



Constraining dark-sector effects using gravitational waves from compact binary inspirals

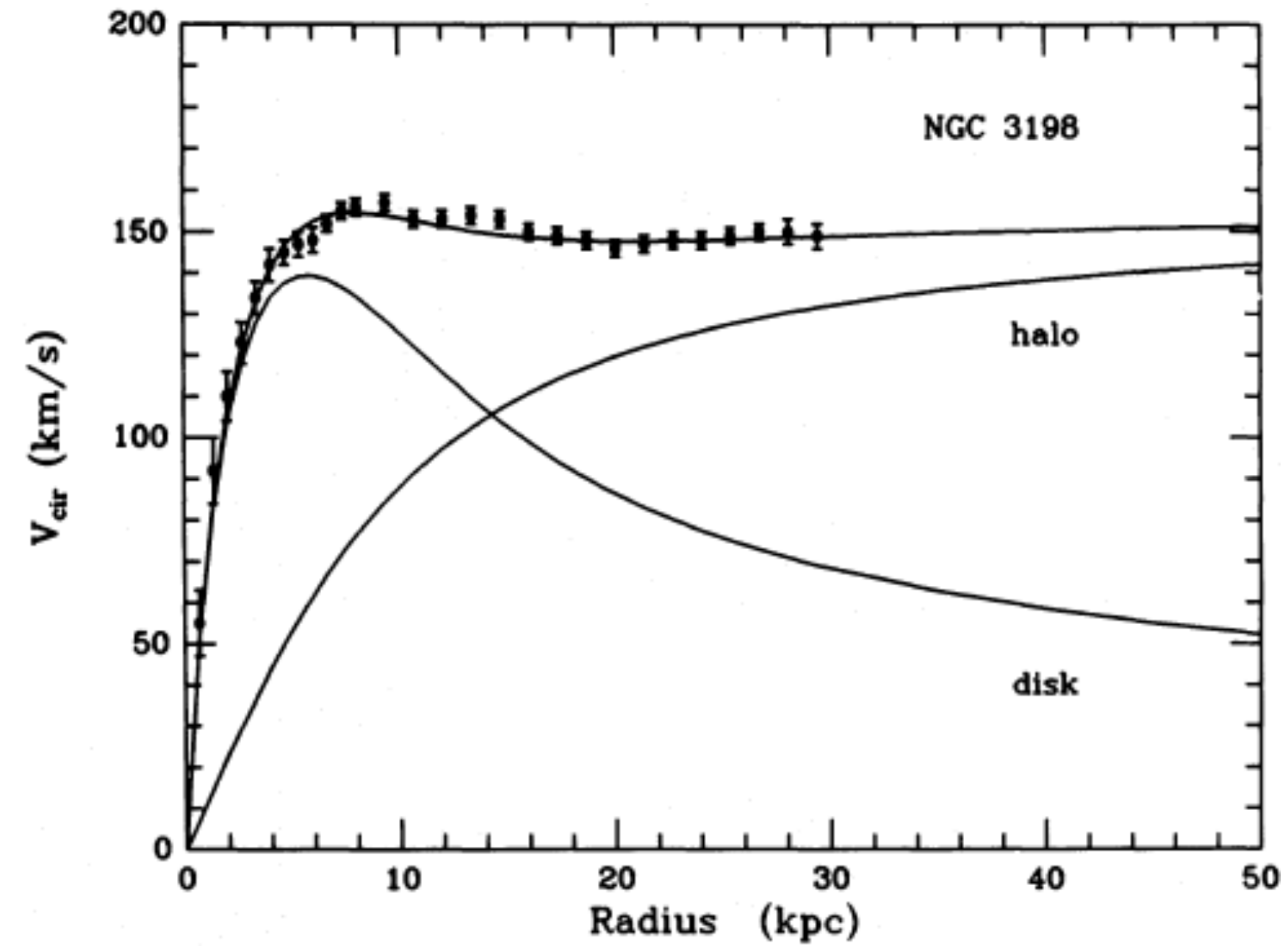
Caroline B. Owen

Alexandria Tucker, Yonatan Kahn, Nicolás Yunes

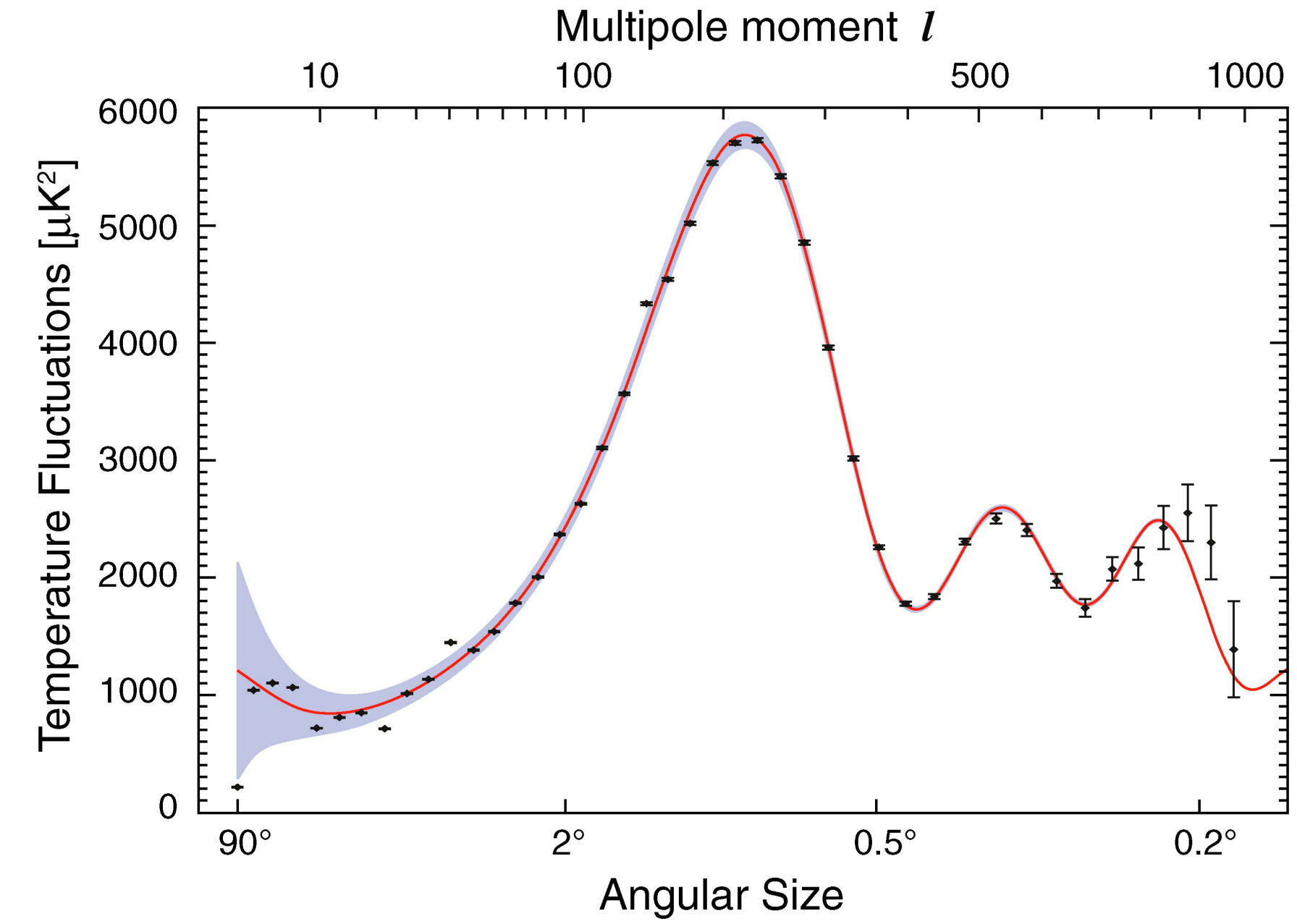
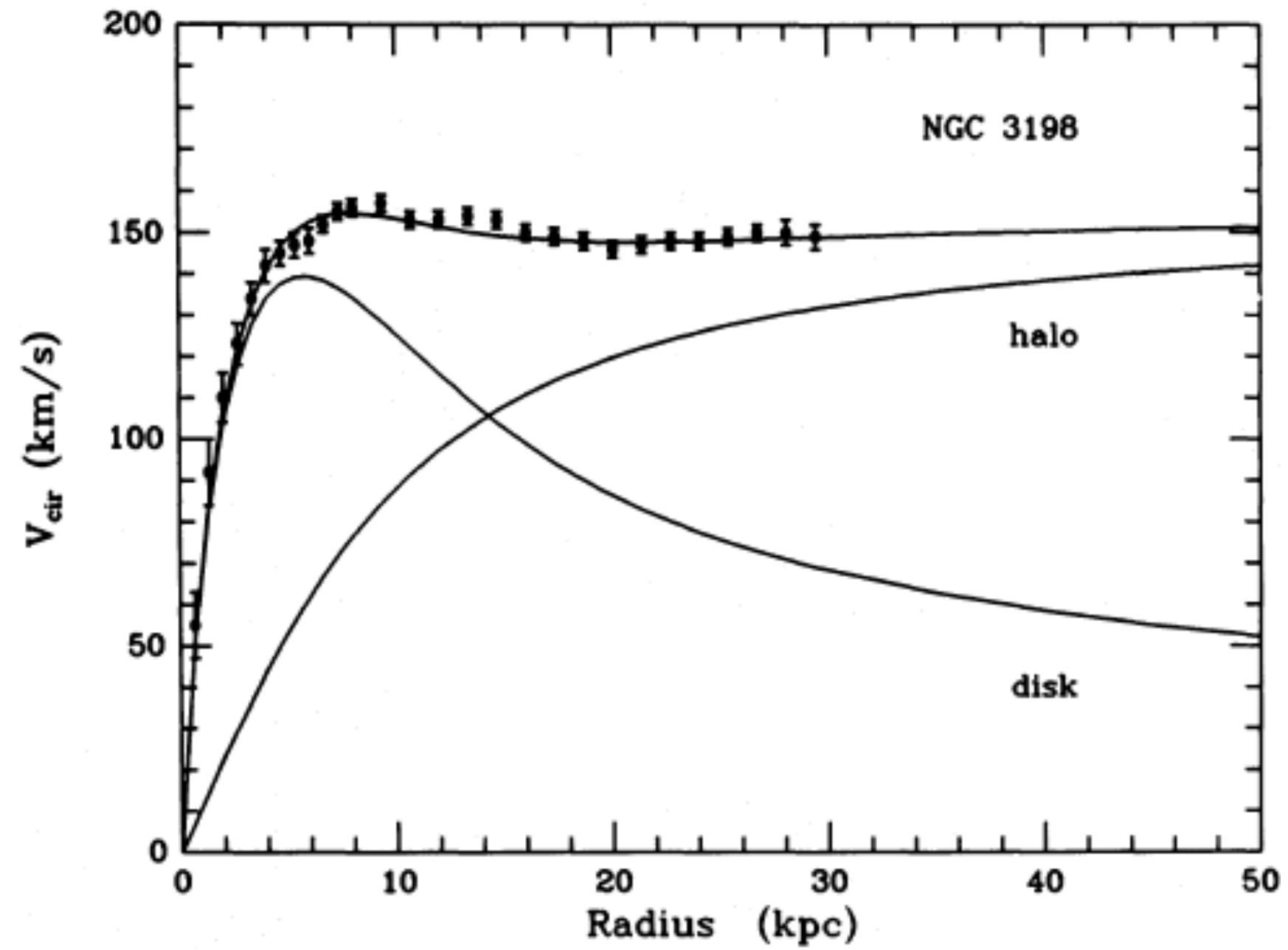
arXiv:2503.04916

