

Kevin Huffenberger: Hard time understanding MM synergies plots; What is the difference between the top and bottom?

- Separated between physics topics (stuff DOE cares about) and astrophysics topics, which we need to understand better to really study physics topics
- Jordan: Label what each of the plots was on the picture so you don't have to go back to the caption
- Glennys thinks all the lines and things are not graspable and the reader may give up
- Make clear difference between fully funded and partially funded program

Steve Allen: Is there an opportunity here to connect to priorities highlighted by the decadal survey? One of the mission concepts highly rec was a med size concept to study transients (particularly GW). There does seem to be a lot of overlap here. Strengthened by nodding to their recommendations and more inter-agency collab?

- Jordan Goodman: ASTRO2020 suggested time-domain committee for what NASA should be doing in this field (DOE, NSF, and NASA to be a part of this); make recommendations what we need and what should be coming out of this
- Steve Allen: Do you think we are fully catalyzing on that strong endorsement? Such a recommendation could carry strong weight and we should think very carefully is that resonance is something that could be front and center
 - Sathya: we have included everything that pertains to high energy physics. We have not necessarily used "Transient Astronomy" because we didn't want to use Astronomy in the report. But also wanted to make independent recommendations and not rely on what the Decadal said.
 - Jordan: It's important to point out that the DOE was involved in Fermi, so there is precedent for their involvement. We need to tell them that we don't always know what we will discover and that they should be part of that. Time domain will tell us things about stuff we've never thought about before, e.g., LIV and ALPs.

Aaron: What are the things that were recommended by the decadal survey and what do we get "for free" from what the astronomy community is doing? What are the science opportunities?

- DOE likes to fund their scientists and there isn't a lot of money to fund analysis of non-DOE projects. What science are we missing out on because of this? Highlight what's missing in these constrained budget scenarios
- Pat: DOE should fund people to work on things that aren't necessarily DOE projects

The black words of the MM plot are the important part, and you want to de-emphasize the lines (no colors)

- Maybe make a table version?
- Make it more simple; show that all these probes go to all these science projects
- Increase size of font?
- Just say all rely on cross correlations and drop the lines entirely?
- Tim suggests splitting the lines closer to the messenger themselves so fewer lines in the center

Marcelle: based on our parameters, how would these experiments contribute to the multimessenger paper? Would help us connect this story of the cosmic frontier connection to the broader community outside this room. What do we learn by getting extra bit in UHE bins for neutrinos, e.g., that we might not otherwise have learned

- Like the DUNE hierarchy figure... Adding how the cosmic frontier would add to this; error bars to show contribution, etc., in a complementary way
- Luis: Most of this was really discussed in the neutrino Frontier (lower-E stuff), which is why we didn't include it here. We were only addressing here the questions coming out of the white papers being submitted to us.
 - If we need to make some statement on this, how should we proceed?
 - Ben Wallace: SM organization is somewhat biting us back since we could not cross-submit WPs. This has happened for several science topics when they span multiple groups.
 - BW: Why does Neutrino plot cut off at keV? You should try to extend this figure for the cf7 report (Cosmic neutrinos expected at the meV)
 - Cosmic Neutrinos covered by NF "Neutrinos from Natural Sources"
 - We should not pull just from the WPs that were submitted to us; we should feel free (according to Tim) to pull whatever we need
 - Grab things out of CF/NF XF discussion Friday morning
 - Glennys REALLY wants us to go get Ptolomy (?) and not trust that cosmic neutrinos is being adequately reported in another Frontier
 - Though we did not go into a lot of details of science that was covered more specifically in another report
 - Pat argues we want maximal overlap between Frontiers. Science in multiple Frontier reports is more supported science
 - Other topics where we could try to do the same thing; not just neutrinos
 - Rana: Like EF and connections with the QCD community; although in our report we mention some connections to that frontier, not sure they have the same interests in neutron star physics.
 - Do we need to be going to them and making presentations, etc?
 - Go to XF meeting and make this case to them to strengthen connections. Make contact with CF-EF Liaisons to facilitate this

Tim: Keep focus on the science, not just the facilities that could accomplish them. What's the bottom line? What kind of science do we get out of these facilities?

- Difference between capabilities of instrument and the science we want to reach

Ke wants to poll the cosmology experts in the room about the H0 plot. We have interesting overlap with CF4-6 in this aspect about H0 and Lambda CDM measurement/history of Universe & cosmology. We have emphasis about GW as standard candle as additional probe. Is this figure a fair way of sorting this information out?

- Julien Guy: In CF4 report there should be an additional paragraph about what the new measurements will be and how to go about this (currently being ignored)

- Some tensions not included in the report because it would become too long, but say there are lower significant anomalies and point to the relevant white paper about that
 - Don't want to lose main message
- Ben W: Not only work to be done on theory/pheno side, but also work to be done on systematic side. This needs to be made clear, not just name the tensions
 - This plot clearly shows the bias of the people who have made it. For the report, it might be beneficial to simplify; not 100 different lines. Group things like the sirens together— broad categories. Show a cartoon version of these discrepancies.
 - Luis: Argument against this is how to pick which measurements we select. Future measurements can solve this situation, but this was voted against in the source WP. Not all the points are here in the first place. Cutting this plot won't be showing the view of the community
 - BW: Why not just refer to the WP where it is for the details? Can it not be condensed/simplified to make the point that there is that tension for messaging purposes to the larger community?
 - Natalie Roe: Refer to the Particle Data Group for this problem? Could this publication meet our needs?