Digital images

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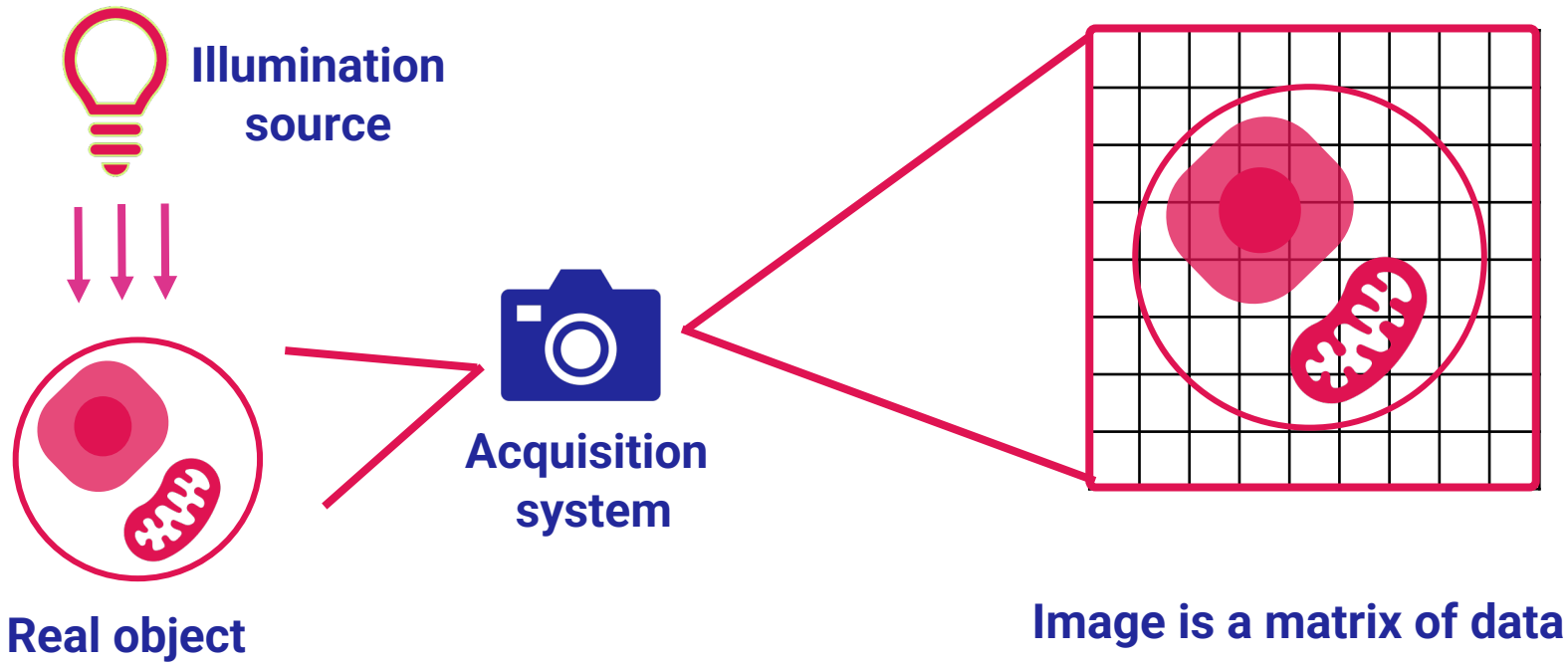
Outline
- Program
- **Digital images**
- Image sequence
- Filters
- Maximum projection

- What is an image?



