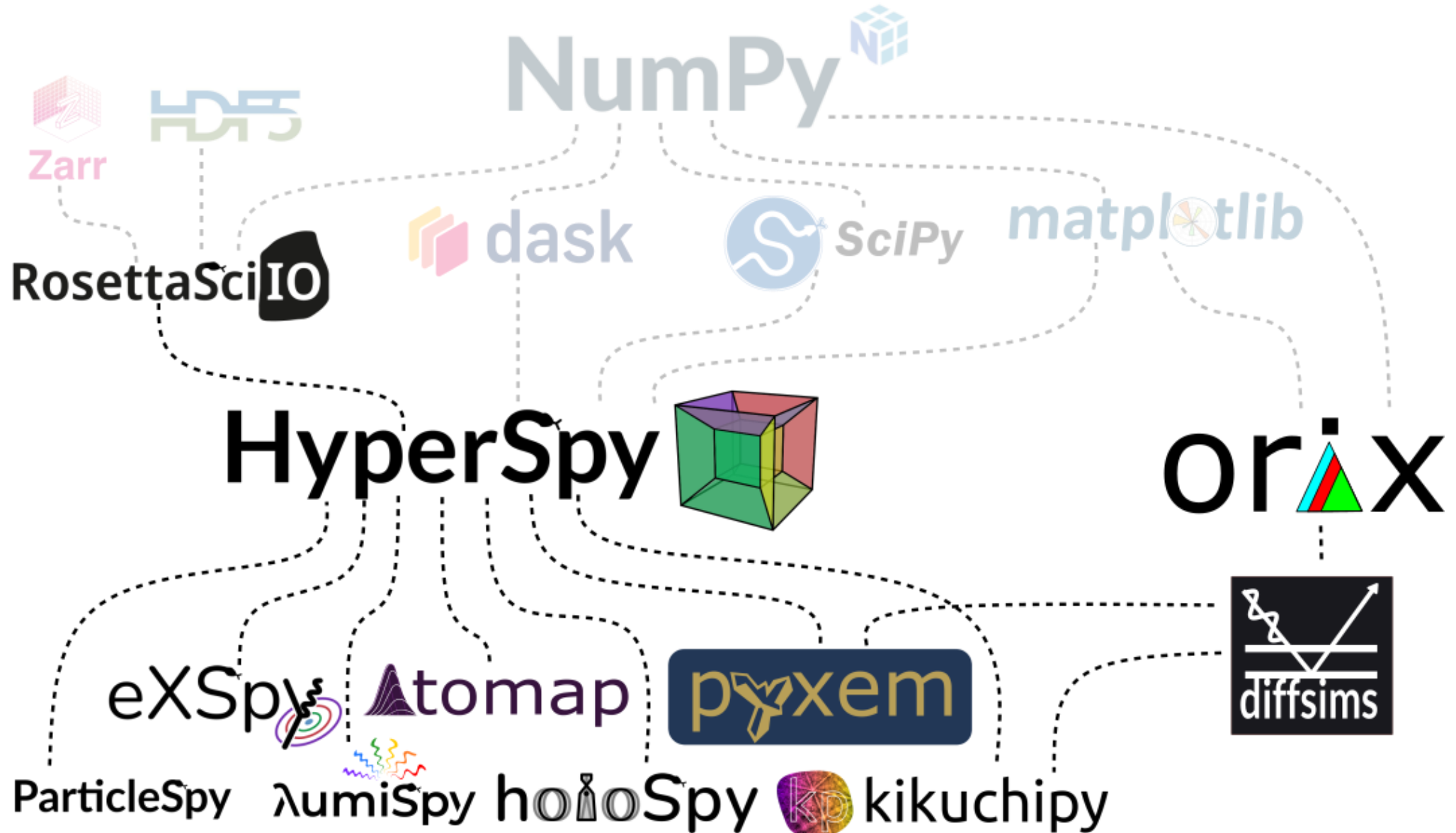




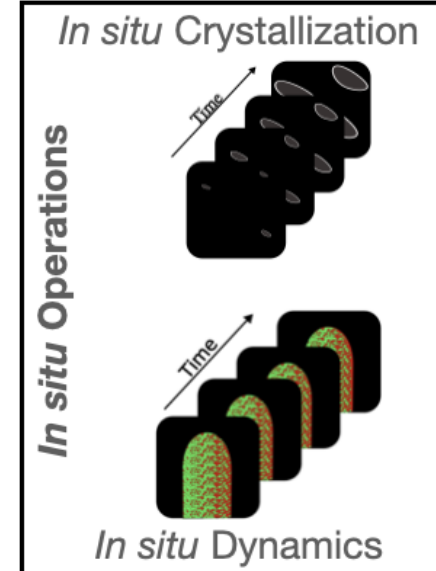
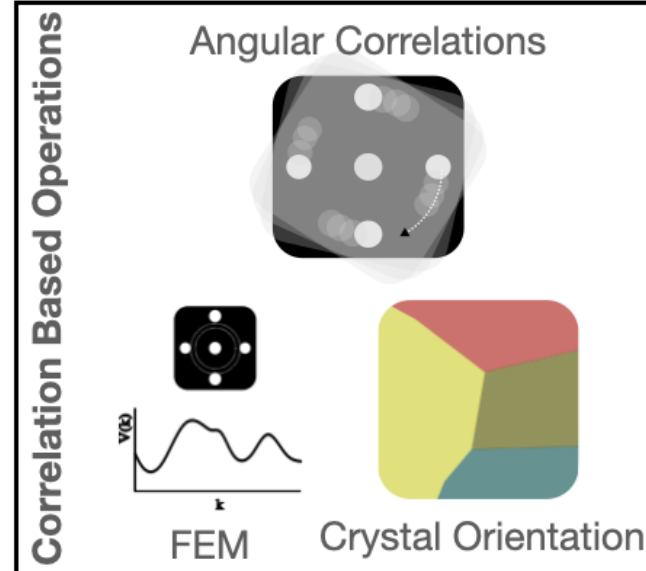
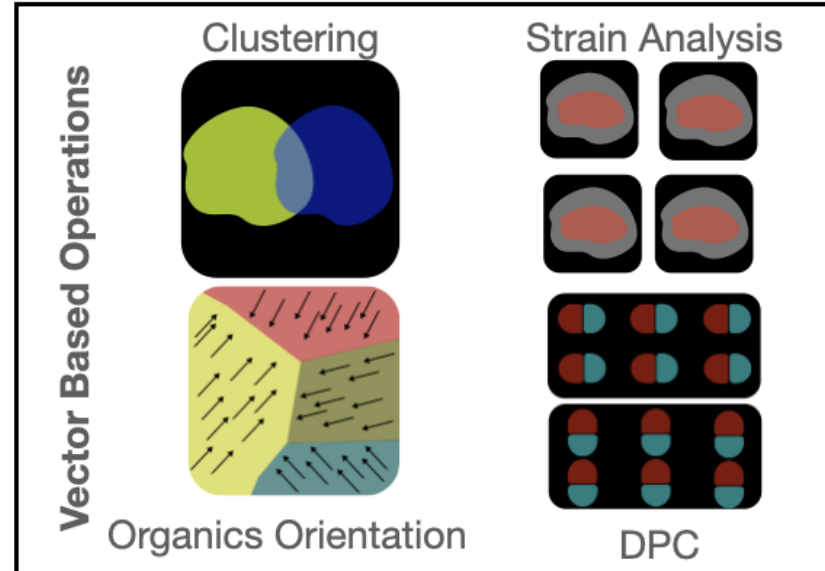
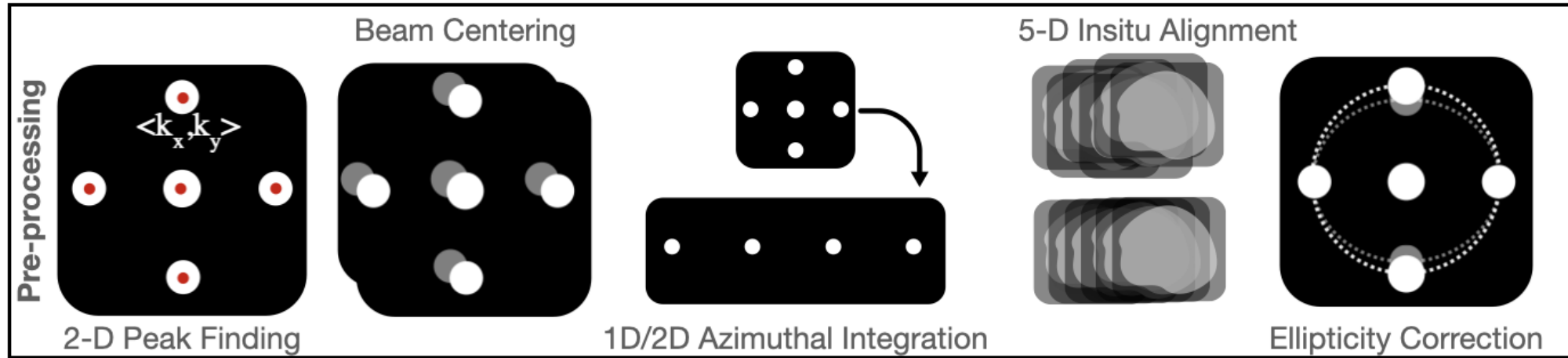
Carter Francis

Direct Electron

# The pyxem Family Tree



# What Can pyxem Do?



Comparing 4D STEM Packages

	Feature	pyxem	py4DSTEM	LiberTEM
General Information	Started	2015	2018	2018
	Main Developers	NTNU/UW-Madison/Cambridge	Berkeley/ Stanford	Jülich
Design Approach	Out of Memory (Lazy)	x		x
	Sparse Data Support			x
	Custom Defined Functions	xxx		xxx
	Parallel Computing	x		x
	GPU Support	x	xxx	x
	Interactive Plotting	xxx		x
	Live Processing			xxx
	ND - Data	xxx		
	Ptychography		x	x
	Iterative Ptychography		xxx	
Methods	Virtual Imaging	x	x	x
	1D Analysis	xxx		
	Peak Finding	x	xxx	x
	Crystal Orientation Mapping	x	x	
	Amorphous Characterization	xxx	x	
	Strain Mapping	x	x	x
	DPC	x	x	x
	Azimuthal Integration	xxx	x	
	Data Preprocessing	xxx	x	

# Key Design Differences

Please don't get mad at me ☺

## pyxem

- *Extensive visualization tools*
- Vector-based or frame-based tools
- Chain operations together with lazy, multi-CPU, and multi-GPU.
- Uses Hyperspy syntax and is thoroughly tested

## py4DSTEM

- *Vector-based analysis*
- Fast development and new features/techniques
- Cutting-edge development but slightly less stable

## LiberTEM

- **Fast**, optimized for real-time live analysis
- Map-reduce model
- Direct integration with detectors
- Basic 4D STEM tools

# Where to get help?

- The first place to look is at the documentation
  - <https://pyxem.readthedocs.io/en/stable/>
  - I've spent **a lot** of time creating [examples](#). They cover a wide range of topics, from conducting experiments to techniques for analyzing data to examples on creating publication-quality plots.
- Feel free to also ask questions in the github [discussions](#)
  - That is a great way to stay involved and a public place for other people to look for answers to questions.
- You can always send me an email (cfrancis@directelectron.com)