GAS LASER

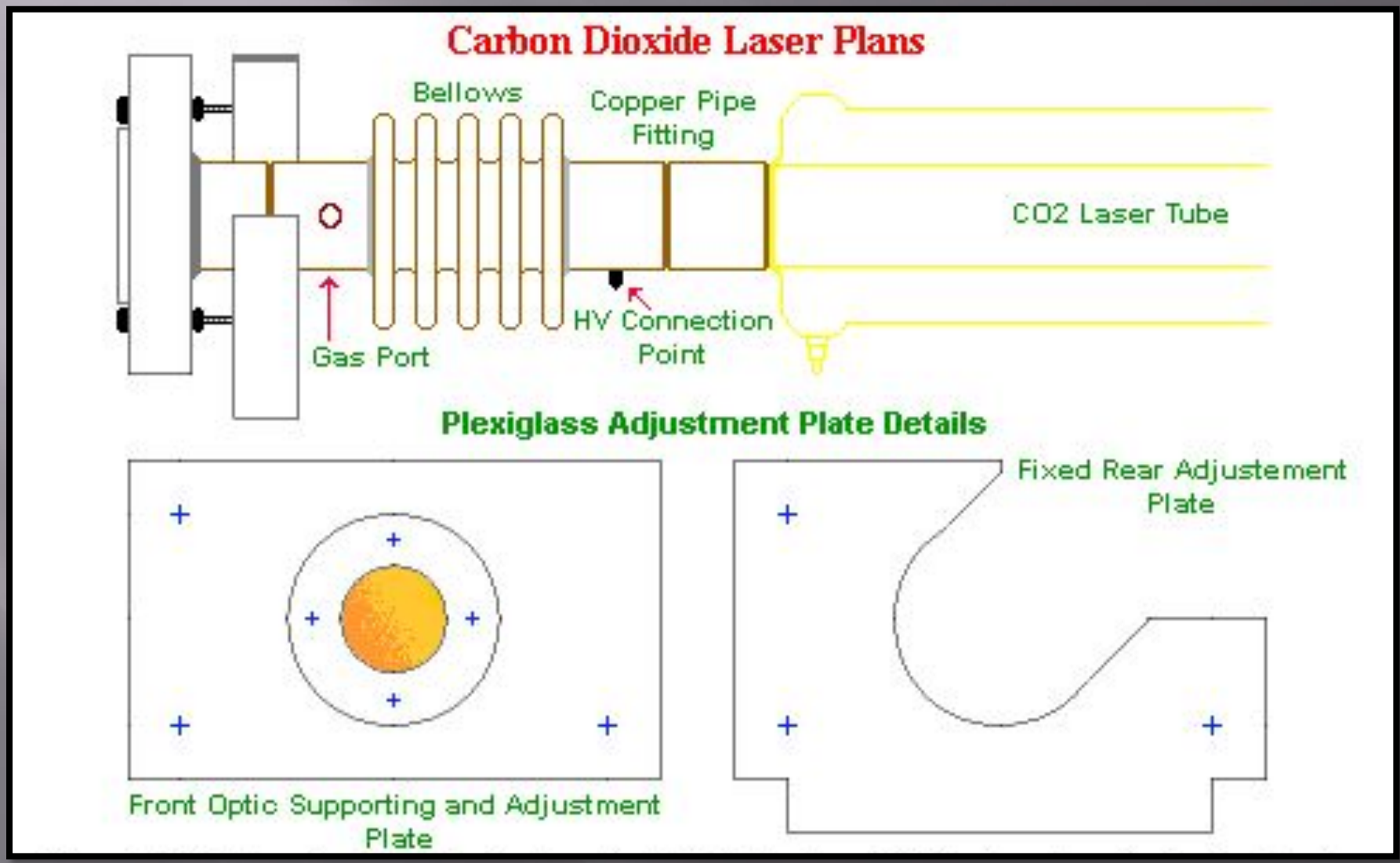
Iranian-American physicist Ali Javan

American physicist William R. Bennett, Jr.

