Von Fahrstühlen, Erdbeben und Lochstreifen

Über 450 Jahre Astronomie in Jena

25jähriges Jubiläumstreffen
MPG-AG „Staub in Sternentstehungsgebieten"

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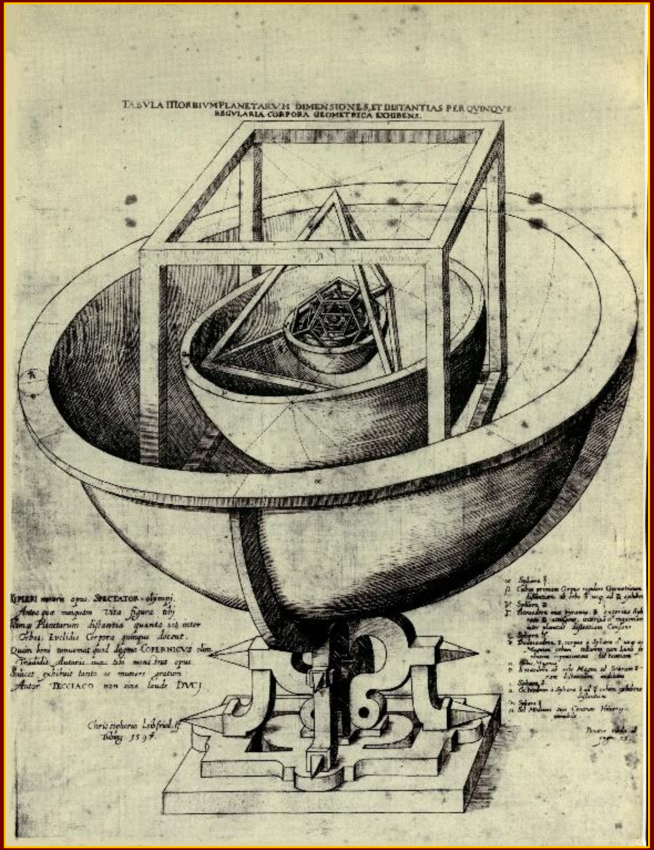
24. September 2017

1548:
Michael Neander
(1529–1581)

Georg Limnäus (1554–1611)

