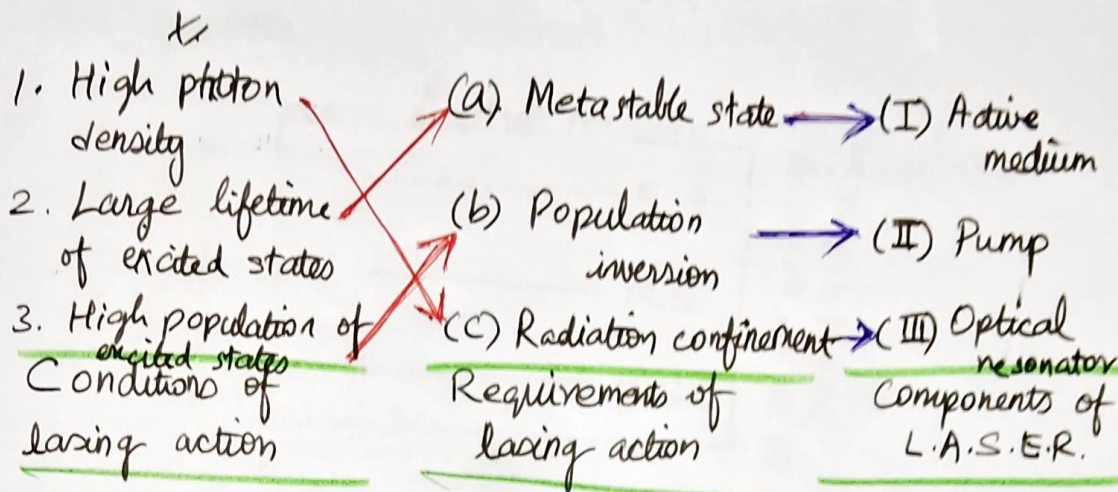


(Fri) 2nd January, 2026

Components of L.A.S.E.R.

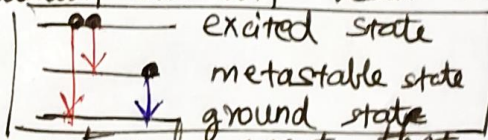
To realize the requirements of lasing action, there are three components required in



Active medium.

Active medium is the physical material in which lasing action takes place. It consists of metastable states that have large lifetimes so that population inversion can be sustained.

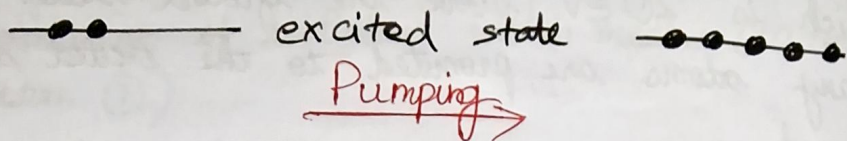
Pump



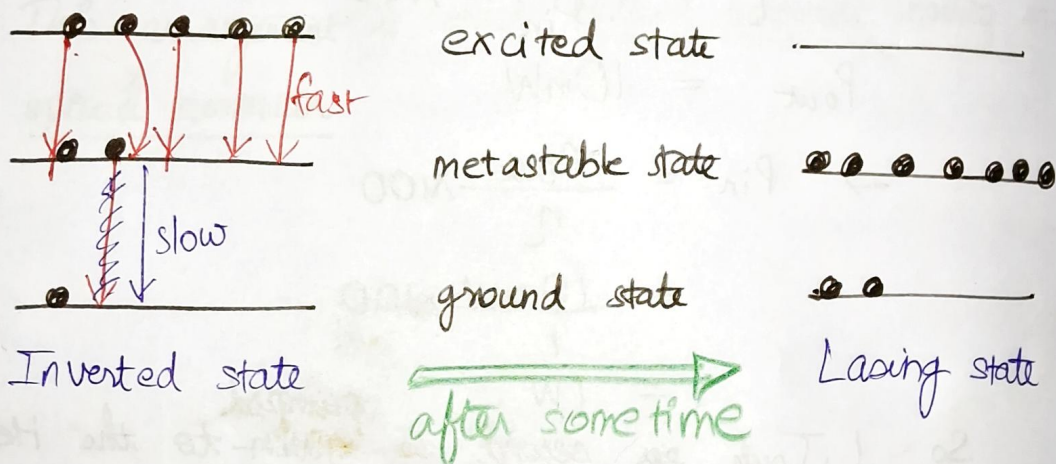
→ fast transition
→ slow transition

Pump is the external agent that transforms the normal state of active medium into inverted state.

