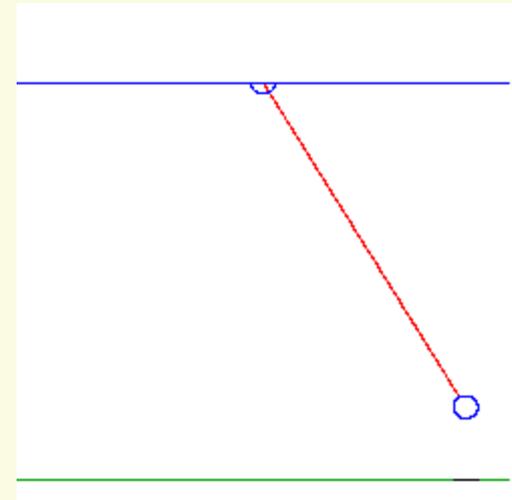
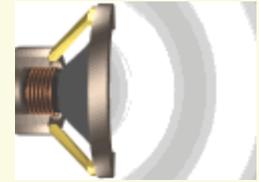


## Aula 13: Movimento harmónico do corpo rígido

1. Energia do MHS
2. Sistemas quase-elásticos
3. Pêndulo físico
4. Pêndulo simples
5. Pêndulo de Foucault

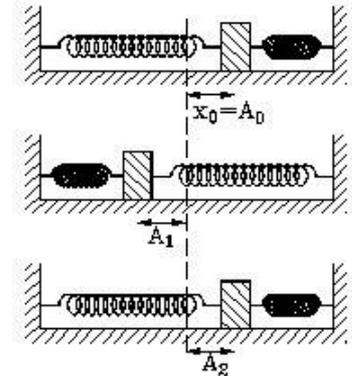
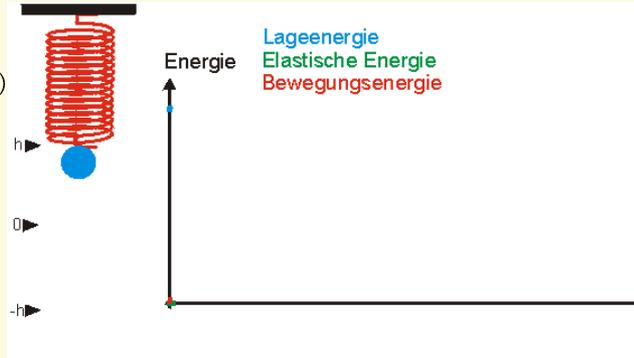
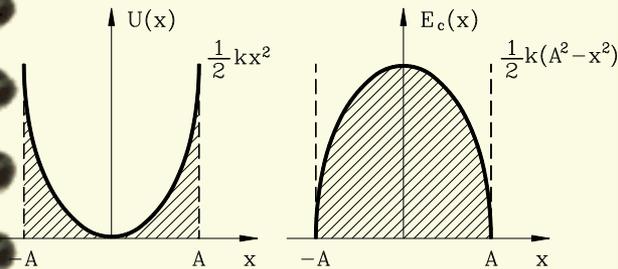


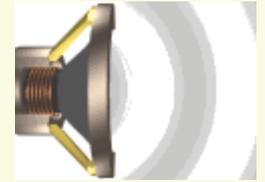


# Simulação da energia do MHS

## 1. Energia do MHS

### Amplitude de oscilação

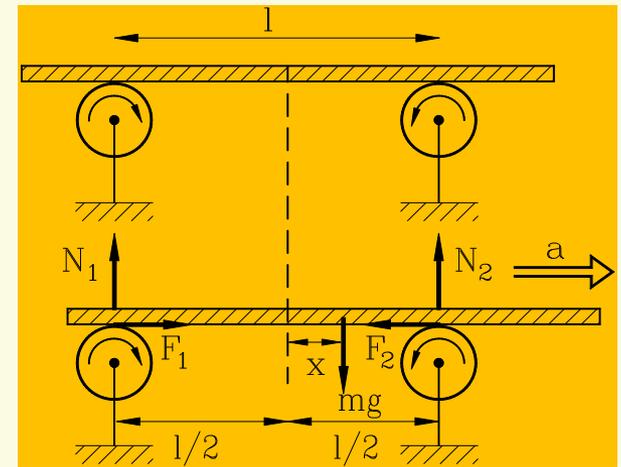




## 2. Sistemas quase-elásticos

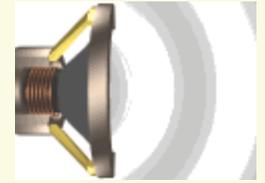
$$ma = -Cx \quad \Rightarrow \quad a = -\frac{C}{m}x = -\omega^2 x$$

$$T = 2\pi \sqrt{\frac{m}{C}}$$



## Simulação: pêndulo físico

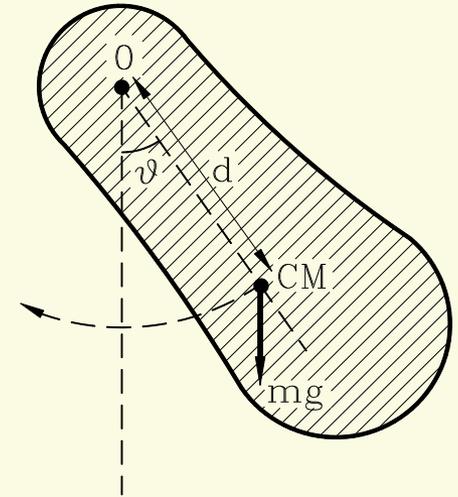
## Determinação do momento de inércia: animação

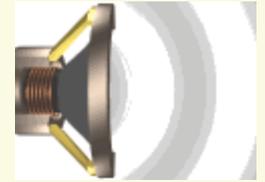


### 3. Pêndulo físico

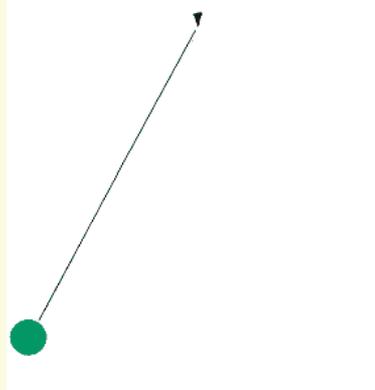
$$I\epsilon = -I\omega^2\theta = -C\theta$$

$$T = 2\pi \sqrt{\frac{I_0 + md^2}{mgd}}$$





# Simulação: pêndulo simples



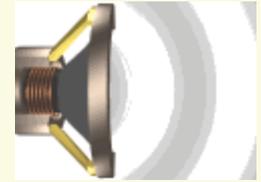
$$T = 2\pi \sqrt{\frac{l}{g}}$$

## 4. Pêndulo matemático

$T = 2\pi \sqrt{\frac{l}{g \pm (F_0/m)}}$ 
 $T = 2\pi \sqrt{\frac{ml}{R}}$

# Pêndulo de Foucault: animação

## Simulação: MH relativo



### 5. Pêndulo de Foucault