Johannes Kepler um 1597

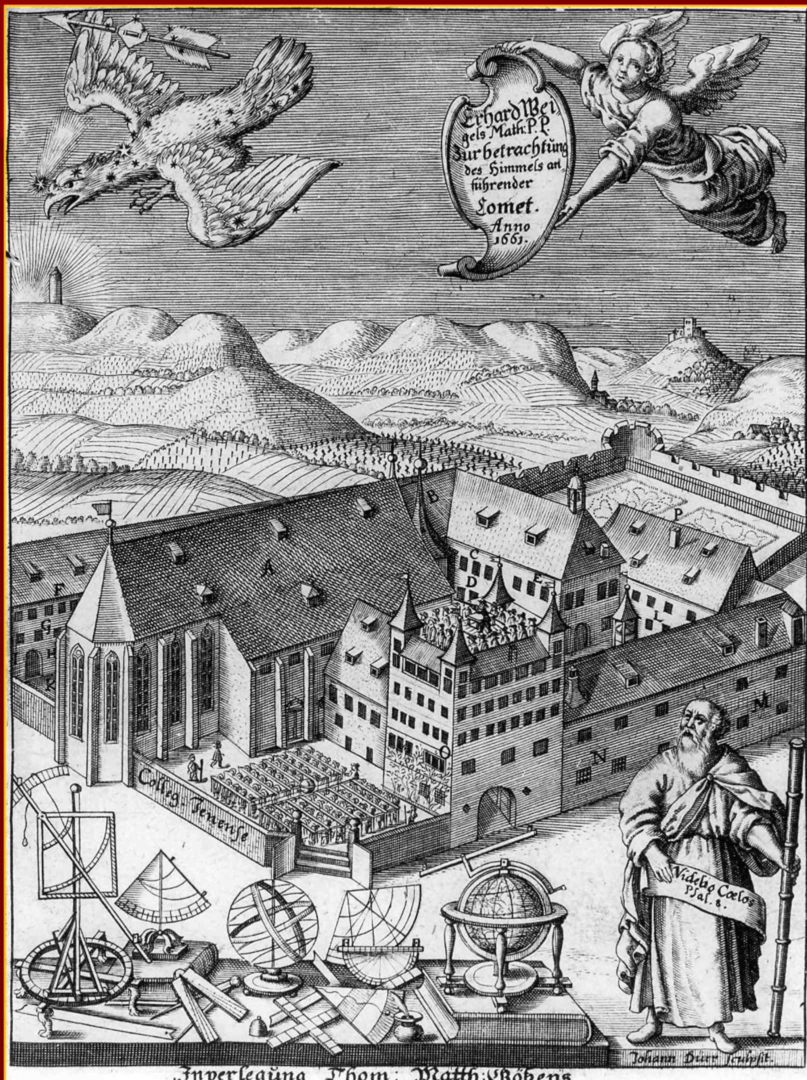


Keplers „Mysterium cosmographicum“, 1596

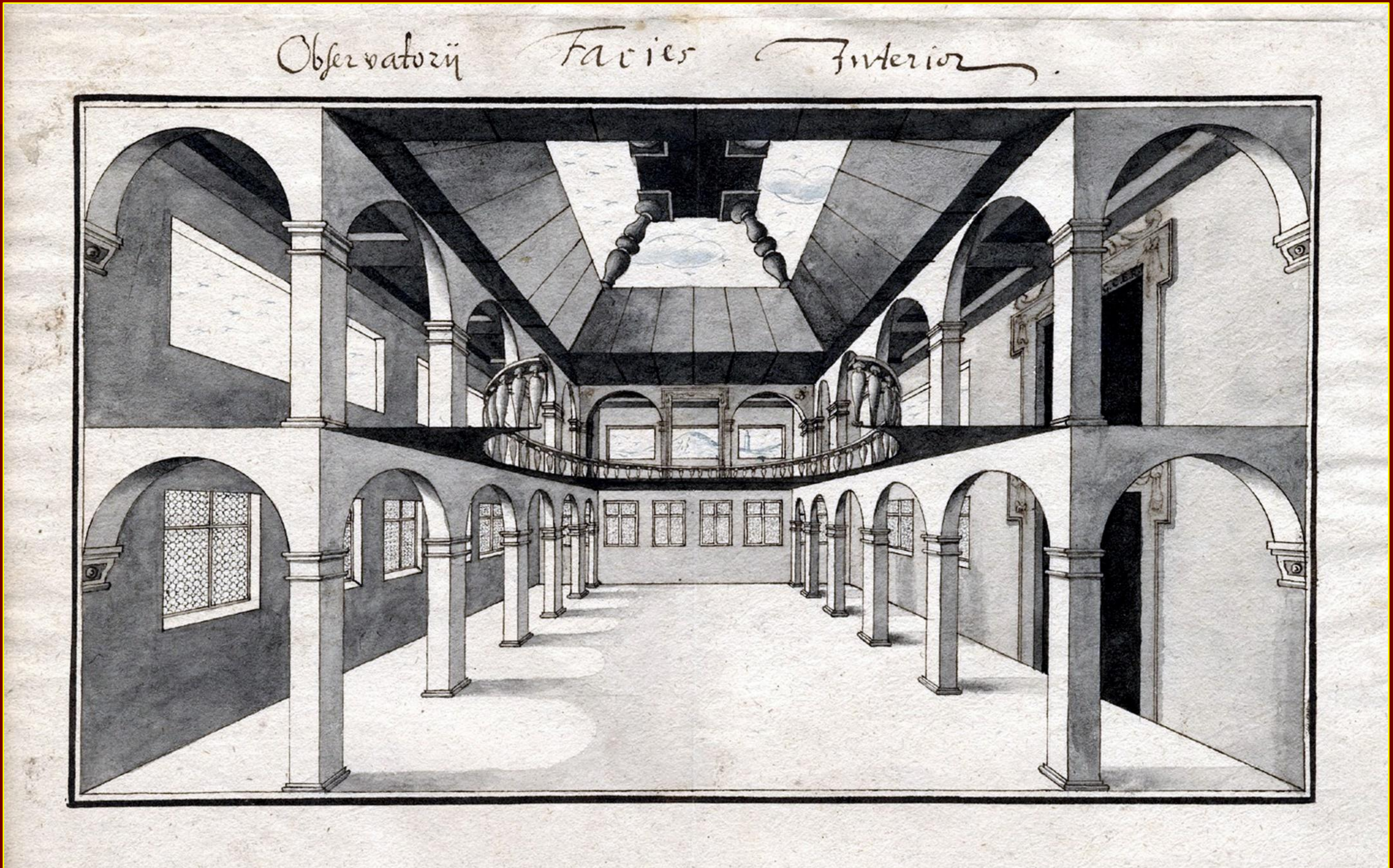
Heinrich Hoffmann (1576–1652)

