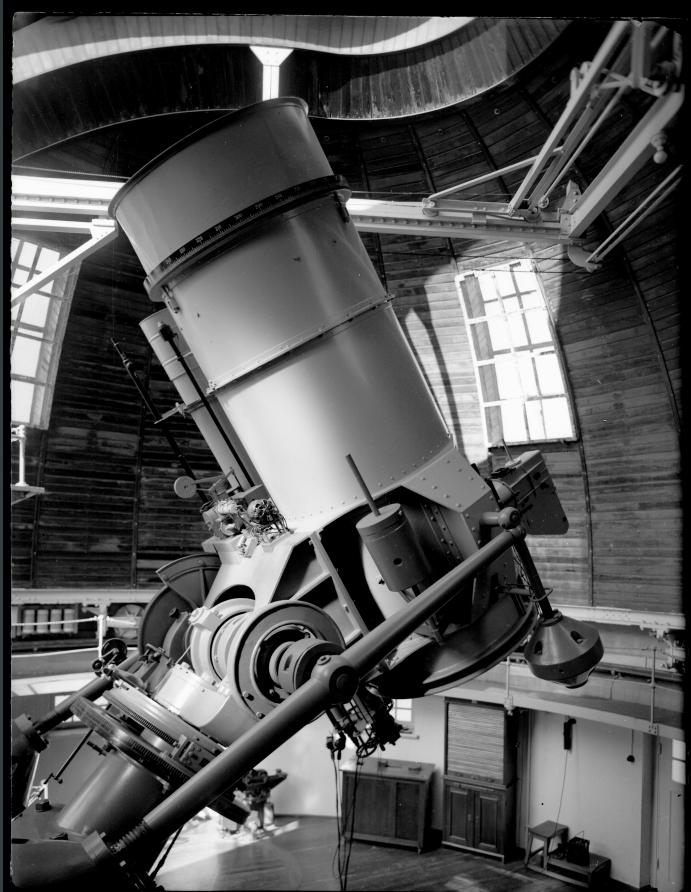


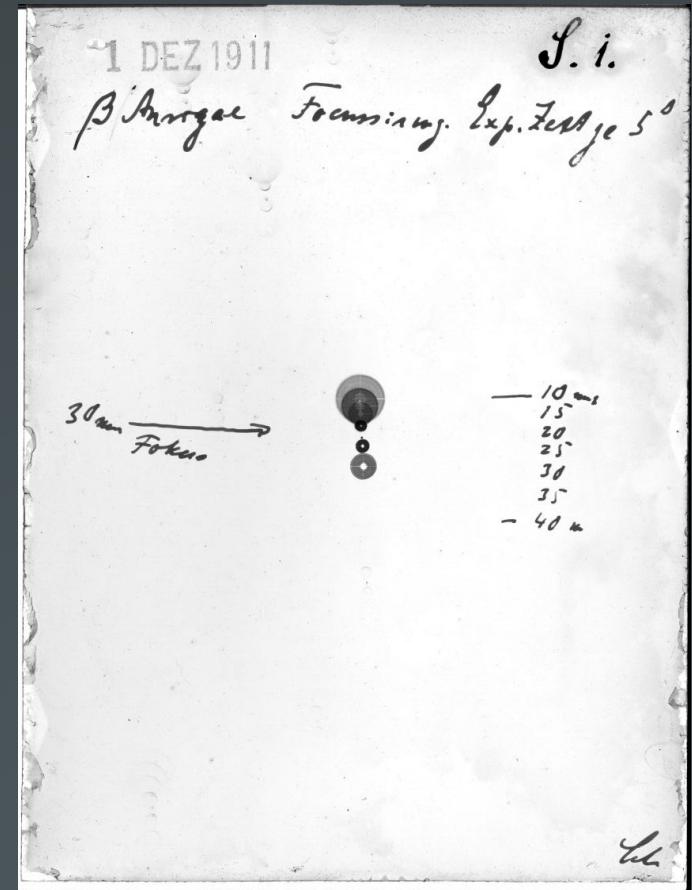
Building up APPLAUSE: Digitization and presentation of Hamburger Sternwarte plate archives



Richard Schorr
Director
1902-1935

First plate

The new 1 m-
mirror telescope



Contents

- Introduction
- Telescopes & history
- Photographic plates & digitizing process
- Internet presentation
- Options for research
- APPLAUSE-collaboration
- Summary

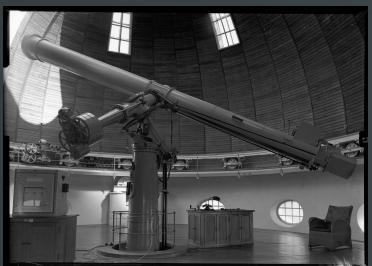
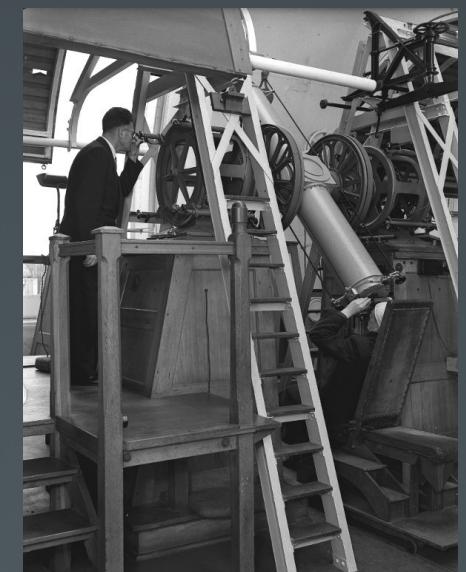
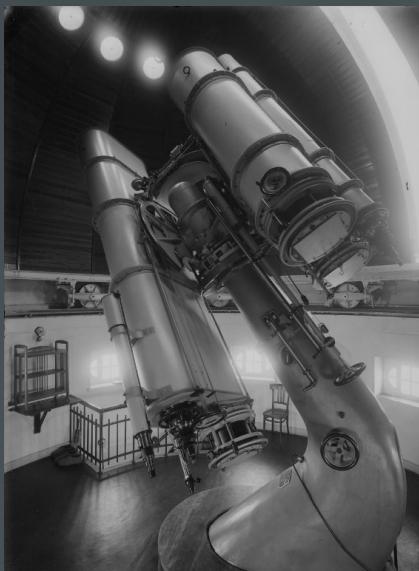


Introduction

- Motivation (treasure for astronomy and cultural heritage)
- Perfect time (scanner, storage costs, ...)
- Goals:
 1. scanning all plates and handwritten information
 2. Internet presentation
 3. Astrometric and brightness calibration
- Designed for:
 - Astronomers and amateur-astronomers
 - Students and pupils
 - Historians and all interested people



Construction of Hamburger Sternwarte



Photographic plates & digitization

- The photographic plate
- Telescopes & plate sizes
- Direct plates & objective prism plates
- Plate envelopes, observers notes & meta-data
- Measuring machines or flatbed scanner
- Data organization, backup, conservation for the future
- Automatic web page generation
- Access, search, editing of the data base

