

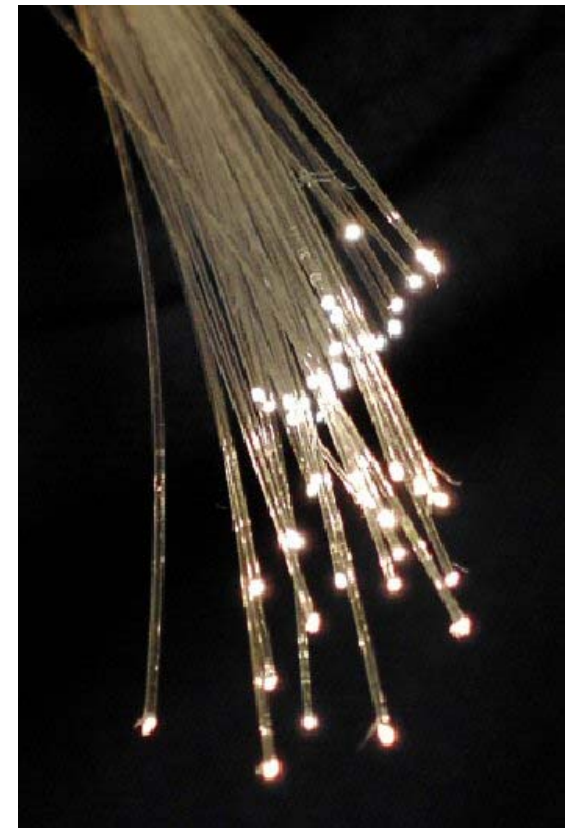
The background features six light purple circles arranged in two rows. The top row has three circles, and the bottom row has three circles. The circles are of varying opacities and are partially overlapping. The title 'Lichtwellenleiter' is centered over the top row of circles, and the author's name 'Bernhard Wintersperger' is centered over the bottom row of circles.

Lichtwellenleiter

Bernhard Wintersperger

Allgemeines

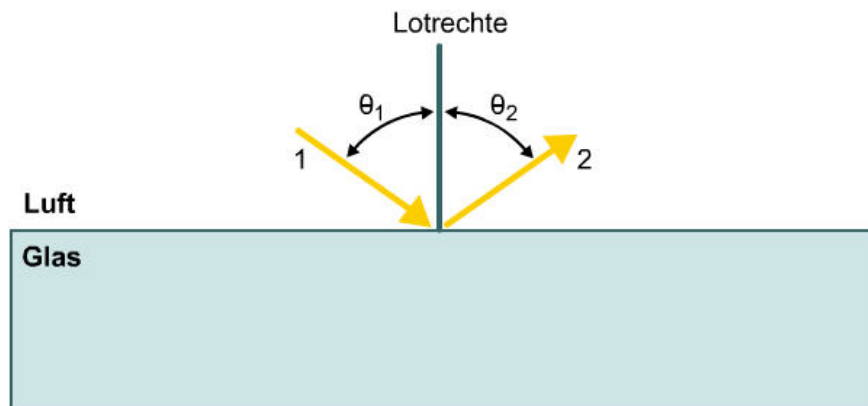
- Leitung zur Übertragung von Licht
- Mineralglas, Quarzglas, Kunststoff
- Anwendungen:
 - Glasfaserkabel
 - Lichtleitkabel
 - Beleuchtungen
 - Messtechnik