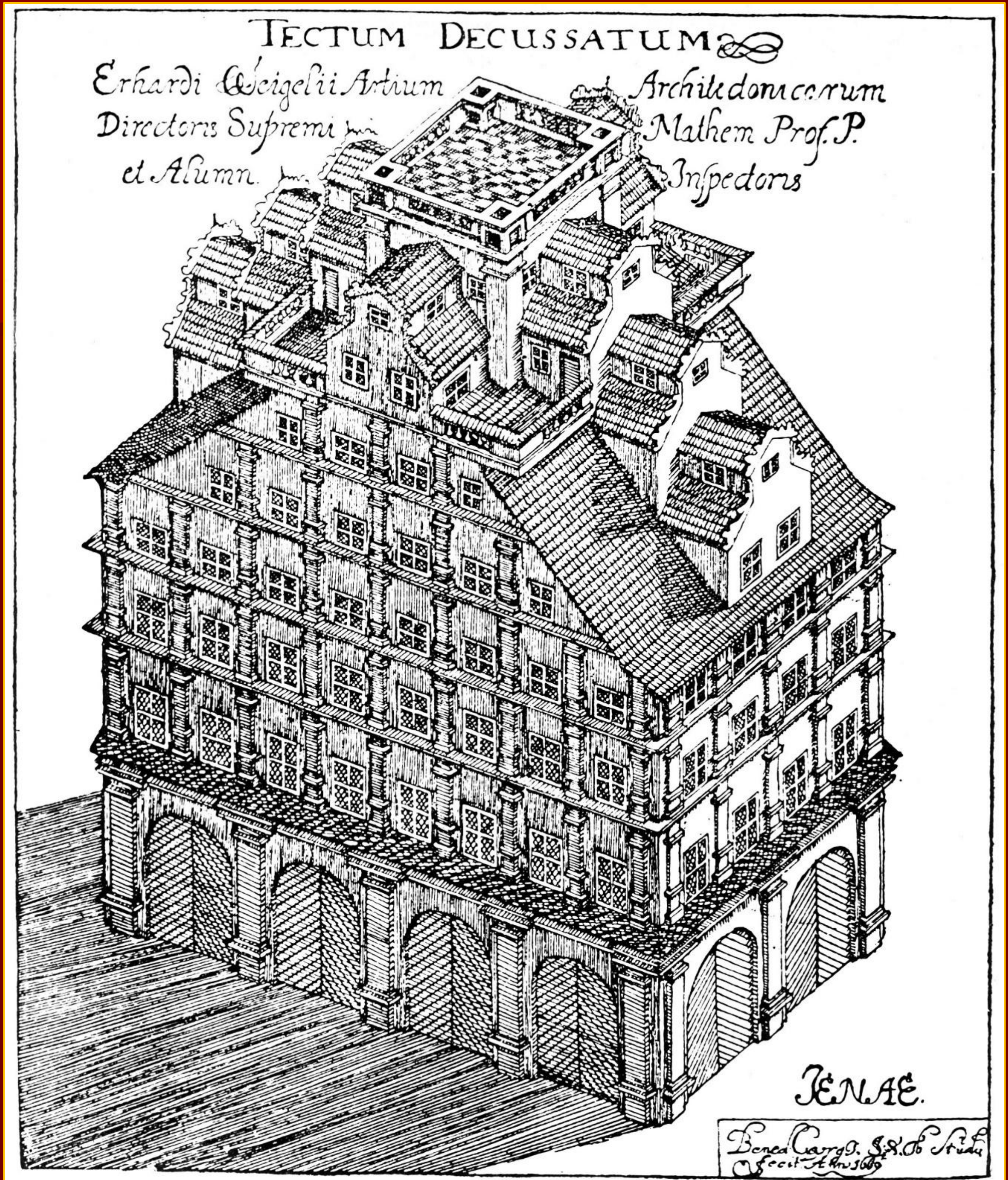
Erhard Weigel
(1625–1699)

Erhard Weigel:
1661: Frontispiz aus dem Himmelsspiegel



Erhard Weigel:
um 1657: Observatorium





Weigelsches Haus:
1668–1670 erbaut,
1686 bezogen

Das Weigelsche Haus zählt zu den sieben Wundern Jenas:

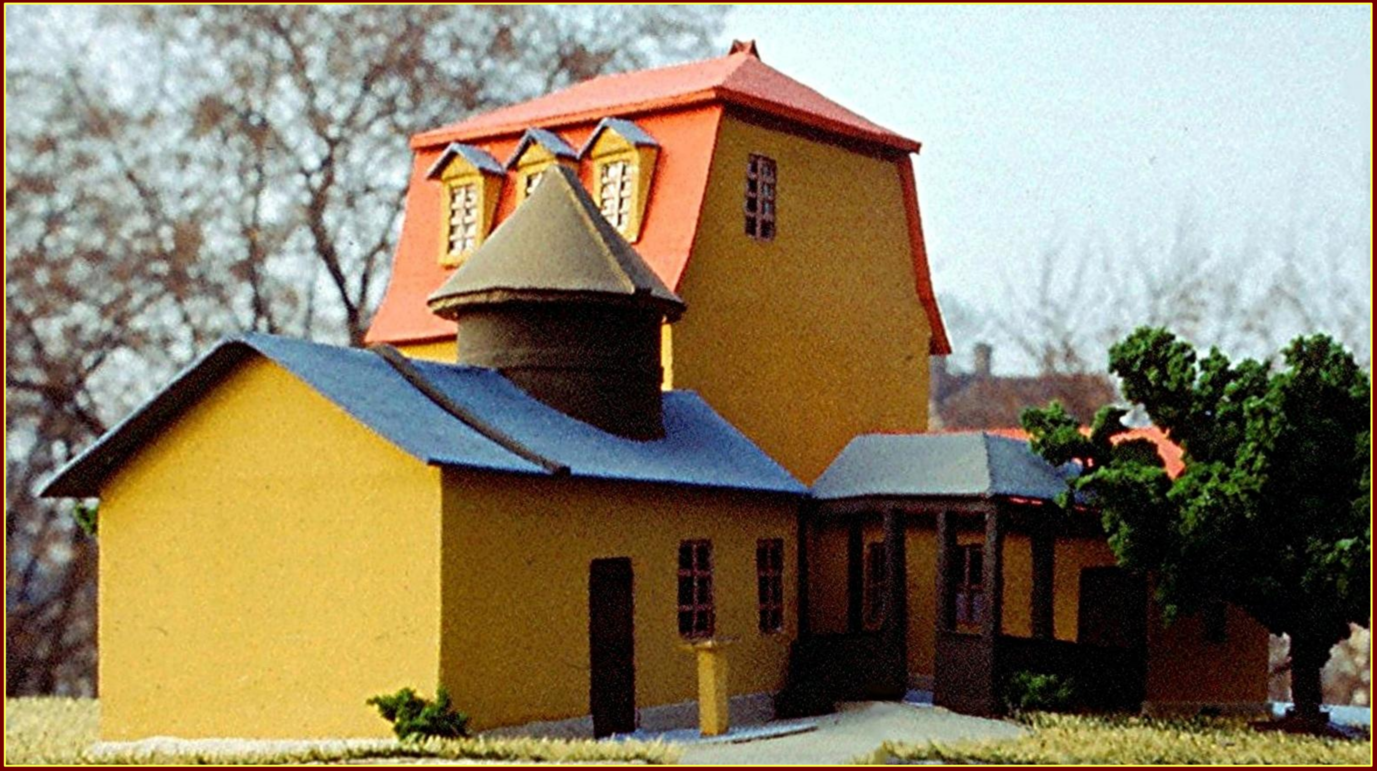
- **7 Etagen + Plattform**
- **offene Treppe durch alle Geschosse**
- **durch den Treppenschacht seien am Tage Sterne zu sehen**
- **Fahrstuhl**
- **„Weigelsche Kellermagd“**

