

General Physics: Mechanics

PHYS-101(en)

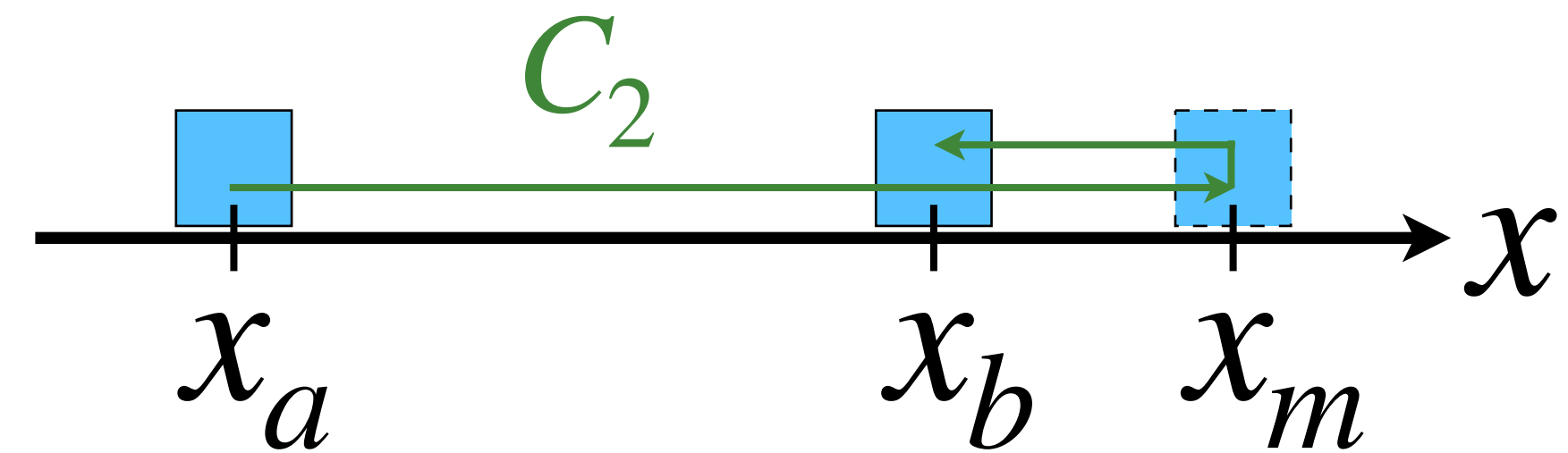
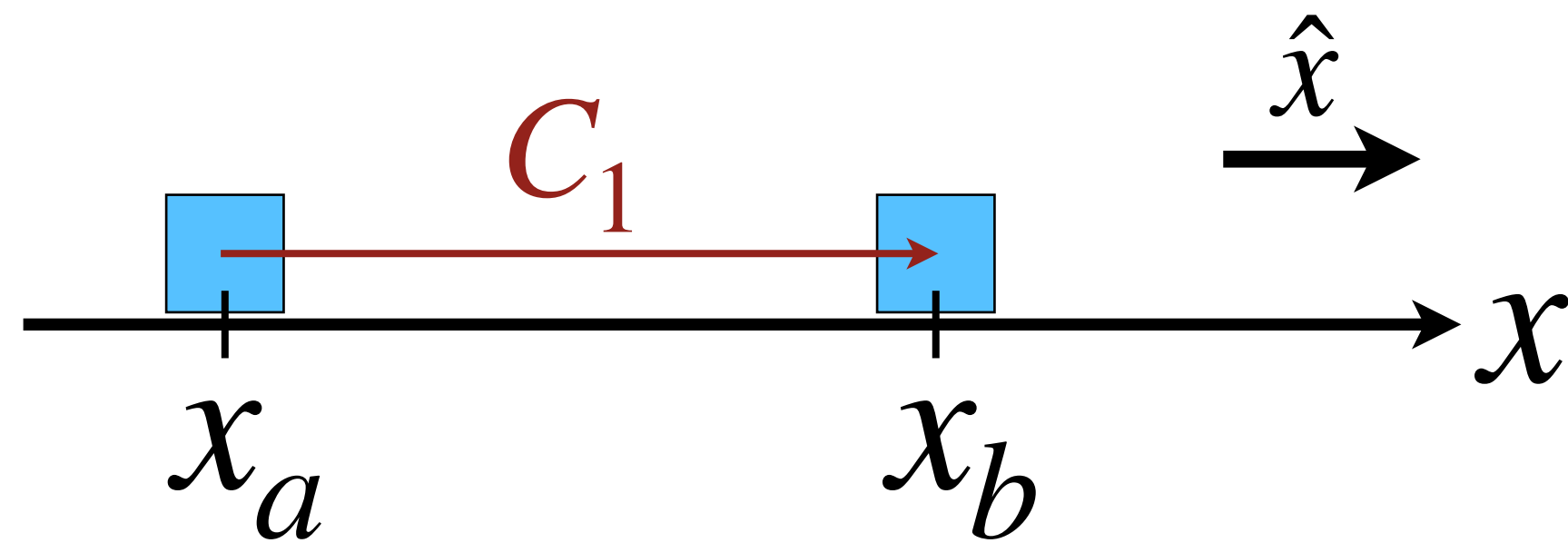
**Lecture 8b: Kinetic energy
and work**

