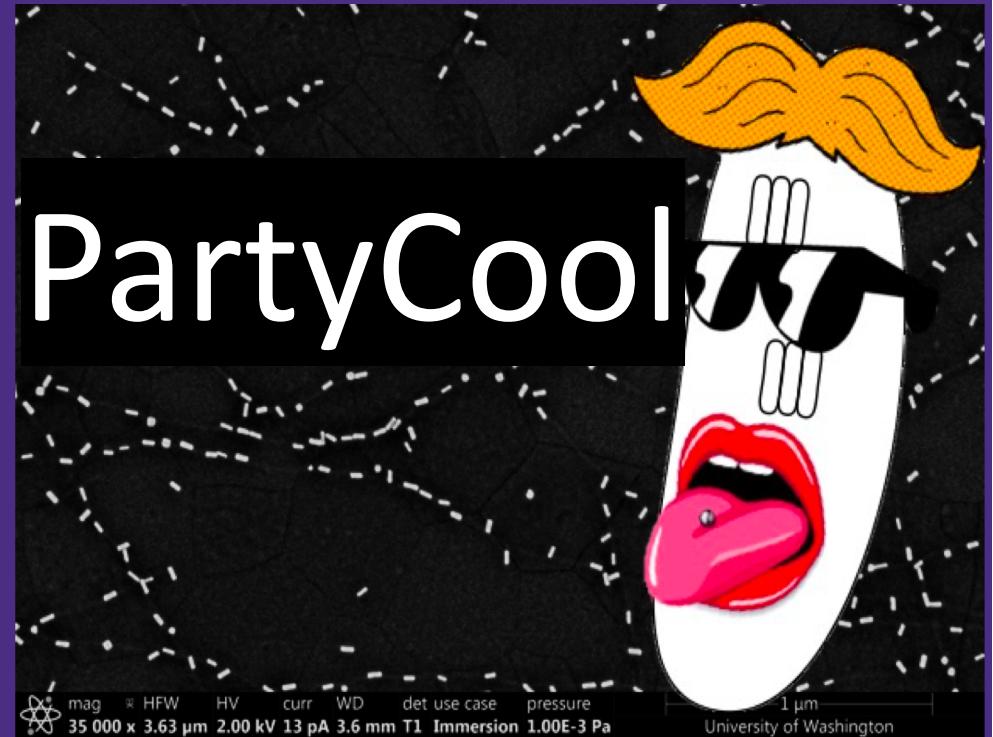


Universal Particle Size Analysis tools

Group members:

Muammer Yaman, Ximin Hu , Margherita Taddei ,Yangwei Shi

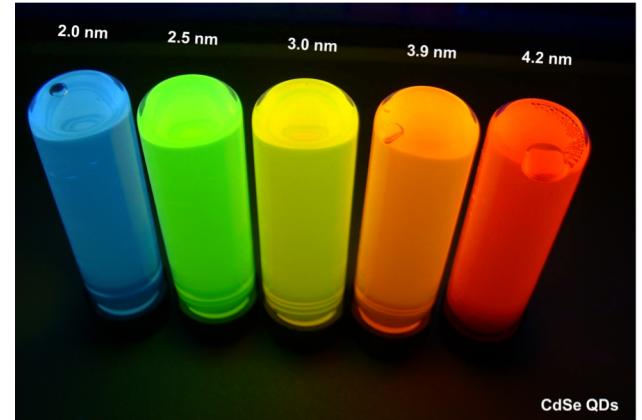
BE BOUNDLESS



W

Background

- Particle size insights the properties of materials
- Develop novel particle size analysis tools
 - electron microscopy (SEM, TEM)
 - optical microscope (bright and dark field)
 - atomic force microscopy (AFM)
- No good particle size analysis tools
 - not updated
 - not universal
 - not user-friendly



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How it works

Ultimate Goal: Obtain the size distribution of particles

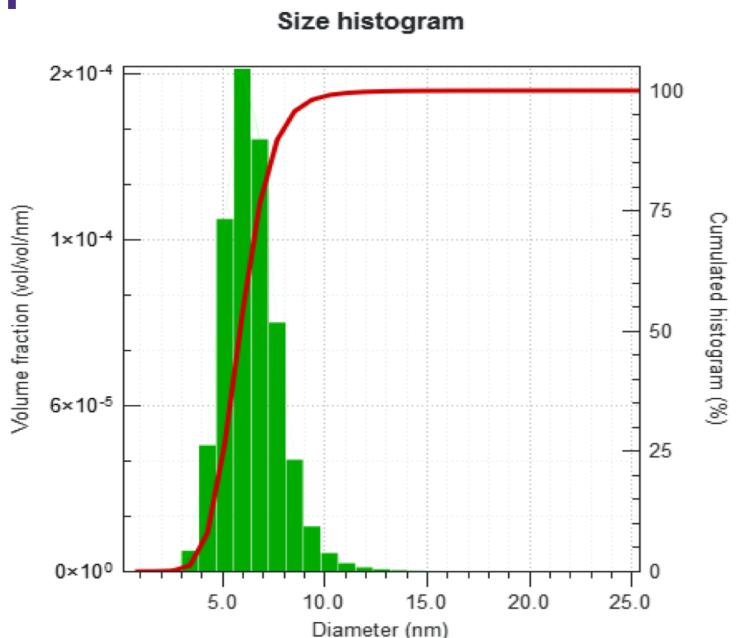
- Particle recognition
- Scale bar search
- Particle size calculation
- PartyCool summary!

