

NATIONAL HIGH
MMAGNETIC
FIELD LABORATORY

Welcome to the RF Probe Workshop

Bill Brey

Florida State University

Sponsored by The National Resource for Advanced NMR Technology NIH P41 GM122698



FLORIDA STATE
UNIVERSITY

UF UNIVERSITY of
FLORIDA

People: NMR Technology Group



Bill Brey
Group Leader



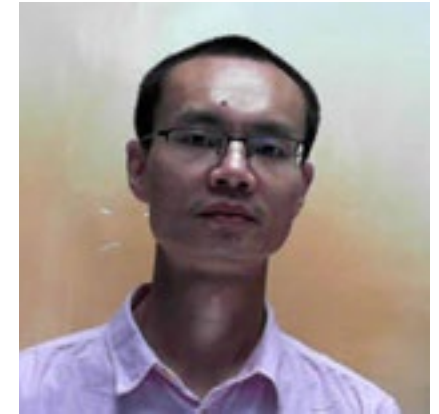
Peter Gor'kov
RF/Probes



Jason Kitchen
RF/Probes



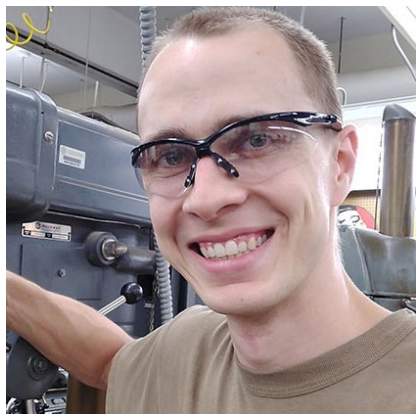
Ilya Litvak
RF/Probes/Field
Regulation



Wenping Mao
RF/Probes



Steve Ranner
Probes/Cryogenics



Joseph Collins
Machinist



Faith Scott
Probes/DNP



Malathy Elumalai
MRI Probes



Ashley Blue
Research Design

Welcome to the MagLab

- Founded in 1990
- Member institutions:
 - Florida State University
 - University of Florida
 - Los Alamos National Laboratory
- World record magnets
 - 36 T resistive & hybrid (NMR)
 - 45 T hybrid
 - Pulsed fields: 60 T, 77.8 T, 90 T
- Research in chemistry, biochemistry, biology, physics, materials science, & engineering

