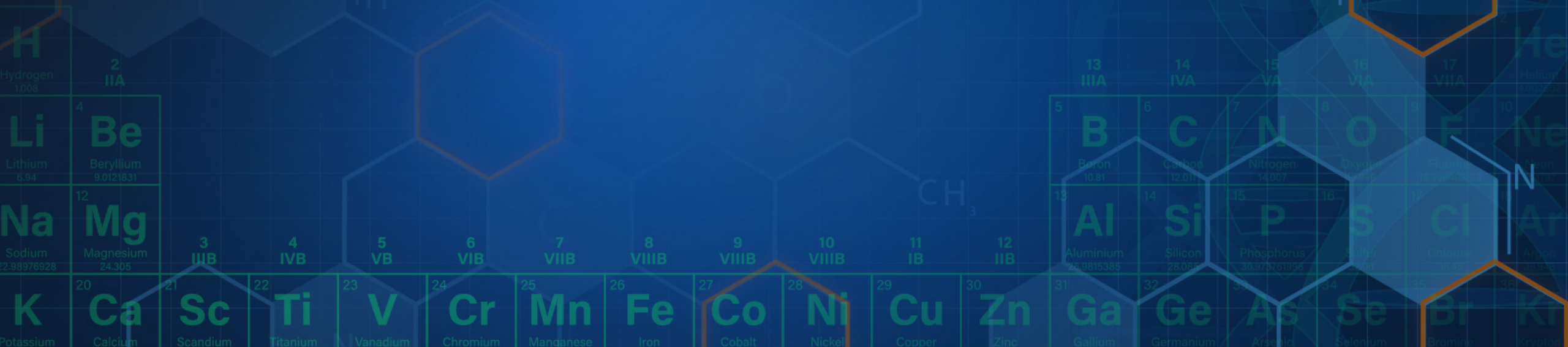


nSoft Consortium - Industry Impacts on Development of Neutron-Based Measurement Science





Market Failure

- Industry needs national facilities to innovate
- Facilities see industry as key customer
- Access models geared toward academics

A Well Known Issue



Incubators

- nSoft built with industrial relevant metrics of success
- Industrial needs = high merit → no proposals
- NIST designs research, new capability

A New Approach



Expertise Transfer

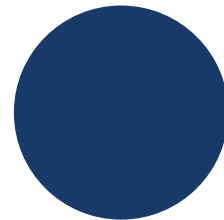
- Measurements co-developed for broader community
- Higher adoption rates, targeted impacts
- User community expands

Reaping Benefits



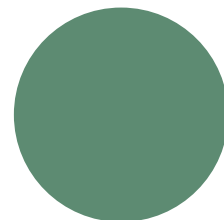
Ronald Jones (NIST, left) and Ryan Murphy (Solvay, right) at the 10 meter Small Angle Neutron Scattering instrument

Collaboratively advance neutron based measurement science toward viable solutions for industrial needs



Member Role

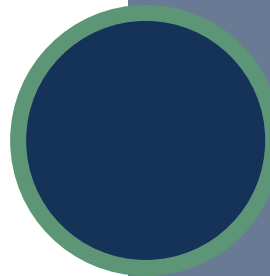
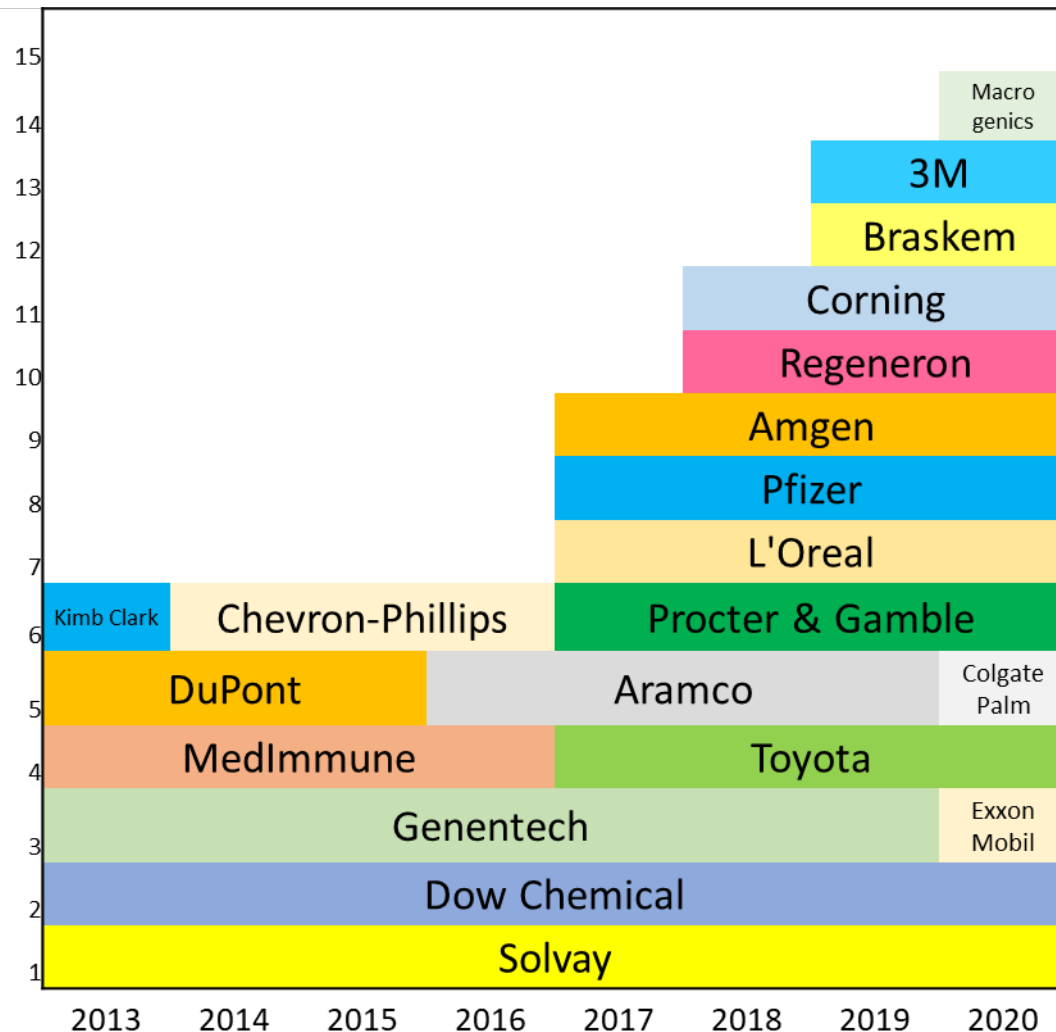
- Participate in on-site experiments
- Provide supporting data
- \$25k/year



