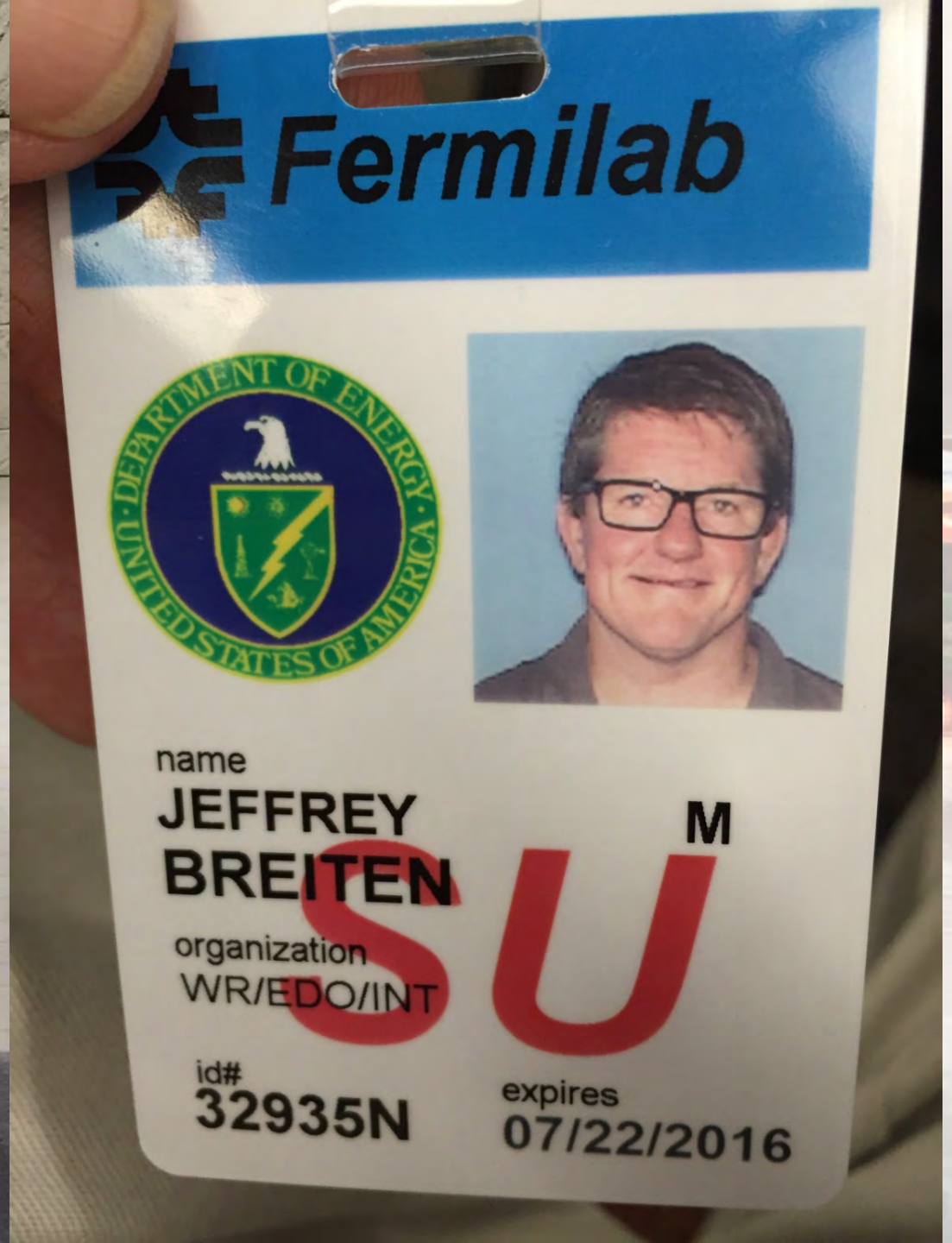
Jeff Breiten
TRAC
Summer 2016


Fermilab
DEPARTMENT OF ENERGY
UNITED STATES OF AMERICA
name
JEFFREY
BREITEN
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organization
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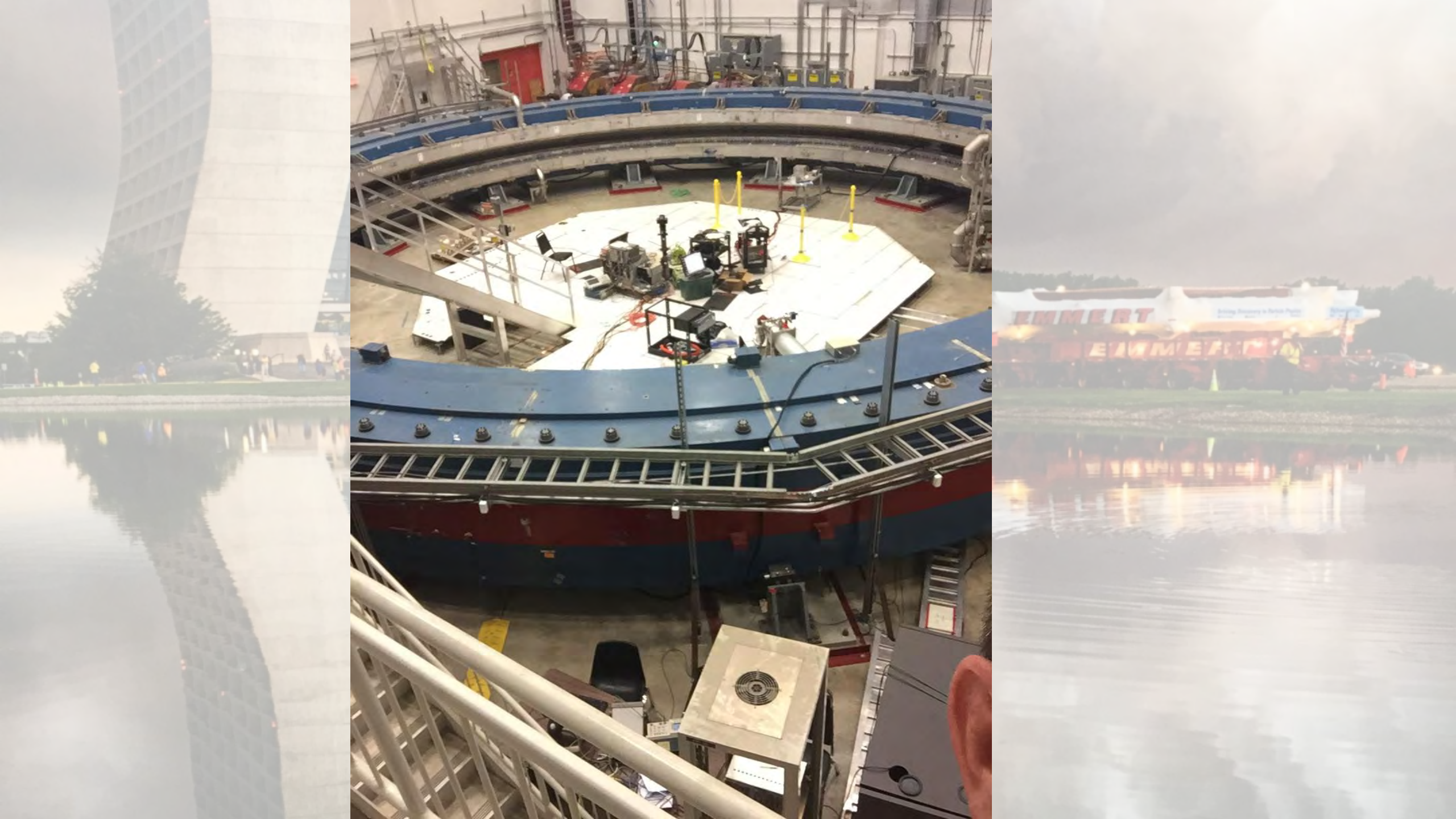
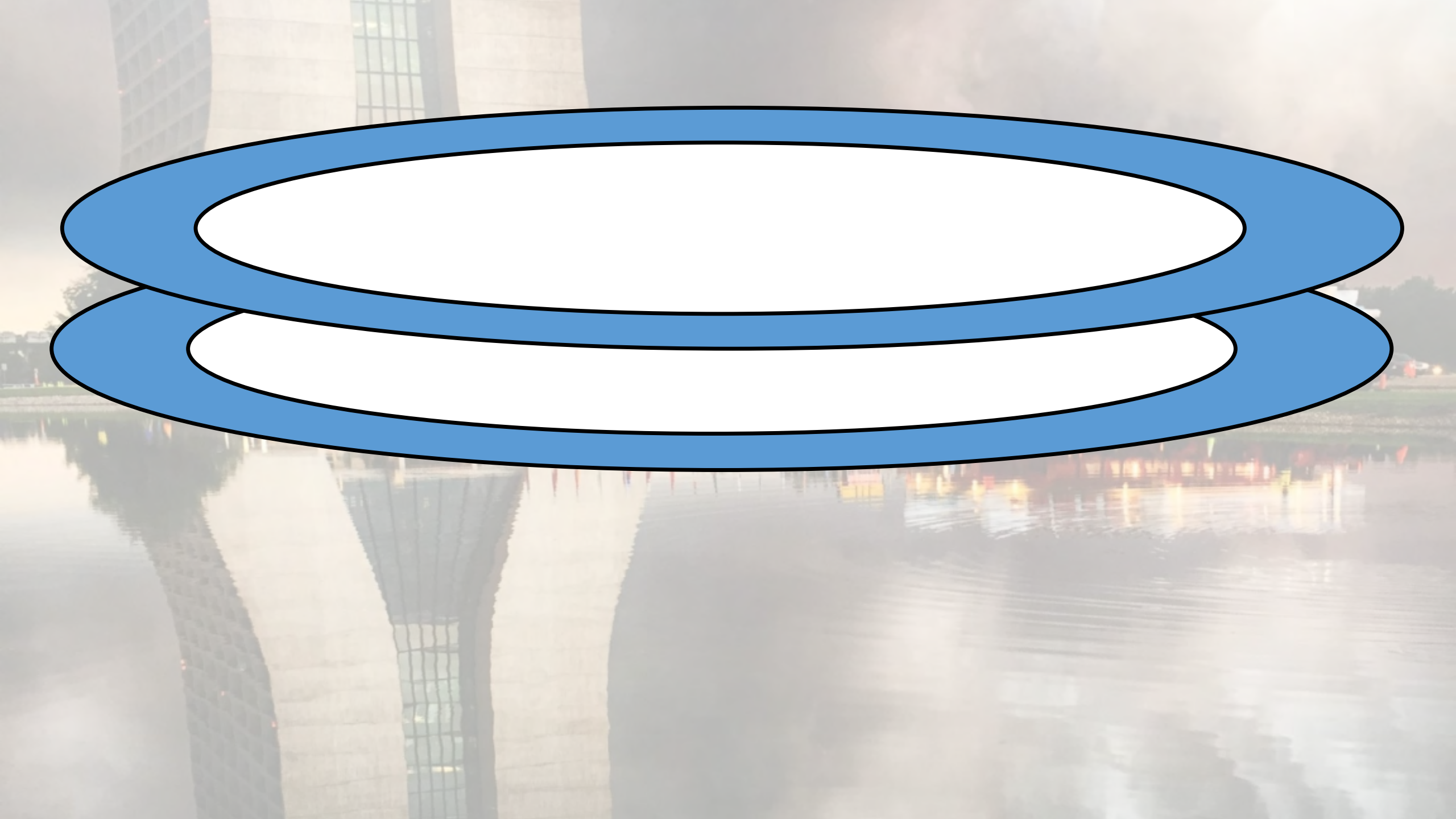
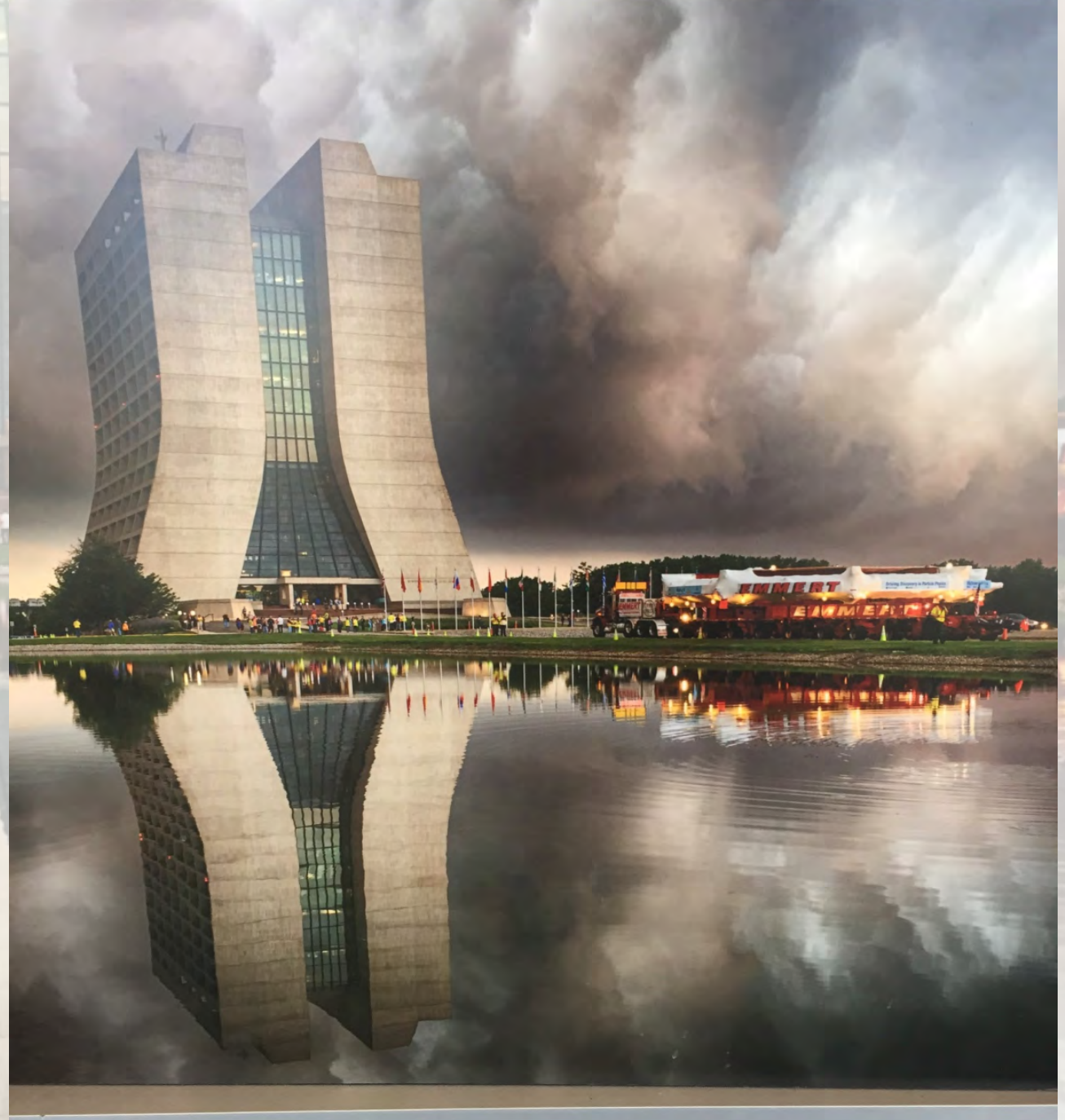
07/22/2016

