



Modification in Leginon to make it smarter



- 3 My best grid
- 2 my 2nd grid
- 1 Probably bad
- 5 Likely junk
- 6 Protein A-1
- 7 Protein A-2
- 8 Protein A-3
- 9 Protein B-1
- 10 Protein B-2
- 11 Protein B-3

Blob Filtering (Set by example targets)

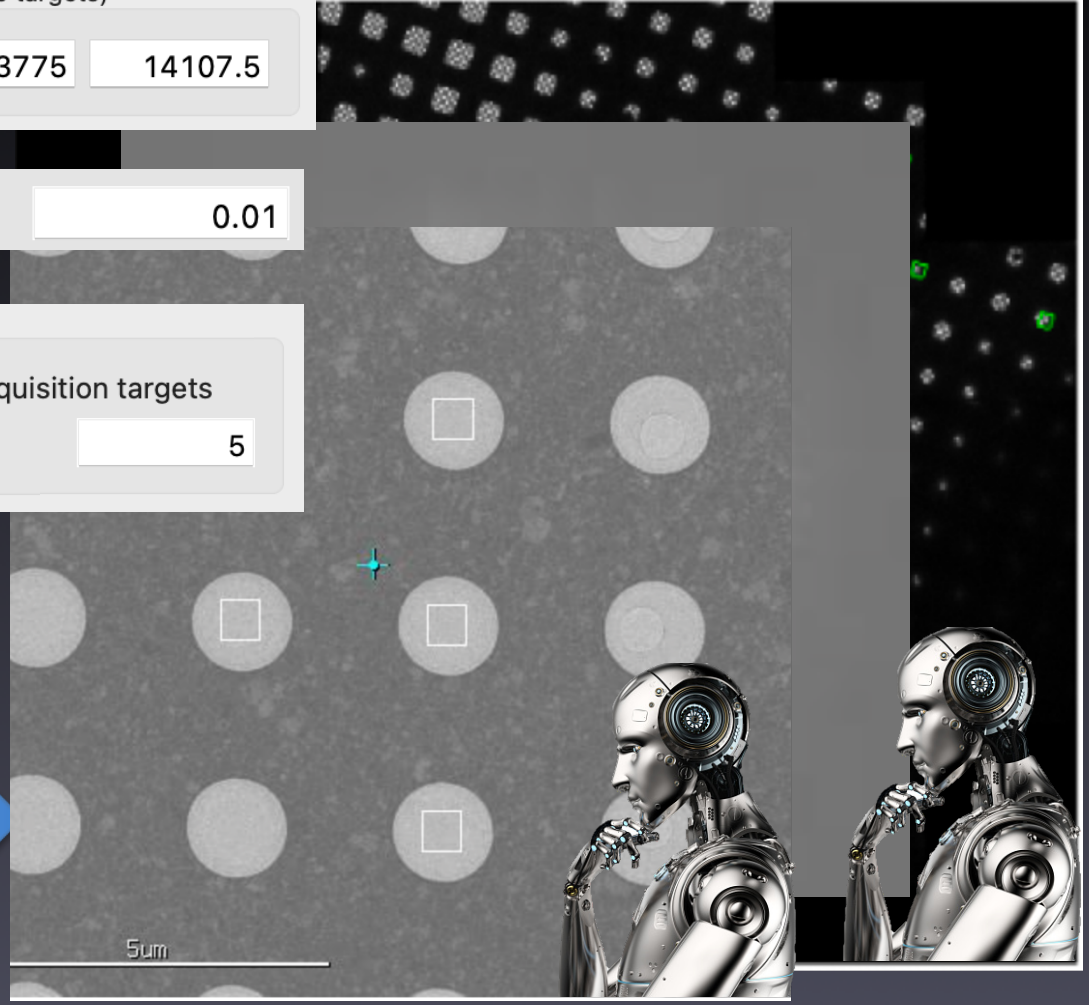
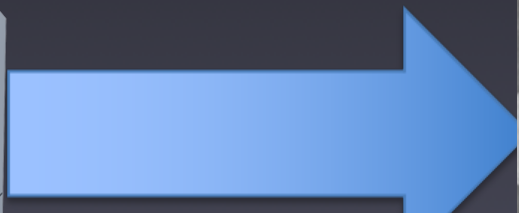
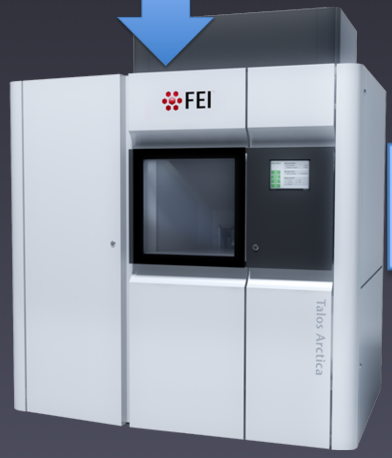
Filter Blob Area:

Min. score to accept

Acquisition Target Sampling

Use subset of the acquisition targets

Sample Maximal of



Anchi Cheng

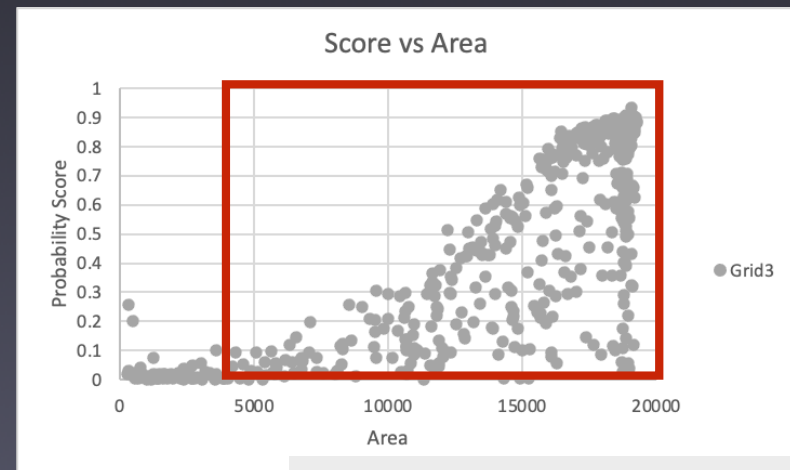
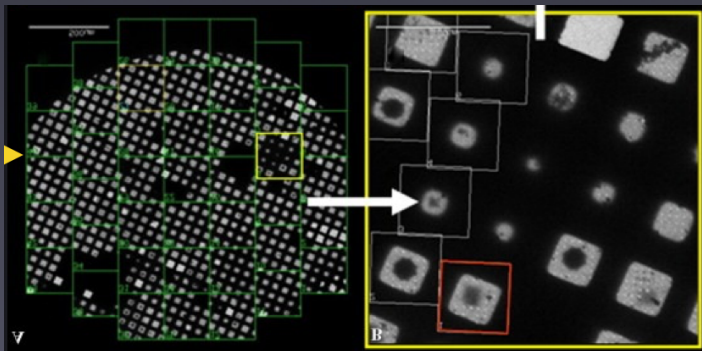


Modification of Leginon for autoscreen



Existing Leginon square/hole finder too optimized for a single grid => Unstable for multigrid screening

- Interface with Ptolemy
 - execute shell script from python->Ptolemy command line
 - loading json results (center, score, **area**, brightness)
- **Square finding on grid atlas individual tile**
 - **multi-thread**
- **Grid area threshold**



Blob Filtering (Set by example targets)

Filter Blob Area:



Aim for diversity in autoscreen



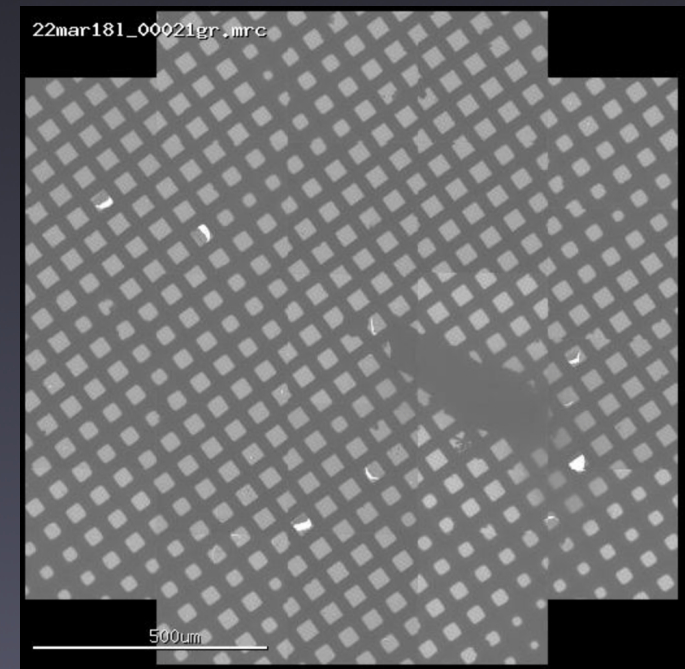
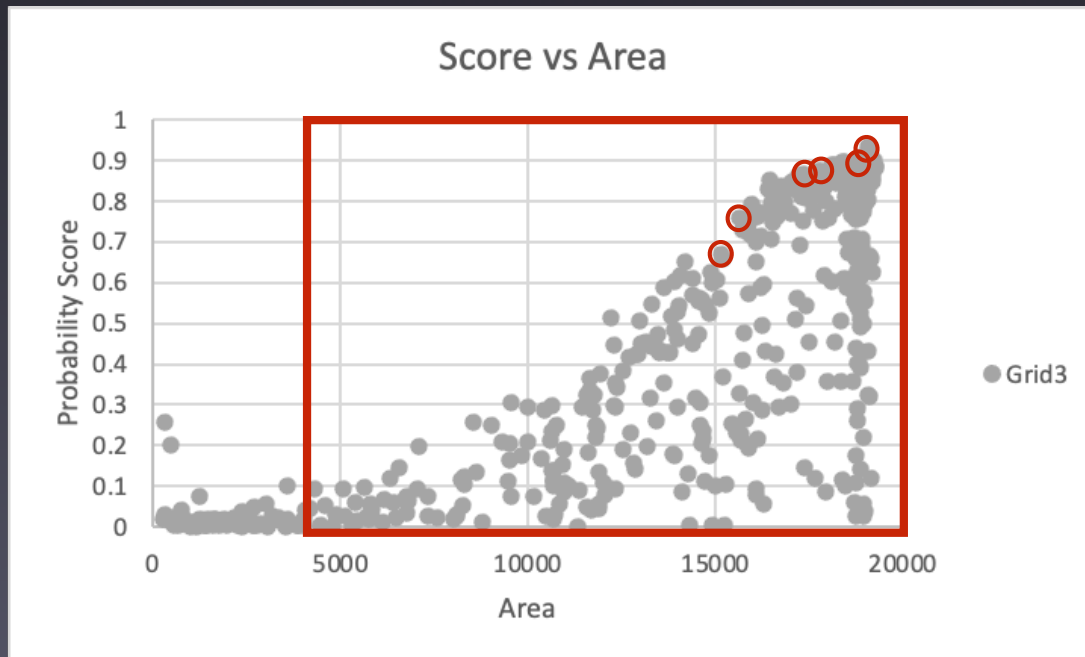
- **Sampling Squares**
 - **Pick squares with the highest Ptolemy probability score within each area-sorted square group**

Target Selection

Max. number of targets:

Number of target group to sample:

Cover each square with: targets



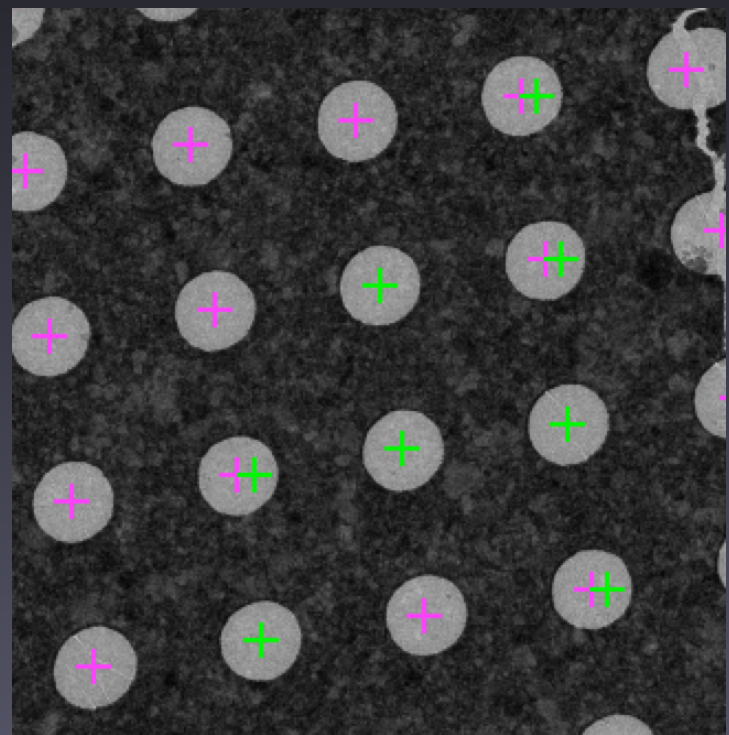
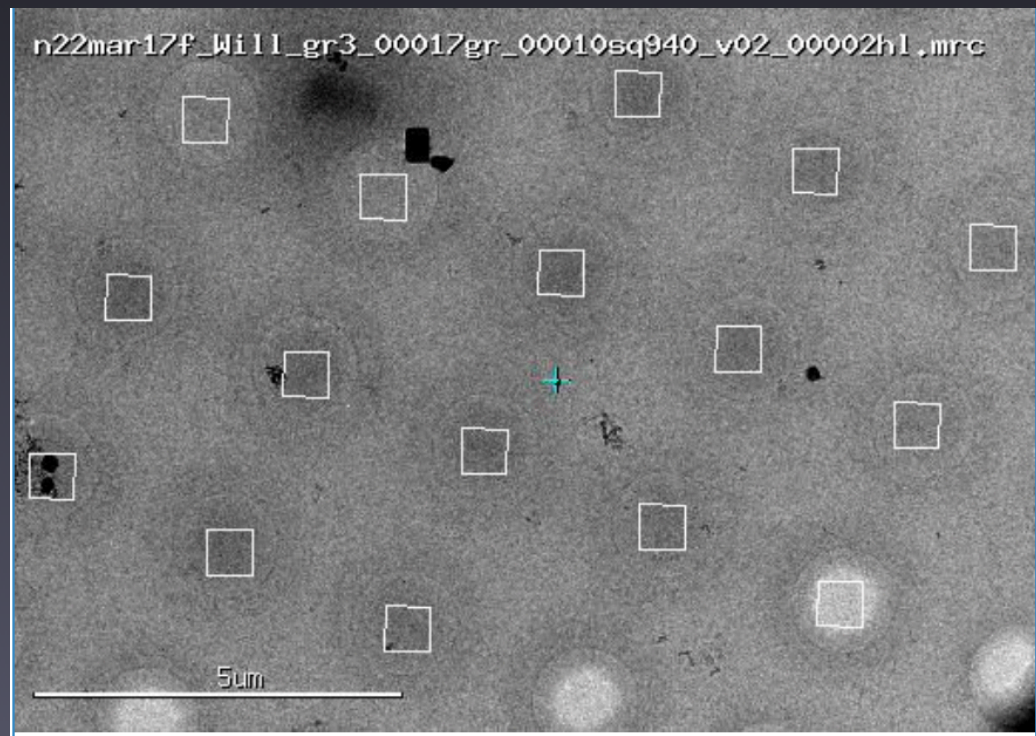