Erhard Weigels Globen

Florenz

Kopenhagen

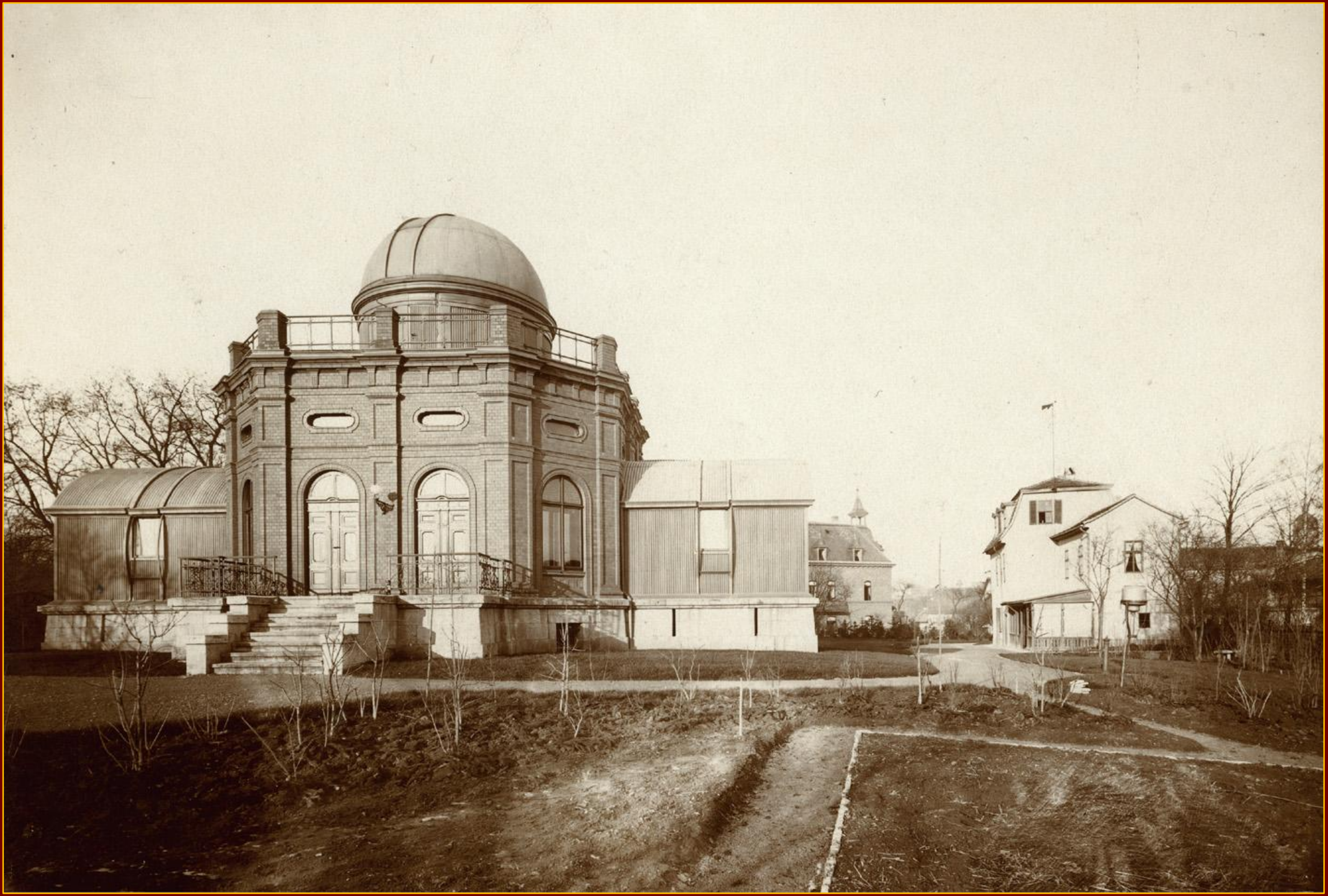
Karl Dietrich von Münchow (1778–1836)



