

Phenix

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BNL

LBNL



The Project



Lawrence Berkeley Laboratory

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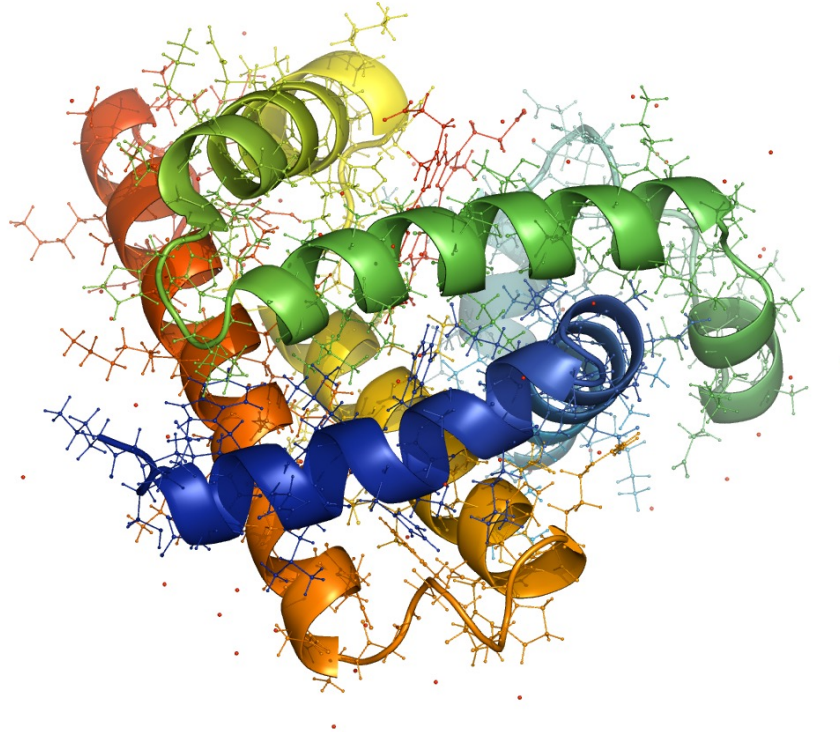
Jane & David Richardson,
Christopher Williams,
Vincent Chen



An NIH/NIGMS funded
Program Project

Liebschner D, *et al.*, Macromolecular structure determination using
X-rays, neutrons and electrons: recent developments in *Phenix*.
Acta Cryst. 2019 **D75**:861–877

Who invented ribbon diagram?



Who invented ribbon diagram?