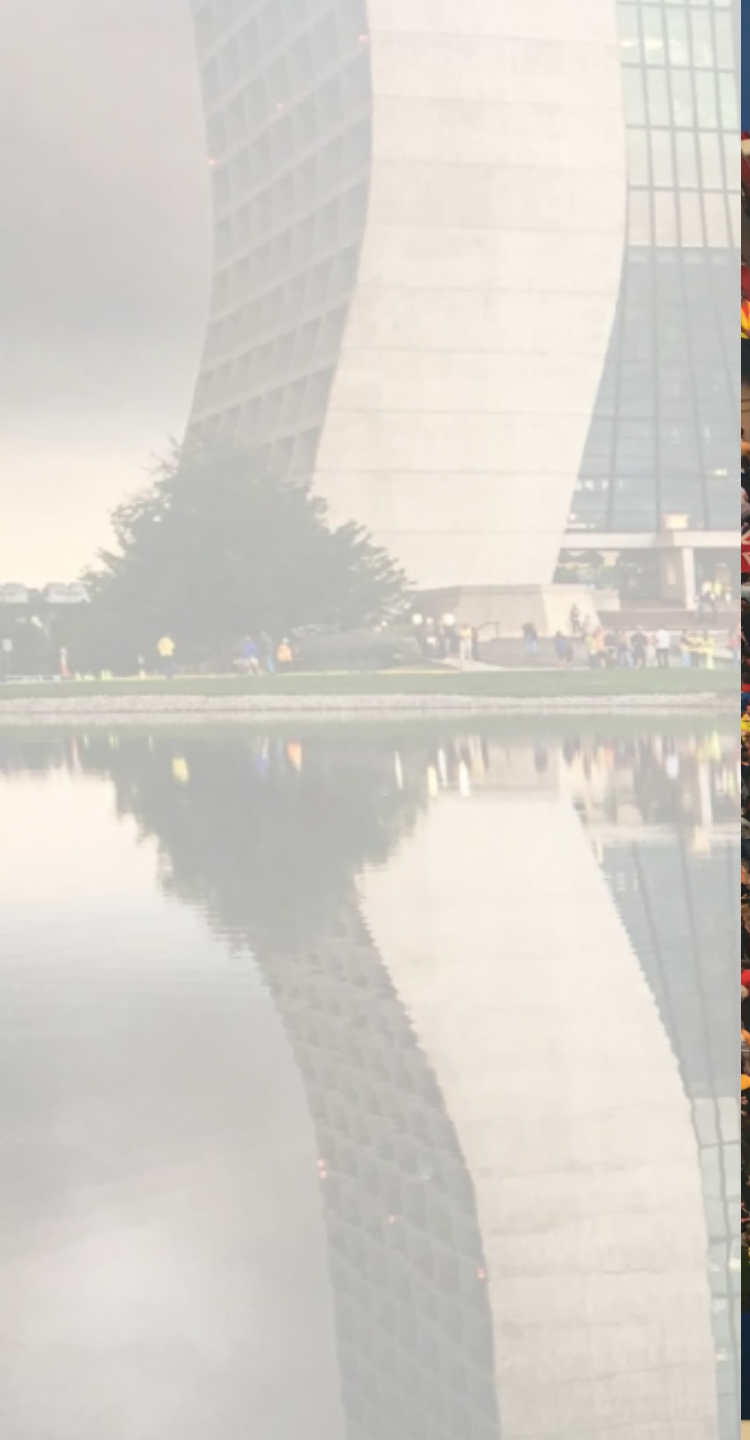


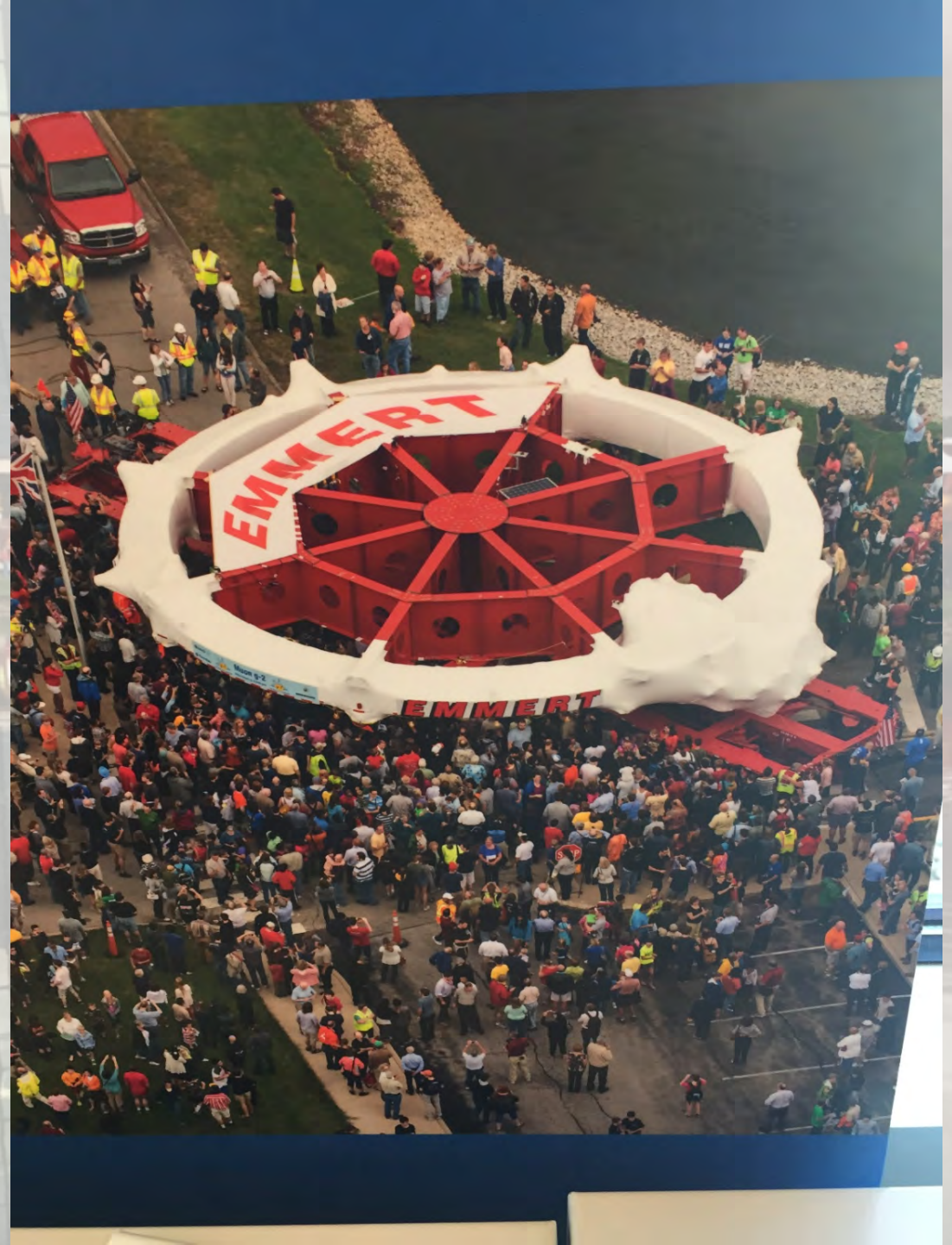


ssembly

w of the 50-foot muon storage ring as it exis
ookhaven National Laboratory in the 200
Brookhaven National Laboratory


EMMERT




EMMERT
EMMERT

U.S. DEPARTMENT OF ENERGY

Storage Ring

Muon Storage Ring

When fully instrumented, the 50 foot diameter storage ring produces a 1.45 Tesla magnetic field that is used to store charged particles called muons.

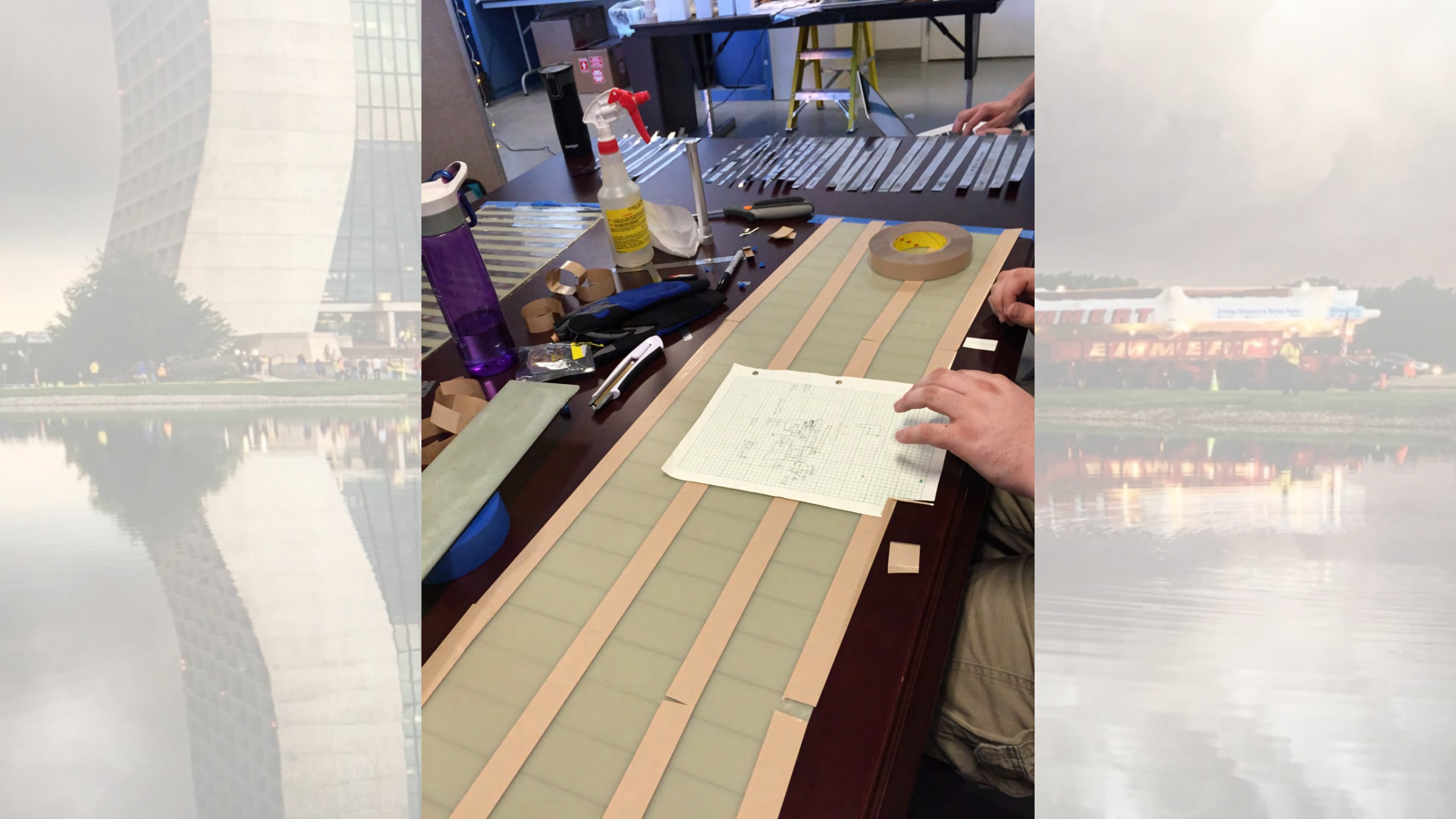
The coils used to energize the magnet are wound from one continuous superconductor. The material used is niobium-titanium in a copper matrix. The coils are cooled to 4.9 Kelvin, which is -450 Fahrenheit, when the experiment is running.