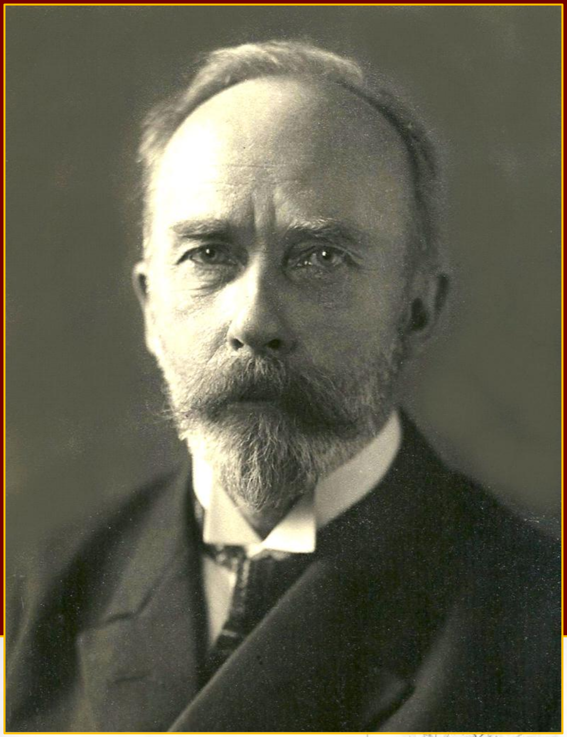
1816: von Münchow und Döbereiner stellen Versuche zur Gas-Straßenbeleuchtung am Jenaer Schloß an

Ernst Abbe (1840–1905)
Prof. Physik seit 1870
Direktor der Sternwarte 1877–1900

Sternwartenneubau, 1889



Otto Knopf (1856–1945) und Rudolf Straubel (1864–1943)



Der Straubelflügel für die Erdbebenstation, 1903

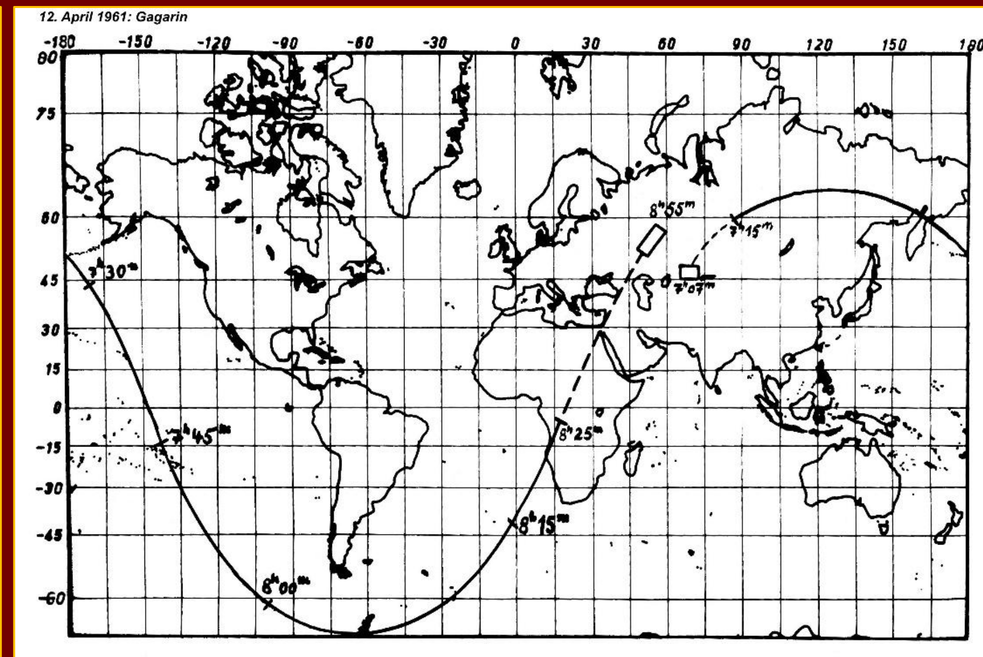
Sommer 1931

Weihnachtsfeier 1930

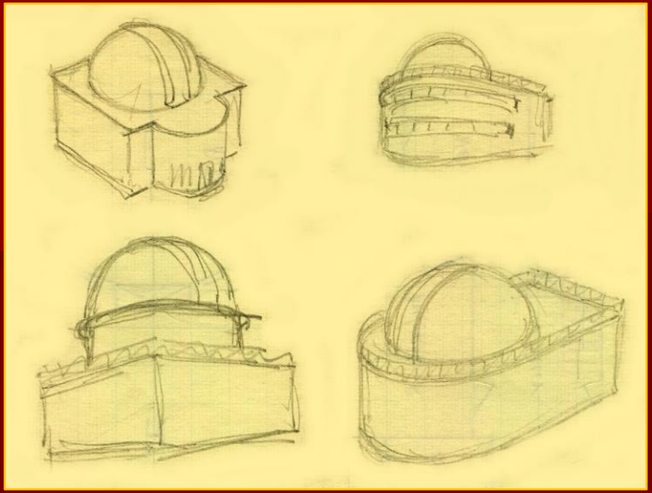
Hermann Lambrecht (1908–1983)

