

Welcome to  
Dark Sectors 2016!

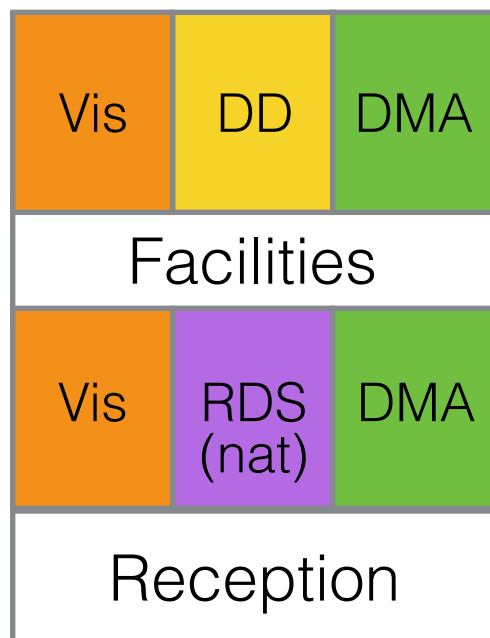
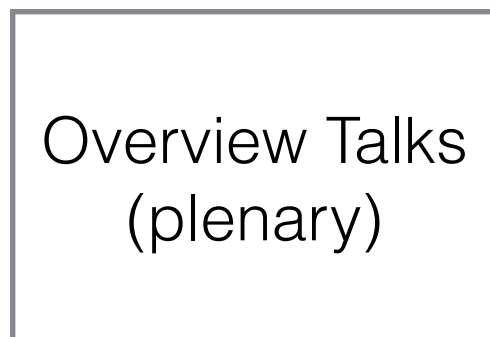
# Structure of the Workshop

- **Plenary talks:** short summaries of the state of the field today and **facility discussion** on Thursday afternoon
- **Working groups:** in-depth discussions, brainstorming, and short talks by physics topic (parallel)
  - Sub-GeV DM at accelerators
  - Sub-GeV DM direct detection
  - Visibly decaying dark photons
  - Rich dark sectors

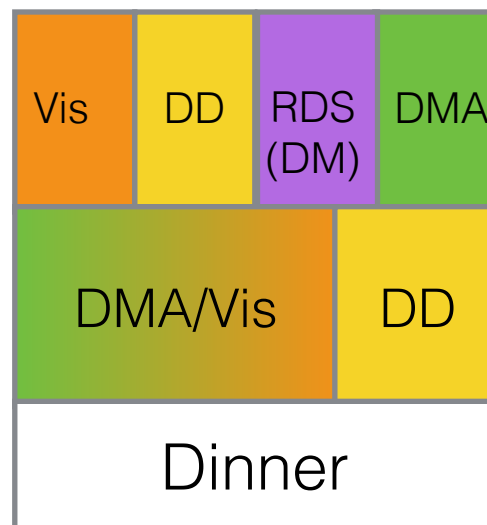
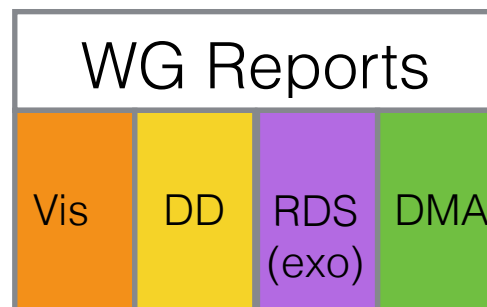
*recurring sessions throughout the workshop*
- Daily morning **WG summaries** (plenary) to keep everyone abreast of discussions & facilitate participation in >1 group (focus on key questions identified in discussion, areas of overlap among groups)
- **WG close-out summaries** Saturday afternoon (address vision for the next 5–10 years: what, why, and how)