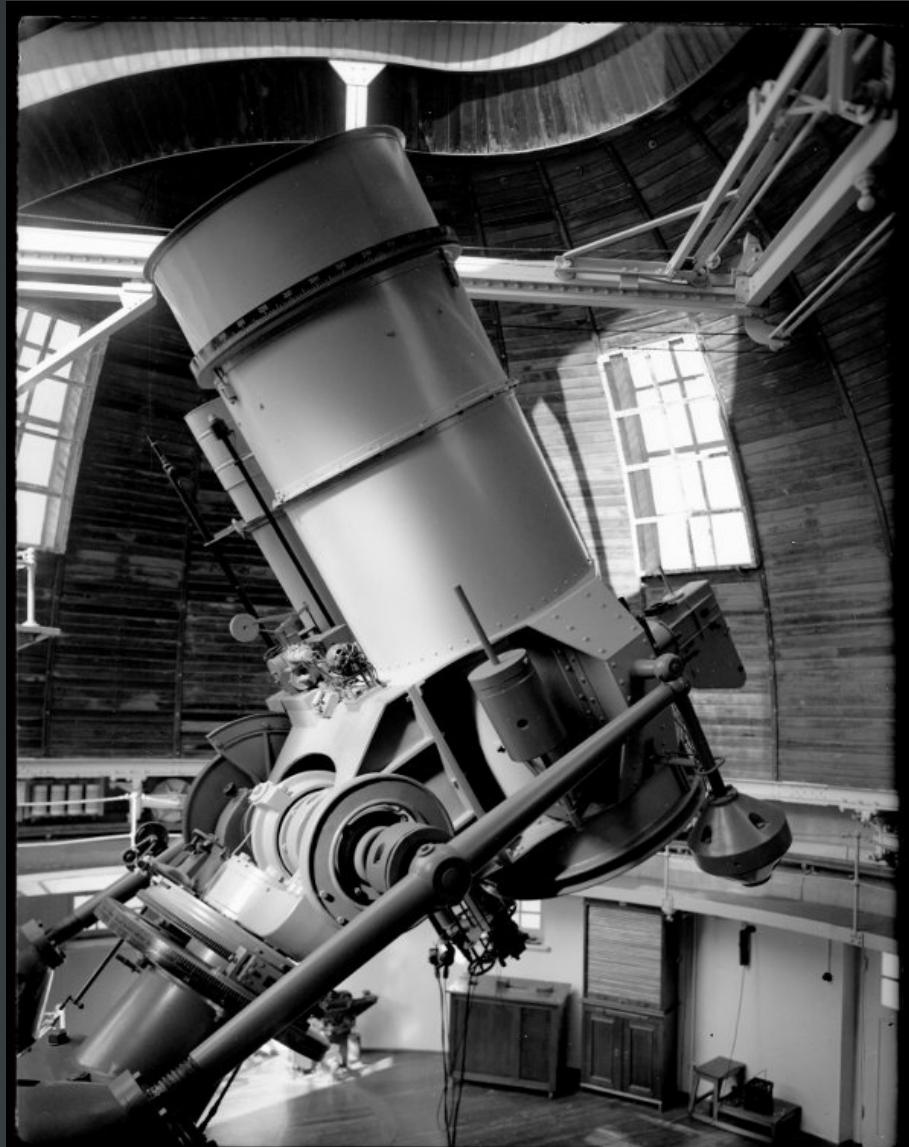


Telescopes & plate sizes [cm]

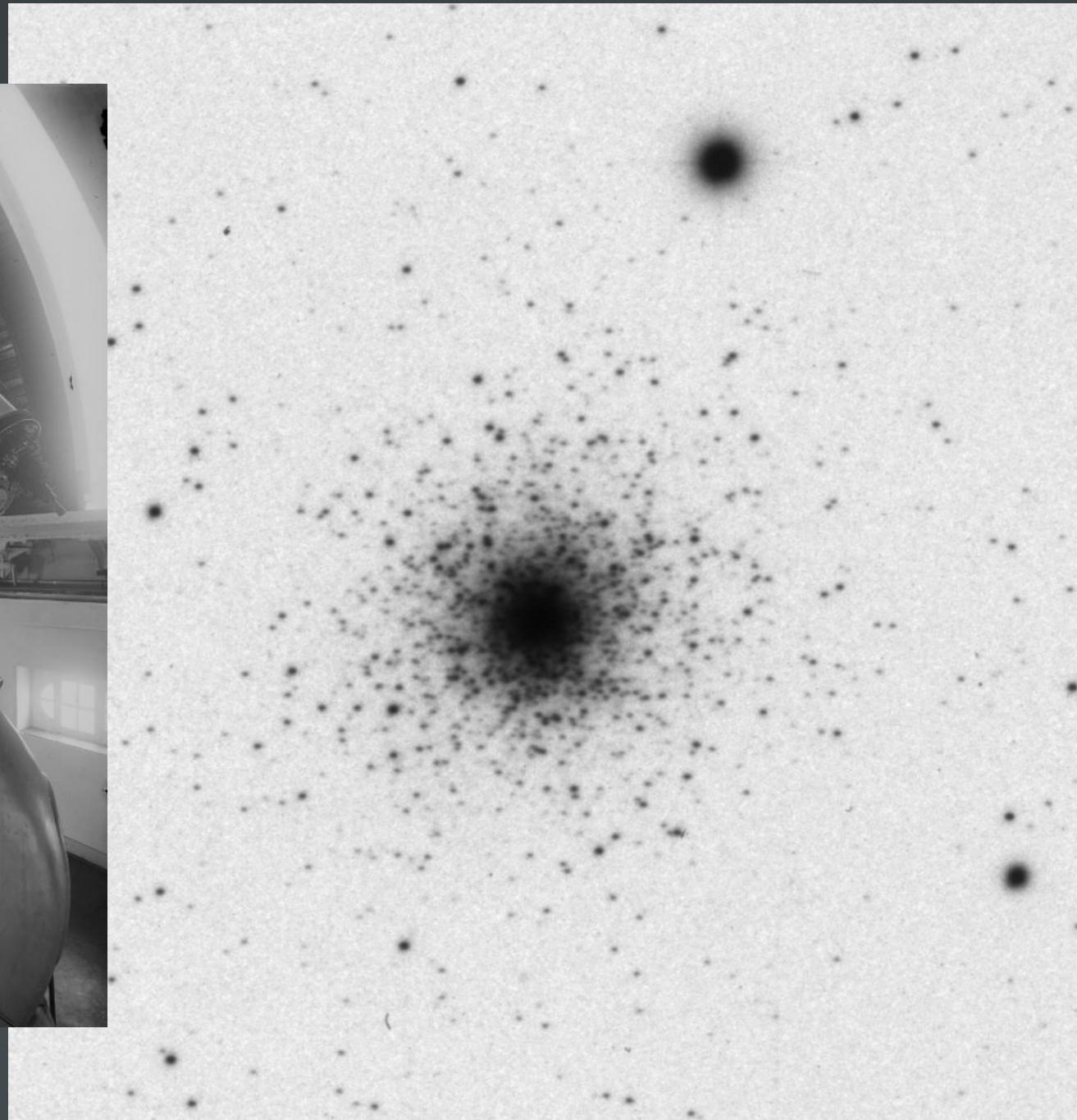
- 1m-Telescope 9x12, 13x18
- Lippert-Astrographs 9x12, 13x18, 24x24, 24x30, 30x30
- Great Refractor 9x12, 13x16, 16x16
- First Schmidt-telescope 3x4, 9x12, 9 circular film
- Double-Reflector 6x9, 9x12, 13x18
- Great Schmidt-mirror-telescope 6x9, 9x12, 24x24