seit 1957:
Sputnik-Beobachtungen

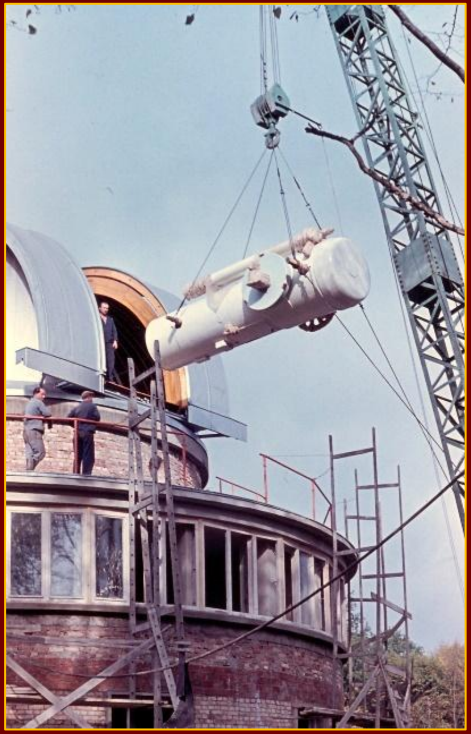
12. April 1961: Gagarin-Flug



Beobachtungsstation Großschwabhausen



Entwürfe von Hans Schlag



Beobachtungsstation Großschwabhausen: 90-cm-Spiegelteleskop

Beobachtungsstation Großschwabhausen:
1972: Teilautomatisiertes Irisblendenphotometer

Beobachtungsstation Großschwabhausen:
1977: Zeiss-Kleinsteuerrechner KSR 4100

Table 1 (Continued)

HD	l	b	V	$E(B-V)$	λ_c (Å)	α	β	γ	W (Å)	HD-REF.	R
37971	220.7	−22.7	6.20	0.06	2182	−0.0087	−0.1796	−0.0251	40	160762	
38010	182.7	−2.2	6.84	0.29	2121	−0.0395	−0.6105	−0.2301	330	43112	
38602	290.7	−30.2	6.04	0.08	2101	−0.0053	−0.0872	−0.1770	260	47670	
38622	193.2	−7.3	5.27	0.07	2228	−0.0145	−0.3258	−0.0062	10	37209	
39698	189.0	−2.9	5.90	0.07	2151	−0.0140	−0.1518	−0.0755	120	36285	
39777	210.0	−14.5	6.56	0.06	2182	−0.0069	−0.1694	−0.0305	50	37303	I
40111	184.0	0.8	4.82	0.13	2129	−0.0418	−0.3207	−0.2468	350	46328	
41117	189.7	−0.9	4.62	0.45	2147	−0.0858	−0.9834	−0.7804	870	52089	
42054	240.8	−23.5	5.81	0.05	2182	−0.0232	−0.2950	−0.0009	00	32249	I
42087	187.7	1.8	5.76	0.35	2152	−0.0764	−0.8539	−0.6257	740	52089	
43247	197.7	−2.0	5.33	0.05	2146	−0.0325	−0.2205	−0.2177	310	16978	
43955	227.5	−16.1	5.52	0.06	2169	−0.0135	−0.2403	−0.0138	20	37209	
44173	199.0	−1.3	6.53	0.06	2155	−0.0205	−0.1620	−0.1027	160	130807	I
44700	206.3	−4.5	6.40	0.06	2164	−0.0043	−0.1918	−0.0172	30	32249	
44996	221.6	−11.8	6.11	0.08	2164	−0.0147	−0.1026	−0.1442	220	109026	
45314	197.0	1.5	6.64	0.45	2158	−0.0522	−0.9320	−0.4817	610	38666	
45321	214.2	−7.6	6.17	0.06	2277	−0.0079	−0.1967	−0.0199	30	51925	
45546	214.5	−7.4	5.04	0.06	2177	−0.0102	−0.2225	−0.0046	10	37209	
45995	200.6	0.7	6.15	0.14	2182	−0.0202	−0.2444	−0.0427	70	51925	I
46064	222.4	−10.5	6.15	0.09	2163	−0.0141	−0.2552	−0.0980	150	37303	
46189	236.2	−16.5	5.93	0.06	2182	−0.0138	−0.3121	−0.0032	10	121263	I
46547	240.5	−17.7	5.68	0.06	2182	−0.0102	−0.1752	−0.0251	40	106490	I
46769	210.3	−3.2	5.79	0.02	2197	−0.0197	−0.0604	−0.2228	320	34085	
47100	175.3	14.8	5.20	0.03	2175	−0.0086	−0.0039	−0.1430	220	47670	
47129	205.9	−0.3	6.05	0.37	2171	−0.0439	−0.8232	−0.4182	550	38666	
47240	207.0	−0.7	6.15	0.38	2139	−0.0806	−0.8890	−0.5527	680	46328	
47306	261.9	−23.7	4.38	0.06	2182	−0.0363	−0.3256	−0.0719	110	16978	I
47417	205.3	0.3	6.97	0.29	2151	−0.0600	−0.5904	−0.4268	550	34816	
47432	210.0	−2.1	6.22	0.40	2161	−0.0869	−0.9203	−0.5766	700	38666	
47839	202.9	2.2	4.65	0.06	2182	−0.0035	−0.1035	−0.0401	60	38666	
48099	206.2	0.8	6.38	0.27	2181	−0.0405	−0.4850	−0.4938	620	38666	
48434	208.5	0.1	5.87	0.28	2133	−0.0666	−0.5969	−0.2738	380	34816	
48917	240.5	−15.0	5.40	0.06	2216	−0.0036	−0.0478	−0.0505	80	52089	
49229	225.3	−7.5	5.28	0.05	2169	−0.0240	−0.0534	−0.1823	270	16978	
50083	208.4	2.4	6.92	0.30	2101	−0.0327	−0.5840	−0.2153	310	36285	
50658	170.3	20.1	5.87	0.04	2172	−0.0184	−0.0137	−0.1433	220	172044	
50707	231.3	−8.6	4.83	0.05	2106	−0.0092	−0.0822	−0.0558	90	46328	
51283	234.0	−9.3	5.28	0.05	2182	−0.0342	−0.2153	−0.0250	40	[illegible]	
52266	219.1	−0.7	7.23	0.29	2161	−0.0594	−0.5699	[illegible]			
52382	222.2	−2.2	6.48	0.43	2160	[illegible]					
52437	233.7	−8.0	6.51	0.07							
52559	209.2	[illegible]	[illegible]								
527[illegible]											