A new window into dark matter

A new window into dark matter

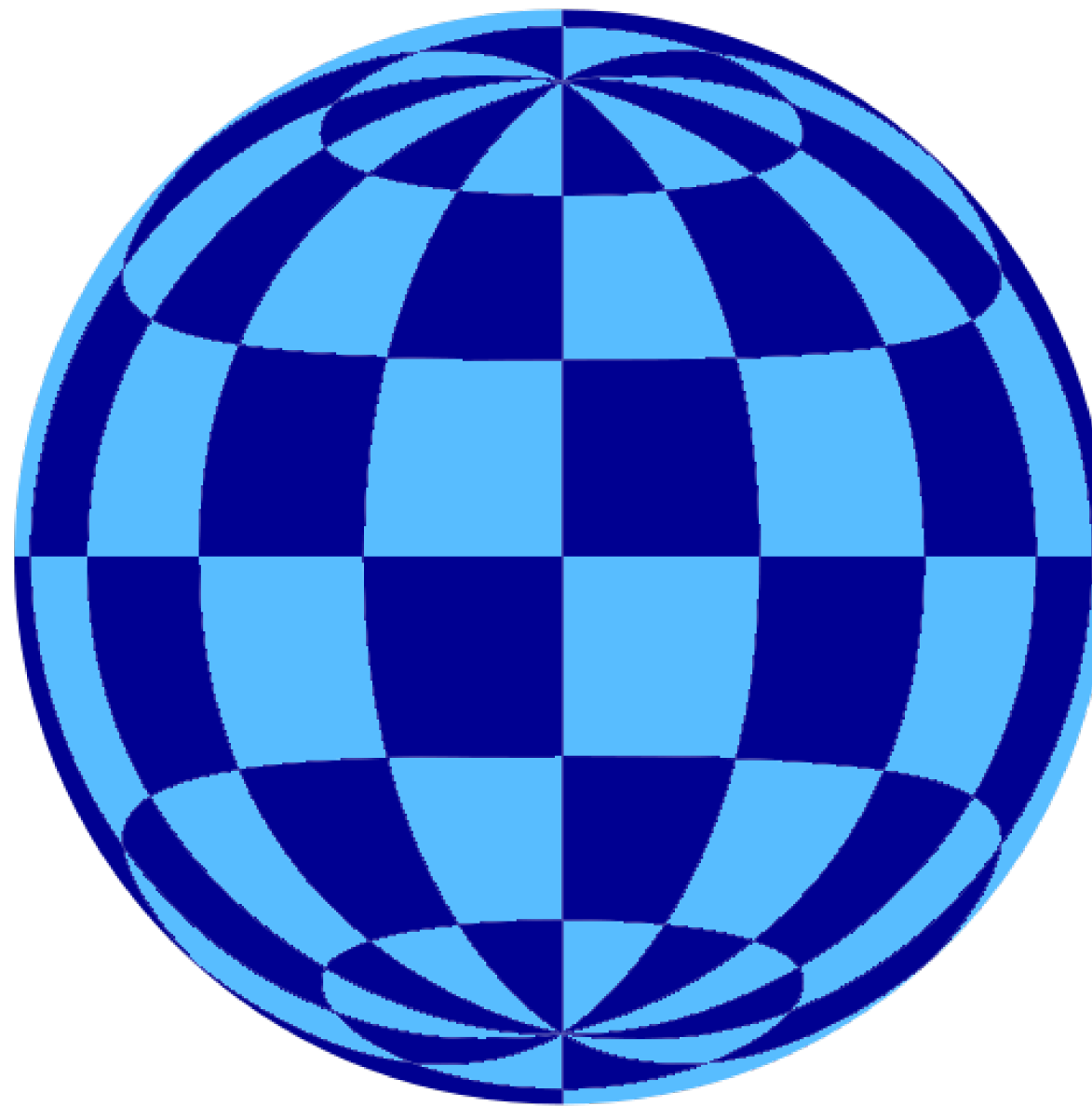


A new window into dark matter



Our system, at a glance

Our system, at a glance



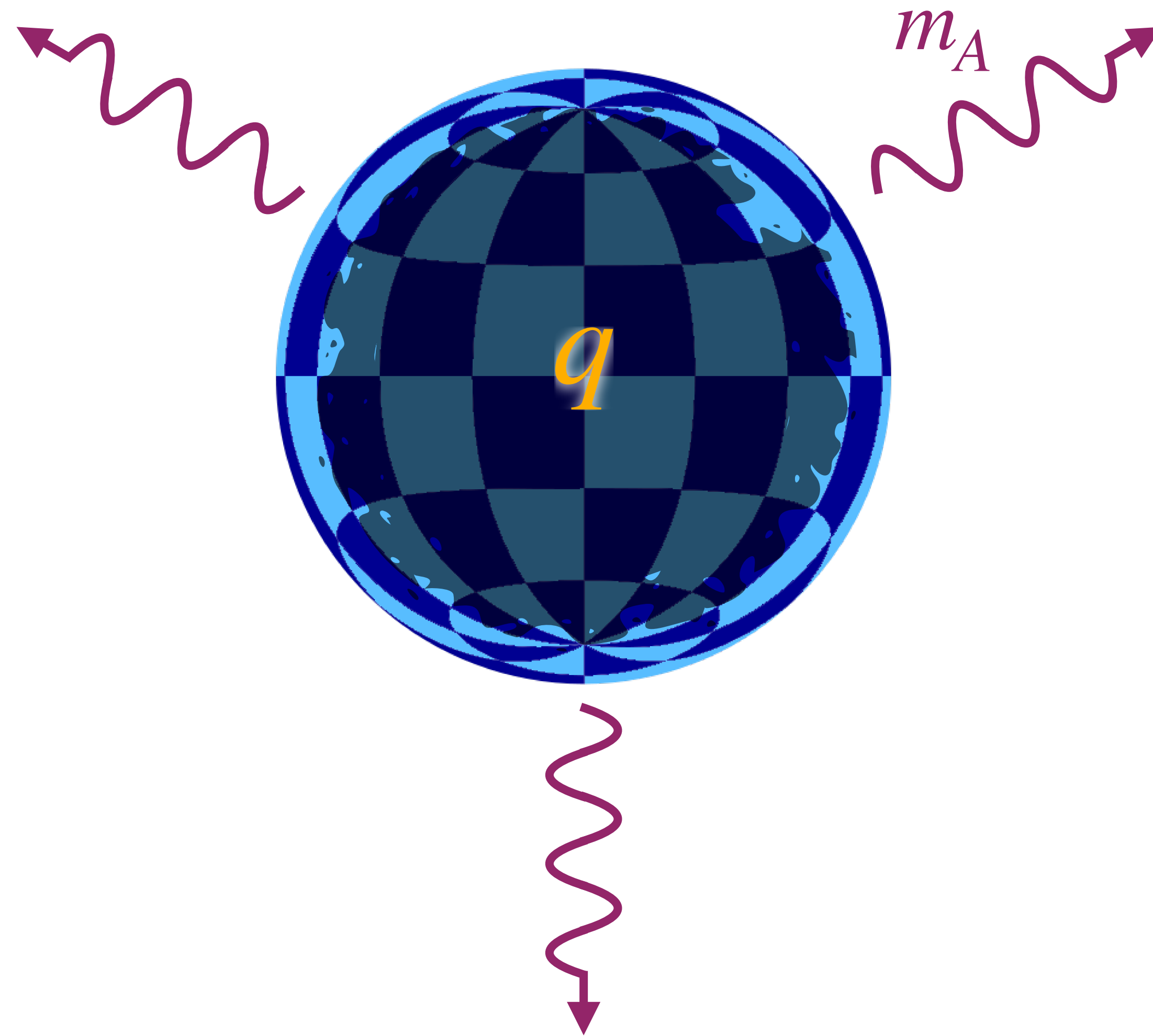
Our system, at a glance



Our system, at a glance

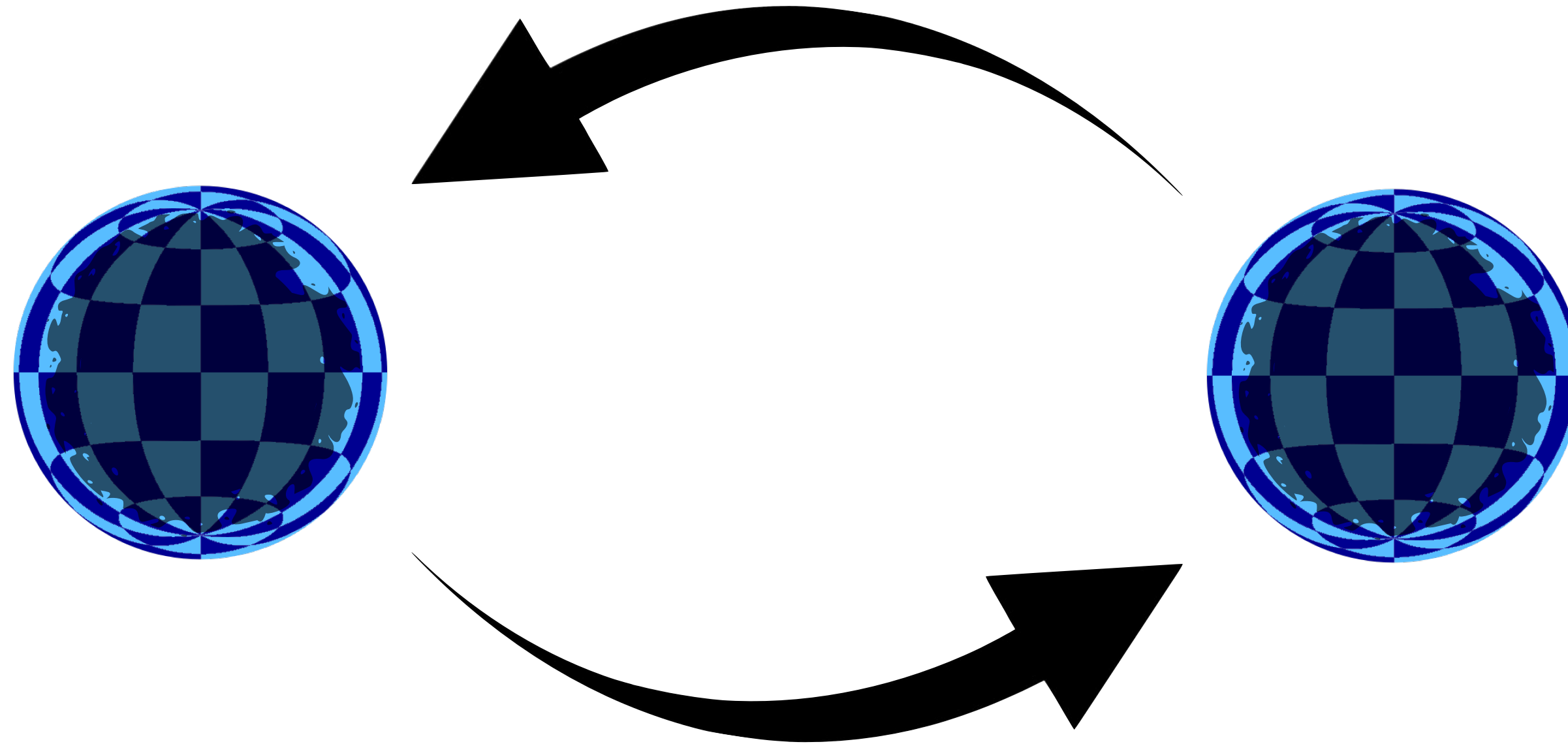


Our system, at a glance

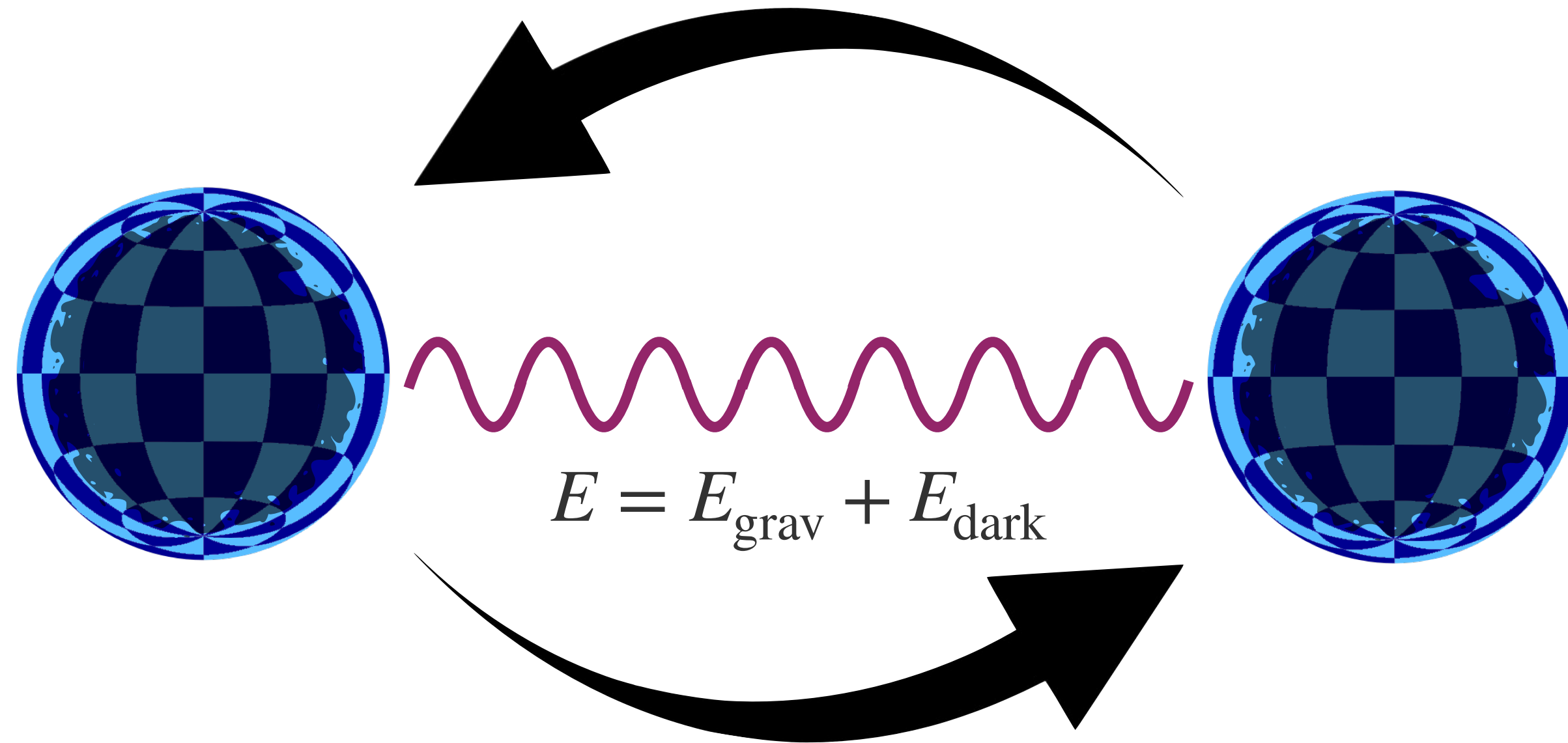


Our system, at a glance

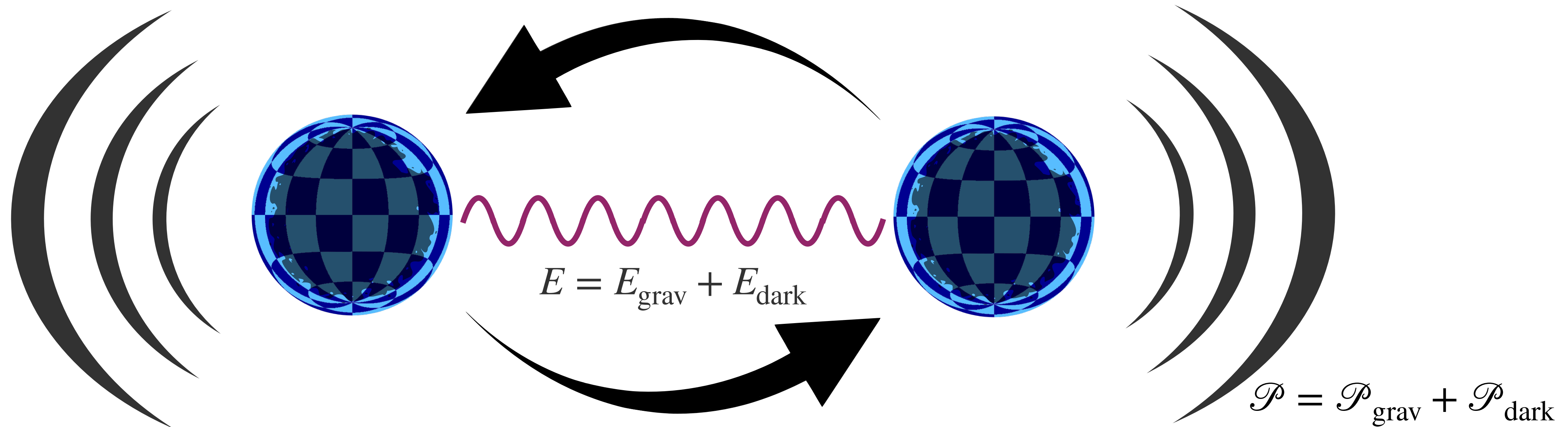
Our system, at a glance



