

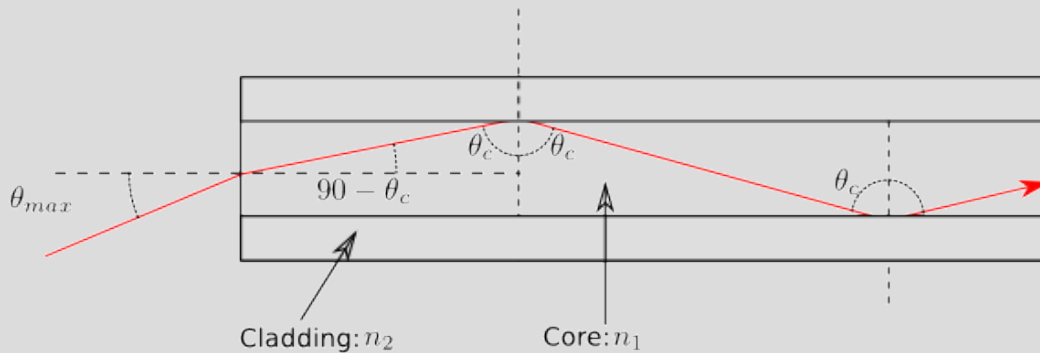
Optische Fasern, Funktionsprinzip

Monomode- und Multimodefasern

ausgewählte optische Geräte

Optische Bauelemente und Funktionsprinzipien

Konfokalmikroskope



$$\theta_c = \arcsin\left(\frac{n_2}{n_1}\right)$$

$$\theta_{\max} = \arcsin\left(\frac{1}{n_0} \sqrt{n_1^2 - n_2^2}\right)$$

$$NA = \sin \theta_{\max} = \sqrt{n_1^2 - n_2^2}$$

50 μm



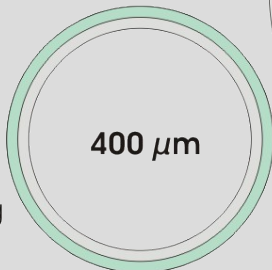
105 μm



200 μm (PCS)

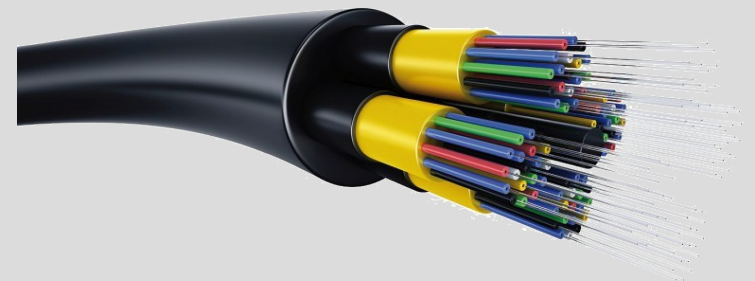
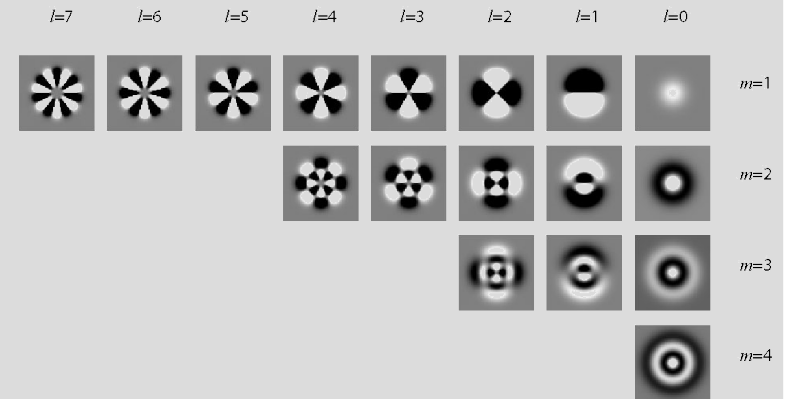
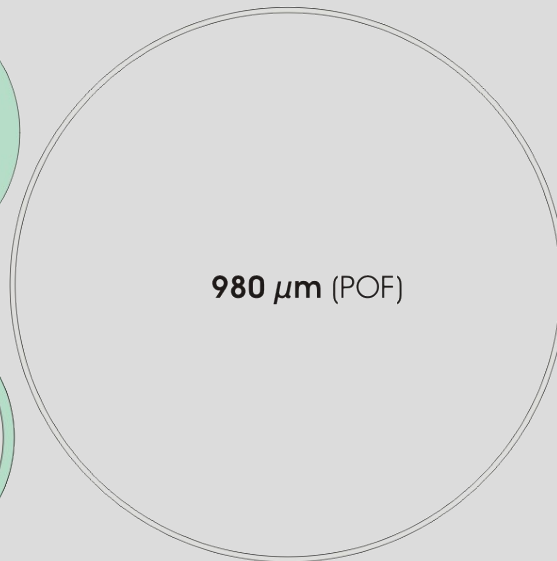


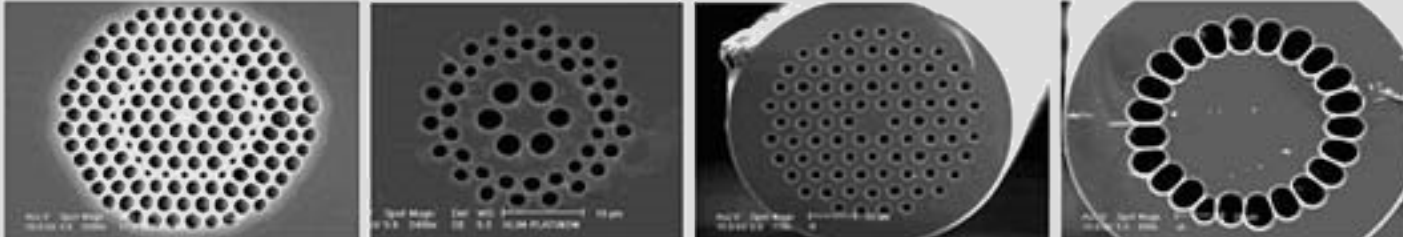
400 μm



- Core
- Cladding
- Coating

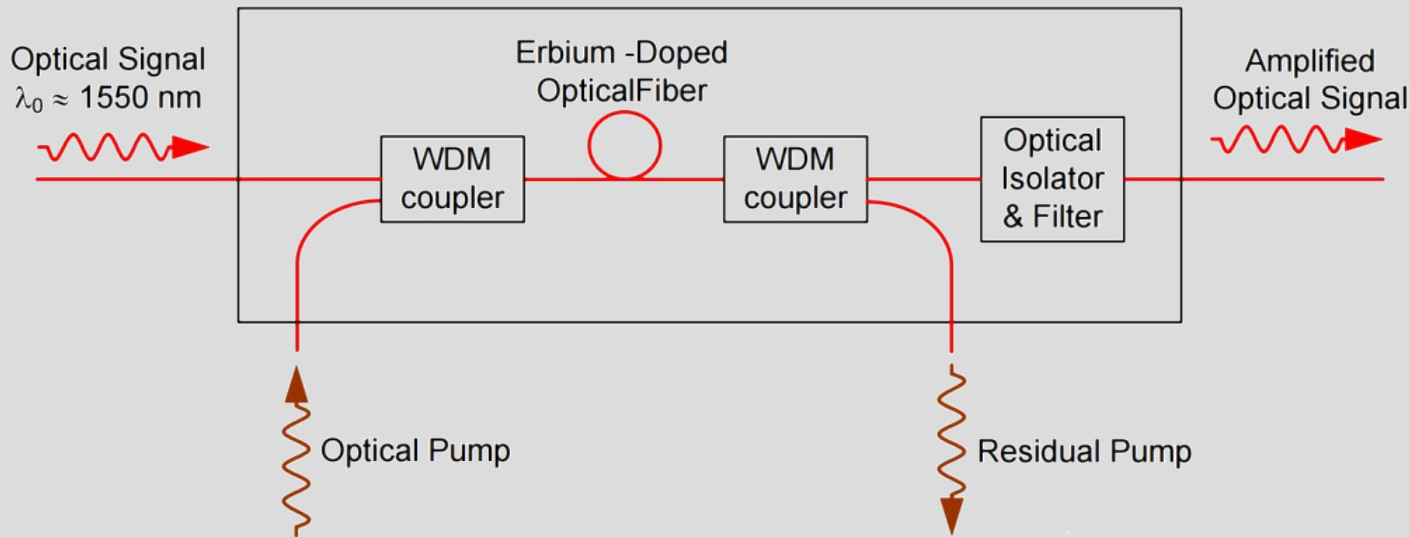
980 μm (POF)