Digital image

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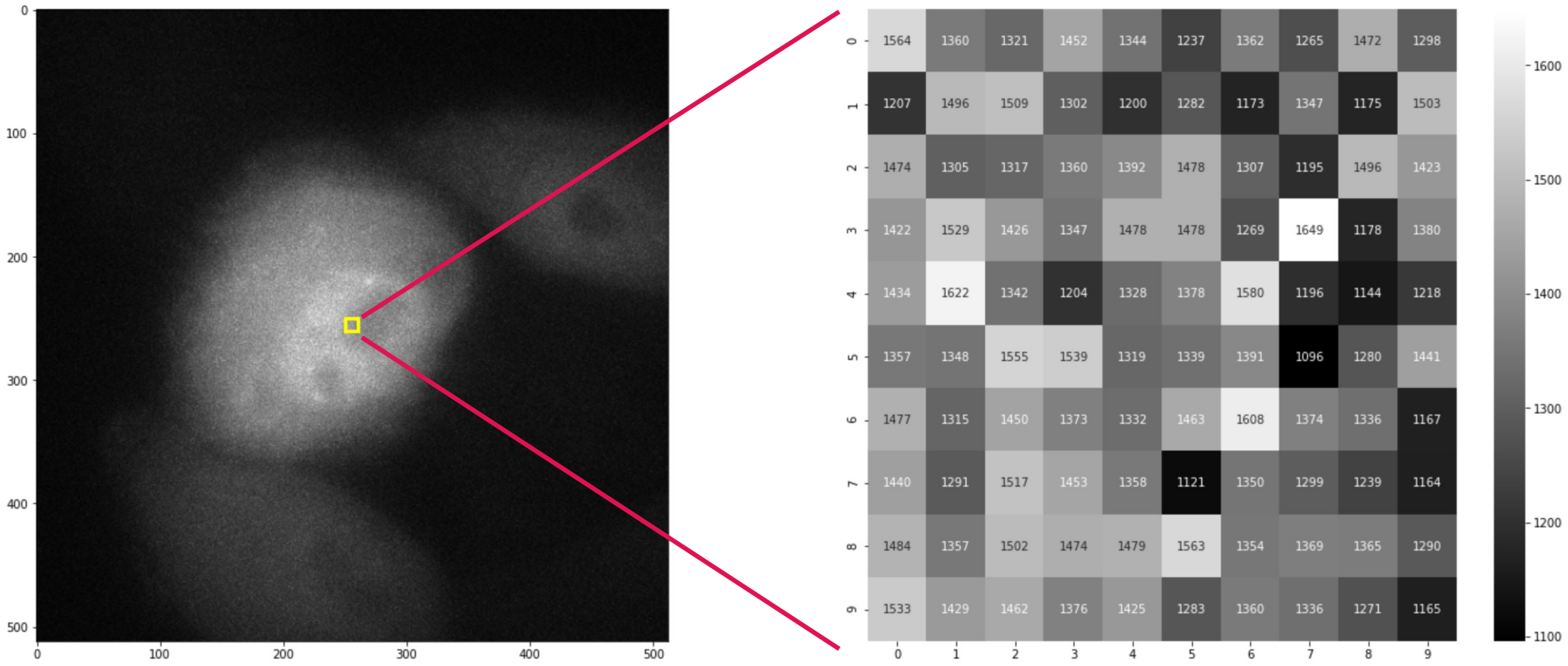

Image sequence

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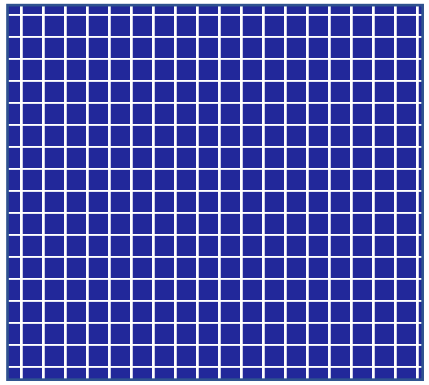
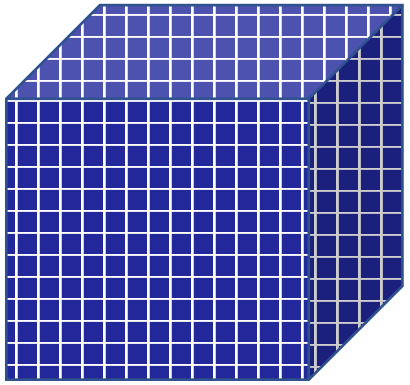
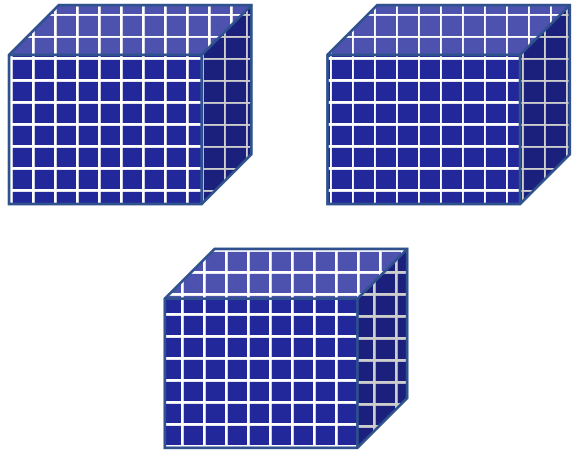
- Sequences of images (3D image, Color image, Video)?



