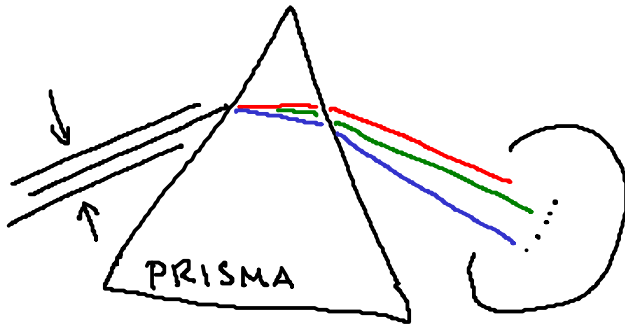
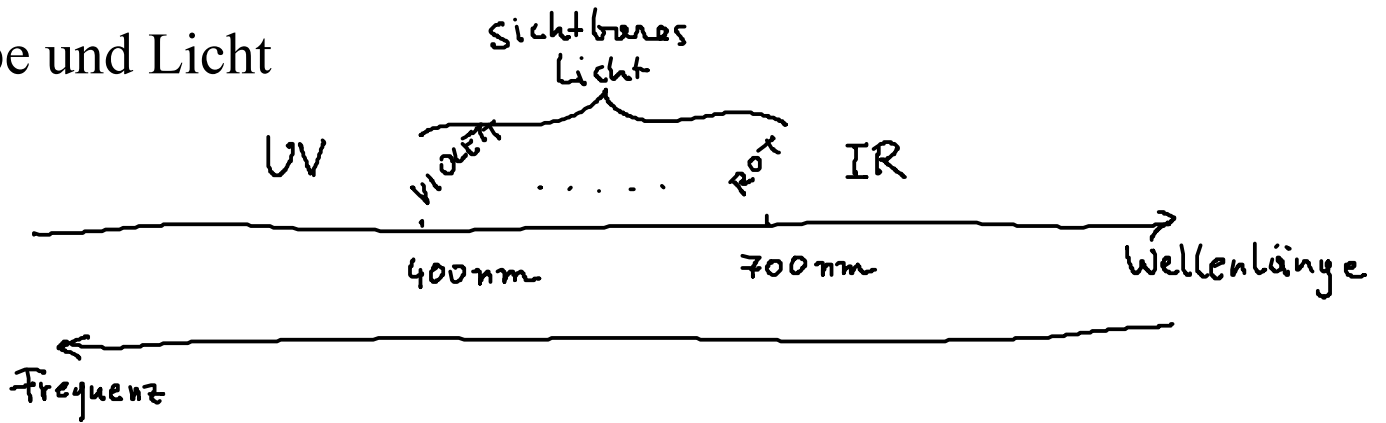
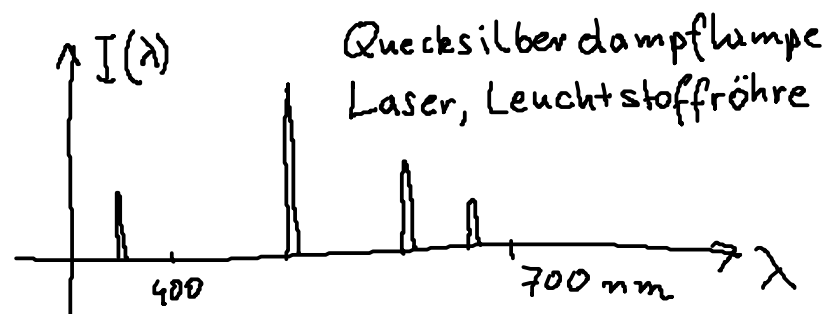
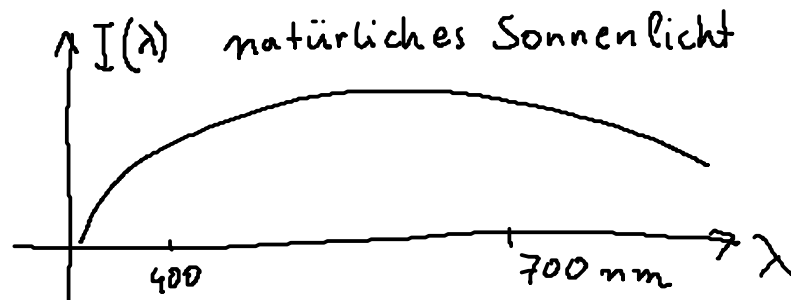
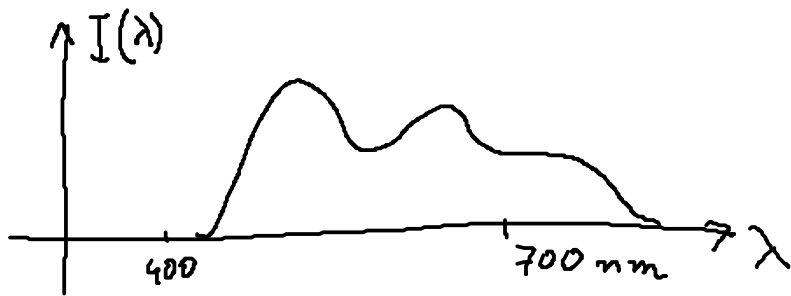


