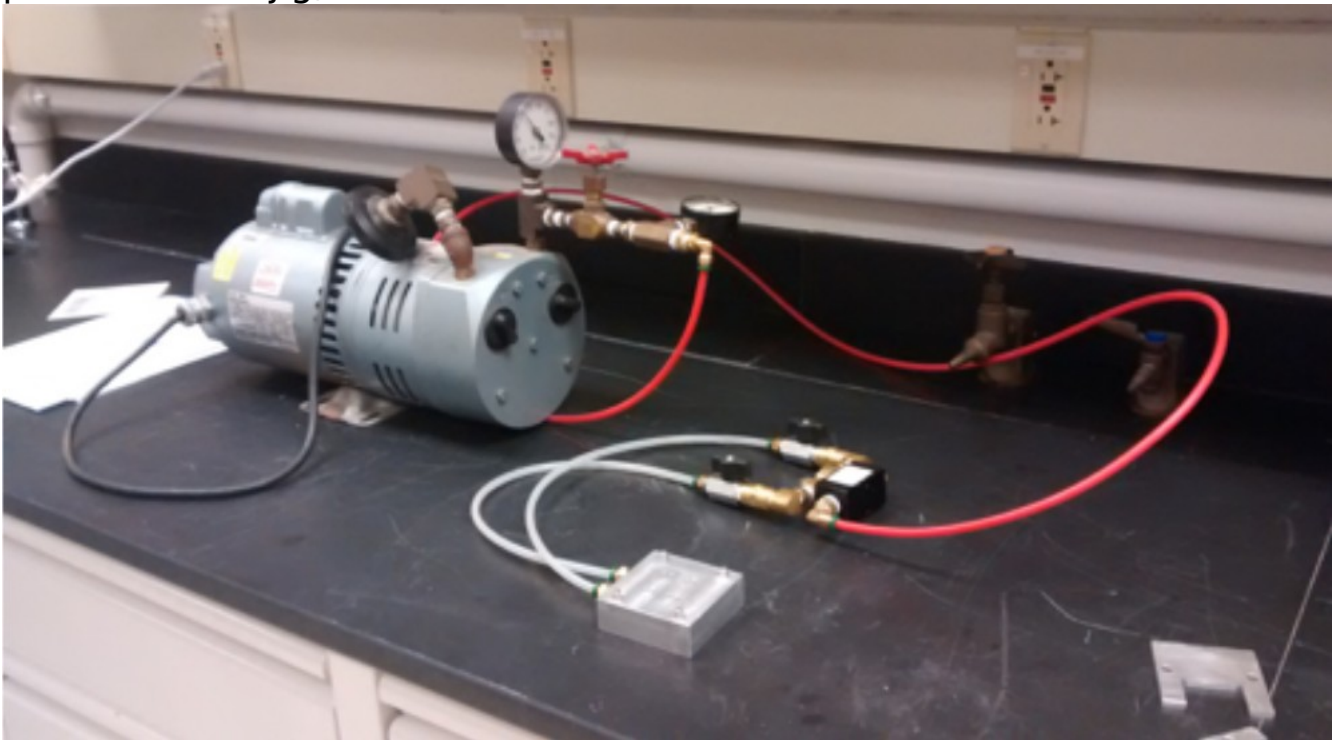


## Dummy Module Assembly

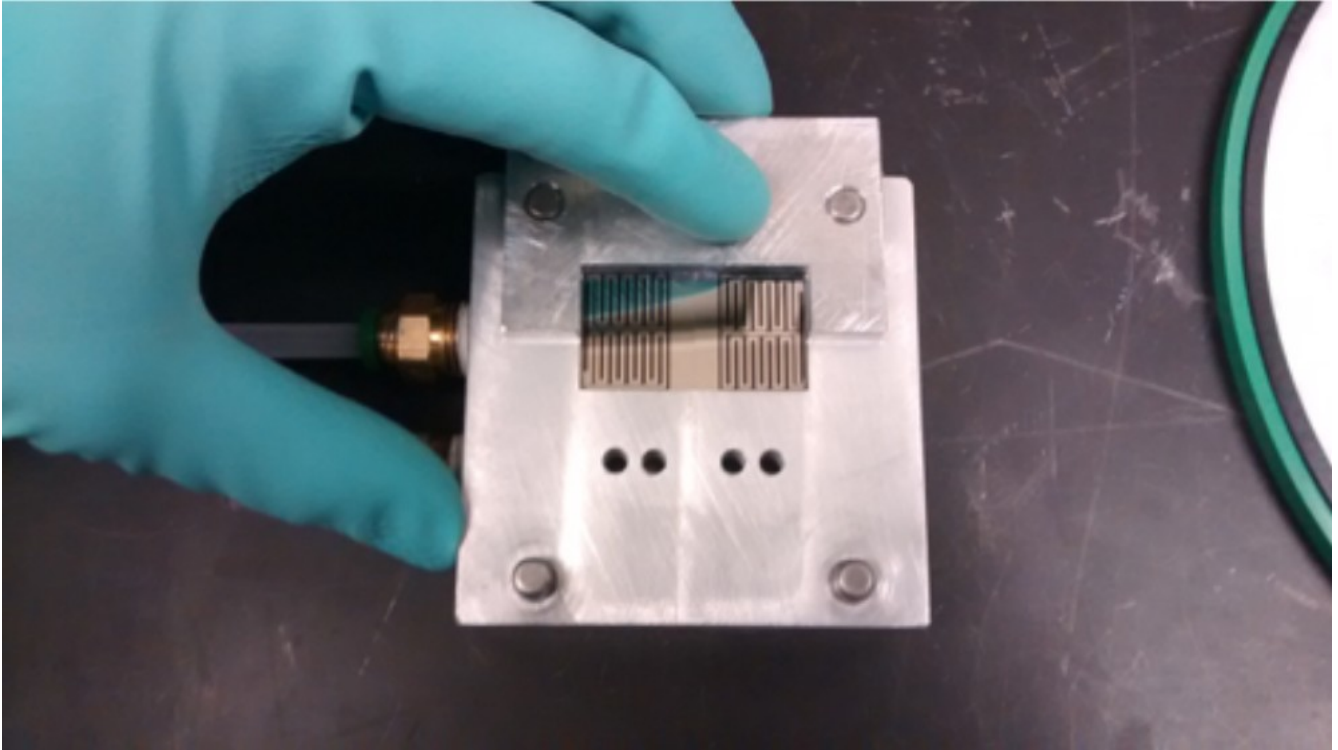
In this document we describe how to assemble dummy modules using two assembly jigs (one for silicon attachment and the other for flex cable attachment) and double-sided epoxy tape.