Pumping is the process of realizing population inversion.



In ^{Normal state} the presence of metastable state, ^{Inverted state} pumping leads to higher population of ~~also~~ of metastable state ~~also~~. However, since the lifetime of metastable state is ^{larger} higher than excited state, there is a gradual increase of population of metastable state compared to excited state.

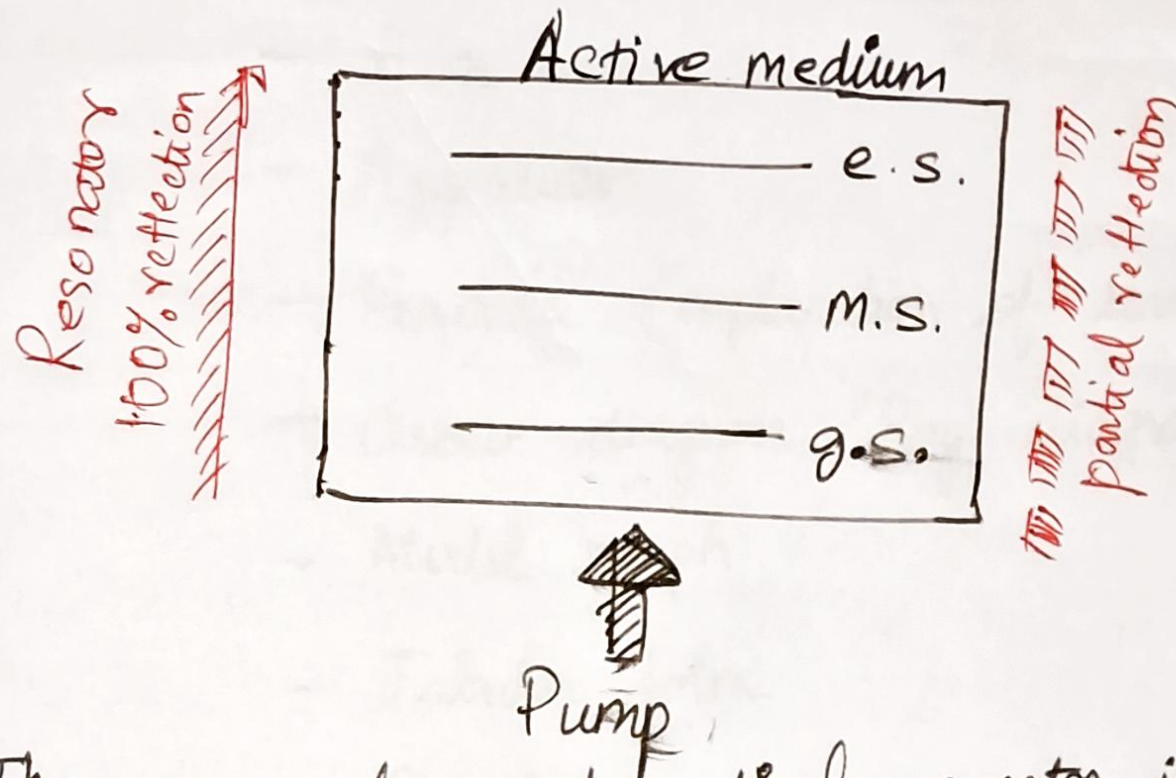


Optical resonator

In order to confine the radiation within the active medium, the ~~pro~~ reflection property of light is used.

A pair of optically flat/plane mirrors enclose the active medium so that photons get confined. ~~This~~ In order to extract the photon

from a single direction, one mirror is made fully reflecting whereas second mirror is partially reflecting. This arrangement is called optical resonant cavity or simply optical resonator.



The commonly used optical resonator is called Fabry-Perot interferometer