

Organizational Details

<https://zzz.physics.umn.edu/lowrad/meeting7>

Reimbursement procedure: Use the form on the wiki or pick up a form at registration. Fill out and return to Jody Kaplan by email or snail mail.

All talks must be uploaded to wiki BEFORE you speak (for remote participants)

Upload them yourselves or give memory stick to the student representative

Family	First	BQT 03.20	Guest?
Auty	David	Beef	N
Bunker	Raymond	Beef	N
Caldwell	Thomas	Beef	N
Chen	Yu	Beef	N
Cooley-Sekula	Jodi	Eggplant	N
Cushman	Prisca	Beef	N
Fritts	Matthew	Beef	N
Gerling	Mark	Beef	N
Hall	Jeter	Eggplant	N
Hoppe	Eric	Beef	N
Vazquez-Jauregui	Eric	Beef	N
Langford	Thomas	Beef	N
Lawson	Ian	Beef	N
Lindsay	Sarah	Beef	N
Loach	James	Eggplant	N
Mei	Dongming	Beef	N
Miller	Eric	Eggplant	N
Pepin	Mark	Beef	N
Piastra	Francesco	Beef	N
Qiu	Hang	Beef	N
Reisetter	Angie	Eggplant	N
Robinson	Alan	Beef	N
Schnee	Richard	Beef	N
Scorza	Silvia	Eggplant (no garlic)	N
Selvi	Marco	Beef	N
Szydagis	Matthew	Beef	N
Tripathi	Mani	Eggplant	N
Villano	Anthony	Beef	N
Zhang	Chao	Beef	N

MEALS

Chez Leon

Is your name here? Is your menu choice correct?
I can add more people, just let me know.

Pay at the restaurant. There is a fixed price for food
and gratuity, which will be reimbursed.

No receipts needed.

Wine is available for purchase at Chez Leon,
but cannot be reimbursed

Saturday Working Pizza Lunch

Need a head count today.

Assay and Acquisition of Radiopure Materials

The **AARM Scientific collaboration** is open to all interested parties

Original Goals were tied to Homestake: AARM was a 3-yr DUSEL S4
Characterization of backgrounds at all levels of Homestake
Design a common low background counting facility: **FAARM**
Develop common screening tools (R&D as needed)

Current Goal is to forge an alliance between experiments searching for rare events, to help understand and mitigate backgrounds.

Simulation recognized as a major “infrastructure”

- Validate and improve current simulation tools

- Apply to specific experiments and underground sites

Background characterization more broadly defined as

- New low background techniques

- Neutron benchmarking (data vs sim)

- Integration of existing assay resources around the world

 - and the development of a unified plan to increase availability

- The Community Assay Database is a vital part of this.

Organization of AARM

We are split into Working Groups with very specific tasks

You can always go to the Group Wiki to learn about it and to join meetings

http://zzz.physics.umn.edu/lowrad/#working_group_wiki_pages

- Community Assay Database
- Cosmogenic Simulation Group
- Depth Task Force (Cosmogenic neutrons
vs depth vs technology)
- Radiogenic Cross Section Working Group
- FLUKA-Geant4 Comparative Study Group
- Neutron Benchmarking Data Group

Results from the working groups will be presented today, but the breakout sessions do not map directly to the working groups. We are planning the future of the AARM collaboration and the breakout sessions are laying the groundwork for this plan and can make use of the work done by the working groups.

“Integrative Tools for Underground Science”

Principle Investigators

Priscilla Cushman (University of Minnesota)

Jodi Cooley (Southern Methodist University)

Toni Empl (University of Arkansas, Little Rock)

Angela Reisetter (Evansville University)

Richard Schnee (Syracuse University)

A 2-year proposal ending this October to continue AARM work in following areas

1. Development of community-wide simulation tools,
2. Confirmation of simulation physics models and cross sections relevant to underground science by comparing to data worldwide and supporting specific efforts in neutron benchmarking,
3. Establishment of a Community Materials Database
4. Continuation of the integration workshops centered around simulation, material screening, and underground physics.

What should we do next?

Natural Radioactivity in Shielding Materials and Detectors

Simulation

Codes and frameworks

General Physics models and processes

Advances in specific detector physics (e.g. noble liquids, or photon physics)

Nuclear cross sections and new experiments to improve nuclear data

Databases (e.g. alpha-n etc)

Assay

Assay techniques and advances

Facilities and access

Materials database (incl. identification of vendors)

Background Reduction

Radon abatement

Cleaning and Handling

Purification Techniques (cryogenics, water, scintillator, noble liquids)

Cosmogenic Effects

Muon distributions

Parameterization and physics

Site-specific distributions, MUSUN

Cosmic Ray physics: bundles and modulation effects

Muon-induced neutrons

Simulation

neutron yield and physics models (FLUKA v GEANT4)

multiplicity, depth study

Benchmarking

Experiments that allow comparison

Simulation of those experiments

Cosmogenic Activation

Nuclear physics and experimental confirmation

Material storage underground

Organization and Shared Resources

Shared User Facilities for screening

Populating and regulating the Materials Database

Simulation tools

Creating a community for shared resources and information - future of AARM

Summary Schedule of the Workshop

Wednesday Afternoon Talks

Introduction and Working Group Status Reports, Community Assay Database
Experiment Screening Programs and Background Reduction

Thursday Morning Talks

Low Background Facilities and Techniques
Neutron Detection and Benchmarking

Thursday Afternoon Discussion

Together: Consortium and AARM Future
Breakout: Identify Topics and Tasks

Friday Morning Talks

Simulation (cosmogenics, noble liquids, backgrounds)
Simulation (general updates on Geant4 and FLUKA, tools)

Friday Afternoon

Talks: Understanding radiogenic backgrounds
Breakout: Prioritize topics and Plan Future Work

Saturday Morning

Reports from the Breakout Sessions
Consolidation and Prioritization of tasks from the Breakout Sessions
Discuss concrete proposals for AARM, Consortium, Integration initiatives
Continue over Pizza (Head Count)