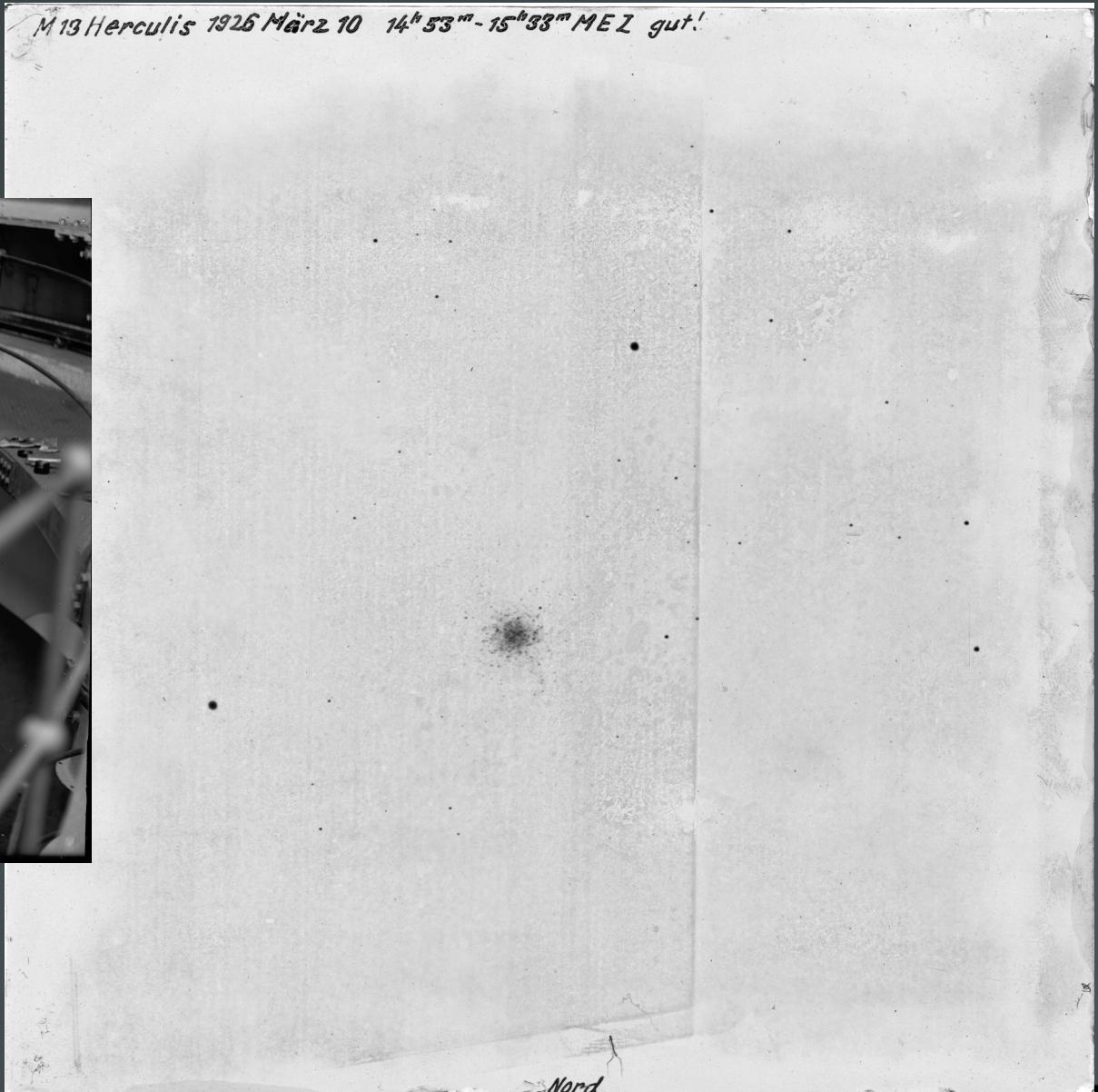
1m-mirror-telescope



Lippert-Astrographs

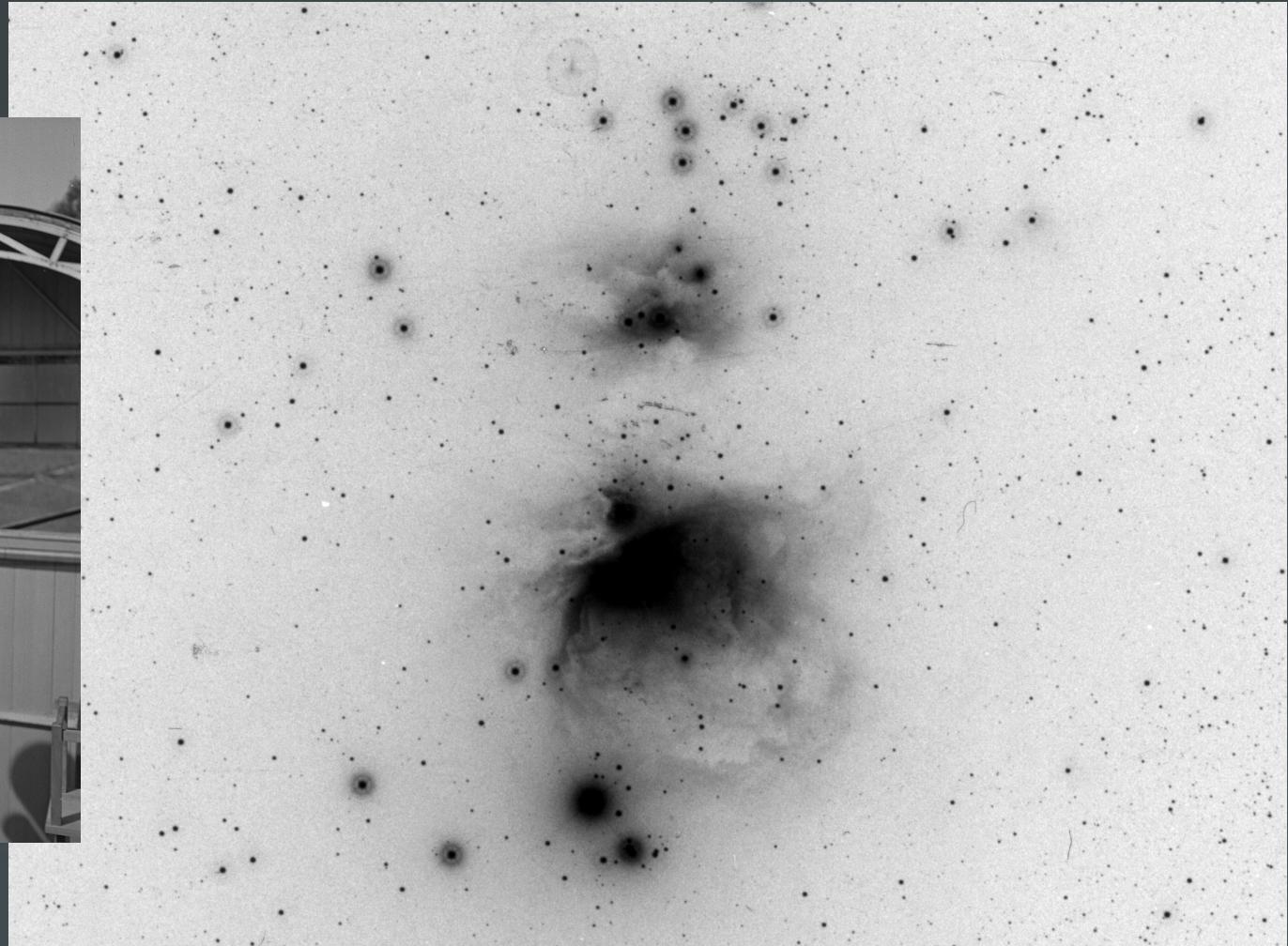


Great Refractor



First Schmidt-telescope

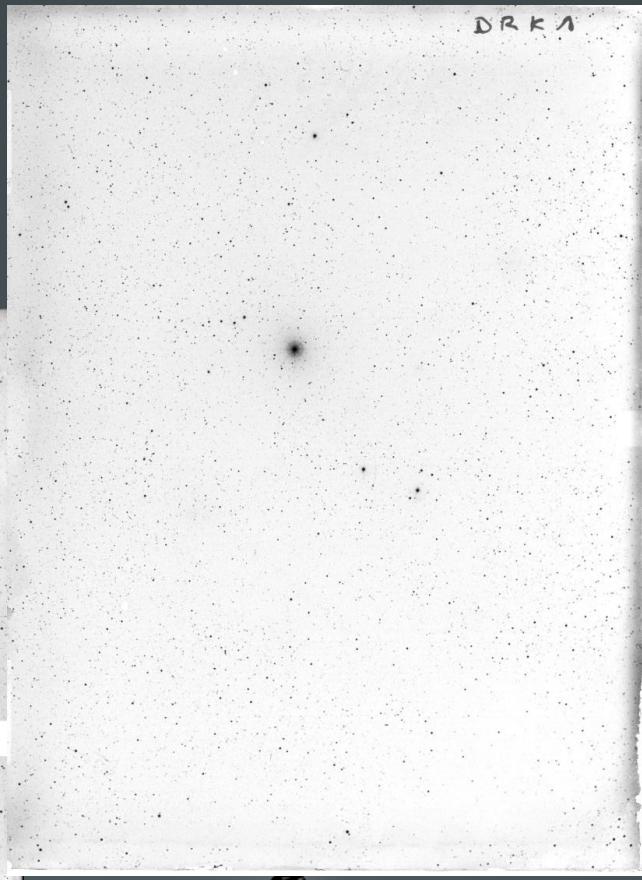
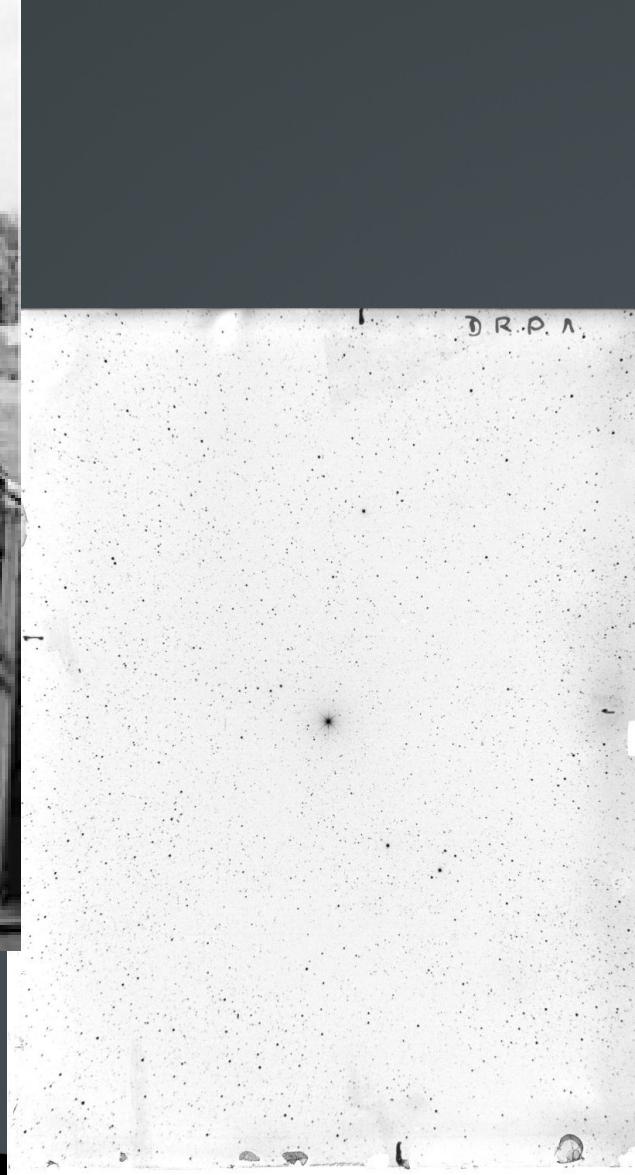
„Schmidt's coma free mirror telescope“



