



Cryo-Images Project

■ Cryo-image

■ First Dataset

- '*.hdf' images which is created by EMAN2
- '*.dm3' images which are created by GATAN

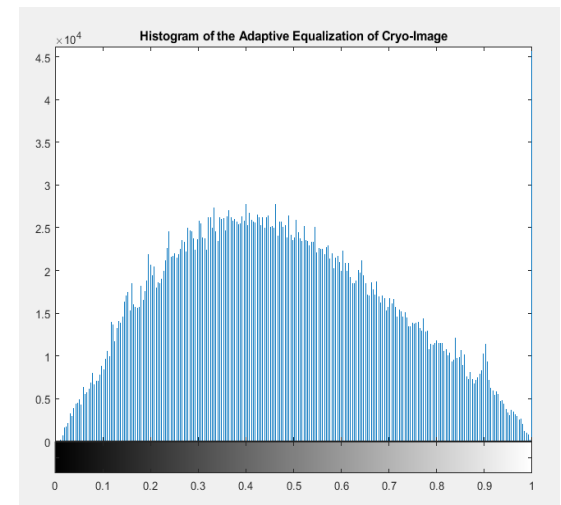
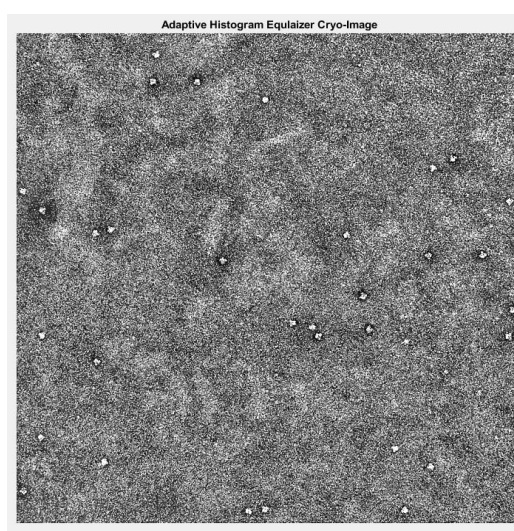
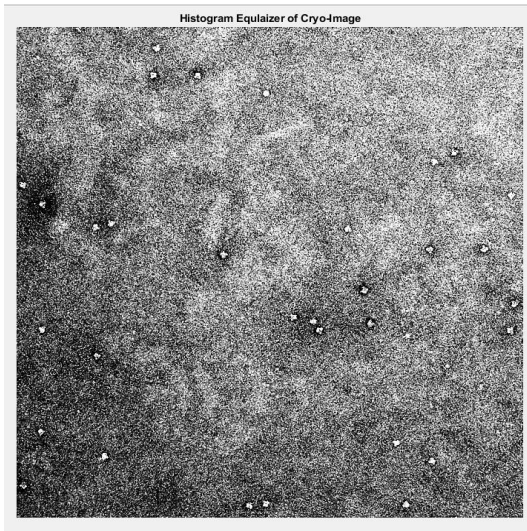
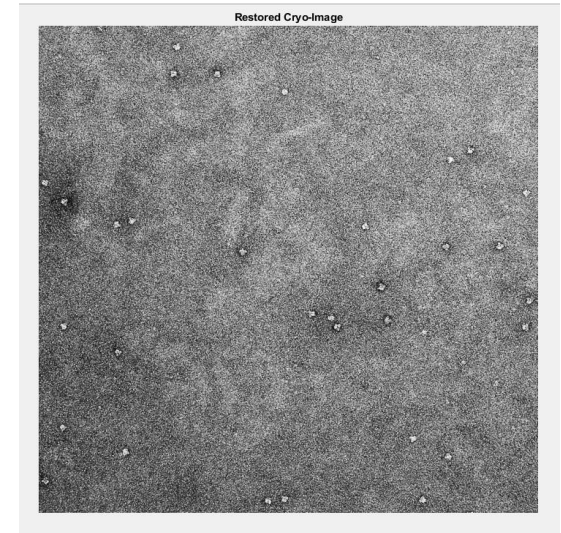
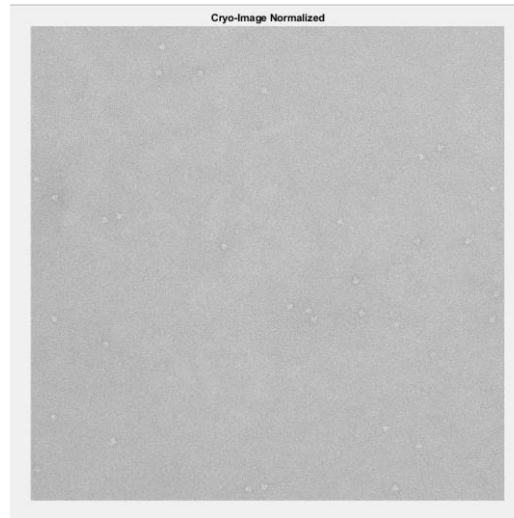


Image Normalization

- ALDH7A1_NAD_UF_B5_0035.tif

Cryo-Image Normalized

Normalized								
2048x2048 double								
	1	2	3	4	5	6	7	8
1	0.9956	0.9953	0.9951	0.9951	0.9950	0.9949	0.9945	0.9955
2	0.9947	0.9948	0.9942	0.9946	0.9947	0.9938	0.9934	0.9941
3	0.9944	0.9943	0.9941	0.9939	0.9939	0.9936	0.9934	0.9929
4	0.9947	0.9945	0.9942	0.9945	0.9950	0.9946	0.9943	0.9933
5	0.9944	0.9943	0.9942	0.9940	0.9949	0.9943	0.9949	0.9937
6	0.9944	0.9945	0.9952	0.9940	0.9944	0.9945	0.9952	0.9947
7	0.9943	0.9948	0.9950	0.9942	0.9948	0.9955	0.9953	0.9952
8	0.9945	0.9951	0.9944	0.9945	0.9944	0.9954	0.9960	0.9955
9	0.9953	0.9950	0.9940	0.9943	0.9944	0.9946	0.9955	0.9950
10	0.9947	0.9943	0.9936	0.9933	0.9937	0.9948	0.9951	0.9955
11	0.9943	0.9938	0.9942	0.9937	0.9941	0.9950	0.9960	0.9972
12	0.9946	0.9941	0.9948	0.9950	0.9945	0.9950	0.9954	0.9958
13	0.9957	0.9950	0.9953	0.9957	0.9951	0.9947	0.9954	0.9946
14	0.9967	0.9957	0.9950	0.9956	0.9961	0.9952	0.9954	0.9960
15	0.9960	0.9960	0.9954	0.9957	0.9964	0.9956	0.9956	0.9962
16	0.9947	0.9959	0.9961	0.9961	0.9965	0.9967	0.9963	0.9961
17	0.9961	0.9970	0.9971	0.9970	0.9967	0.9974	0.9964	0.9951
18	0.9974	0.9977	0.9975	0.9971	0.9964	0.9960	0.9960	0.9959
19	0.9971	0.9973	0.9970	0.9965	0.9958	0.9949	0.9946	0.9958
20	0.9961	0.9967	0.9962	0.9954	0.9956	0.9955	0.9947	0.9946
21	0.9951	0.9948	0.9955	0.9951	0.9953	0.9955	0.9950	0.9941
22	0.9949	0.9940	0.9946	0.9947	0.9951	0.9956	0.9955	0.9948