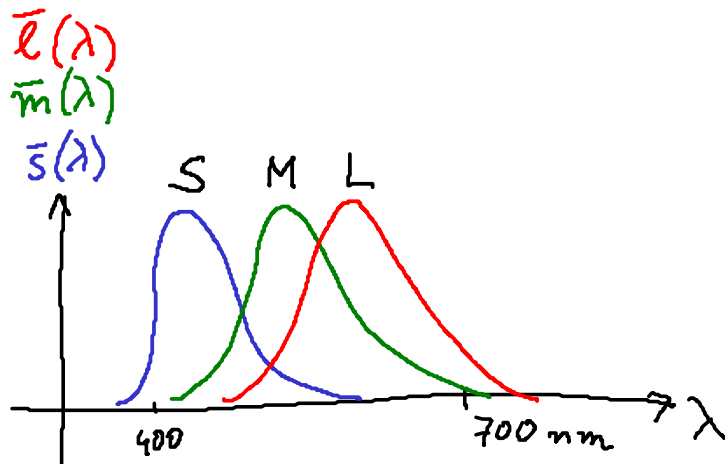
Farbe und Licht



Spektrum an der Schrankwand



drei Arten von Zapfen (engl. cones)



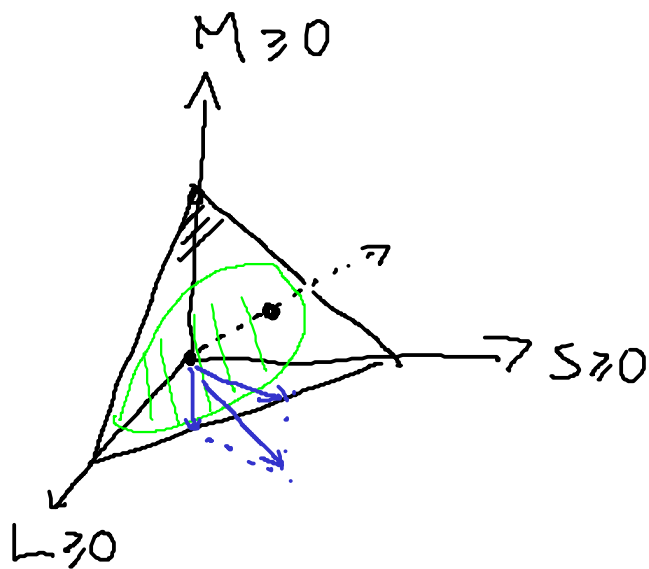
$$S = \int I(\lambda) \bar{s}(\lambda) d\lambda$$

$$M = \int I(\lambda) \bar{m}(\lambda) d\lambda$$

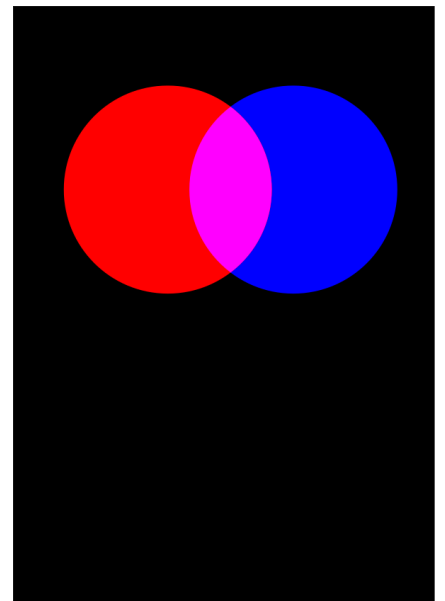
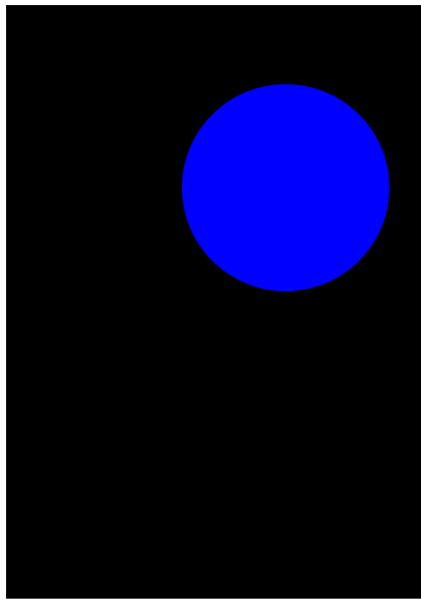
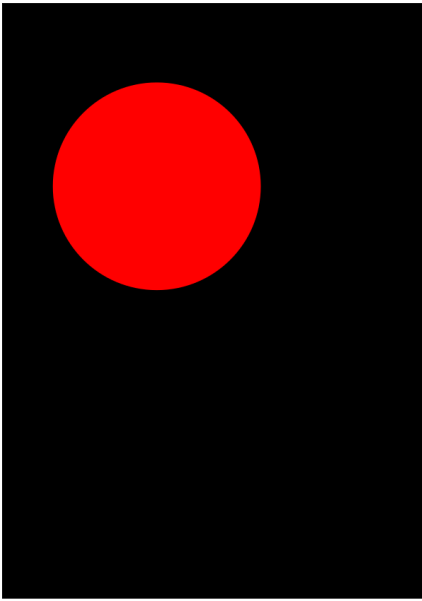
$$L = \int I(\lambda) \bar{l}(\lambda) d\lambda$$