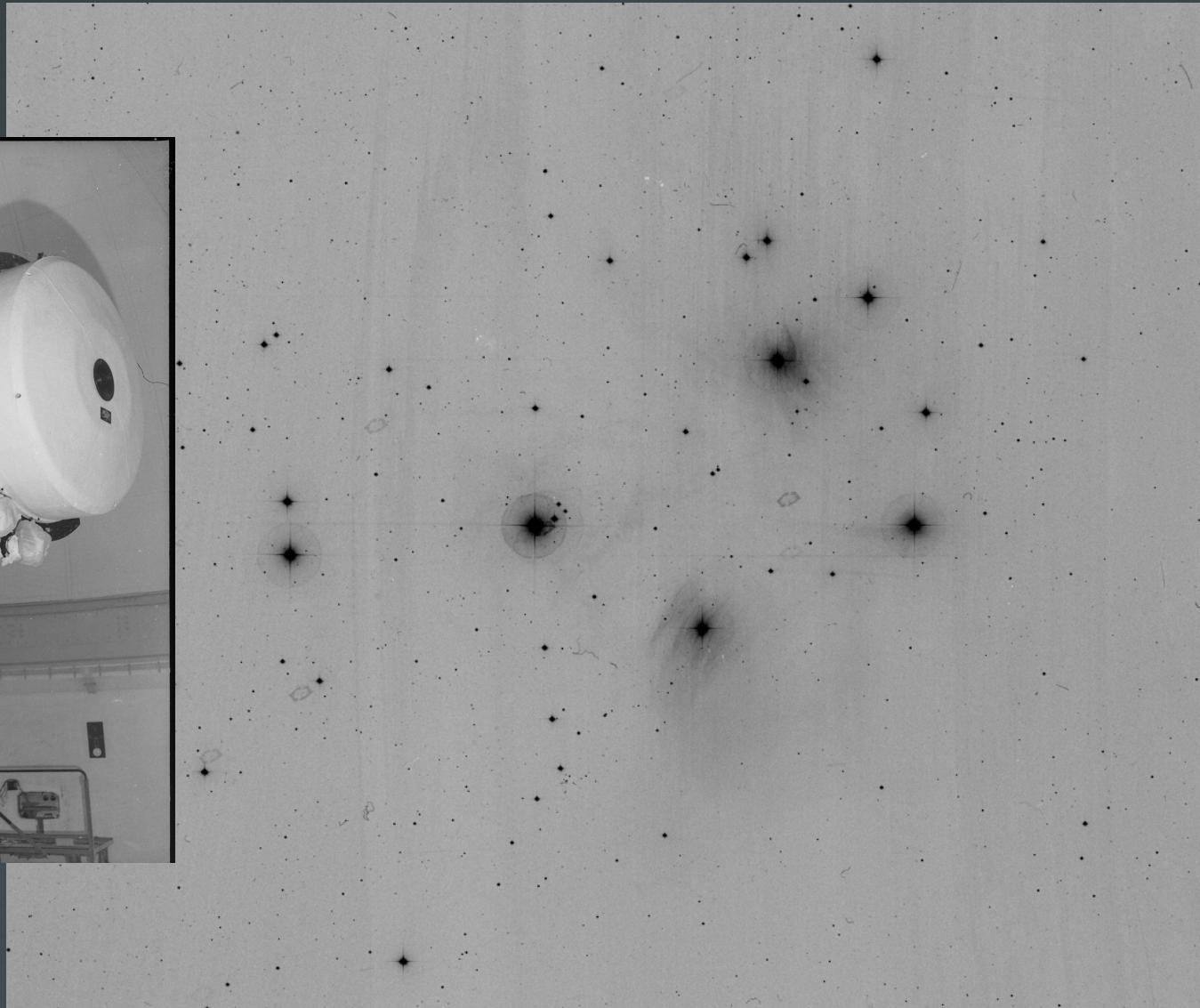
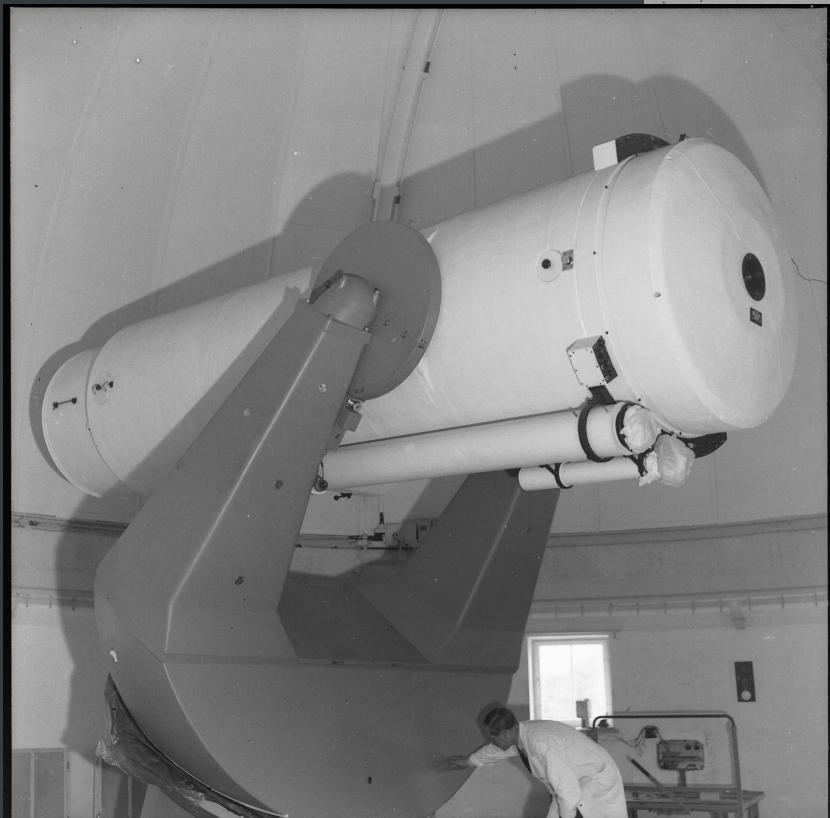
First tests with the first Schmidt-telescope



Double reflector (constructed by Bernhard Schmidt)