Physikalische Grundlagen

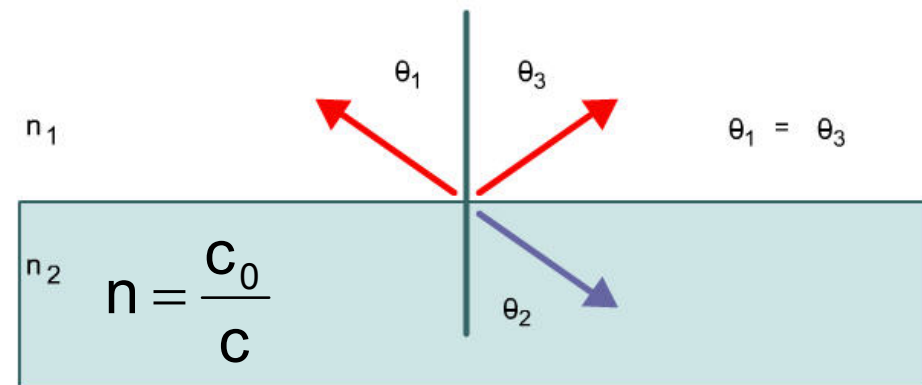
- Reflexion

$$\theta_1 = \theta_2$$



- Brechung

$$n_1 \cdot \sin(\theta_1) = n_2 \cdot \sin(\theta_2)$$



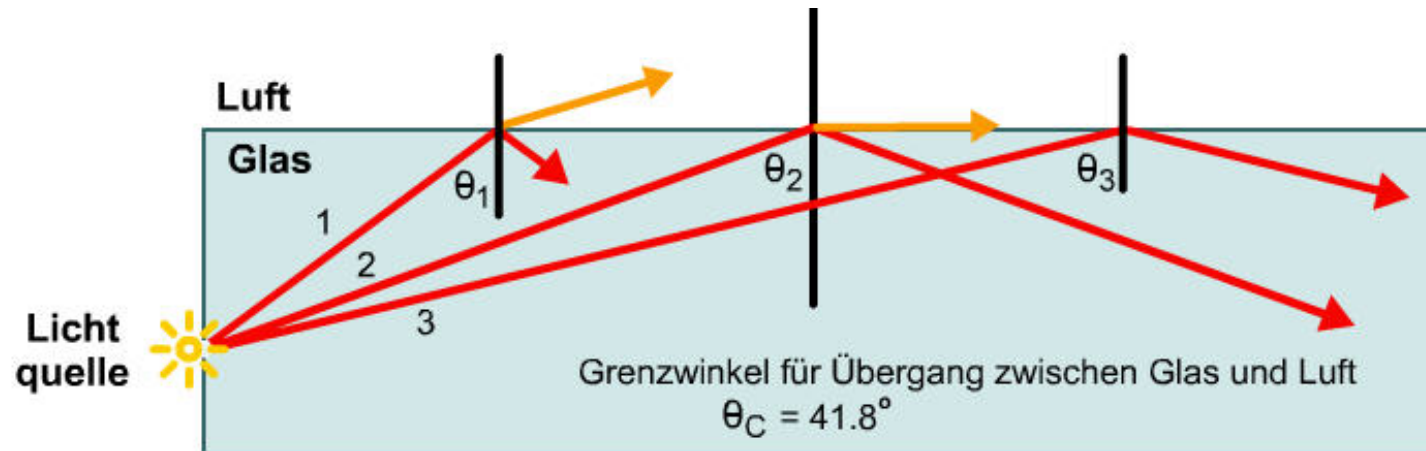
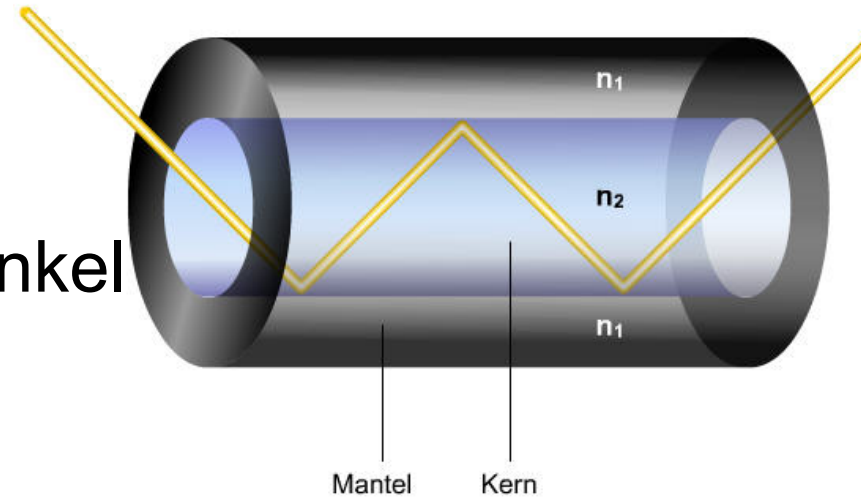
Physikalische Grundlagen