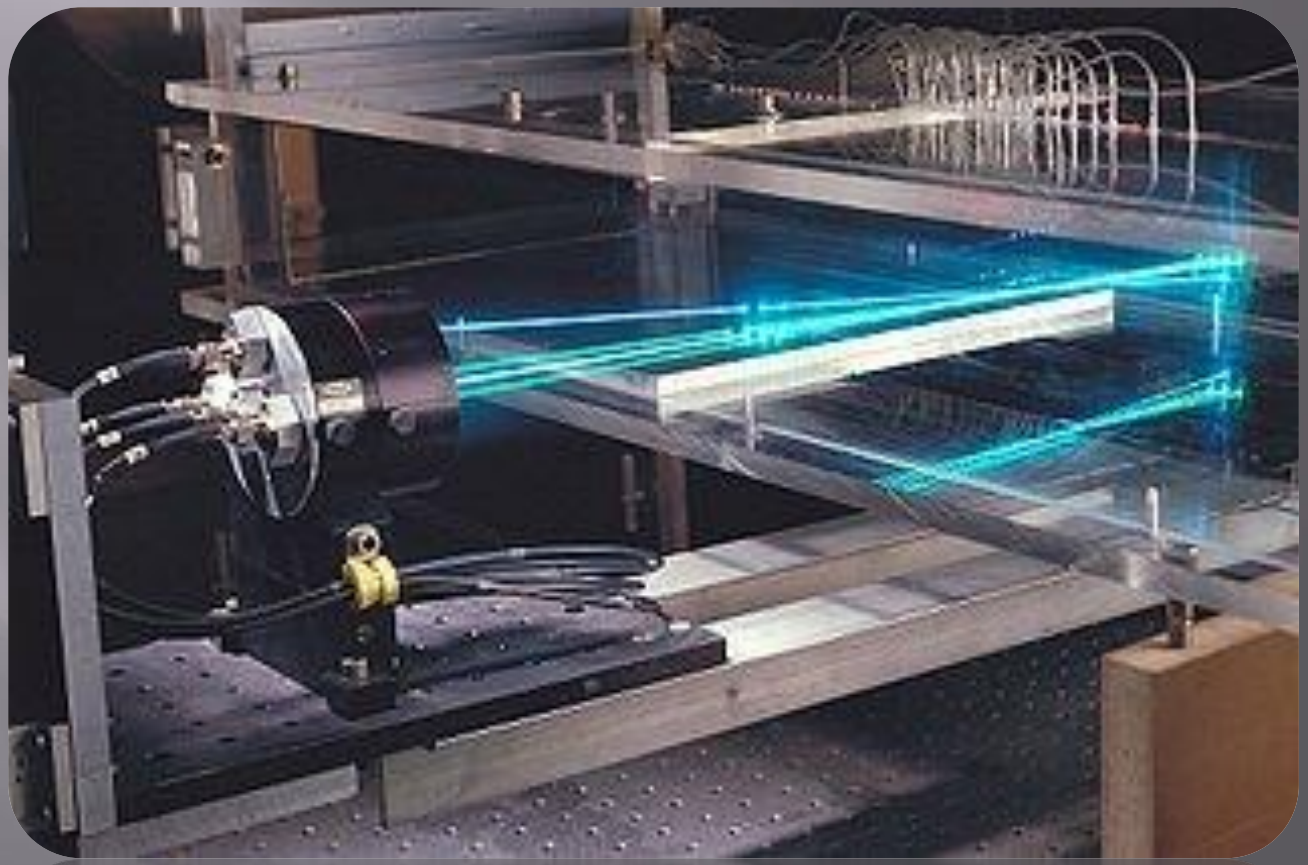
Types of gas laser

- *Carbon dioxide lasers, or CO_2 lasers*
- *Carbon monoxide lasers*
- *Helium–neon (HeNe) lasers*
- *Nitrogen lasers*
- *TEA lasers*
- *Chemical lasers*
- *Excimer lasers*
- *Ion lasers*
- *Metal-vapor lasers*

