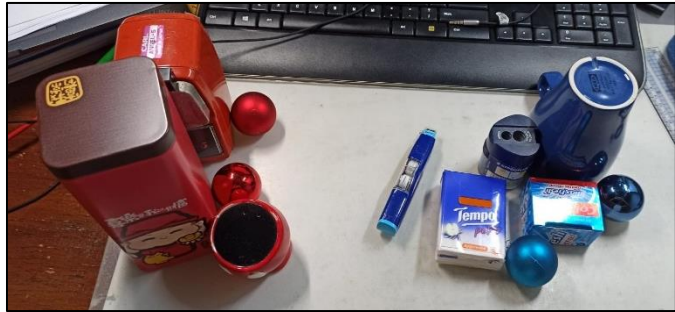
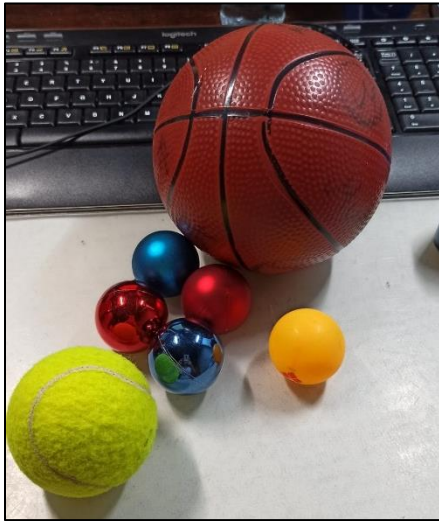


**NLOS Investigation #2 with focus on the shape, texture and colour of objects**



**Overview of items chosen**

1. Classified by colour

Red	Blue
Matt ornament	Correction tape
Mickey Mouse decoration	Matt ornament
Pen Sharpener	Pen sharpener
Shiny ornament	Toothpaste box
Tin	Mug
	Shiny ornament

Ornaments	
Red	Shiny and Matt surface
Blue	

2. Classified by shape

	Small	Medium	Large
Ball	Table Tennis ball Ornaments (matt/shiny)	(normal) Tennis Ball	Rubber Ball
Rectangular	Blue Toothpaste box	Red Tin	Red Pen sharpener

## 3. Classified by texture

Ornaments	
Shiny surface	Red and Blue
Matt surface	

Diffuse reflection	Specular reflection
Matt surface ornaments	Shiny surface ornaments
Table tennis ball	Red Pen sharpener
Tennis ball	Blue Mug
Blue correction tape	Red Mickey mouse decoration
Rubber ball	Red Tin
	Blue toothpaste box

**Set-up and collection of images**

- Same as initial experiment
- Camera settings are as follows

Focal Length	Focus	Aperture	ISO	White Balance	Shutter Speed	Position	Group of object size
15mm	Manually Focused to the top-left crop mark	F3.5	100	5600K	1/200	1cm	S, M, L
					1/500		
					1/800		

**Processing and enhancement of images**

- Same as initial experimentation
- Attempt in using the ShadowCam code (in C++)

**Results and sources of error**

The following part exhibits multiple sets of images which consists of 3 parts each: The object image, the difference image and the amplified image. *For consistency, the amplification parameter will be set at 100*, regardless of the quality of the final image.

This part will be laid out as follows:

1. *Red objects*
  - a. Of diffuse reflection
  - b. Of specular reflection
2. *Blue objects*
  - a. Of diffuse reflection
  - b. Of specular reflection

Evaluate the effect of **texture**

3. *Ornaments*

- a. Of red colour
- b. Of blue colour
- c. Of diffuse reflection
- d. Of specular reflection