Tensor order 2
2D-image
Matrix
[Y,X]



Tensor order 3
3D image
[Y,X,C]
[Z,Y,X]
[T,Y,X]



Tensor order >3
nD array of images
[T,Y,X,C]
[Z,T,Y,X,C]

Filters

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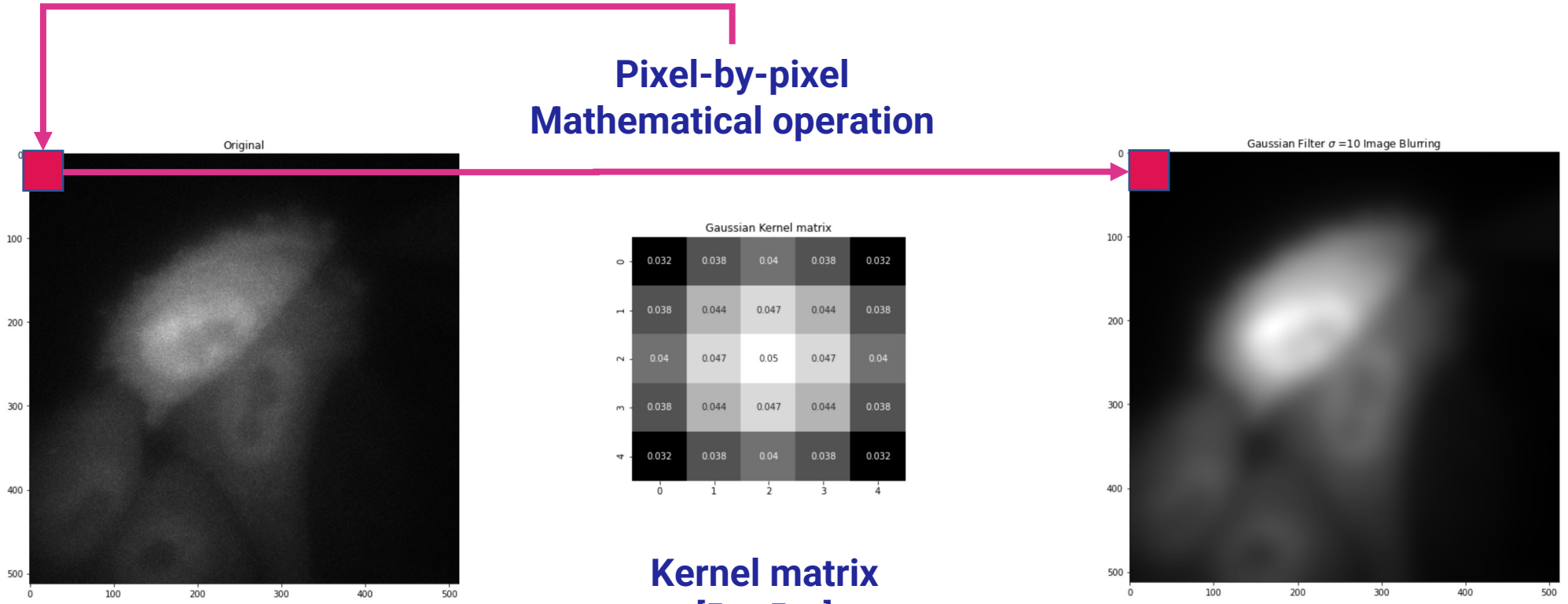
- Filters – 2D Convolution



Maximum projection

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- Maximum projections

Images with 3-dimensional space.

