



Reflectometry Y3 Report

P. Kienzle, Z. Fu, J. Krycka,
C. Metting, N. Patel, I. Sahin

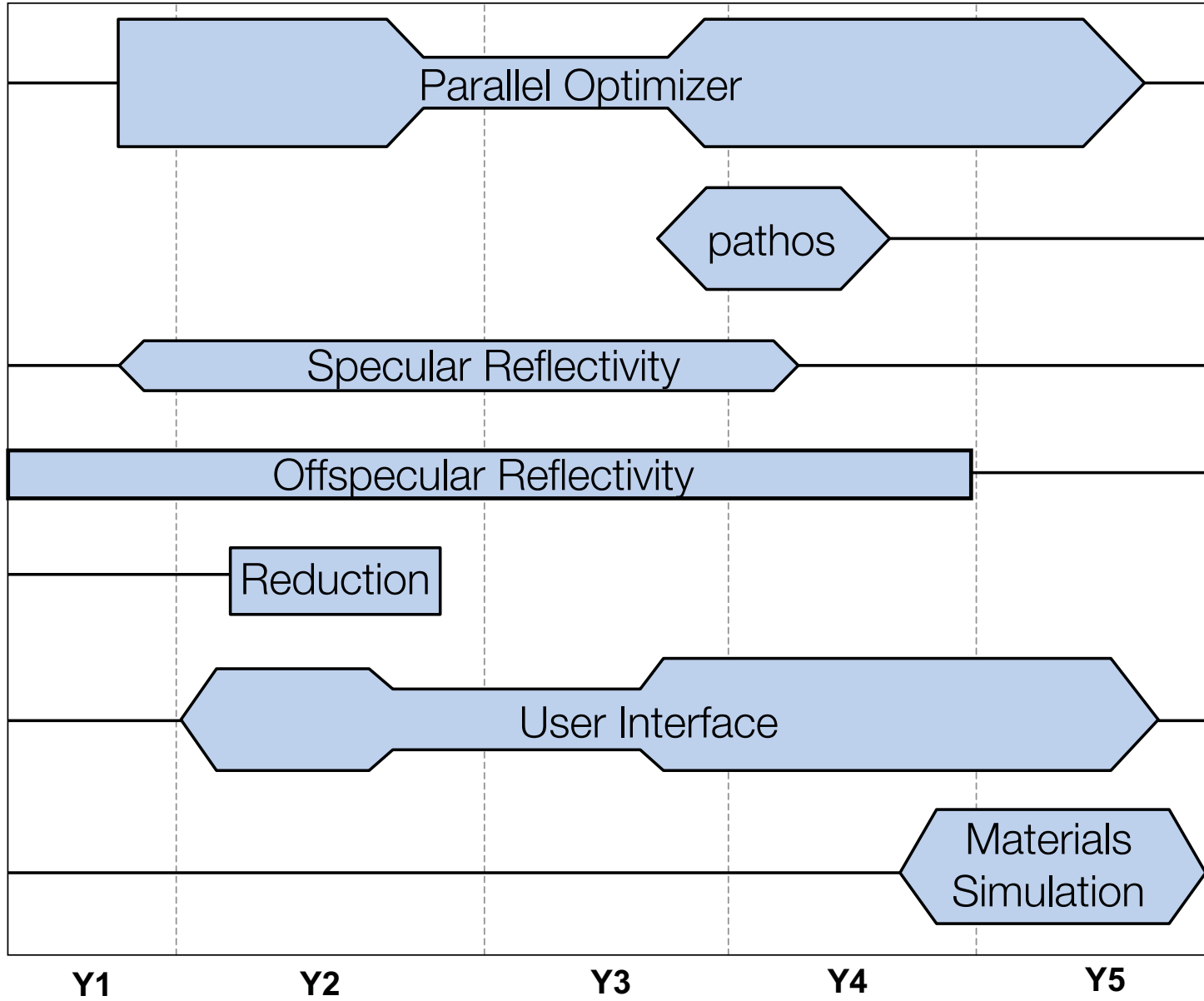


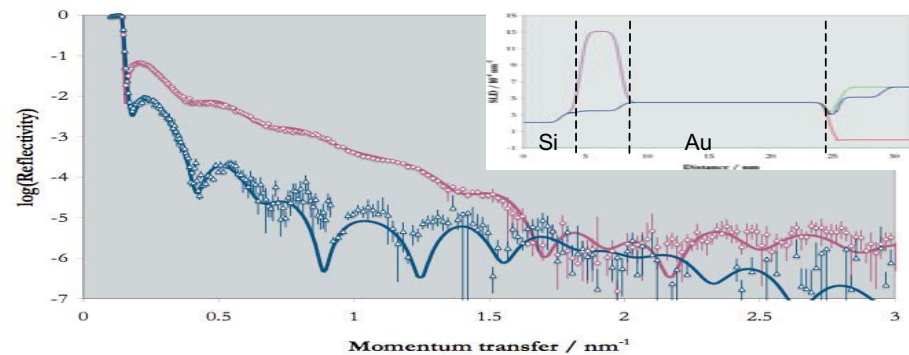