Evaluate the effect of **colour**  
and **texture**

4. *Ball-shaped objects*

- a. Of small shape
- b. Of medium shape
- c. Of large shape

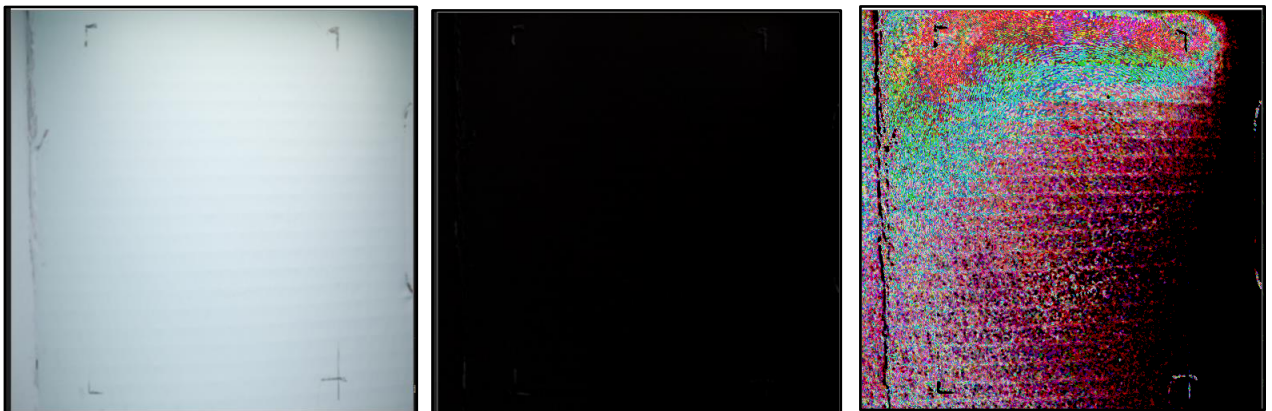
Evaluate the effect of **size**

5. *Rectangular-shaped objects*

- a. Of small shape
- b. Of medium shape
- c. Of large shape

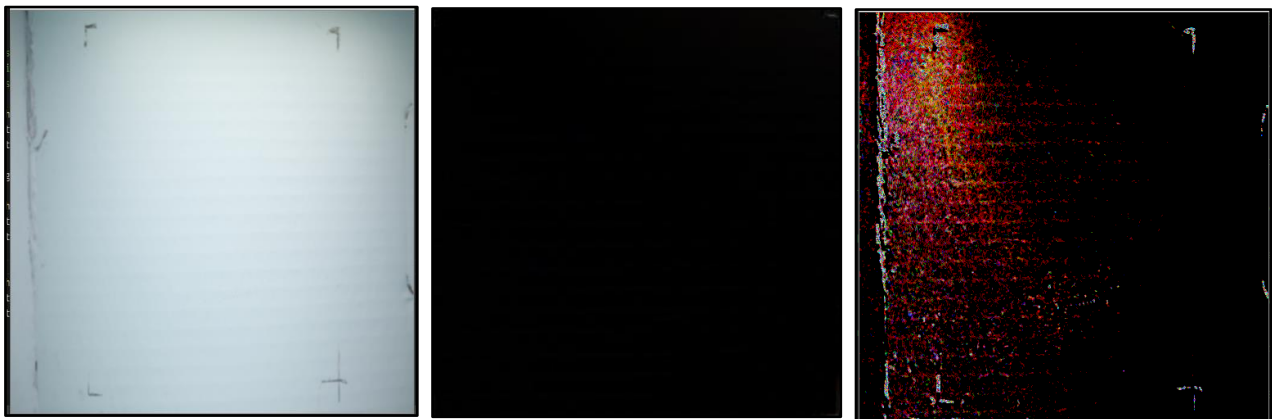
**Pool of all images (14 Items in total)**

1. Blue correction tape



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

2. Blue matt ornament



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

3. Blue mug



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

4. Blue pen sharpener



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

5. Blue shiny ornament



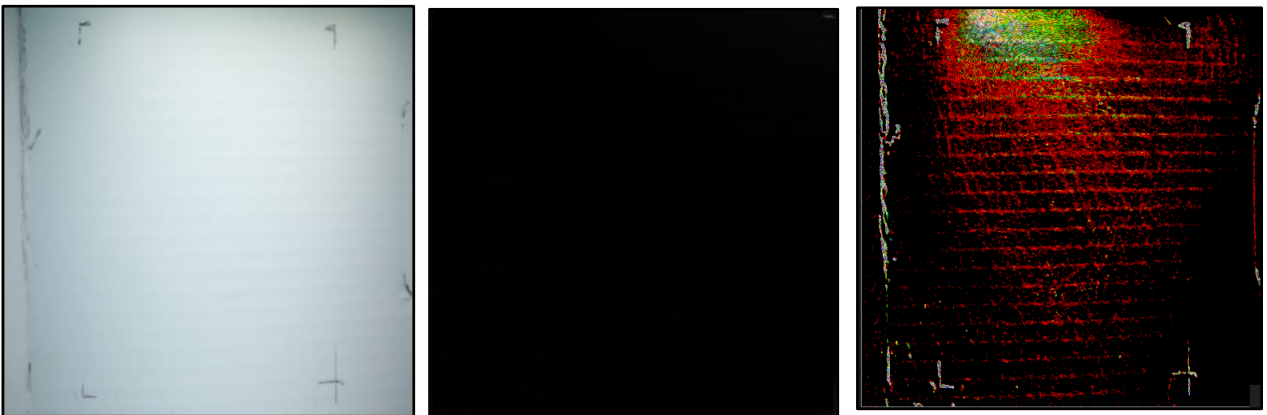
*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