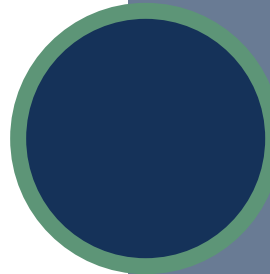
NIST Role

- Connect members to NIST Community
- Guide experiments toward success
- Build, Use, Support, and Publish
- Operate 10m SANS

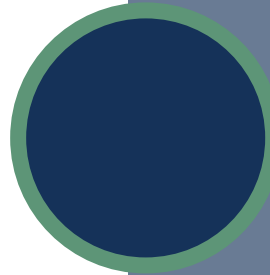
Healthy Growth



Growth rate accommodated by expansion across techniques

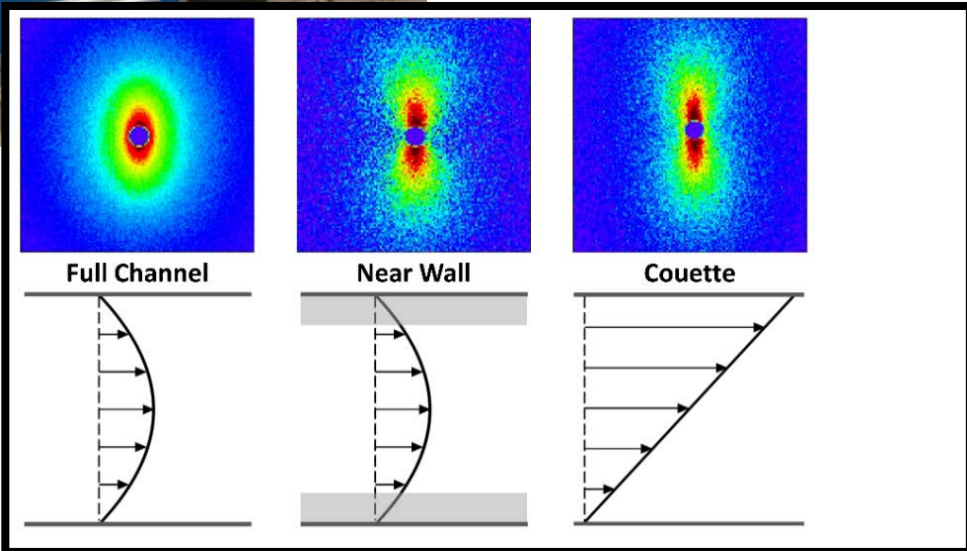
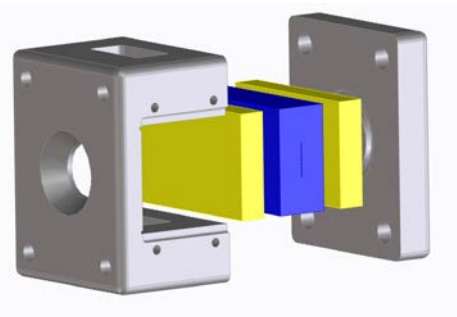
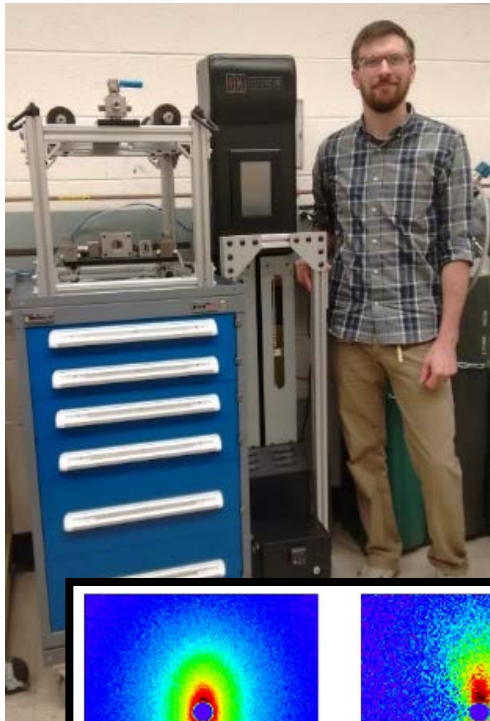