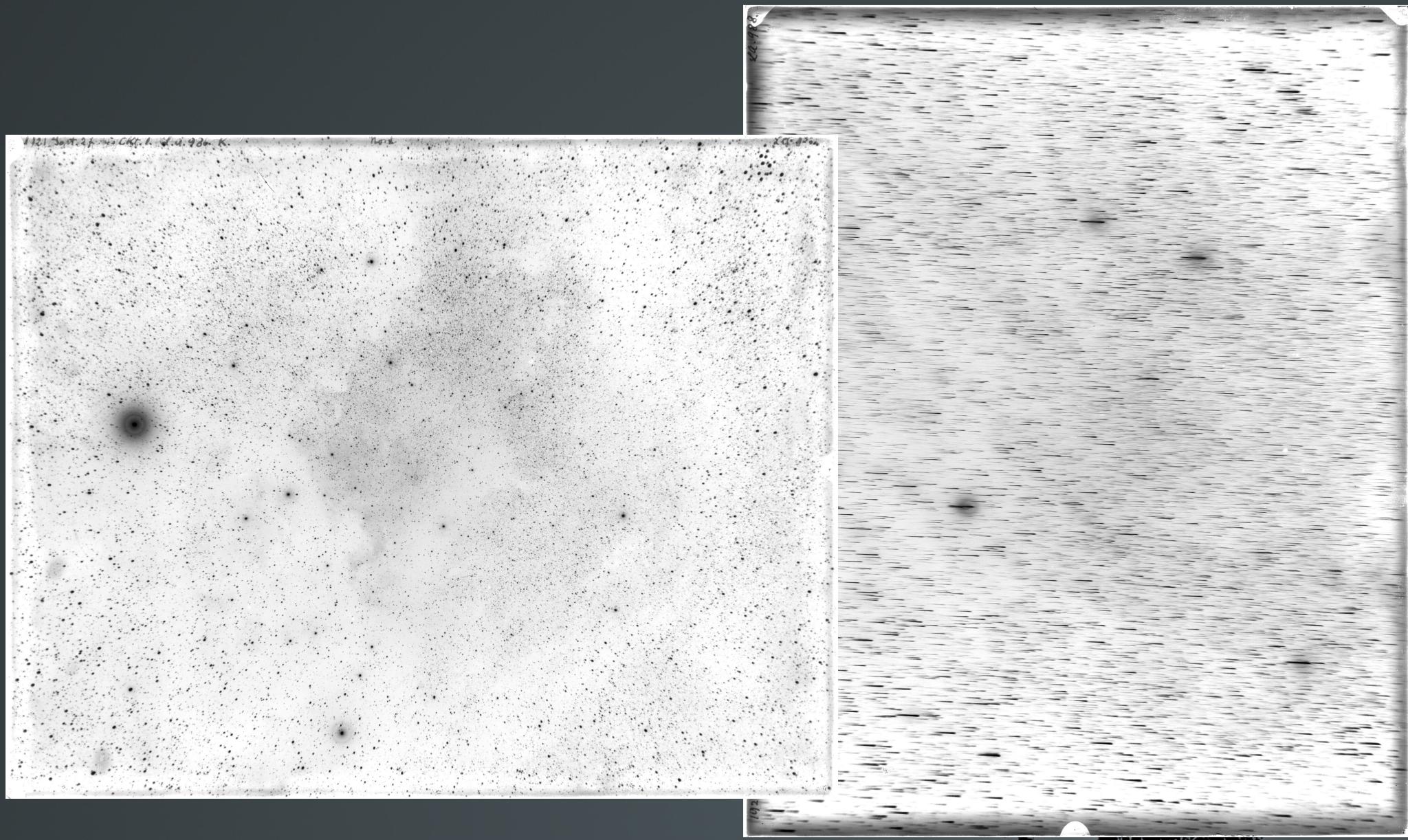


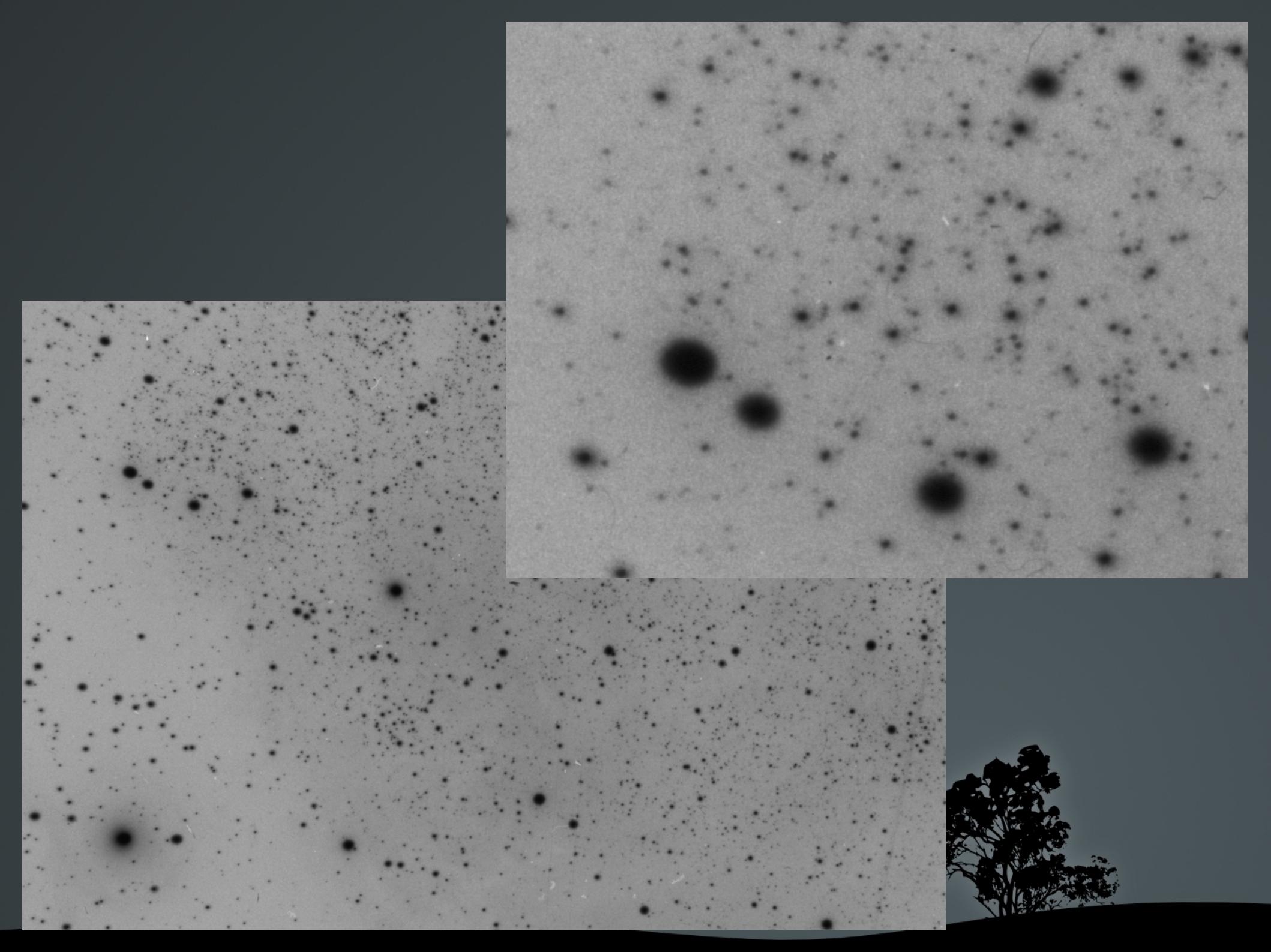
Great Schmidt-Mirror-Telescope



GS20, Plejades

Direct plates & objective prism plates





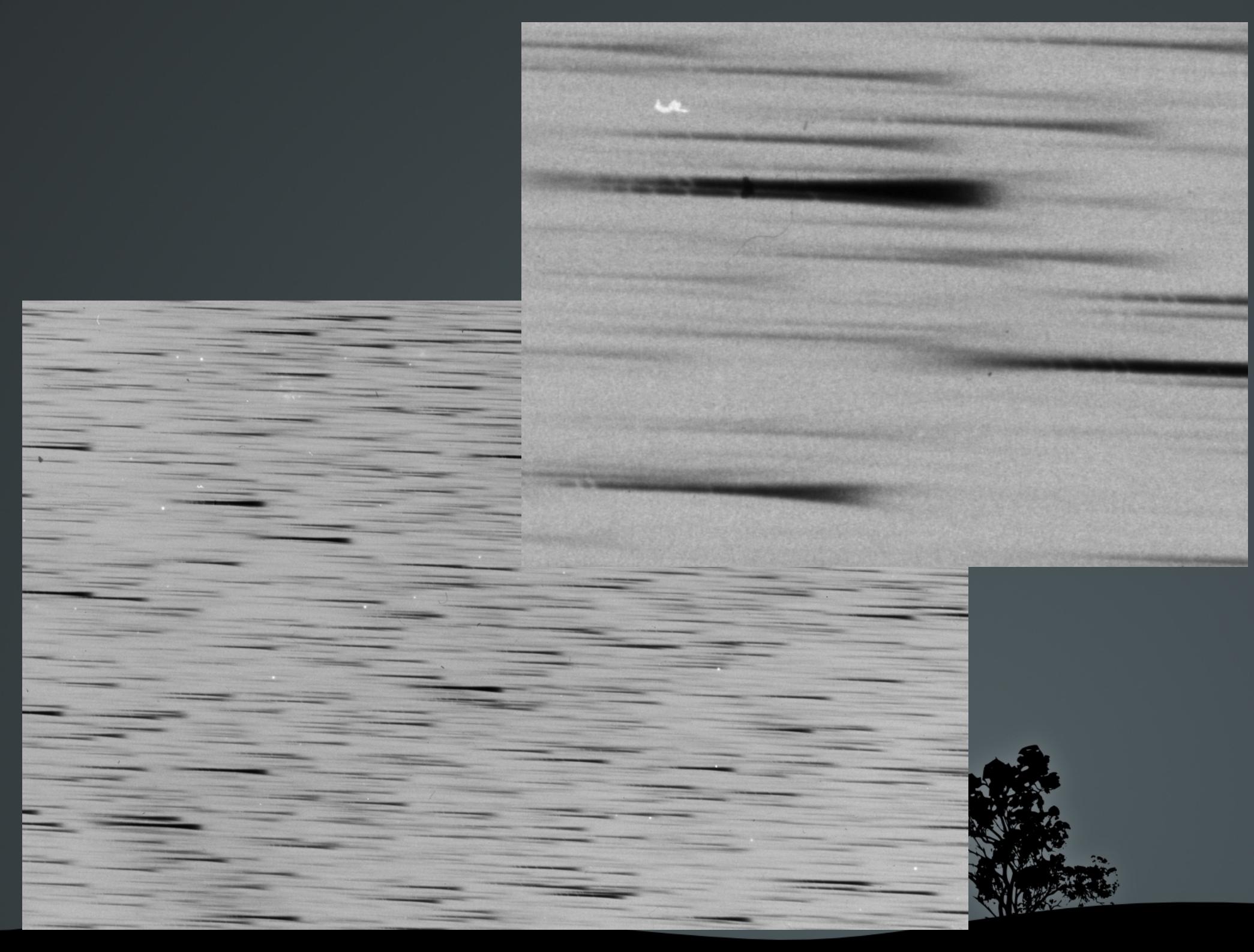
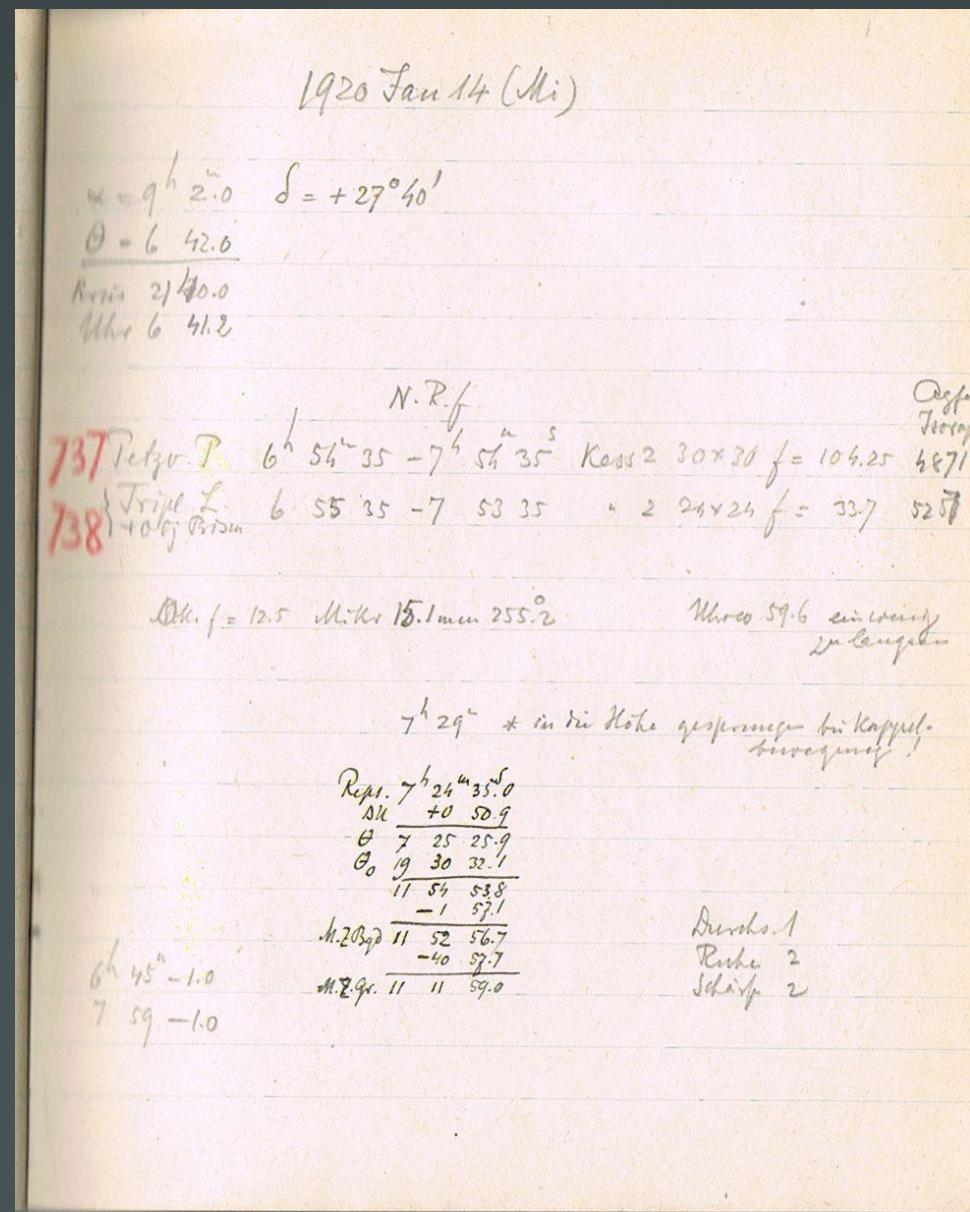
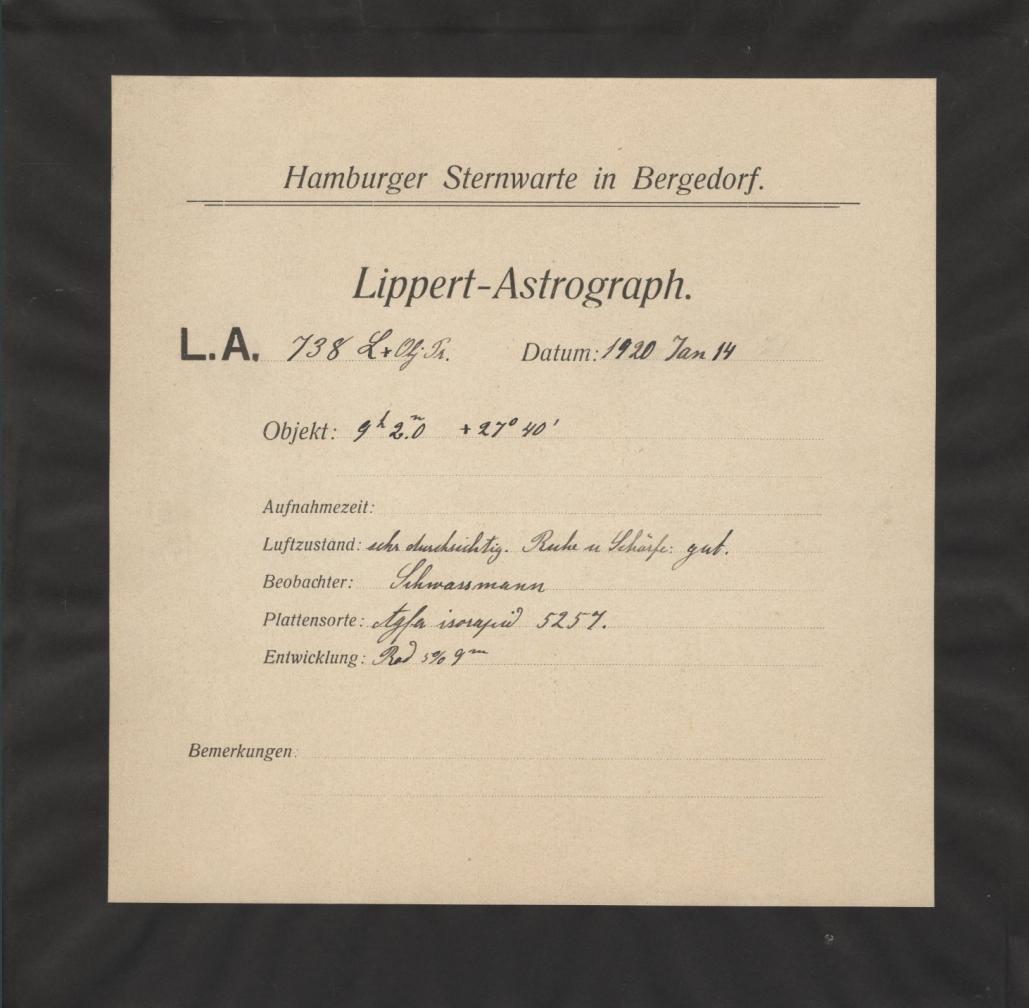


Plate envelopes, observers notes, meta-data



Measuring machine or flat bed scanner

PDS-microdensitometer



Epson Expression 10000XL



Plate-archives website

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe
Beobachtungs- und L... S00004.jpg (JPEG-Gra... Skywatch Time Calcul... Meister oder Technik... digitized - Englisch - D... uli heber bamberg - C... Telescopes Program | Astroplate Erreichbare IP-Adress...
plate-archive.hs.uni-hamburg.de/index.php/en simbad Int. Lesez. Bill-Tel Astro-ph Nature SuW LEO D-E LEO D-F ADS Plattenarchiv GEOFOX RegenRadar Akt.W+F dradio.de ViaMichelin dradio.de DB ING-DiBa VWB Bank of Scotland 4 Tage Wetter

You are here: Telescopes

Digital Plate Archives of Hamburger Sternwarte

Telescopes and photographic plates

Lippert-Telescope

The **Lippert Telescope** ([history](#), in [German](#) only) has seen many changes in the course of the years and is still used with a 60 cm reflector. Of the original setup, only the mounting is still in its place. As **Lippert Astrograph**, this instrument was originally a combination of three astrophotographs and two guiding refractors, installed on the same mounting. The first plates were taken in 1912. Observations were made on plates of different size from 3.5x4.7 up to 11.8x11.8 inch. There are about 8800 plates in the [plate archive](#) ([HTML version](#)).