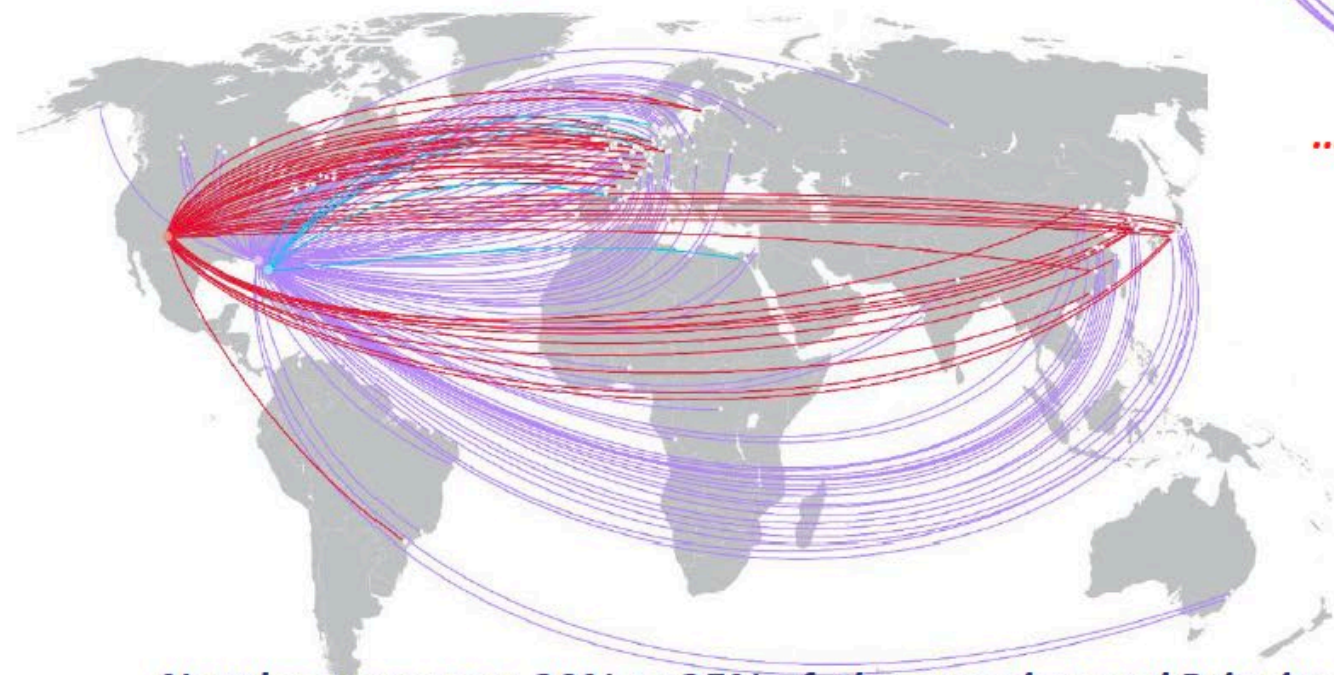




The MagLab Attracts Researchers From Around The World

In 2019, the MagLab hosted experiments
by more than **2,050 users**
from **162 institutions across the United States....**

...and a total of 298 institutions
from throughout the world.



Nearly every year, 20% to 25% of the experiments' Principal Investigators are first-time-ever PI's at the MagLab.

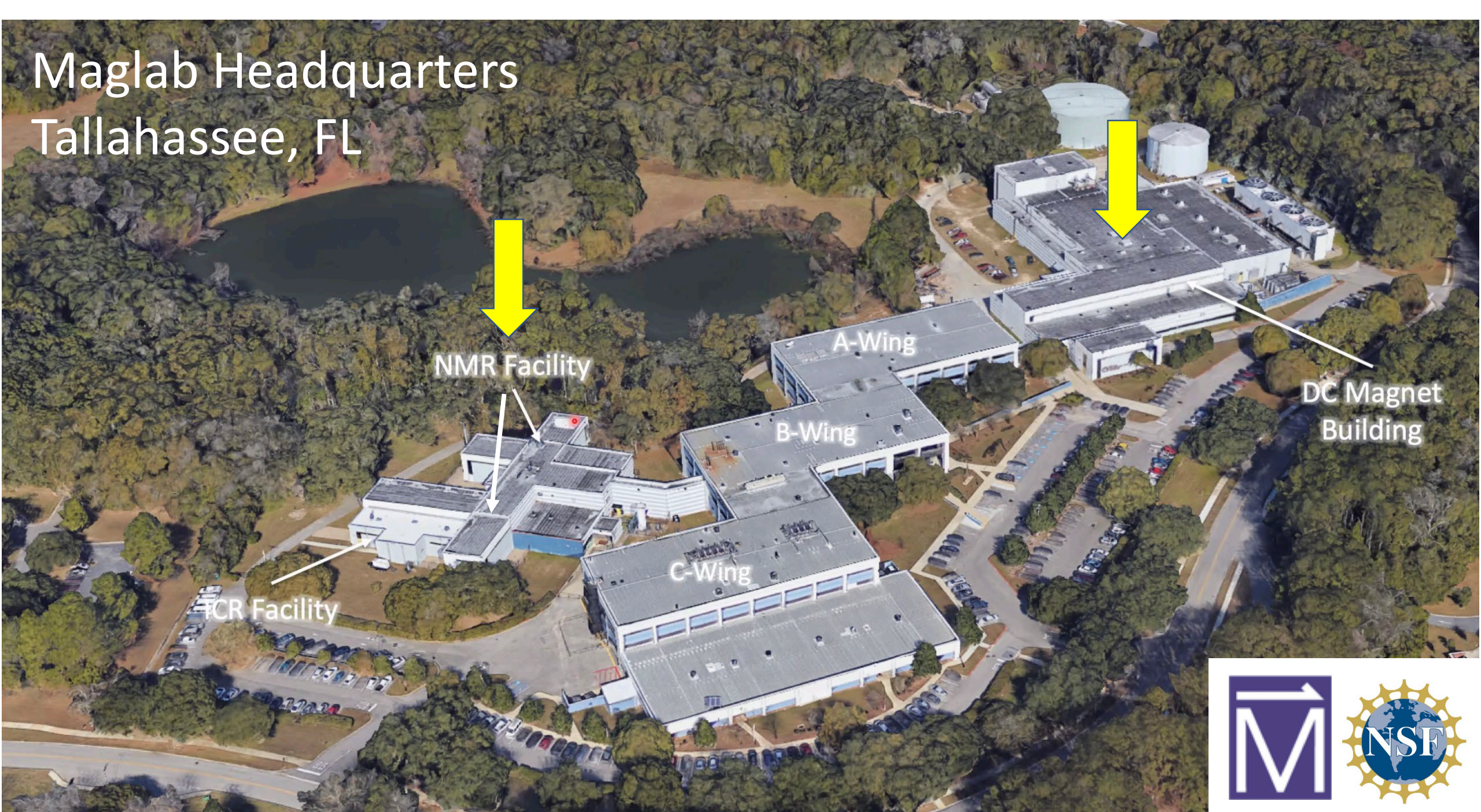
Since 2016, the MagLab User Program has published
>2260 refereed papers, including...



...at least...

- 37 Proc. of National Academy of Sciences**
- 169 Nature Journals**
- 13 Science**
- 78 Physical Review Letters**
- 276 Physical Review B**
- 69 IEEE Trans. on Applied Superconductivity**
- 258 American Chemical Society Journals**
- 59 Inorganic Chemistry**
- 40 Energy and Fuels**

Maglab Headquarters Tallahassee, FL



NMR Facility

ICR Facility

A-Wing

B-Wing

C-Wing

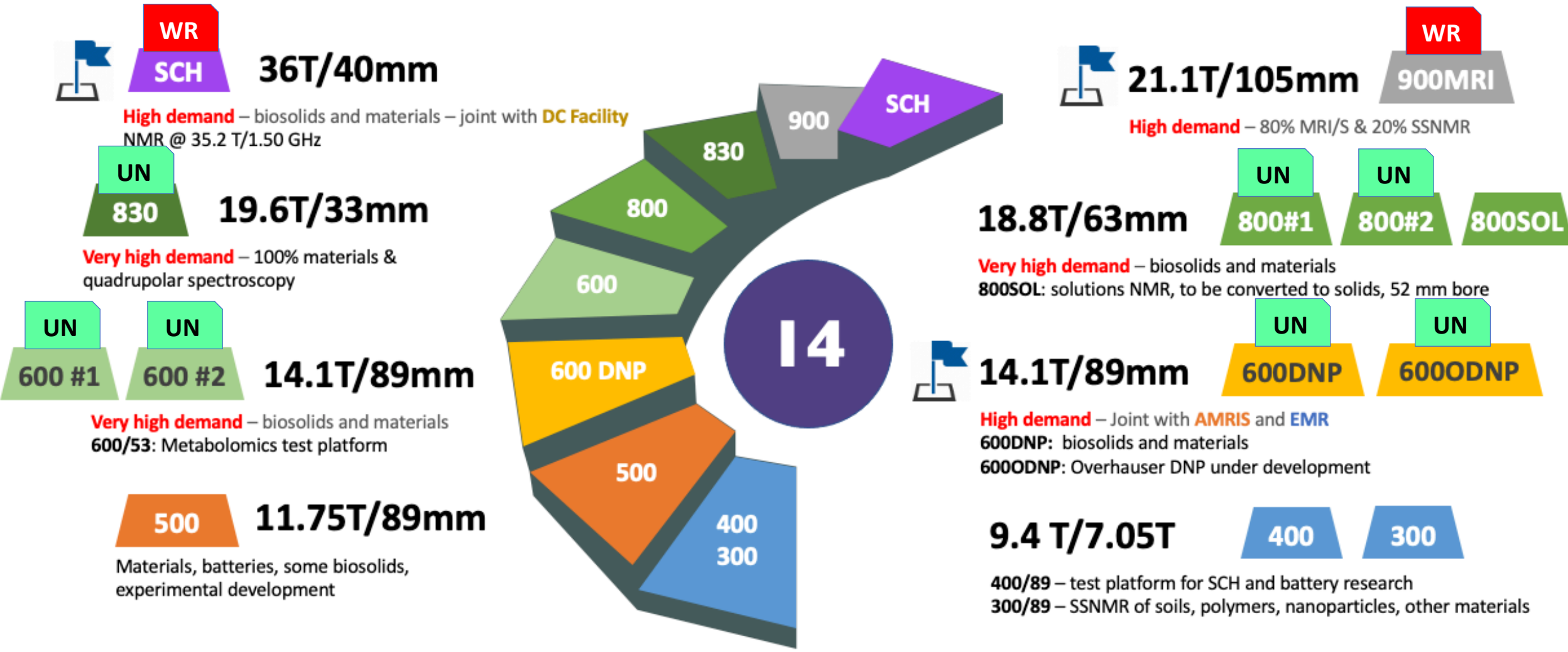
DC Magnet Building



NMR/MRI Instruments @ MagLab (Field/Bore)

