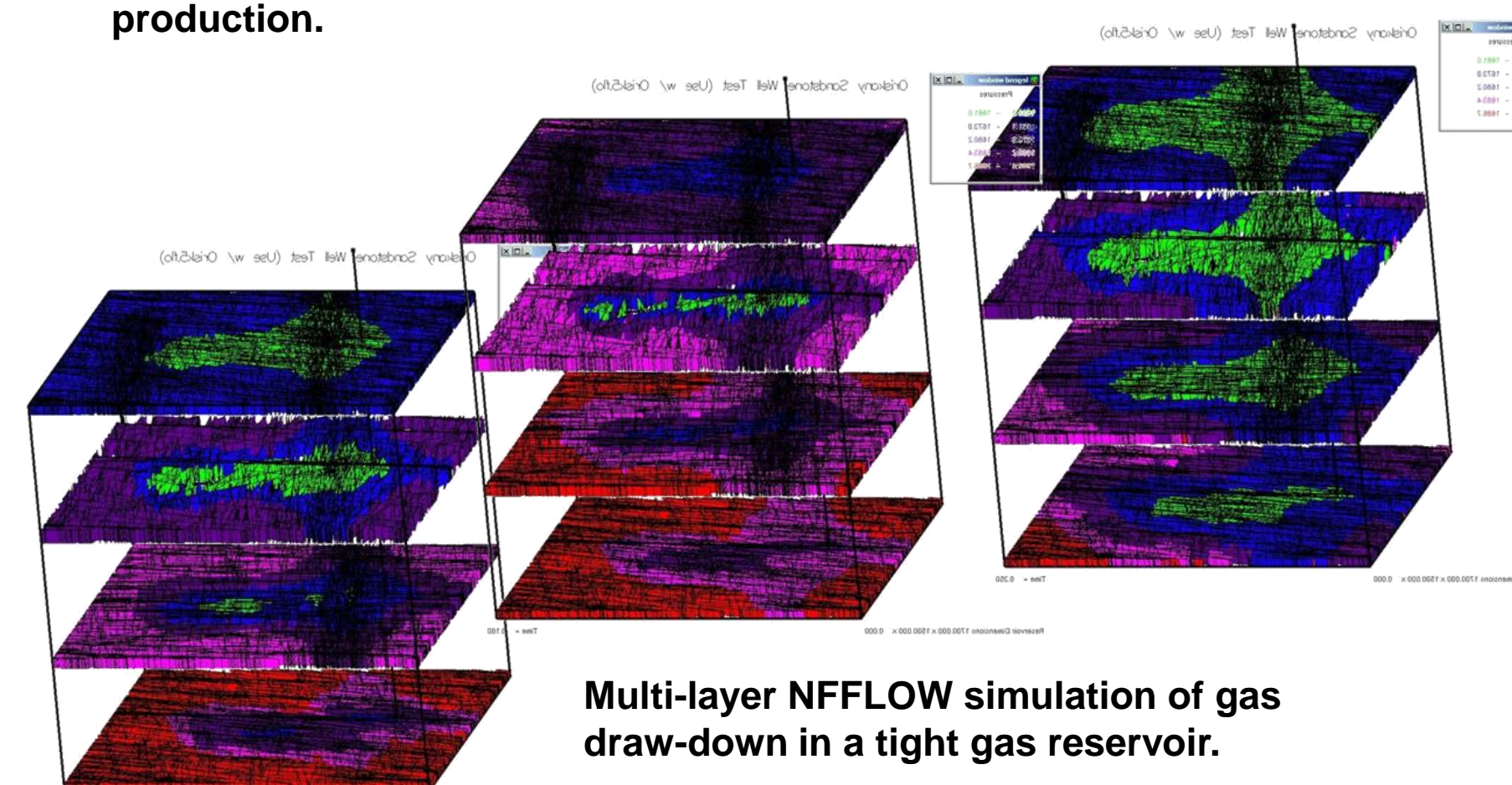