Unsere Farbwahrnehmung ist durch die 3 „Messwerte“ S, M, L bestimmt.

Der Raum unserer Farbwahrnehmung ist dreidimensional.



Additive Farbmischung

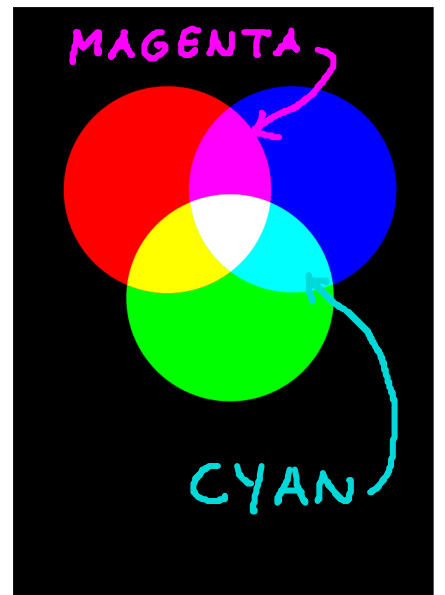
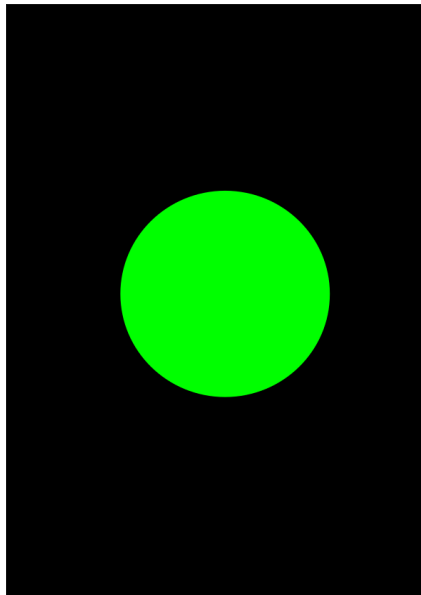


(S_1, M_1, L_1)

(S_2, M_2, L_2)