Begin with four front-end chips, a silicon detector (either a quad chip or 1X2 chip), and the silicon attachment assembly jig. This particular jig should come with two detachable plates. **\*\*NOTE: All images in this document show the assembly of a quad module.**

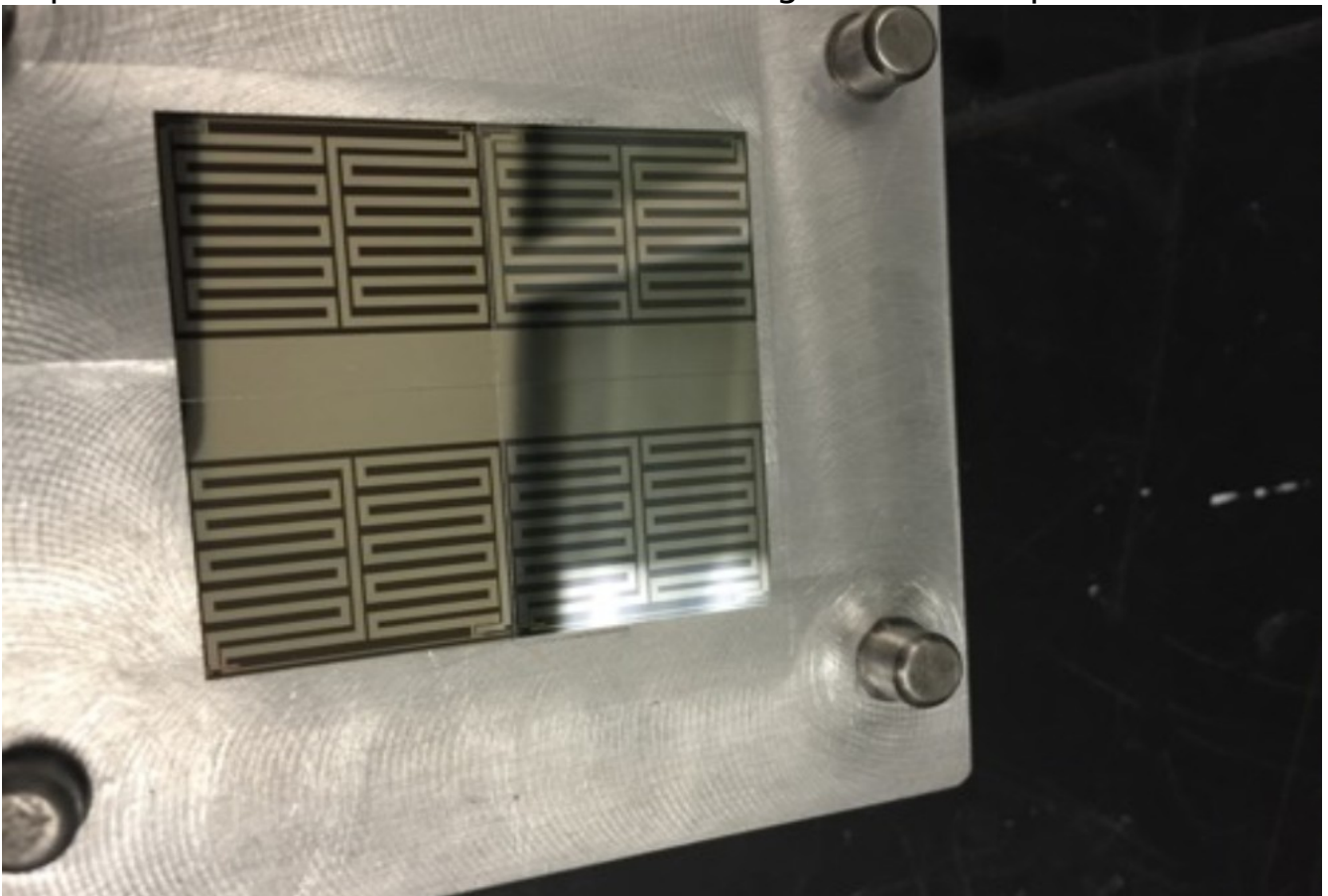
Attach the jig to a vacuum with two control valves. These control the left and right channels separately. Before any front-end chips are placed on the jig, make sure that the vacuum is off.



