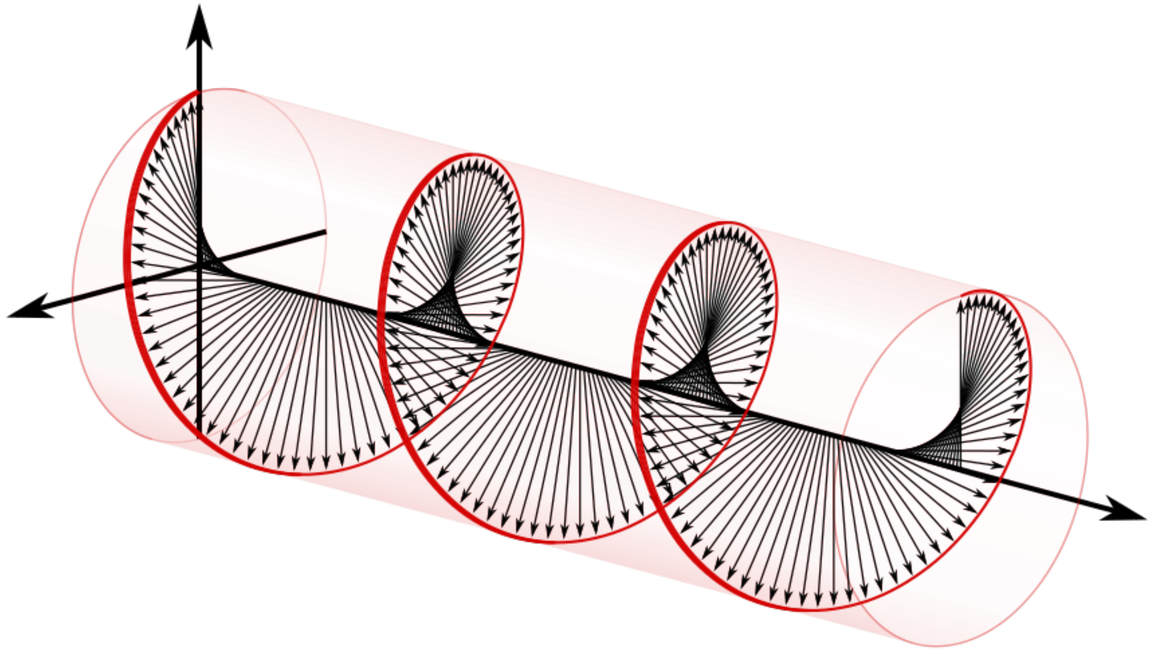
Experimental Physics 3 - Em-Waves,Optics, Quantum mechanics