Using Ptolemy hole finding at medium mags

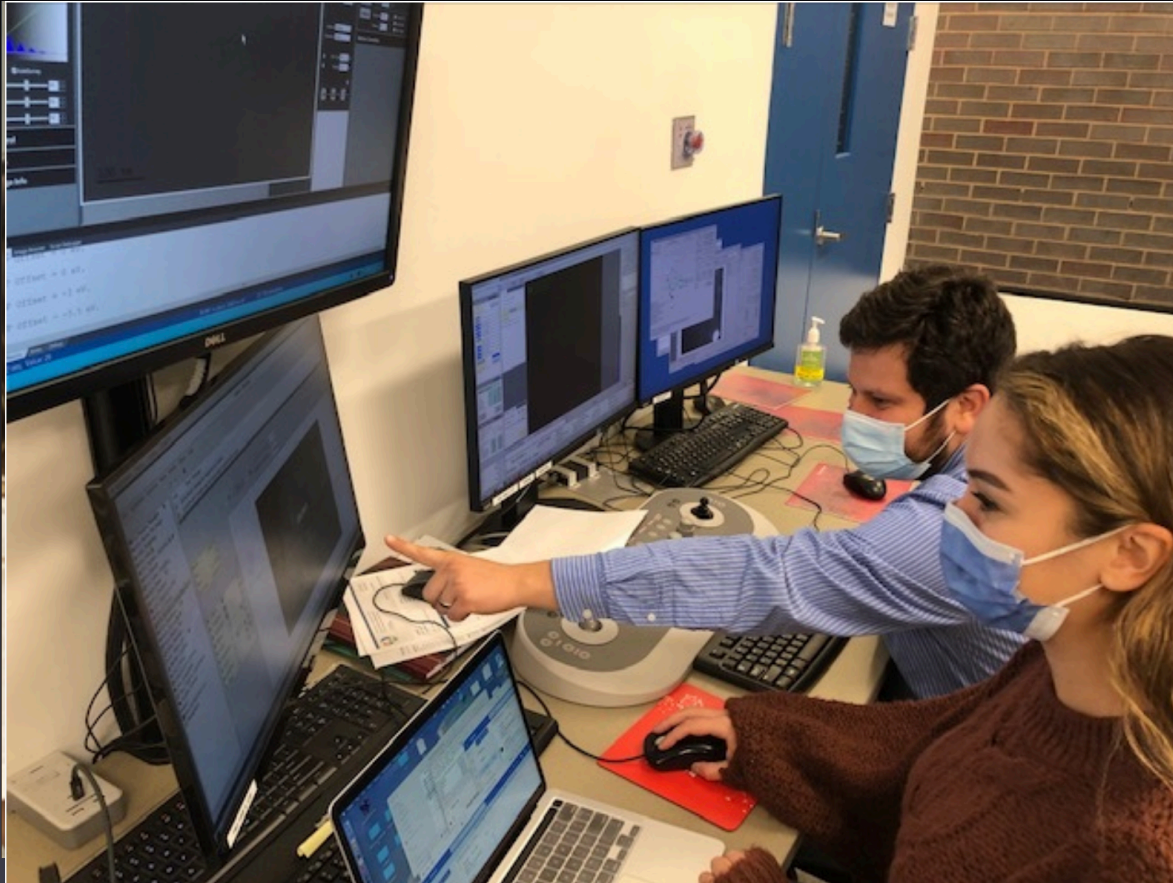


- Ptolemy hole localization
 - No parameter setting required

- Legimon sampled Holes
 - ice-thickness -sorted groups
 - including convoluted targets in hole

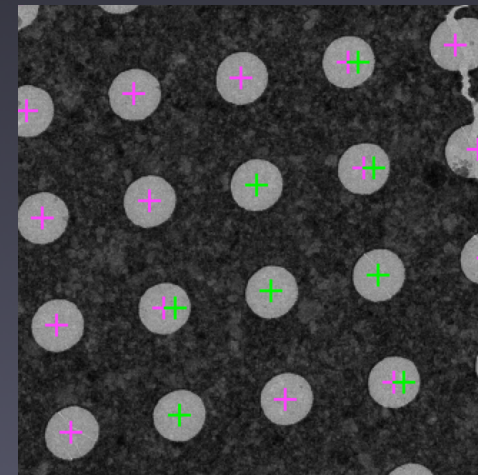


Success

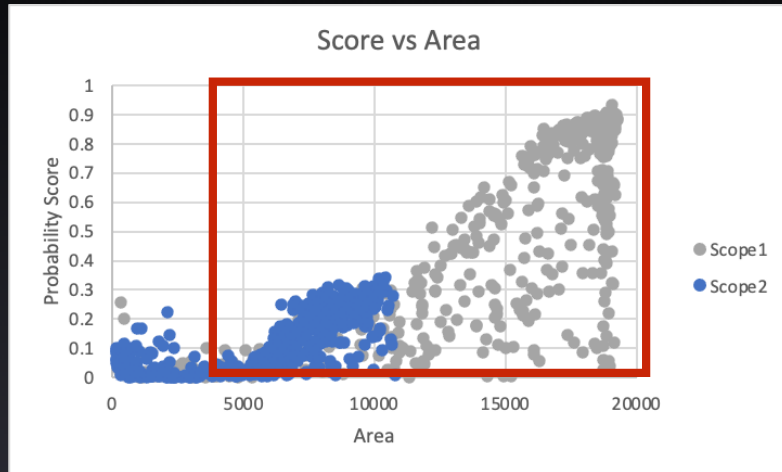


- Operators want to use smart-legend autoscreen. 🎉

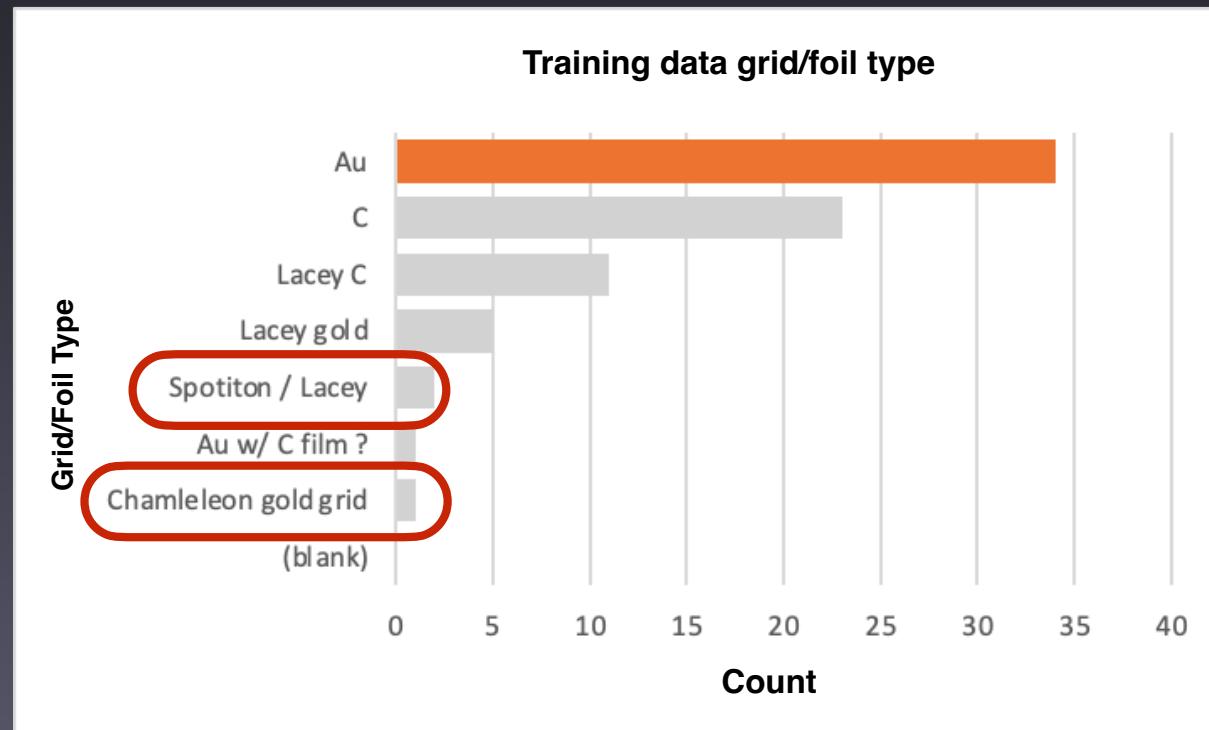
- Ptolemy hole localization is preferred by operators, too. 🎉