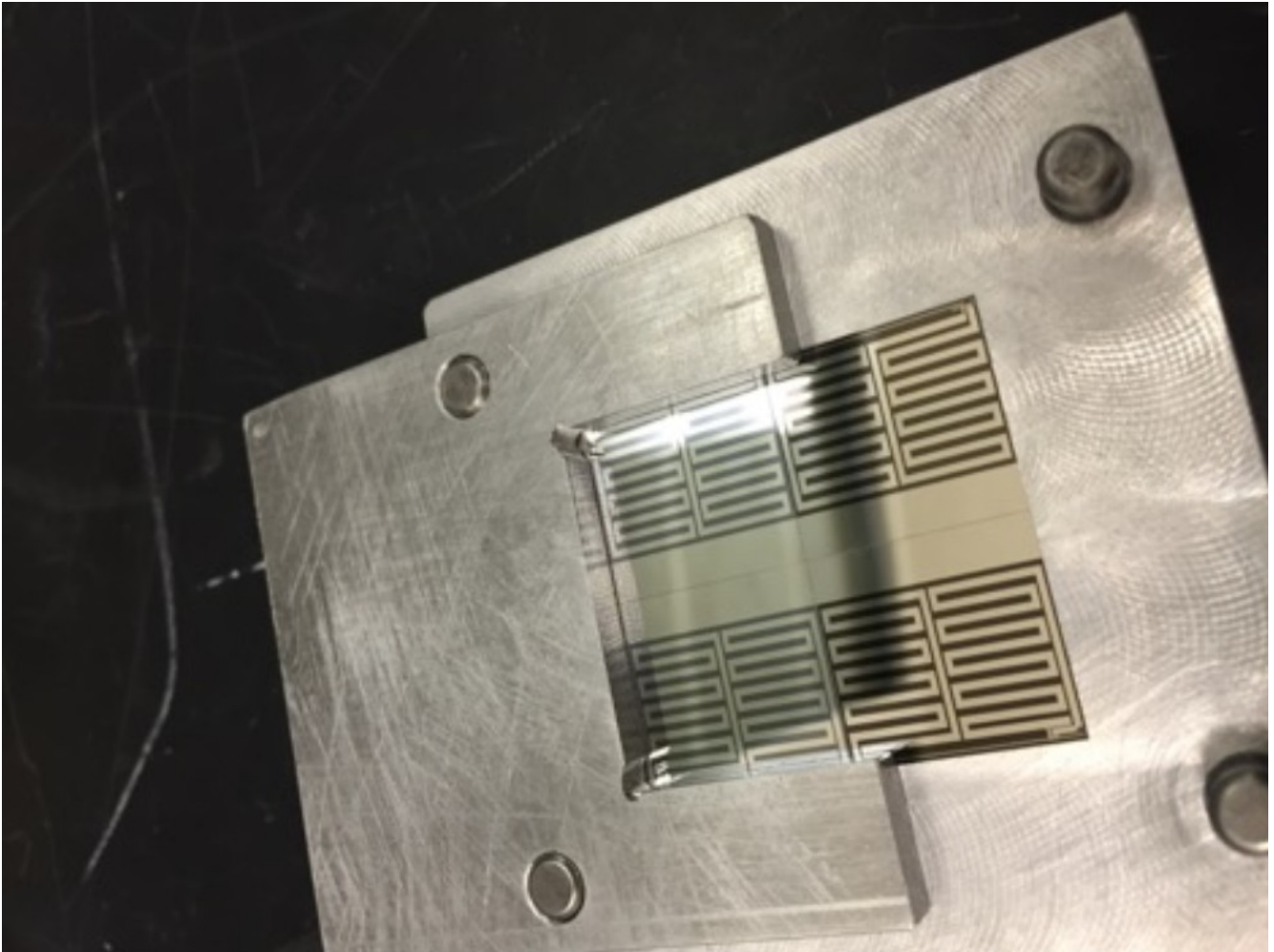
One of the detachable plates should have a slightly wider opening than the other. This one is used for positioning the front-end chips. Place this plate on the jig. Since it has some lateral freedom of movement, push the plate towards the center so as to get a consistent placement. Place two front-end chips on the jig, and push them towards the corners of the alignment plate. Note the placement of the bump-bonding pads on the front-end chips. Open one vacuum channel to keep the chips in place.