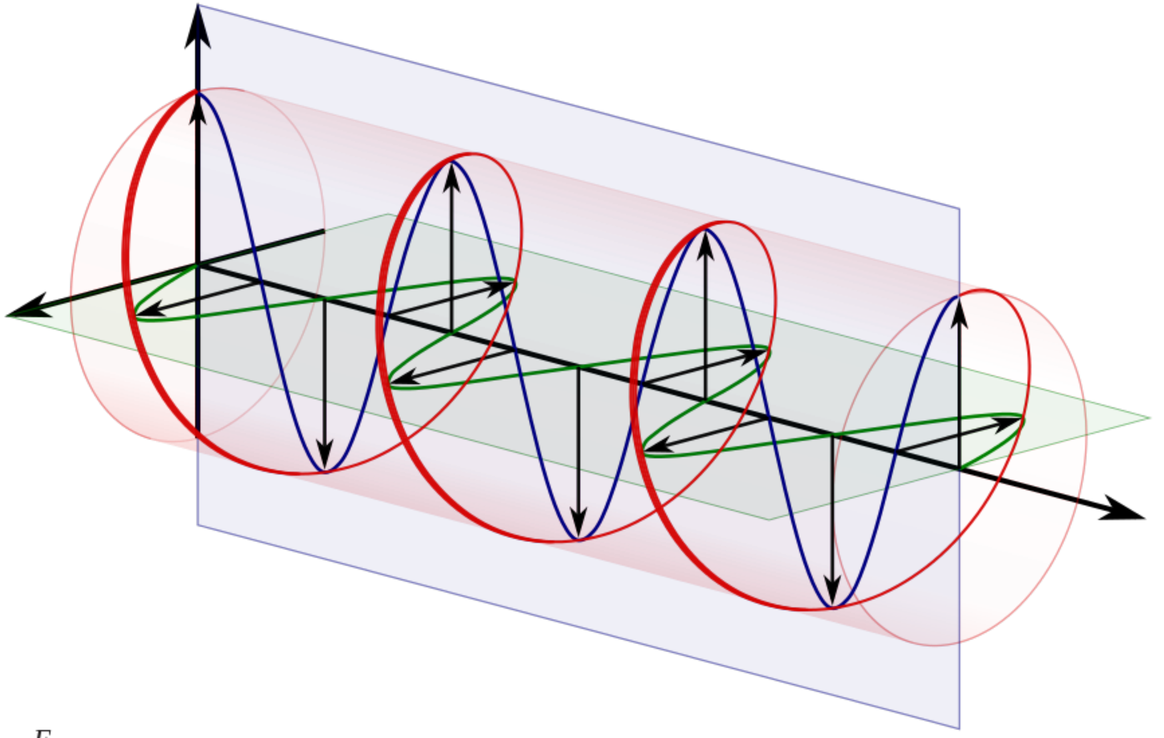
Lecture 16

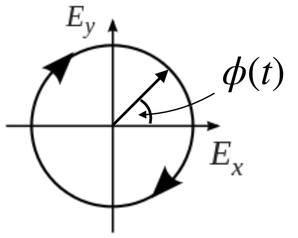
Prof. Dr. Frank Cichos
WS 2020/21

3. Electromagnetic Optics

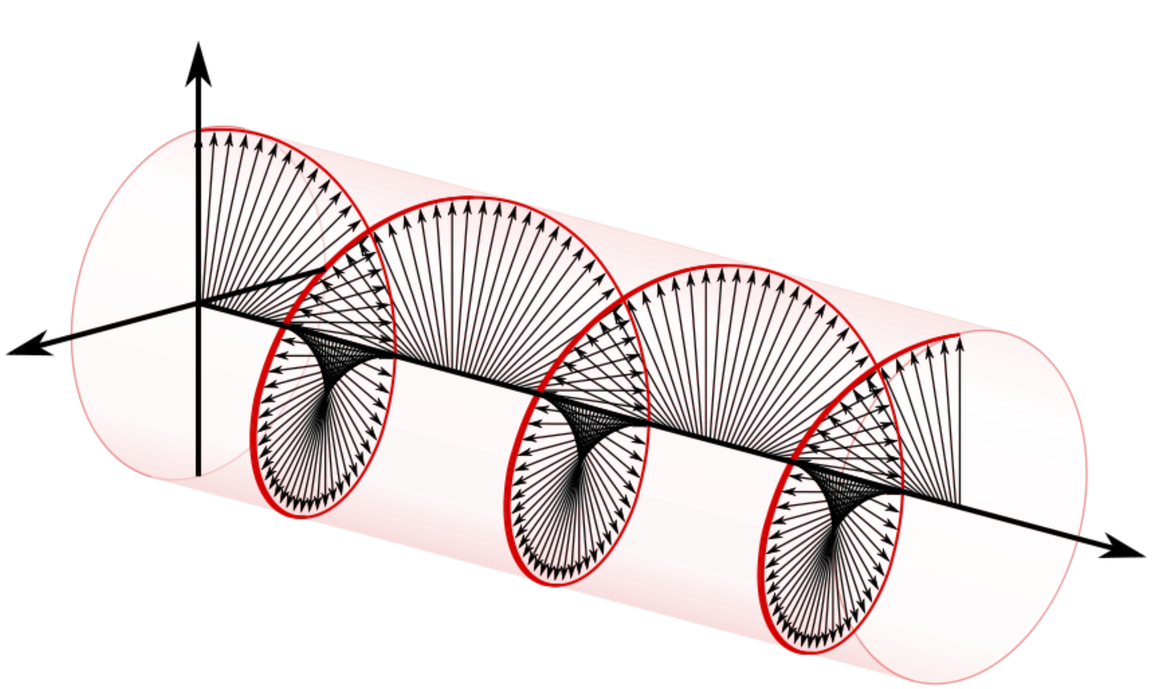
Right Circularly Polarized

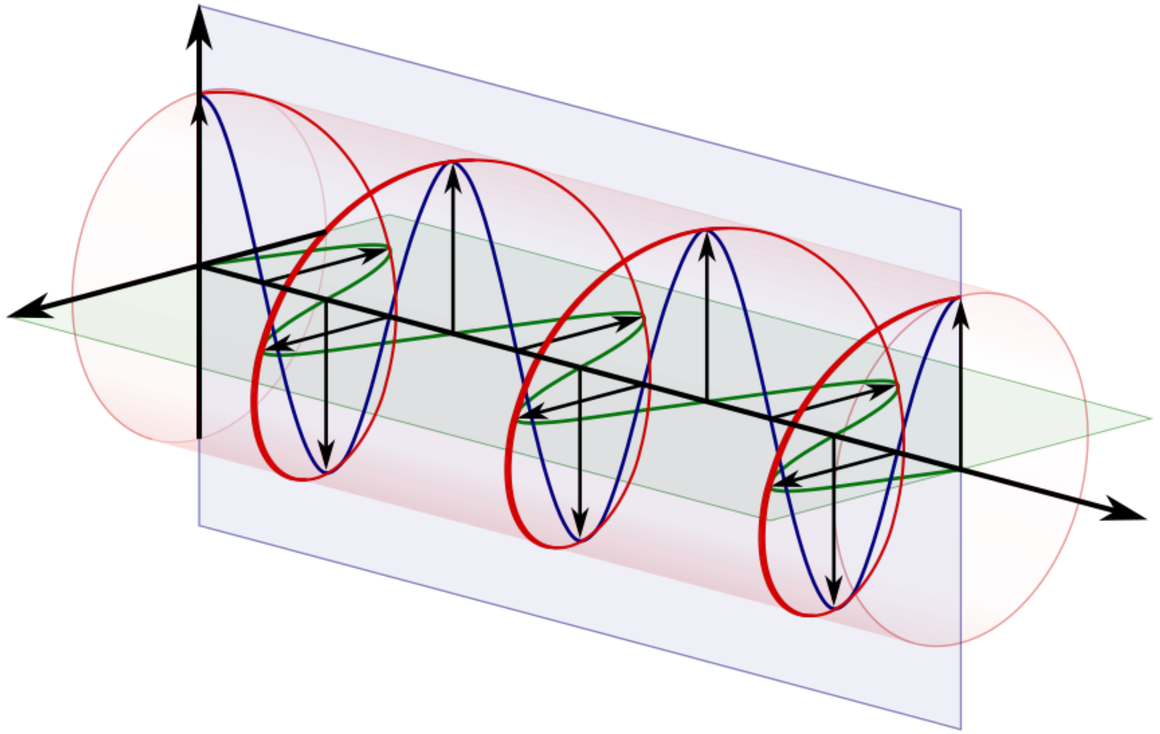