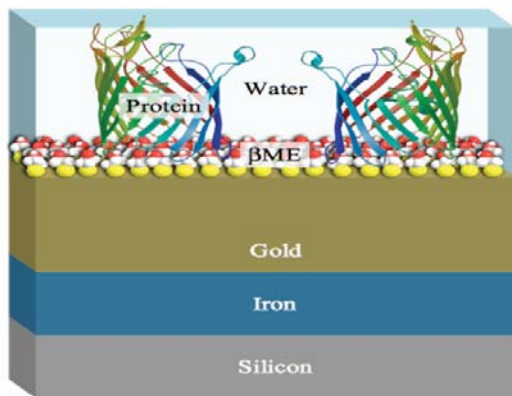
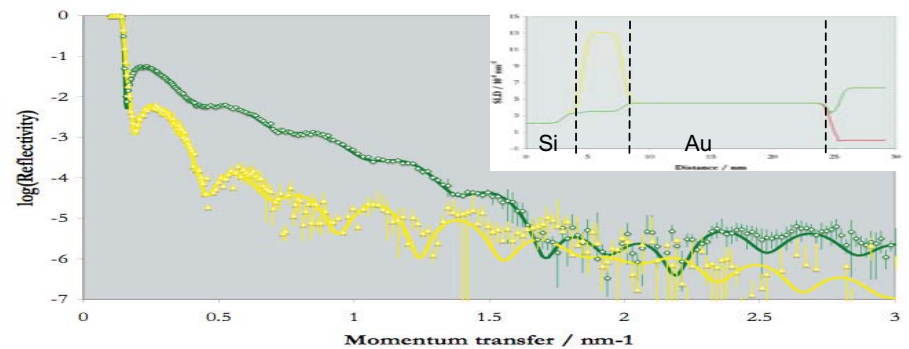
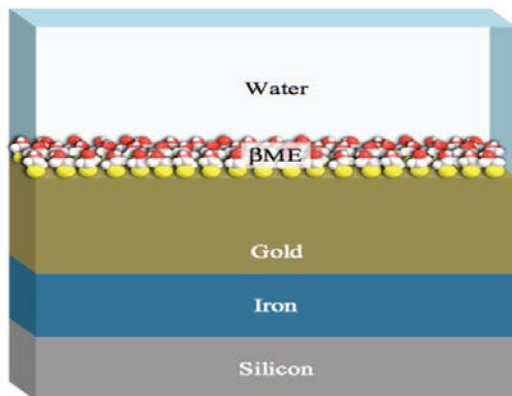
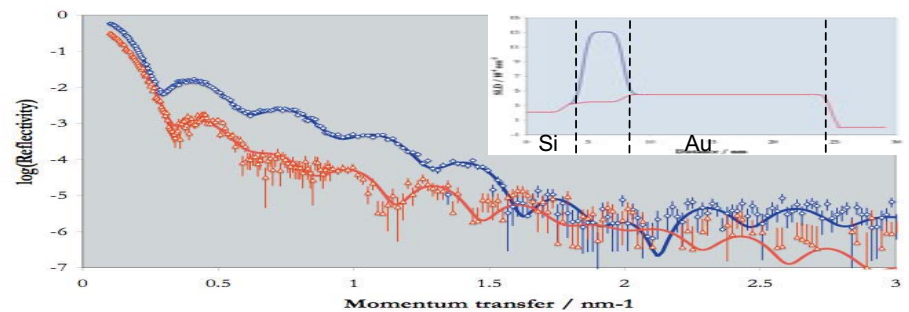
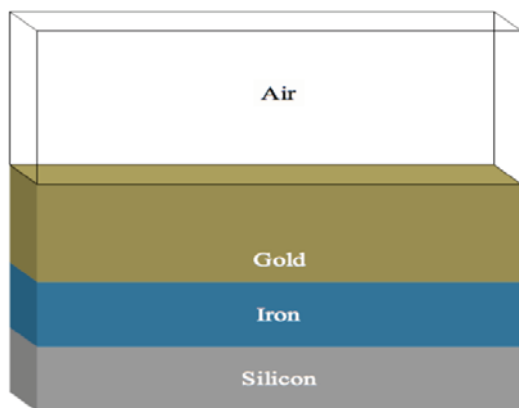
NIST