The yoke, pole pieces, and specialized shim steel are all precisely machined and aligned to produce a magnetic field that is uniform to better than 1 part-per-million in the region where the muons are stored.

The total weight of the storage ring with the steel is approximately 750 tons.

DANGER
MAGNET
ENERGIZED
EMERGENCY
SHUTDOWN

L11
L17
L10
.5045 L13
L13 .4440
.4500 L14
.4834 L10
3515
L13
0.5343
L10
.5272 L10
.4689 L10
0.3574
L18
0.4158 L13
.5034 L14
.3538 L10
.4425 L14
L12 .5021
L15
.4120 L10
3555
L13



L11
L17
L10
.5045 L13
L13 .4440
.4500 L14
.4834 L10
3515
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.5272 L10
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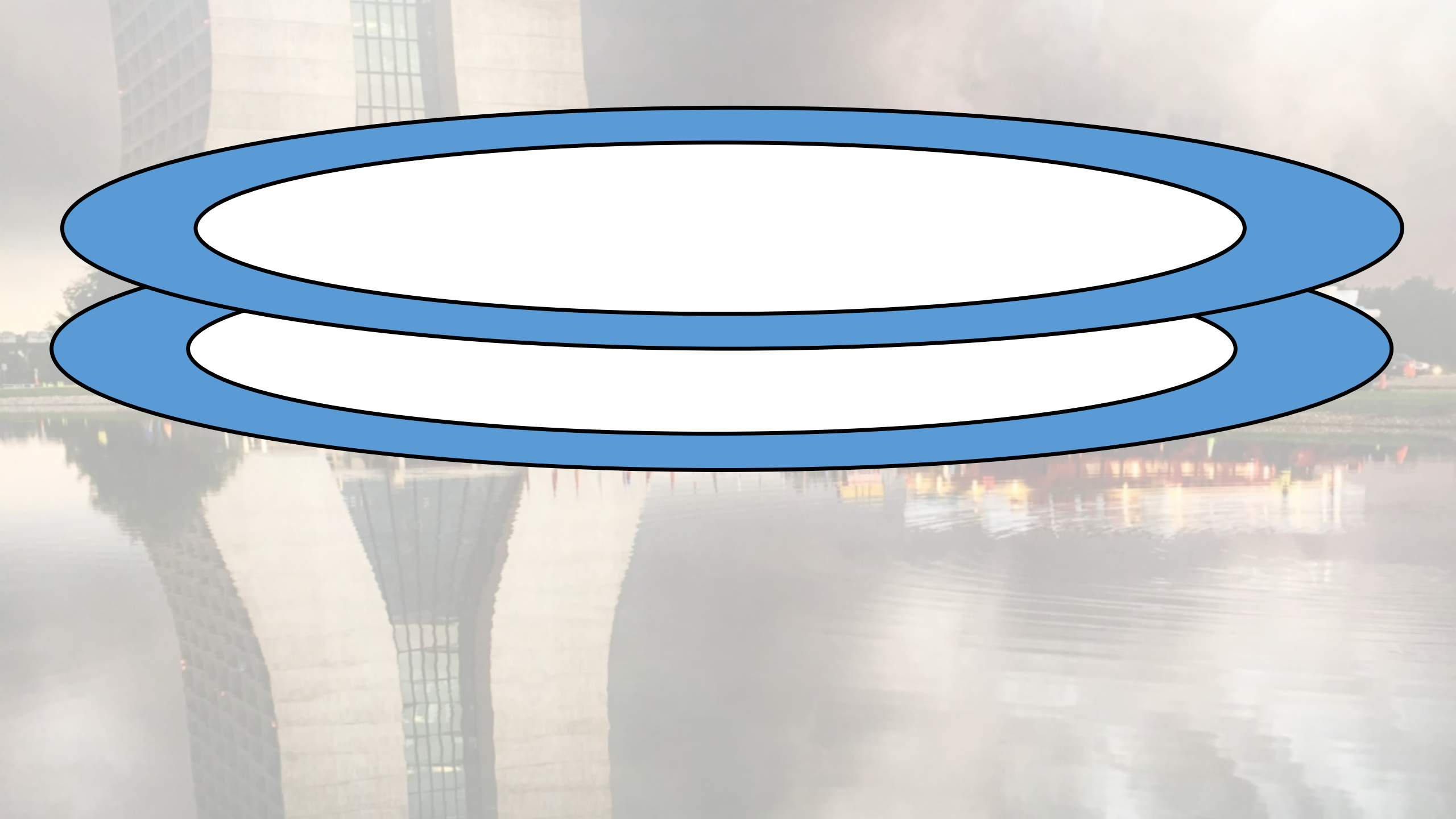
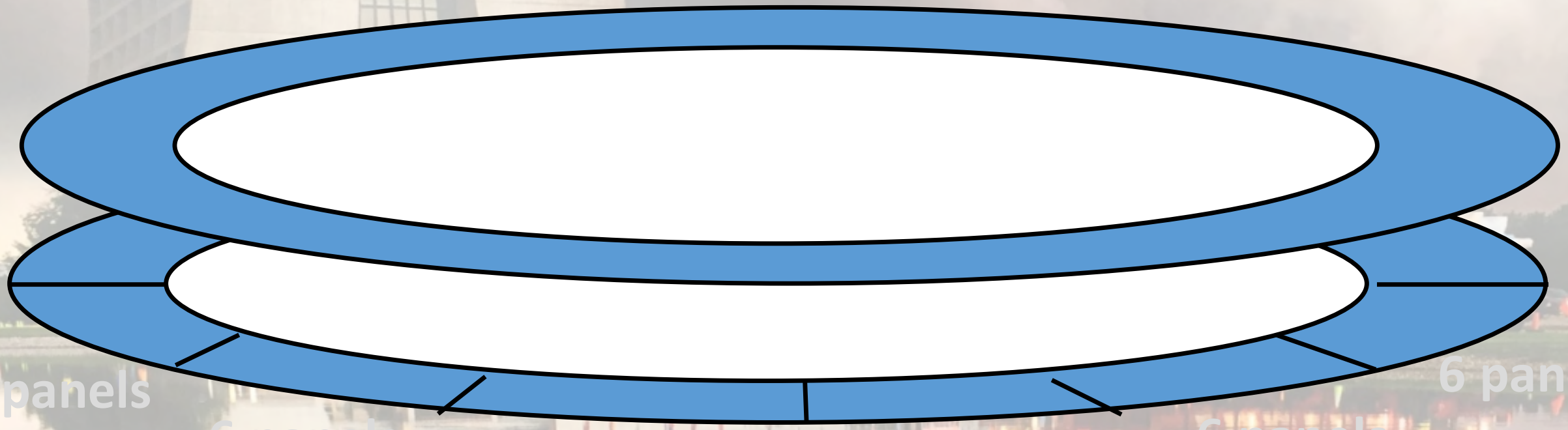