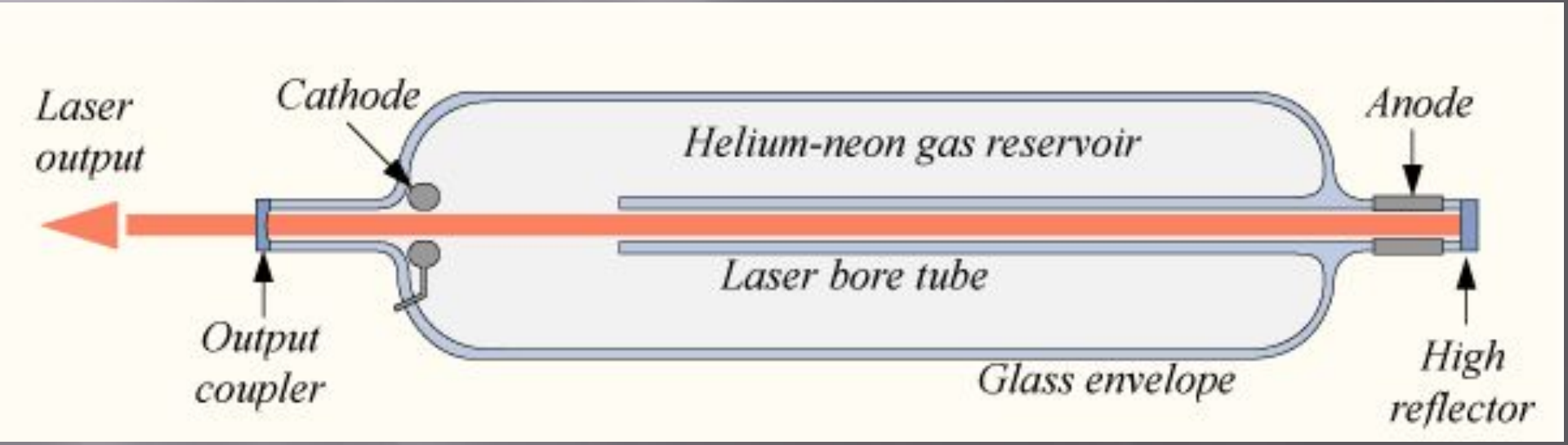
Carbon dioxide lasers



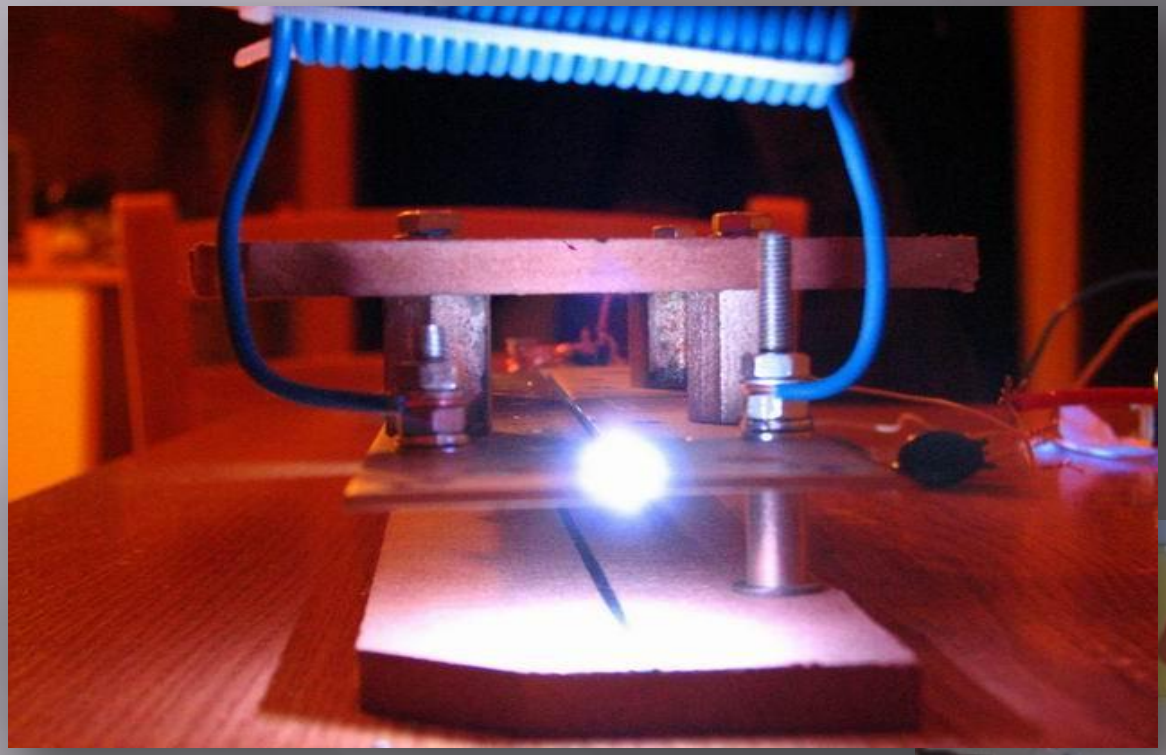
Carbon monoxide lasers



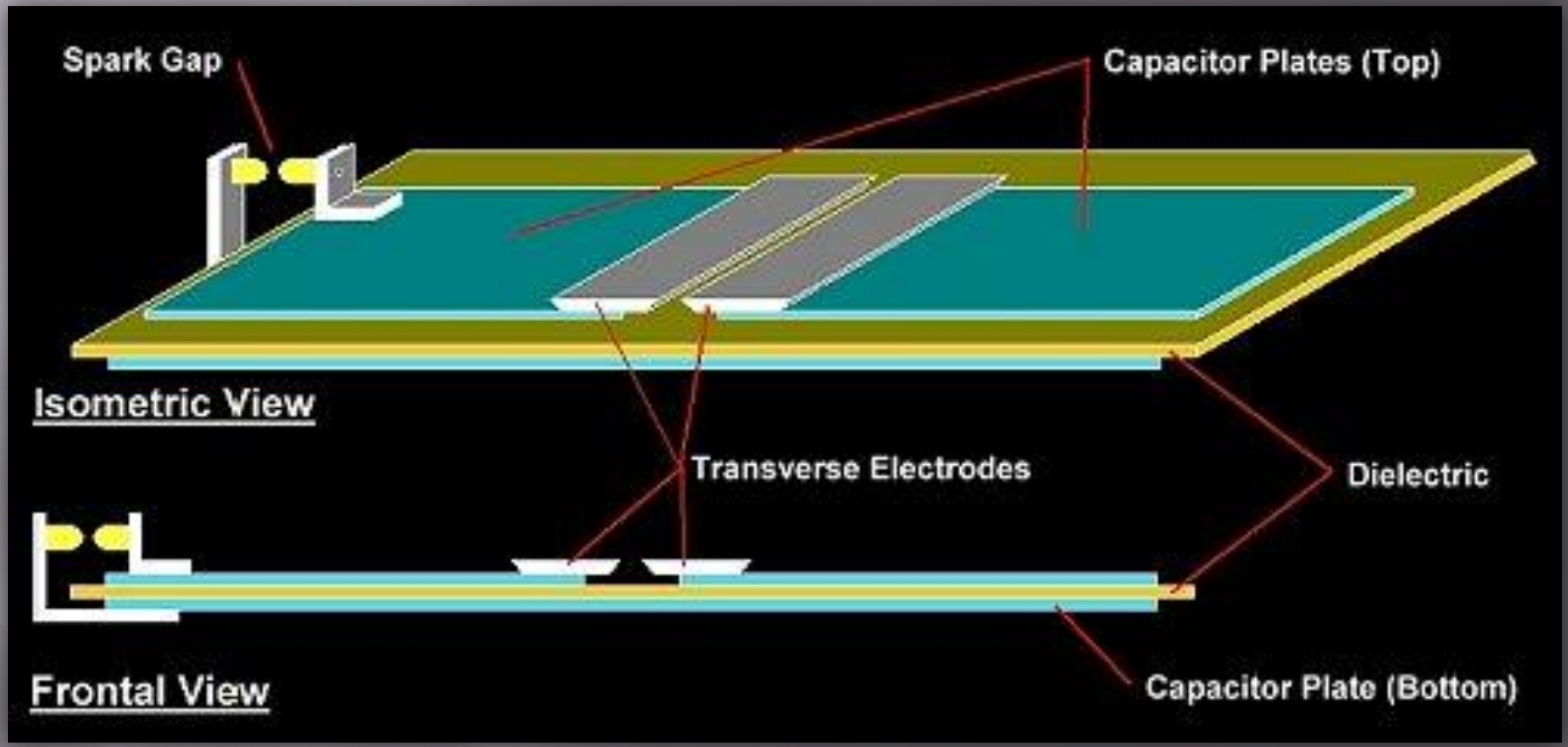