↓

~~$(S_1+S_2, M_1+M_2, L_1+L_2)$~~



$0,3 (S_1, M_1, L_1)$
 $+ 0,7 (S_2, M_2, L_2)$

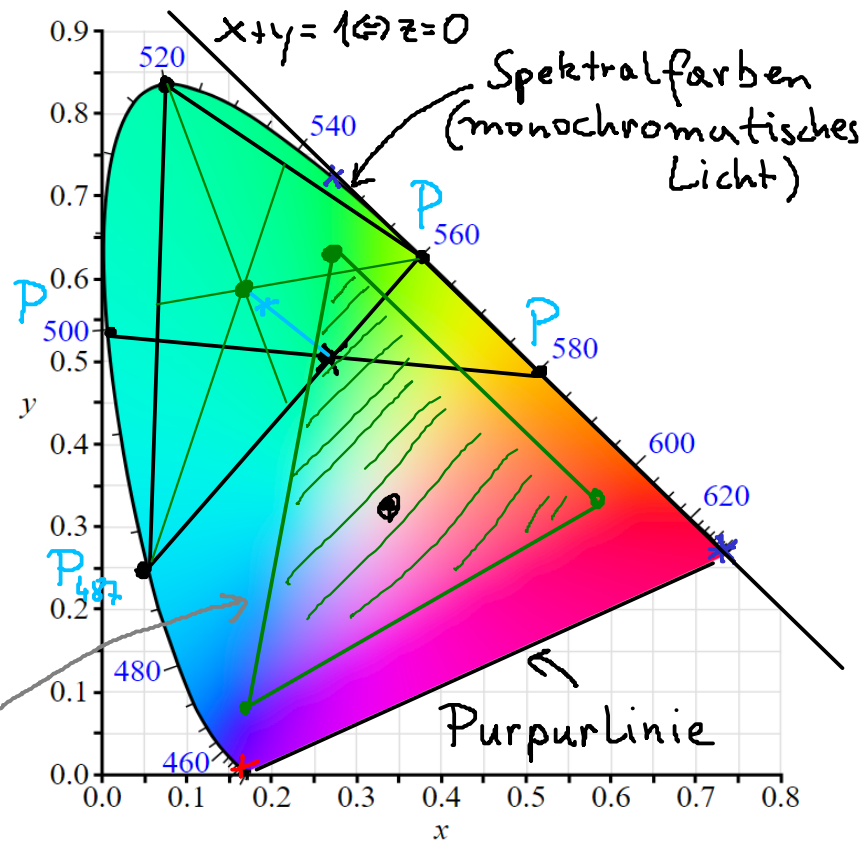
↑
30% Anteil von (S_1, M_1, L_1) gemischt mit
70% Anteil von (S_2, M_2, L_2) .

Der CIE-xyz Farbraum von 1931

- metamere Farben

$$0,45 P_{500} + 0,55 P_{580} = 0,69 P_{560} + 0,31 P_{487}$$

eindeutig bis auf affine Transformationen



<https://commons.wikimedia.org/w/index.php?curid=7889658>

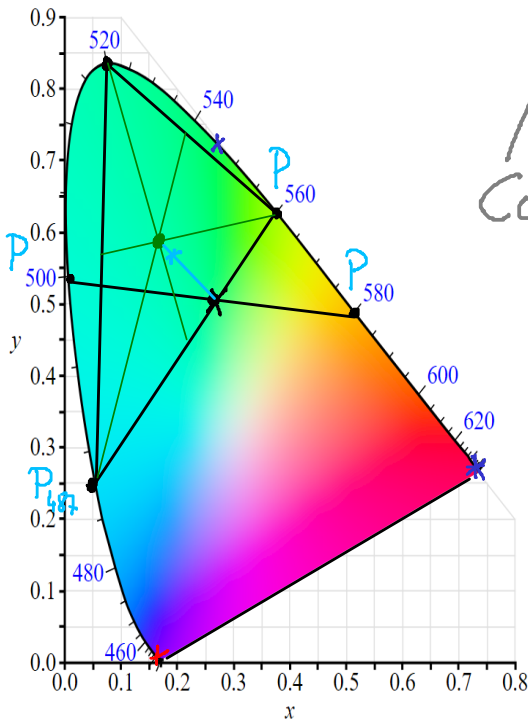
Color gamut (darstellbarer Farbbereich)

$$x, y \geq 0 \quad z, \quad x+y+z=1$$

$$z = 1 - x - y \geq 0$$

$$x = y = \frac{1}{3} = z : \text{weiß}$$

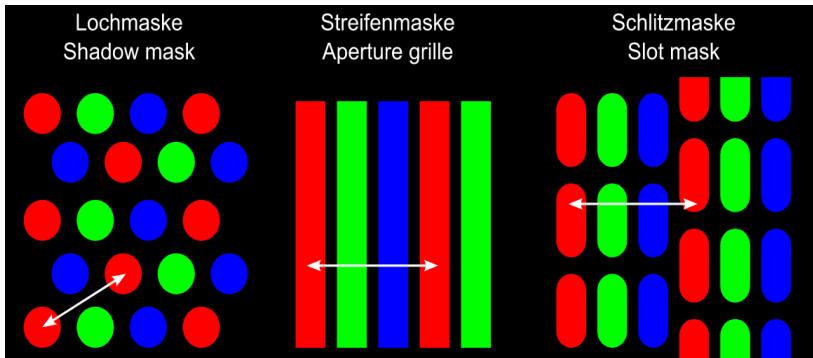
y ... Helligkeit



CIE = Commission internationale de l'éclairage

Bildschirmfarben : additive Farbmischung

Grundfarben: Rot, Grün, Blau (RGB)



Von Philipp M. Moore - Eigenes Werk, Gemeinfrei,
<https://commons.wikimedia.org/w/index.php?curid=9646497>

RGB-Farbraum

$$0 \leq r, g, b \leq 1$$