Astron. Nachr. 303 (1982) 2, 105–116

The Interstellar 2200 Å Band: A Catalogue of Equivalent Widths

(Mitteilungen der Universitäts-Sternwarte zu Jena Nr. 151)

J. Gürtler, R. Schielicke, J. Dorschner, and C. Friedemann, Jena

With 5 figures (Received 1981 August 20)

Die spektralphotometrischen Daten des Ultraviolet Bright-Star Spectrophotometric Catalogue werden benutzt, um für 422 Sterne die Äquivalentbreite der interstellaren Absorptionsbande bei 2200 Å zu bestimmen. Die vorläufige statistische Auswertung bestätigt die gute Korrelation zwischen der Äquivalentbreite der 2200-Å-Bande und dem Farbexzeß. Die Lage des Bandenzentrums scheint in geringem Maße von Stern zu Stern zu variieren.

Using the data of the Ultraviolet Bright-Star Spectrophotometric Catalogue, the equivalent width of the interstellar absorption band at 2200 Å is derived for 422 stars. A preliminary statistical analysis confirms the good correlation between the equivalent width of the 2200 Å band and the colour excess. The wavelength position of the band centre seems to vary to a small extent.

1. Introduction

The ultraviolet part of the interstellar extinction curve is now known down to 1000 Å wavelength. Its main features include a pronounced extinction "bump" at 2200 Å and a steady increase of the extinction in the direction of shorter wavelengths, continuing to the boundary of present-day observations.

The existence of the extinction bump was first realized by Stecher (1965). Dorschner (1973) pointed out that its shape could be represented to a good approximation by a classical dispersion profile. Savage (1975) and Seaton (1979) confirmed this on the basis of enlarged observational data. From measurements of the diffuse galactic light Witt and Lilley (1973) found the albedo of interstellar dust to have a minimum around 2200 Å, indicating that the extinction bump may be produced by absorption rather than by scattering. To be sure, conclusive support from observations of reflection nebulae is lacking so far.

Up to now, there is no generally accepted identification of the 2200 Å bump. In this regard, it is quite similar to the so called diffuse interstellar bands seen in the visual part of the spectrum. Most workers in the field are convinced of an origin in some component of the interstellar dust. A majority favours carbon grains (made of graphite or carbyne). Using optical constants given by Taft and Philipp (1965) for graphite, various workers have made extensive Mie calculations. The common result is that the diameters of the graphite grains should be quite small and the wavelength position of the band centre sensitive to the size of them. As a consequence, an appropriate size distribution function can always be found that provide a good fit to the observed profile.

Duley, Millar, and Williams (1979) proposed photoexcitation of oxygen ions laying near the surfaces of small metal-oxide grains. They noted that, as the wavelength of the absorbed photons depends strongly on the coordination number of the oxygen ions, the same process may give rise to the strongest diffuse interstellar band in the visible at 4430 Å. Moreover, the grain surfaces may be influenced by chemical reactions, the kind of which will be determined by the interstellar environment of the grains (Duley 1980).