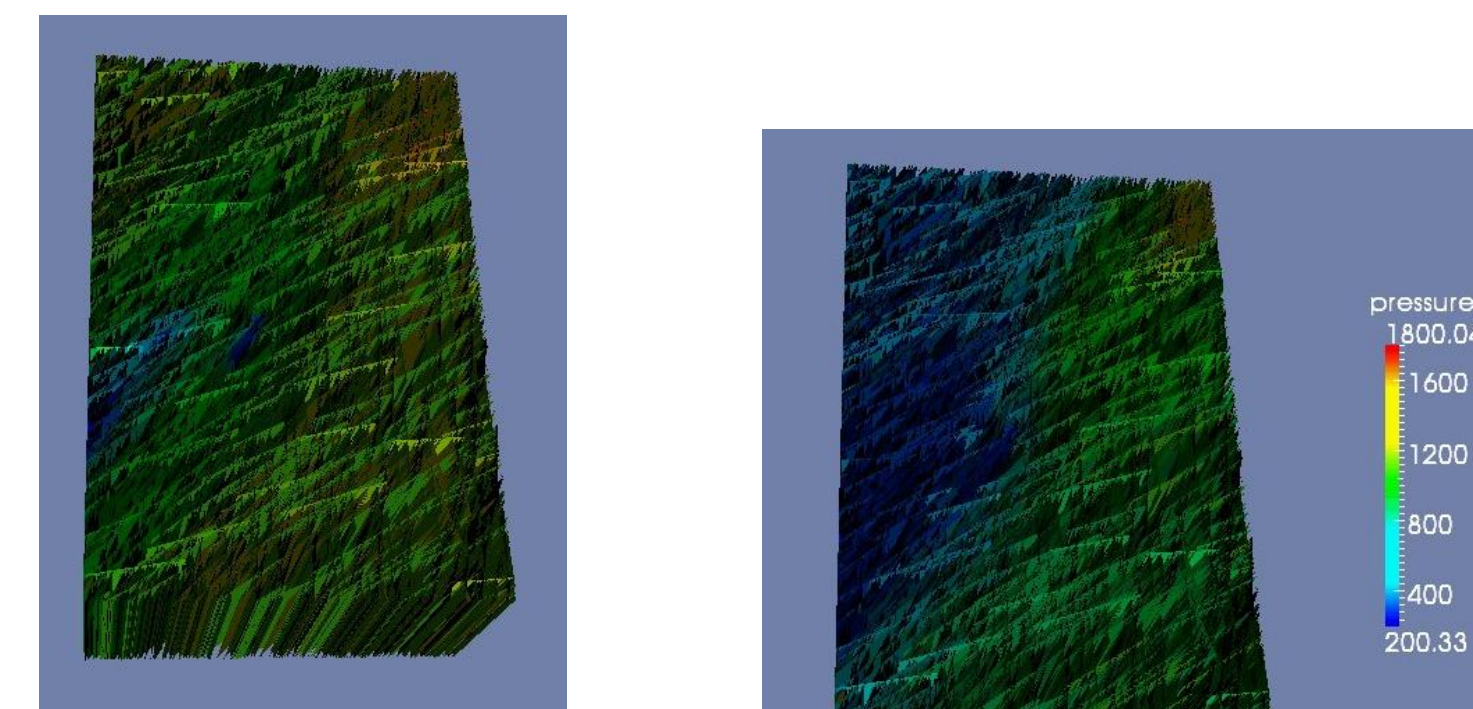
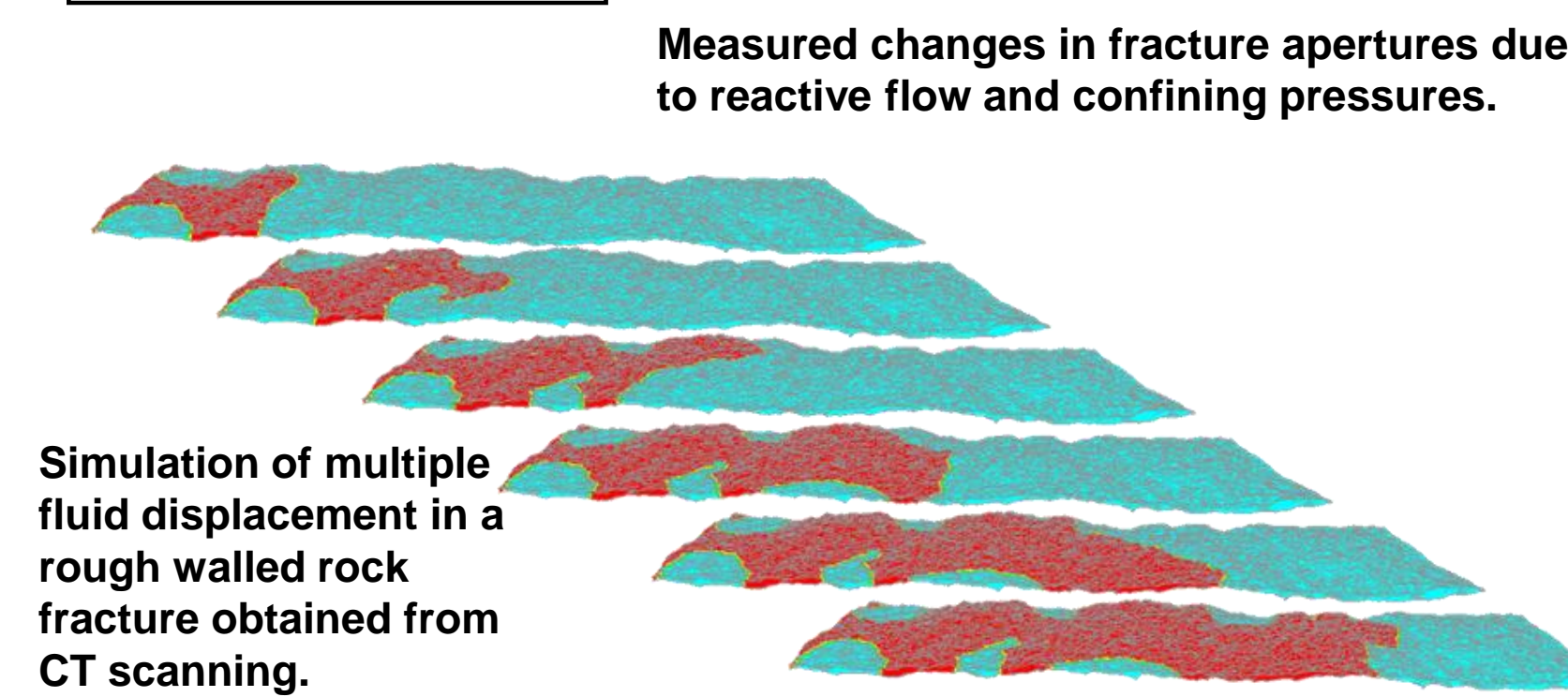