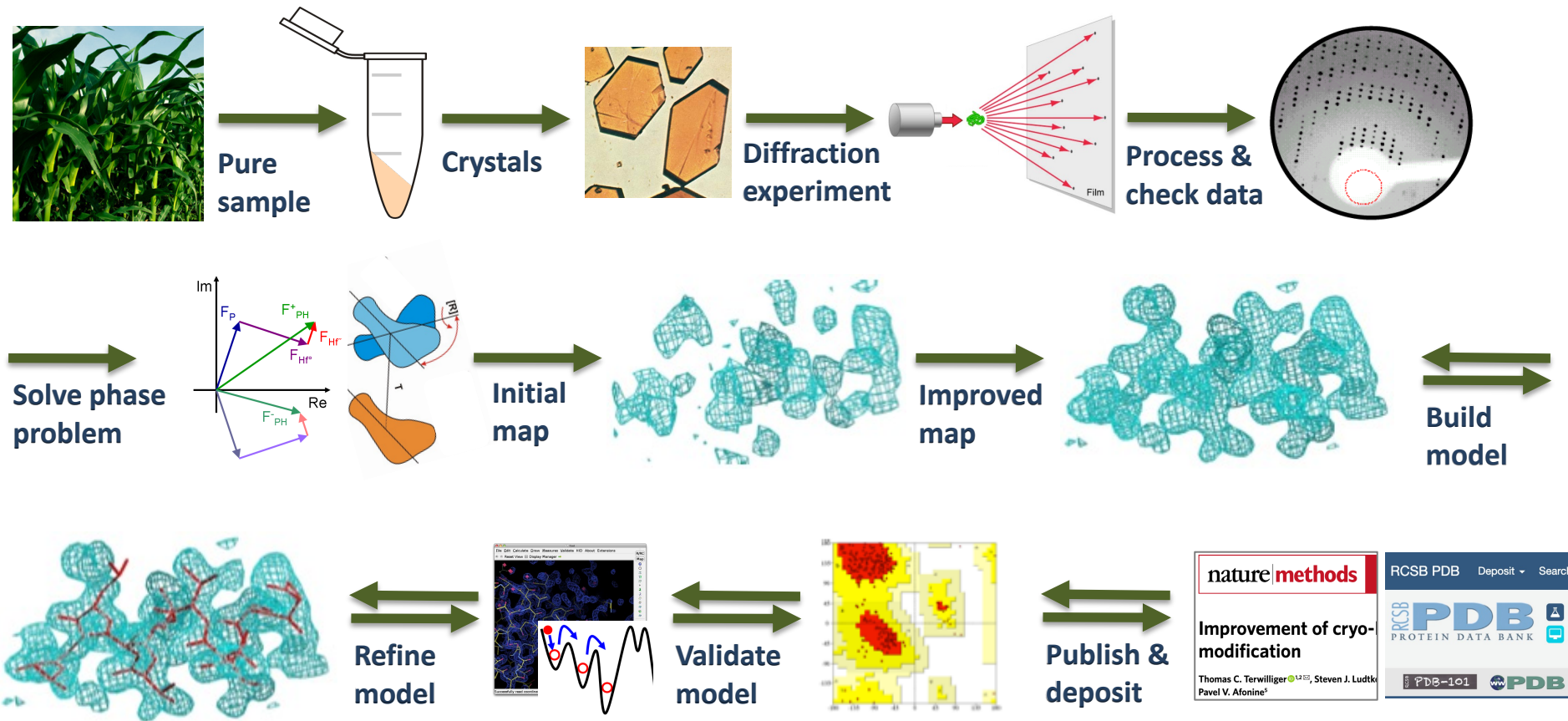


Ribbon schematic of triose P
isomerase monomer (PDB: 1TIM)



Hand-drawn by **J. Richardson**, 1981

Solving structure by crystallography



Cryo-EM resolution revolution

Werner Kühlbrandt, 2014