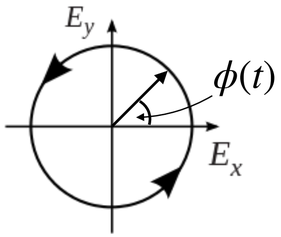




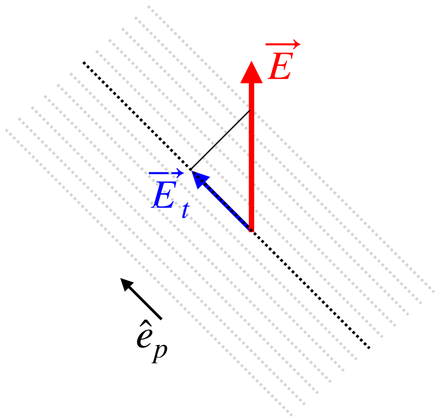
Left Circularly Polarized

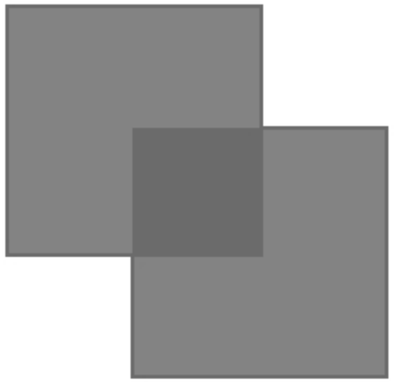




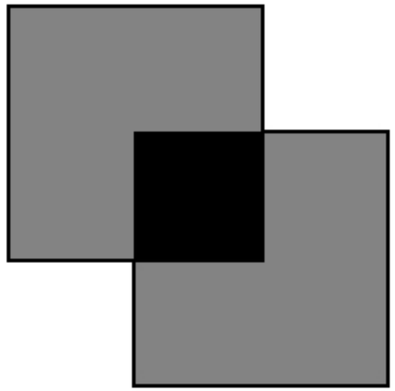


Malu's Law

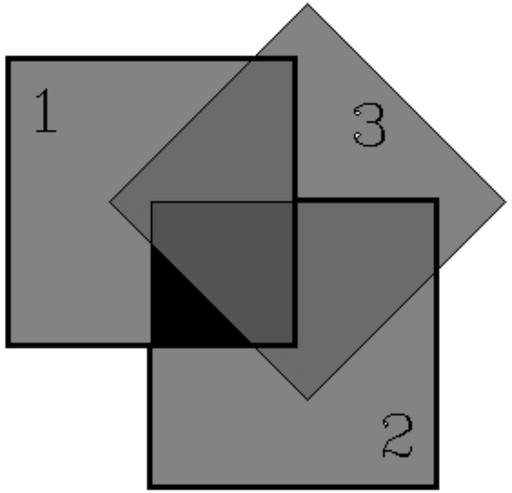




Two polarizers