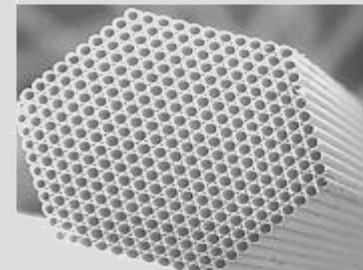
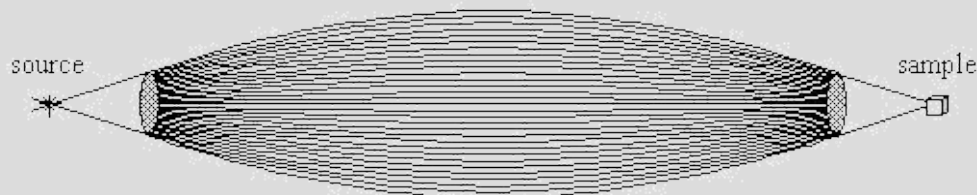


Mono- und Multimodefasern mit luftgefüllten Isolatoren

Erbium-Doped Fiber Amplifier

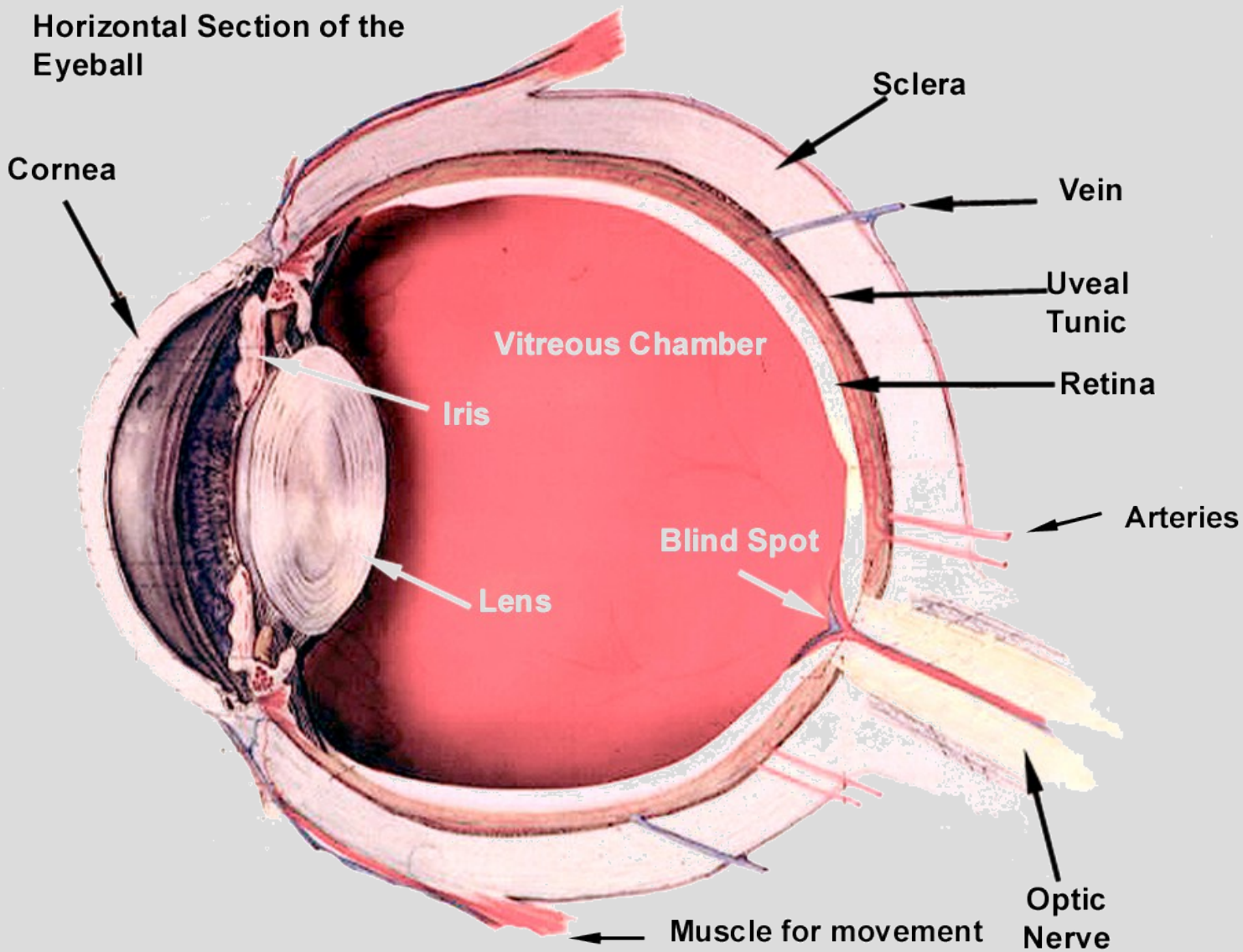


Erbium-dotierte Faserabschnitte zur Signalverstärkung

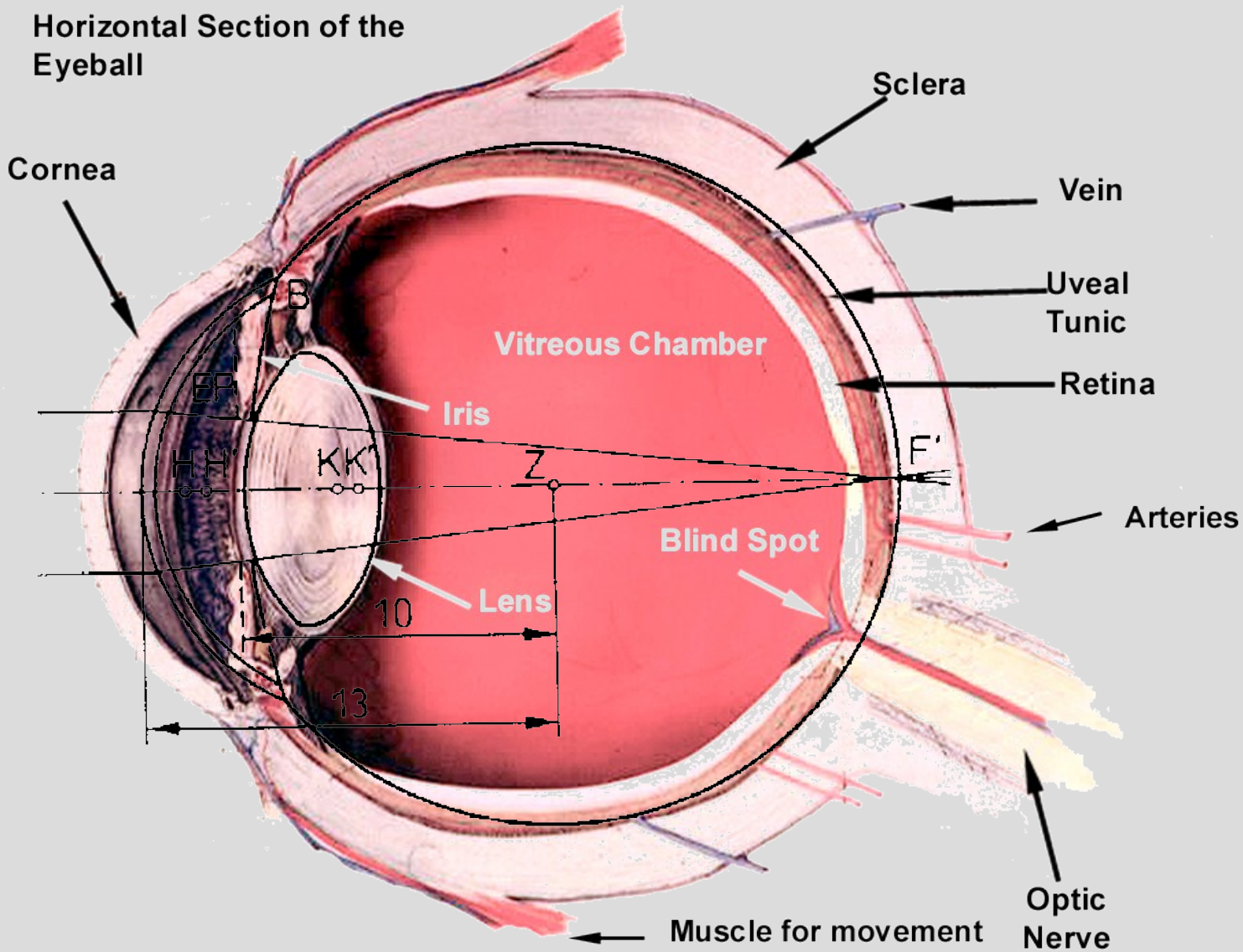


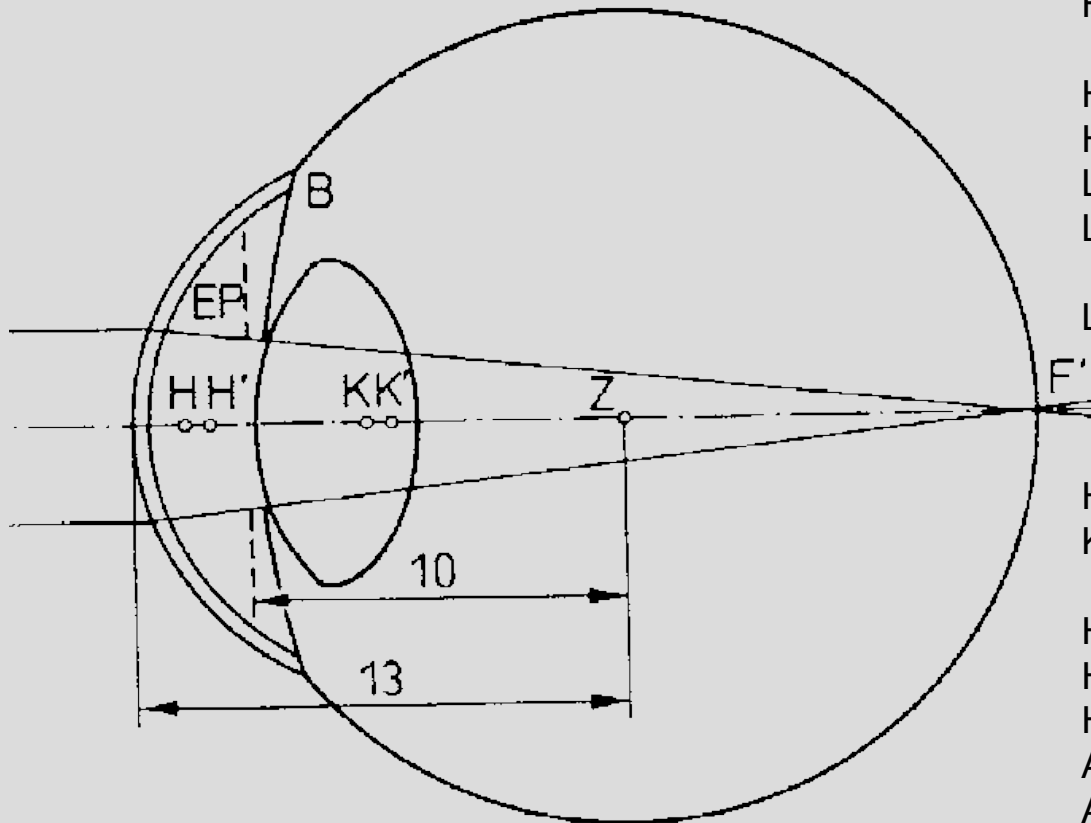
Röntgenoptiken mit luftgefüllten Hohlfaserbündeln