6 panels
6 panels
6 panels
6 panels
6 panels
6 panels

12 “yokes”

6 Laminate tracks/yoke

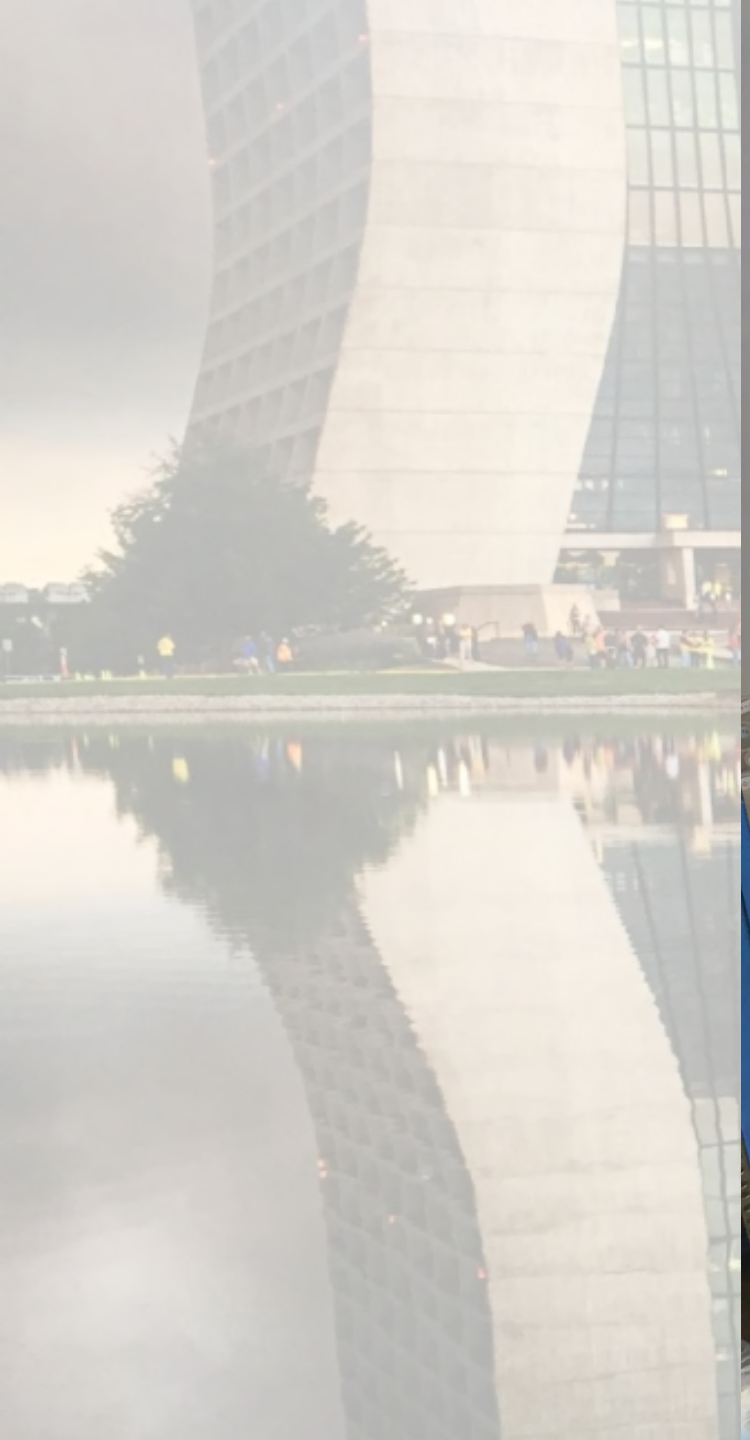
Each 3ft track 143 foils

So…..