Correlation studies carried out so far showed a fairly close relation between the strength of the 2200 Å band and visual extinction (e.g., Dorschner et al. 1977, Meyer and Savage 1981). On the other hand, striking deviations from the average relationship have been reported for several stars (Borgman 1978, Koorneef 1978, Morales et al. 1980, Willis and Wilson 1975, 1977, Snow and Seab 1980). Even if correlation studies cannot lead to a definite answer, they may give supporting evidence for some hypotheses and disprove others.

This paper is intended to provide an enlarged data base for further correlation work. The TD-1 satellite has returned ultraviolet spectra of a large sample of bright stars (Jamar et al. 1976, Macau-Hercot et al. 1978). Using spectrophotometric data to derive the equivalent widths and the wavelength position of the 2200 Å band rather than the strength of the extinction peak from a filter photometry, we hope to present a more reliable data base for further studies.

2. Reduction of the observational data

a. Reduction procedure

The spectrophotometry done with the TD-1 satellite provides a large sample of stars for which the strength of the extinction bump can be determined. The observational data are conveniently available as a catalogue (Jamar et al. 1976) giving both the measured stellar fluxes in steps of 20 Å for the spectral interval from 1360 Å to 2540 Å and graphical representations of the spectra.

Astron. Nachr. 303 (1982) 2, 105–116

The Interstellar 2200 Å Band: A Catalogue of Equivalent Widths

(Mitteilungen der Universitäts-Sternwarte zu Jena Nr. 151)

J. Gürtler, R. Schielicke, J. Dorschner, and C. Friedemann, Jena

With 5 figures (Received 1981 August 20)

Astron. Nachr., 304 (1983) 5, 237–251

The Interstellar 2200 Å Band: A Second Catalogue of Equivalent Widths and Preliminary Statistical Analysis

(Mitteilungen der Universitäts-Sternwarte zu Jena Nr. 162)

C. Friedemann, J. Gürtler, R. Schielicke, and J. Dorschner, Jena

With 9 Figures (Received 1983 January 12)

A second catalogue of equivalent widths of the interstellar 2200 Å band is presented. It is based on spectrophotometric data obtained with the TD-1 satellite and supplements a catalogue already published (Paper I). Both catalogues list a total of 779 stars. The reliability of the derived parameters is analysed. There is a satisfying agreement with spectrophotometric data obtained with the OAO-2 satellite. The relationship between the equivalent width of the 2200 Å band and and the colour excess is discussed, making use of additional data for more strongly reddened stars obtained with OAO-2 and IUE.

Es wird ein zweiter Katalog mit Äquivalentbreiten der interstellaren 2200-Å-Bande vorgelegt. Er beruht auf spektralphotometrischen Meßdaten, die mit dem TD-1-Satelliten erhalten wurden, und ergänzt einen früher publizierten Katalog. Beide Kataloge enthalten zusammen 779 Sterne. Die Zuverlässigkeit der abgeleiteten Parameter wird diskutiert. Es besteht eine befriedigende Übereinstimmung mit den Parametern, die aus Messungen mit dem OAO-2-Satelliten bestimmt wurden. Die Beziehung zwischen der Äquivalentbreite der 2200-Å-Bande und dem Farbexzess wird unter Benutzung zusätzlicher Daten für stärker verfärbte Sterne untersucht, die mit dem OAO-2- und dem IUE-Satelliten beobachtet wurden.

1. Introduction

The most remarkable feature in the ultraviolet part of the interstellar extinction curve is the broad absorption band centred at 2175 Å. As Dorschner (1973) pointed out and Savage (1975) and Seaton (1979) later confirmed, its shape can be represented to a good approximation by a classical dispersion profile. Starting with this assumption and a rather crude analytical approximation of the interstellar extinction curve outside the 2200 Å band, Gürtler et al. (1982, hereafter referred to as Paper I) derived the band's equivalent width for a total of 422 stars using the data of the Ultraviolet Bright Star Spectrophotometric Catalogue (Jamar et al. 1976, hereafter referred to as TD-1 Catalogue).

The stars contained in Paper I had been selected by visual inspection of the spectra graphically displayed in the TD-1 Catalogue. Virtually all of the stars with $E(B-V) \geqq 0.05$ mag had been caught. For about 14 per cent of a total of 495 stars the fitting procedure did not give a satisfactory representation of the extinction curve. These stars were omitted in the catalogue of equivalent widths given in Paper I.

The aims of the present paper are threefold. First, we will investigate the stars for which an unsatisfactory fit was reached originally. Second, we will include the data given in the Supplement to the Ultraviolet Bright Star Spectrophotometric Catalogue (Marau-Hercot et al. 1978, hereafter referred to as TD-1 Supplement) and all stars from both the TD-1 Catalogue and TD-1 Supplement for which $E(B-V) \geqq 0.04$ mag. Third, we will process the spectrophotometric data obtained with the OAO-2 satellite and compiled by Code and Meade (1979) and Meade and Code (1980) in the same manner and perform a comparison of both data sets.

... catalogue of equivalent widths from TD-1 observations

2. Mai 1994