# Agenda (birds eye view)

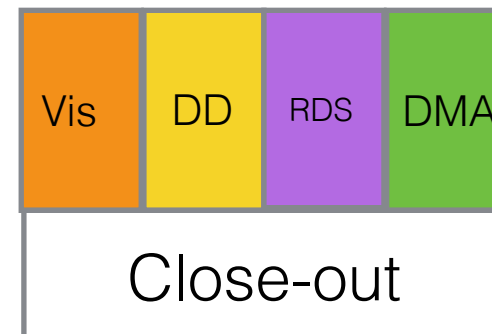
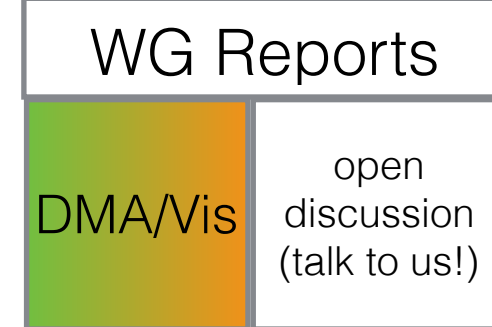
## Thursday



## Friday



## Saturday



# Working Groups:

## Some things to think about

Working groups are an opportunity to take stock of challenges and opportunities for the next decade.

- Are there *particularly well motivated* parts of parameter space? What does it take to reach these targets? e.g. thermal relic target for DM
- Are there *particularly challenging* regions of parameter space? How do we start reaching them? e.g. “Mont’s gap” visible dark photons with  $\epsilon^2 \sim 10^{-7}$
- What does it take to make a convincing discovery? e.g. distinguishing DM signals from backgrounds

# Working Groups: Some things to think about

- Are there “brick walls” to sensitivity that don’t just plague one experiment but are inherent to a common approach? e.g. systematics in visible  $A'$  search
- Will new facilities planned for other purposes open up new opportunities for this type of experiment? (e.g. DUNE, LCLS-II)
- Do we need something new from facilities?

# Working Groups:

## Some things to think about

- How can we broaden the kinds of physics these experiments are sensitive to – e.g. non-universal couplings, non-Abelian sectors
- Are there ideas from competing experiments that could be merged together to make a better one?
- What would constitute a game-changing experiment — even if you're not at all sure how to do it?

# Working Groups: Surprise us!

These are questions to get you started, but are not meant to be prescriptive!

If you leave the workshop with some new ideas to think about, we'll consider it a success!

# DS2016 Report

- In the last 5-10 years, the field of “dark sectors” has expanded dramatically
  - SNOWMASS '13 provided a snapshot
  - Many new results and ideas proposed since '13
- Would be good to capture contributions and results from this meeting as a reference for the community
  - Snapshots of ongoing/planned experiments
  - Outcomes of WG discussion



# Report Structure?

- **General Introduction:** Explanation of scope and goals of field with a couple summary plots of existing results with references. Edited by organizers and conveners?
- **Working Group Sections:** compilations of contributions in the WG sessions on new ideas and ongoing projects (i.e. like the summary pages already requested):
  - Sub-GeV DM at accelerators
  - Sub-GeV DM direct detection
  - Visibly decaying dark photons
  - Rich dark sectors
- **Conclusion:** Description of the salient findings of the meeting, largely articulating the content of the closeout sessions. Summarize future goals with a road map. Edited by organizers and conveners?

# Report Structure?

## **From each working group:**

- Snapshot of the field today
  - We already got a start to this by requesting experiment/new ideas summary pages from many of the people in attendance. Good response rate, but many still missing.
  - Can we enlist contributors to provide similar short summaries intended for a report (if they haven't already)?
- Perspective of the community
  - The WG morning summaries and close-out will aim to articulate this
  - Ongoing effort after the workshop to develop and refine this!

The organizers cannot do this alone!

It is important to decide on how to approach writing the report while we're here, and start on it in person... it's much easier to start now!

# Today's agenda

**12-1:30**

**Lunch (cafeteria)**

**1:30-3**

**DD**  
**(Berryessa)**  
super\*  
detectors

**DMA**  
**(Kavli 3rd)**  
MiniBoone,  
SBN, Daedalus

**VDP**  
**(Kavli Aud)**  
SHiP,  
SeaQuest,  
LHCb

**3-3:15**

**Coffee break (Kavli lobby)**

**3:15-4:30**

**Facilities overview (Kavli Auditorium)**

**4:30-6**

**DMA**  
**(Kavli Aud?)**  
DUNE/LBNF  
& SeaQuest

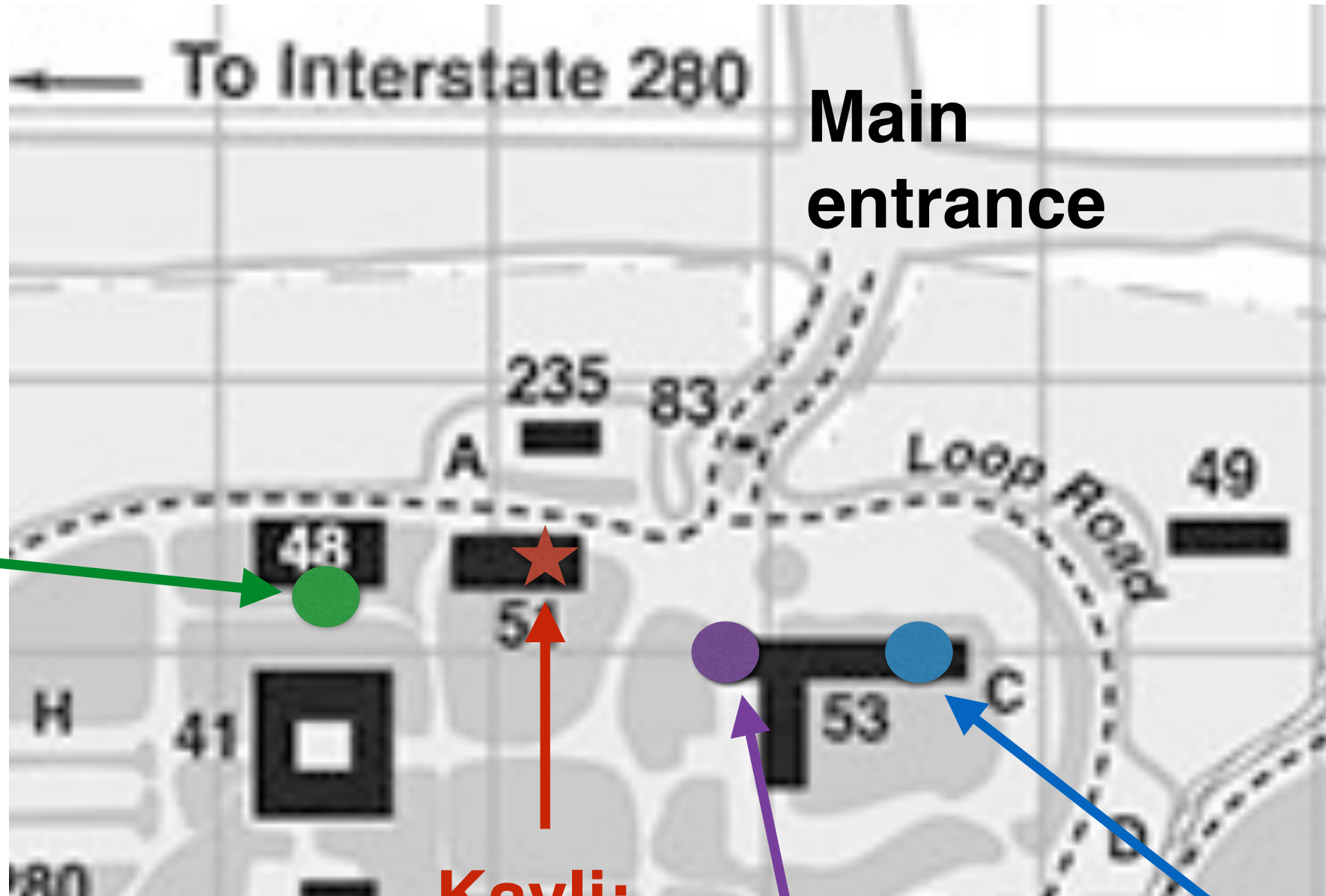
**RDS**  
**(Berryessa)**  
Dark Scalars  
& Naturalness

**VDP**  
**(Kavli 3rd?)**  
APEX, HPS  
+discussion

**6-??**

**Reception (ROB courtyard)**

# SLAC Map



**Reception**



**Kavli:  
Auditorium  
& 3rd floor**



**Berryessa  
(2nd floor)**



**Cafeteria  
(2nd floor)**