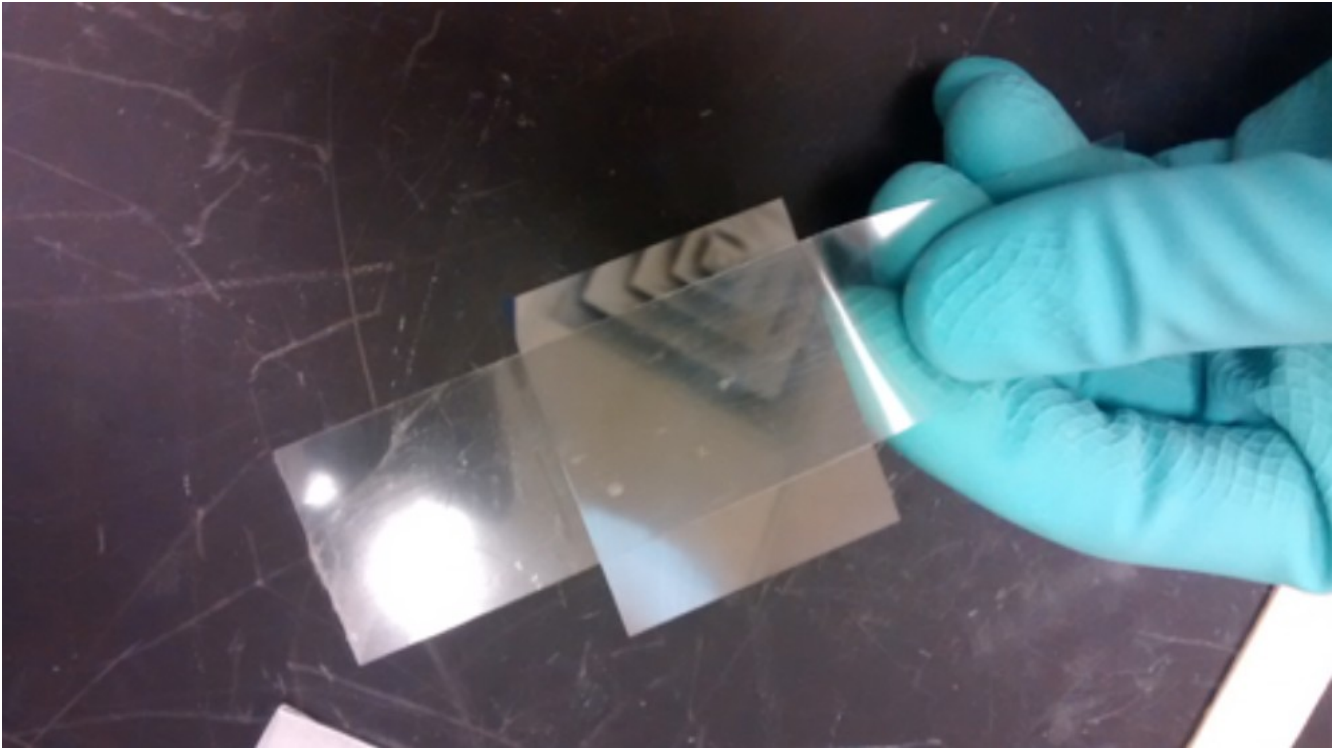
Repeat on the other side in order to arrange all four chips.



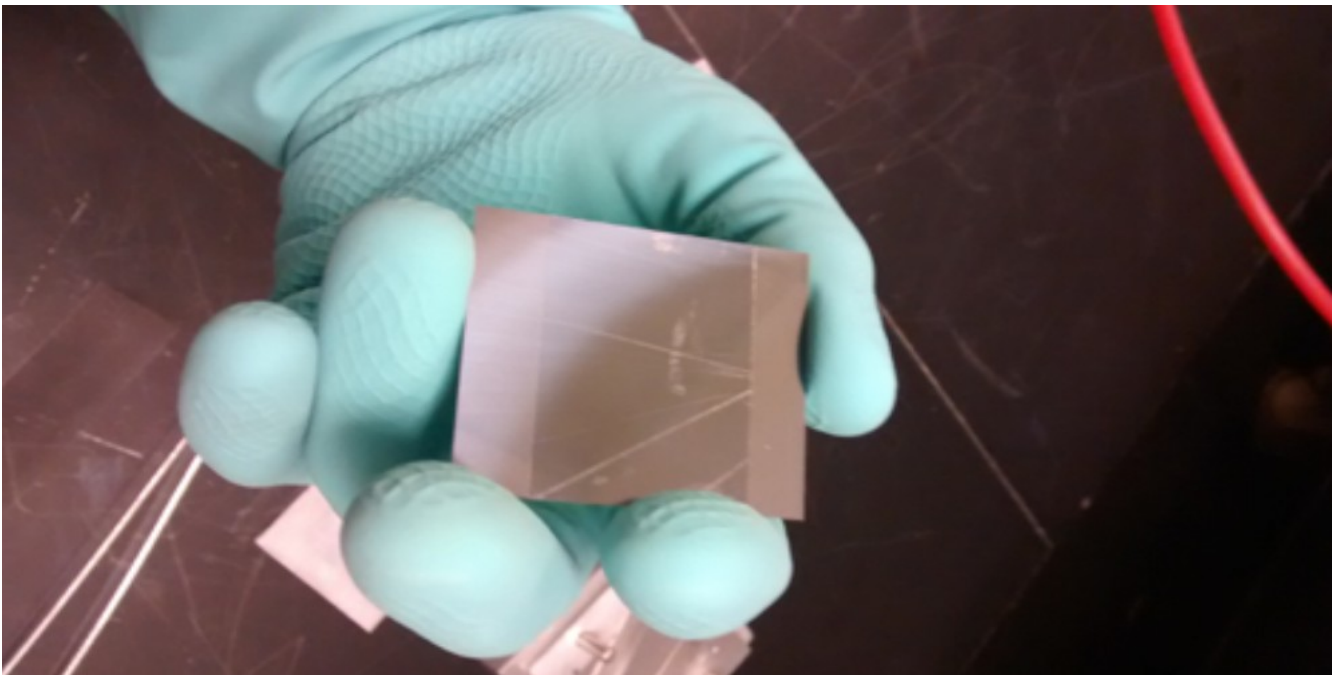
Now, place the other alignment plate on top. There should be a slight groove cut on one side of this plate, and this should face down.