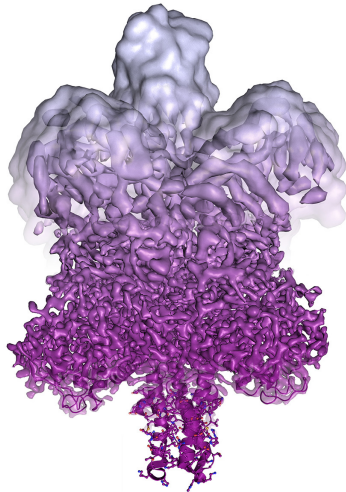
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HOME > SCIENCE > VOL. 343, NO. 6178 > THE RESOLUTION REVOLUTION

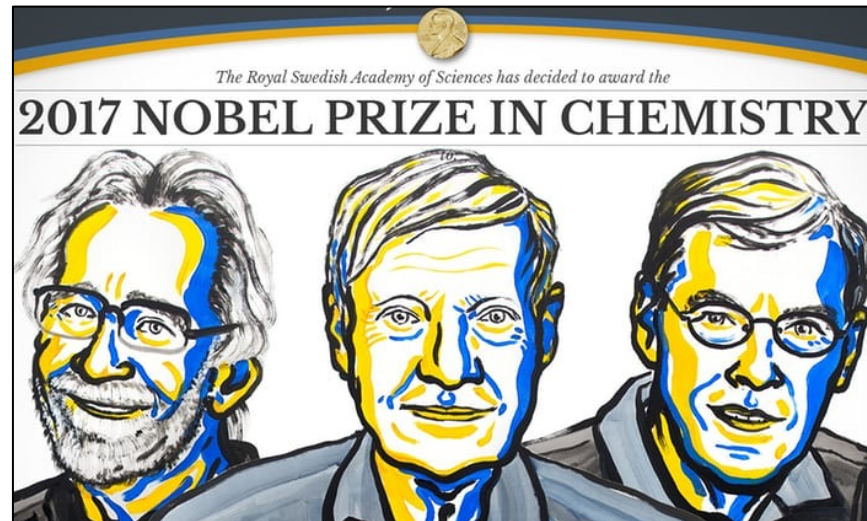
🔒 | PERSPECTIVE | BIOCHEMISTRY f t in d w e

The Resolution Revolution

Advances in detector technology and image processing are yielding high-resolution electron cryo-microscopy structures of biomolecules. [Also see Report by [Amunts et al.](#)]

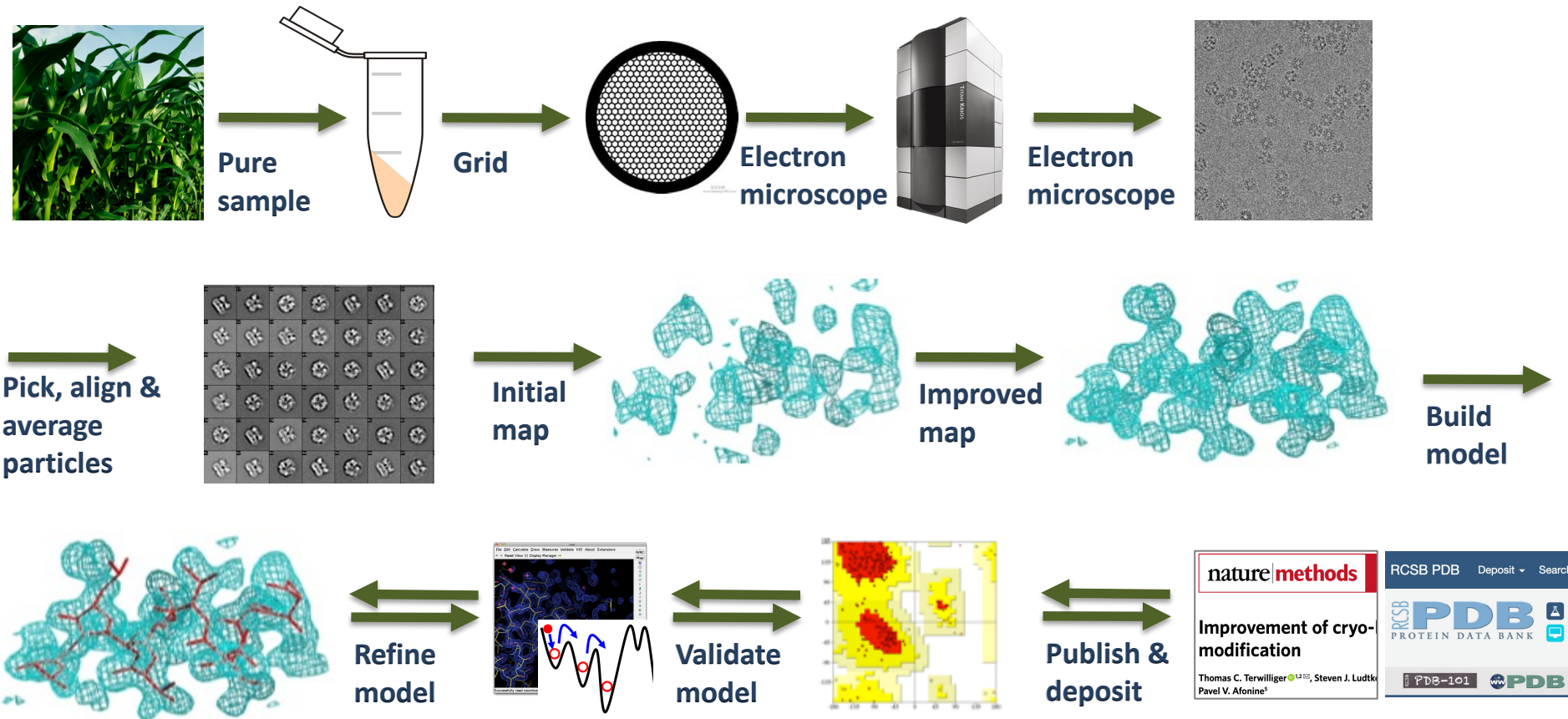


Dubochet, Frank, Henderson



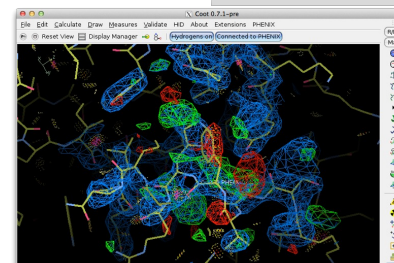
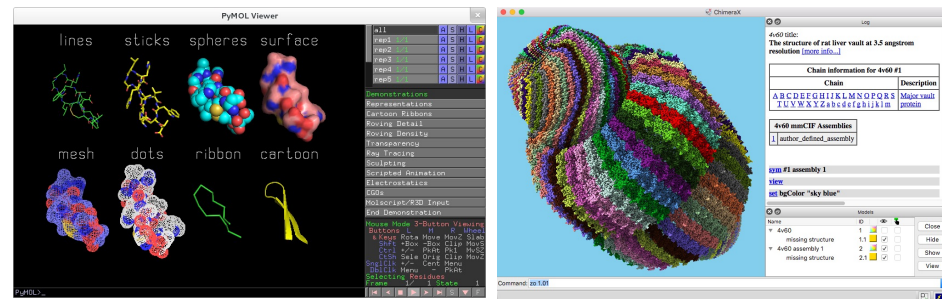
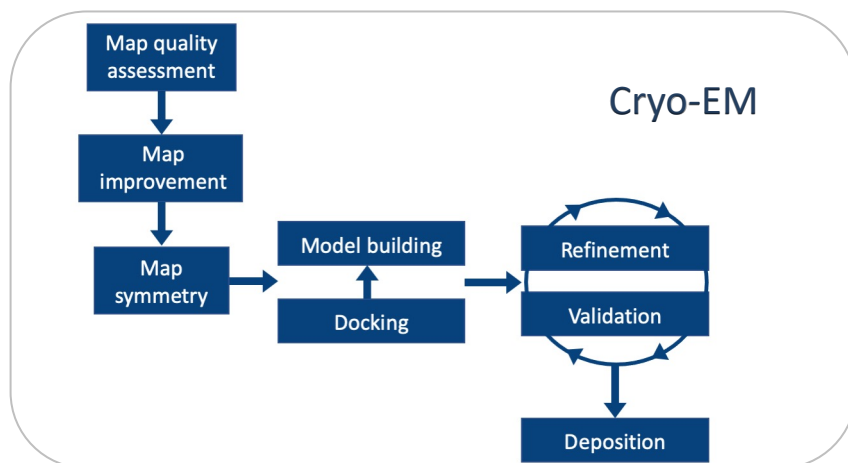
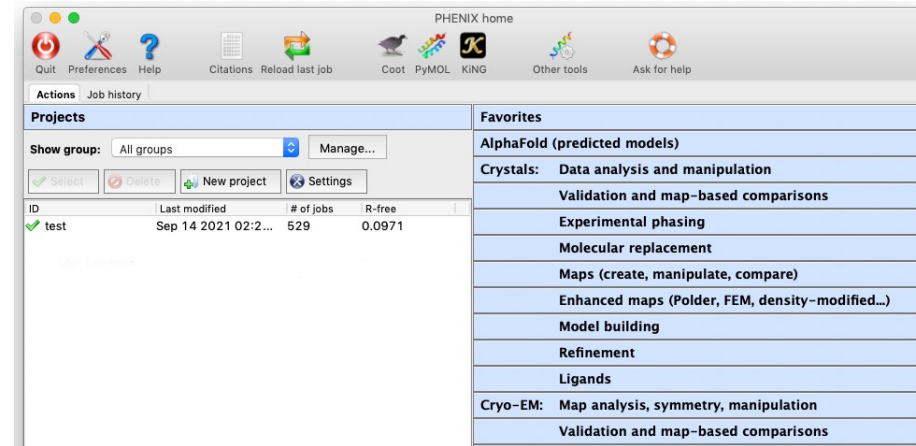
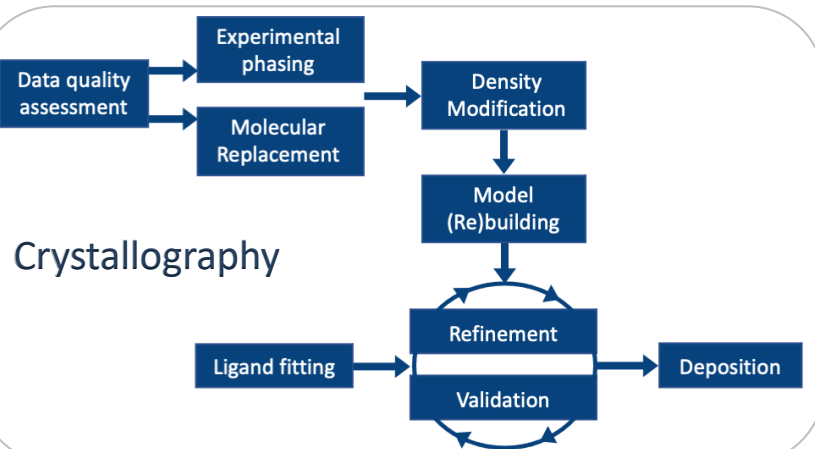
“For developing cryo-electron microscopy for the high-resolution structure determination of biomolecules in solution”

Solving structure by electron cryo-microscopy



Phenix today

- Complete system for crystallography (X/E/N) and cryo-EM structure solution
- Available at scripting, command line and GUI levels
- Integrated with popular molecular graphics programs: Coot, PyMol and ChimeraX



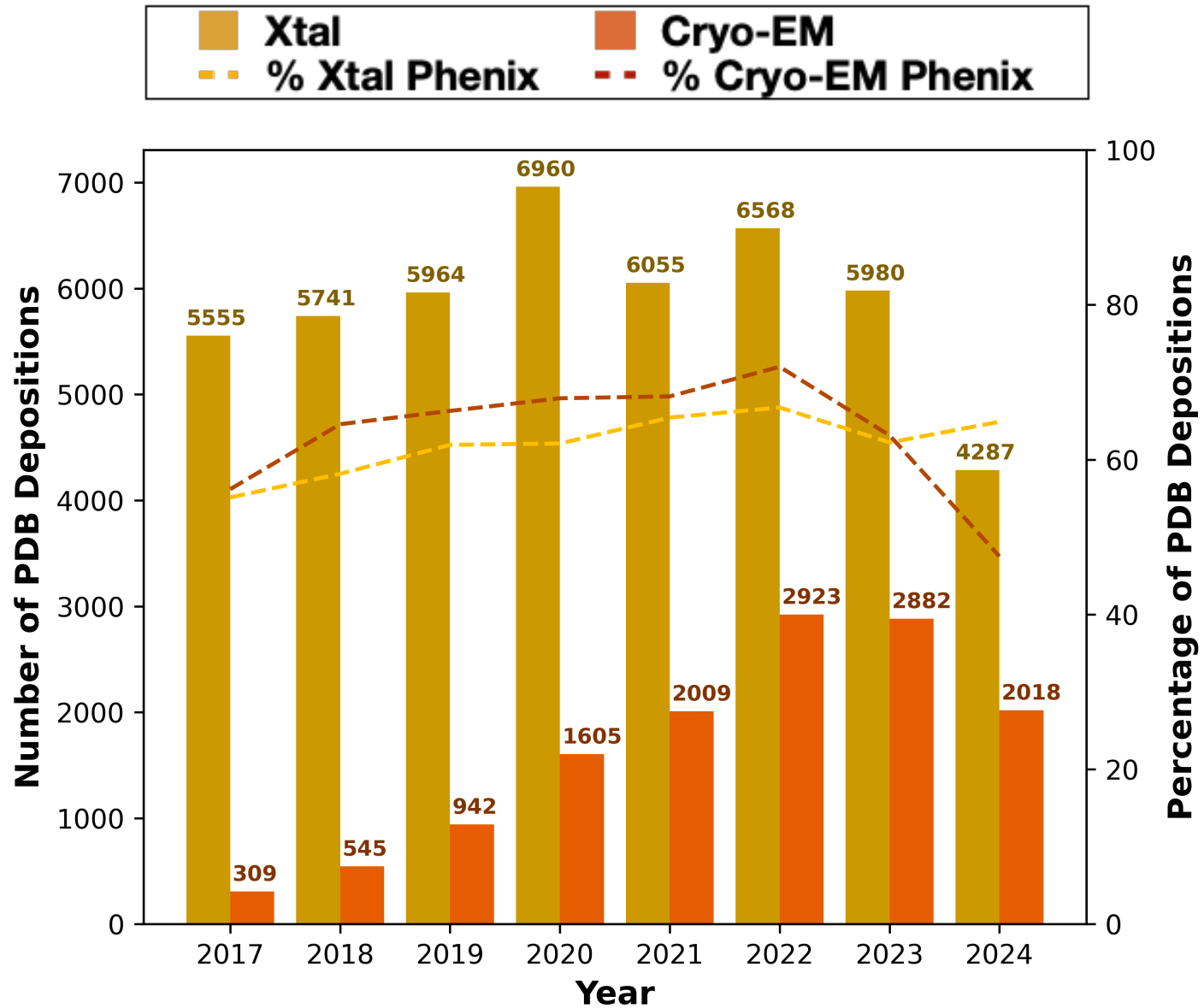
Phenix metrics

220 publications | 18447 citations | 82101 models in PDB | 35000 users | 33 countries

About 70 industry users



Phenix metrics



Keep up with trends: video tutorials

- **YouTube** channel: 67 videos

The screenshot shows the YouTube channel page for "Phenix Tutorials". The channel has 560 subscribers and a red "SUBSCRIBE" button. The page displays a grid of video tutorials related to X-ray crystallography. The videos are arranged in two rows, each with a thumbnail, title, description, view count, and upload date.

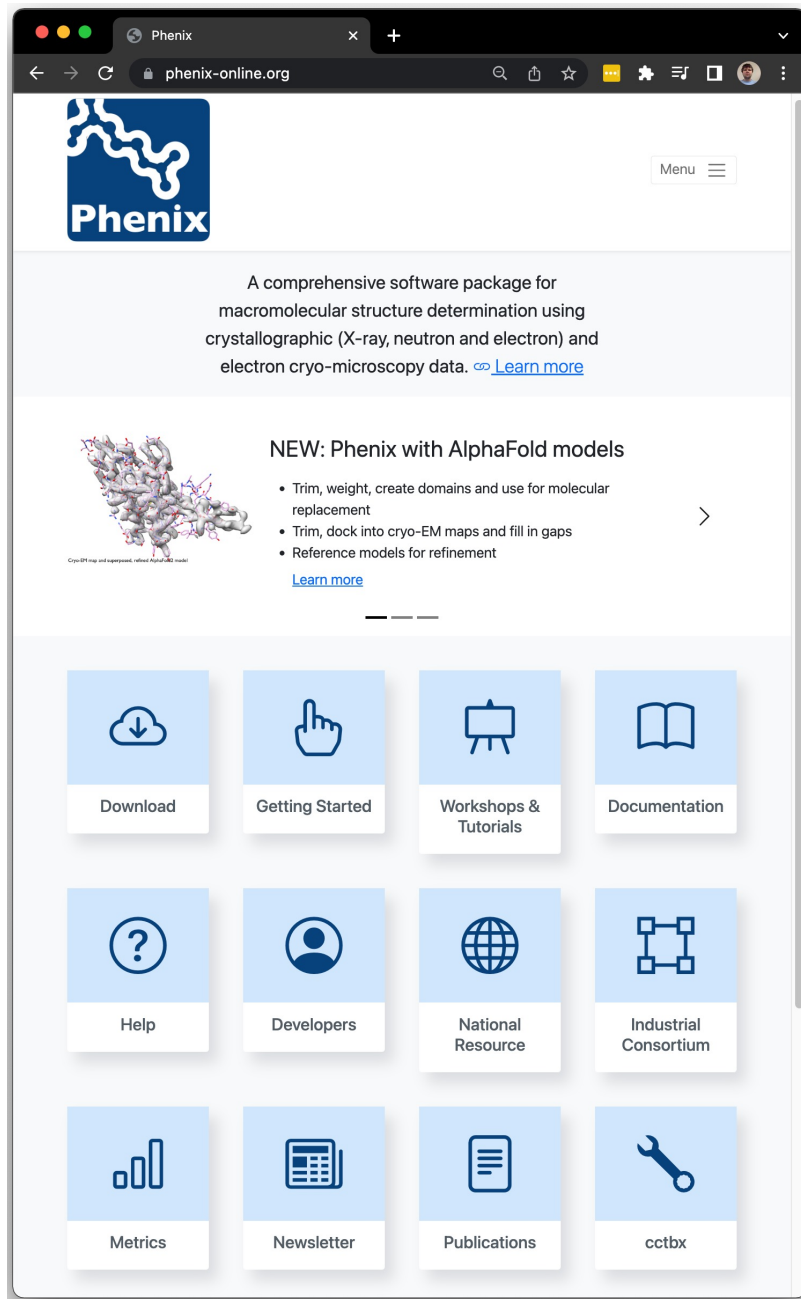
Channel Information:

- Channel Name: Phenix Tutorials
- Subscribers: 560
- Channel Icon: A blue and red molecular structure.

Video Tutorials:

Video Title	Thumbnail Description	Duration	Views	Upload Date	License
real_space_refine	Two molecular models, one in blue and one in red.	5:27	763 views	7 months ago	CC
Secondary Structure Restraints	A molecular model with a green stick representation of a protein.	6:23	399 views	8 months ago	CC
Multiple refinement strategies	A molecular model with a blue stick representation of a protein.	5:46	281 views	8 months ago	CC
Planning a SAD experiment	A molecular model with a blue stick representation of a protein.	6:00	483 views	1 year ago	CC
Map-to-model	A molecular model with a blue stick representation of a protein.	5:33	1.3K views	1 year ago	CC
Scale-and-merge	A molecular model with a blue stick representation of a protein.	7:31	387 views	1 year ago	CC
Automated map sharpening	A molecular model with a blue stick representation of a protein.	6:05			
Ligandfit	A molecular model with a blue stick representation of a protein.	5:48			
Wilson plots and space group identification	A graph showing a Wilson plot.	8:23			
Twinning	A graph showing a twinning plot.	6:08			
Translational NCS	A molecular model with a blue stick representation of a protein.	4:55			
Checking data quality with Xtriage	A screenshot of the Xtriage software interface.	6:49			

Phenix resources



Phenix paper

Video tutorials

Documentation

Relevant papers

Bi-annual newsletters

Slides from workshops

User support

- **Feedback, questions, help**

Mailing list (anyone signed up): phenixbb@phenix-online.org

Bug reports (developers only): bugs@phenix-online.org

Ask for help (developers only): help@phenix-online.org

- **Reporting a bug or asking for help:**

- We can't help you if you don't help us to understand your problem
- Make sure the problem still exist using the latest *Phenix* version
- Send us all inputs (files, non-default parameters) and tell us steps that lead to the problem
- All data sent to us is kept confidentially