To Follow Up from Workshop

To Follow UP

- Primordial magnetic fields - Levon
- Cosmic birefringence constraints - Levon
- Axions - Grin
- High \ell + Neff - Green
    - How much sky is it reasonable to assume for Neff predictions
    - other high \ell science beyond Neff?
    - articulate the complementarity of low \ell PICO and high \ell ground
    - Rayleigh scattering improves Neff - Daan
- neutrinos
    - Joel will do forecasts with Euclid-BAO, and Euclid+DESI
    - check/quantify whether LSST z's are good enough for cluster cosmology
- Francis-Yan
    - run forecasts for PICO? Anything special to space?
- Dust in high z clusters - Jim + Jean Baptiste
    - how does the bias in cluster count affect cluster cosmology (e.g. neutrino, DE)? Jean Baptiste agrees that this needs to be quantified.
- Galaxy evolution models using the tsz, ksz and lensing signals (baryons).
    - what galactic evolution models does PICO rule out
    - find a succinct compelling way to quantify 'feedback'
- dark matter annihilation + energy injection - Yacine
    - PICO Forecasts? Impact of new upper limits?

To Follow UP

- Colin’s Temperature pipeline
  - what science is enabled specifically with the high frequency bands?
  - Colin - what else do you think is useful?
- What does PICO add relative to CCAT + S4 or, PICO + CCAT + S4?
- prospects for including foregrounds in lensing/delensing forecasts - Alex?
  - Alex - what else is important?
- Cross-Correlations - Marcel
  - any new information by correlating to anything other than LSST?
  - Do forecasts for PICO please?
  - complementarity with JWST?
- Reionization - Marcelo and Nick
  - What’s next?
  - use pico high frequency to clean CIB and use ground high \ell for ksz (for z, deltaz plot; are we happy with this parametrization in the first place?)

To Follow UP

- Galactic Magnetic fields (GMF)
  - Susan - We should be able to point PICO's ability to distinguish between models of large scale GMF. Can we make that point clearer? with e.g. a figure and text?
  - Cloud collapse and star formation efficiency is complicated. What is the best way to relay the science deliverables?
  - Is there a clearer way to connect the simulations to the forthcoming data? How will the forthcoming data be used to constrain the simulations?
- NextBASS (+ Matthieu's work) - a possible descope?
- Foregrounds
  - push ahead with analyzing the full sky models, include 85% (fake) delensing. Any real delensing?
  - How much of the sensitivity can we realize on small patches? Are we foreground or noise limited?
  - What's the next step with realizing small scale foreground complexities? Is it a high priority?

To Follow UP

- Report Structure
  - An overall thread for some of the ‘extragalactic’
    - ‘baryons, star formation, mass’
    - perhaps more broadly ‘structure formation and evolution’
  - Presentation of complementarity to include with other surveys, not only sub-orbital.
    - discuss complementarity in relevant science section, but also highlight in a separate dedicated section
- Galactic Science Poster
- Potential for papers?
  - Gianfranco, point sources
  - Jim’s point about ‘overall framework’, e.g. CORE

Imager Related Issues

- 1/f
- ADR and temperature stability - effect on responsivity
- Focal plane mass
- Scan strategy: precession speed
- TDM, FDM noise
- TDM, FDM and Cryogenic loading
  - what loads each temperature stage? wiring? radiation?

Ritz-I

- JWST now scheduled to have launch readiness date of May 2020 (but there is an independent panel re-assessing this date).
- NASA is concerned about doing the decadal panel while JWST hasn’t finalized yet.
- Decision expected within a month or so.
- CAA is proceeding assuming the panel process will start in 12/2018.
- In departure from previous practices, they will issue call for white paper with 1-2 months. Papers will be due ~12/2018.
- They will only issue the call after the panel schedule is known.
- These are ‘science white papers’, not project papers. They should give the science goals, and measurement capabilities, but not necessarily advocate for a specific project.
- Who makes the decision about the final schedule: the agencies, mainly NSF and NASA. DOE participates, but has a smaller stake.

Ritz-II

- White papers are ~5 pages
- From beginning to end the decadal process is ~2 years.
- There will be a CATE again, but with somewhat different rules.

Final Panel Discussion-I

- Tension/Complementarity with Other Projects
  - PICO is powerful with clusters, but what about CCAT+S4? Colin Hill argues that this should be looked at carefully. Perhaps include Niemack in the discussion.
- There is a lot of talk about ‘feedback’ and feedback is important. Boulanger (and Colin?) say quantifying it succinctly may be difficult.
- Charles points out that many people in other parts of the EM spectrum are claiming to constrain feedback; we should be cognizant that we may not own this.
- Paper on feedback could be common to a number of communities.
- Discussion of Decadal Review White papers
  - First round of papers are science oriented, not project oriented.
  - Is there a reason to have separate PICO/S4 set of papers? Perhaps not. Papers can highlight the science, not with which project to get to it.

Final Panel Discussion-II

- When project papers are submitted then it may be the time to submit an additional write up on space/ground complementarity.
- Suzanne:
  - “let’s not present to the decadal panel a battle between space and ground”;
  - “S4 would certainly feel less threatened - and therefore more open to supporting space - if the PICO project wouldn’t push for prioritization in the next decade”;