- Totalreflexion

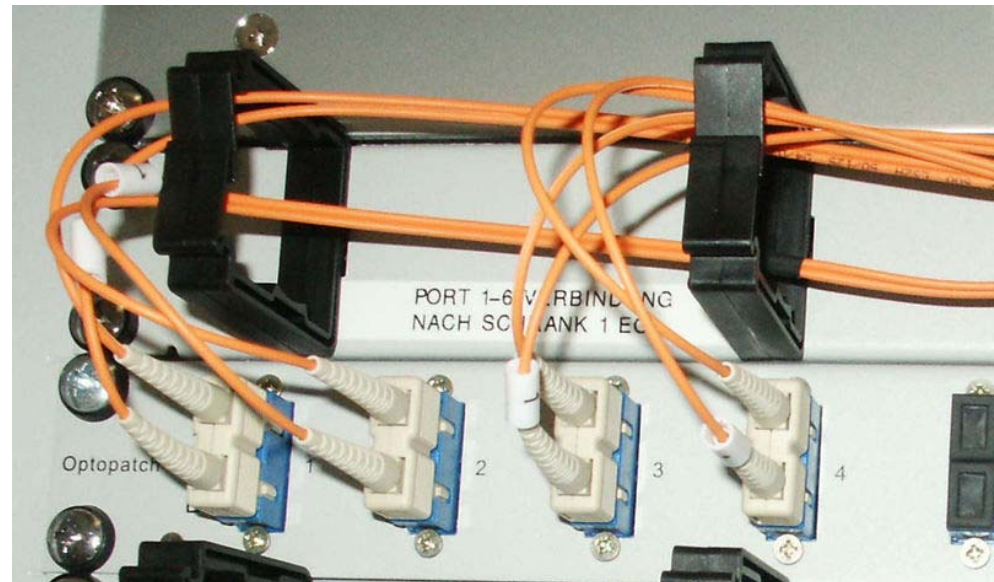
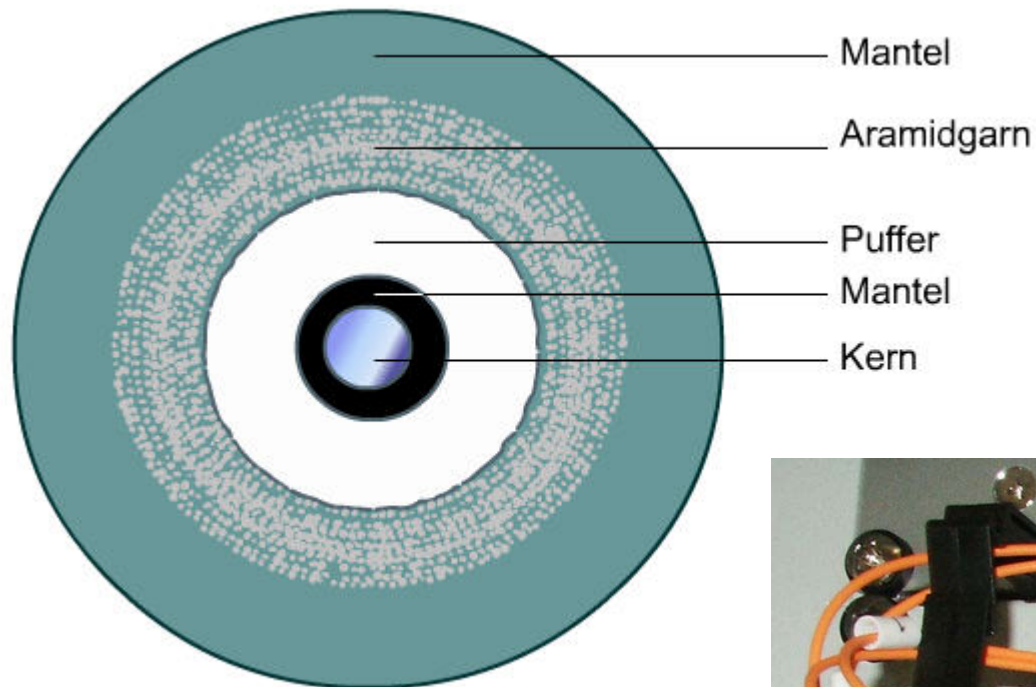
- $n_2 > n_1$