6. Blue toothpaste box



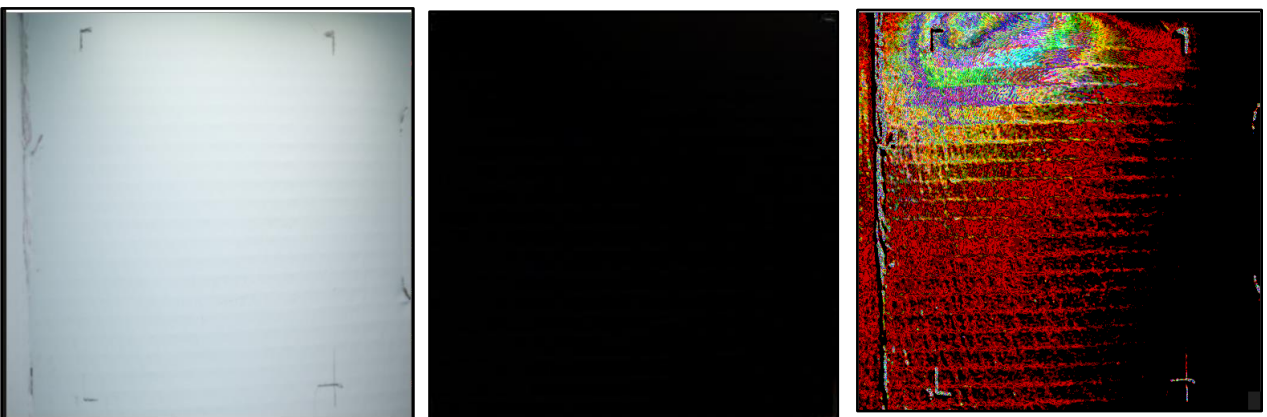
*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