Expanding support from across the NIST campus



#1 reason for departure is member reorganization

High Shear in Manufacturing

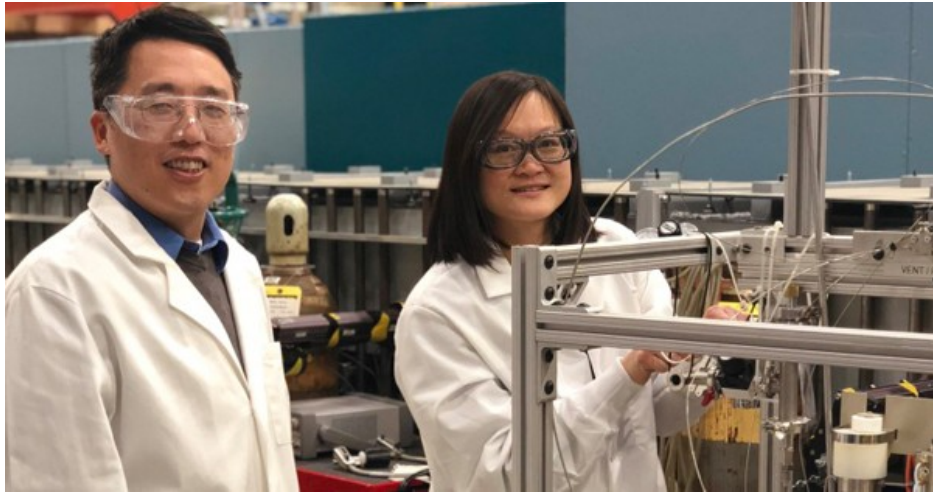


- Rheo-SANS a NIST core competency
- Current magnitude of shear limited, mismatch to manufacturers
- Funded at >\$1M/year for 5 years by NIST
- 3 publications to date
- Device will transition to user program by 2020



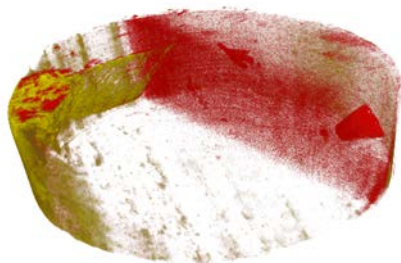
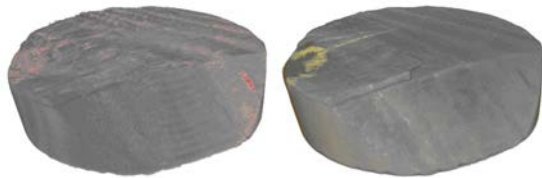
New capability for the user program

Efficient Shale Gas Extraction



Neutron

X-ray



Composite

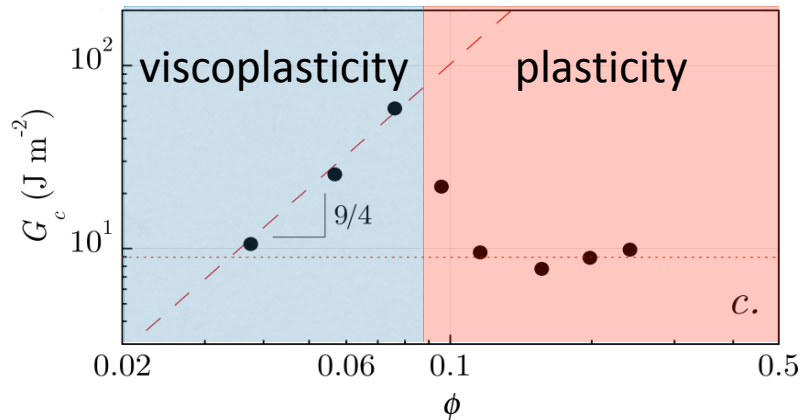


- Need to understand gas storage in shale
- Aramco provides shale cores
- New high pressure gas cell designed, built
- SANS for pore size distribution, chemistry
- Neutron and X-ray tomography (NeXT) provides macroscopic map



Petrochemical Society
Award, Nature Comm.

Robust OTC Drug Delivery



- Soft gel performance varies with climate, loss of product and regulatory challenge

- \$500 M market for Pfizer alone (Advil)

- Pfizer provides gel cap formulations

- SANS and poroelasticity measurements provide molecular insight into burst time

- New formulations being tested for adoption



New product formulations in pipeline



QUESTIONS?