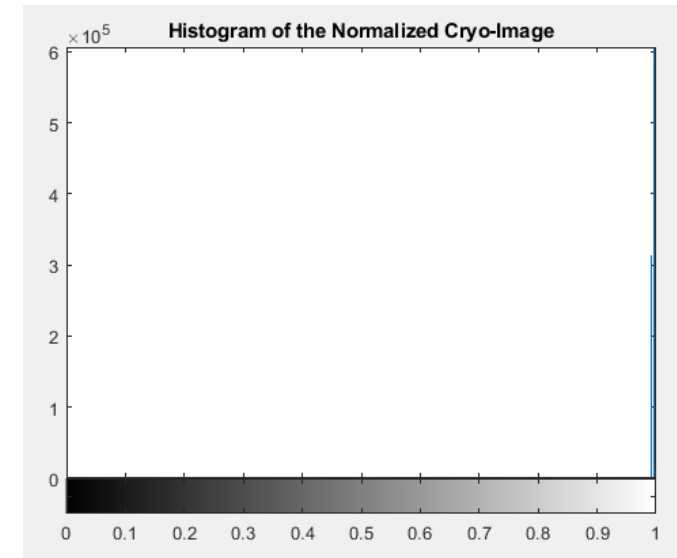
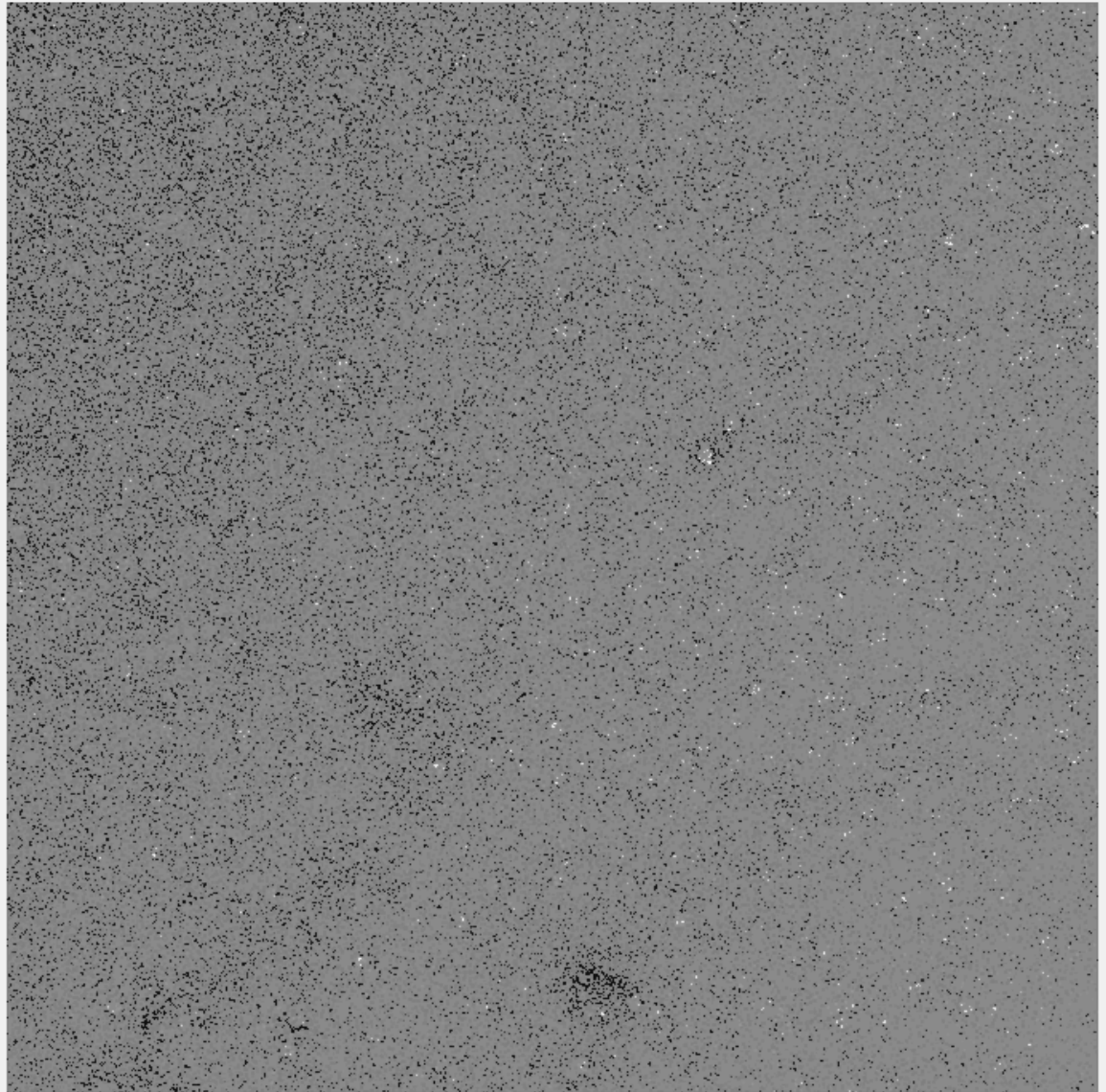