Helium–neon (HeNe) lasers



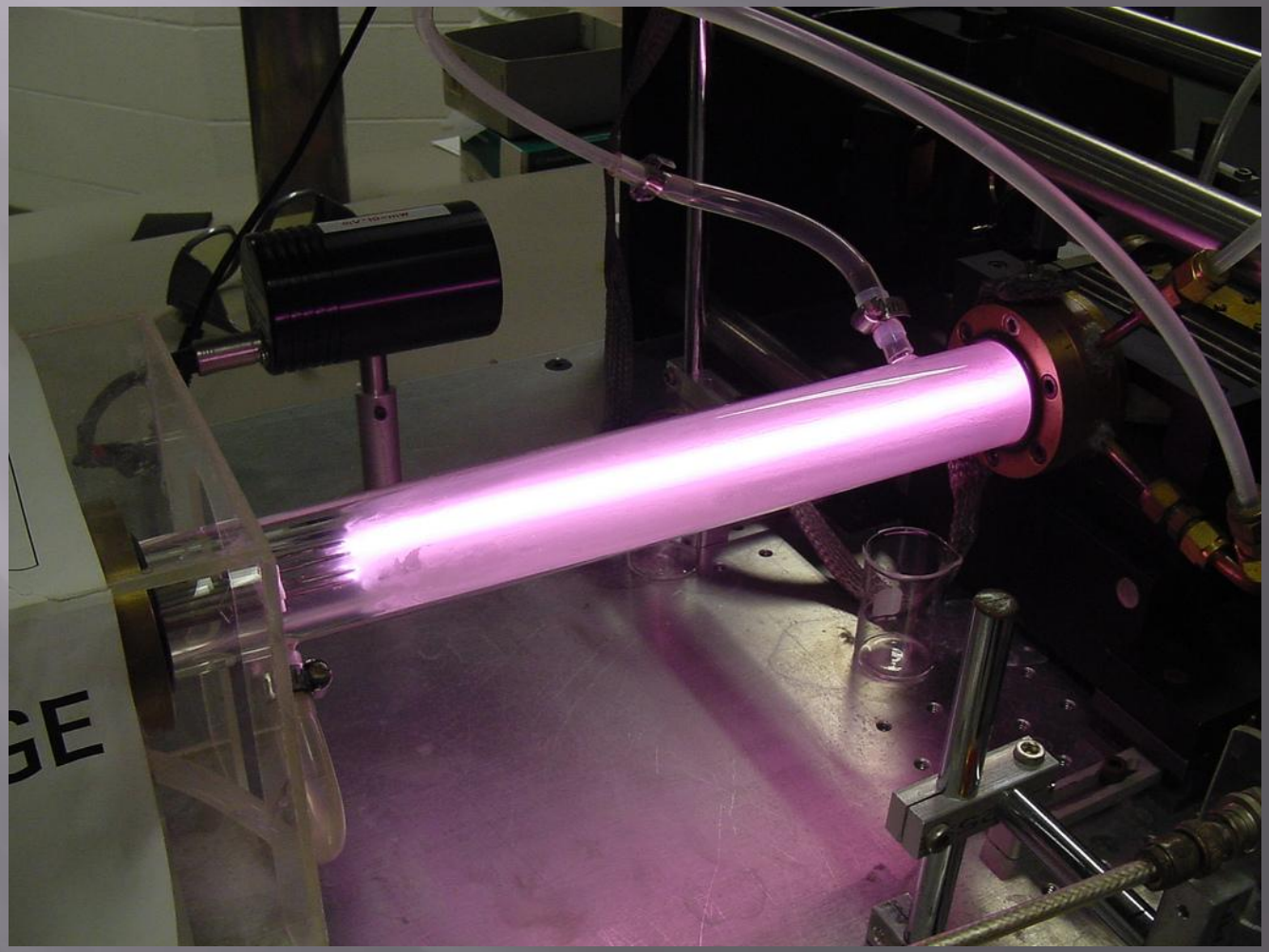
Nitrogen lasers

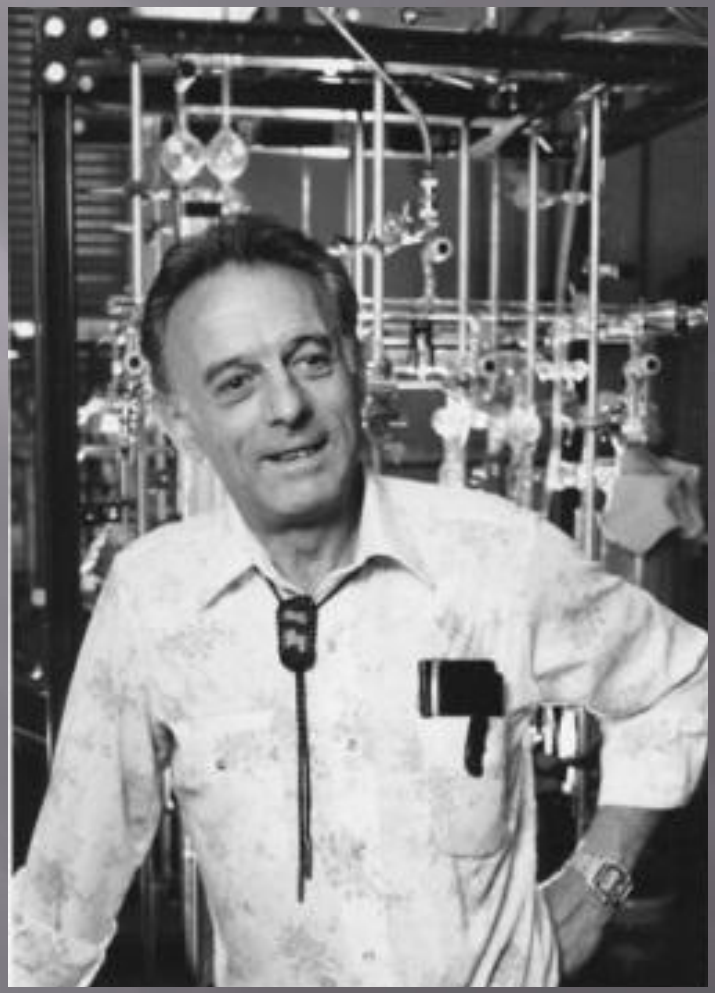


TEA lasers