Horizontal Section of the Eyeball



Horizontal Section of the Eyeball



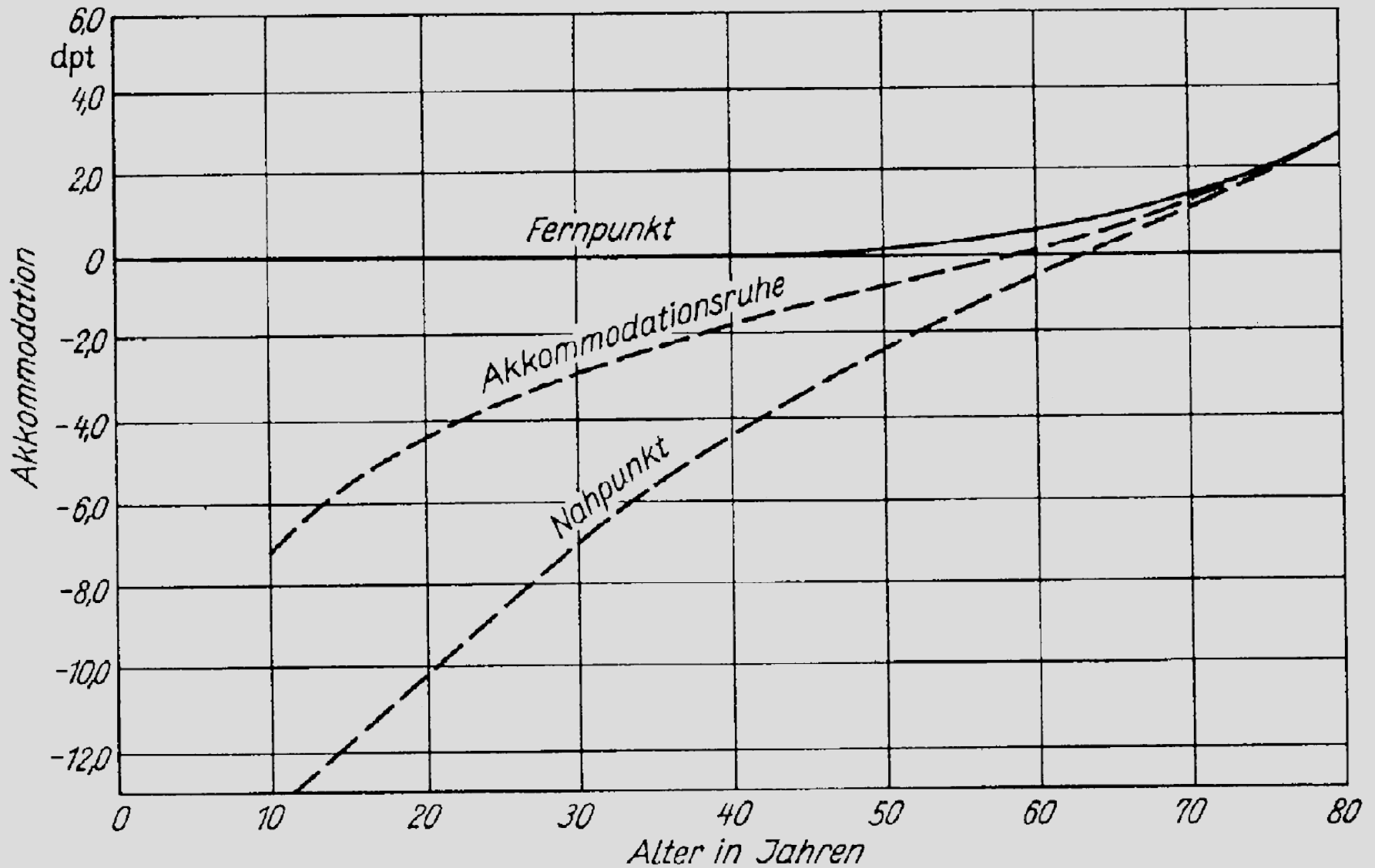


Hornhautdicke	0,5 mm
Hornhautvorderfläche-Linse	3,6 mm
Linsendicke	3,6 mm
Hornhautvorderfläche-Netzhaut	24 mm

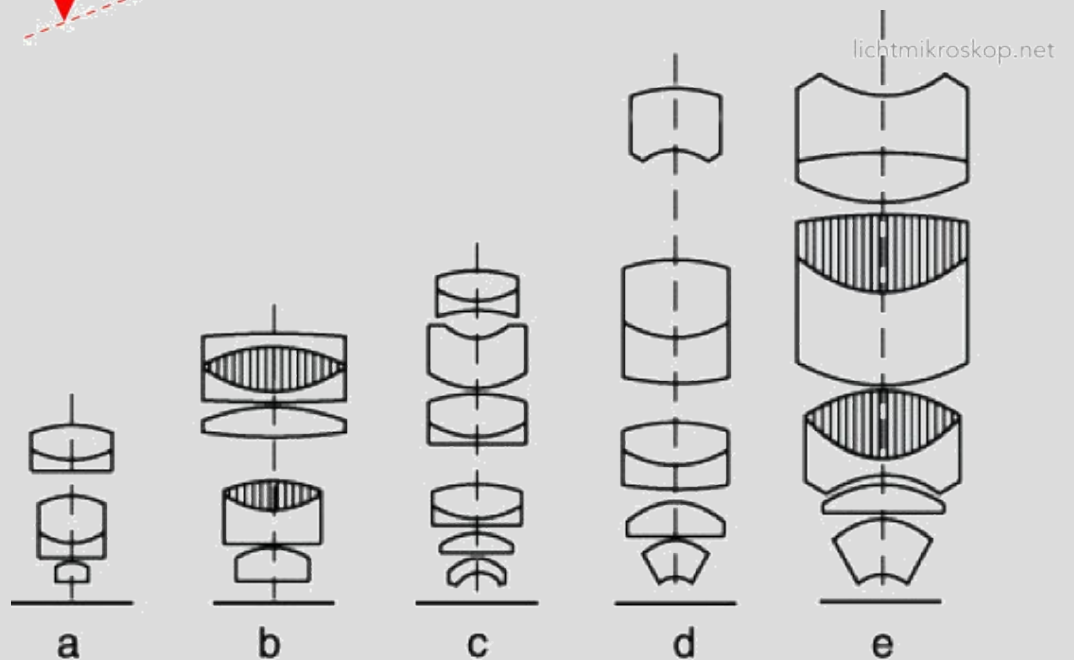
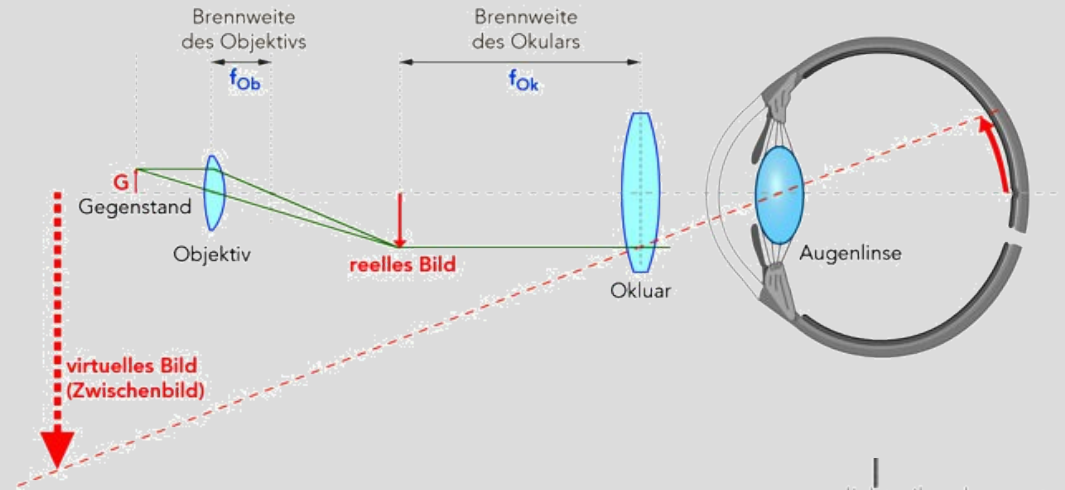
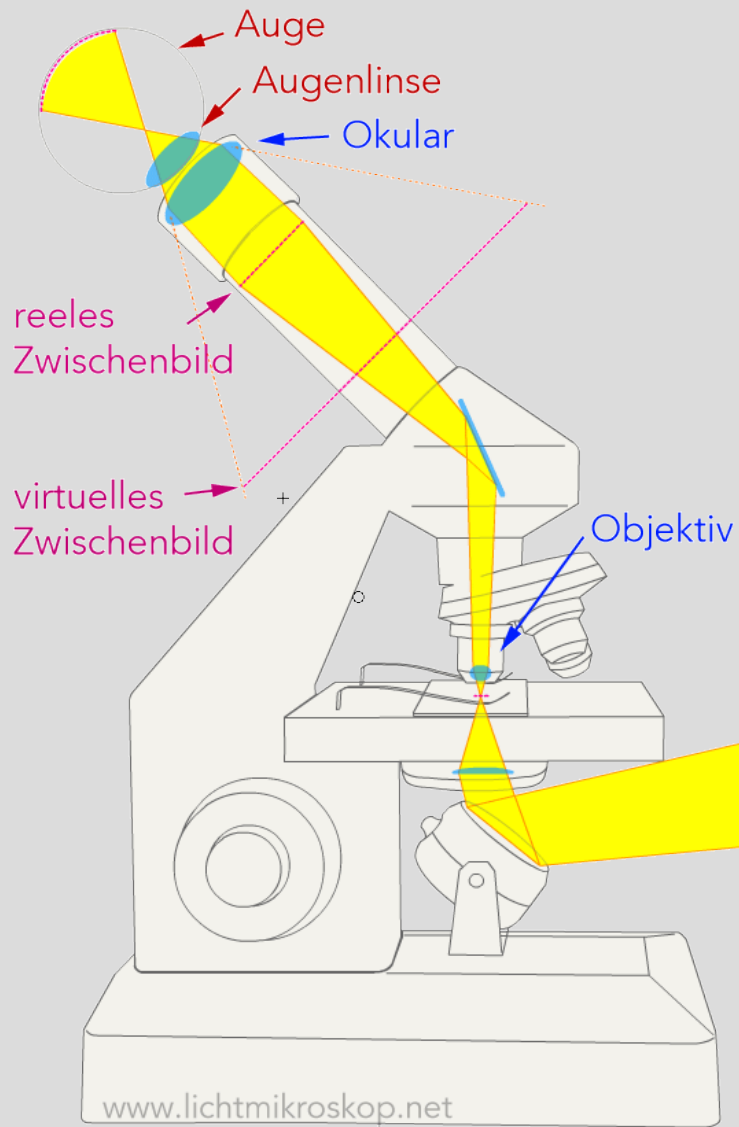
Hornhautvorderfläche, r	7,8 mm
Hornhauthinterfläche, r	6,7 mm
Linsenvorderfläche, r	10 mm
Linsenhinterfläche, r	- 6 mm