Stretch Goal

- Using machine learning to distinguish the
- SEM, TEM, AFM images

Tools

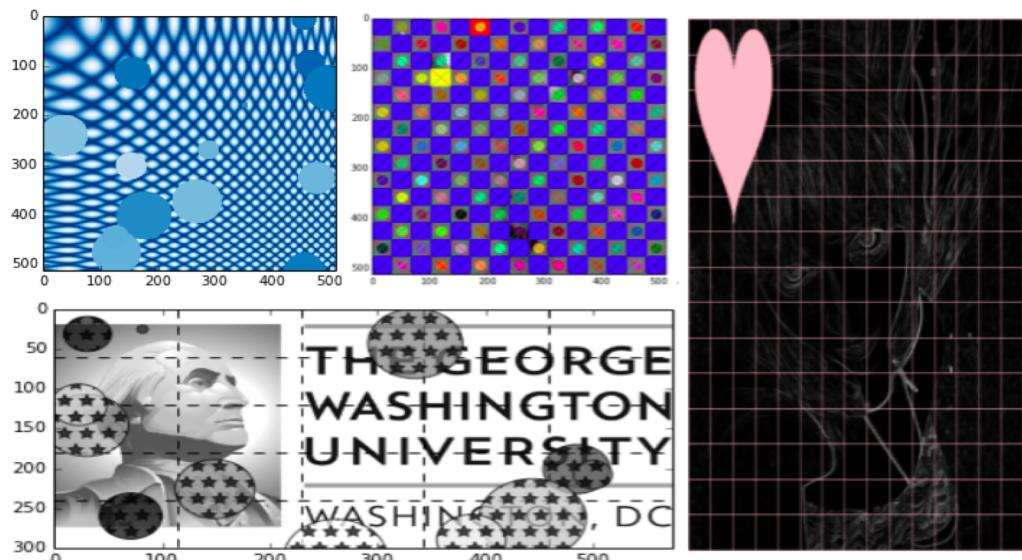
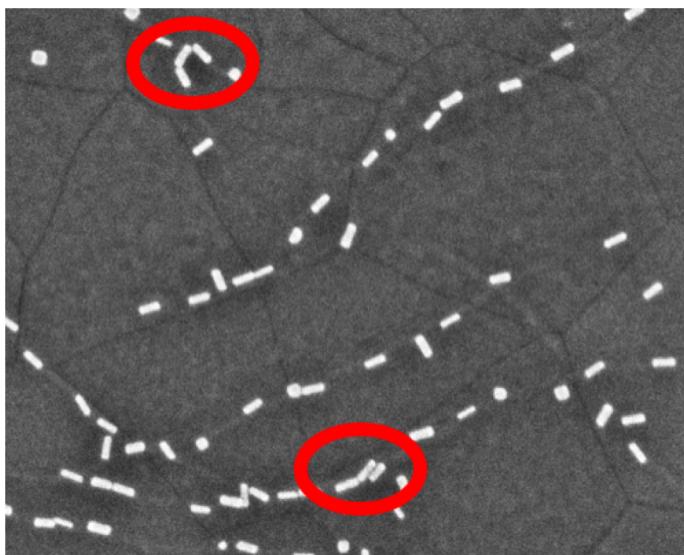
- Image processing: scikit-image and OpenCV
- Data visualization: matplotlib



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Appeal

- Uniform
- Simple
- Precise



pyparty: Python (py) particles (party)

`pyparty` is a small library for drawing, labeling, patterning and manipulating particles in 2d images. `pyparty` was built atop the excellent image processing library, [scikit-image](#).

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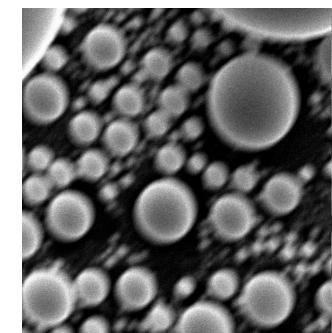
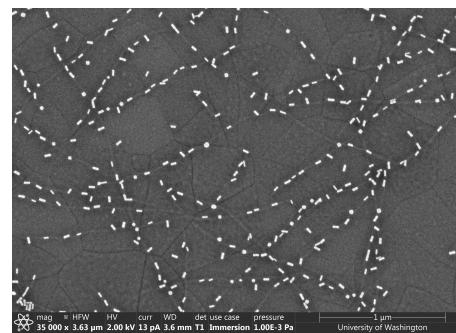
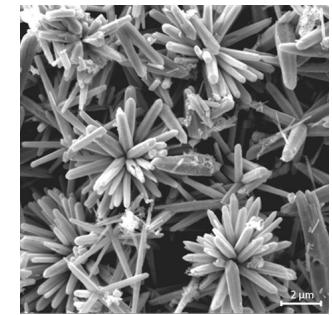
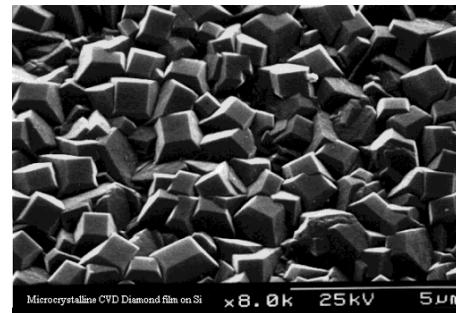
Drawbacks and Challenges

Drawbacks

- Image of AFM
- Not suitable for polycrystalline material

Challenges

- Scale Bars
 - Scale bar moving from image to image
 - Discontinuous scale bar
- Extract information from images
- Blurred images



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