

### Enakomerno pospešeno gibanje

$$v(t) = v_0 + a_0 t$$

$$v^2 = v_0^2 + 2as$$

$$s = v_0 t + a_0 \frac{t^2}{2}$$

### Poševni met

$$t = \sqrt{\frac{2h}{g}} \quad v_{0x} = v_0 \cos(\alpha)$$

$$v_{0y} = v_0 \sin(\alpha)$$

$$s_x = v_0 \cos(\alpha)t$$

$$s_y = v_0 \sin(\alpha)t - g \frac{t^2}{2}$$

$$v_y = v_0 \sin(\alpha) - gt$$

$$v_x = \text{konst.}$$

### Navpični met

$$v_z = v_0 - gt$$

$$z = v_0 t - g \frac{t^2}{2}$$

### Prosti pad

$$t = \sqrt{\frac{2h}{g}}$$

### Kroženje

$\alpha$  -kotni pospešek

$\omega$  -kotna hitrost

v-hitrost

a-pospešek

$a_t$  -tangentni pospešek

$a_r$  -radialni pospešek

$a_s$  -sistemski pospešek

$\varphi$  -kot

$$\omega = 2\pi f$$

$$\omega = \omega_0 + \alpha t$$

$$\omega^2 = \omega_0^2 + 2\alpha\varphi$$

$$v = \omega r$$

$$a_r = \omega^2 r = \alpha^2 t^2 r$$

$$a_t = \alpha r$$

$$a_s = \sqrt{a_r^2 + a_t^2} \quad m_1 v_1' + m_2 v_2' = m_1 v_1 + m_2 v_2$$

$$\varphi = \omega_0 t + \frac{\alpha t^2}{2} = \int \omega dt$$

### Sile pri kroženju

$$F_{ct} = m\omega^2 r_0$$

$$F_{cor} = 2m(\omega \times v_r)$$

$$F_{sist} = m\omega^2 r_0 - 2m(\omega \times v_r)$$

$$\alpha = \frac{d\omega}{dt}$$

$$\omega = \frac{d\varphi}{dt}$$

$$v = \frac{1}{t_0}$$

$$\omega = 2\pi v$$

Sile na klancu

$F_d$  -dinamična

$F_{st}$  -statična

$$F_d = F_g \sin(\alpha)$$

$$F_{st} = F_g \cos(\alpha)$$

### Gravitacija

$$F = G \frac{m_1 m_2}{r^2}$$

$$G = 6.67 \times 10^{-11} \frac{Nm^2}{Kg^2}$$

$$g(h) = g_0 \frac{r^2}{(r+h)^2}$$

### Izrek o gibalni količini

$$\Delta G = F \Delta t = G_2 - G_1 = m_2 v_2 + m_1 v_1$$

### Popolnoma neelastičen trk

$$m_1 v_1 = (m_1 + m_2) v$$

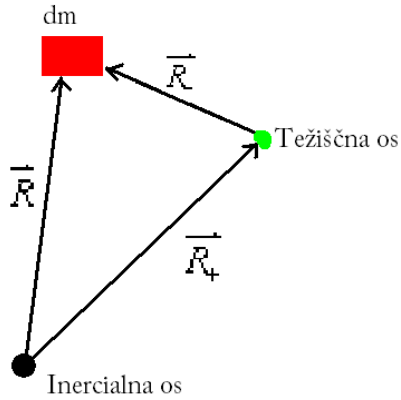
### Popolnoma elastičen trk

$$m_1 v_1' + m_2 v_2' = m_1 v_1 + m_2 v_2$$

### Vrtilna količina

$$\vec{M} = \vec{r} \times \vec{F} = \frac{d\vec{\Gamma}}{dt} = J\vec{\alpha} = \vec{\omega} \times \vec{\Gamma}$$

$$\vec{\Gamma} = \vec{r} \times \vec{v} = \vec{r} \times \vec{G} = \int \vec{M} dt = J\vec{\omega}$$



$$\omega_0 = \sqrt{\frac{k}{m}}$$

$$\omega_0 = \sqrt{\frac{D}{J}}$$

$$\omega_0 = \sqrt{\frac{g_0}{l}}$$

$$\omega_0 = \sqrt{\frac{mg_0 r_t}{J}}$$

$$J = mR_+^2 + J'$$

\*vztrajnostni moment ( $J'$ )