Room for improvement



- **Square Classifier** model may need **grid mesh** and **pixelsize** as prior to **scale score**



- **Hole Classifier** not good enough

Active Learning

- **Square Finder** does not work on **Chameleon** and **Lacey grids**



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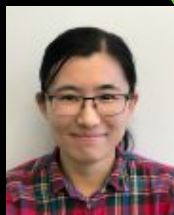
Anchi Cheng
Scientist



Kashyap Maruthi
Scientist



Alex Wei
Scientist



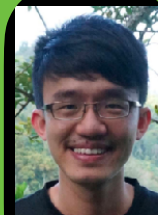
Huihui Kuang
Scientist



Chase Budell



Christina Zimanyi
Scientist



Eugene Chua
Scientist



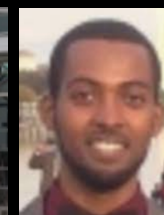
Daija Bobe
Scientist



Joshua Mendez
Scientist



Ali Nasini
Scientist



Kasahun Neselu
Scientist



Carolina Hernandez
Res. Assoc.



Robert Gheorghita
Res. Assoc.



Mahira Aragon
Res. Assoc.



Anjelique Amelia Sawh
Res. Assoc.



Slavic Serbynovsky
Technician



Daniel Podolsky
Res. Assoc.



Ed Eng
Scientist, NCCAT Manager



Misha Kopylov
Scientist, NCITU Manager



Alex Noble
Group Leader



Tristan Bepler
SMLC Group Leader



Micah Rapp
Grad Student



Jake Johnston
Rotation Student



Jason Gorman
Embedded Post Doc.



Serban Ilca
Post Doc.



Reza Paraan
Post Doc.



Oleg Klykov
Embedded Post Doc.



Michael Alink
Instr. Manager



Ashleigh Raczkowski
Scientist, Lab Manager



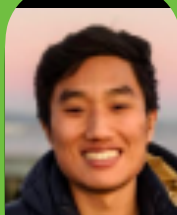
Sargis Dallakyan
Sys. Admin.



Bruno Scap
IT Manager



Dennis Shushunov
Sys. Admin



Paul Kim
Software Eng.



Adam Akovity
Software Eng.



Elina Kopylov
Traffic Controller



Catherine Costello
Lab Administrator



Charlie Dubbeldam
Administrtror



Clint Potter
Director



Bridget Carragher
Director

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