Linse	an den Polen	1,386
	am Äquator	1,375
	im Zentrum	1,406
	"Totalindex"	1,413
Hornhautsubstanz		1,376
Kammerwasser, Glaskörper		1,336

Hornhautvorderfläche	48,2 dpt
Hornhauthinterfläche	- 6,0 dpt
Hornhaut, gesamt	42,4 dpt
Augenlinse, Vorderfläche	7,7 dpt
Augenlinse, Hinterfläche	12,8 dpt
Augenlinse, gesamt	20,2 dpt
Auge, gesamt	58,8 dpt
(entspricht Brennweite von 17 mm)	



Das Mikroskop



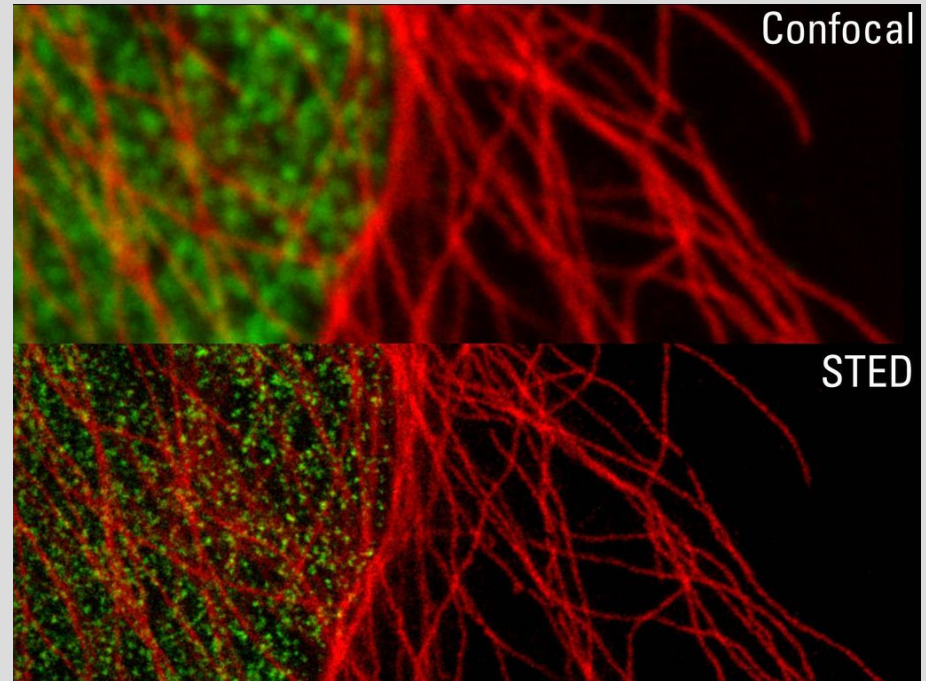
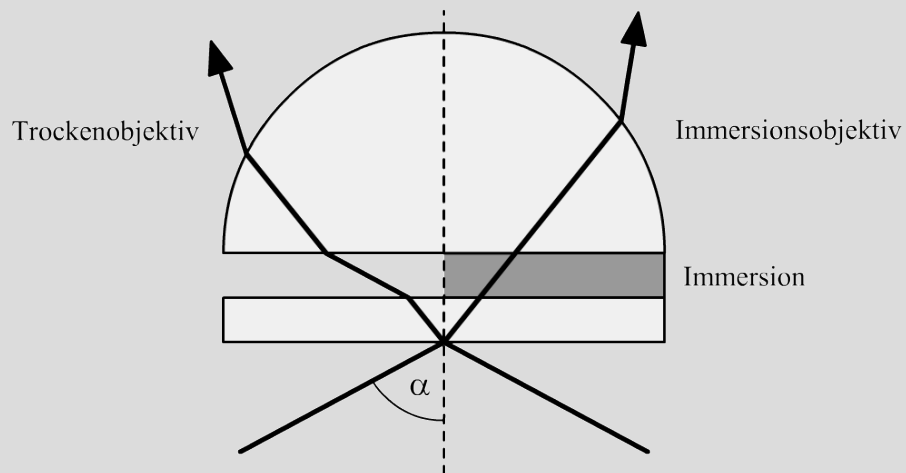
Auflösungsgrenze beim Mikroskop