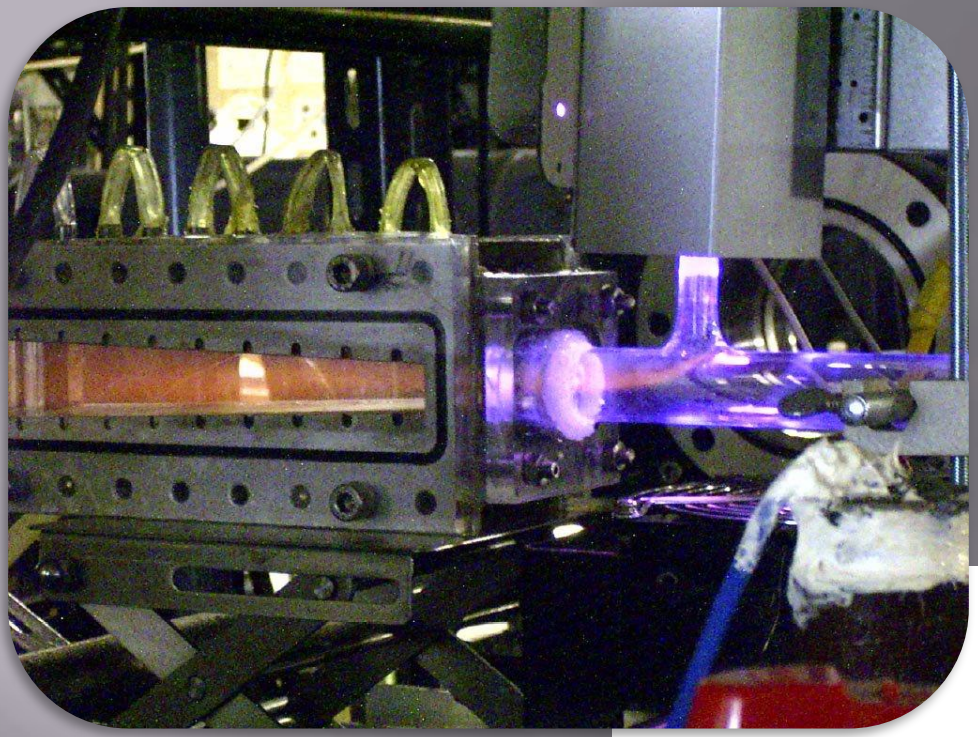

Spark Gap
Capacitor Plates (Top)
Isometric View
Transverse Electrodes
Dielectric
Frontal View
Capacitor Plate (Bottom)