Image Restoration Using Wiener Filtering

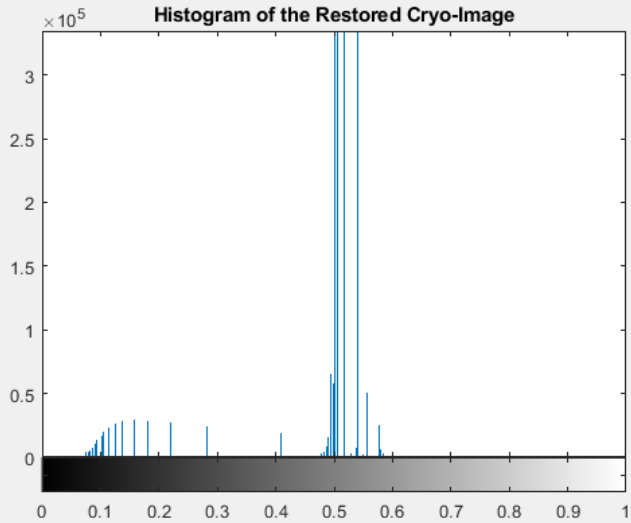
Cryo-Image Normalized



Restored Cryo-Image

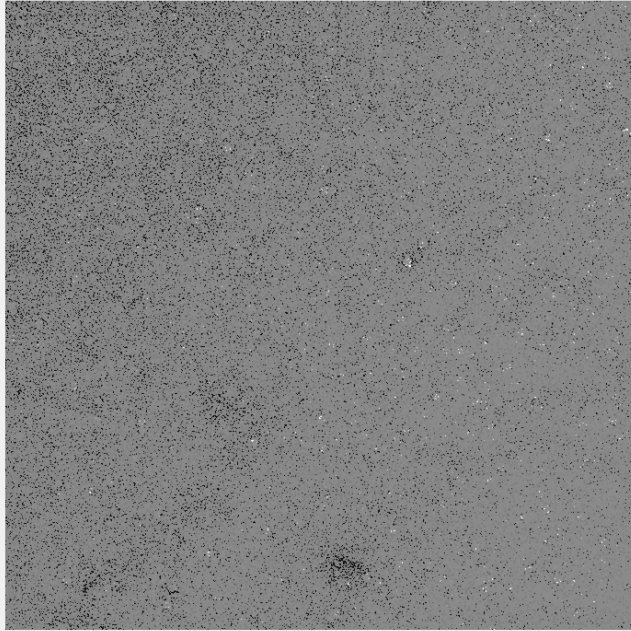


Histogram of the Restored Cryo-Image

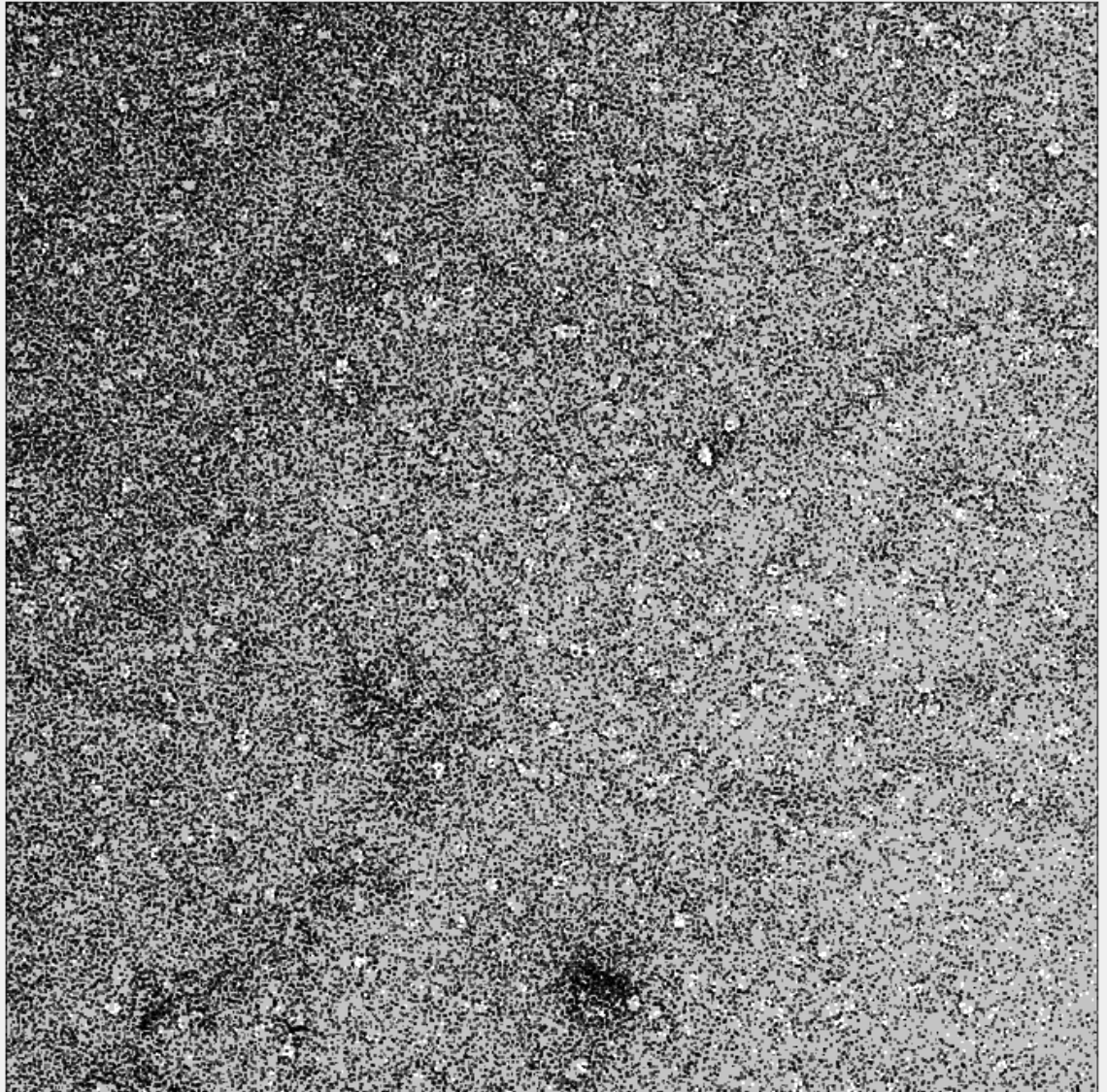


■ Histogram Equalization

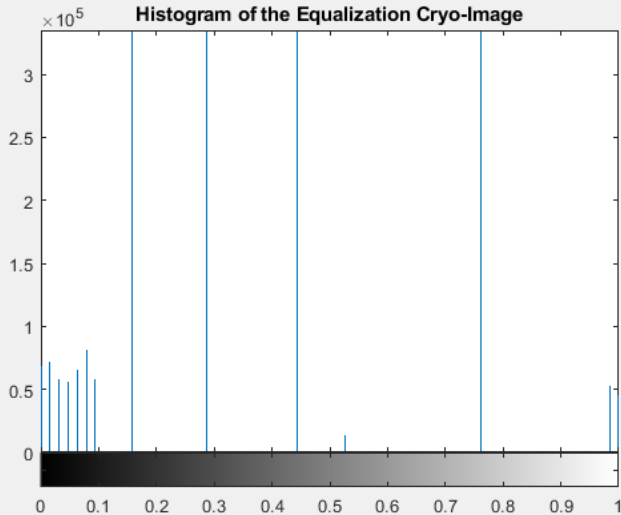
Restored Cryo-Image



Histogram Equalizer of Cryo-Image