$$l'_{\min} = 0,61 \frac{\lambda}{n' \sigma'}$$

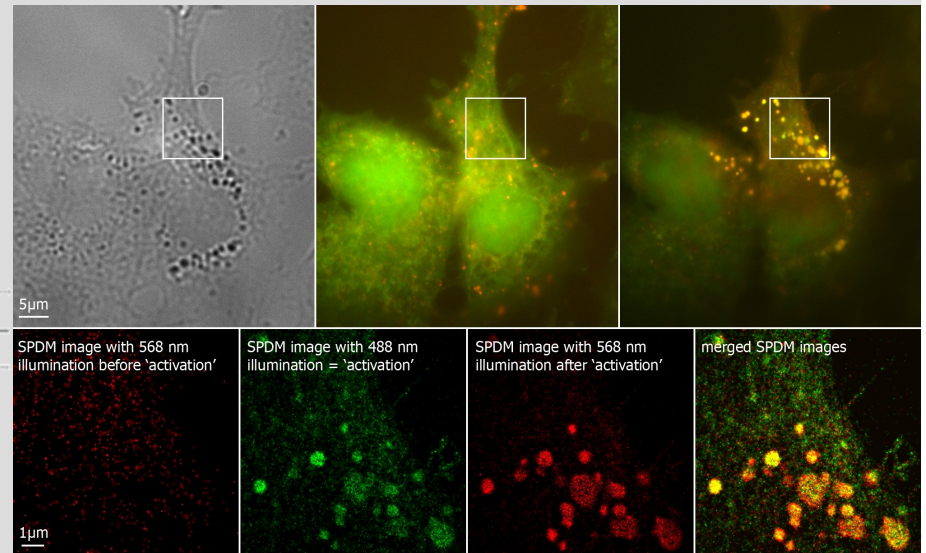
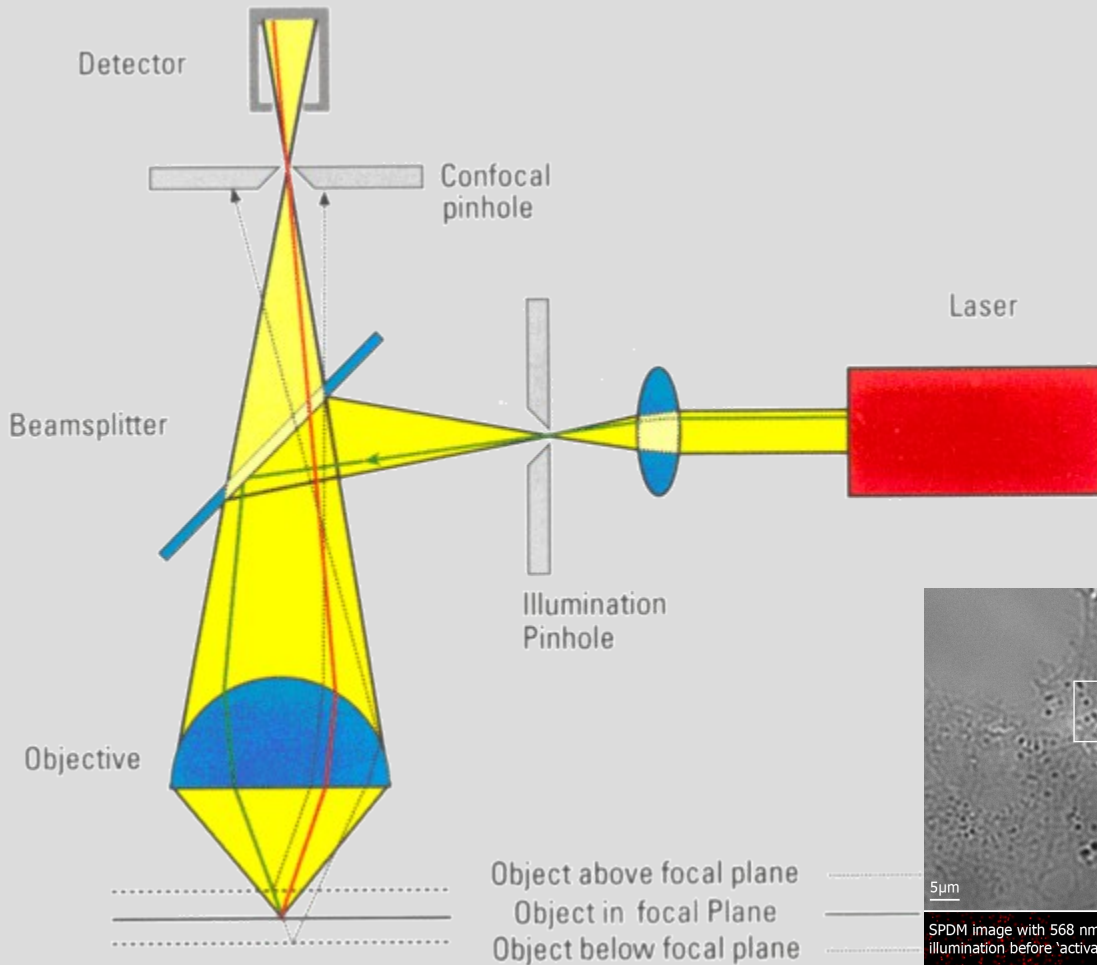
inkohärente Abbildung

$$l'_{\min} = \frac{1,22 \lambda}{NA'}$$