Parallel orientation



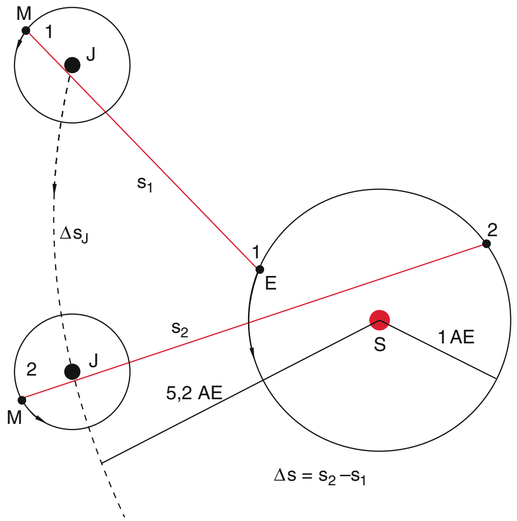
Two polarizers
Orthogonal orientation



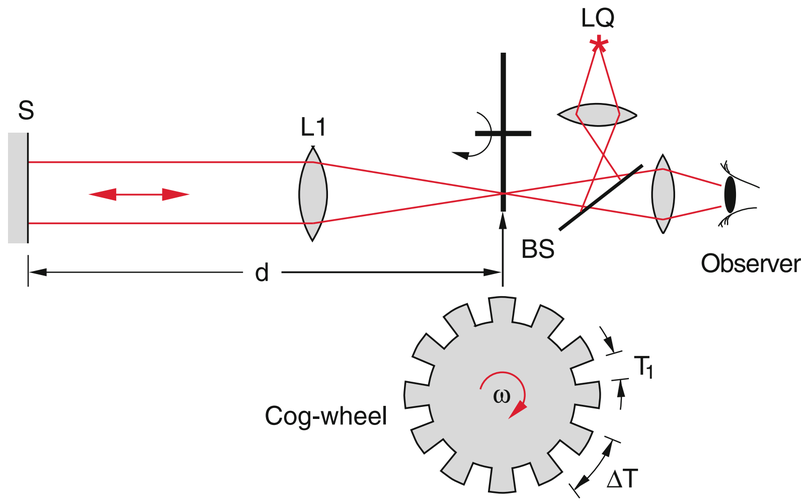
Three polarizers
1 and 2 orthogonal
3 between 1 and 2

Speed of Light Measurement

Astronomical method (Ole Rømer)