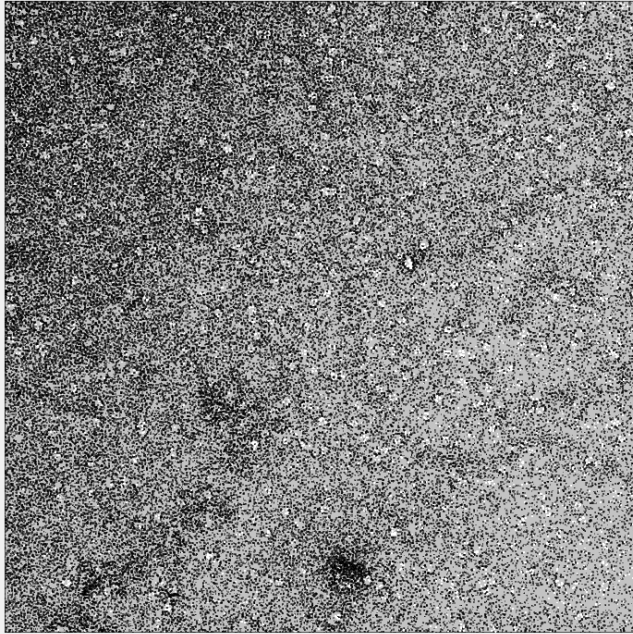


Histogram of the Equalization Cryo-Image

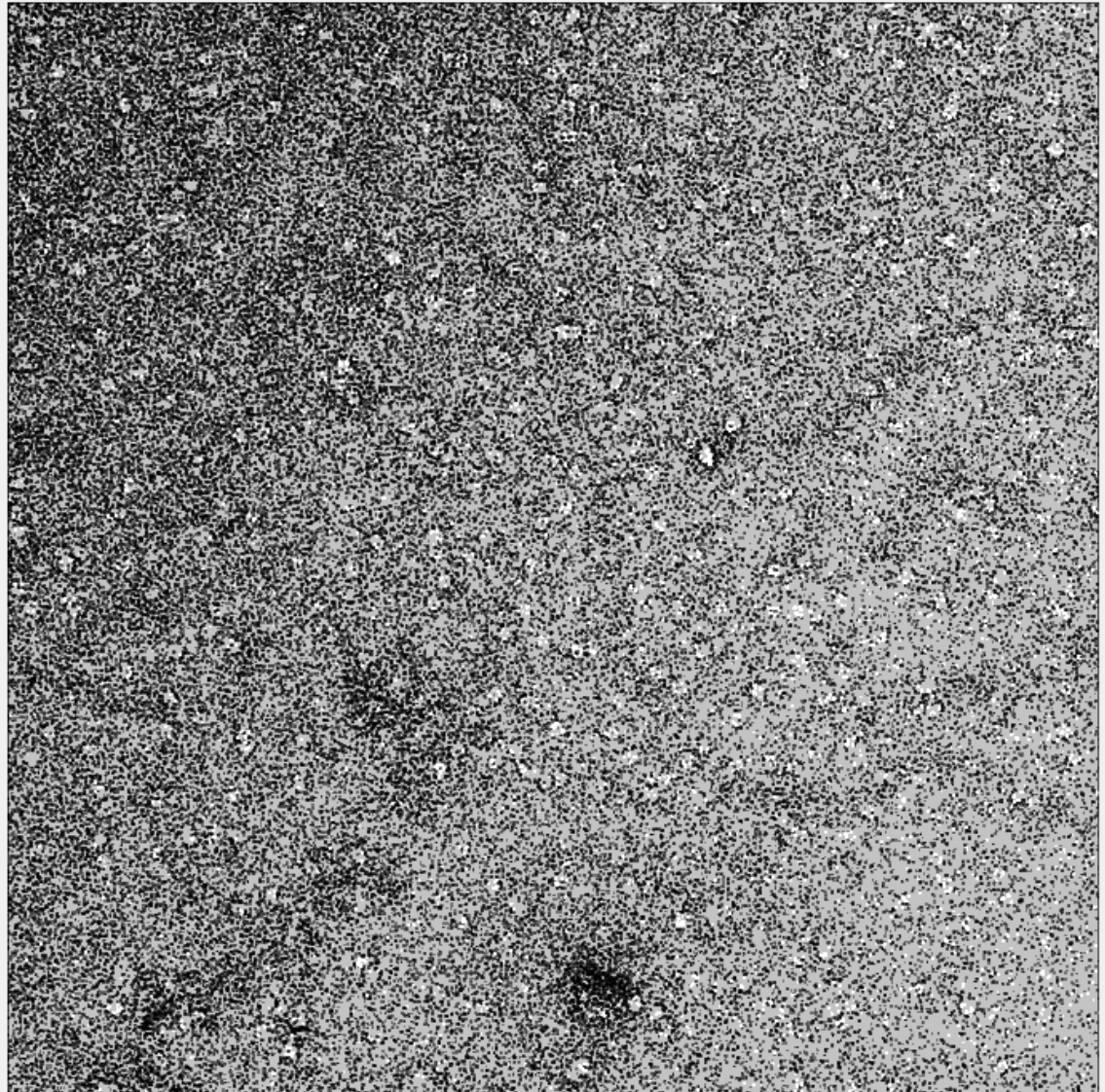


▪ Adaptive Histogram Equalization

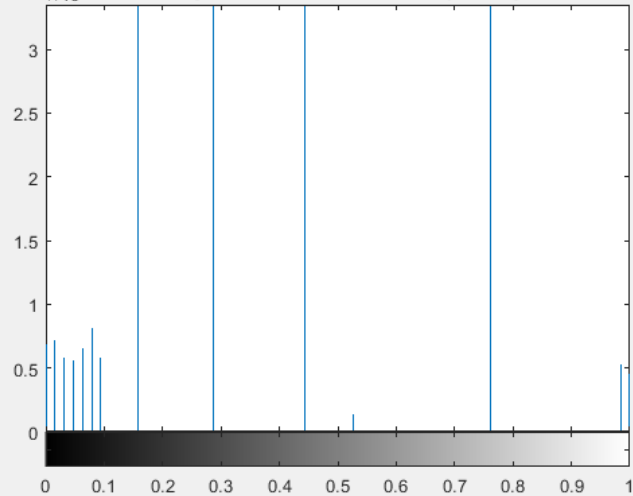
Histogram Equalizer of Cryo-Image



Adaptive Histogram Equalizer Cryo-Image

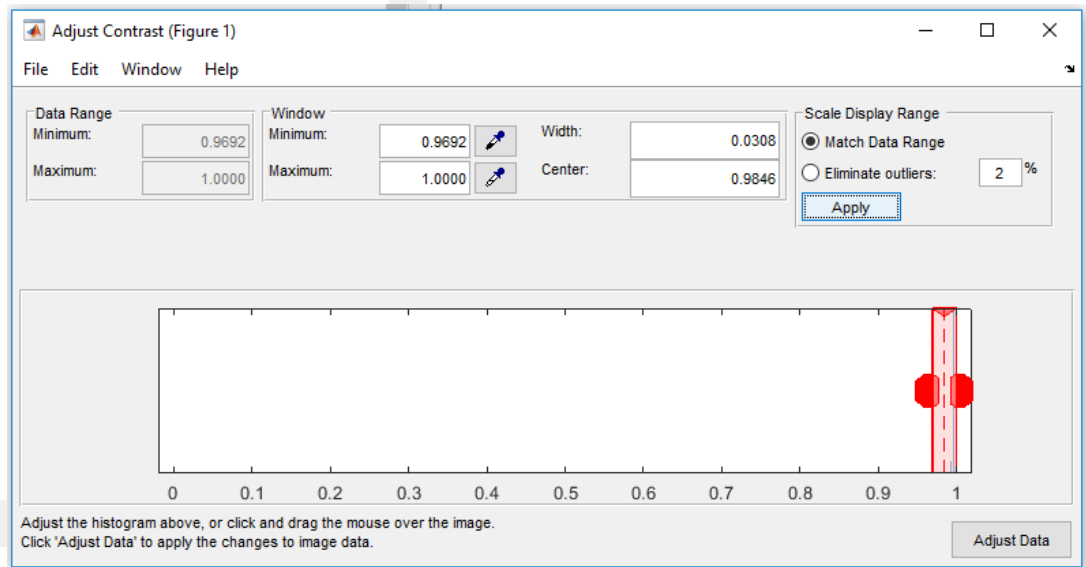
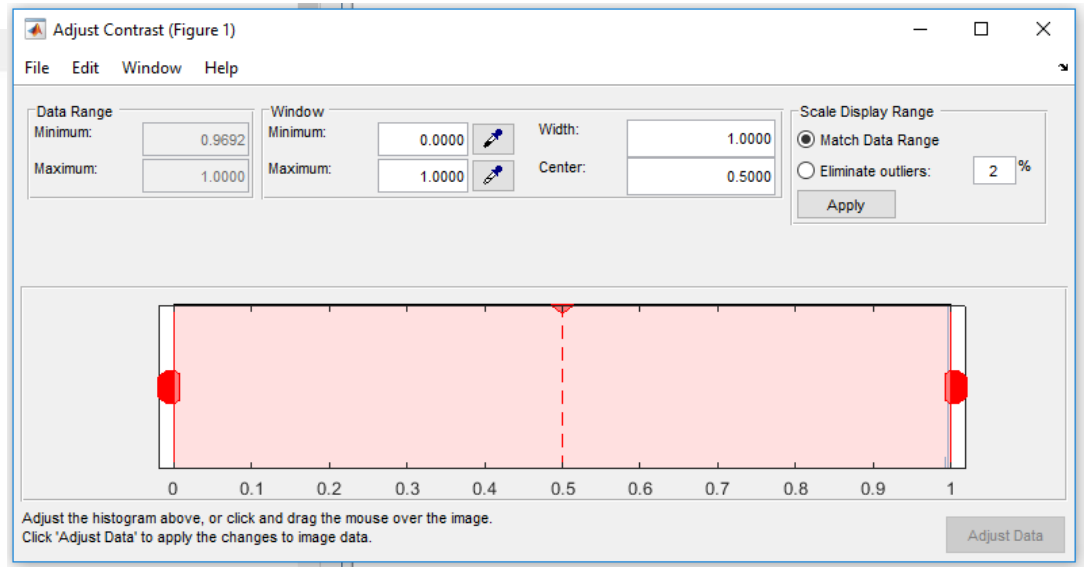