kohärente Abbildung



Das Konfokal-Mikroskop



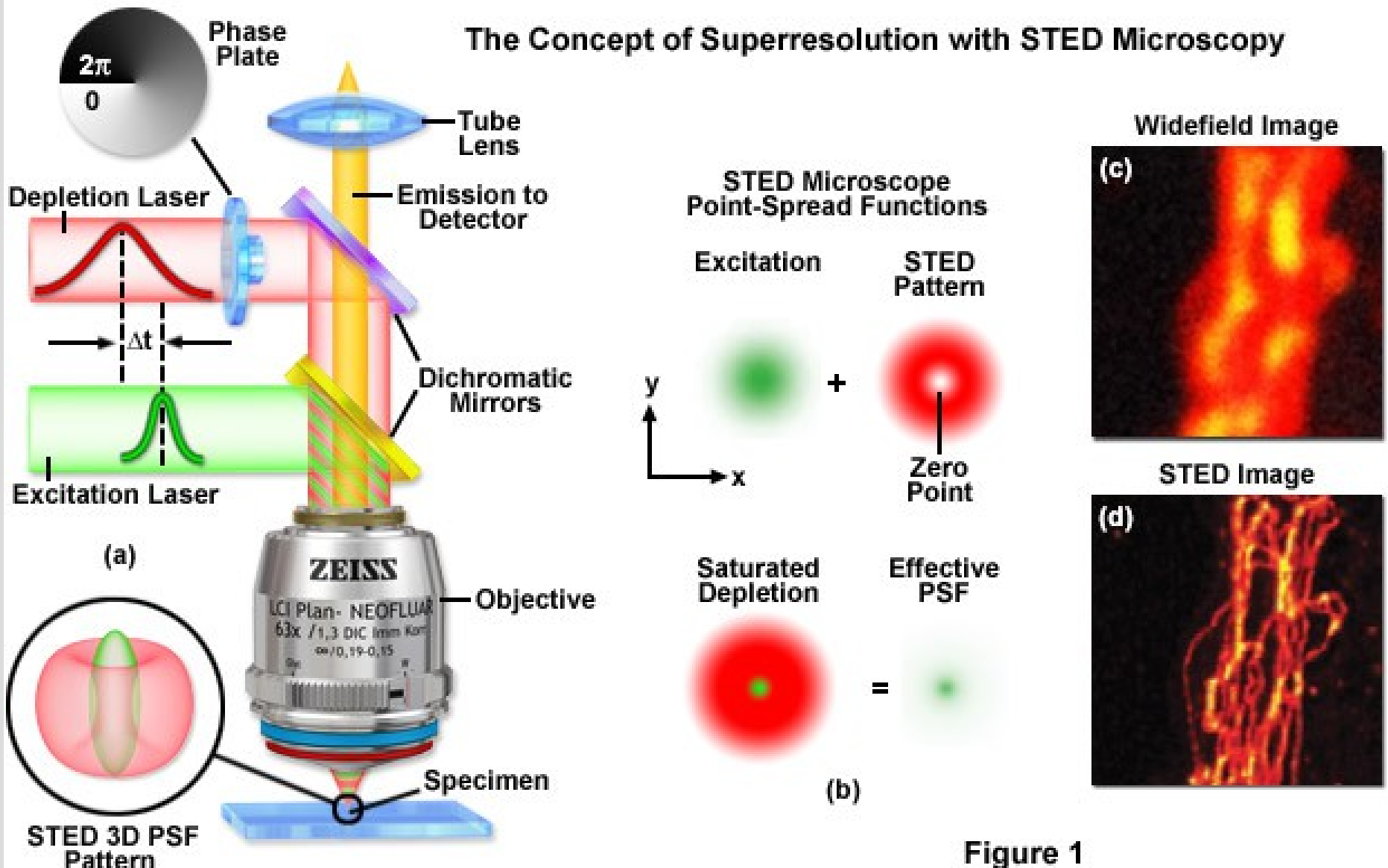
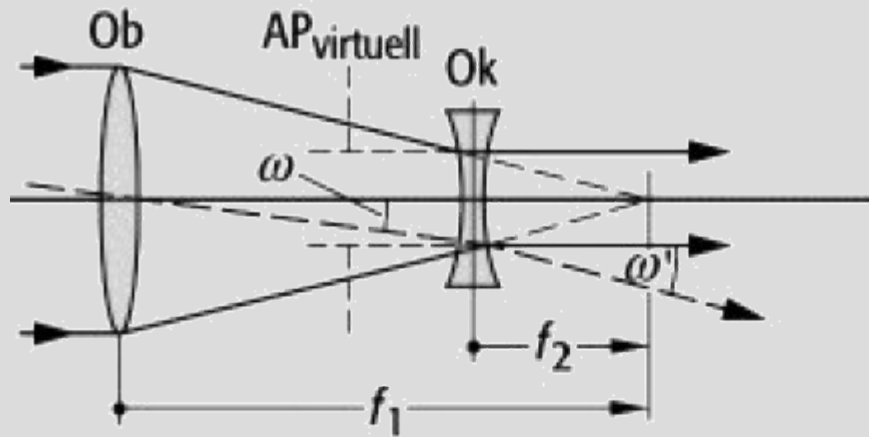
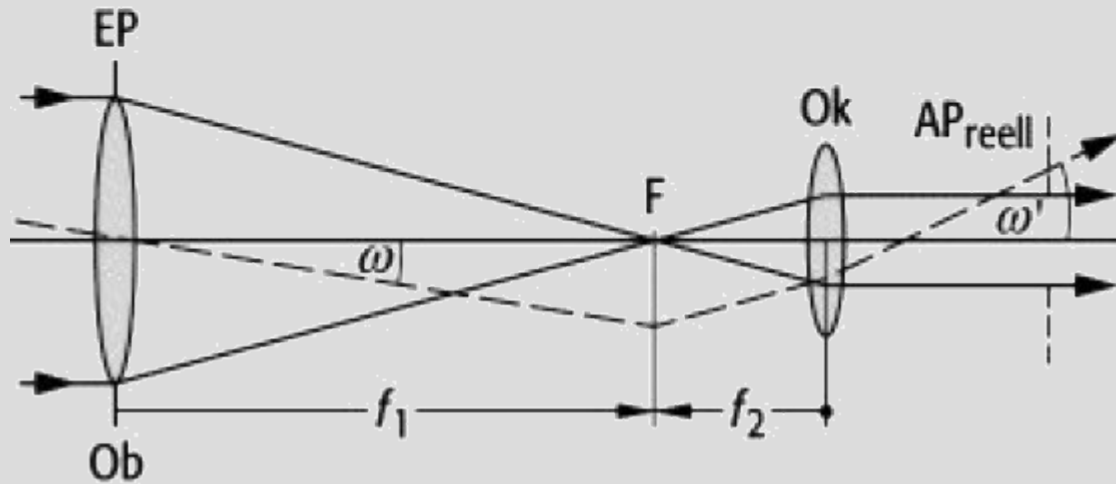


