatici, Spiral Nebula</td>
<td>Exposure 5 hrs., March 9, 1910</td>
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<td>16</td>
<td>4826</td>
<td>Coma Berenices, Spiral Nebula</td>
<td>Exposure 7 hrs. 56 min., May 5, 6, 7, 8, 1910</td>
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<td>17</td>
<td>5272</td>
<td>Canes Venatici, Star Cluster</td>
<td>Exposure 4 hrs., April 9, 1910</td>
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<td>*18</td>
<td>6720</td>
<td>Lyra, Ring Nebula</td>
<td>Exposure 45 min., July 1, 1910</td>
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<td>19</td>
<td>6853</td>
<td>Vulpecula, Dumb-bell Nebula</td>
<td>Exposure 5 hrs., July 6 and 7, 1910</td>
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<td>20</td>
<td>3034</td>
<td>Ursa Major, Irregular Nebula</td>
<td>Exposure 4 1/2 hrs., February 6, 1910</td>
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<td>*21</td>
<td>2841</td>
<td>Ursa Major, Spiral Nebula</td>
<td>Exposure 2 hrs., February 19, 1912</td>
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<td>22</td>
<td>5383</td>
<td>Canes Venatici, Spiral Nebula</td>
<td>Exposure 6 hrs., May 5 and 6, 1913</td>
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<td>23</td>
<td>4449</td>
<td>Canes Venatici, Irregular Nebula</td>
<td>Exposure 5 hrs., April 7, 1913</td>
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<td>24</td>
<td>102</td>
<td>Boötes, Split Spindle Nebula</td>
<td>Exposure 2 3/4 hrs., June 14, 1912</td>
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<td>25</td>
<td>3115</td>
<td>Sextans, Spindle Nebula</td>
<td>Exposure 1 7/8 hrs., December 25, 1911</td>
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<td>26</td>
<td>5746</td>
<td>Virgo, Spiral Nebula on edge</td>
<td>Exposure 6 hrs., March 20, 21, 22, 1914</td>
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<td>27</td>
<td>6555</td>
<td>Hercules, Spiral Nebula</td>
<td>Exposure 6 hrs., May 28 and 29, 1916</td>
<td></td>
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<td>28</td>
<td>4567-8</td>
<td>Virgo, Twin Spiral Nebula</td>
<td>Exposure 6 hrs., March 22, May 19, 1914</td>
<td></td>
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<td>29</td>
<td>278</td>
<td>Cassiopeia, Spiral Nebula</td>
<td>Exposure 4 hrs., November 8, 1912</td>
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</tbody>
</table>
MOUNT WILSON OBSERVATORY

G 30  N.G.C. 2403 Camelopardus, Spiral Nebula, exposure 3½ hrs.,
     November 8, 1912

31  4594  Virgo, Spiral Nebula on edge, exposure 2¾ hrs.,
     May 3, 1916

32  M 94  4736 Canes Venatici, Spiral Nebula, exposure 3½ hrs.,
     February 20, 1912

33  7009  Aquarius, Planetary Nebula, exposure 3½ hrs.,
     July 13, 1912

34  1501  Camelopardus, Planetary Nebula, exposure 2 hrs.,
     January 7, 1913

35  7662  Andromeda, Planetary Nebula, exposure 1½ hrs.,
     October 17, 1911

36  2392  Gemini, Planetary Nebula, exposure 2 hrs., De-
     cember 19, 1915

37  2022  Orion, Planetary Nebula, exposure 1 hr., February
     4, 1913

38  2371-2  Gemini, Planetary Nebula, exposure 3¾ hrs.,
     March 6, 7, 1916

39  7008  Cepheus, Planetary Nebula, exposure 3 hrs., July
     22, 1914

40  2681  Ursa Major, Planetary Nebula, exposure 3½ hrs.,
     January 7, 1913

41  7217  Pegasus, Annular Nebula, exposure 5½ hrs., Sep-
     tember 2, 1913

42  2976  Ursa Major, Elliptical Nebula, exposure 3 hrs.,
     December 10, 1912

*43  13  6205  Hercules, Star Cluster, four exposures, 6, 15, 37½
     and 94 minutes, increasing one magnitude on
     each exposure

44  3242  Hydra, Planetary Nebula, comparison of yellow
     and blue images

45  51  5194  Canes Venatici, Spiral Nebula, comparison of yel-
     low and blue images

46  94  4736  Canes Venatici, comparison of yellow and blue
     images

47  99  4254  Virgo, Spiral Nebula, comparison of yellow and
     blue images

48  6960  Cygnus, Network Nebula (south part), exposure
     12 hrs., July 12, 13, 14, 1915
<table>
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<th>Slide No.</th>
<th>Object</th>
<th>Description</th>
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<tr>
<td>49</td>
<td>M 77 N.G.C. 1068</td>
<td>Cetus, Spiral Nebula</td>
<td>two exposures, December 22 and 25, 1911</td>
</tr>
<tr>
<td>50</td>
<td>5857-8</td>
<td>Bootes, Double Spiral Nebula</td>
<td>H II 751-752, exposure 6 hrs., May 30, 31, June 1, 1916</td>
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<tr>
<td>51</td>
<td>7317-20</td>
<td>Pegasus, Close Group of Spiral Nebulae</td>
<td>exposure 7 hrs. 45 min., August 26, 27, 1916</td>
</tr>
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