× 10⁵ Histogram of the Equalization Cryo-Image



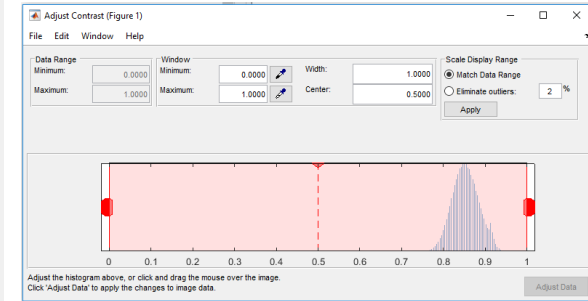
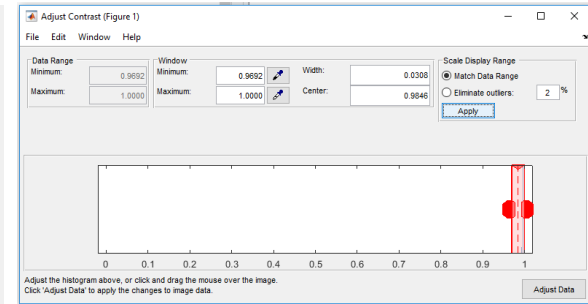
■ Contrast Transfer Function (CTF) Issue

Normalized Cryo-Image

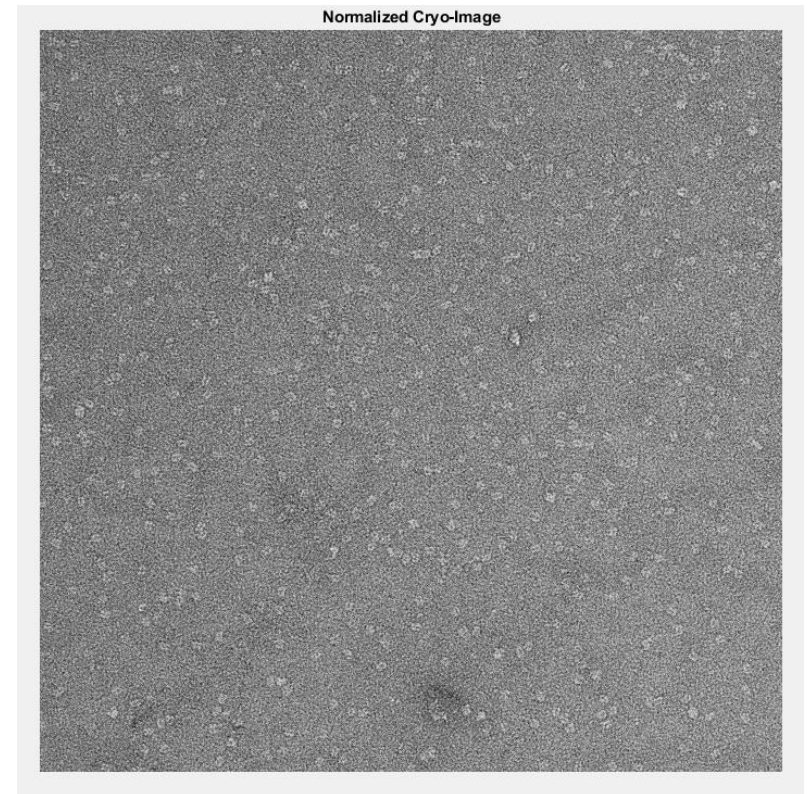
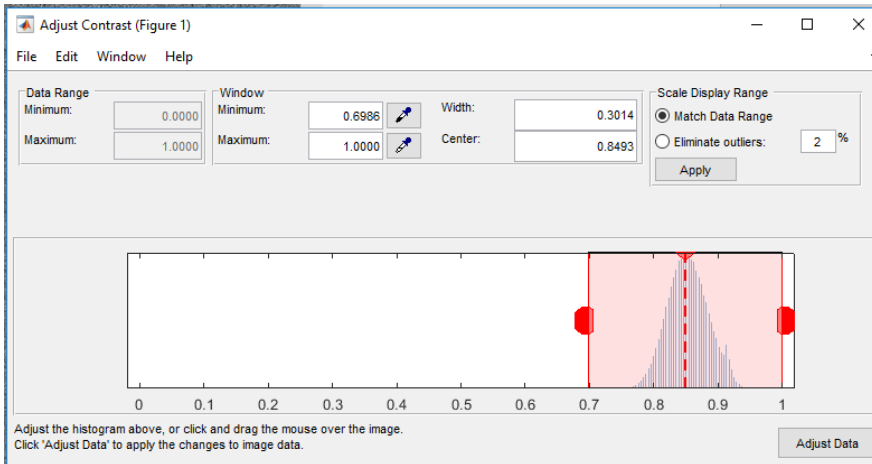
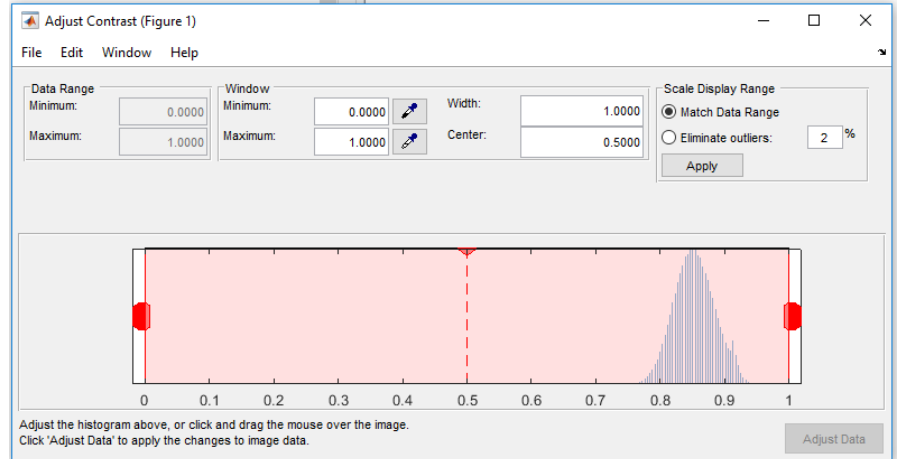
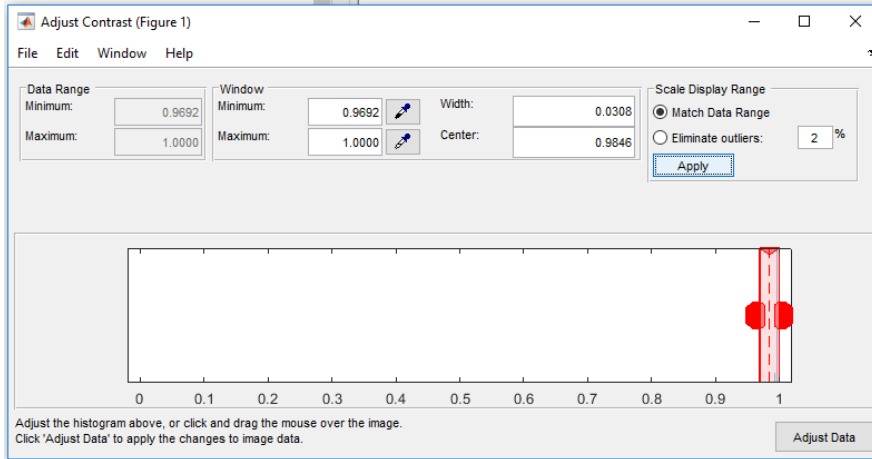