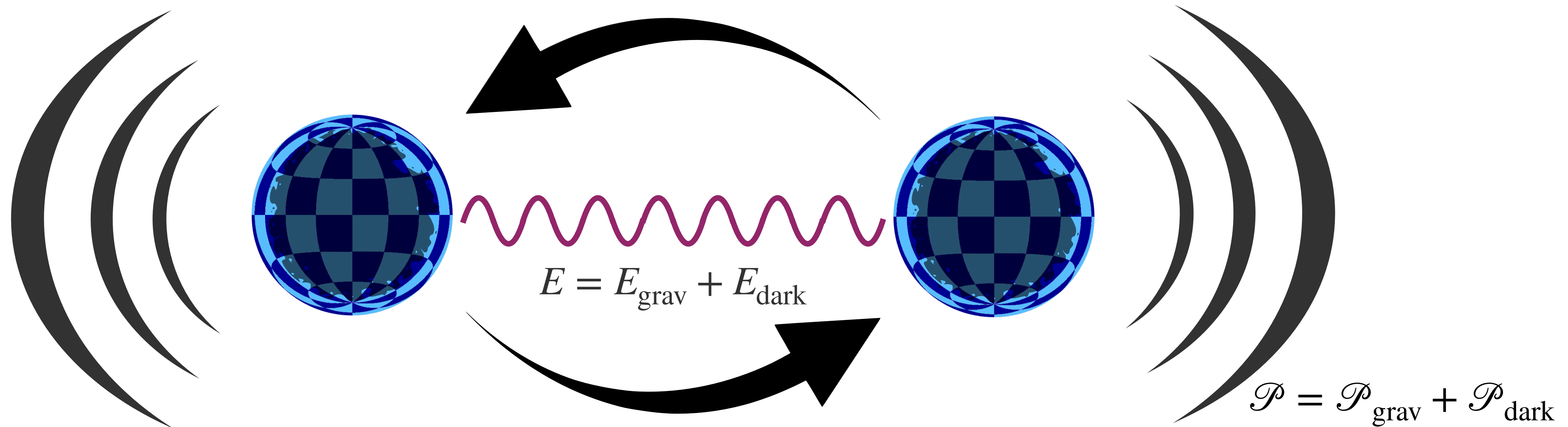
Our system, at a glance



Our system, at a glance

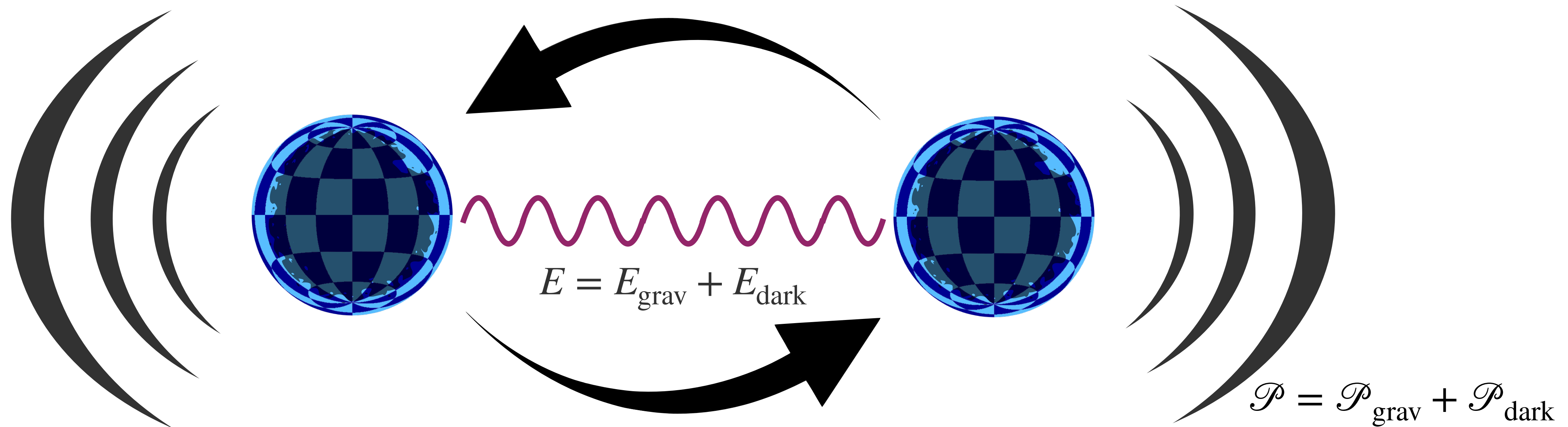


Our system, at a glance



The project

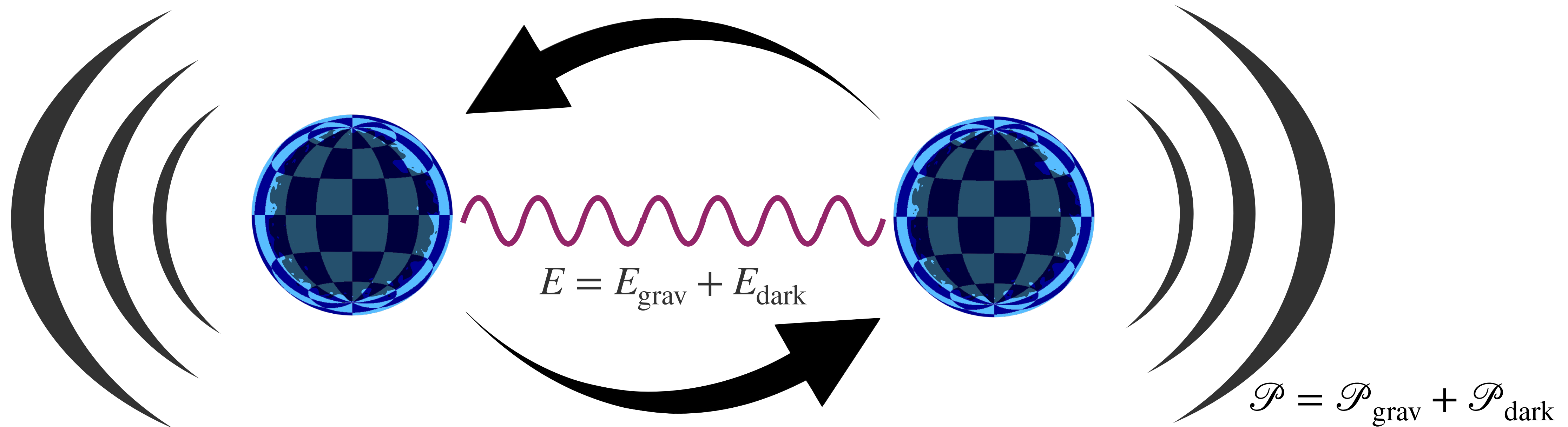
Our system, at a glance



The project

- Compute $\tilde{h}(f)$ for this system

Our system, at a glance



The project

- ▶ Compute $\tilde{h}(f)$ for this system
- ▶ Bayesian analysis of real NS/NS and NS/BH data
- ▶ Project future constraints

