

Physik und Musik - Vom Gartenschlauch zur Posaune

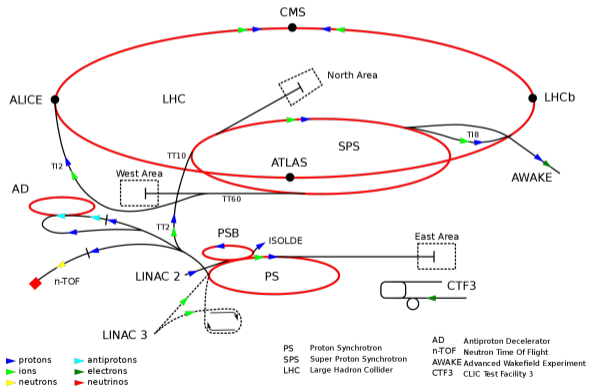
Jörg Pretz



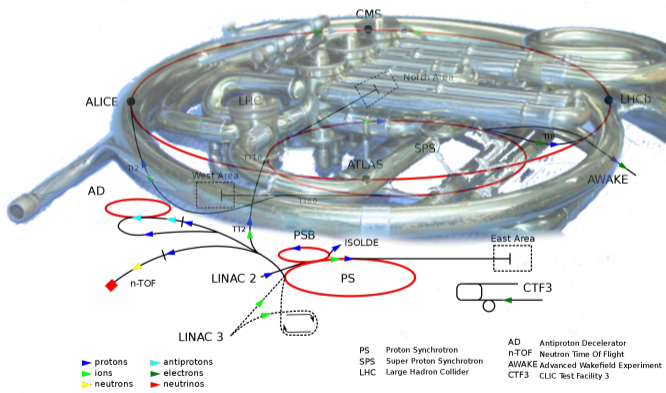
Düsseldorf, Nacht der Wissenschaft, 13. September 2019

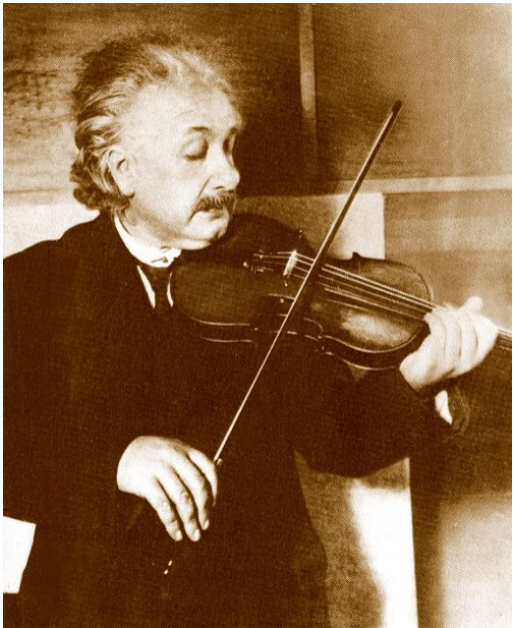


COMPASS



Frequenz, Wellenlänge Harmonische, Resonanz





A SURVEY OF RADIAL VELOCITIES
in the
ZODIACAL DUST CLOUD



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· 2007 ·

(Schall)wellen



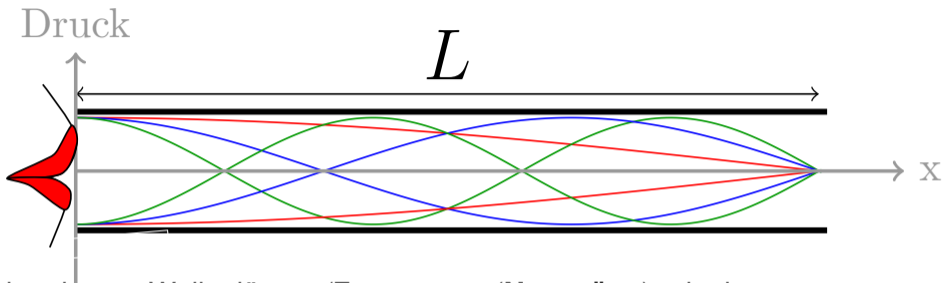
λ (lambda)	Wellenlänge
T	Periodendauer
$f = \frac{1}{T}$	Frequenz