7. Red matt ornament



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

8. Red mickey mouse decoration



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

9. Red pen sharpener



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

10. Red shiny ornament



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

11. Red tin



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*



12. Rubber ball



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

13. Table tennis ball



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

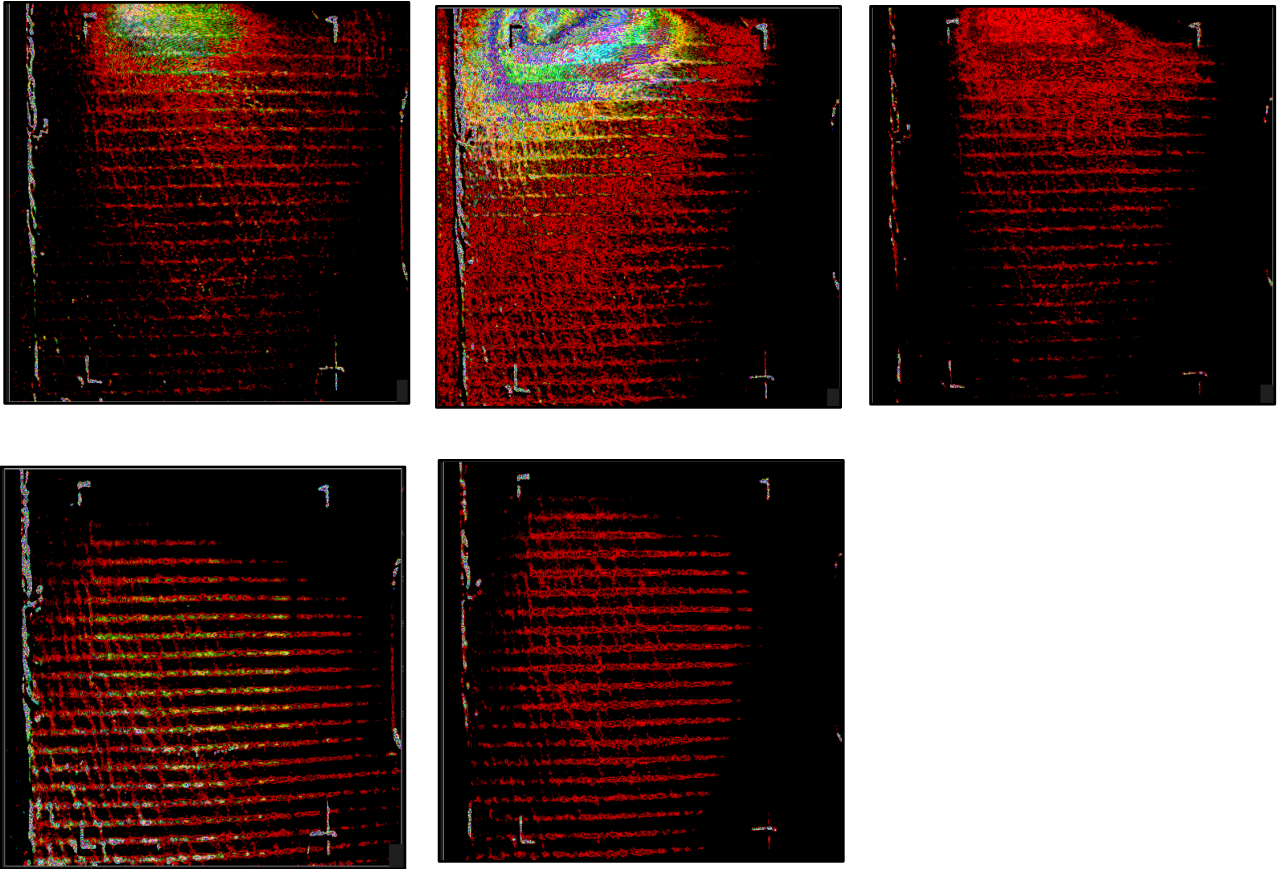
14. Tennis ball



*Object Image, difference image and amplified image of Shutter Speed 1/200 seconds, with a.p of 100*