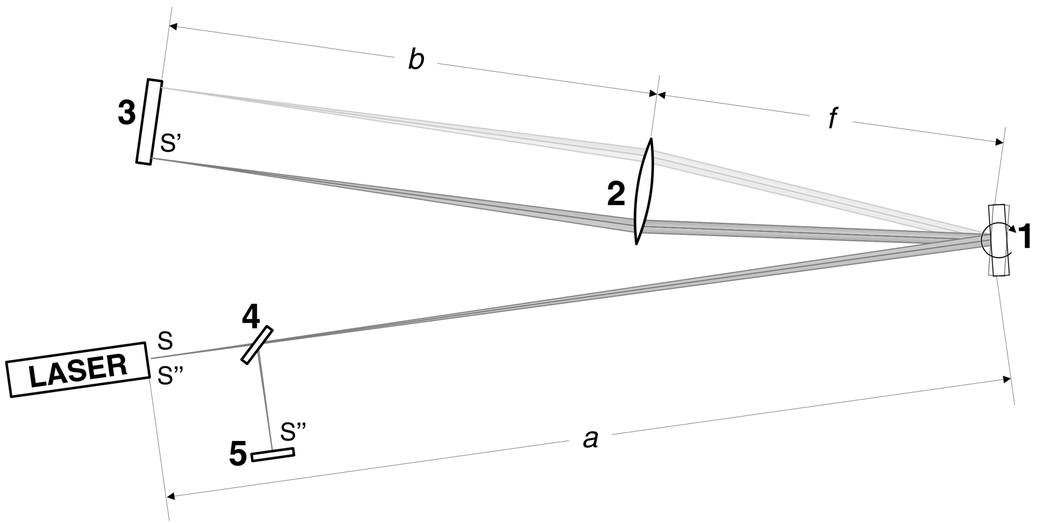


Cogwhell (Fizeau)



Speed of Light Measurement

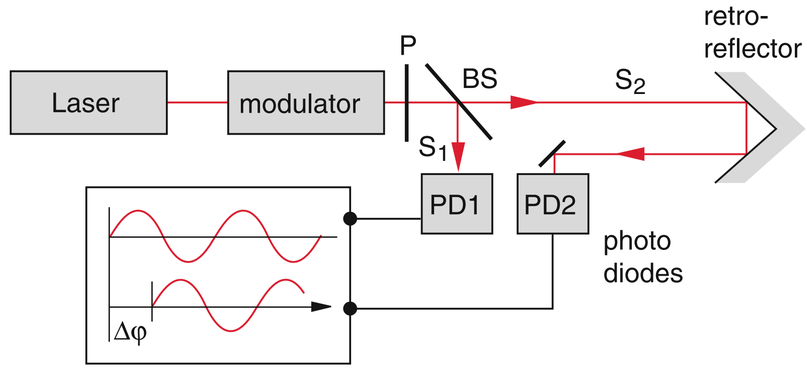
Rotating Mirror (Foucault)



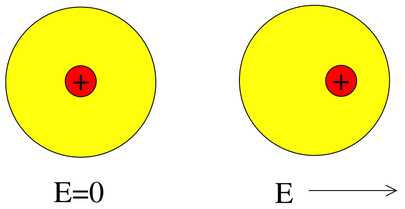
Year	Author	Method	Measured value given in km/s
1677	Ole Rømer	astronomical	finite, no value given
1678	Huygens	Analysis of Romers measurements	220–300 × 10^3
1849	A. Fizeau	cogwheel method	315 000
1862	L. Foucault	rotating mirror method	298 000
1879	A. Michelson	improved rotating mirror technique	299 910
1926	A. Michelson	interferometer	299 791
1950	L. Essen	Microwave cavity	299 792,5
1973	K. Evenson	measurement of wavelength and frequency of a laser transition	299 792,45
seit 1983	–	todays defined fixed value	299 792,458