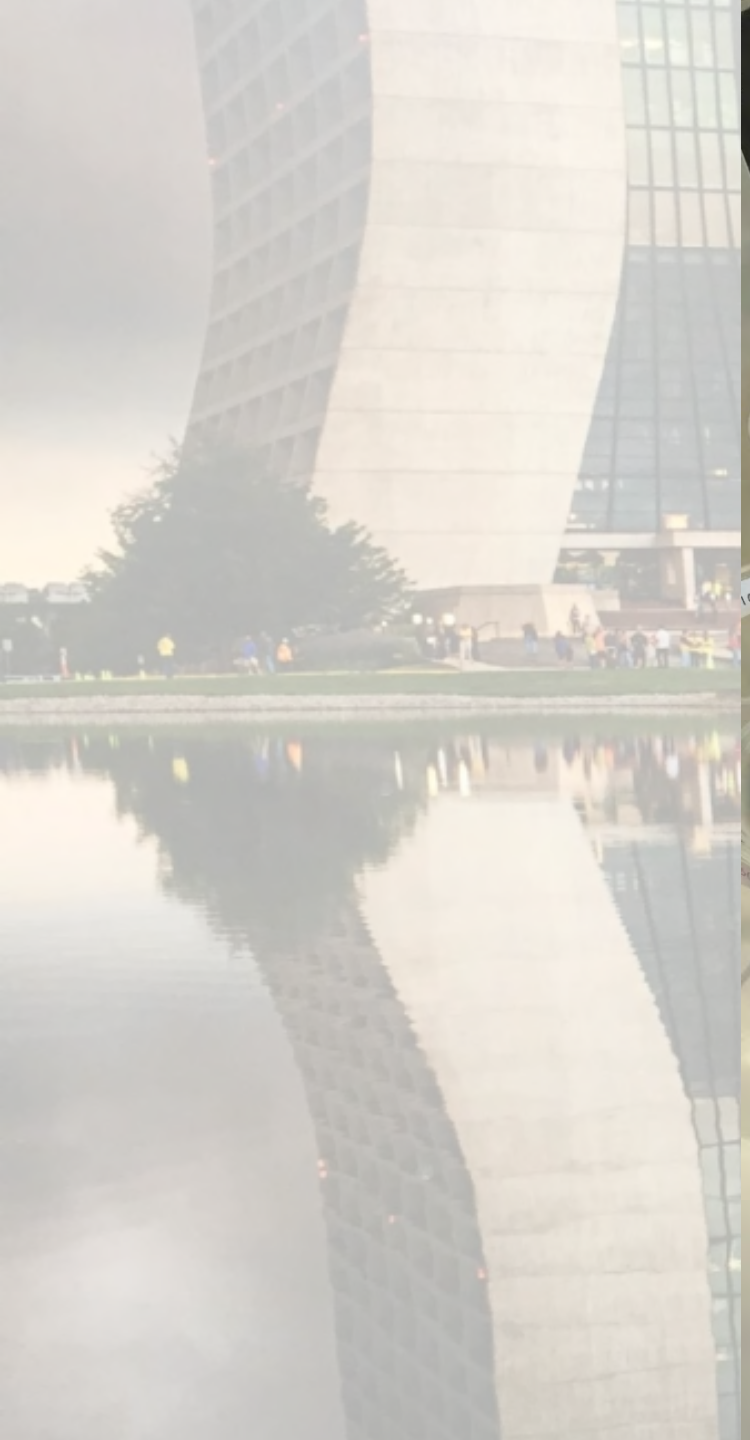
12x6x143=10,296

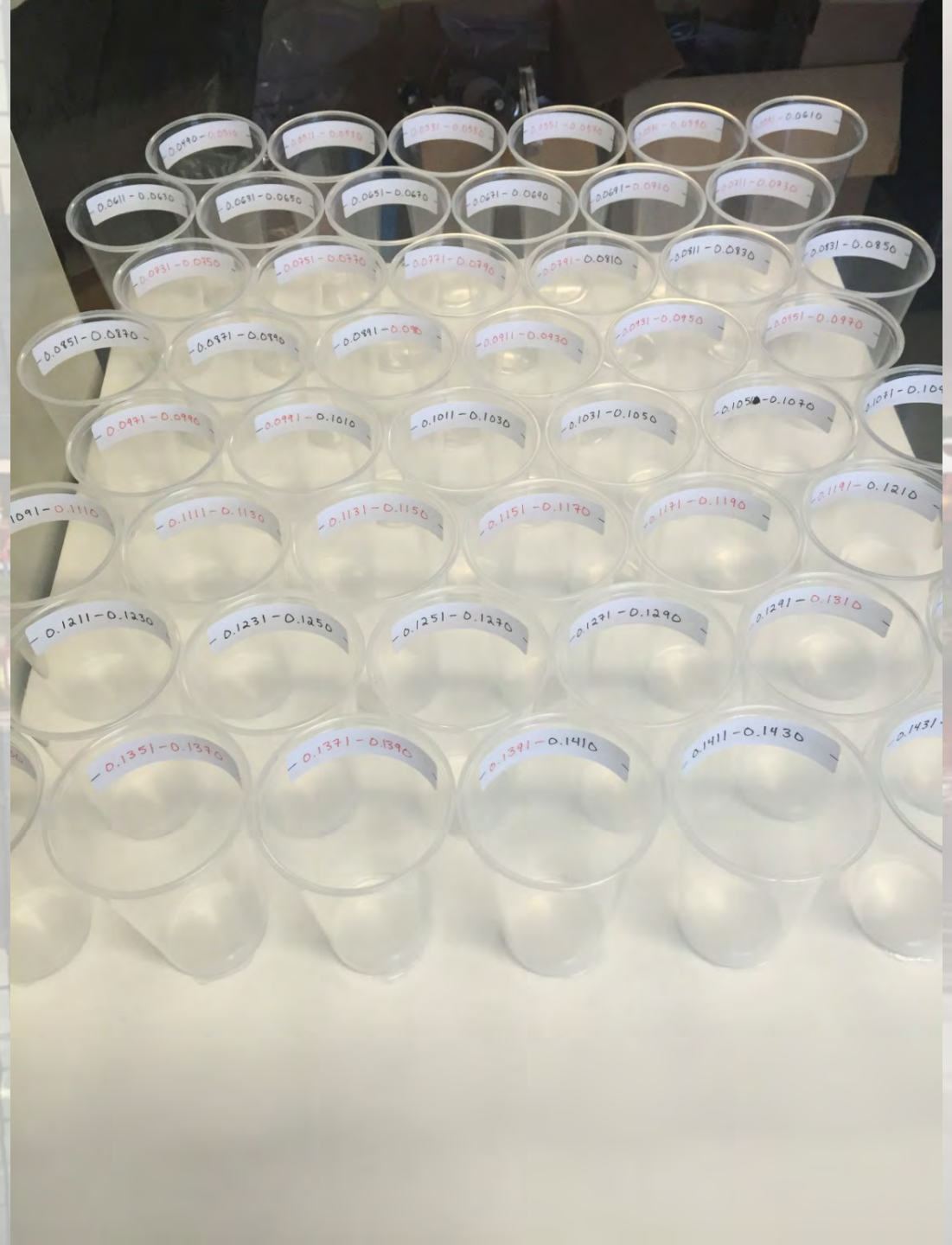
(8,850)

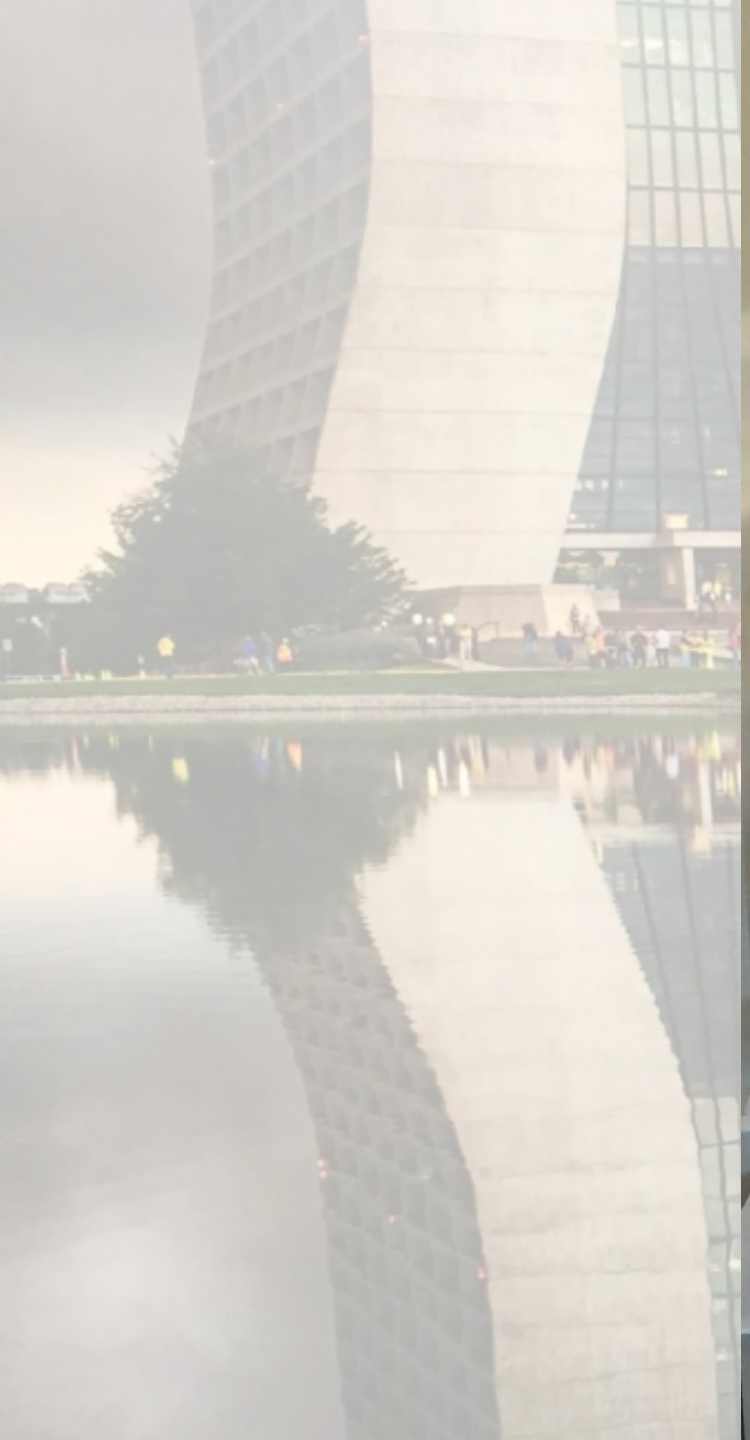
Each massed, sorted,
Recorded,
shopped and placed