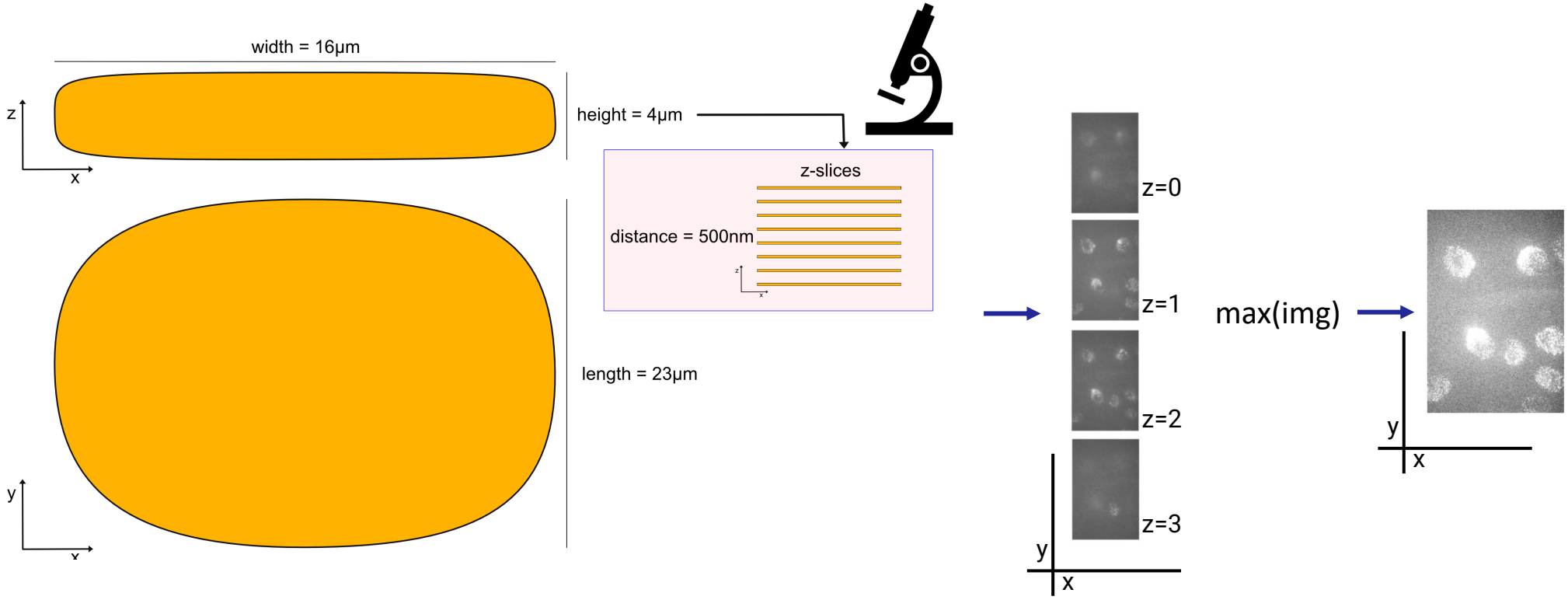

Image registration

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