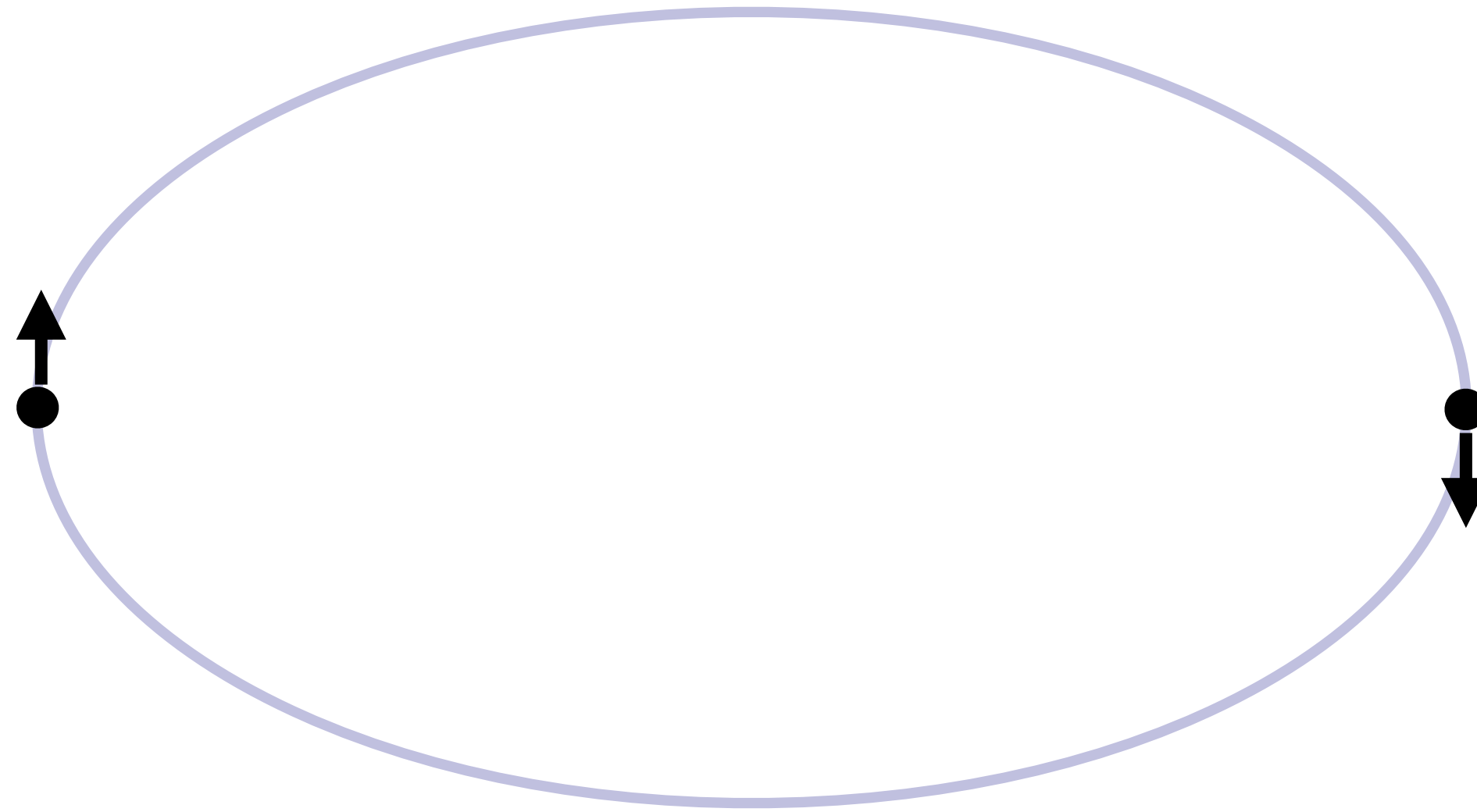
Our system, at a glance



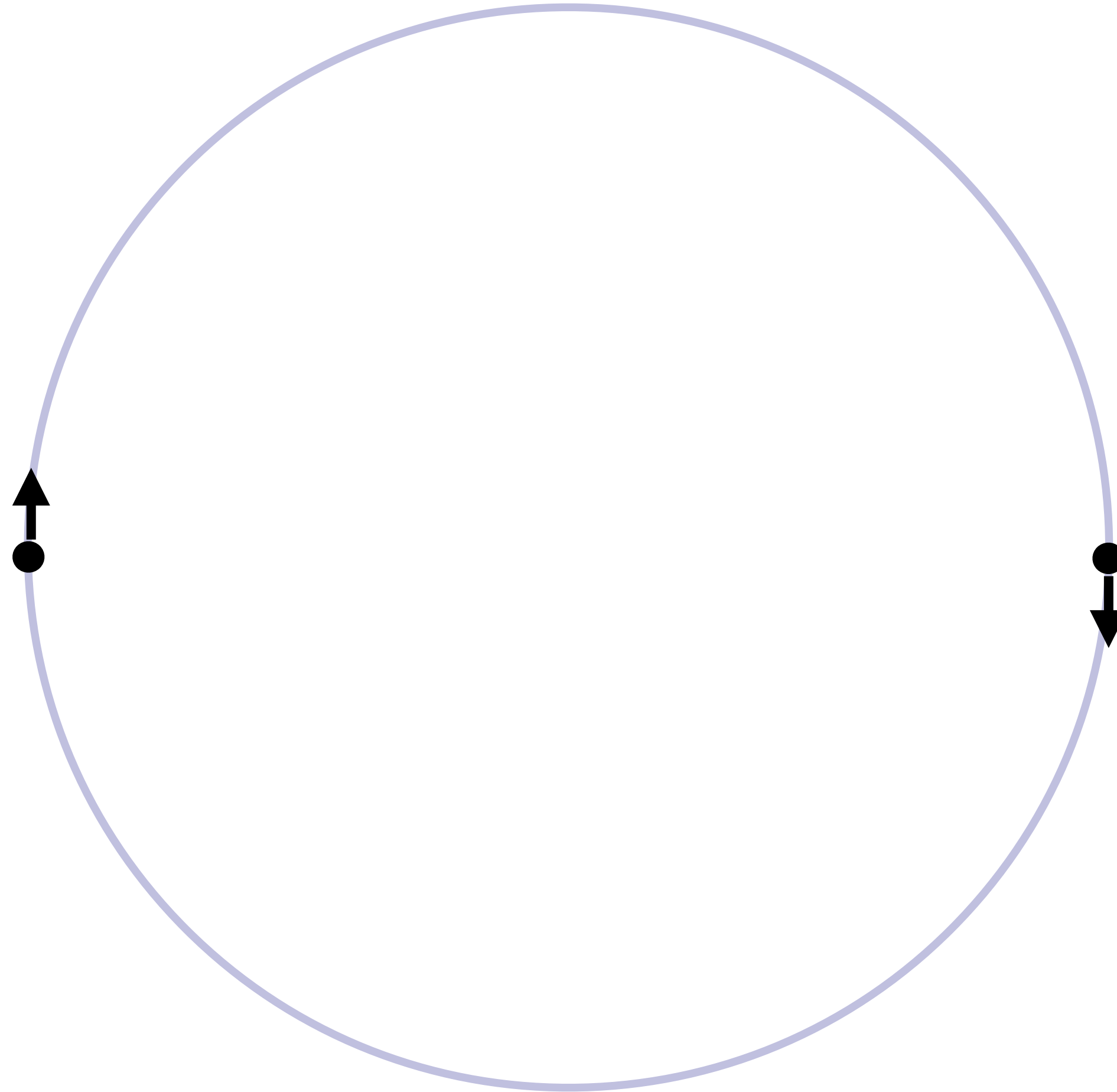
Our system, at a glance



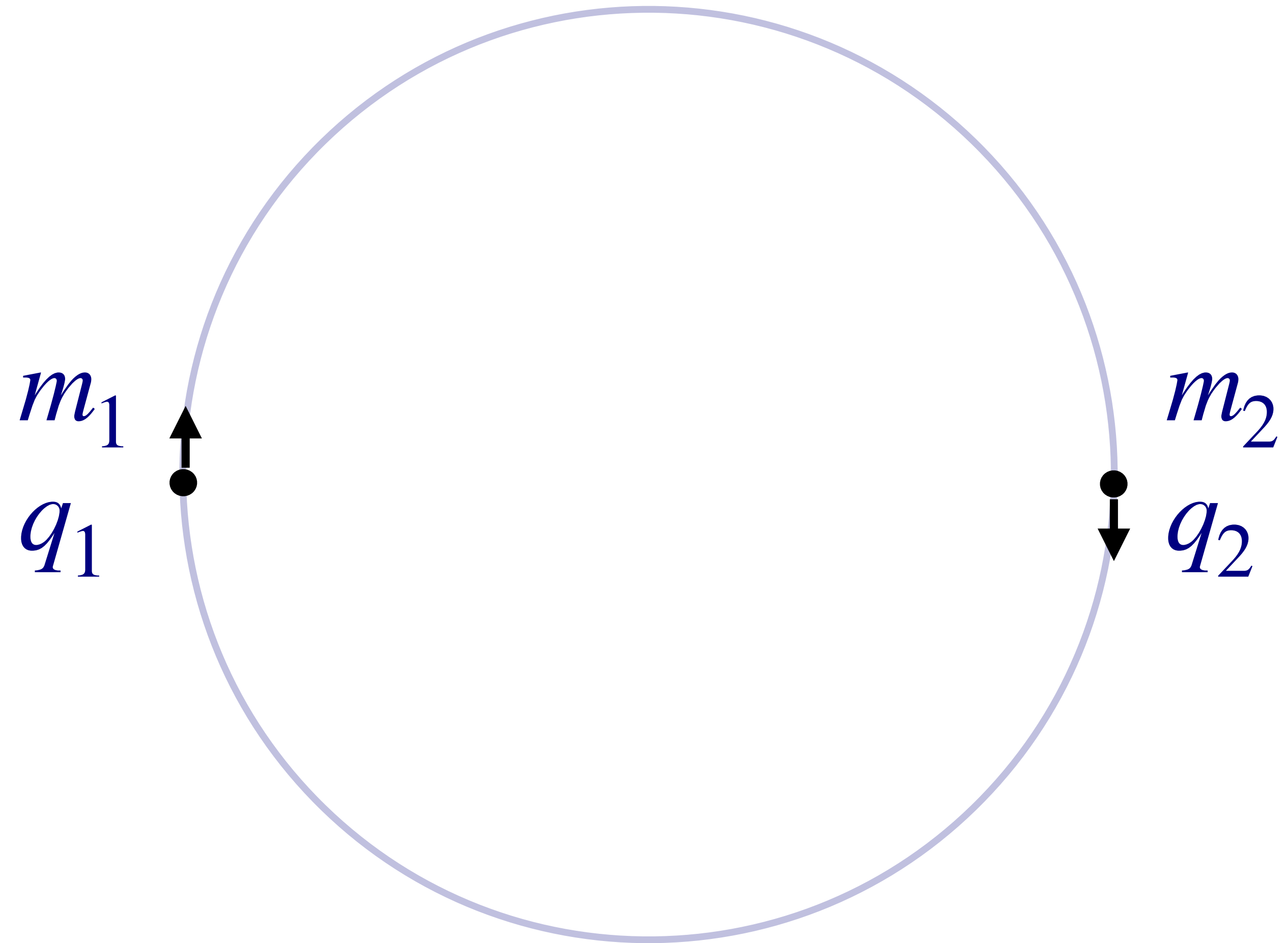
Our system, at a glance