Dr. Marcelo Baquero
marcelo.baquero@epfl.ch
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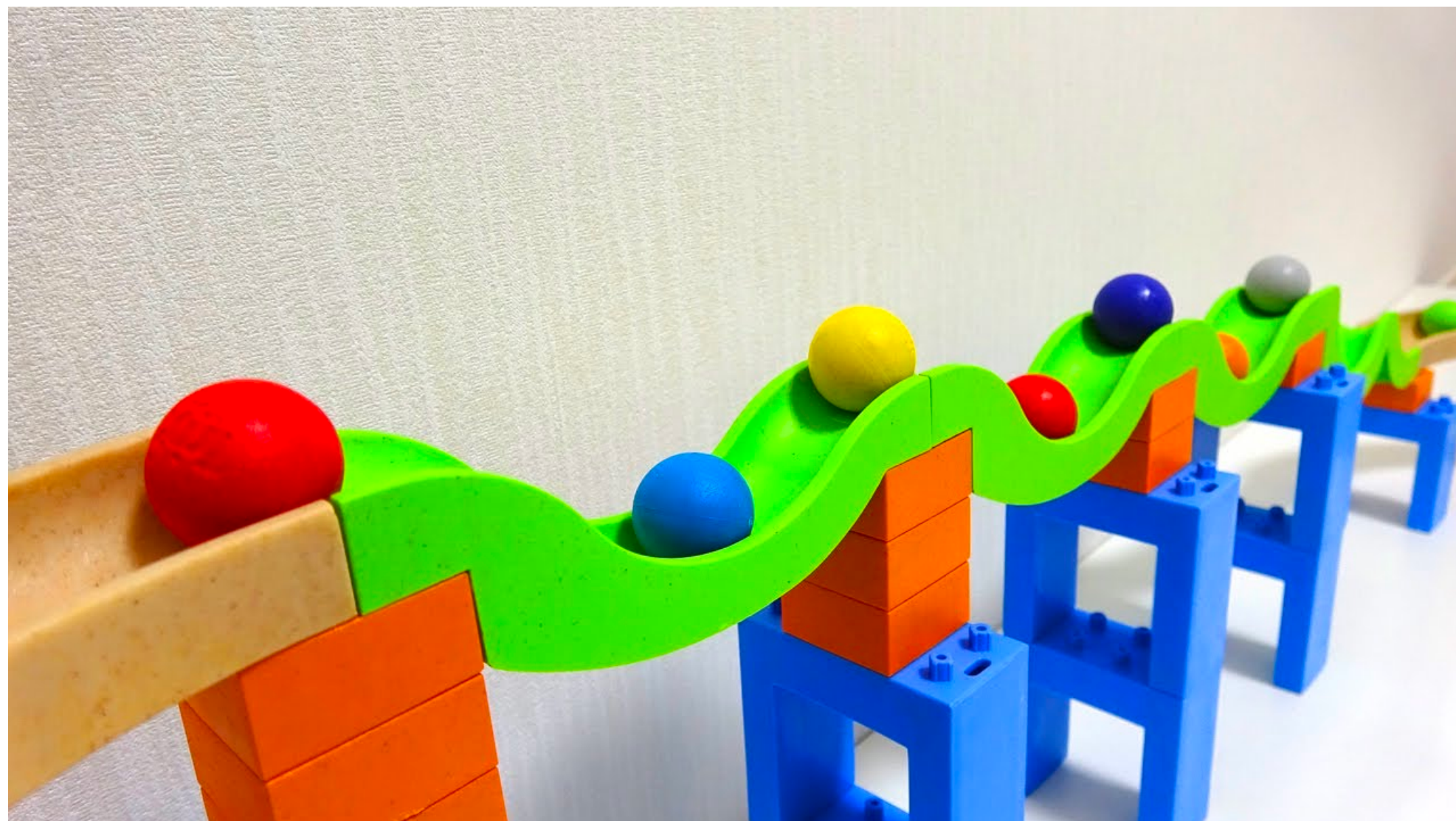
Path dependence of kinetic friction

Show that the kinetic friction force $\vec{F}_k = \pm \mu_k N \hat{x}$ is not conservative



Example: Marbula One racing

You're designing a *marble racing* track! The course is straight (i.e. no left or right turns) and the marbles are released from rest at a height h_0 . Given the height $h(s)$ as a function of the distance s along the track, you need to calculate the marble's speed $v(s)$ to ensure they can make it to the bottom. Ignore friction and drag.



Example: Marbula One racing

Example: Marbula One racing (w/ friction)

You're designing a *marble racing* track! The course is straight (i.e. no left or right turns) and the marbles are released from rest at the top. Given a **linear height profile that makes an angle θ below the horizon**, $h(s) = -\sin \theta s + h_0$, you need to calculate the marble's speed $v(s)$ to ensure they can make it to the bottom. Let the friction coefficient be μ_k and ignore drag.



Example: Marbula One racing (w/ friction)
