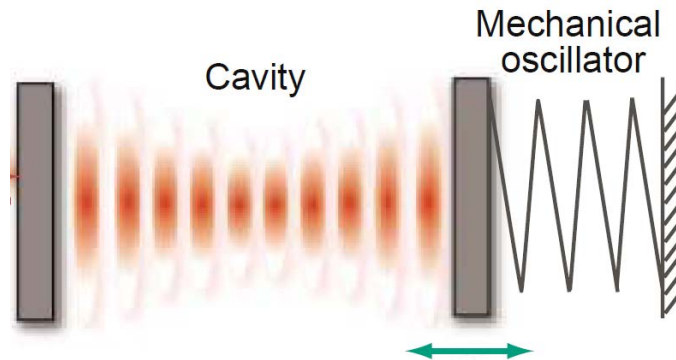


Clearly state any assumptions you make while solving the problems. Good luck!

1. Optical resonator

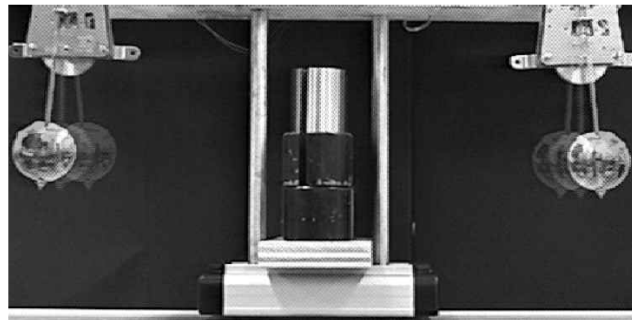
An optical resonator has one of its mirrors attached on a spring, as shown in the figure. How would a spectrum of such a resonator look like (and would it be any different than a spectrum of a resonator with two fixed mirrors)?



Kippenberg and Vahala, *Science* (2008)

2. Spontaneous synchronization

In 1665, Dutch scientist Christiaan Huygens discovered that two pendulum clocks suspended side by side on the same rod eventually synchronize. Why does this synchronization happen?



Bennett et al, *Proceedings of the Royal Society* (January 2015)