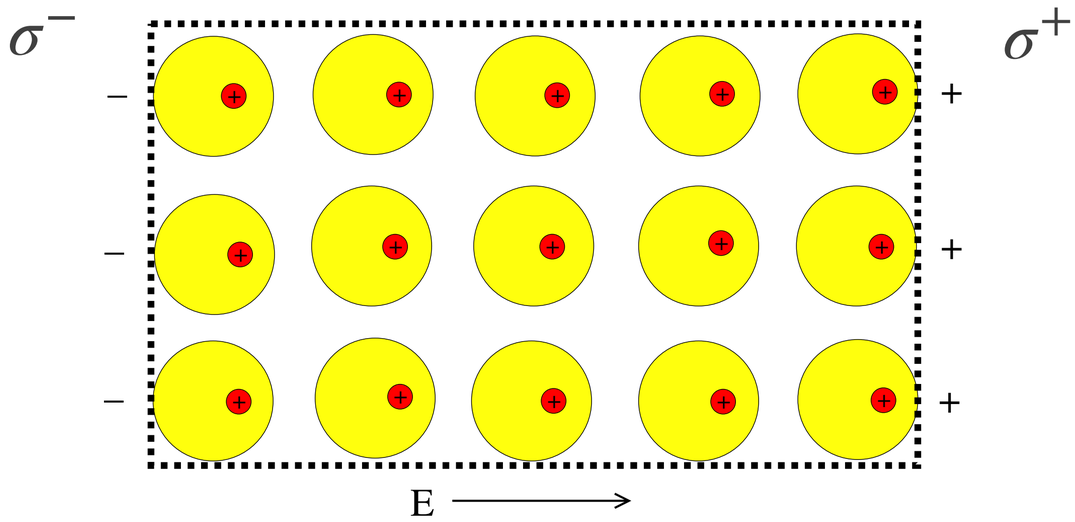
299 792 458 ms^{-1}

Phase Method

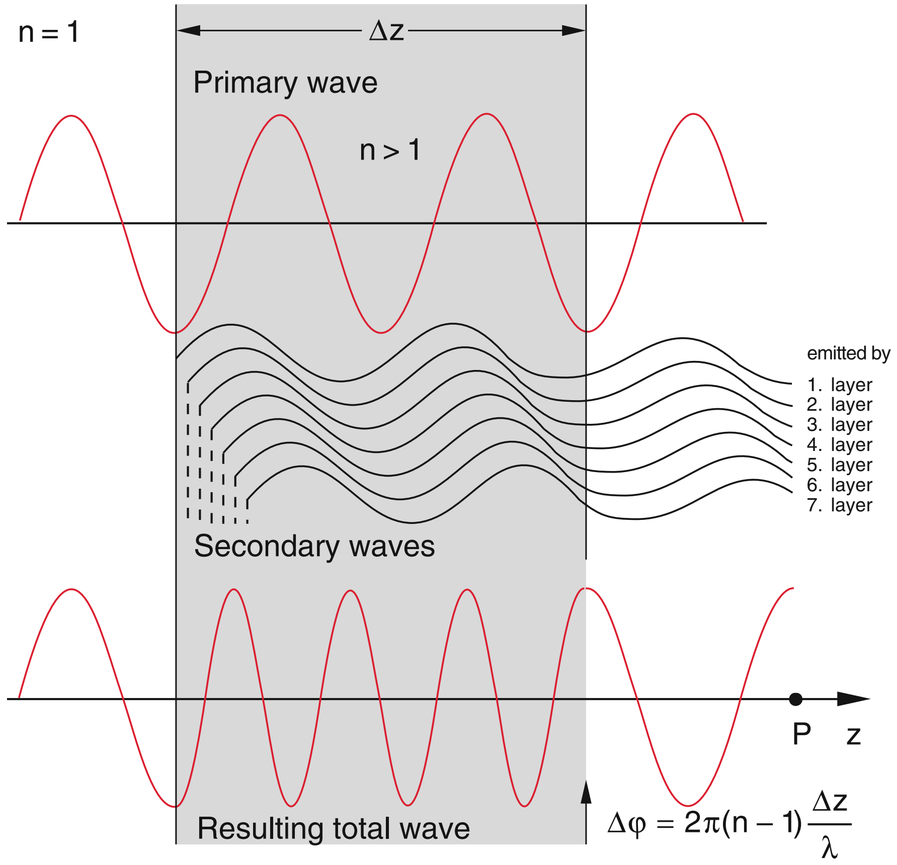


Electric fields in Materials





Effect of Materials



Dispersion and Absorption