1 meter Reflector Telescope

When it took up work in 1911, the **1 Meter Reflector Telescope** was the fourth largest reflecting telescope in the world, and for many years, the largest in Germany ([history](#)). It was used by Walter Baade for his pioneering work about variable stars. The first plate was taken in 1911 and there are about 10000 plates in the [plate archive](#) ([HTML version](#)) (the 5500 direct plates are completely digitized).

The Original Schmidt-Mirror-Telescope

The **Original Schmidt-Mirror** was the first spheric mirror telescope with correction plate and put into operation in 1932. It was first called **Schmidt's coma free mirror telescope** and was used from the beginning with circular films. Spectra were obtained with an objective prism plate. Until 1955 more than 1800 images were taken, about half of them on glass plates, see [plate archive](#) ([HTML version](#)).

The Dual-Reflector Telescope

Plate-archives search mask

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

Beobachtungs- und L... S0004.jpg (JPEG-Gra... Skywatch Time Calcul... Meister oder Technik... digitized - Englisch - D... uli heber bamberg - G... Search in Plate Archiv... Program | Astroplate Erreichbare IP-Adress...

plate-archive.hs.uni-hamburg.de/archive_filter.php simbad

Int. Lesez. Bill-Tel Astro-ph Nature SuW LEO D-E LEO D-F ADS Plattenarchiv GEOFOX RegenRadar Akt.W+F dradio.de ViaMichelin dradio.de DB ING-DiBa VWB Bank of Scotland 4 Tage Wetter

■ Telescopes ■ Project ■ Staff ■ Status ■ Funding ■ Archive Search ■ Help Search...

SEARCH IN METADATA

Telescopes

- 1m-Spiegelteleskop (S)
- Großer Refraktor (GR)
- Schmidtsches Spiegelteleskop (SS)
- Hamburger Schmidtspiegel (HS)
- Lippert-Astrograph (LA)
- Doppel-Reflektor (DR)
- Großer Schmidt-Spiegel (GS)
- other

plate number

RA (h:m:s)
from to
dec (°:':")
from to
or radius (°)

object
orion

date (yyyy-mm-dd)
from to

exposure [min]
from to
plate size [cm]

- excludes

multiple exposures / prism
- / -
- excludes

notes
- excludes
mode / emulsion / filter
 / /
- excludes
output rows
skip max. outputs

Search **Reset**

SEARCH RESULTS

9 result(s).

Please click on the plate numbers to get detailed information.

number	RA	dec	object	date	plate size [cm]	sky: transparency steadiness/sharpness	multi. exp.	OP	exp. time	emulsion	mode	filter	notes	scan
S00013			Orion-Nebel	1912-01-10/11	09x12	/2/2-3			60m	Agfa isorapid				Y
S02701			Orion-Nebel	1921-12-04/05	13x18	1/1/2			60m	Agfa isorapid			abgebl. 1:5	Y
LA01011	05:31.4	-05:31.0	Orion-Nebel	1921-12-04/05	24x30	2/2/2			113m		Petzval P			Y,X
LA01311	05:29.0	+02:30.0	Nebelgr. i. Orion +5°	1924-02-23/24	24x24				60m		Triplet K			Y,X
GRb0002			Orionnebel	1929-01-09/10	09x12				60m				vis. Obj. + prov. Gelbfilter	
SS00110			Orionnebel	1932-11-29/30	cif19				60m				sehr gut	X
SS00166			Orion-Nebel	1938-03-22/23	cif19	2-3/3/3			60m					X

2381 Das Seitenende wurde erreicht; Suche vom Seitenanfang fortgesetzt Hervorheben Groß-/Kleinschreibung

Plate-archives plate view

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

Beobachtungs- und L... S0004.jpg (JPEG-Gra... Skywatch Time Calcul... Meister oder Technik... digitized - Englisch - D... uli heber bamberg - G... Metadata of Plate - H... Program | Astroplate Erreichbare IP-Adress...

plate-archive.hs.uni-hamburg.de/detail.php simbad

Int. Lesez. Bill-Tel Astro-ph Nature SuW LEO D-E LEO D-F ADS Plattenarchiv GEOFOX RegenRadar Akt.W+F dradio.de ViaMichelin dradio.de DB ING-DiBa VWB Bank of Scotland 4 Tage Wetter

Plate Archives Project Staff Status Funding Search in Archives Search...

METADATA FOR LA01011

telescope	number	RA	dec	object	date	plate size [cm]	sky condition
Lippert-Astrograph	LA01011	05:31.4	-05:31.0	Orion-Nebel	1921-12-04/05	24x30	2/2/2

multi. exp.	prism	exposure time	emulsion	mode	filter	observer	notes	scan direction
		113m		Petzval P		Schwassmann		Y,X

IMAGE **COVER** **OBSERVER NOTES AND LOGBOOKS**

View these pages in reader!

2381 Das Seitenende wurde erreicht, Suche vom Seitenanfang fortgesetzt

Hervorheben Groß-/Kleinschreibung

Plate-archives bookreader

Plate-archives webeditor

Editor - Plattenarchiv der Hamburger Sternwarte - Mozilla Firefox Do Mär 13 14:16 Detlef Grotte

Datei Bearbeiten Ansicht Chronik Lesezeichen Extras Hilfe

Beobachtungs- und ... S00004.jpg (JPEG-Gra... Skywatch Time Calcul... Meister oder Technik... digitized - Englisch - D... uli heber bamberg - G... Editor - Plattenarchiv ... Program | Astroplate Erreichbare IP-Adresse... plate-archive.hs.uni-hamburg.de/verwaltung/editor.php simbad Int. Lesez. Bill-Tel Astro-ph Nature SuW LEO D-E LEO D-F ADS Plattenarchiv GEOFOX RegenRadar Akt.W+F dradio.de ViaMichelin dradio.de DB ING-DiBa VWB Bank of Scotland 4 Tage Wetter

Hilfe

Editor der Datensätze

METADATEN DER PLATTE LA01011

Teleskop	Plattennummer	RA	dec	Objekt	Datum	Plattengröße [cm]	Beobachtungsbedingung	
LA ■ Afrika	01011 <small>Suche per Ziffern: z=01, z=26, ggf. 0.001 addieren</small>	05:31.4	-05:31.0	Orion-Nebel	04/05-12-21 z.B. 17/18-01-12	24x30	2/2/2	
Mehr.Bel.	Prisma	Belichtungszeit	Emulsion	Modus	Filter	Beobachter	Notizen	Scanrichtung
		113m		1		47		Y,X

Search Update New Delete Reset

PLATTENANSICHT HÜLLE

EINTRÄGE IM BEOBACHTUNGSBUCH

1921 Dec 4 (Fr)
2 Persei Petzval-Fokussierung
Fokus stand auf 102.4
 $\alpha = 0^{\circ}18'8'' \delta = +49^{\circ}35'$ Kreis 20^h48^m 49^o29ⁱ
Uhr 0 7.0 N.R.F.
Setup { 0 9^m35-11^m35' 102.6 } 10/10 0 14 35-16 35 102.4 Kass 24x30 1012.A
10/10 0 19 35-21 35 102.2 OK f=12.5 Mirk 0.0 40.5° Uhrw. 53.9 m. Sek Kast

www.hs.uni-hamburg.de/DF/Oef/Scans/Dir/Lippert-Astrograph/24x30/ipeas/LA01011.ipb