- Einfallswinkel $>$ Grenzwinkel

- Numerische Apertur



Aufbau eines Glasfaserkabels



Single- und Multimode Fasern

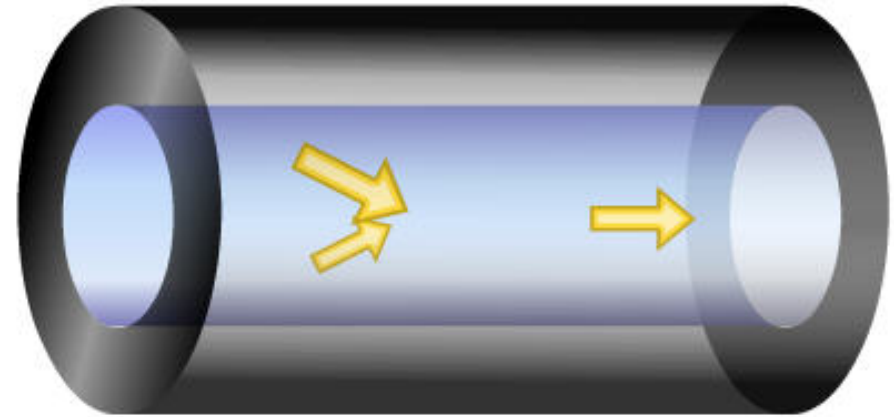
Multimode:

- 50, 62,5 μm Kern
- Mehrere Wege (Moden) des Lichts möglich.
- höhere Dispersion

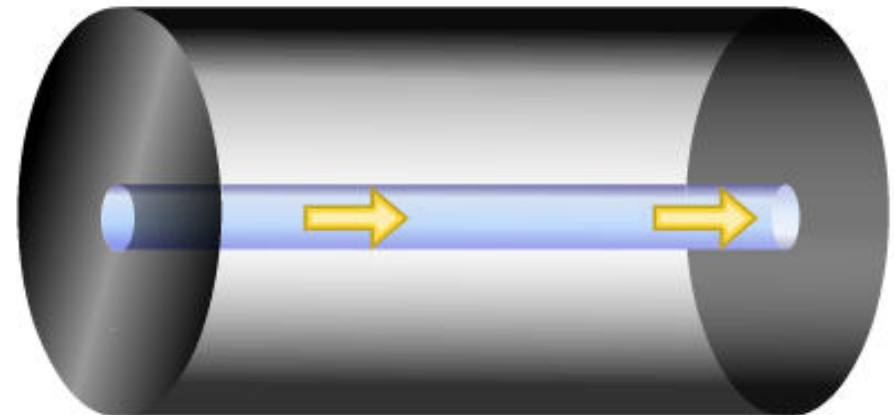
Singlemode:

- 8,3 – 10 μm Kern
- Nur ein Weg für das Licht möglich.
- geringere Dispersion

Multimode-Faser

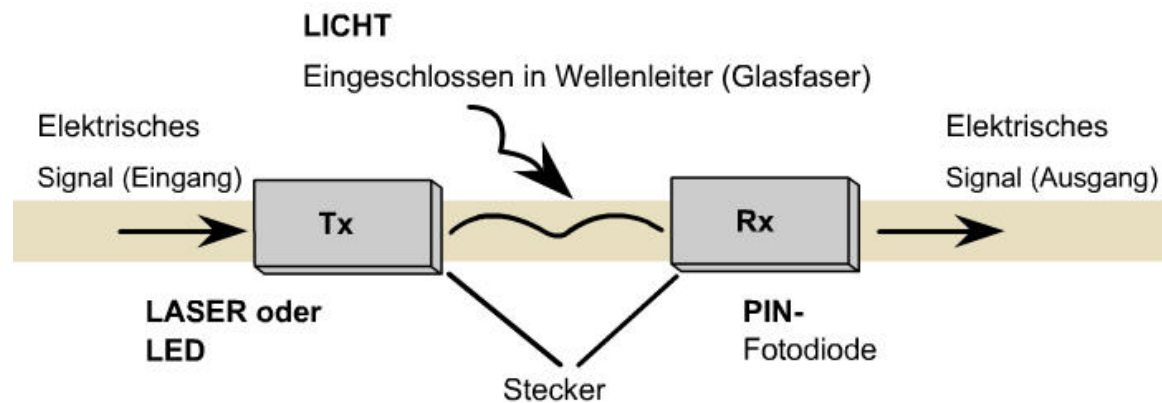


Einmodenkabel

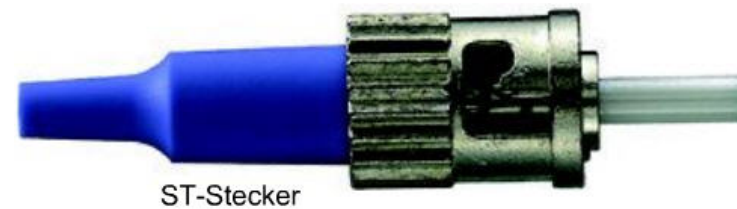


Signalverlauf

- Elektrisch – Licht – Elektrisch

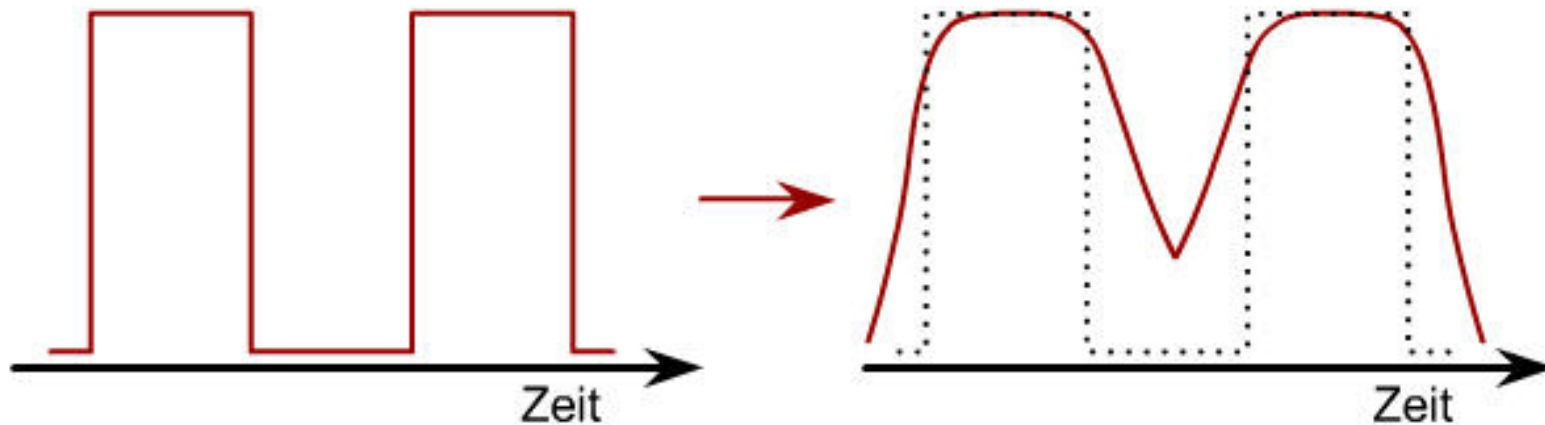


- Steckverbindungen



Störungen

- Keine äußeren Störeinflüsse möglich
- Chromatischen Dispersion
 - Ausweitung des Lichtes
 - Lösung: nur eine Lichtfrequenz