NMR

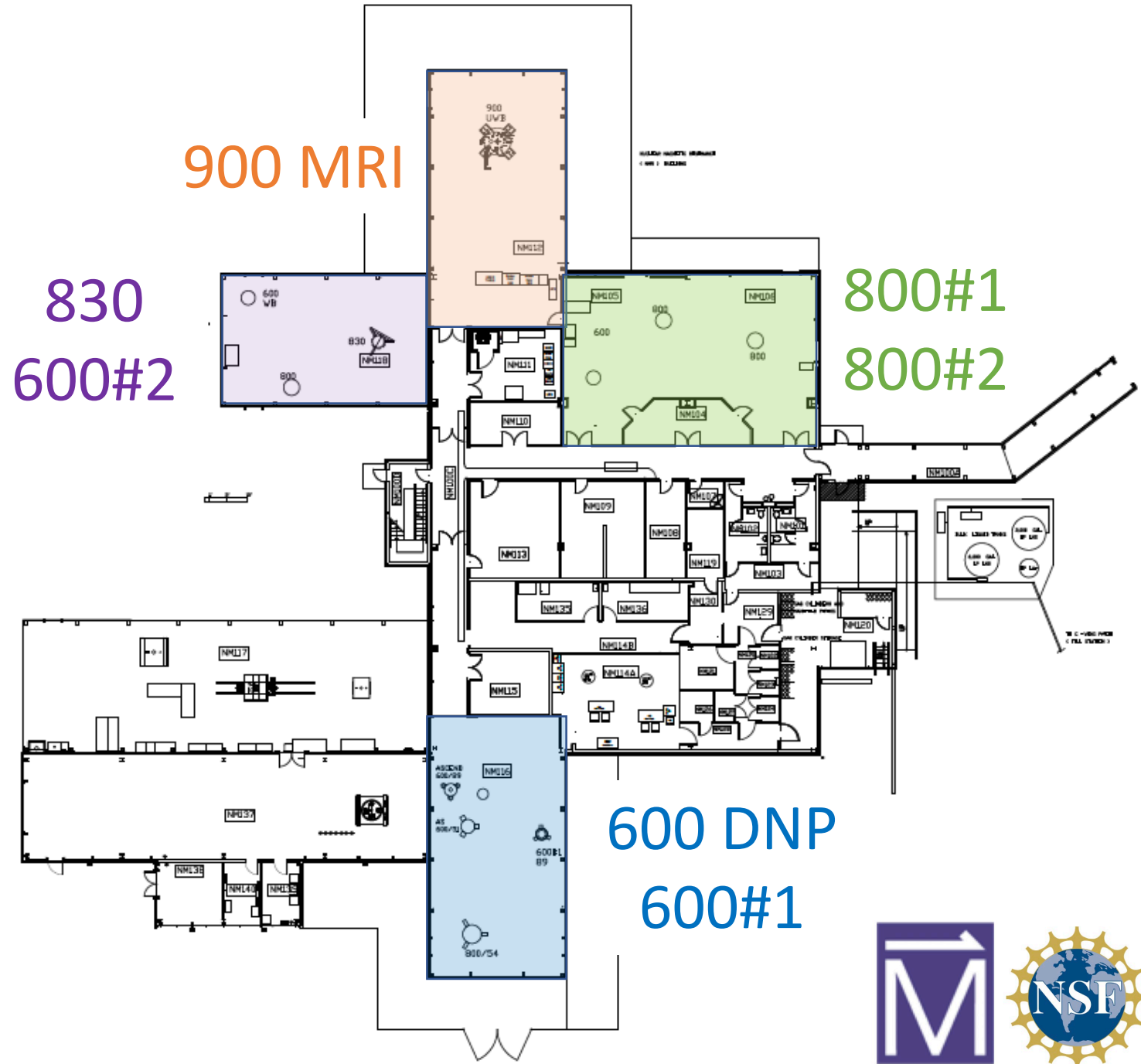
➤ 14 NMR/MRI Platforms for our User Program



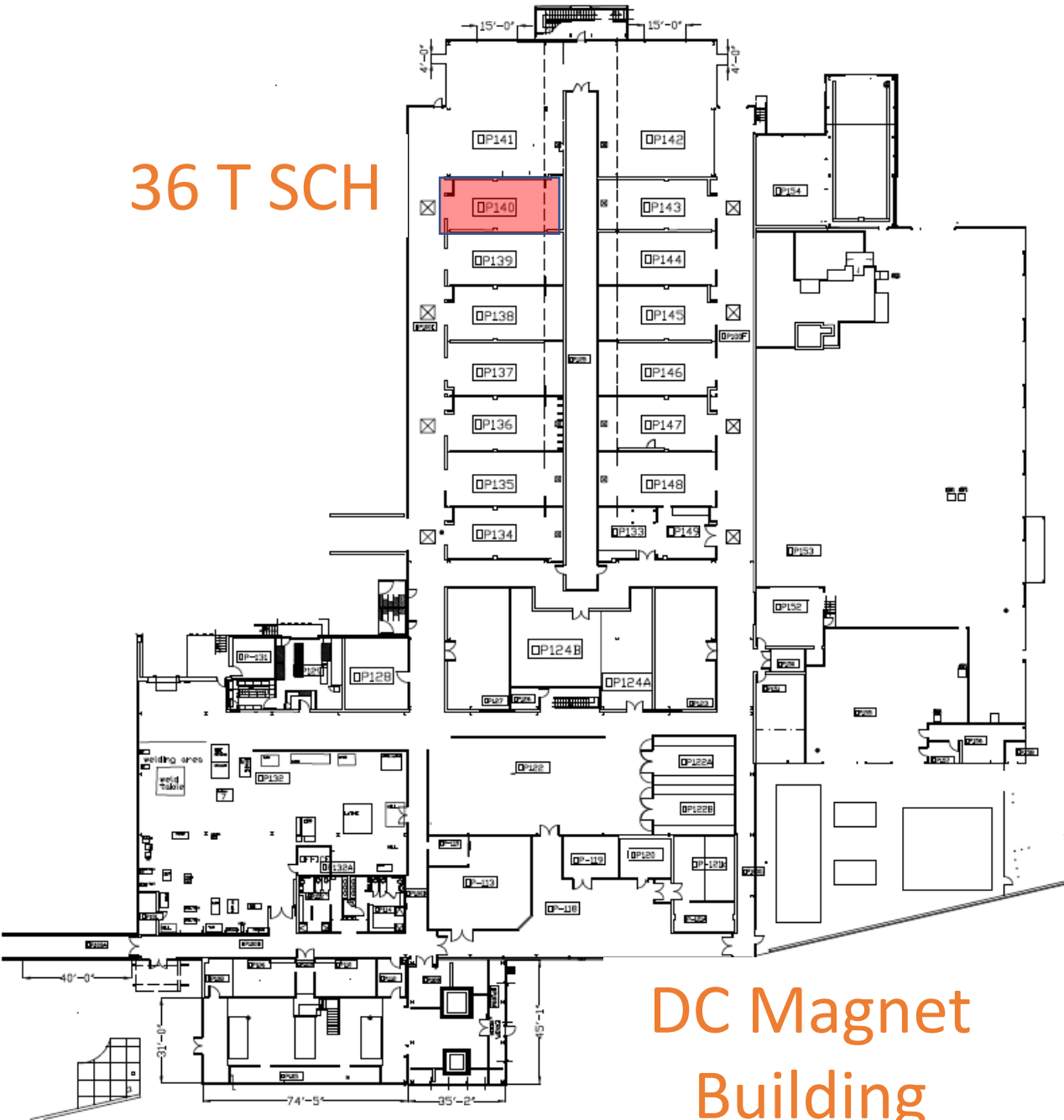
WR = WORLD RECORD

UN = SIGNIFICANT/UNIQUE INSTRUMENTATION

- SCH 36T/40 – DC Facility
- 900/105 – MRI
- 830/33
- 800/63 (2)
- 800/52 solution
- 600/89 (2)
- 600 DNP – FSU/AMRIS/EMR
- 600 Overhauser DNP
- 600/53
- 500/89
- 400/89
- 300/89



36 T SCH



DC Magnet
Building



The SCH in 3D:
<https://www.youtube.com/watch?v=PCcOCn7aDbA&t=4s>

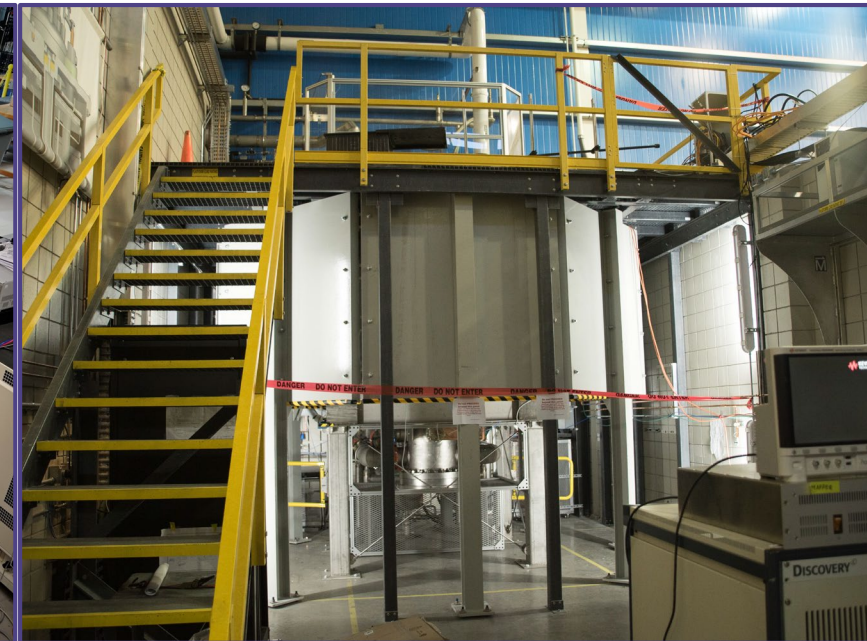


National Resource for Advanced NMR Technology

Solution NMR

MAS-DNP

35 T / 1.5 GHz



Sponsored by NIH NIGMS through P41 GM122698

NMRprobe.org



Workshop Agenda

Monday, May 23

Time	Event	Staff Responsible	Location
9:00 - 9:20	Arrival and badge distribution, lunch order (Jimmy Johns)	Jason Kitchen	Atrium / B101
9:20 - 9:40	Welcome, overview of agenda	Bill Brey	B101
9:40 - 10:00	Presentation - general information about NHMFL magnets and probes	Wenping Mao	B101
10:00 - 10:45	Presentation - probe circuits, including low-E design	Peter Gorkov	B101
10:45 - 11:00	Break		
11:00 - 12:00	Tour of NHMFL, photos during tour	Ilya Litvak	
12:00 - 12:10	Group photo	Stephen Bilenky	Atrium
12:10 - 1:00	Lunch, place lunch order for Tuesday (Tazikis)	Kim Mozolic / Jason Kitchen	Atrium
1:00 - 1:45	Presentation - Eclipse circuit simulation	Bill Brey	B101
1:45 - 1:55	Break		
1:55 - 2:30	Hands-on Eclipse circuit simulation	Bill Brey	B101
2:30 - 3:00	Presentation - probe building tools and materials	Jason Kitchen	B101
3:00 - 5:00	Spinner assembly demo	Peter Gorkov	C212



Workshop Agenda

Tuesday, May 24

Time	Event		Location
9:00 - 11:00	Cryo capacitor modification demo Hands-on benchtop NMR circuit	Faith Scott Jason Kitchen	C212 C213
11:00 - 11:15	Break		
11:15 - 12:00	Participant lectures (part 1) (~15 min each x3)	Blake Wilson, Jose Uribe, Cocoa Wang	B101
12:00 - 12:40	Lunch, place lunch order for Wednesday (Panera)	Kim Mozolic / Jason Kitchen	Atrium
12:40 - 2:45	Low-E coil assembly demo Hands-on benchtop NMR circuit	Peter Gorkov Jason Kitchen	C212 C213
2:45 - 3:00	Break		
3:00 - 5:00	Low-E coil assembly demo Hands-on benchtop NMR circuit	Peter Gorkov Jason Kitchen	C212 C213



Workshop Agenda

Wednesday, May 25

Time	Event		Location
9:00 - 10:00	Presentation - RF test equipment	Bill Brey	B101
10:00 - 11:00	Hands-on RF test equipment	Bill Brey	C212, C213, NM105
11:00 - 12:00	Participant lectures (part 2) (~15 min each x3)	Collette Xu, Jaekyun Jeon, Justin Douglas	B101
12:00 - 12:40	Lunch	Kim Mozolic / Jason Kitchen	Atrium
12:40 - 1:00	Survey	Jason Kitchen	B101
1:00 - 5:00	Hands-on session at 800 #1 spectrometer	Joanna Long / Ivan Hung	NM105





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Thank You!

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