■ Contrast Transfer Function (CTF) Issue

Normalized Cryo-Image

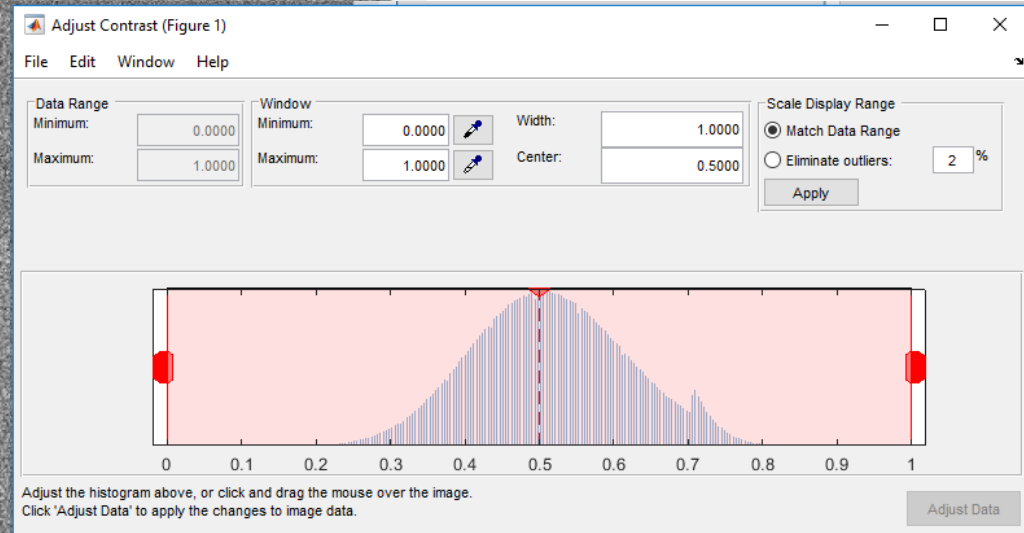
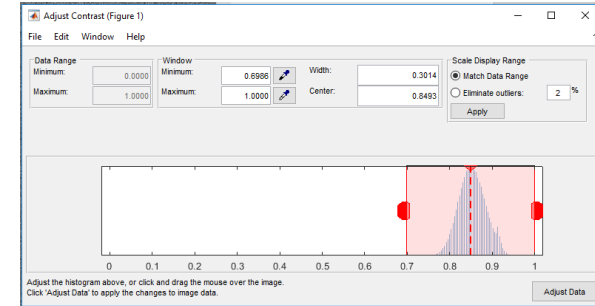
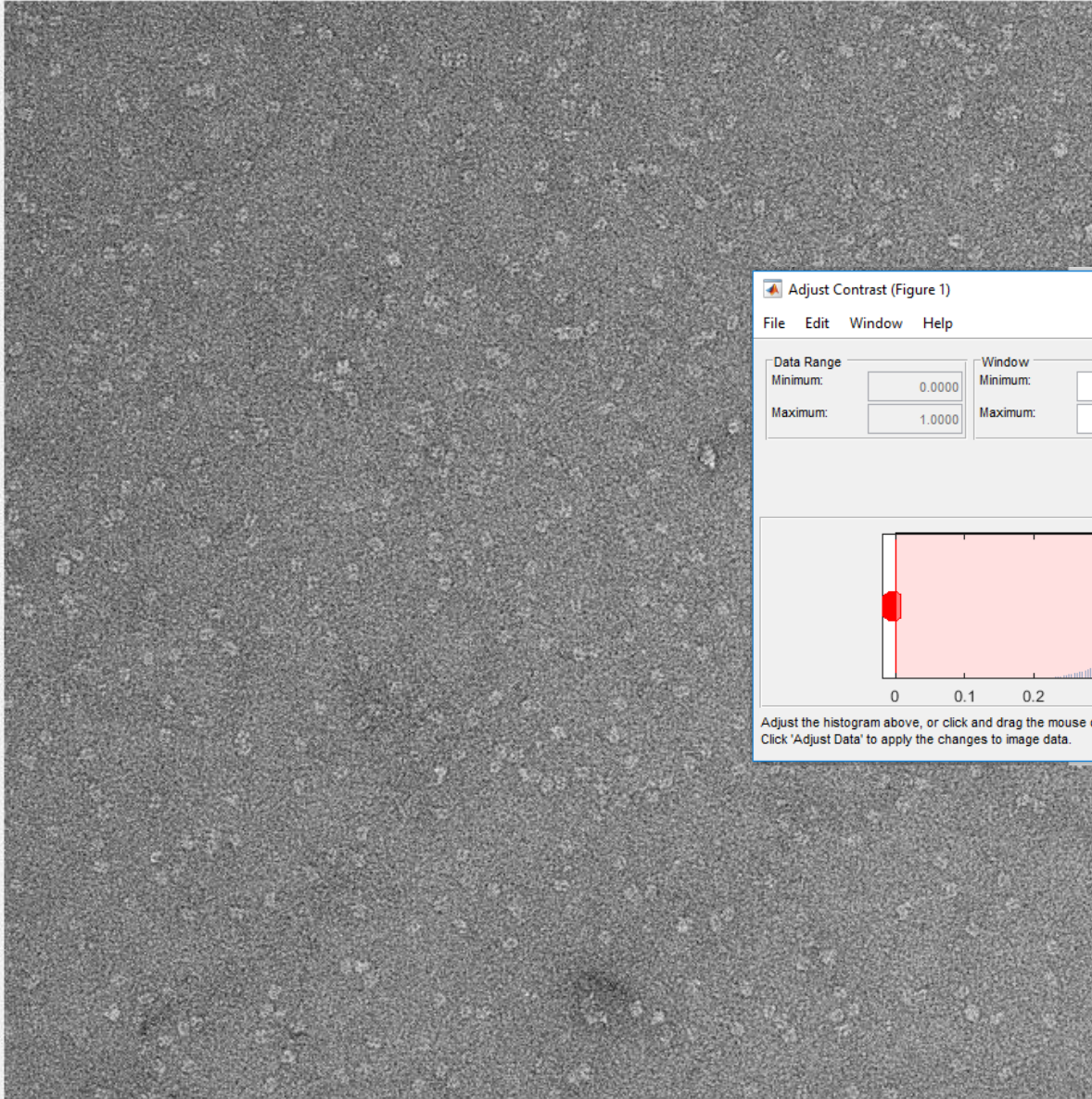