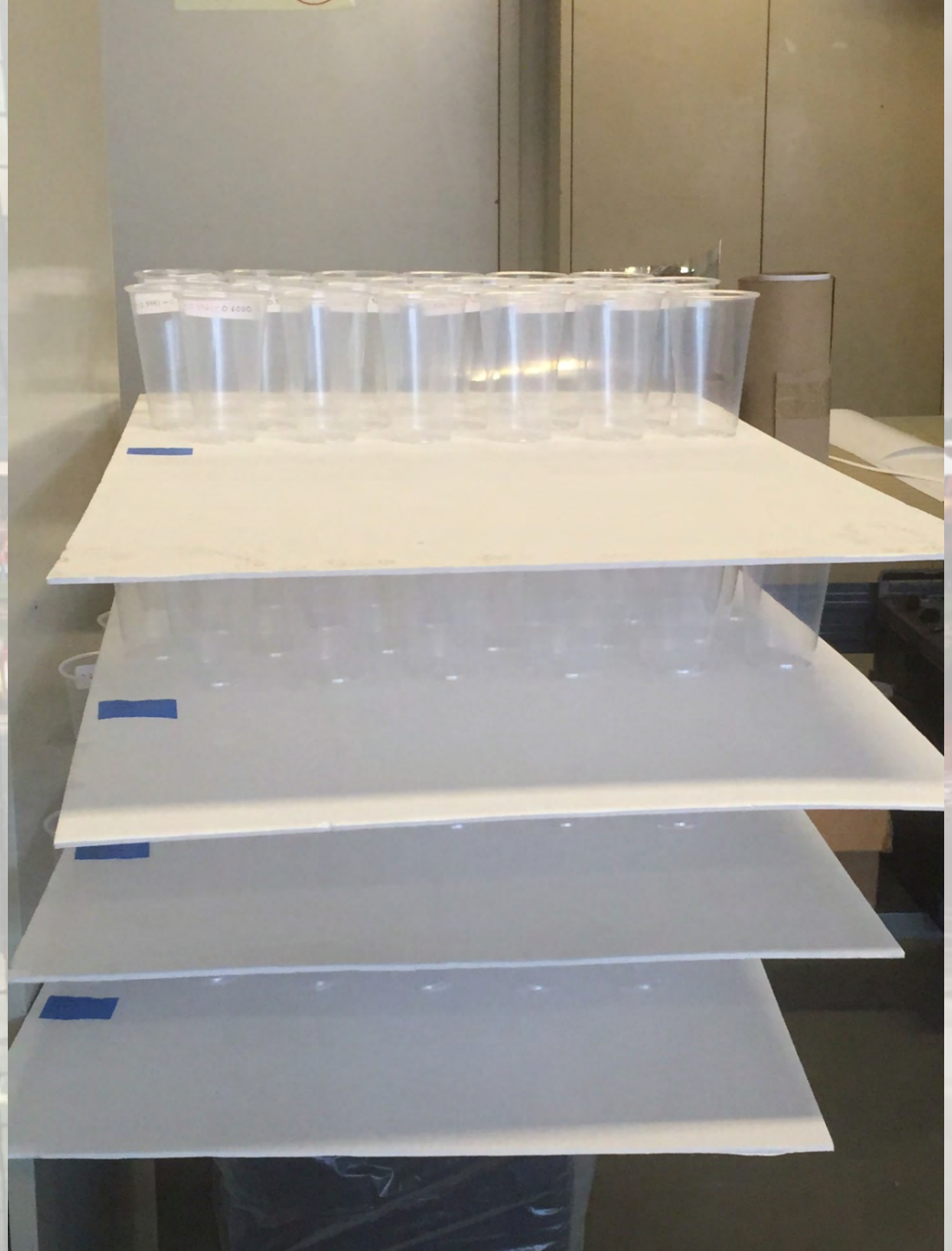


.0490 – .1450
.1451 – .2820
.2821 – .5740
CAUTION
THIS SIDE UP
DELICATE INSTRUMENTS HANDLE WITH CARE
FRAGILE

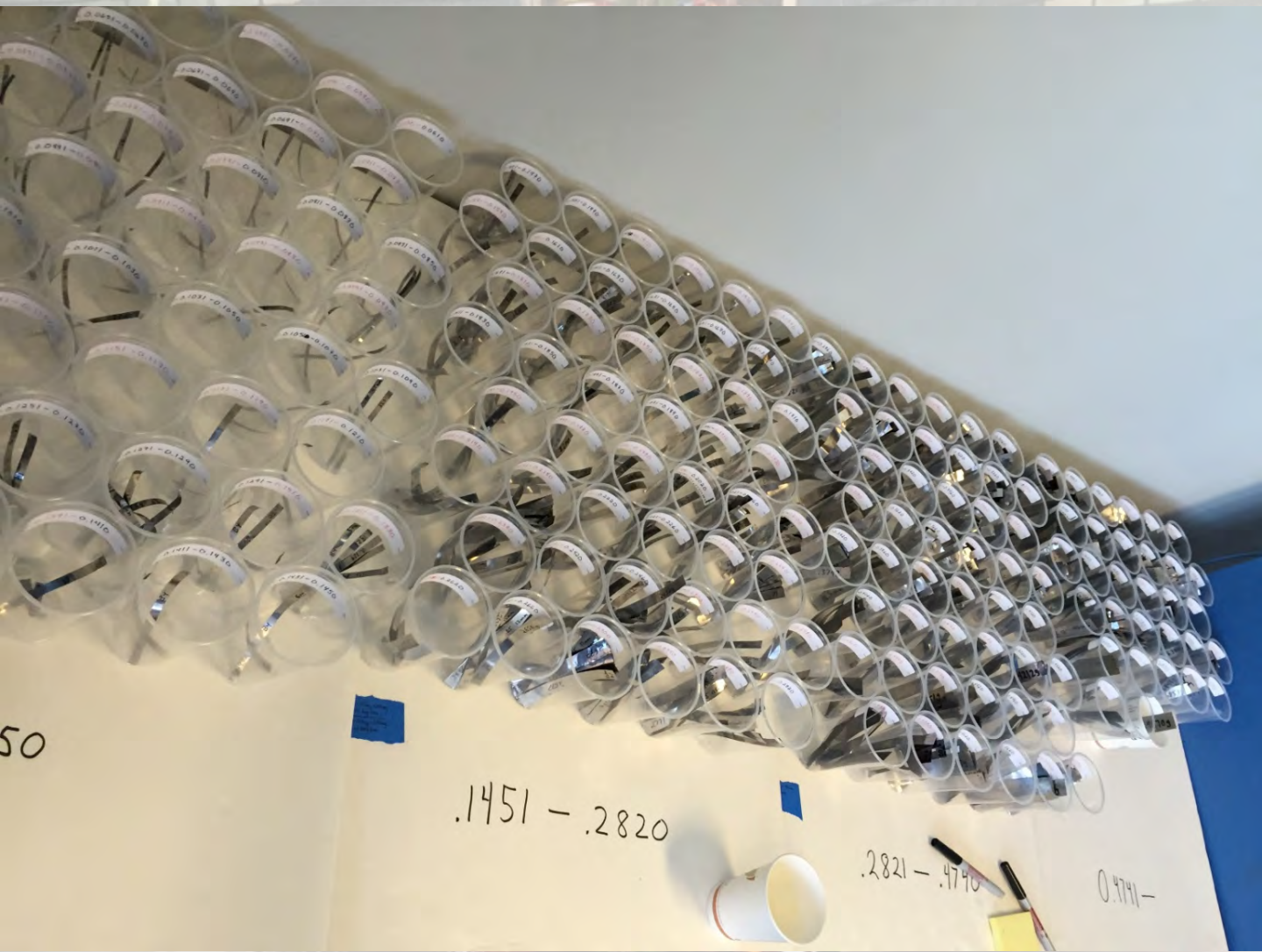


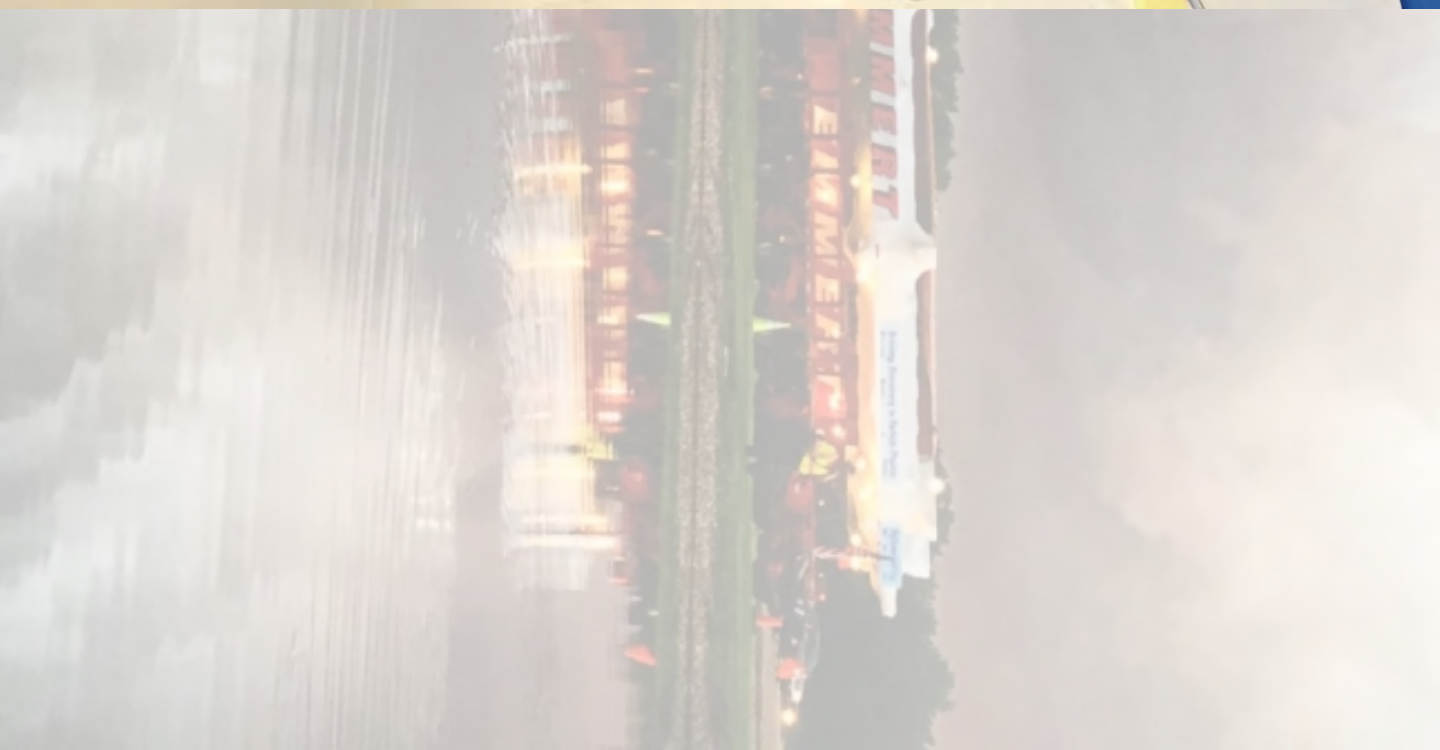

0.0611 - 0.0630
0.0631 - 0.0650
0.0651 - 0.0670
0.0671 - 0.0690
0.0691 - 0.0710
0.0711 - 0.0730
0.0731 - 0.0750
0.0751 - 0.0770
0.0771 - 0.0790
0.0791 - 0.0810
0.0811 - 0.0830
0.0831 - 0.0850
0.0851 - 0.0870
0.0971 - 0.0990
0.0991 - 0.1010
0.1011 - 0.1030
0.1031 - 0.1050
0.1071 - 0.1090
0.1111 - 0.1130
0.1131 - 0.1150
0.1151 - 0.1170
0.1171 - 0.1190
0.1211 - 0.1230
0.1231 - 0.1250
0.1251 - 0.1270
0.1271 - 0.1290
0.1291 - 0.1310
0.1351 - 0.1370
0.1371 - 0.1390
0.1391 - 0.1410
0.1411 - 0.1430