Figure 1



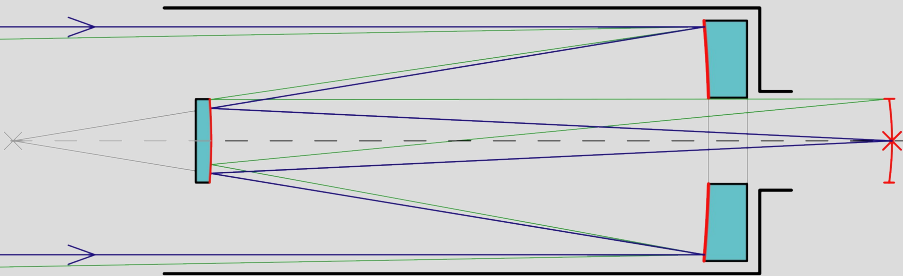
a

Fernrohr Aufbau nach
Galilei

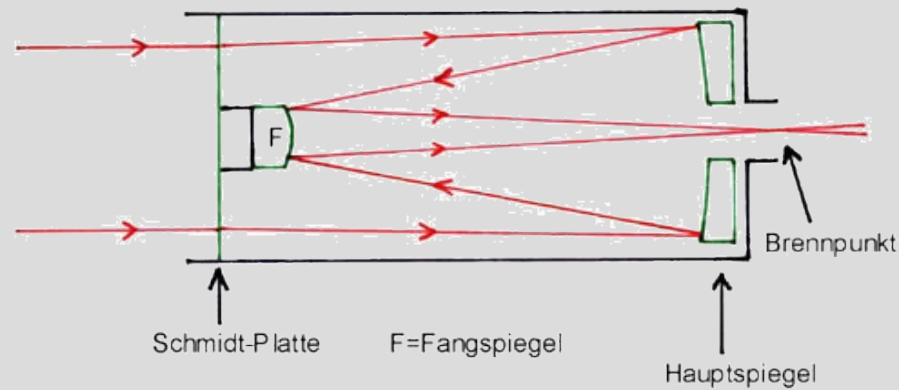


b

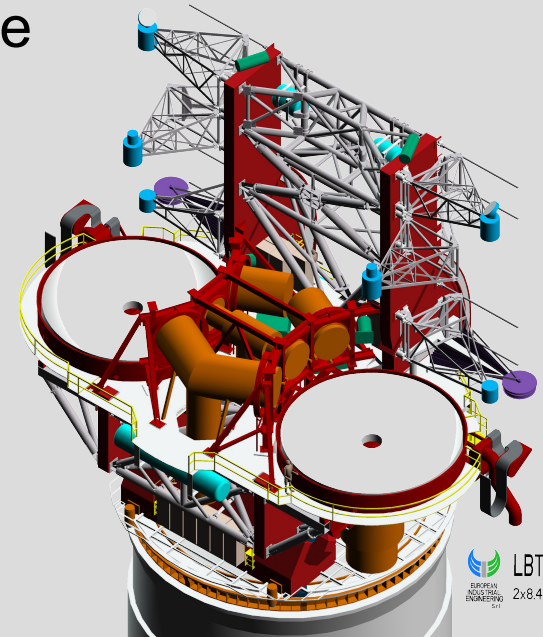
Kepler



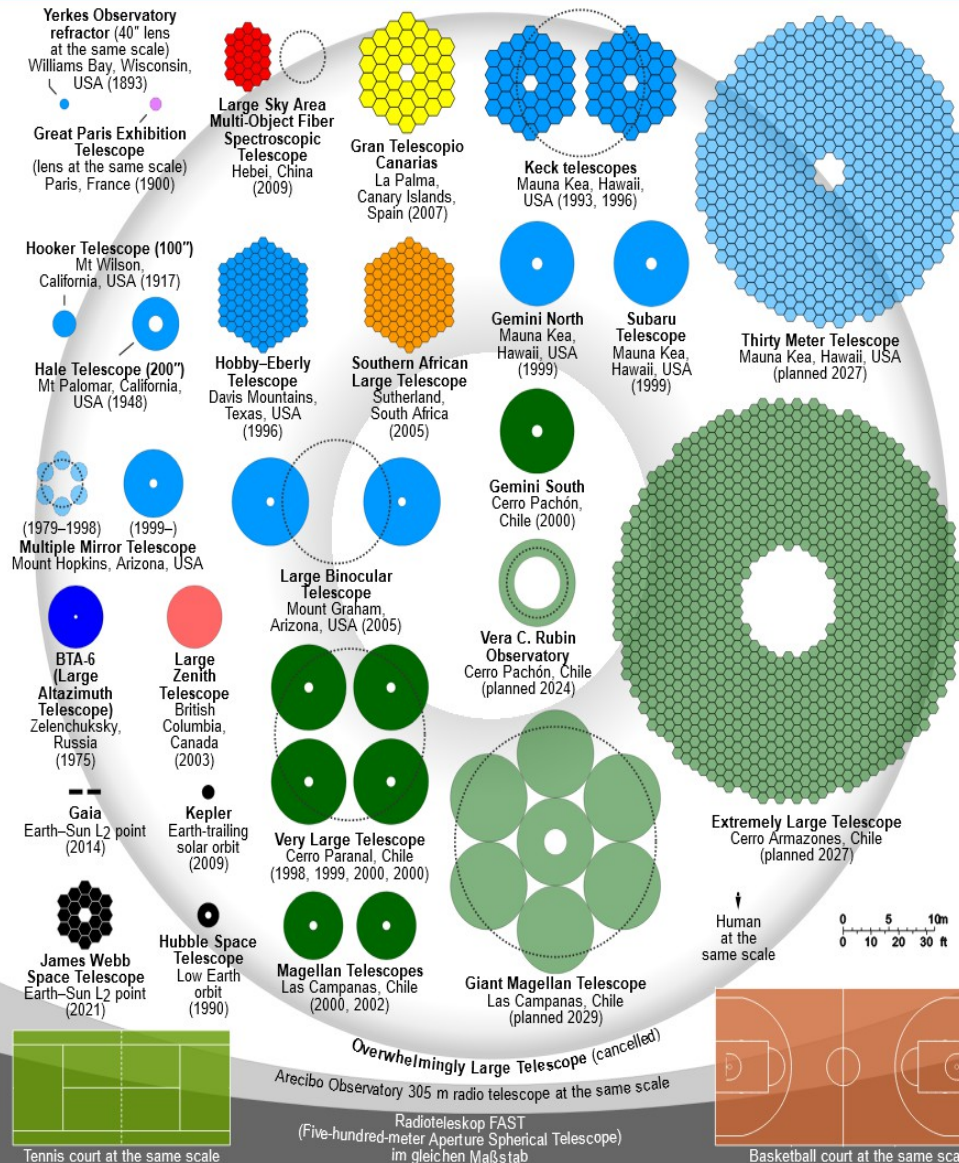
Fernrohraufbau
nach
Cassegrain