National Institute of Standards and Technology
Technology Administration, U.S. Department of Commerce

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or Brent Fultz for access to
information contained on this slide.

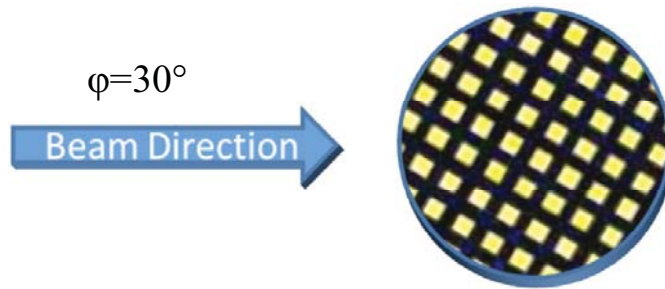
Project roadmap



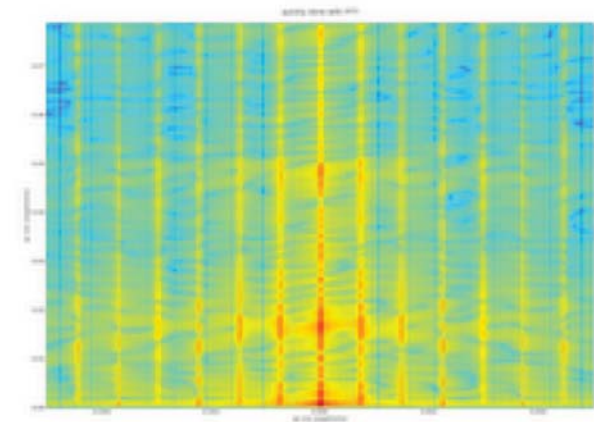
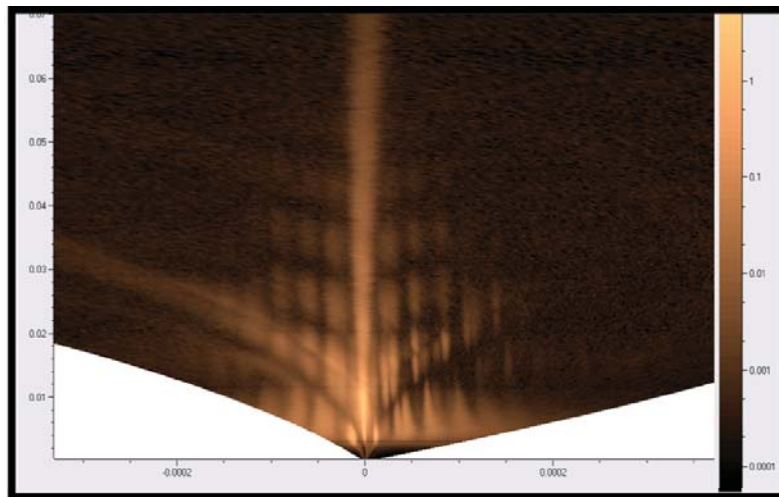


3-D Reflectometry

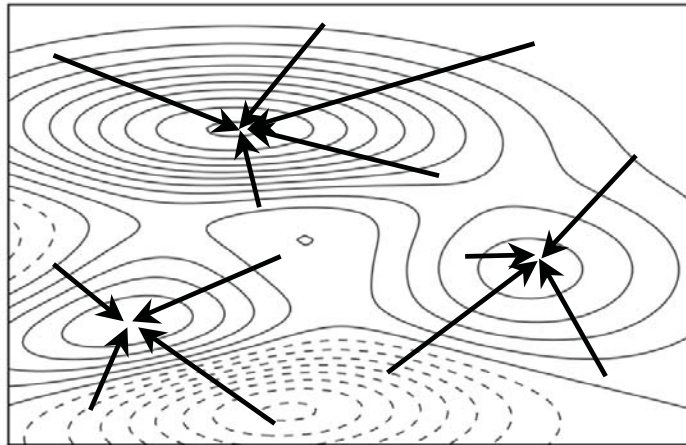
Patterned Surfaces



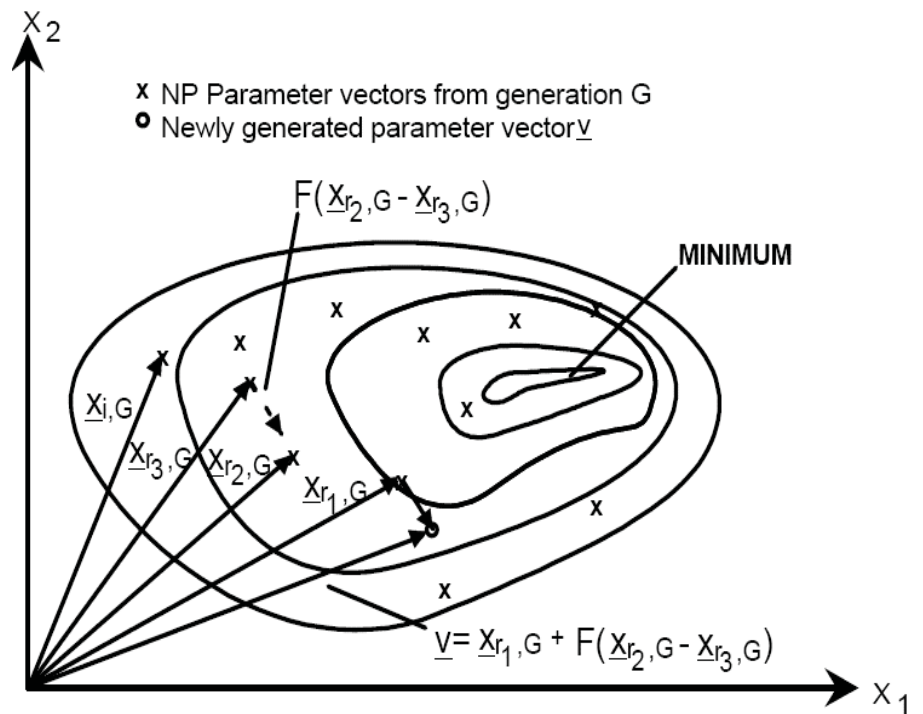
Self-Organizing Systems



Optimization

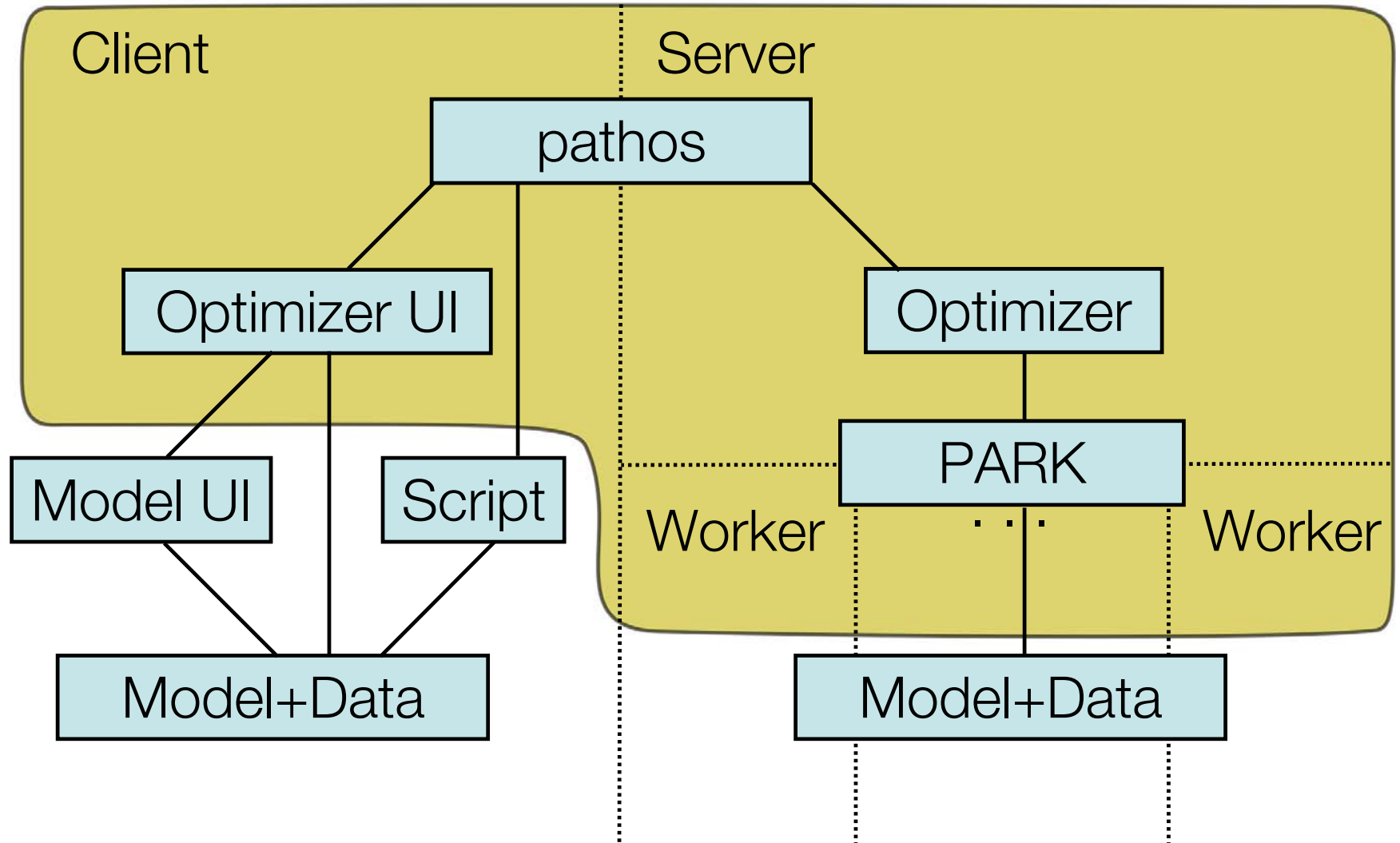


Deterministic Optimizers

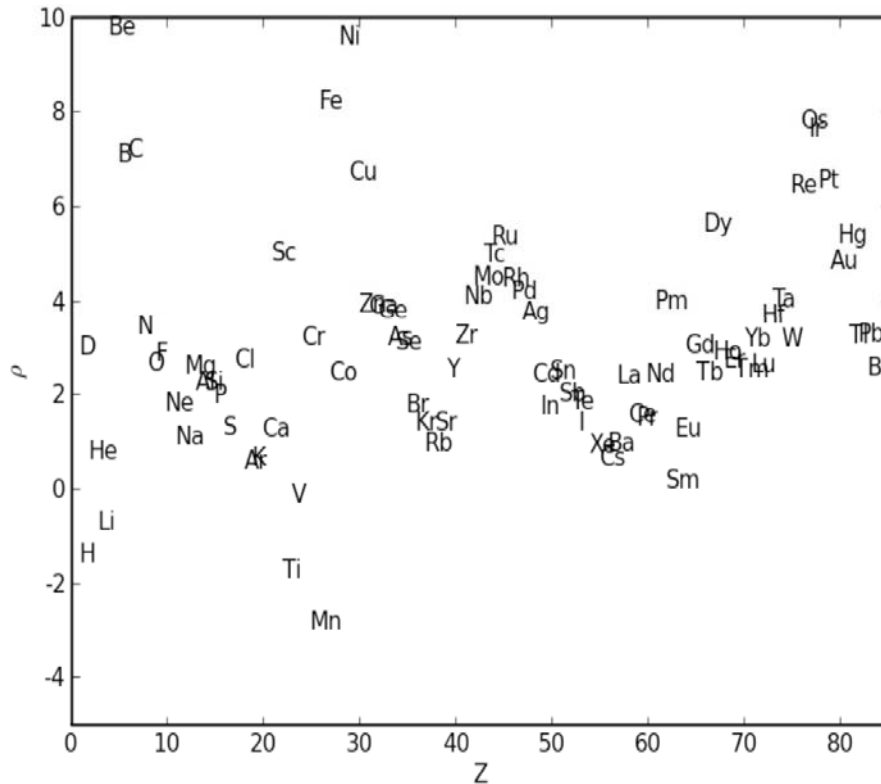


Stochastic Optimizers

Optimizer Architecture



Common Infrastructure



<svn://danse.us/common/elements>



<http://www.nexusformat.org>



<svn://danse.us/common/orbiter>



<http://matplotlib.sourceforge.net/>

Education and Outreach

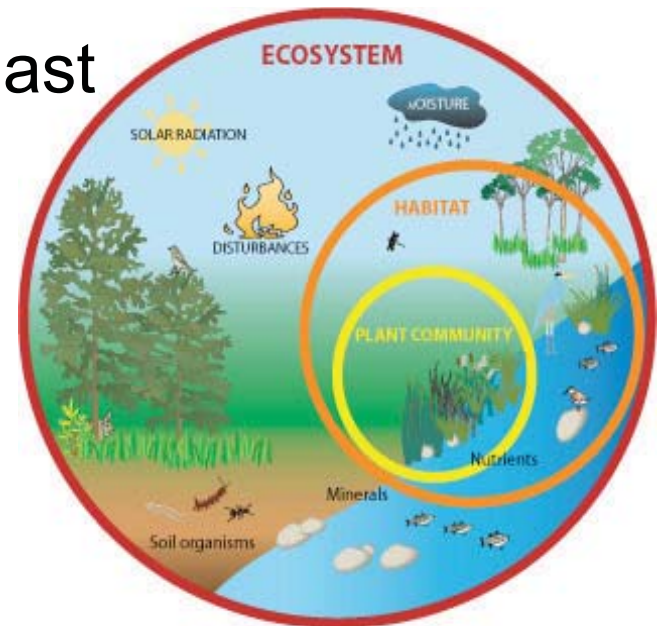
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4-H Adventures in Science: a weekend
science program for K-12 students

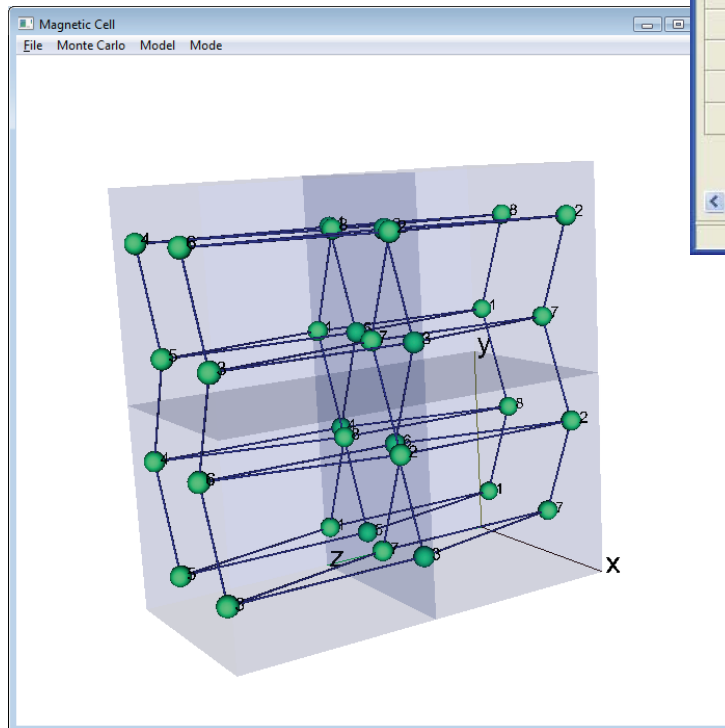
- K12 mini-courses
 - Scientific programming
 - Crystal structures
 - Magnets
 - Polymers
- Conferences
 - ACA, ACNS, APS, ICNS
- Workshops
 - NCNR summer school
- Diversity
 - 2 offers for FTE positions

What makes a community?

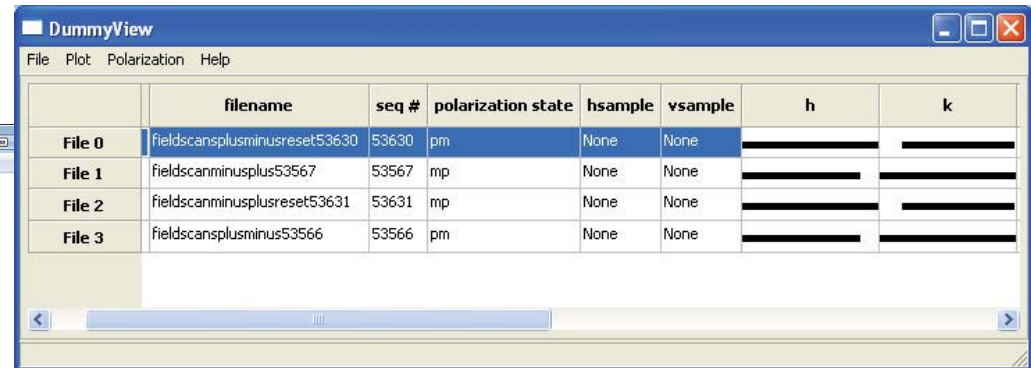
- Extensible software applications
- Components: load, view and transform data
- Programming: scientists develop the science
- Software carpentry: tools of the trade
- Software engineering: build to last