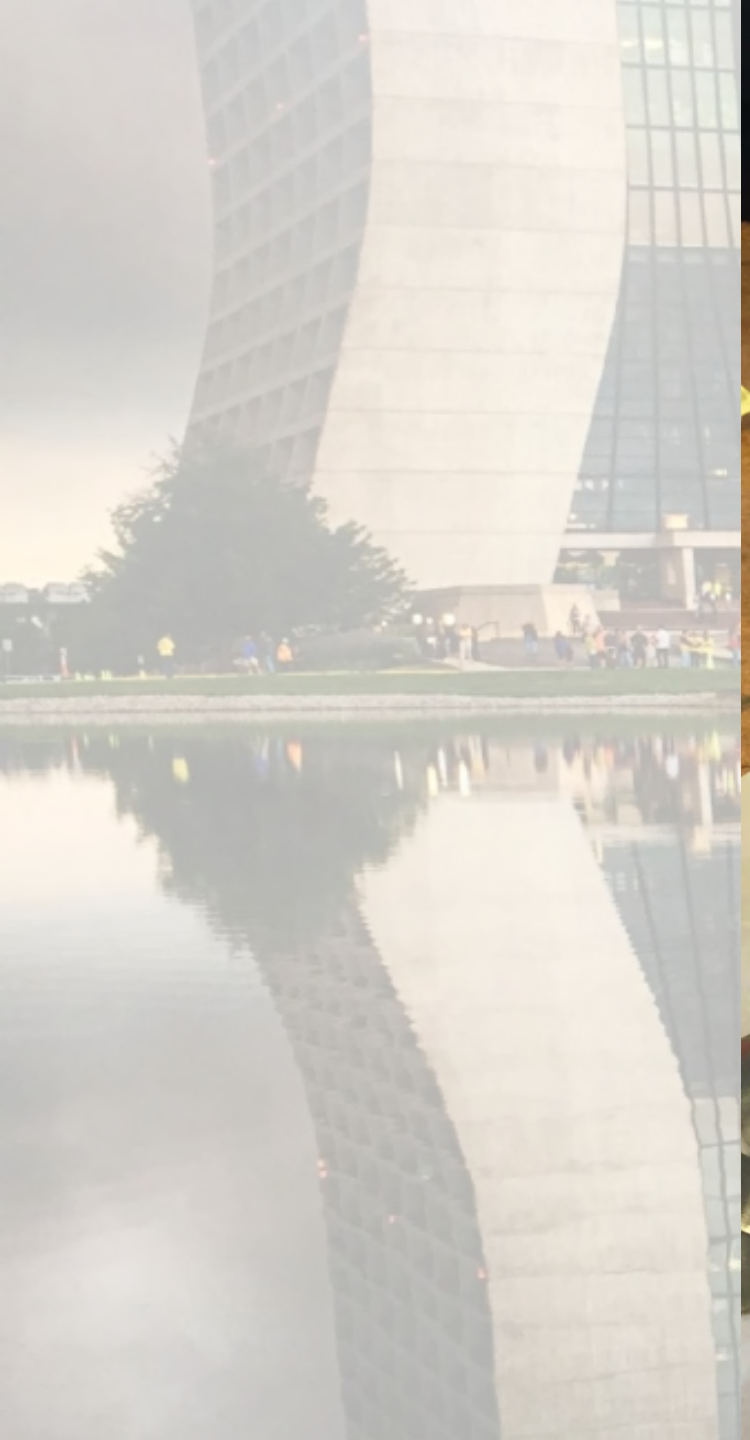




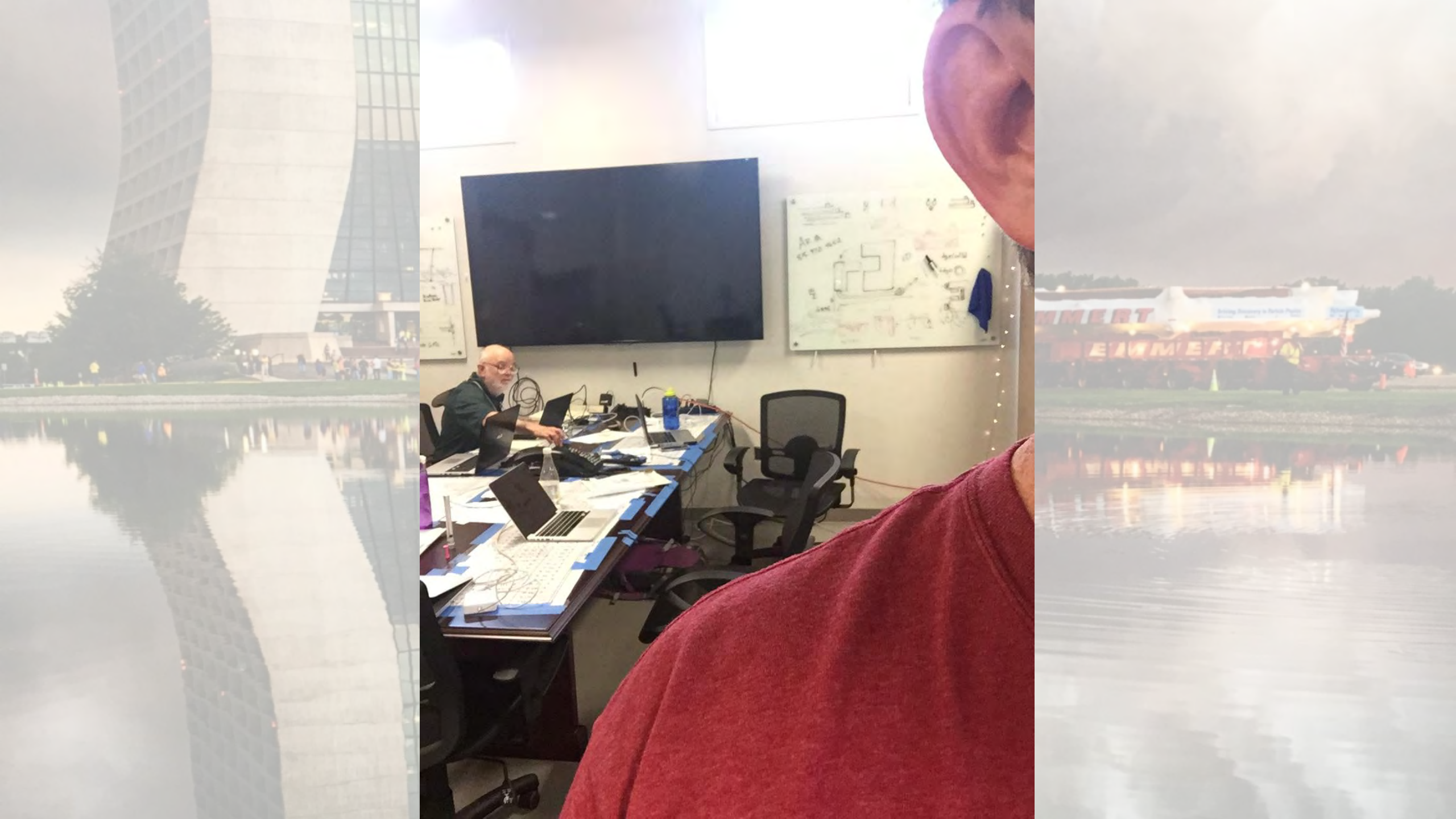
Fermilab
820

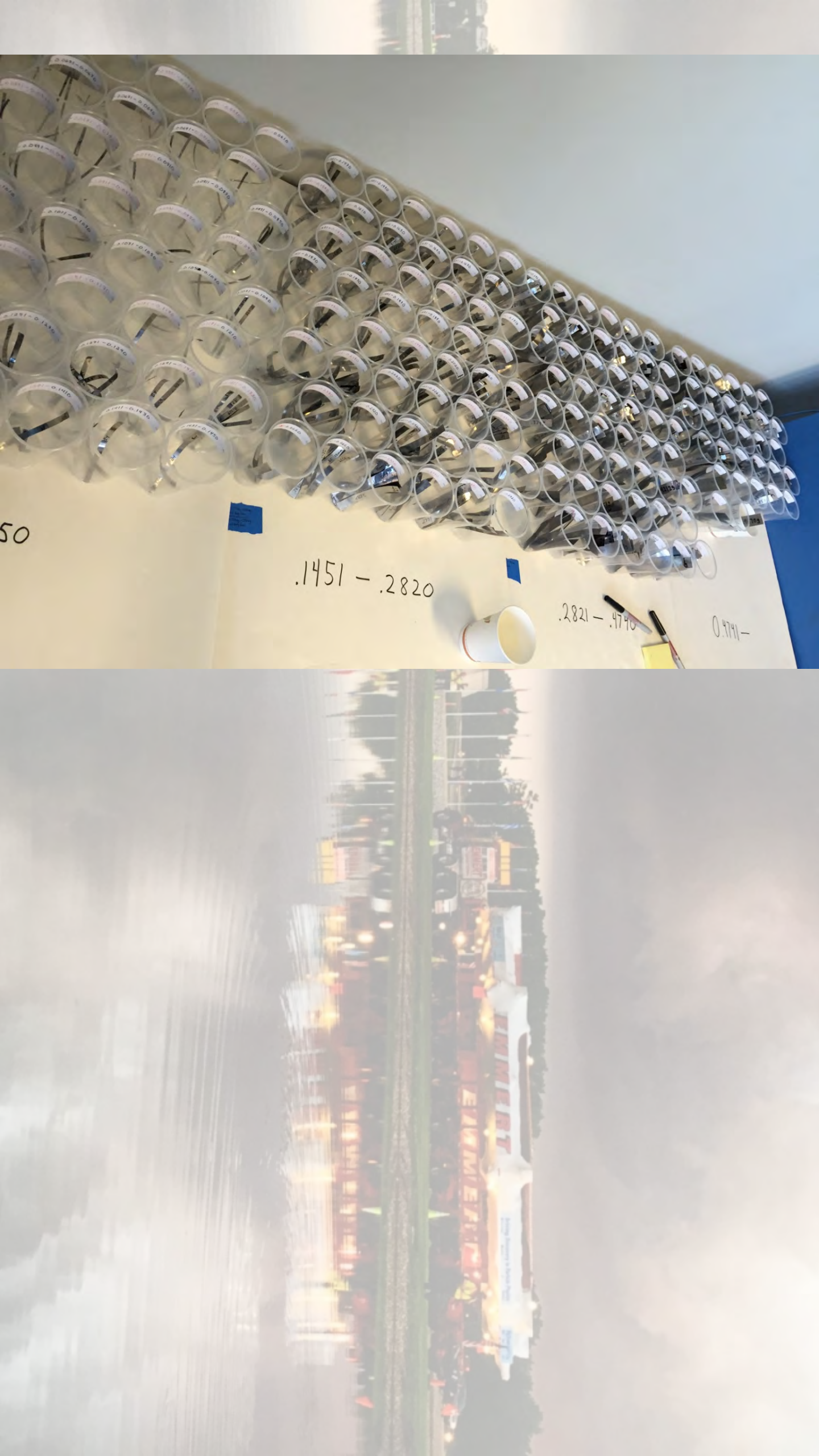
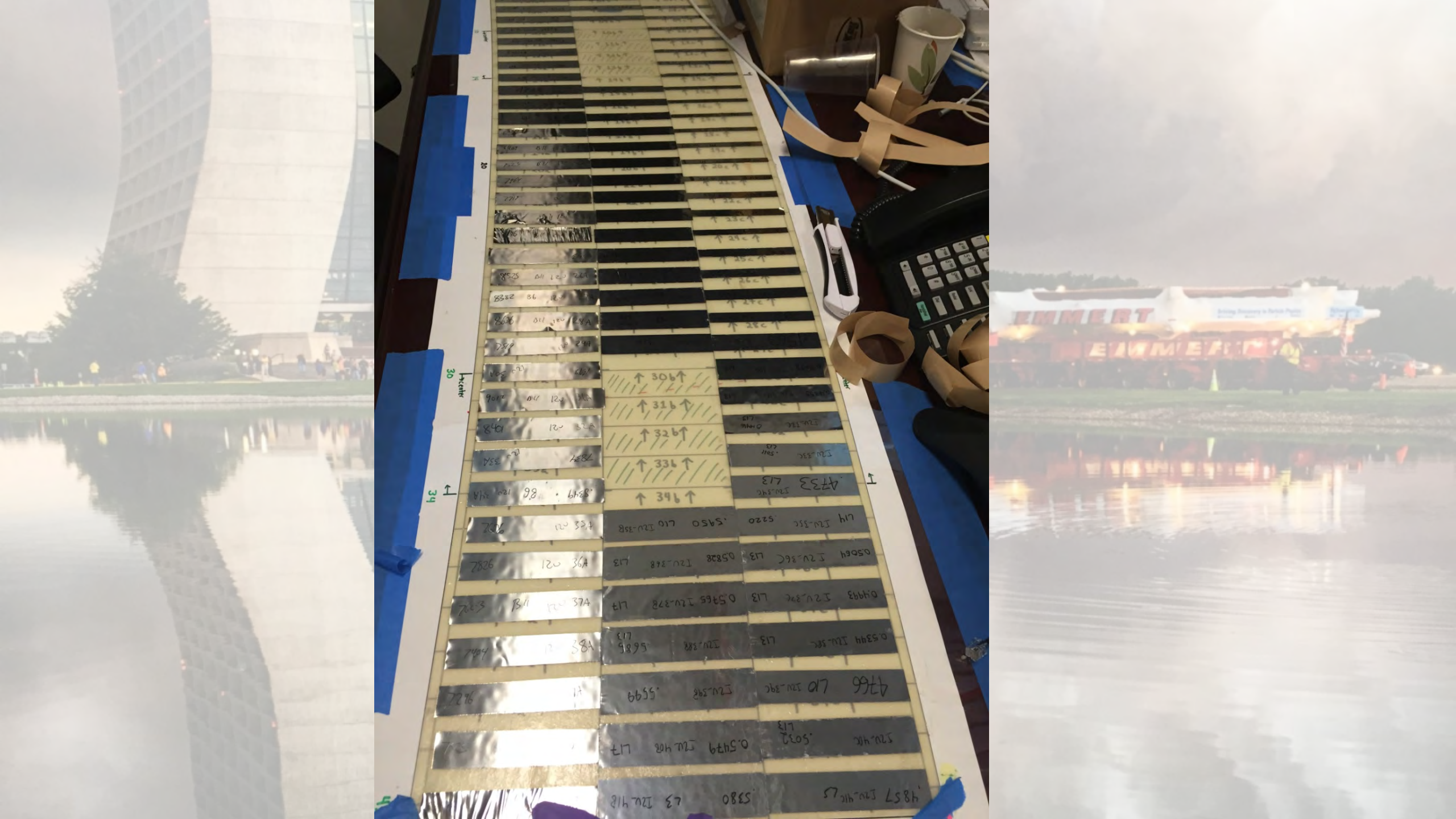