Masna točka

$$J = mr^2$$

Valj

$$J = \frac{1}{2} mr^2$$

Krogla

$$J = \frac{2}{5} mr^2$$

Palica

$$J = \frac{1}{3} ml^2$$

**Delo, energija, moč**

$$A = \int_a^b \vec{F} \cdot d\vec{r}$$

$$A = Fs$$

$$P = \frac{dA}{dt} = \frac{A}{t}$$

$$W_k = \frac{mv^2}{2} = \frac{J\omega^2}{2}$$

$$W_p = G \frac{mM}{r} = mgh$$

$$W_{pr} = \frac{kx^2}{2} = \frac{D\varphi^2}{2}$$

**Nihanje**

$$x(t) = x_0 \sin(\omega_0 t + \delta)$$

→ **Vzmet**

$$\omega_0 = \sqrt{\frac{k}{m}}$$

→ **Vijačna vzmet**

$$\omega_0 = \sqrt{\frac{D}{J}}$$

→ **Utežno nihalo**

$$\omega_0 = \sqrt{\frac{g_0}{l}}$$

→ **Fizikalno nihalo**

$$\omega_0 = \sqrt{\frac{mg_0 r_t}{J}}$$

$r_t$  - razdalja od težišča

$$W_k = \frac{m\omega^2 x^2}{2} \cos(\omega_0 t)$$

$$W_{pr} = \frac{kx_0^2}{2} \sin^2(\omega_0 t)$$

$$\omega_0 = \frac{2\Pi}{t}$$

**Valovanje**

$$c = \frac{\lambda}{t} = \lambda v$$

$$v = \frac{1}{t}$$

→ **c valovanja strune**

$$c = \sqrt{\frac{F}{\varphi S}} = \sqrt{\frac{Fd}{m}}$$

c-hitrost

F-sila s katero je vrv napeta

$\rho$  - gostota vrvi

S-površina povprečnega preseka vrvi

d-dolžina vrvi

### → c valovanja kapljevine

plitva kapljevina ( $h < \lambda$ )

$$c = \sqrt{gh}$$

Globoka kapljevina ( $h > \lambda$ )

$$c = \sqrt{\frac{g\lambda}{2\pi}}$$

c-hitrost

h-globina

g-težni pospešek

$\lambda$  -valovna dolžina

### Valovanje v plinih

$$c = \sqrt{\frac{KRT}{M}}$$

$$R = 8314 \frac{J}{K}$$

$$K = \frac{c_p}{c_v}$$

$$c_x = c_y \sqrt{\frac{M_y}{M_x}}$$

$$\frac{c_1}{c_2} = \sqrt{\frac{T_1}{T_2}}$$

$c_1$  -hitrost pri  $T_1$

$c_2$  -hitrost pri  $T_2$

### Zvočni tlak

$$\Delta p = \rho c v$$

### Glasnost

$$G = 10 \log\left(\frac{j}{j_0}\right)$$

$$j_0 = 10^{-12} \frac{W}{m^2}$$

$j_0$  -meja slišnosti

j-gostota zvočnega toka

G-glasnost

### Machov stožec

$$\sin(\alpha) = \frac{c}{v} = \frac{1}{M}$$

### Interferenca

$$d \sin(\alpha_n) = N\lambda$$

$N=1,2,3,\dots$

$\alpha_n$  -kot med pravokotnico in n-to

ojačitvijo

d-razdalja med dvema režama na

uklonski mrežici

### Lomni zakon

$$\frac{\sin(\alpha_1)}{\sin(\alpha_2)} = \frac{c_1}{c_2}$$

### Dopplerjev pojav

→ Sprejemnik se giblje

$$v = v_0 \left(1 \pm \frac{v}{c}\right)$$

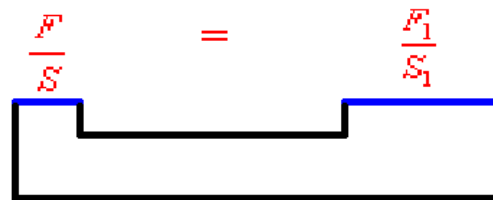
Ko se približuje (+), (-) ko se oddaljuje

→ Oddajnik se giblje

$$v = v_0 \frac{1}{1 \pm \frac{v}{c}}$$

Ko se približuje (-), (+) ko se oddaljuje

### Mehanika tekočin



$$\rho = \varphi g_0 h$$

### Upor v kapljevinah

$$R_e = \frac{d\varphi v}{\eta}$$

→ viskozni upor ( $R_e < 1$ )

$$F_u = 6\pi r \eta v$$

→ dinamični upor ( $R_e > 1$ )

$$F_u = c_v S \frac{\rho v^2}{2}$$

### Splošna plinska enačba

$$\frac{pV}{T} = \frac{m}{M} R$$

p-tlak

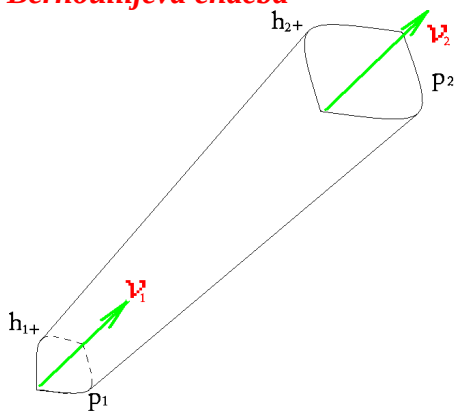
V-prostornina

T-temperatura

M-kilomolska masa

R-splošna plinska konstanta

## Bernoullijeva enačba



$$p_1 + \frac{1}{2} \rho v_1^2 + \rho g h_1 = p_2 + \frac{1}{2} \rho v_2^2 + \rho g h_2$$

p-tlak

$\rho$  -gostota

v-hitrost

g-težni pospešek

h-višina