■ Contrast Transfer Function (CTF) Issue



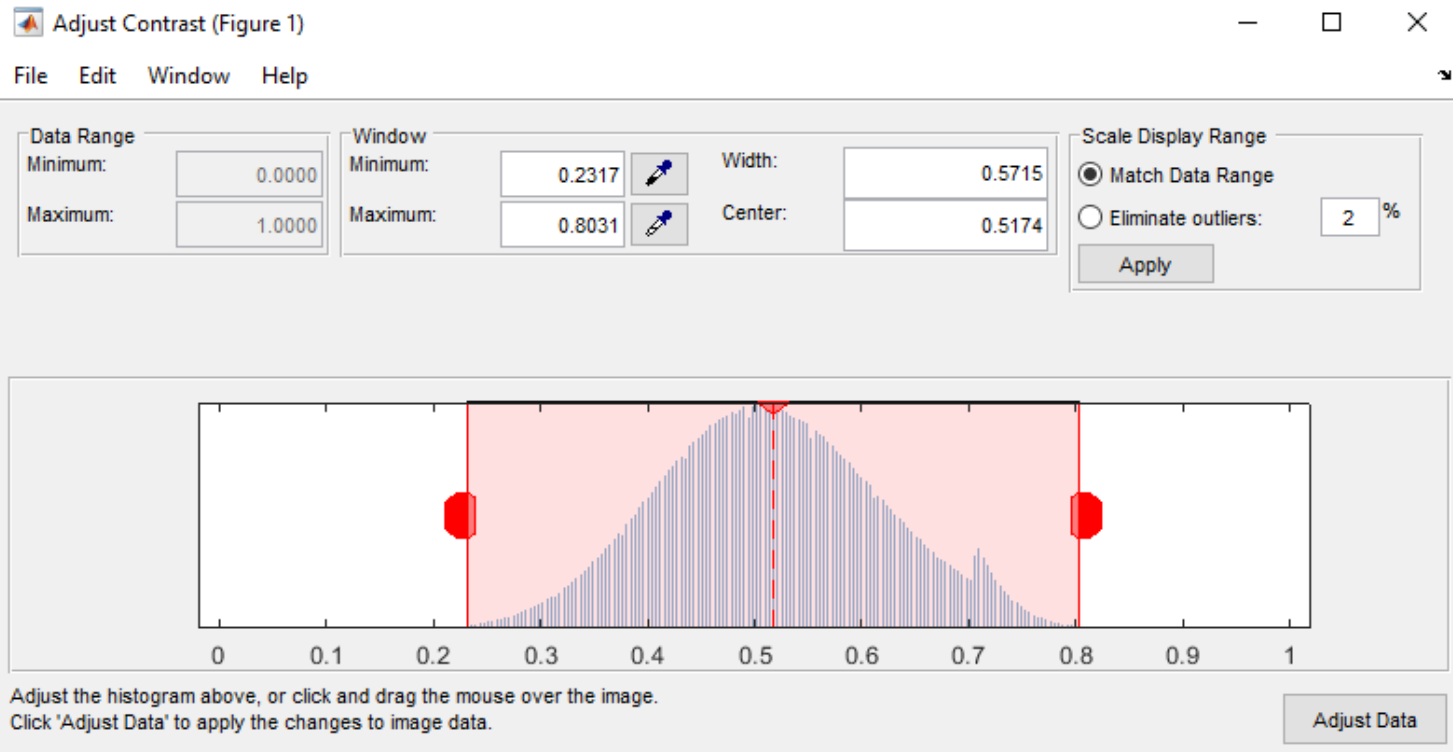
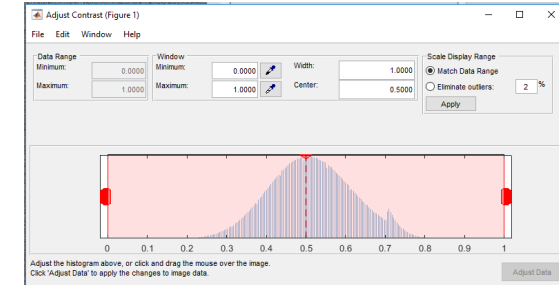
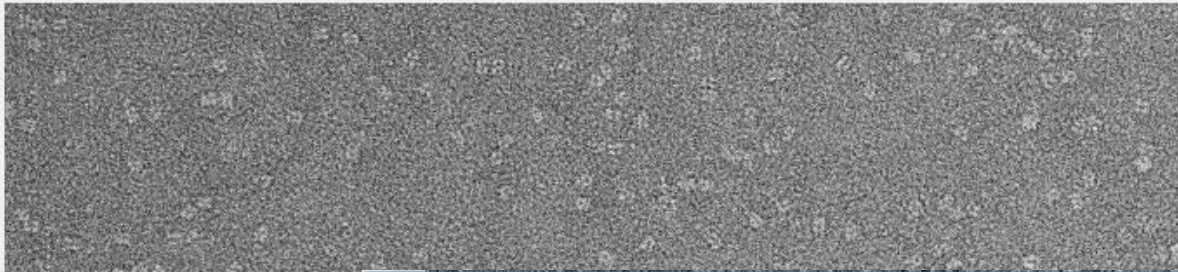
■ Contrast Transfer Function (CTF) Issue

Normalized Cryo-Image



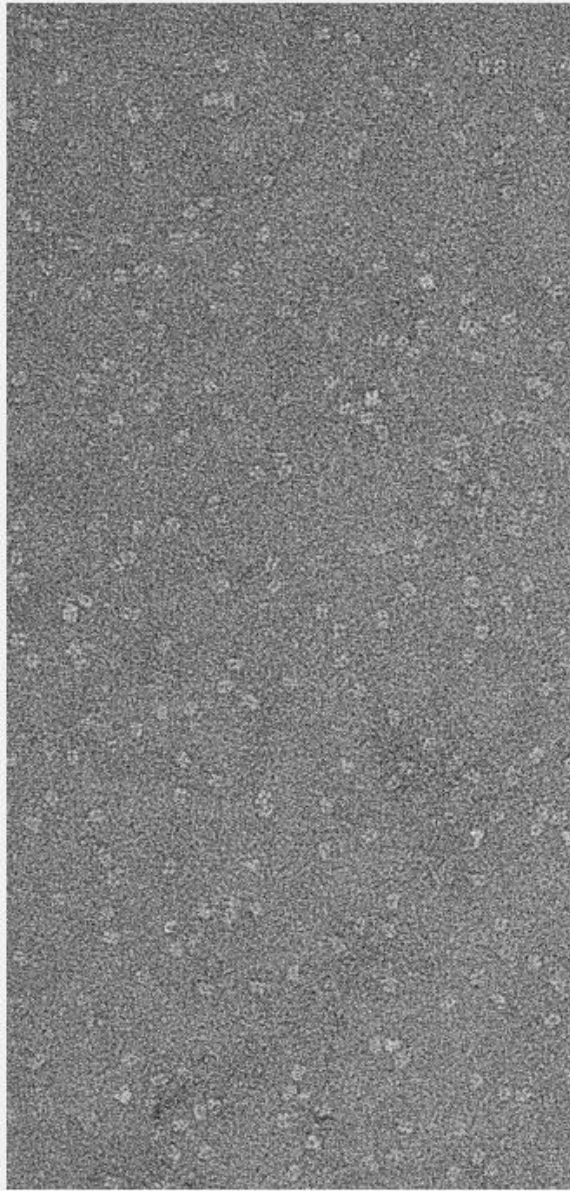
■ Contrast Transfer Function (CTF) Issue