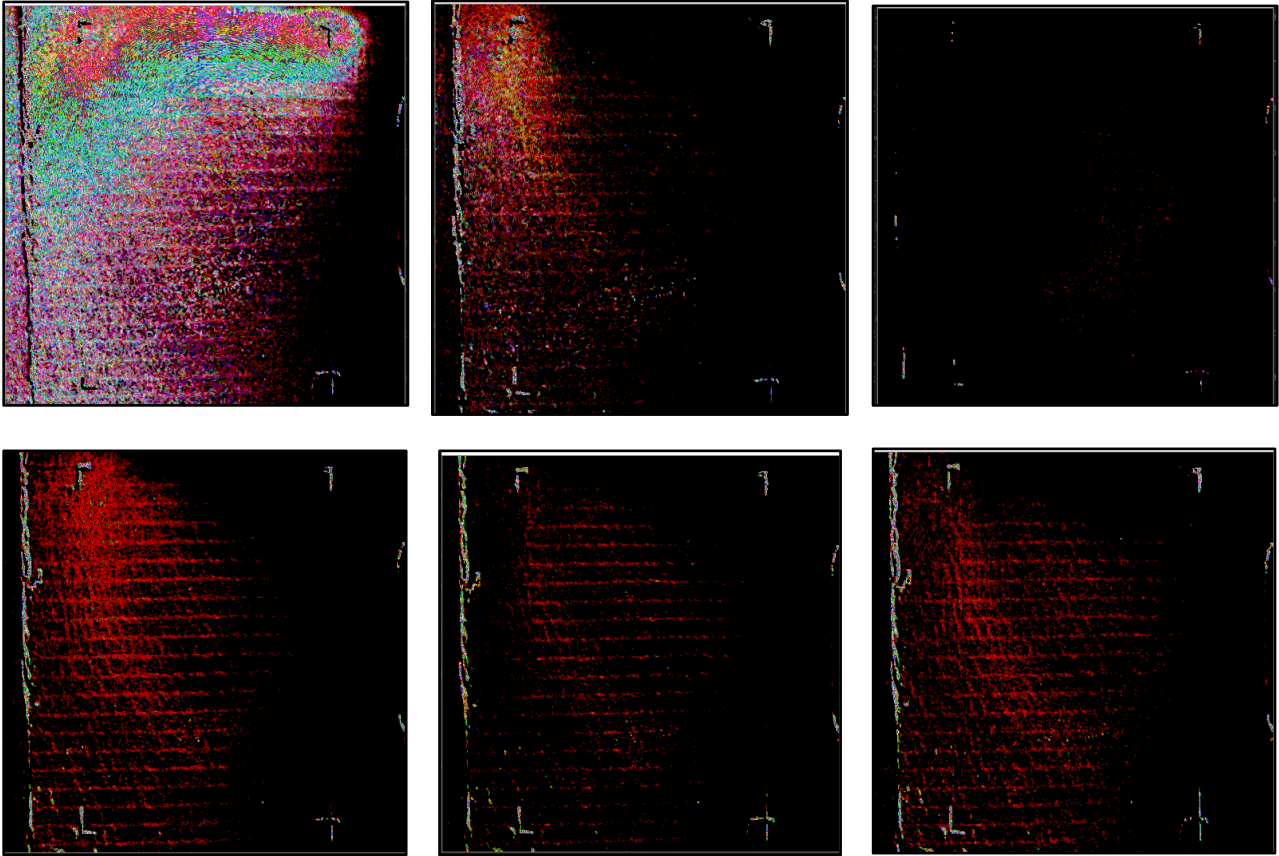
### Classification by colour

#### Red



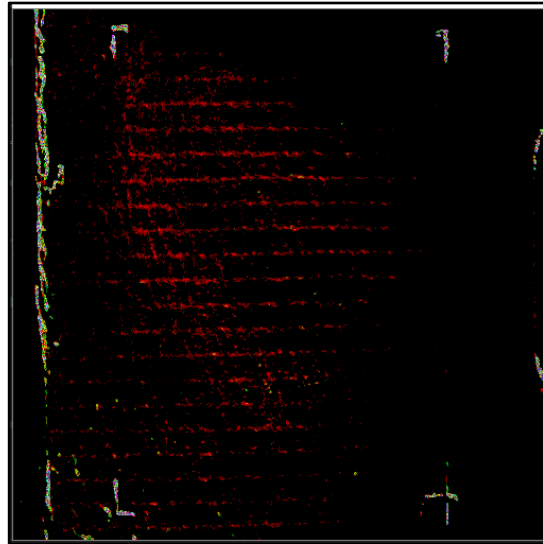
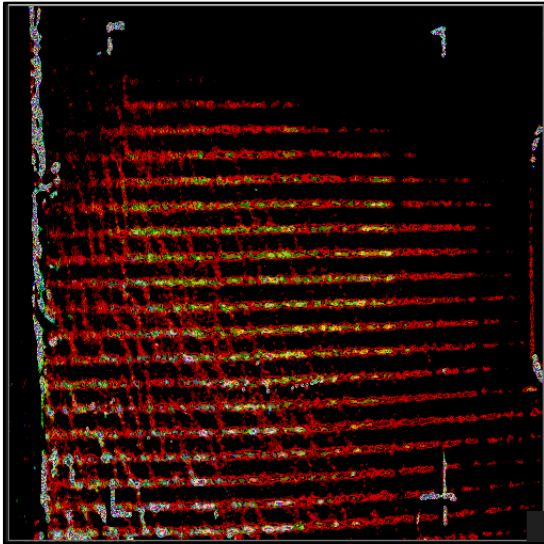


Blue

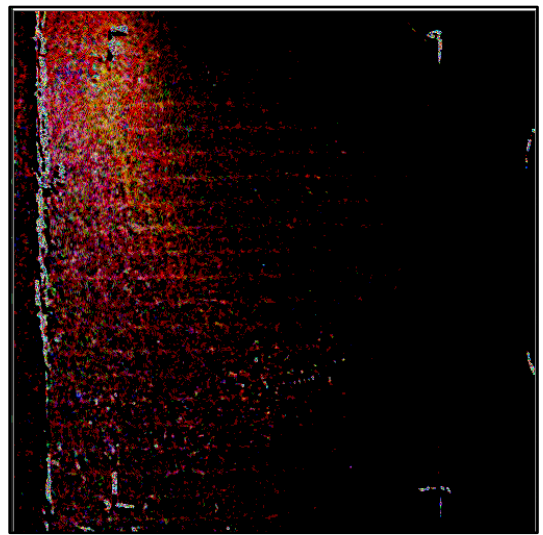
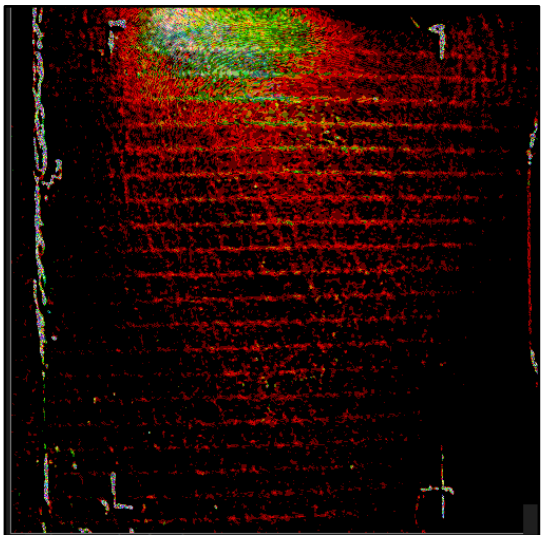