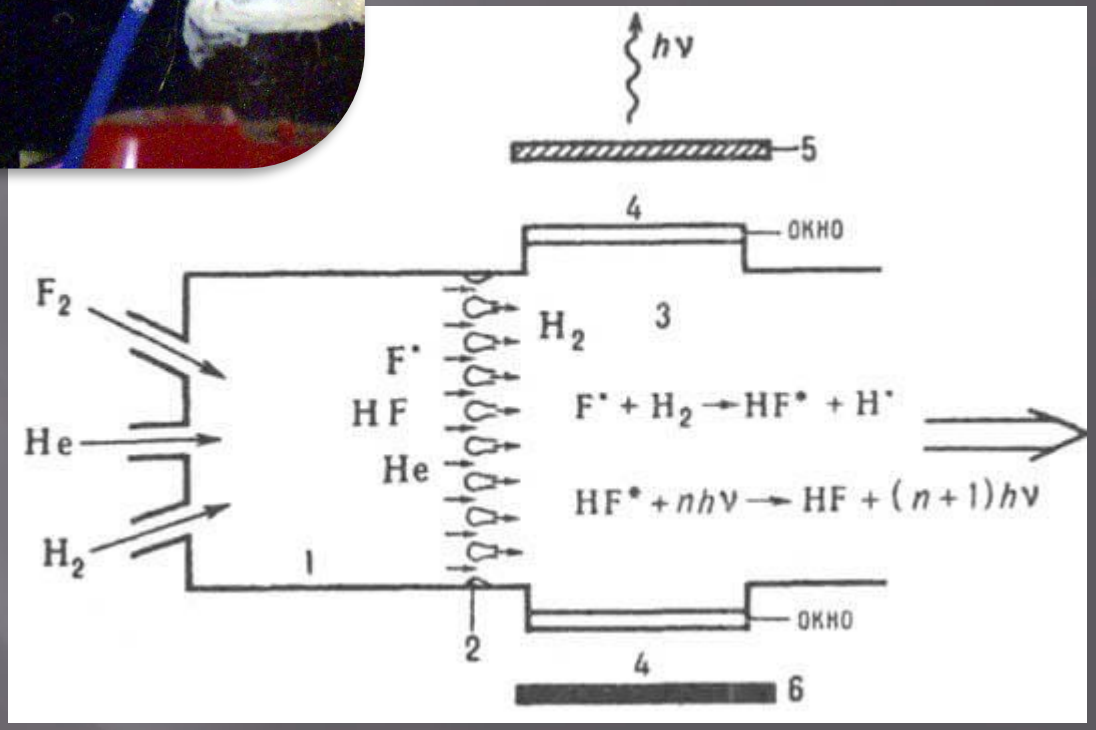
Chemical lasers



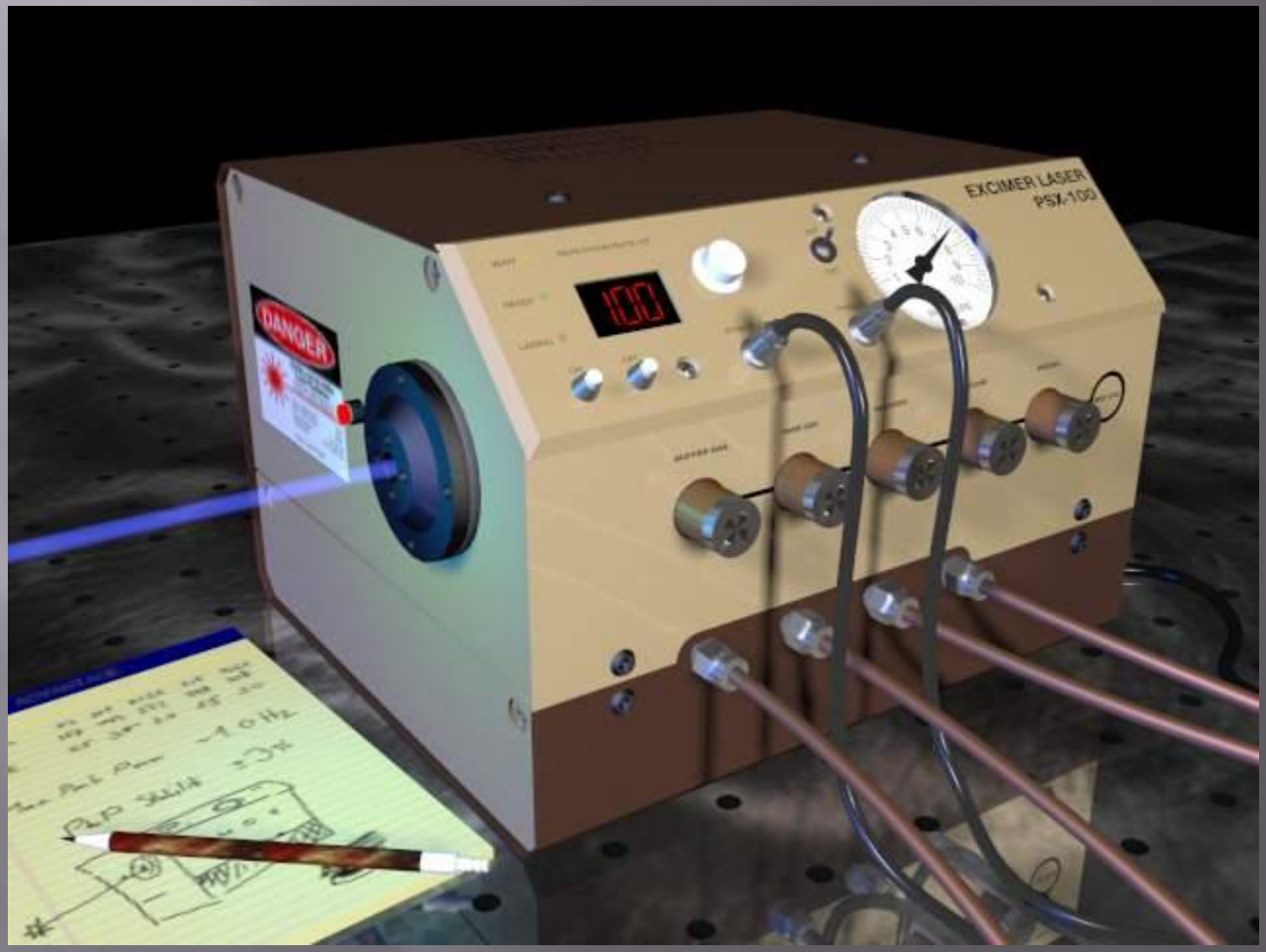


George C. Pimentel

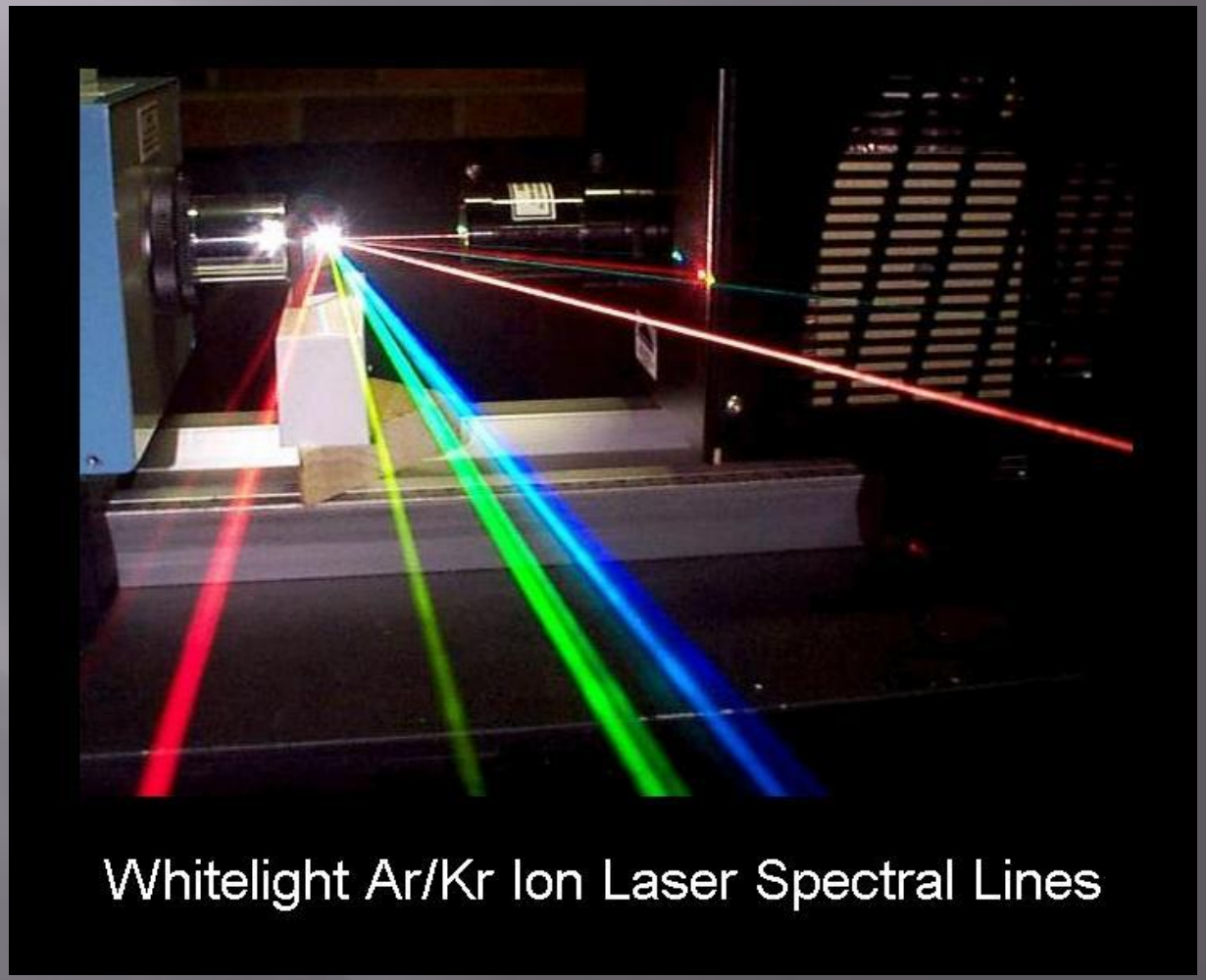



hν
5
4
ОКНО
F2
H2
3
F·
HF
He