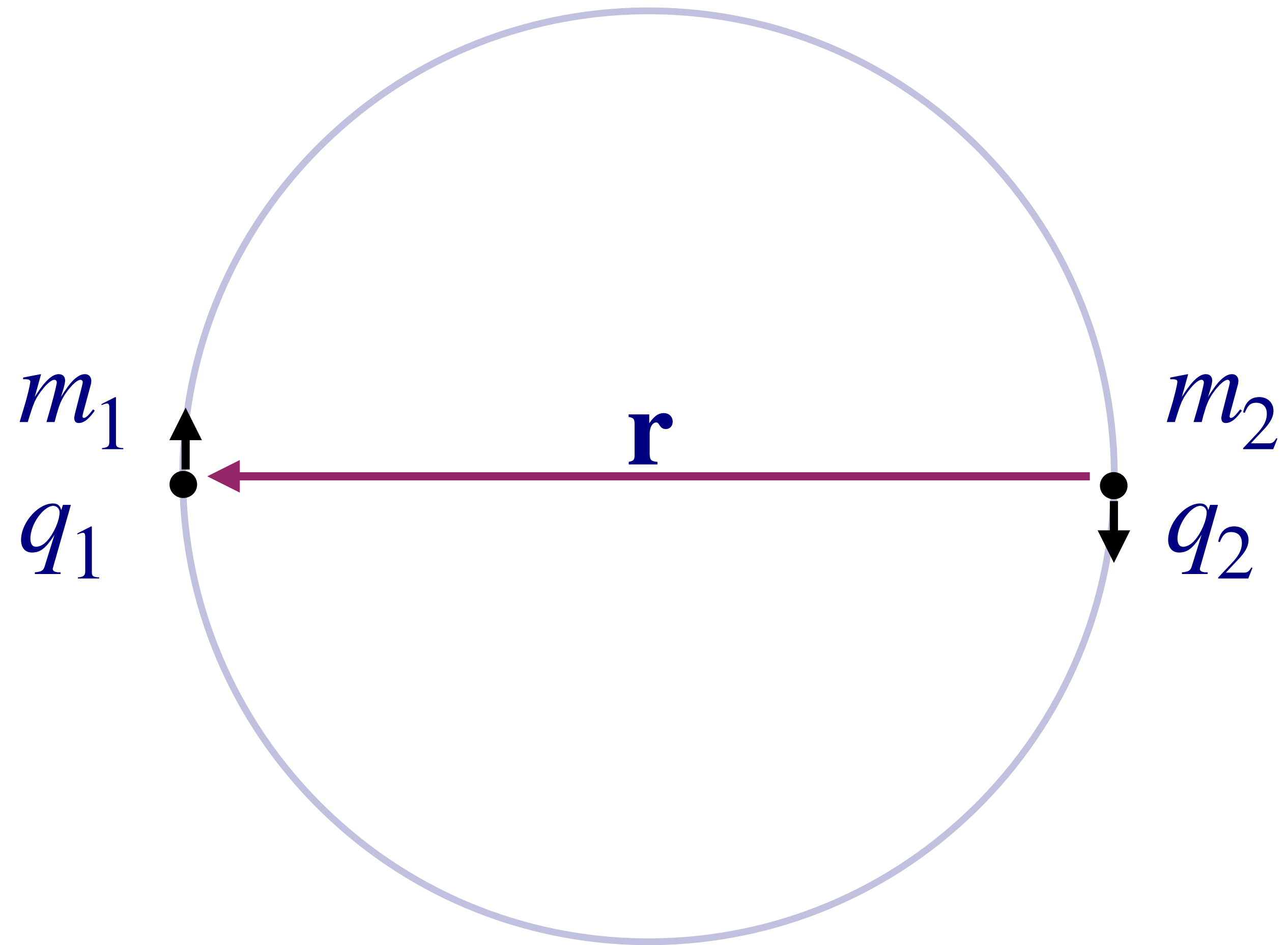
Our system, at a glance



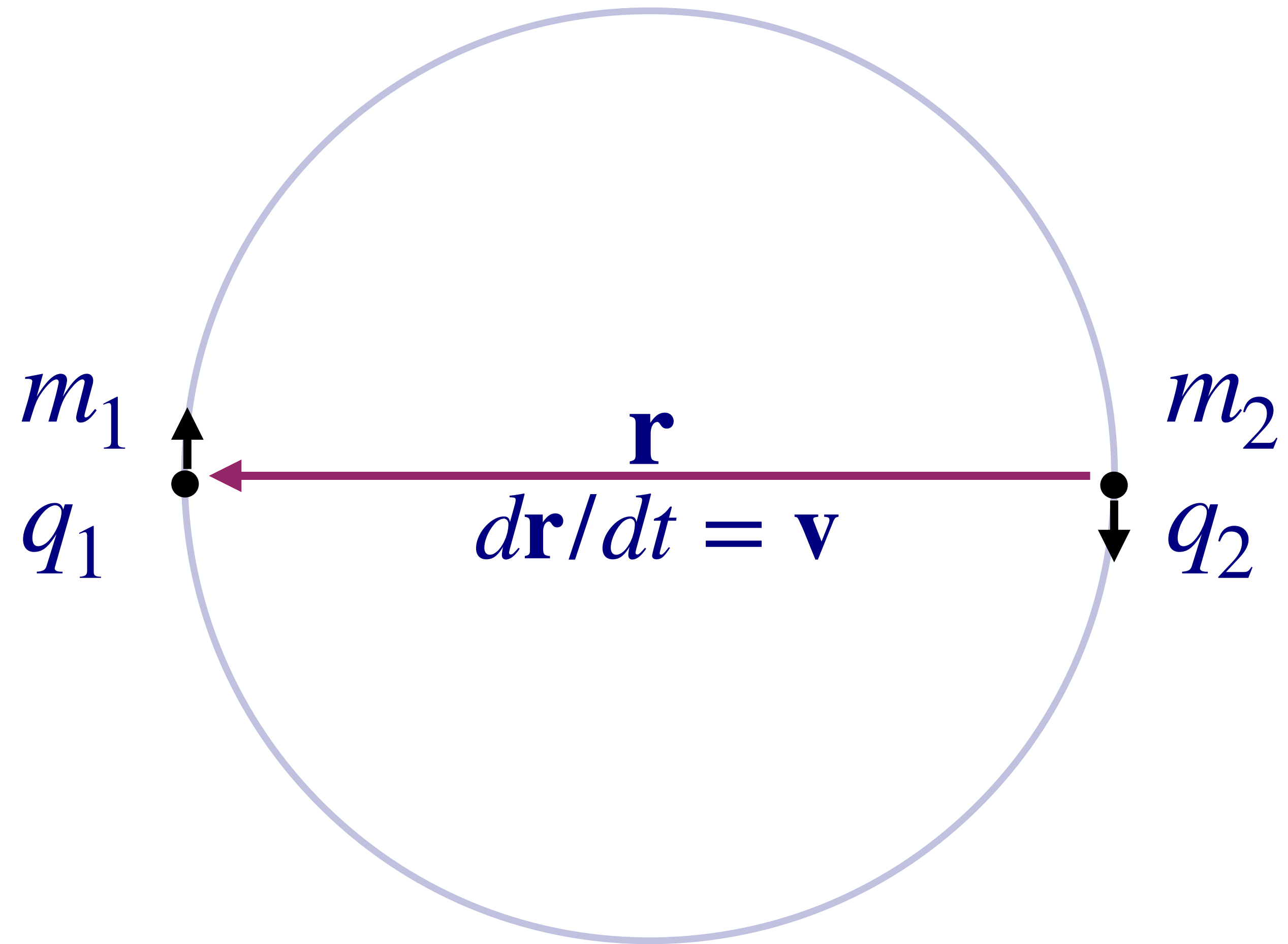
Our system, at a glance



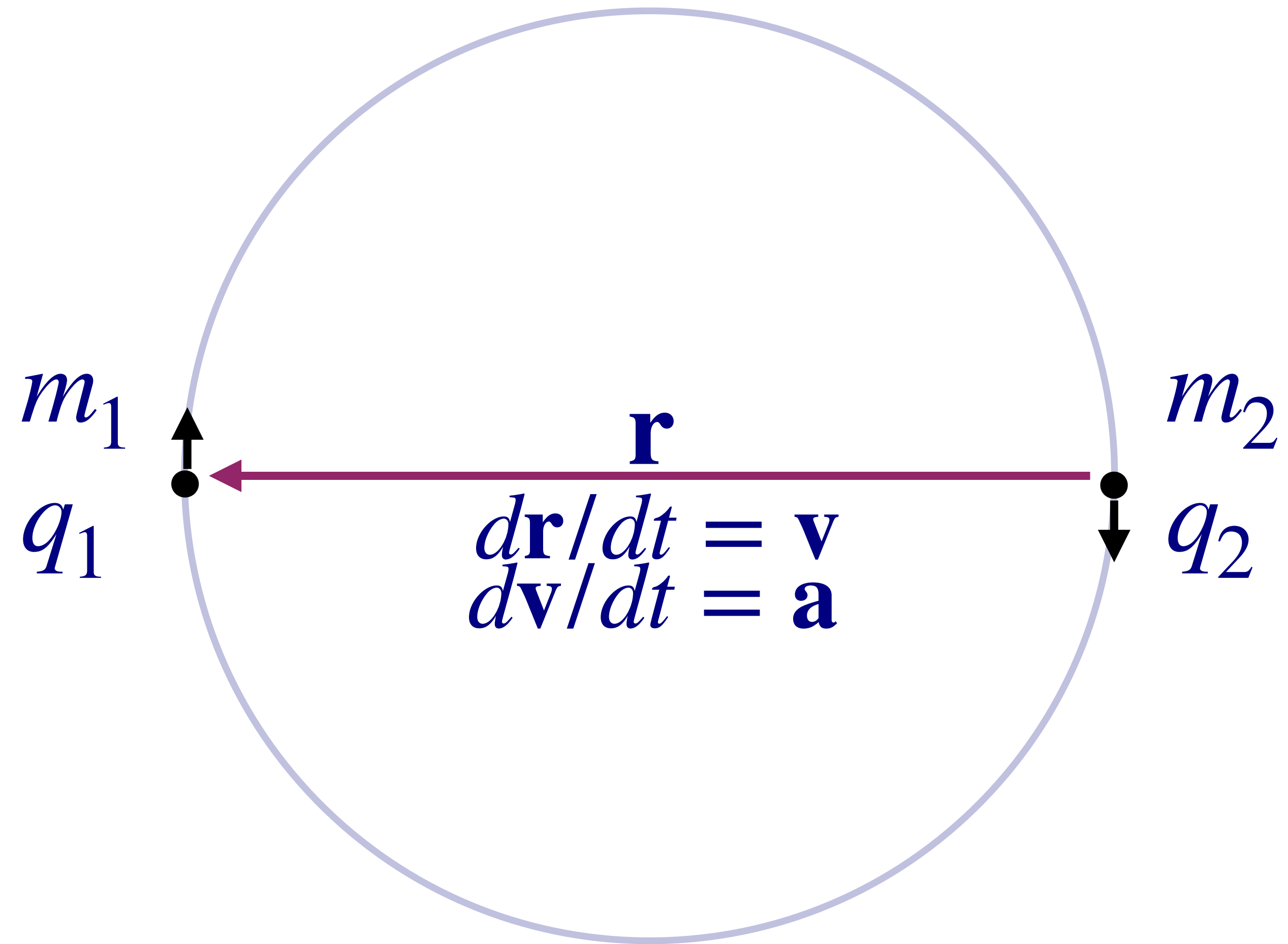
Our system, at a glance