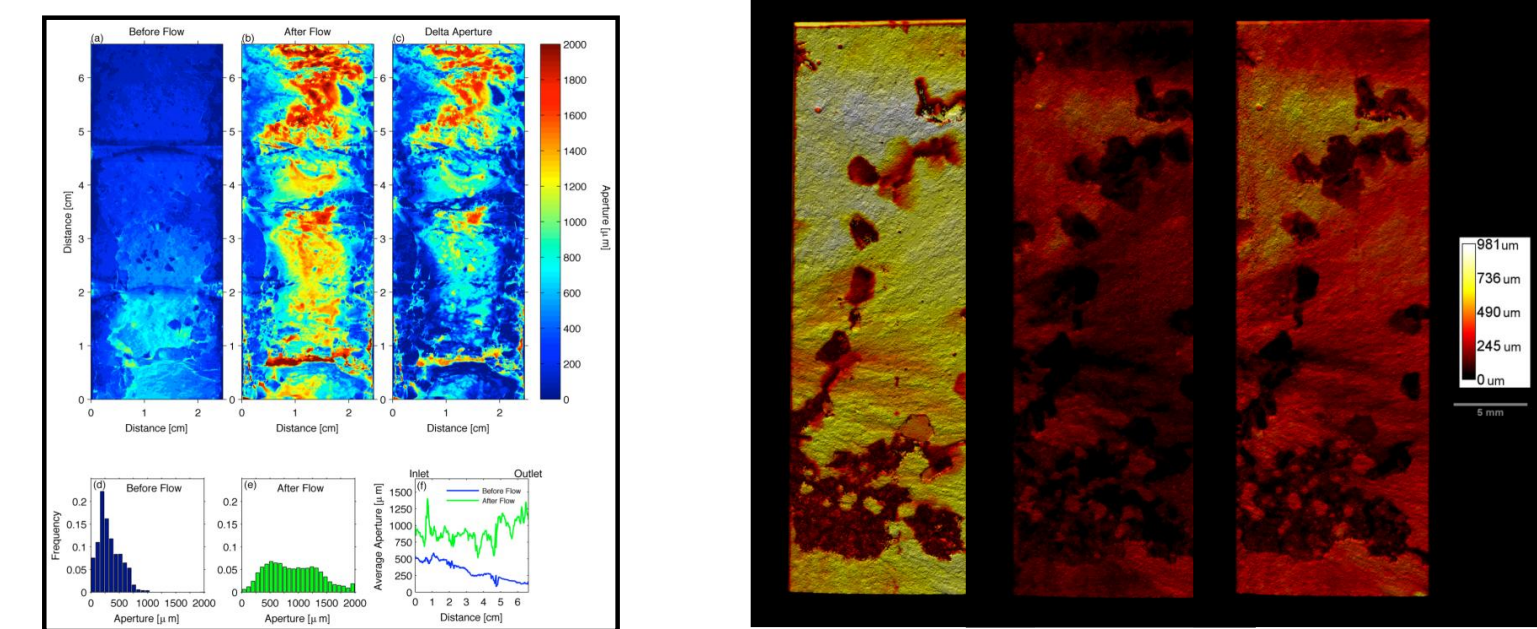