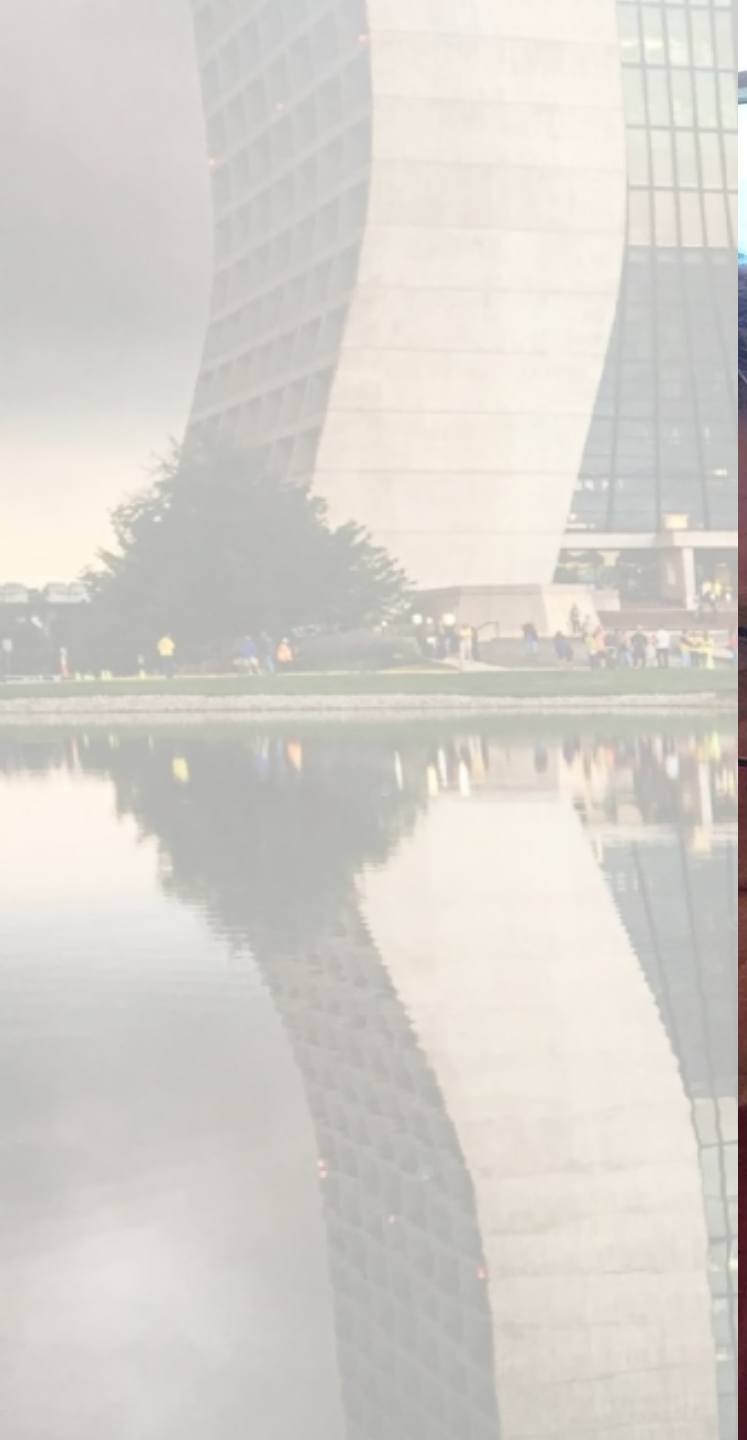
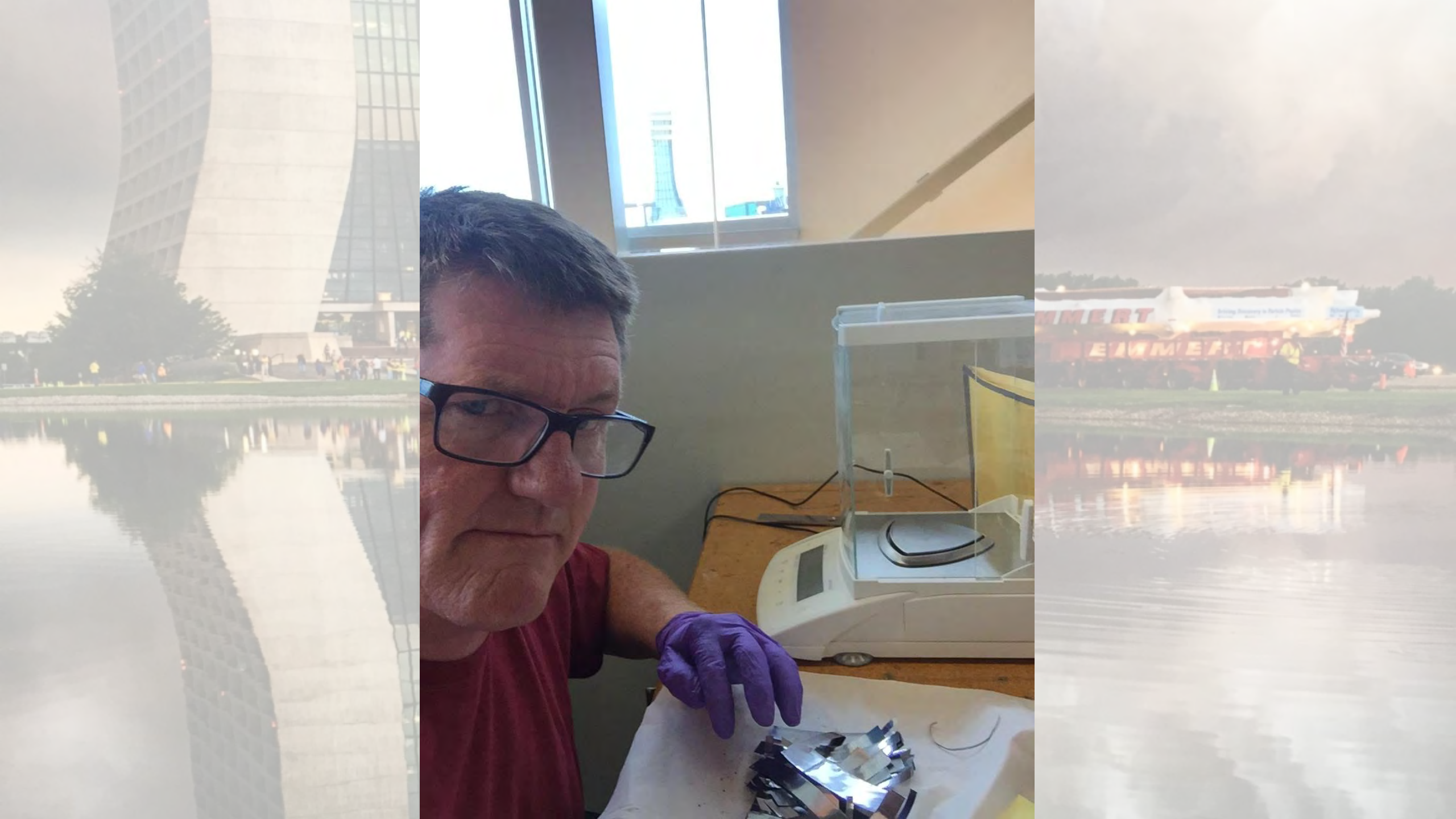

50
.1451 – .2820
.2821 – .4740
0.4741 –





SUPER PERMANENT INK




.1451 – .2820
.2821 – .4740
0.4741–