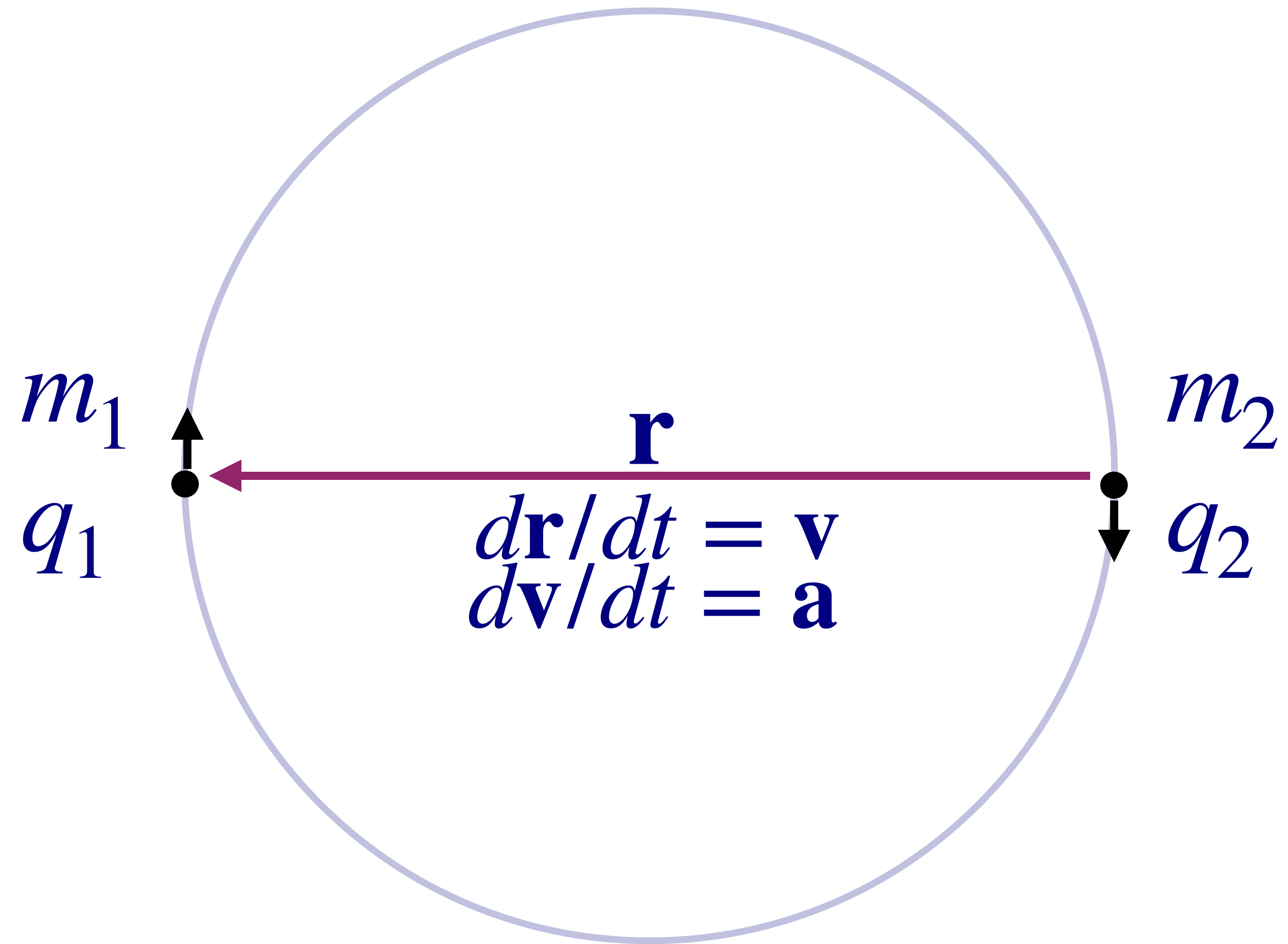
Our system, at a glance



Our system, at a glance



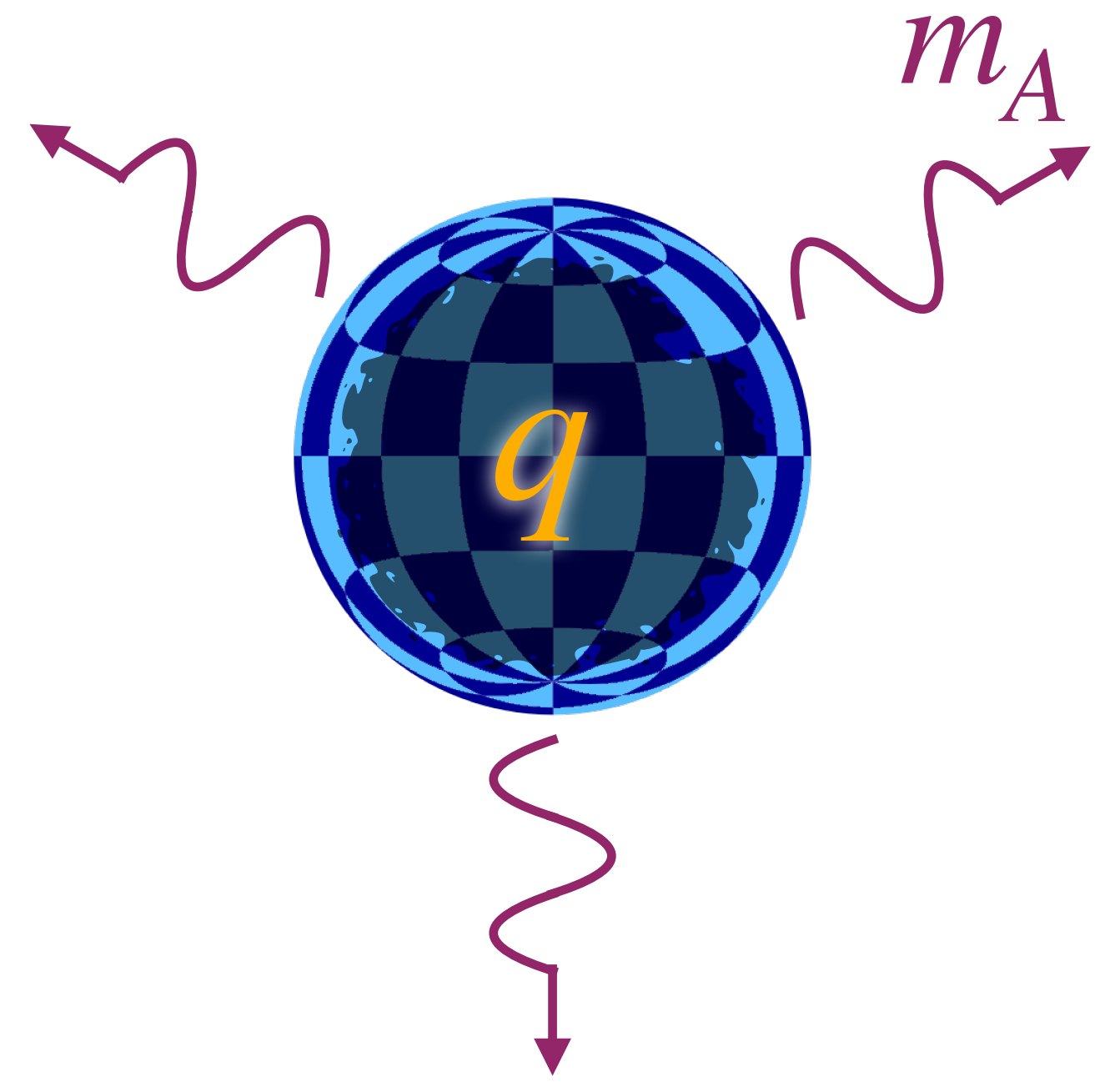
Our system, at a glance



$$m = m_1 + m_2 \quad \eta = \frac{m_1 m_2}{m^2} \quad q = \frac{m_2}{m_1} \quad \mathcal{M} = m\eta^{3/5}$$

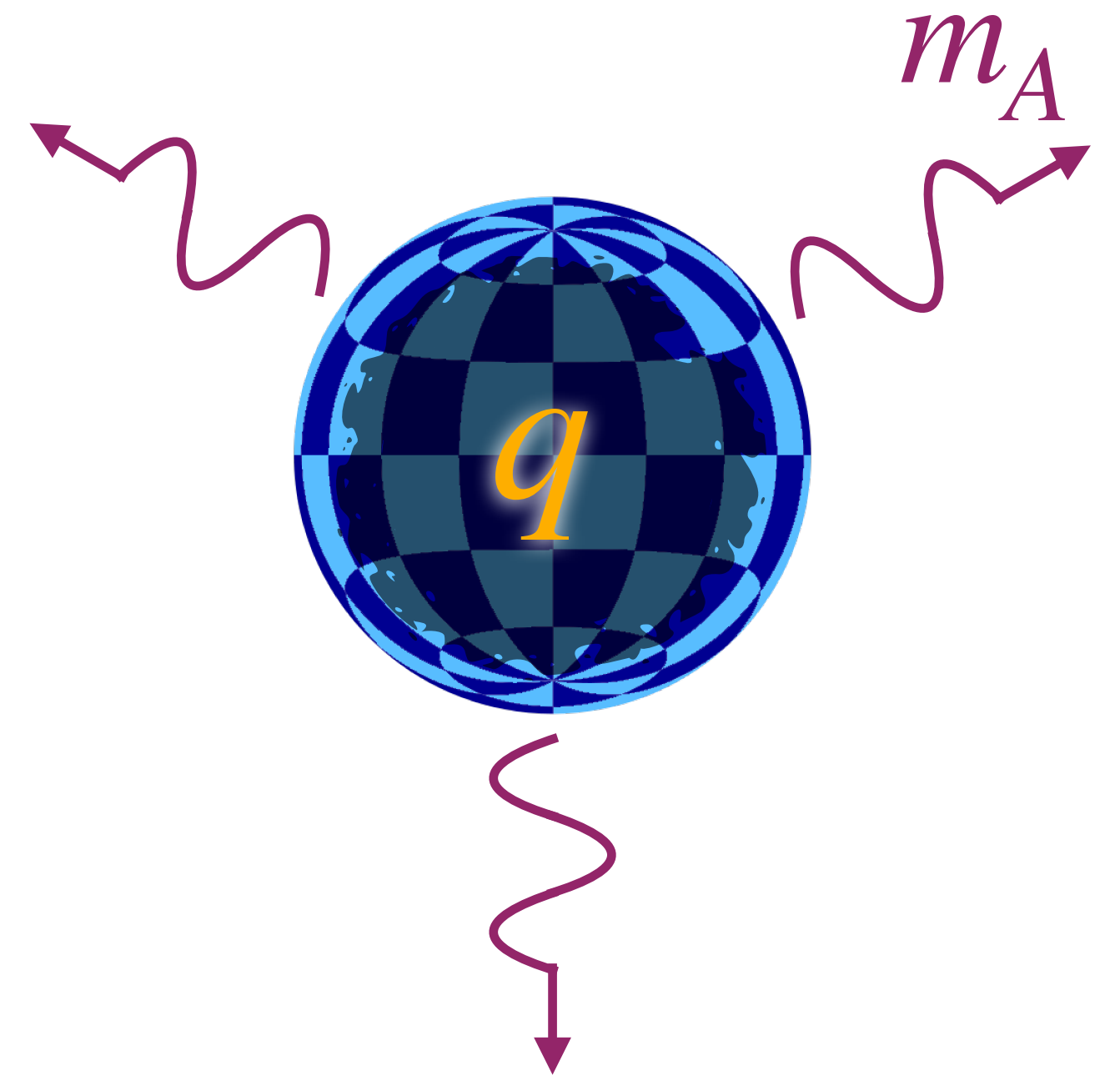
Atomic dark matter (aDM)

Atomic dark matter (aDM)



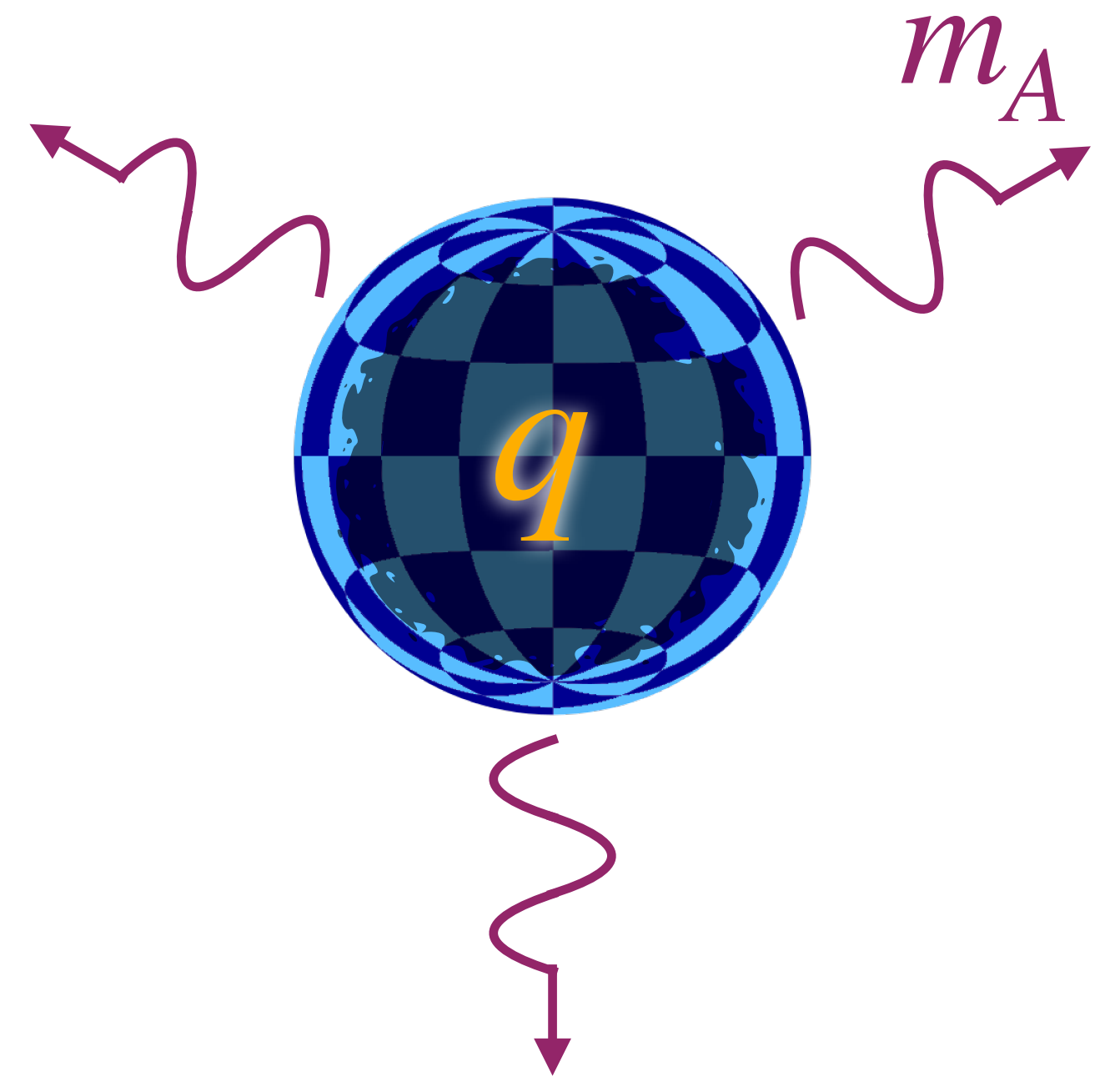
Atomic dark matter (aDM)