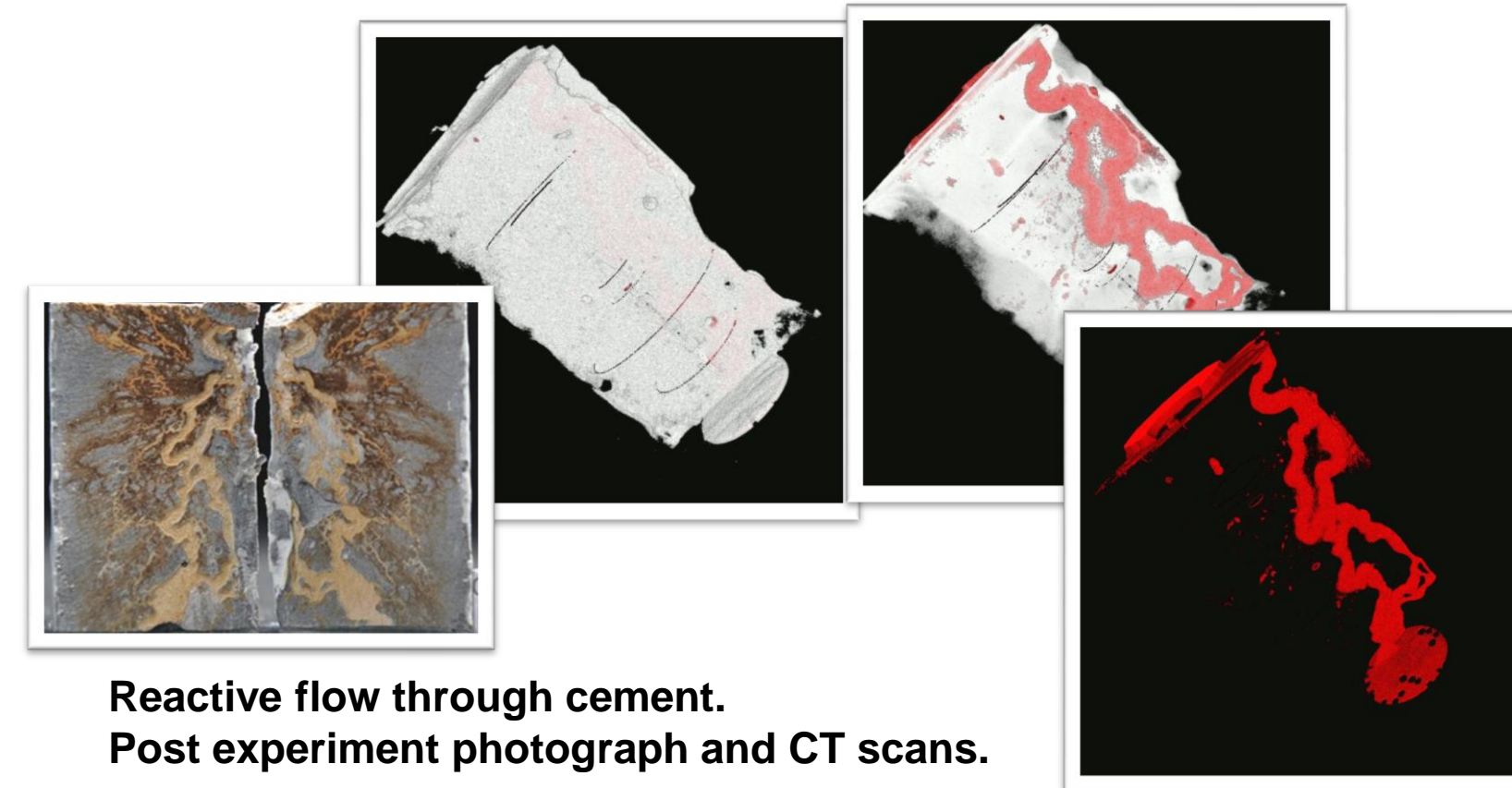