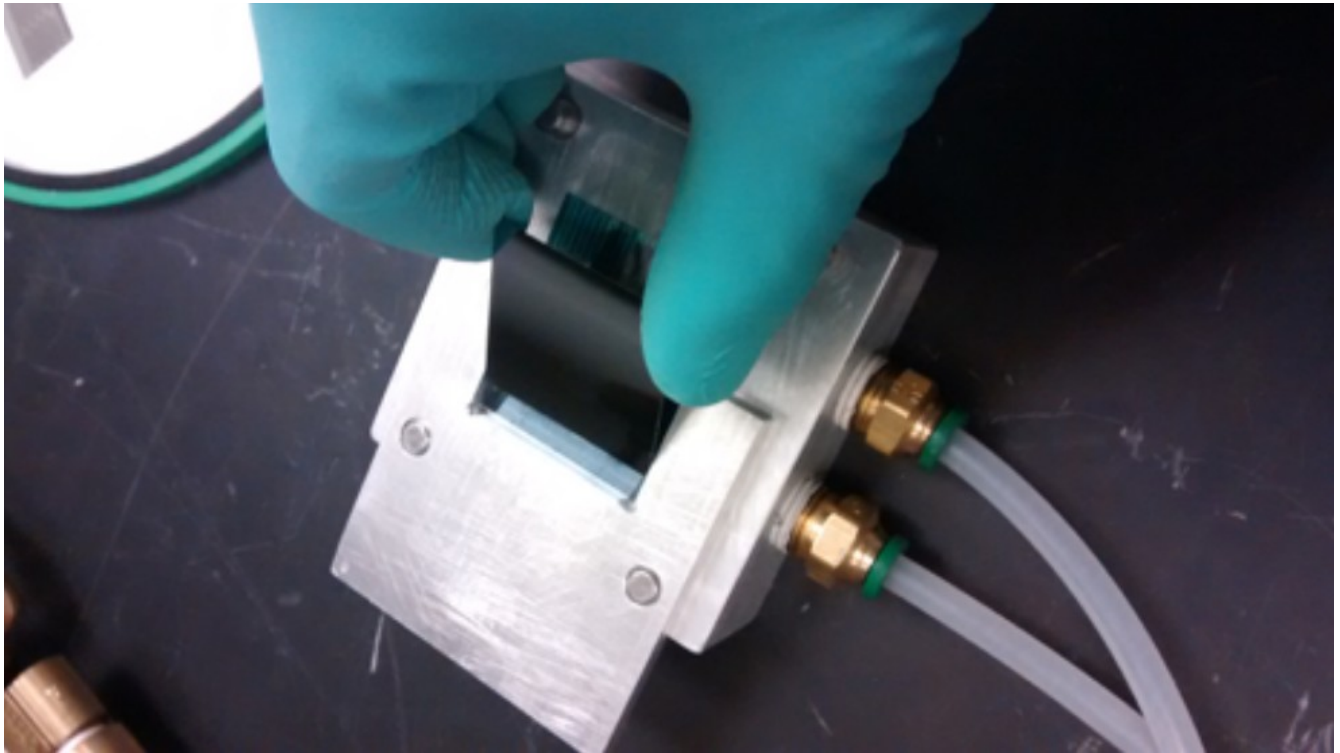


Remove one side of the double-sided epoxy and attach it to the silicon sensor. Then, use scissors to cut away the excess portion on either side.