Fermion χ



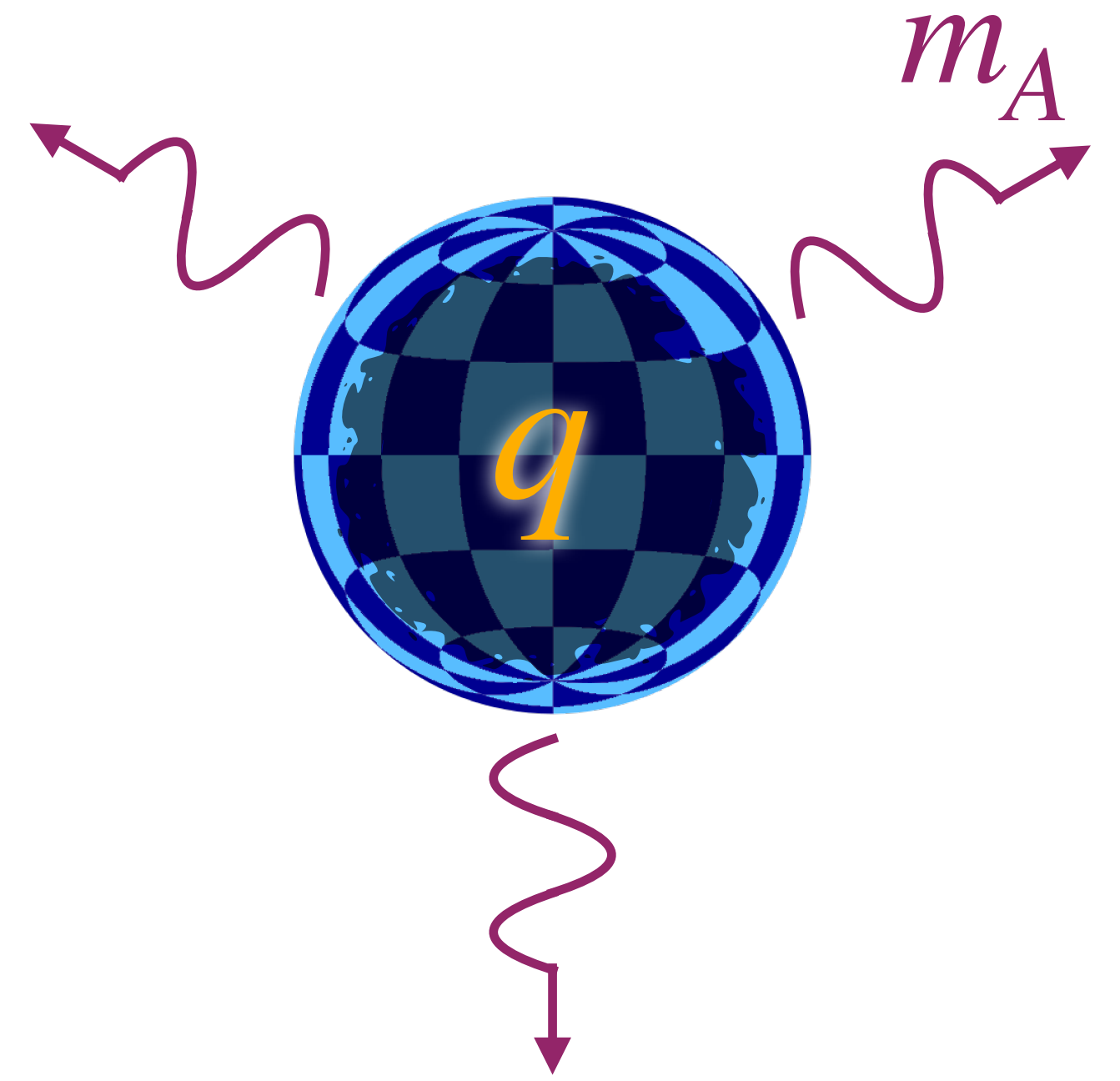
Atomic dark matter (aDM)

Fermion χ , m_χ



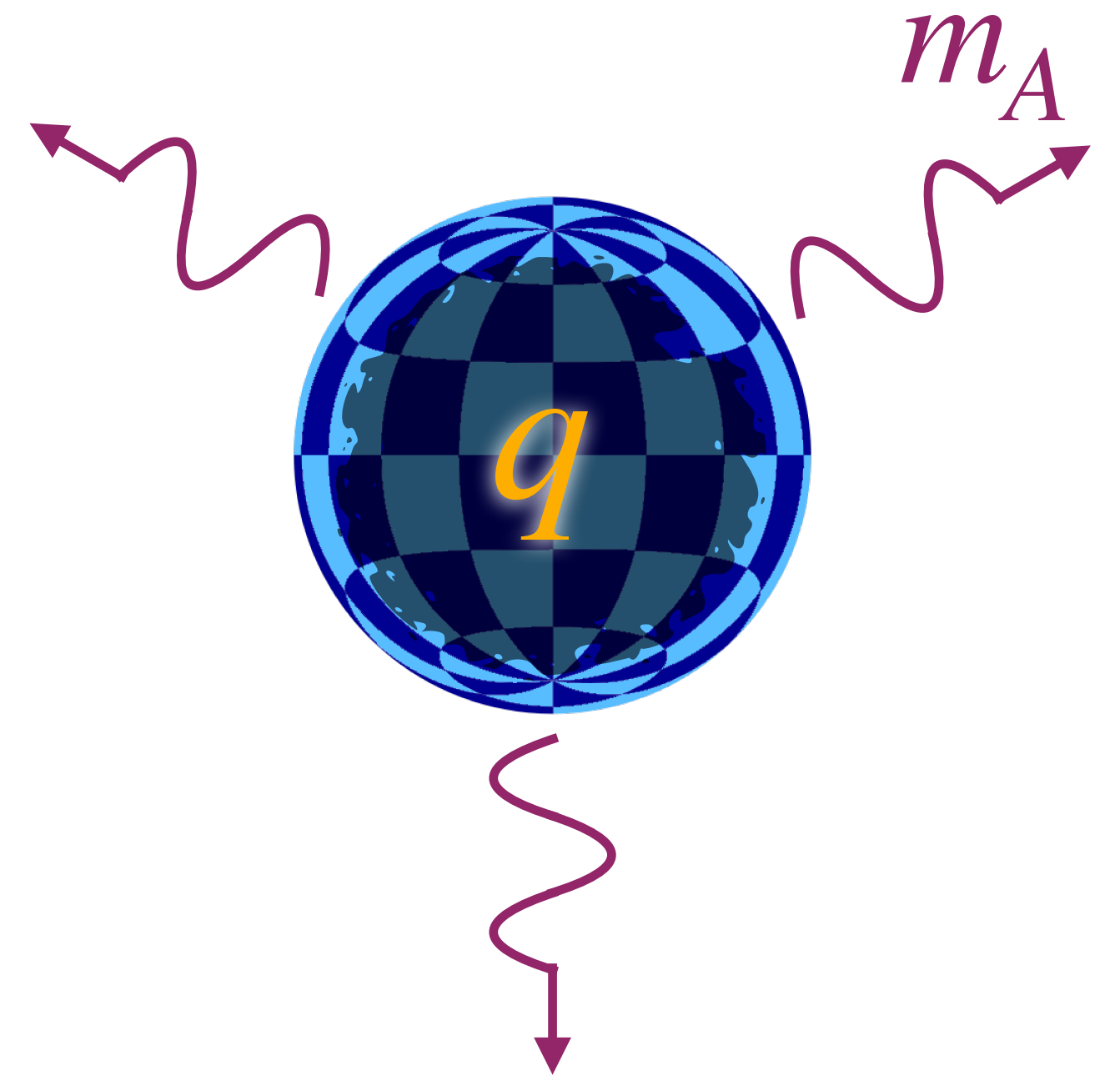
Atomic dark matter (aDM)

Fermion χ , m_χ , g_D



Atomic dark matter (aDM)

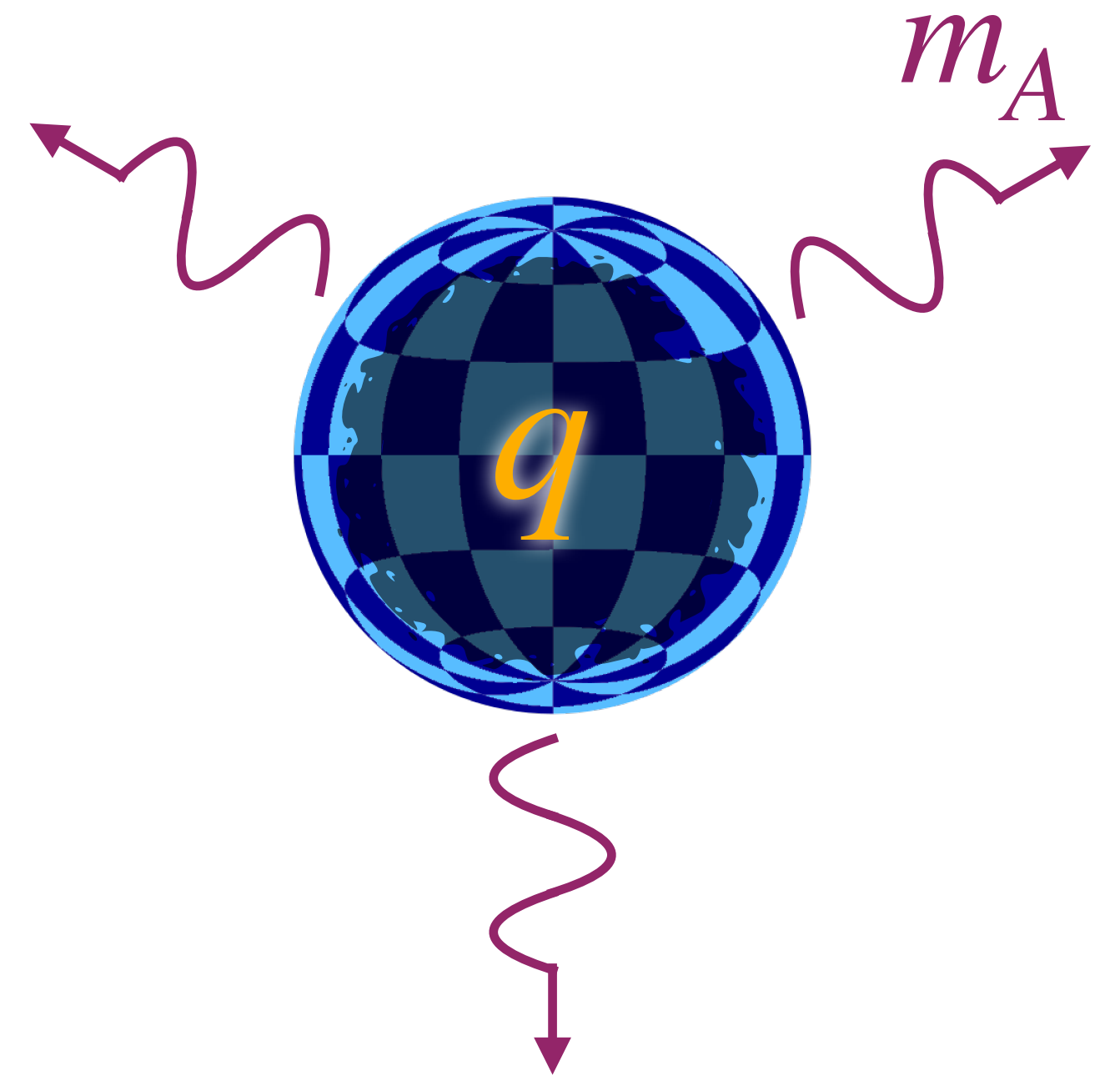
Fermion χ , m_χ , g_D , unit charge



Atomic dark matter (aDM)

Fermion χ , m_χ , g_D , unit charge

Fermion χ'



Atomic dark matter (aDM)

Fermion χ , m_χ , g_D , unit charge

Fermion χ' , $m_{\chi'}$

