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## Introduction

Team-based scientific collaborations play a key role in the discovery and distribution of scientific knowledge. Scientific collaboration allows teams to pool their knowledge and expertise, increase productivity, and improve their chances of successful experiments, projects, and publications. It is important to examine the technical, organizational, and social factors that play a role in such collaborative work and its potential transition to a long-term, successful program of research.

To help solve this research problem, this study observed teams at the National High Magnetic Field Laboratory (NHMFL) in Tallahassee, FL, the largest and most powerful magnet laboratory in the world. Over 1,100 scientists collaborate with each other and with NHMFL scientists and technicians each year.



*How do scientific teams successfully transition from short-term experiments to long-term programs of collaborative research?*

## Method

**79**  
scientists

**28**  
teams

**58**  
hours

**48**  
observations



We observed teams conducting experiments at the NHMFL to see what they did while at the facility. Our quantitative and ethnographic findings were captured using data sheets. Qualitative data were coded and analyzed using concepts of lifecycles and scientific collaboration and the theory of information worlds.



## Key Findings

- Collaborations consist of multiple nested and overlapping lifecycles and information worlds of activity.
- Teams may share similar social norms, social types, information values, and information behaviors, but many subtle differences indicate boundaries and barriers between worlds and lifecycles.
- Differences based in technology use, information and data practices, and other factors impact teams' ability to transition from short-term experiments to long-term programs of collaborative research.
- The teams and individuals most successful at juggling, bridging, and adapting to the various overlapping and nested worlds and lifecycles are most likely to successfully make this transition.



VOSS Observation Data Sheet		Observers: OBSERVER 1 and OBSERVER 2	ID # 028A
Date: 6/XX/11	Start Time: 11:23am	End Time: 12:23pm	
Department: DC Field	Location: Cell XX		
General Observations: Should complement your included sketch; use back / separate sheet if necessary. See timeline (4 pp., attached)			
<b>Observations Checklist</b>		<b>Observations Timeline</b>	
Note that boxes checked here should be connected to observations in the timeline on the right-hand side.		Observations	
<b>People</b>		Time	
Give numbers observed		See attached timeline (4 pp.)	
<input type="checkbox"/> Undergraduates <input type="checkbox"/> Graduates <input type="checkbox"/> Postdocs		People: X (grad), F (PI), A, B, M (all Mag Lab scientists), Y (grad)	
<input type="checkbox"/> Mag Lab Scientists <input type="checkbox"/> Professors <input type="checkbox"/> PI		Minimal use/adjustment of probe and magnet. Cart equip. and wiring most prominent.	
<input type="checkbox"/> Other:		F and A monitoring data, or setting up monitoring. M doing "other work usage," hard to tell exactly what though.	
<b>Equipment use</b>		Only M on telephone; others solely F2F communication.	
<input checked="" type="checkbox"/> Probe <input checked="" type="checkbox"/> Magnet <input type="checkbox"/> Sample <input checked="" type="checkbox"/> Cart equip.		A instructing/teaching F and X (one presumes in the equipment rather than the physics, at least in F's case!)	
<input checked="" type="checkbox"/> Other equipment, instruments, tools: <u>Wiring</u>		All troubleshooting (per X); X and A watching observers; Y and X walking; X talking to observers.	
<b>Computer use</b>		Activity: high F, average most of rest (grads a little less). Engagement similar.	
<input checked="" type="checkbox"/> Monitoring data <input type="checkbox"/> Analyzing data			
<input checked="" type="checkbox"/> CMC (please check appropriate type below)			
<input type="checkbox"/> MS Word / etc. <input type="checkbox"/> Wiki / Google Docs			
<input checked="" type="checkbox"/> Other work usage <input type="checkbox"/> Non-work usage			
<b>Communication</b>			
<input checked="" type="checkbox"/> F2F <input checked="" type="checkbox"/> Telephone <input type="checkbox"/> E-mail <input type="checkbox"/> Skype			
<input type="checkbox"/> Other CMC:			
<b>Interactions</b>			
<input checked="" type="checkbox"/> As colleagues <input type="checkbox"/> As senior/junior			
<input checked="" type="checkbox"/> Instructing / teaching <input type="checkbox"/> Solo work			
<b>Other activities</b>			
<input checked="" type="checkbox"/> Troubleshooting <input checked="" type="checkbox"/> Watching observer(s)			
<input checked="" type="checkbox"/> Walking <input type="checkbox"/> Eating			
<input checked="" type="checkbox"/> Other: <u>Talking to observers</u>			
<b>Stage of collaboration</b> (ask about and note here)			
About what level of <u>activity</u> did you observe?		About what level of <u>engagement</u> did you observe?	
<input type="checkbox"/> Above average <input checked="" type="checkbox"/> Average <input type="checkbox"/> Below average		<input type="checkbox"/> Above average <input checked="" type="checkbox"/> Average <input type="checkbox"/> Below average	



This research was supported in part by the National Science Foundation (NSF) under Grant OCI-0942855. Our findings and conclusions are our own, and do not necessarily reflect the views of the NSF or NHMFL.

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