Yu Wang’s February Report(2019)：

【work】

1、Analyze the defect(in design and in assembling) of the previous objective（by maoliang） for collecting ion fluorescence. The main problem is the large aberration and bad image quality.

* The previous design only increases the working distance by less than 2mm, make it still not convenient in use.
* The way that the spacers touch the lenses is not stable enough to control the distance between the lenses precisely. And the previous material（Nylon） for spacers maybe not proper--It does not provide a smooth surface to fix the lenses as we want.
* This design calls for two customized lenses (with different clear aperture) which introduce more error in general. And it is not easy to test the customized parts.
* Cleaning and carefully assembling are needed. Since I can see some dirt and scratch in the objective(cannot be moved without taking apart)

2、Design a new objective scheme and overcome most of the defect above.

* Long working distance: focal length=27.1mm, NA=0.33. Increase the working distance about 10mm so that it is easy to adjust in a real experiment while keeping the same NA.
* All lens are commercial. Standard parts are relatively more reliable. And time and money cost are reduced.
* Less sensitivity to the distance between lenses. I demonstrate that within the error of 0.02mm it is still diffraction limited. A less sensible system will be more robust when we have some unknown error in practical.
* We change the way how spacers touch the lenses and plan to use grass to make spacers.

【plan】

1.     Assemble and characterize the new objective after the lenses&spacers&tube arrive

2.     Set up the fiber noise cancellation system for 355nm with Yuzi Xu.

3.     Look for an alternative of the objective from photon gear Inc. The main difficulty is the correction of chromatic aberration.