## Classification by Ornament

### Shiny Ornaments

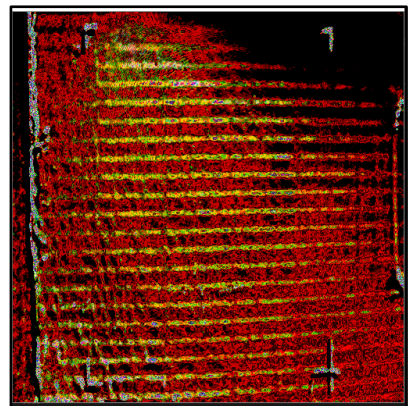
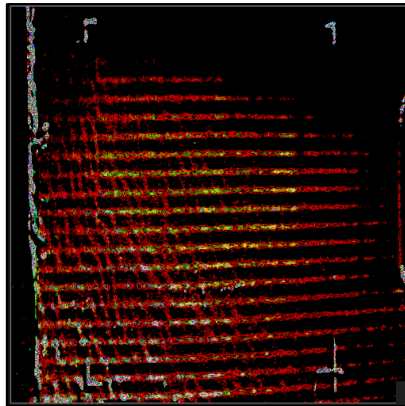
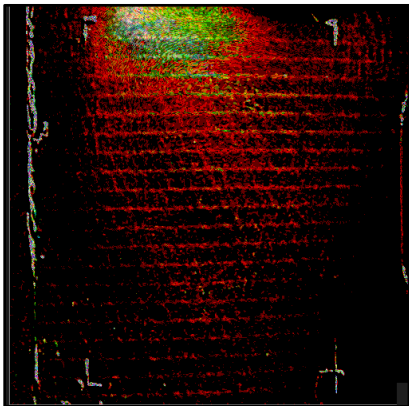
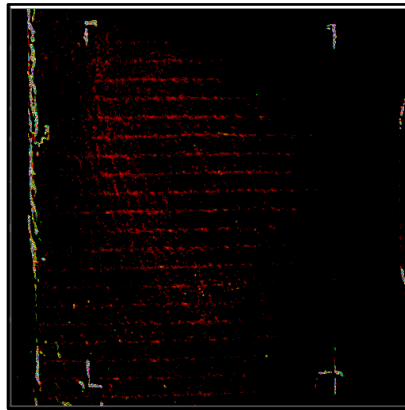
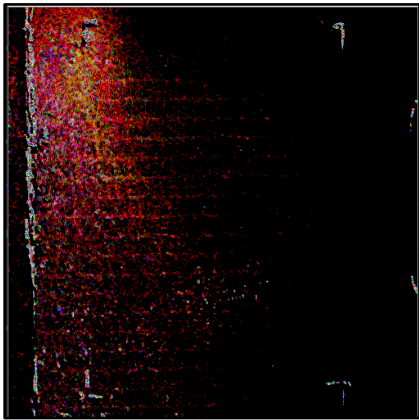


### Matt Ornaments

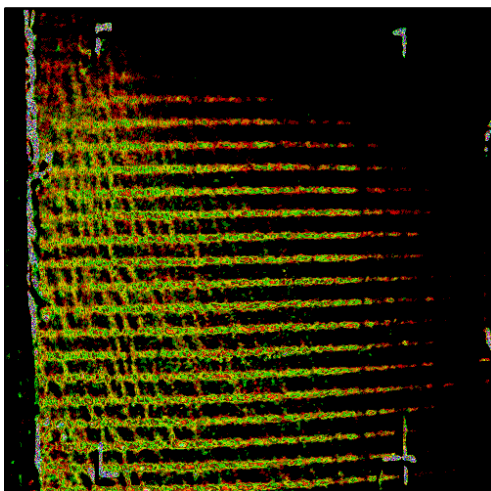


## Classification by shape

### Small Ball



### Medium Ball



## Large Ball