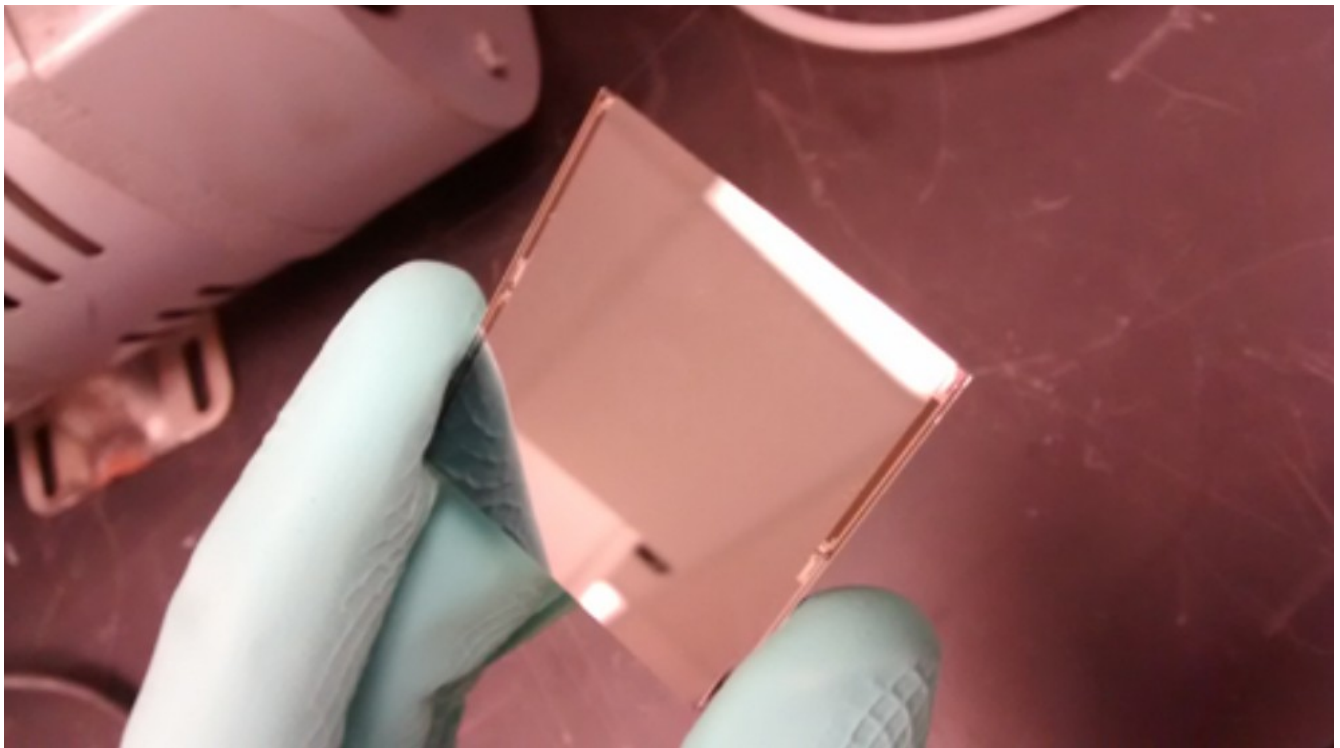


Now, remove the other side of the epoxy tape, and use the alignment jig to attach it to the front-end chips. In the case of a 1X2 module, you will only attach two of the front end chips and will want to align the silicon detector along the right hand side of the alignment jig to ensure enough space is left between the edge of the front end chips and the silicon detector.



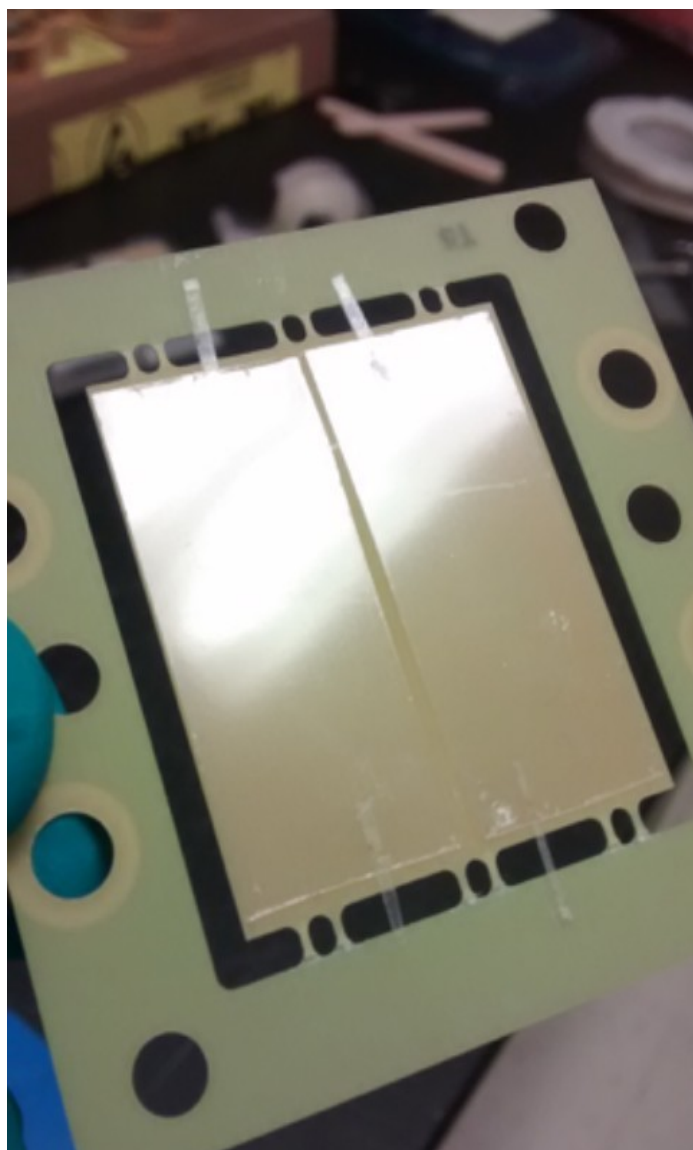
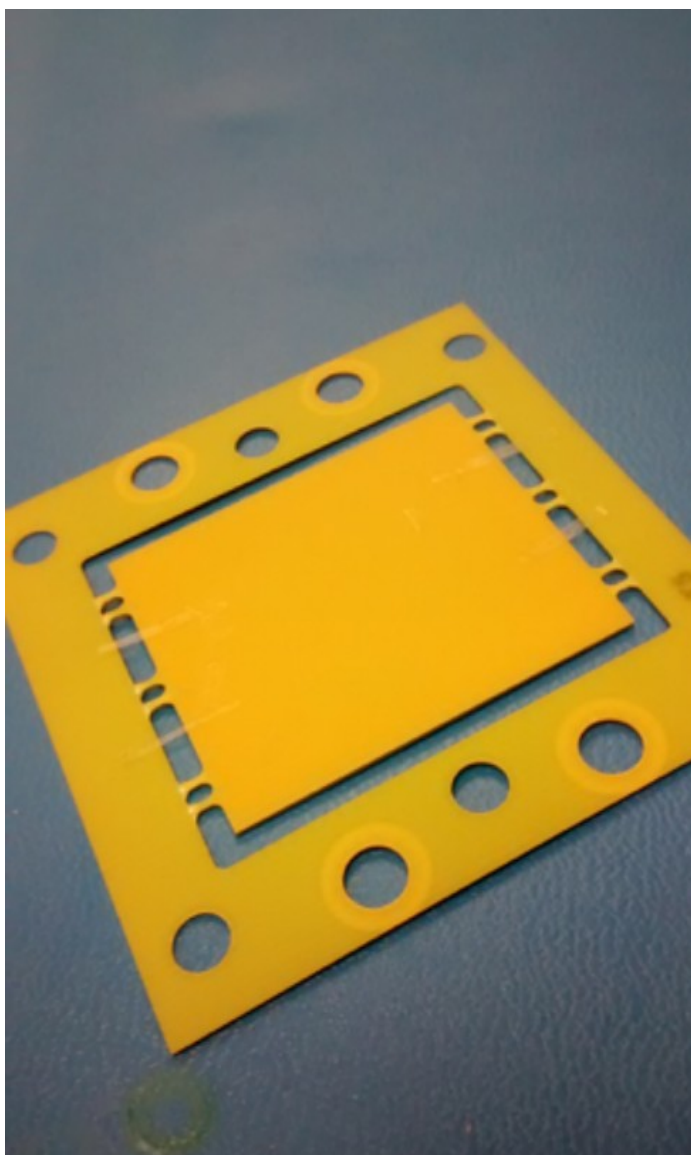