(Schall)wellen

$$c = \lambda \cdot f$$

- Schallgeschwindigkeit
- Wellenlänge
- Frequenz

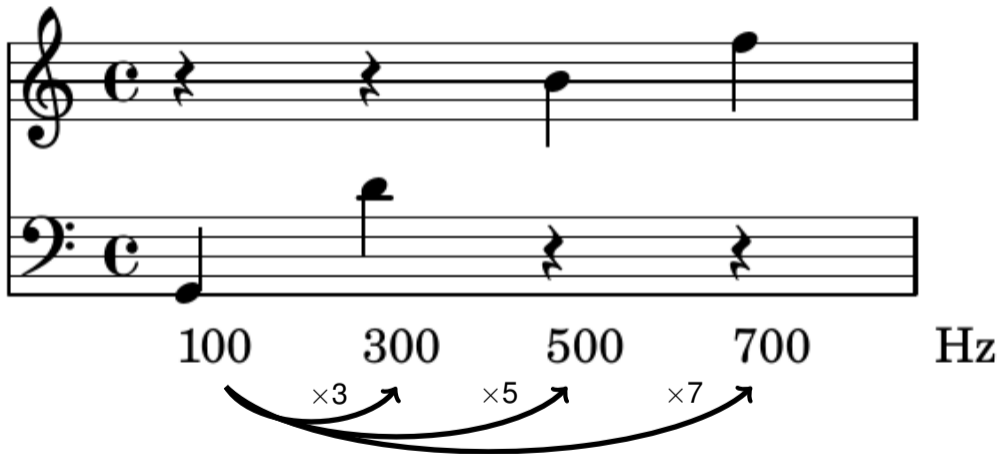
Stehende Wellen



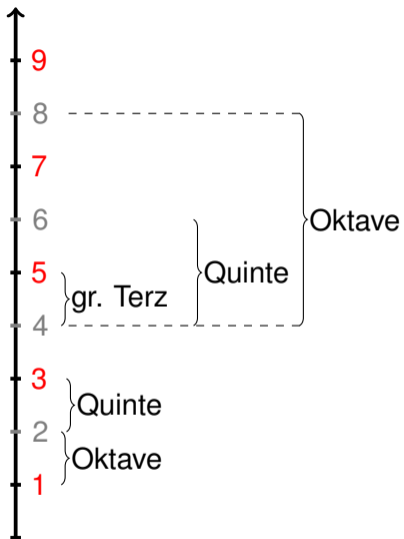
Nur bestimmte Wellenlängen/Frequenzen (**Naturtöne**) erlaubt.
Bedingung: **Knoten** an einem Ende, **Bauch** am anderen Ende.

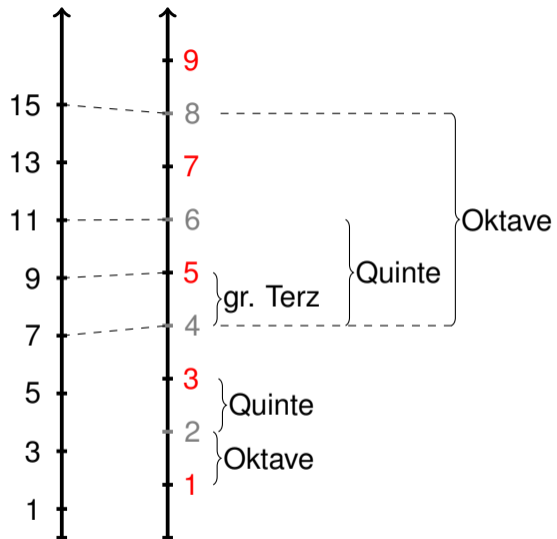
Wellenlänge	Frequenz	$L=86 \text{ cm}, c = 343 \text{ m/s}$
$\lambda = 4L$	$f = \frac{c}{4L}$	= 100 Hz
$\lambda = \frac{4}{3}L$	$f = 3\frac{c}{4L}$	= 300 Hz
$\lambda = \frac{4}{5}L$	$f = 5\frac{c}{4L}$	= 500 Hz

Naturtöne Gartenschlauch (Zylinder)

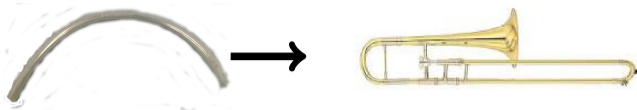








Geschickte Vereinfachungen:



Einfache Grundgesetze:

$$c = \lambda \cdot f$$

Vergleich Theorie ↔ Experiment:

