

Direct Geometry Spectroscopy Team Overview

Doug Abernathy, DGS Team Lead

2020 Review of the Instrument Suites for Spectroscopy
September 17–18, 2020

ORNL is managed by UT-Battelle, LLC for the US Department of Energy

Direct Geometry Spectroscopy Team

ARCS



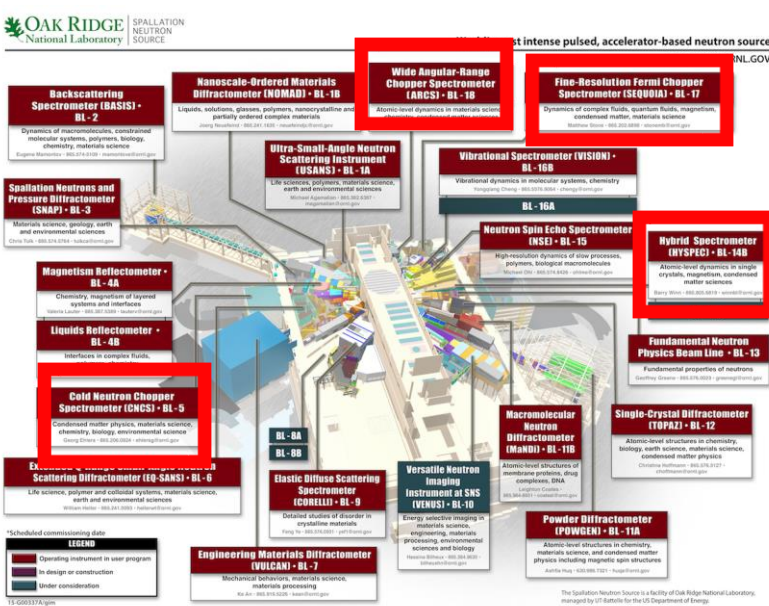
CNCS



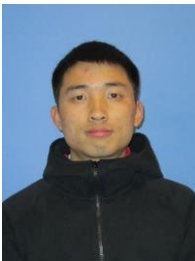
SEQUOIA



CIS



Postdocs



Anjana Samarakoon

Allen Scheie

Tao Xie

Shang Gao

HYSPEC



Direct Geometry Spectroscopy investment examples

- Complete instrument planned configurations
 - CNCS and SEQUOIA detectors
 - HYSPEC purchase supermirror array (done)
- Support reliable and efficient operations
 - SEQUOIA and ARCS vacuum upgrades (done)
 - ARCS detector electronics upgrade (done)
 - HYSPEC elevator / oscillator (done)
 - [Software, e.g. DAS scripting, autoredaction \(ongoing\)](#)
- Enhance current capabilities
 - CNCS radial collimator (done), SEQUOIA radial collimator
 - HYSPEC: shielding to reduce time independent background (ongoing)
 - [Software, e.g. event data tools](#)
- Enable new science
 - Sample Environment, e.g. 14 Tesla magnet (ongoing)
 - SEQUOIA Brillouin scattering upgrade
 - [Software, e.g. advanced computing with experiment modeling](#)

Direct Geometry Spectroscopy investment priorities

- Shorter term improvements:
 - ARCS multi-sample stick (~1 year)
 - ARCS / SEQUOIA: new 70mm top-loading CCR; automatic exchange gas handling (~1 year)
 - HYSPEC: shielding to reduce time independent background (funded and shielding ordered - <1 year: \$30K)
 - DGS - 50/35mm bore ^3He insert compatible with magnets
- Significant upgrades:
 - CNCS – add detectors (from Pharos): (approved but not funded: ~2 years after funds allocated: \$2M)
 - SEQUOIA collimator (approved but not funded: ~2 years after funds allocated: <\$1M)
 - SEQUOIA detectors
 - SEQUOIA Brillouin scattering option (approved but not funded: ~2 years after funds allocated: \$1M)

Direct Geometry Spectroscopy performance

- SNS DGS suite (PUSH 2018 – Aug 2020)

Instrument	Publications	Pubs with IF > 7	PhD dissertations
BL-18 (ARCS)	52	18 (35%)	9
BL-5 (CNCS)	59	15 (25%)	7
BL-17 (SEQUOIA)	75	20 (27%)	12
BL-14B (HYSPEC)	25	10 (40%)	3

- ISIS DGS suite (ePub 2018 - 2020)

Instrument	Publications	Pubs with IF > 7	PhD dissertations
MERLIN	48	13 (27%)	3
LET	30	11 (37%)	1
MAPS	34	8 (24%)	0
MARI	23	4 (17%)	2

Direct Geometry Spectroscopy performance

- Journal article publications over time (as reported on facility web pages)

Year	ARCS	CNCS	HYSPEC	SEQUOIA	LET	MAPS	MARI	MERLIN	4SEASONS	AMATERAS
2019	23	20	11	28	10	13	6	18	6	8
2018	18	22	7	29	8	10	10	18	9	7
2017	20	20	11	20	18	15	10	14	6	5
2016	24	16	8	16	7	21	5	15	6	4
2015	20	18	5	12	7	9	12	6	0	6
5-yr Average	21.0	19.2	8.4	21.0	10.0	13.6	8.6	14.2	5.4	6.0

Thank you for your participation.
We look forward to your feedback.

September 17, 2020

Time	Event		
8:30–8:50 am	Welcome (Paul Langan)		
8:50–9:20 am	Neutron Scattering Division Outlook & Strategy (Hans Christen)		
9:20–9:50 am	Spectroscopy Overview & Strategy (Mark Lumsden)		
9:50–10:15 am	Break		
10:15 am–12:05 pm	Parallel Beam line presentations		
	<i>Direct Geometry</i>	<i>Triple-Axis</i>	<i>Chemical Spectroscopy</i>
10:15–10:25 am	Team overview (Doug Abernathy)	Team overview (Jaime Fernandez-Baca)	Team overview (Timmy Ramirez-Cuesta)
10:25–10:50 am	CNCS (Daniel Pajerowski)	CTAX (Tao Hong)	BASIS (Eugene Mamontov)
10:50–11:15 am	HYSPEC (Barry Winn)	HB-1 (Masa Matsuda)	NSE (Laura Stingaciu)
11:15–11:40 am	SEQUOIA (Matt Stone)	HB-1A (Adam Aczel)	VISION (Luke Daemen)
11:40 am–12:05 pm	ARCS (Doug Abernathy)	HB-3 (Songxue Chi)	
12:05–1:00 pm	LUNCH		
1:00–1:30 pm	Direct Geometry / Triple-axis software (A. Savici)		Chemical spectroscopy software (YQ Cheng)
1:30 pm -	Committee work time and report writing		

September 18, 2020

9:00–9:30 am	Committee recap and Q&A (GL and TLs)		
9:30–11:30 am	Meet with Direct Geometry Team members	Meet with Triple-Axis Team members	Meet with Chemical Spectroscopy Team members
11:30 am–12:30 pm	Committee work time and report writing		
12:30–1:30 pm	Lunch		
1:30–2:30 pm	Committee Verbal Report and Recommendations (DD, GL, TLs, instrument teams)		
2:30 p.m.	Adjourn		