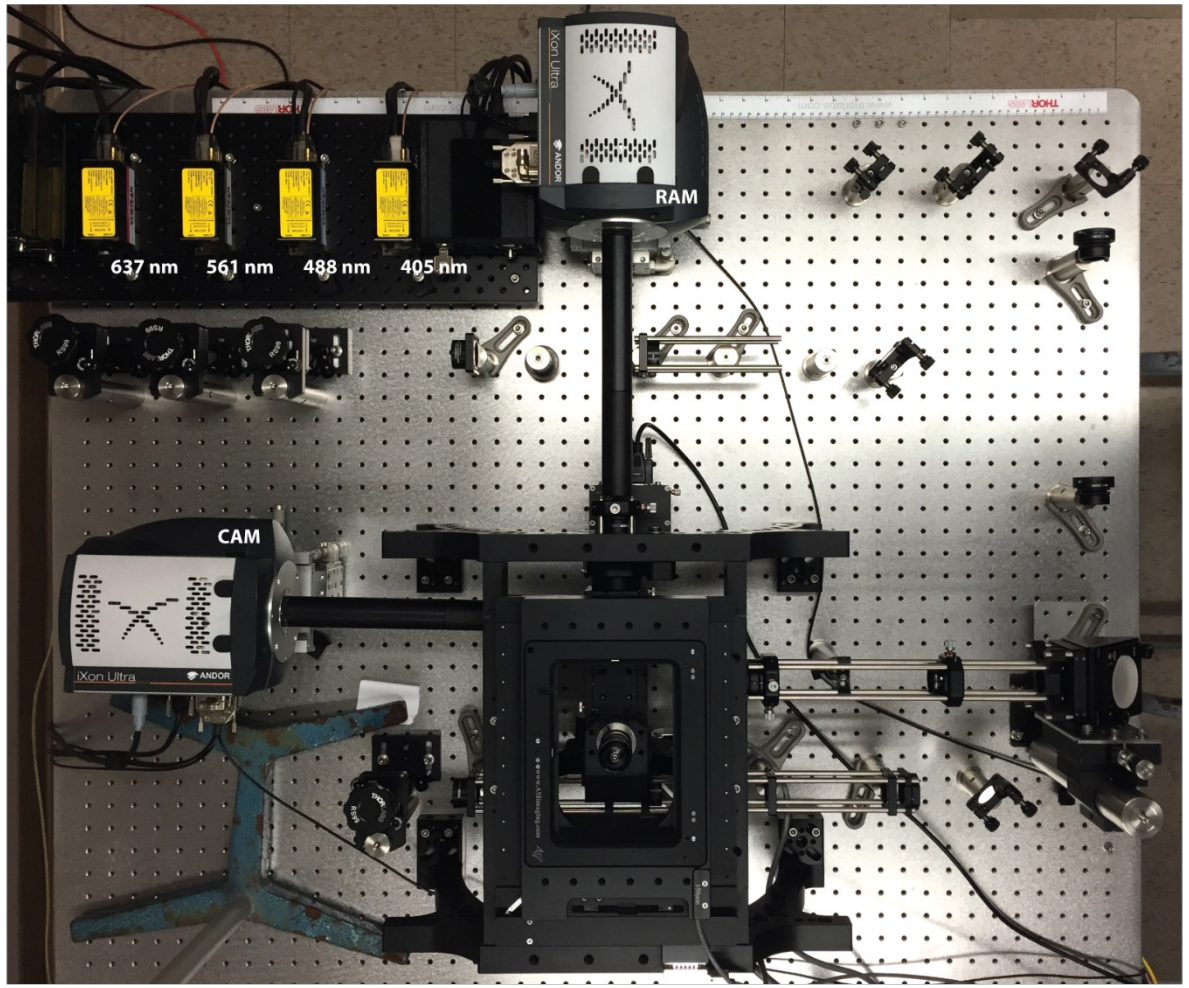
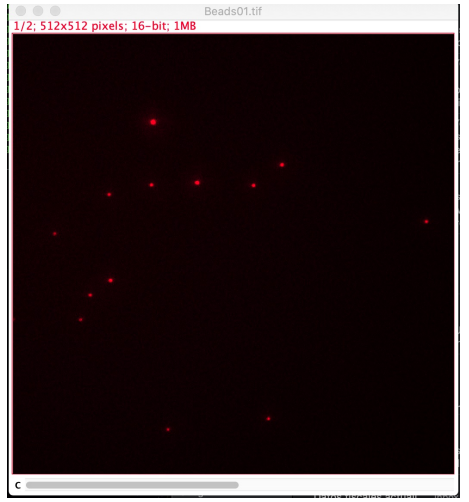
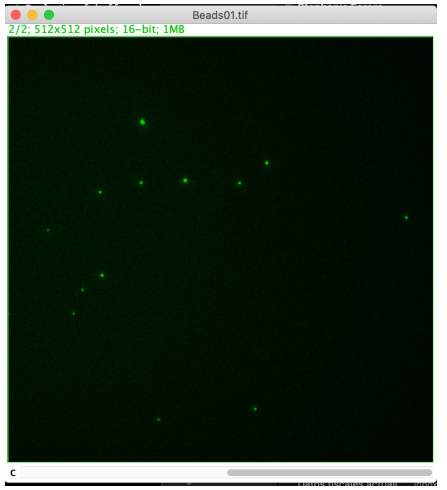
- FiXie microscope



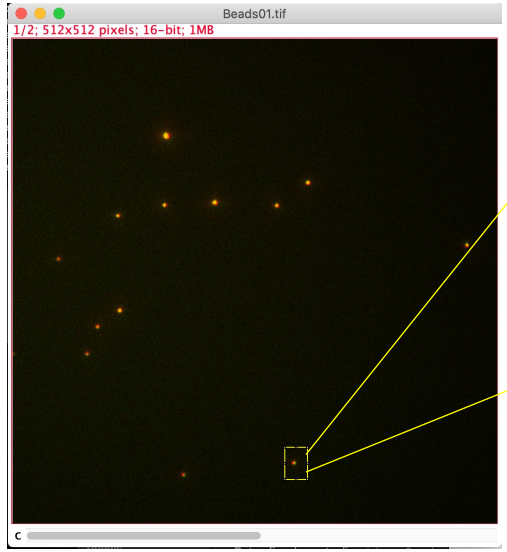
Camera 1



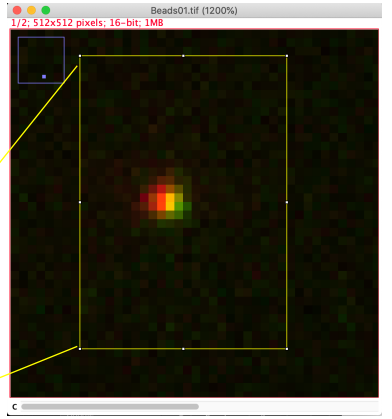
Camera 2



Merged image



Zoom in



Basic Python

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- In Python everything is an object!

```
import numpy
    A = numpy.array([1,2,3,4,5])
```

```
import numpy as np
    A = np.array([1,2,3,4,5])
```

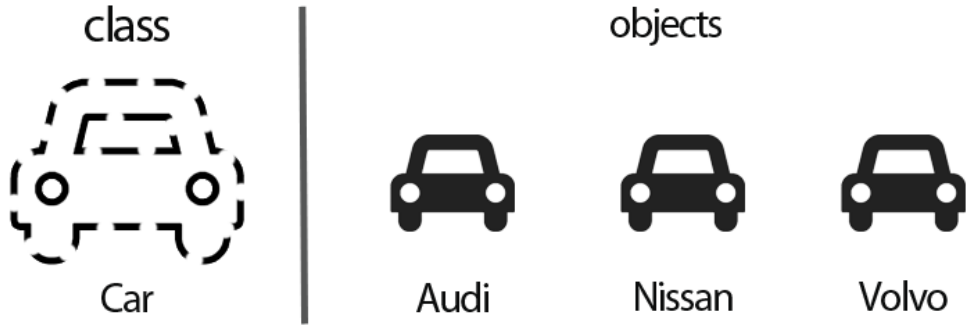

Image source: https://javatutorial.net/java-oop/

Object attributes (properties)

```
A.shape
```

Using methods/functions from numpy library

```
np.shape(A)
np.max(A)
```