2. Workshop Organization

Workshop objectives:

i) identify high priority, strategic areas of subsurface science or engineering or NE USA geology, for which basic research conducted in a deep continental borehole could lead to major advances in knowledge.

ii) design borehole experiments (including sampling plans, monitoring in and adjacent to a borehole, complementary modeling, and analyses) that advance science/engineering in areas in which the assembled participants are interested.

iii) identify synergies between those experiments and the Cornell focus on assessments of reservoir properties and technical risks for a geothermal energy extraction project.

iv) lay the foundation for preparation of one or more scientific drilling proposals, targeted toward one or more appropriate funding sources, and initiate the proposal preparation steps.

v) initiate the assembly of a suite of state-of-art published materials that underpin the selections of proposal topics, the experimental design choices, and the analyses of results

Posters: Participants are welcome to bring a poster on the Workshop-relevant topic.

Workshop schedule:

January 8

	Who or what	Objective or task
8:30-9:00 AM	Welcome; introductions of selves	
9:00-9:20 AM	Cornell hosts	Overview of Cornell's geothermal project: heat demand, reservoir targets, plan for test borehole. Workshop objectives and expectations.
9:20-10:20	Lightning session (5 minute presentations) *List of topics:* • *Induced earthquakes* • *Experimental rock mechanics (in relation to fluid injection and fault activation)* • *Rock-fluid-chemistry-mechanics interactions and impacts* • *State of stress heterogeneity* • *Hydrological monitoring* • *Crystalline basement of Adirondacks* • *Deep strata & pore fluids of central NYS*	Brief introduction to state-of-the-art understanding and/or characteristics; "Teasers" for content of breakouts; Identify relevant content expertise among participants

	• *Natural fractures of central NYS+Adirondacks* • *Seismicity and structures of central NYS* • *Appalachian Basin boreholes*	
10:20- 10:40 AM	coffee break	
10:40- 11:45 AM	First break-out session *List of initial topics to seed discussion (changeable by the participants)* 1. Stress – fluid flow – earthquakes: What are the big questions and big opportunities in a central New York borehole? 2. Rock-fluid-chemistry-mechanics interactions and impacts: What are the big questions and big opportunities in a central New York borehole? 3. For which topics of NYS geological history would borehole science opportunities most accelerate progress? 4. How best can outcrop and Cornell borehole studies be integrated to accelerate understanding of geothermal reservoirs in low porosity sedimentary and metamorphic rock? 5. How best to drill, sample, instrument and monitor the mid-grade metamorphic rocks below Ithaca?	Identify the scientific and engineering challenges most worthy of and appropriate to tackle via borehole science in Ithaca, NY; Engage all group participants in brainstorming.
11:45- 12:30 PM	Full group	Brief reports from each breakout group of ideas that coalesced as promising high priority borehole science targets; b) whole group discussion of overlaps and synergies between the priority topics of the differing topical groups c) whole group discussion of challenges or opportunities omitted thus far

12:30-1:30	Lunch in Snee Atrium	Informal discussions; Poster session in Atrium
1:30-3:00	Science topic breakout groups reconfigured with a regional expert inserted into each group	Discuss and improve strategies for experiments and sampling specific to the best available knowledge about local subsurface materials, fluids and conditions
3:00-3:15	Coffee break	Poster session in Atrium
3:15-3:30	Plenary	flex time: short presentations (5 minutes) if someone needs this opportunity
3:30-5:00 PM	Science topic breakout groups reconfigured again with a borehole engineering expert inserted into each group	outline general strategies for experiments and sampling to achieve “science challenge” goals and likely to be technically viable
5:00-5:30 PM	break	Poster session in Atrium
5:30-7:30 PM	Dinner in Snee Atrium	Informal discussion; Poster session in Atrium

January 9

	Who or what	Objective or task
8:30-9:00 AM	Gather, coffee, continental breakfast	
9:00-10:00 AM	Full workshop plenary session	Each breakout group describes their short list of “science challenge” targets and strategies
10:00-10:30	Breakout groups by expertise (rock core methods, logging and tracer methods, pore fluids methods, seismic /geophysical methods, etc)	For each “science challenge” nascent plan, improve plan for instrumentation or sampling or analytical methods
10:30-10:50 AM	coffee break	Poster session in Atrium
10:50-11:15 AM	Continue preceding breakout groups	Continue to identify best instrumentation or sampling methods
11:15-11:30 PM	Plenary session	Discussion of funding opportunities for borehole science experiments, samples, and analyses

11:30-12:30 PM	Plenary session with Cornell project staff engineers and geologists	Discuss comparison between narrow borehole test needs for Cornell geothermal reservoir analyses and the basic science experimental opportunities illuminated in Workshop; Perceptions of pragmatic limits, including time and money; Planning interface between Cornell ESH staff and groups preparing proposals and accessing borehole.
12:30-1:30	Lunch in Snee Atrium	Informal discussions; Poster session in Atrium
1:30-2:15	Plenary session; Dean Lance Collins (Cornell) and designated leaders of experimental theme groups	Workshop participants briefly describe state of science planning (during boring, immediately after boring, longer duration monitoring), opportunities to secure funding of the experiments, and time frame; Remarks from Dean Collins about Cornell's activities to raise funds for the basic test borehole and preferred time frame; Expectation for data availability.
2:15-3:00	Plenary session; Participants from core storage and data archival facilities	Brief presentations on the available core for comparative experiments (NYS), core storage, subsurface data archives; Review requirements or guidelines for data and material archiving; Discuss challenges and opportunities
3:00-3:15	Coffee break	Poster session in Atrium
3:15-5:00 PM	Breakout groups	Outline the content of multiple proposals borne from each interest group
5:00 PM	Official end to full group Workshop activities	
5:00-6:15	Break for return to hotel	
6:30-8:00 PM	Dinner for those remaining in Ithaca for the night: Moakley House, Cornell golf course	Informal discussion

January 10

Drafting proposal(s) reflective of the Workshop participants' guidance, to be done by a small subset of workshop participants who have previously agreed to this role.