www.hs.uni-hamburg.de/DE/Oef/Scans/Dir/Lippert-Astrograph/24x30/jpeg/LA01011.jpg

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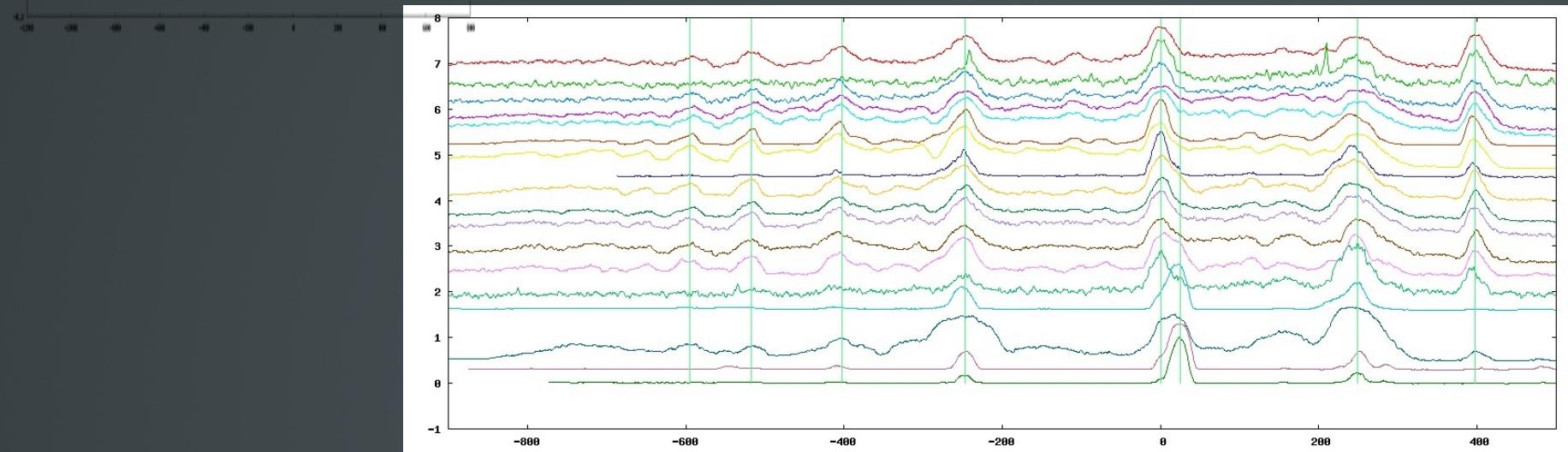
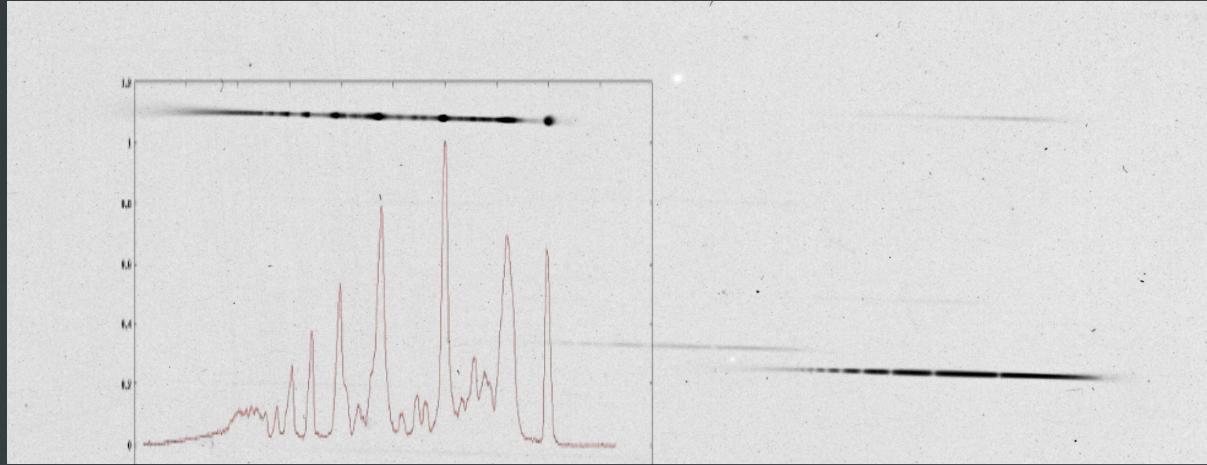
Hervorheben Groß-/Kleinschreibung

Options for research

- Long time base for proper motion measurements
- Search for special objects (e.g. variable stars)
- Re-evaluation of former events (e.g. Nova Gem 1912)

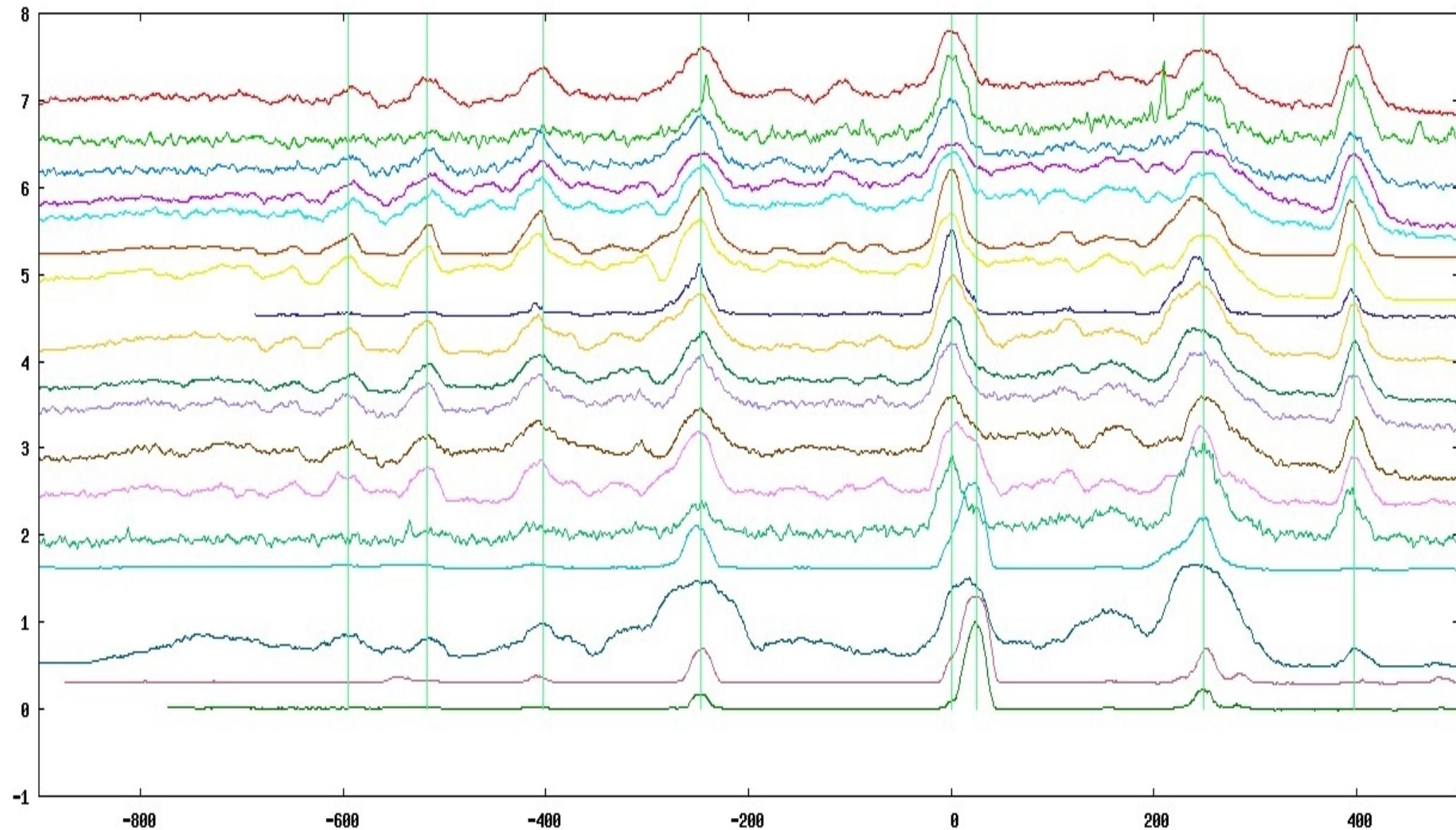


Novae – nuclear fusion reaction on White Dwarfs



Nova Gem 1912

Spectral variation over months



APPLAUSE

Archives of Photographic PLates for Astronomical USE

- APPLAUSE-collaboration

H. Encke, R. Arlt, T. Tuvikene (Potsdam)

U. Heber, H. Edelmann (Bamberg)

D. Groote (Hamburg)

- A common Data base of more than 80 000 plates residing in the AIP-Potsdam
- Common data reduction (astrometry, photometric calibration)
- Linked to GAVO virtual observatory



Status of the project

- Already more than 22 000 plates are digitized, all published
- Supported by Deutsche Forschungsgemeinschaft
- In Hamburg there are presently 5 staff members + 1 (honorary) +
2 full time positions for scanning
- Tight cooperation with Potsdam and Bamberg observatories
- First data are already copied to the APPLAUSE-project (Potsdam)



Summary

- Digitization project for all plates and handwritten information of nearly 90 years of observations.
- There is open access through a special web site, links to virtual observatories are planned.
- 15 man-year project, 35 000 plates, 30 TB of Data
- Cooperation with APPLAUSE-project
- Funded by Deutsche Forschungsgemeinschaft
- Already 22 000 plates accessible
- Trilingual web server with search functions and book reading capabilities to be found at

<http://plate-archive.hs.uni-hamburg.de>