Case Study: Triple Axis Spectrometry



<http://code.google.com/p/spinwaves/>



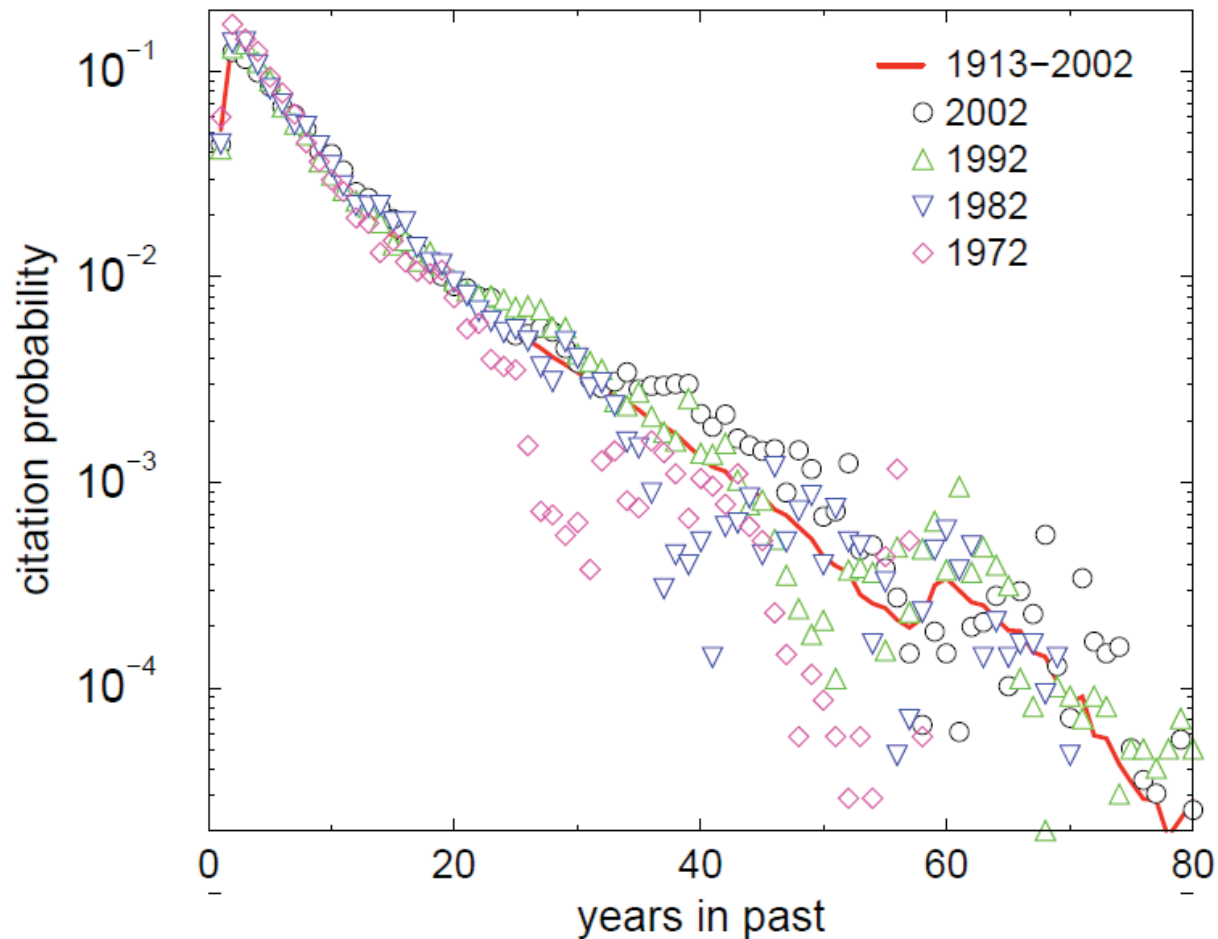
A screenshot of the DummyView software interface, showing a table of data. The table has columns for filename, seq #, polarization state, hsample, vsample, h, and k. The data is organized into four rows labeled File 0 through File 3.

| | filename | seq # | polarization state | hsample | vsample | h | k |
|--------|-------------------------------|-------|--------------------|---------|---------|-------|-------|
| File 0 | fieldscansplusminusreset53630 | 53630 | pm | None | None | _____ | _____ |
| File 1 | fieldscanminusplus53567 | 53567 | mp | None | None | _____ | _____ |
| File 2 | fieldscanminusplusreset53631 | 53631 | mp | None | None | _____ | _____ |
| File 3 | fieldscansplusminus53566 | 53566 | pm | None | None | _____ | _____ |

<http://code.google.com/p/tripleaxisproject/>

- Gui frame from SANS
- Data loader from REFL
- Optimizer from PARK
- REU funded by CHRNS

1 paper in 30 is cited after 10 years
— will the software still run?



Source: Redner (2004) [arXiv:physics/0407137v2](https://arxiv.org/abs/physics/0407137v2) [physics.soc-ph]