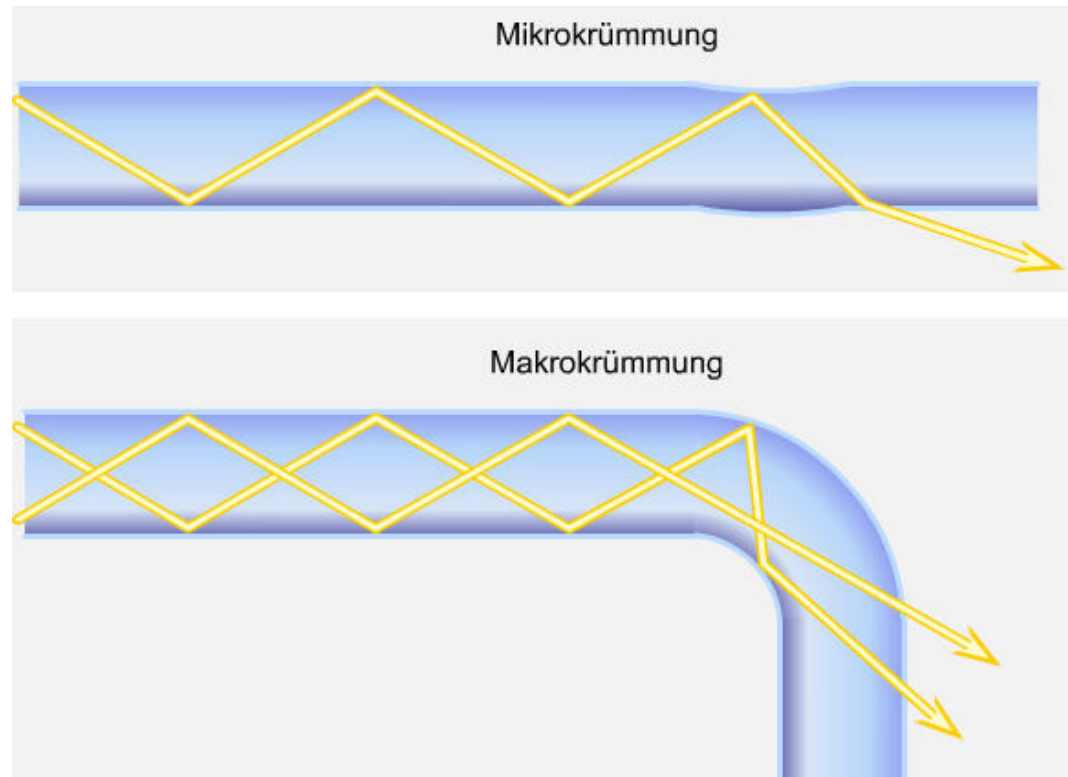


Störungen

- Falsche Installation

- Spleißen

- Stecker



Anwendungen

A decorative graphic at the top of the slide consists of two groups of three circles. The left group has a solid light purple circle on the left, a white circle with a light purple outline in the middle, and a solid light purple circle on the right. The right group has a solid light purple circle on the left, a white circle with a light purple outline in the middle, and a solid light purple circle on the right.

- LAN:
 - Gebäudeverbindungen
 - Backbones
- WAN
 - Unterseekabel
- Audio / Video Bereich
 - TOSLINK

Anwendungen



- Potentialgetrennte Signalübertragung
 - Hochspannungsanlagen
 - Galvanische Trennung
 - Störende Umgebung
- Laser
 - Heranführung an den Wirkungsort
 - mehrere Kilowatt Leistung
- Beleuchtung / Dekoration
 - „Sternenhimmel“

The text is centered and surrounded by six light purple circles. Three circles are arranged in a horizontal row above the text, and three are arranged in a horizontal row below it. The circles are semi-transparent and overlap slightly.

**Vielen Dank für ihre
Aufmerksamkeit!**