You have an assembled detector module without the flex cable.



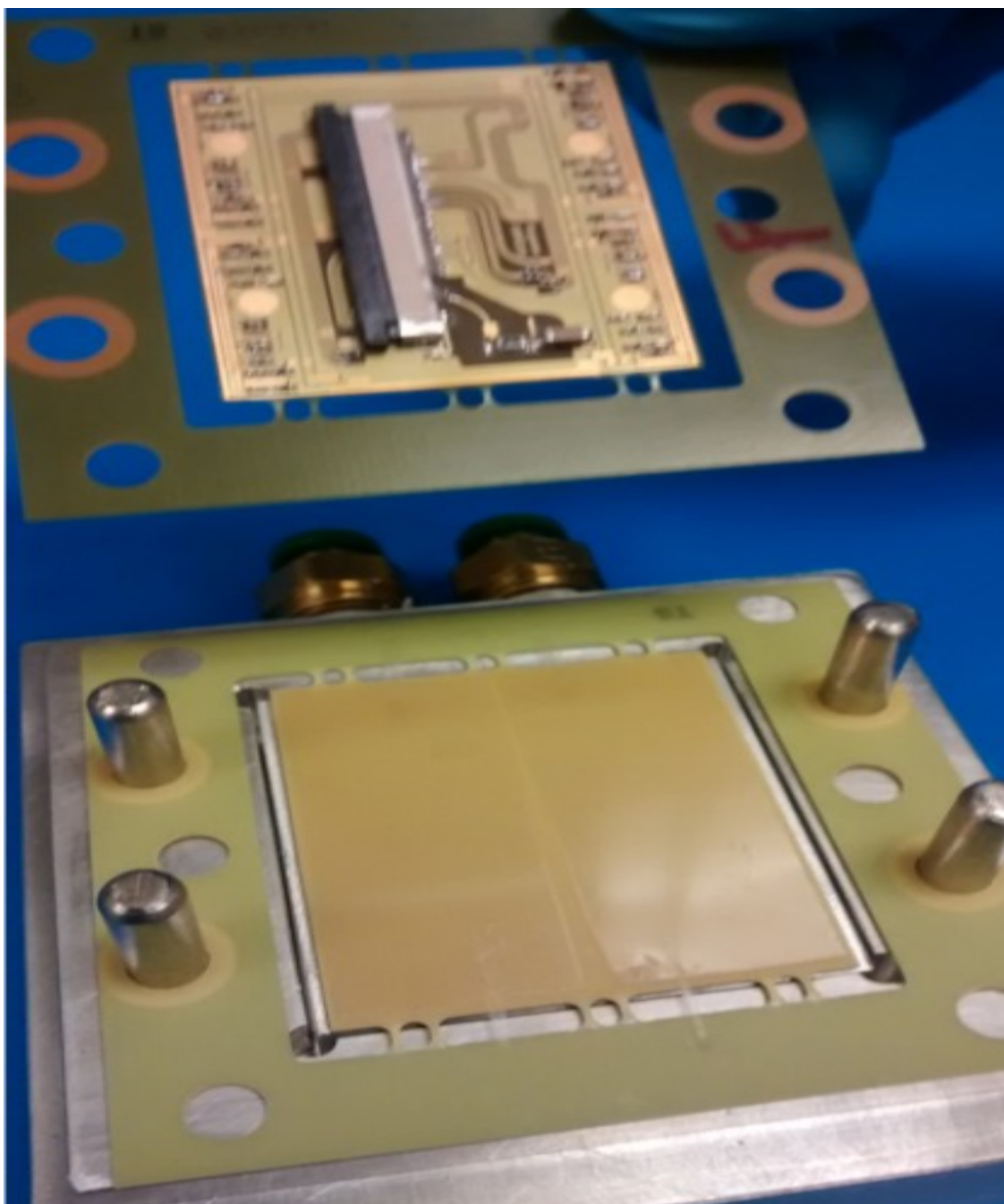
Now, attach the flex cable to the front end chips using epoxy again and a second alignment jig. **\*\*NOTE: These flex cable instructions only apply to the quad modules for which we have a jig for. A description for how to do this for the 1X2 modules is listed at the very end of this section.**

In order to attach the epoxy tape to the flex cable accurately, use a secondary flex cable. Begin by cutting the epoxy tape and, using Scotch double stick tape, align the epoxy on the secondary chip, unexposed.

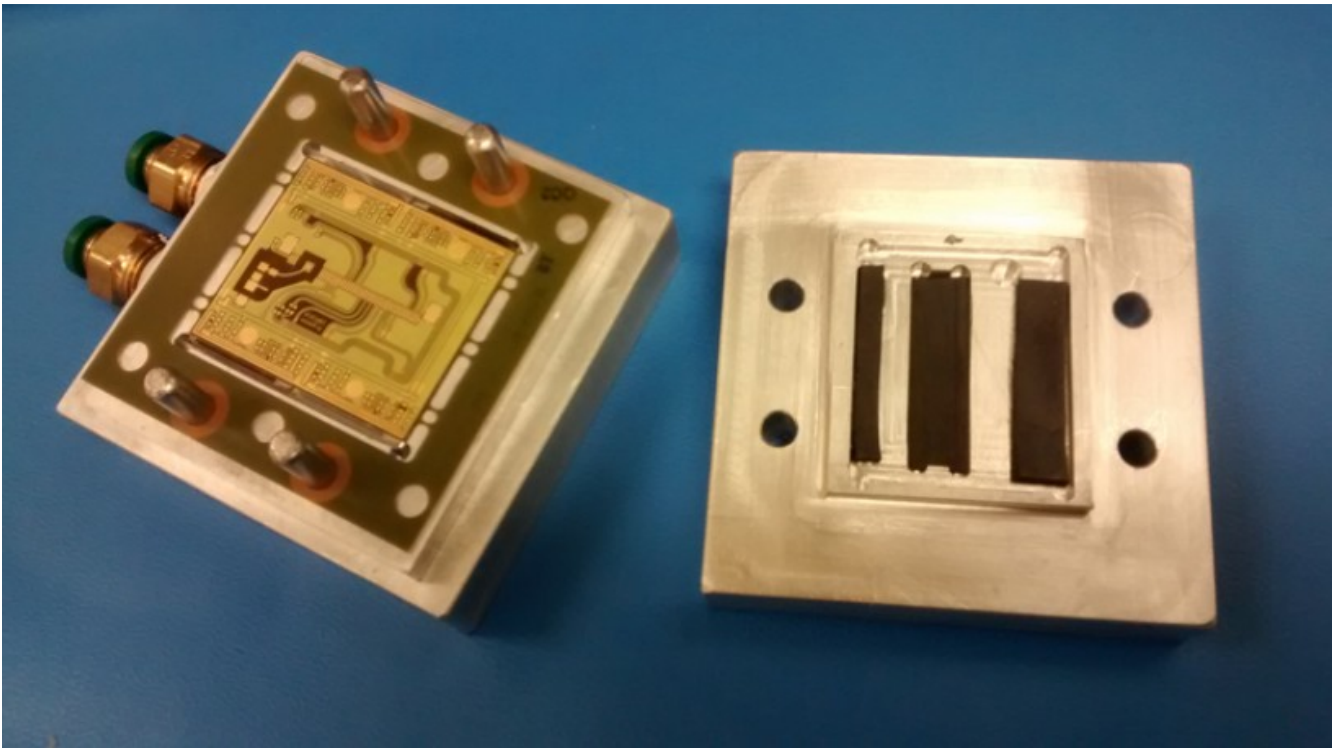


Now expose the epoxy tape after placing the secondary flex cable in the second jig. Then place the flex cable for use onto the exposed

epoxy to transfer the tape correctly to the flex cable.



Using the flex cable jig, attach the detector module to the flex cable by exposing the other side of the epoxy.



Flex cable attachment instructions for a 2X1 module are slightly different. Instead of aligning the flex cable using the jig, you will have to do it by eye, making sure the epoxy is as close to the edge of the flex cable as possible and then attach it to the detector module.

You now have a complete module and flex cable attached!

