

# Heavy Quarks Working Group

Oct 31 Phone Conference

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# Phone Meeting Agenda

1. Goals of Workshop / Goals of Working Group
2. Discussion of Physics Topics/Questions to receive focus
3. Input to the Working Group
4. Plans for Workshop meeting / parallel sections / posters
5. Plans for open discussion session at the Workshop
6. Preliminary thoughts on the Working Group report

# Goals of Workshop / Goals of Working Group

- From the DOE charge
  - Identify the most exciting opportunities to carry out experiments on the intensity frontier for our future planning.
  - Identify these opportunities, explain what can potentially be learned from such experiments, determine which experiments can be done with current facilities and technology, as well as determine which experiments require new facilities or new technology to reach their full potential.
- Working Group goals
  - To survey the status of heavy-quark flavor physics, to explore the reach of experiments studying strange, charm, and bottom quarks for new physics, and to clarify the value of these experiments during the LHC era.
  - To conduct a lively and well-attended workshop meeting, which will give the community interested in this physics an opportunity to impress DOE with its strength
  - To document the physics opportunities in a report
  - To avoid unproductive competition between different groups, and to steer clear of DOE politics; there will be no ranking of experiments and no discussion of priorities

We will not be able to satisfy every request for time, or act on every good idea. There are limits on time, and there are many topics and experiments to cover.

# Discussion of Physics Topics/Questions to receive focus

1. Is heavy quark flavor physics really needed in the LHC era? If LHC discovers new physics, how will flavor physics help to interpret it? What if LHC finds nothing new?
2. How do studies of strange, charm, and bottom quarks complement one another?
3. Are there enough cross-checks of experimental results in the currently planned program? For instance,  $B_s$  measurements from LHCb may not be accessible to other experiments; is one measurement of  $K^+ \rightarrow \pi^+ \nu \bar{\nu}$  enough? Etc.
4. What accelerator or detector R&D is needed to enable this program?
5. What facilities are needed?

# Input to the Working Group

- We have invited 14 experimental groups to submit short (six page or less) documents , to provide a concise discussion of their physics opportunities, important issues, realistic schedule etc.
  - Most useful by mid-November (Nov 11 target)
- We have also invited a group of theorists to submit 1-2 page short written contributions to identify key issues and motivations for heavy quark flavor physics.
- Such contributions are welcome from any source, not just those we have specifically invited.
- This is the best way to contribute to this working group before the workshop.
- We expect that these written inputs will provide an important resource for the working group report.

# Plans for Workshop meeting / parallel sections / posters

- Parallel sessions afternoon of Nov 30 + all day Dec 1
  - We have communicated with 14 experimental groups and we expect representatives of at least 11 to attend.
  - We will need to cover these experiments/initiatives in a series of presentations.
  - We want to include a few well-chosen theory talks.
- To create more opportunities, especially for younger participants, poster sessions are being considered.
  - The neutrino community is likely to take advantage of this; will ours?
- We tentatively plan to reserve about 2 hours for “discussion” near the end of the second day.

# Possible Talks

- Theory Talks
  - Quark flavor physics in the LHC era, what have we learned, what's interesting and why, depending on whether the LHC does (does not) see BSM. Correlations between B/D/K/lepton observables, patterns of deviations from SM, etc. What could flavor teach about high energy physics?
  - Lattice QCD
  - Opportunities with kaons
  - Opportunities with B decays
  - Opportunities with charm
- Experimental Talks (grouped by K's, B's, and charm)
  - Six kaon experiments/initiatives to be covered (NA62 at CERN,  $K^+ \rightarrow \pi^+ \nu \nu$  at FNAL, KOTO at JPARC, TREK at JPARC, KLOE-2 at Frascati, K's at Project X)
  - Three B-physics experiments/initiatives to be covered (LHCb, SuperKEKB/Belle II, SuperB)
  - Three charm experiments/initiatives to be covered (BES-III, Panda at GSI, pbar's at Fermilab); plus charm capabilities of the B-experiments

# Discussion Session

- Possible approaches
  - Open discussion on a few predetermined topics or questions
  - Short (e.g., five minute presentations) from volunteers
  - Panel discussion
  - Open mike



# Working Group Report

- This needs to be no more than 40 pages, probably 25 to 30 is a good target. It should be completed roughly by the end of January.
- It should review both the theory case and experimental opportunities, presenting the “best foot forward” for all initiatives.
- We have discussed, but not arrived at, an outline for the report.
- The “authorship” policy is a broader issue than for just our working group. An inclusive policy to include all contributors as co-authors, with some opt-in or opt-out mechanism, is expected.
- To maintain a smooth process and coherent document, we believe the co-conveners must exercise editorial control.
  - Assistance may be sought on various sections, but it would be premature to consider “writing assignments” now
  - Drafts will be posted for broad comment and feedback.