Normalized Cryo-Image

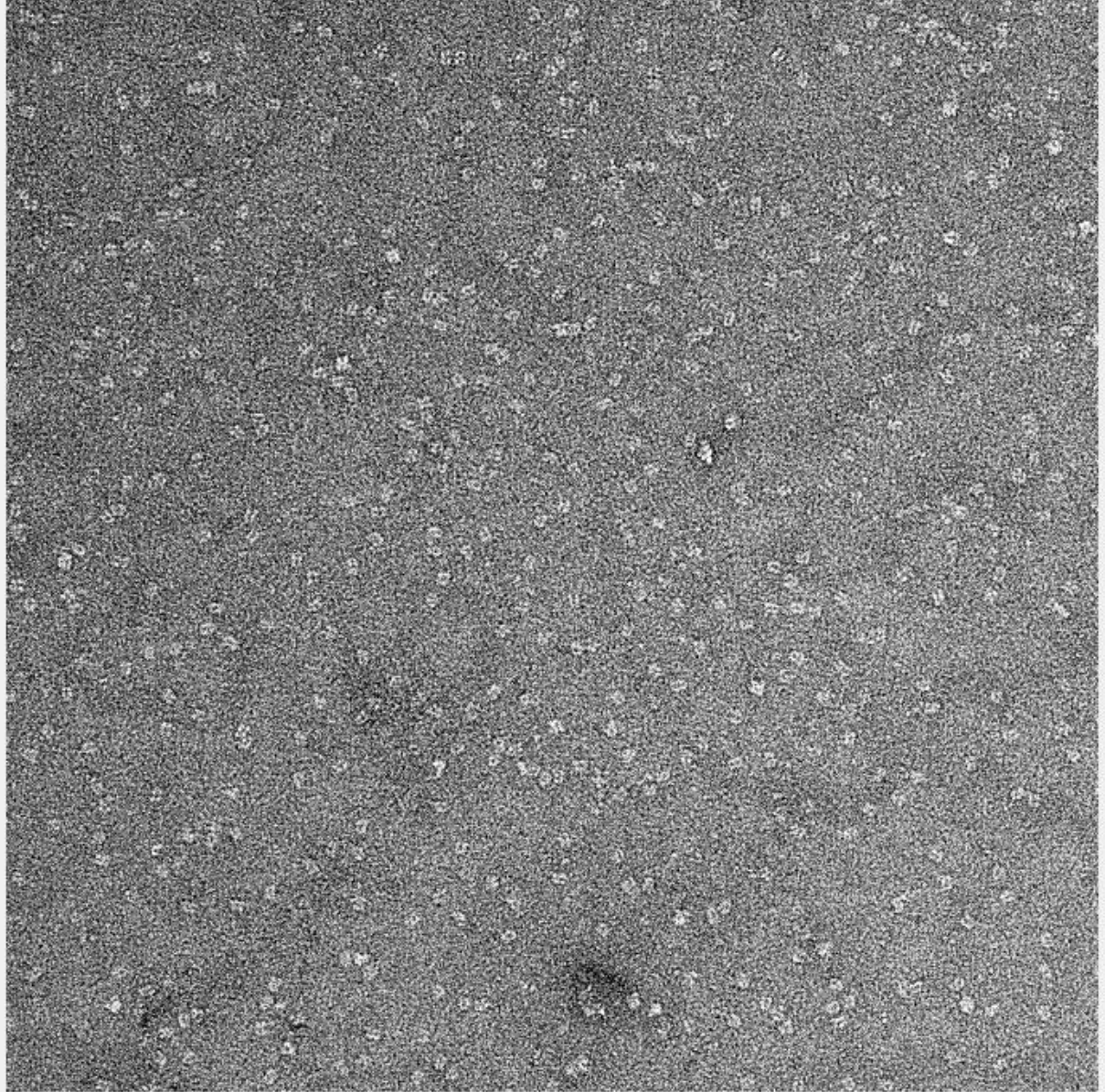


■ Contrast Transfer Function (CTF) Issue

Normalized



Normalized Cryo-Image



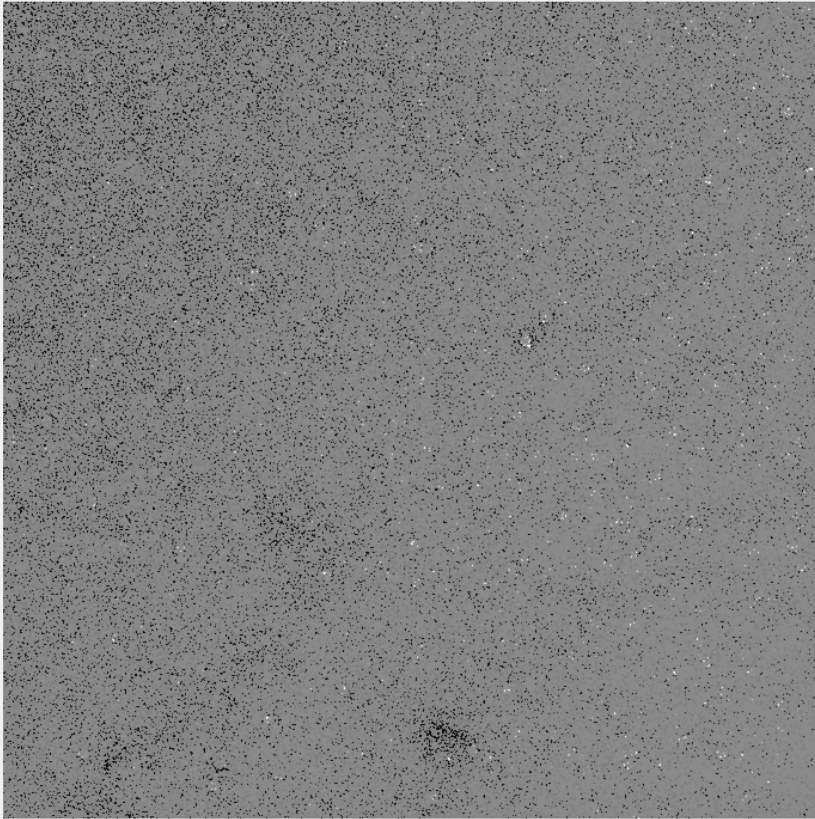
Before Contrast Adjustment

After Contrast Adjustment

▪ Contrast Transfer Function (CTF) Issue

Before CTF

Restored Cryo-Image



After CTF

Normalized Cryo-Image