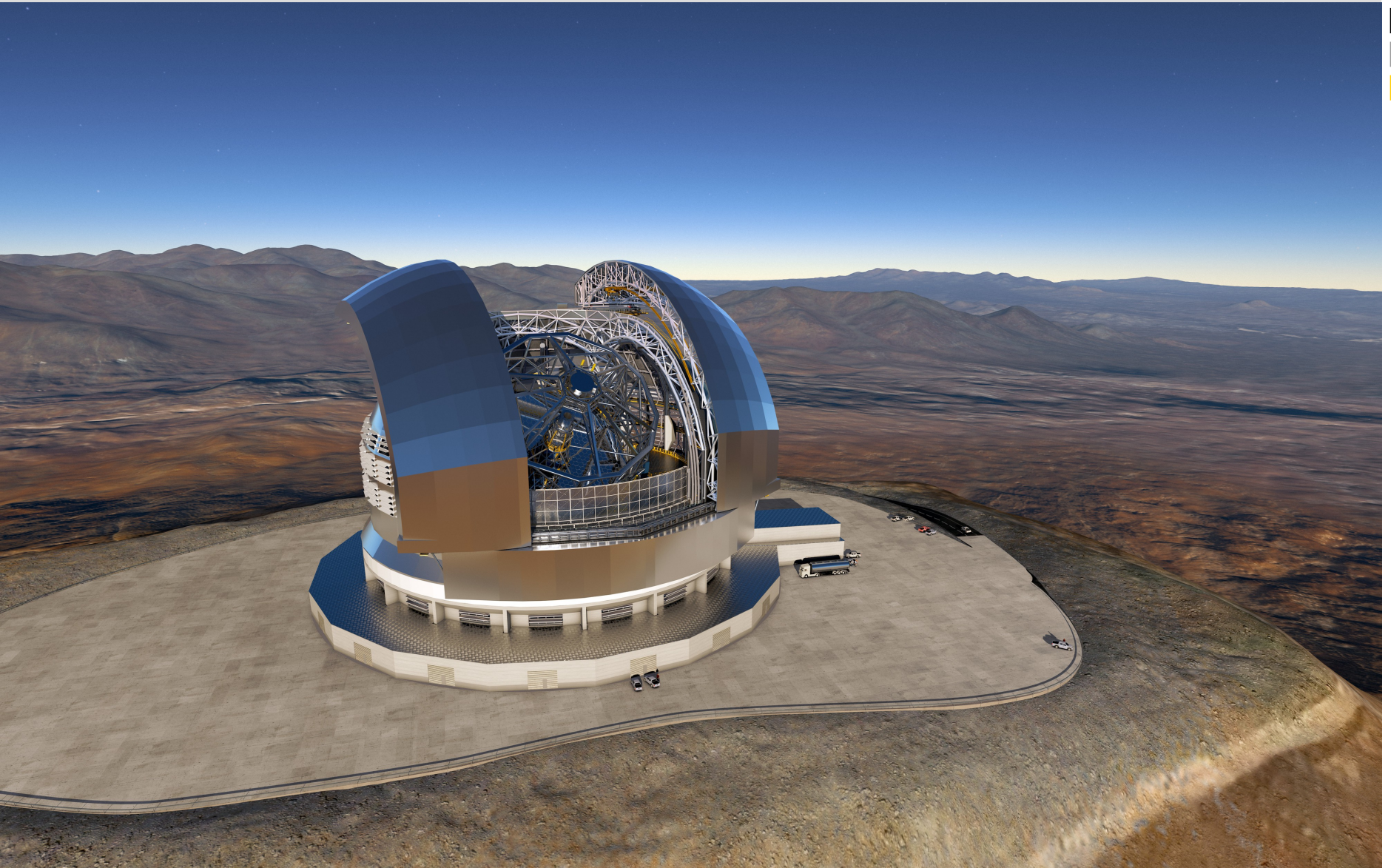


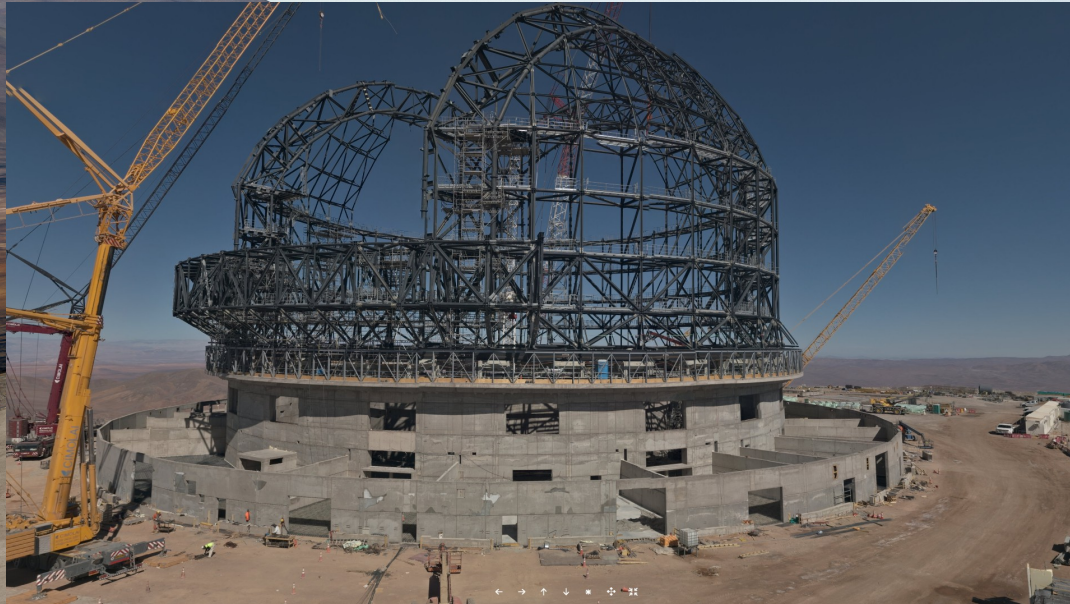
mit Schmidtscher
Phasenplatte



Große Teleskope







Ende von Teil 3

**Vielen Dank
für Ihre Aufmerksamkeit!**

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