Technology/Capability Overview

- Fluids move preferentially through fractures in underground rock formations, such as those producing shale gas, geothermal energy, or used to store CO₂
- NETL-RUA has unique facilities and expertise to understand and describe flow in rock fractures

- Experimental Computed Tomography Scanning

Three CT scanners and ancillary flow equipment mean that we can visualize fractures with flow from 1 micron resolution on up! Previous studies have evaluated reactive flow, performed long term flow tests, and evaluated multiphase flows under *in situ* conditions.



Benefits to Partner

Facilities available:

- Medical CT scanner with flow through capabilities, 250 micron resolution imaging, temperature & pressure controls
- Industrial CT scanner with down-to-5 micron resolution and high pressure capabilities
- Micro CT scanner with sub-micron resolution
- Full rock core preparation facilities
- Multi-scale core logger with gamma density, P-wave and XRF measurement capabilities
- Scientists, engineers, technicians, and students hungry to apply their knowledge to real-world problems of importance to industrial partners of all sizes

Opportunity

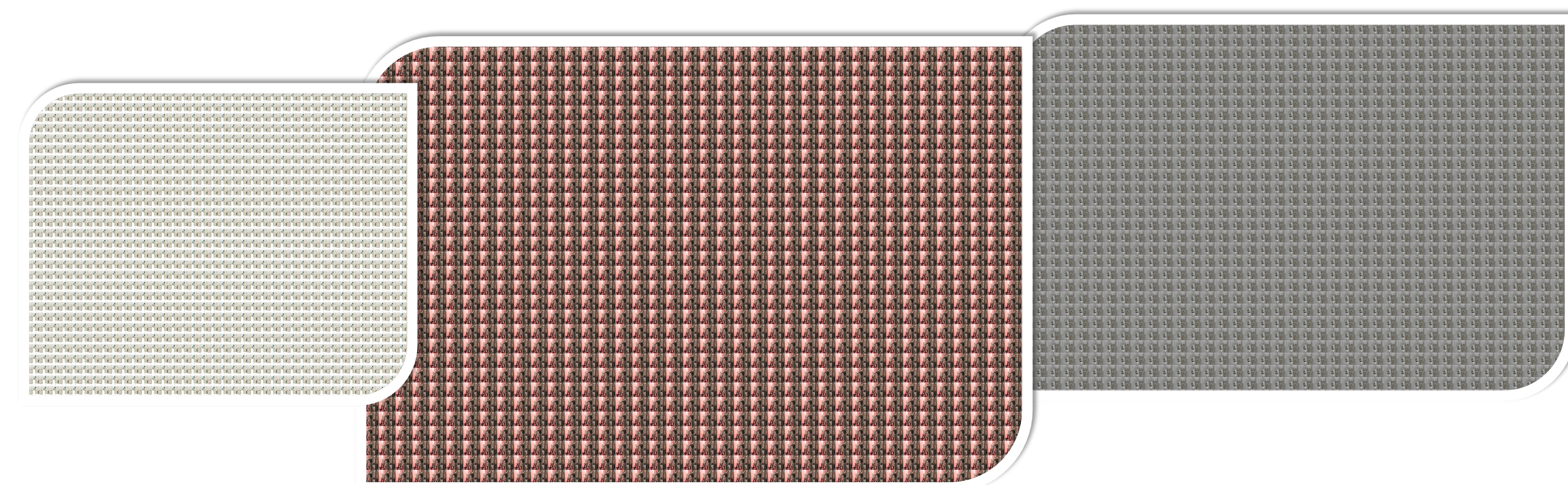
- From an MOU to test a process to a CRADA to help develop novel materials, we are interested

Development Status

- We have been operating the experimental CT flow facilities for over eight years with numerous partners. Recent CT scanner acquisitions have been brought on line and integrated
- Decades of experiences in reservoir and small scale fluid flow simulation experience, ready to be applied

Contact

Dustin Crandall, URS, Dustin.Crandall@contr.netl.doe.gov
Grant Bromhal, NETL, Grant.Bromhal@netl.doe.gov
Dustin McIntyre, NETL, Dustin.McIntyre@netl.doe.gov



- Computational Modeling

At the reservoir scale NFFLOW/FRACTGEN are NETL's in-house codes for evaluating flow in fractured reservoirs. In addition, small scale simulations can complement CT/experimental work to expand the utility of the work.

Industry Significance

- The ability to leverage an understanding of the fundamental physics underlying flow in fractures towards improved field applications, without a large capital investment, can improve operations
- Customizable. A wide variety of experiments and simulations have been, and will be, performed. From testing of novel viscosifiers to evaluating how additives keep fractures open, the NETL facilities can provide new insights