F· + H2 → HF* + H·
He
HF* + nhν → HF + (n + 1)hν
H2
1
2
ОКНО
4
6

Excimer lasers

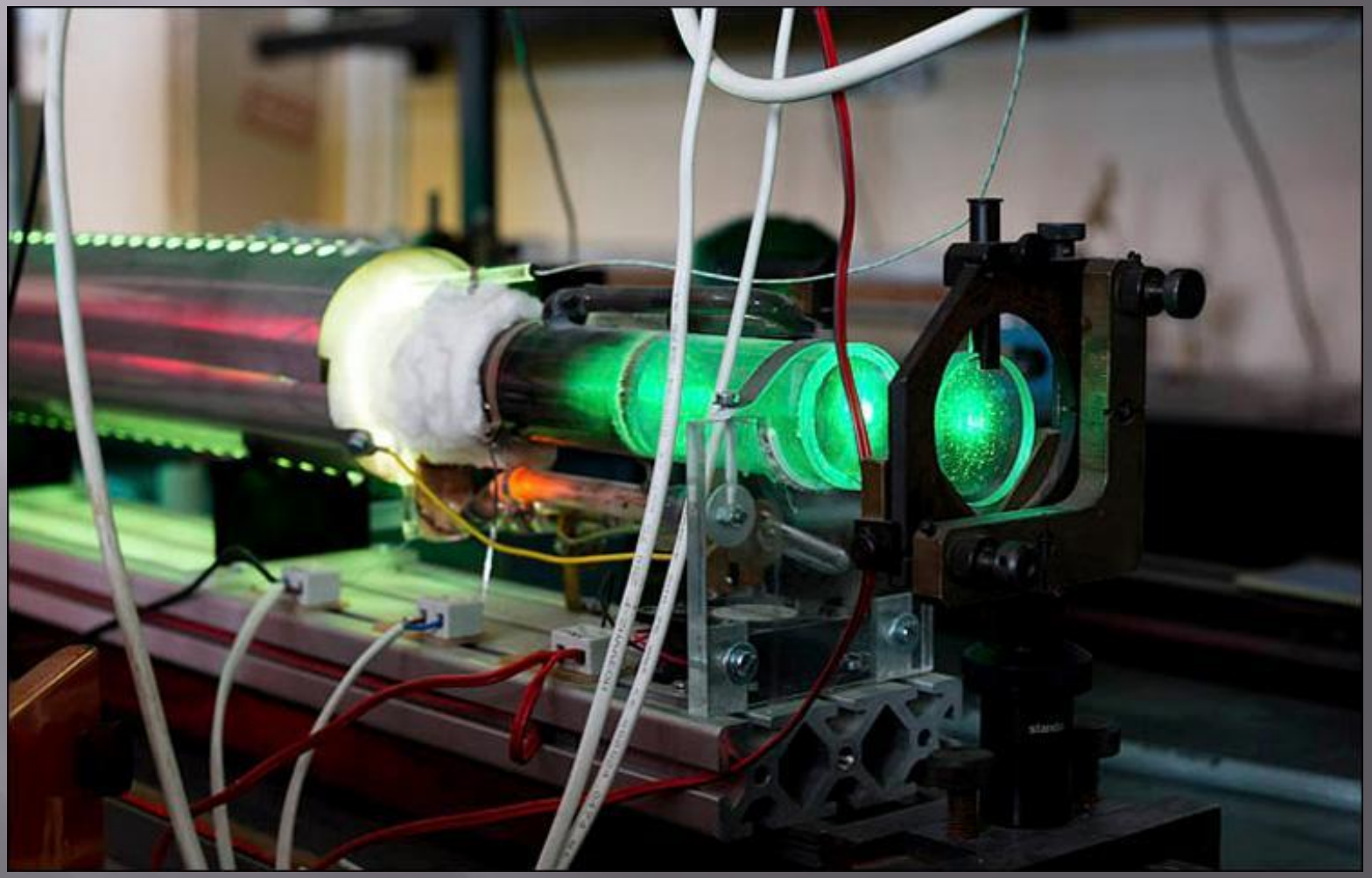


Ion lasers



Whitelight Ar/Kr Ion Laser Spectral Lines

Metal-vapor lasers



Advantages:

- High volume of active material
- Active material is relatively inexpensive
- Almost impossible to damage the active material
- Heat can be removed quickly from the cavity

Applications