**Center for Nanophotonics, TTU**

**E-beam Evaporator (Edwards Auto 306)**

Always keep chamber vacuum. Working pressure should be lower than 10-5 torr

Loading the sample:

1. Press seal, then press vent. Open the gas valve while venting.

2. After the pressure reaches atmosphere pressure, open lid and load the sample.

3. When loading the sample, remember to plug in the rotator power cable, check: **rotator, crucible, and sensor**

4. Close lid, pump chamber for at least 1 hour (press process pump). Use liquid nitrogen to speed up if needed

Depositing metal:

1. **Check Water!!! Important!!!** Make sure water flow indicator is rotating before you turn ON the machine. Then, turn on power, turn on rotator too.

2. Switch crucible to target metal if needed. If the metal is switched, remember to check the metal parameters. See attached paper on the device, remember to switch "layer"

3. Turn on electron beam gun

4. Slowly twist the knob to increase beam gun power to desired level. (No more than 1/4 of the full range at most.)

5. Wait a short while for the growth speed to stabilize, then open the shutter (left bottom of the 3 in a line)

6. Take your time while depositing

7. When desired layer thickness reached, close shutter, turn off electron beam gun

8. If a swich in the metal is needed, switch "layer", check parameter, and rotate the crucible clockwise.

Hint:

1. Sometimes it's hard to determine whether the desired metal is under the electron beam. Reduce the electron beam power to a lower level, use eye-wear & monitor the metal being irradiated.

2. The appearance of metals:

Gold: Does not stick to crucible, requires less power to vaporize, faster deposition (~0.9)

Nickel: sticks with crucible, hard to vaporize, deposit at very low speed (<0.05)