SIG 1 Virtual Meeting #2, July 14th, 2015
Amy Lo's Notes

Caveat: I summarized comments rather than type verbatim, hopefully got the gist right. My apologies for any inaccuracies. The chat transcripts are shown in italics and should be verbatim.

Dashed lines separates discussion topics; italics indicate comments from on-line chat. I've tried to place them in context of the voice discussions, at least chronologically.

Attendees: bunch of people at Bern, the system shut down before I could get the list, sorry.

Bern: Hey ho, Bern is on Adobe Connect. Working on the sound.
Scott Gaudi: We have the Bern contingent!

1. Presentation by Scott: notes only contain info not in explicitly Scott's charts

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Meeting structure

- 1:00 – 1:30 intro & summary
- 1:30 – 2:30 discussion of remaining issues
- 2:30 – 3:00 discussion of joint executive summary
- 3:00 – 4:00 report outline, path forward, writing assignment

Welcome people at Bern, enjoying their wine and cheese
Bern: No cheese. Just wine and crisps.

Overview of Paul's charge
Scott got clarification from Paul:

- a large mission is defined as anything >$1B
- also got a question on whether there is a maximum cost to the missions, Paul welcomes inputs

Due date Oct. 8th for report
Suggested report format

- describe process
- brief description of response
- procedure and criterial used for PAG analysis of community response
- outcome of analysis & final small set of mission concepts, every mission concept that is retained, added, etc., with a short rationale
- additional considerations, if desired, info on probe class missions

Constraints/assumptions

- missions to follow JWST & WFIRST
- Gravity Wave space based observatory is partnering with ESA on LISA
    - NSA has Study participation & Tech development
- CMB polarization surveyor is probe class
- Assume 2010 decadal priorities are going to be followed

What is NOT in our charge:

- Detailed science goal/requirements
- Detailed architecture/technology requirements
- Advocacy or advice
- Prioritization of missions
- Ownership of mission
- Pre-populate the STDTs

Bern: Attendance here in Bern: Aki Roberge, David Ciardi, Daniel Apai, Nick Cowan, Avi Mandell, Maggie Turnbull, Bill Sparks, Steve Unwin
Peter Plavchan: Peter PLavchan called in from hotel...

Bern: Oh we do have cheese.
Bern: And Mark Clampin

Paul is not looking for specific science drivers, not looking for advocacy, just looking for identification of missions.

Upcoming meetings: Joint PAG splinter session at IAU, 1-5 pm
1 more virtual meeting, should be a clean up meeting on Aug. 18th

ExoPAG points of consensus (circulated via email by Scott)

Summarize results from Meetings

- COPAG SIG2 UV/VIS meeting
    - Scott presentation not well received
    - COPAG SIG struggled with understanding the HabEx mission definition and requirements and did not think they should recommend it at the level of LUVOIR
    - Subsequent discussion with Ken Sembach indicated COPAG will not make that statement in the summary
    - Scott suggests this may affect how we define science cases given this sentiment in COPAG

  David Bennett: It would be nice to have more details on this COPAG SIG2 "pushback" on HabEx. Who was complaining and what did they say?
- HEAD meeting
    - PhysPAG agrees with the 4 mission being studied
    - Primary differences in probe mission response, PhysPAG thinks Paul should request for ideas for probes
- Speaking to Paul, he emphasized analysis no advocacy

Steve Unwin: Scott: This is Steve Unwin. Regarding probes. DO we know what Paul plans to do with probe recommendations?

Bern: More in Bern: Rus Belikov, Eduardo Bendek

Suggested topics of discussion

- Representation and structure of STDE
- How do HDST/ATLAST/THEIA fit in

- Specificity of science goals for various missions
- Content of the table of mission parameters
- Executive summary
- Path forward

Discussion

Dave Bennett: more on the COPAG pushback?
Scott: don't want to dwell on the details, largely resolved with Sembach, but basic discussion that followed Scott's presentation at COPAG is: what is the main difference between HabEx and LUVOIR? I said, mainly aperture (8m) and cost. Brings in a lot of trades on technology. Got some pushback because people did not agree on various things, 1 of which is that HabEx would be less expensive than LUVOIR. Would bet that it is cheaper, e.g. something like a THEIA mission is likely to be less expensive than LUVOIR.

Bern: No takers on the bet
Shawn Domagal-Goldman: That was a decent description of the push-back.

Dave: isn't the main point that LUVOIR is a big mission with many goals and HabEx is an exoplanet science mission?
Scott: that's not clear. Given a coronagraph, generally something with a smaller aperture should find fewer planets. But throw in a starshade and it could change, a smaller HabEx with a starshade may be as capable as a larger LUVOIR [with a Coronagraph]. It could be that we want something more capable with the exoplanet science and less capable in the UVOIR science.

Shawn Domagal-Goldman: A lot of this revolves around the specific numbers in the HabEx architecture example Scott has been using in the slides on the mission.

Scott: part of the discussion/controversy have been because things have not been super well defined, but I think we shouldn't have it well defined, we should bracket the range of possible science.

SALLY HEAP: My handwaving icon is frozen. I'd like to commen on 8m vs 12m

Karl Stepelfeldt: has this been circulated widely, haven't seen anything.
Scott: Shawn has been trying to put this on a webpage, JPL & ExEP is working on that and it should be available.

Karl: want to continue on issue on representation of difference science community [in the STDT]. We want to make clear both missions are driven by habitable planet requirements, we can't relax that. But in your summary, LUVOIR may be underrepresented. In WFIRST, we only had 6 exoplanet representation [out of 20(?)], and it's worked out, so why would we think representation is a problem?

Scott: Dave and I have struggled a little with WFIRST science team to maintain the fraction of time for microlensing, and have heard WFRIST science team members say “we all know this is a dark energy mission”, so we have first hand experience, and can see this happening for LUVOIR.

Karl: would be good to have some reference to WFIRST, and some wordsmithing.
Jeremy: key is upfront when you formulate the basic mission scenario to get the time you need [to bake it in].

David Bennett: Just because you are paranoid doesn't mean that you are wrong.
Tom Greene: The decadal survey never intended WFIRST to be solely - or even mostly - a dark energy mission!
David Bennett: Right, Tom, but the dark energy advocates don't see it that way
Tom Greene: Dave, I don't doubt that, but the record shows that dark energy probes went nowhere (think JDEM, SNAP), until dark energy + exoplanet microlensing + GO wide field was all rolled together.

Scott: the technology for exoplanets is challenging, so you can image when push comes to shove, the challenging technology get eliminated.

Bern: (Nick) regarding HabEx, according to High Energy astronomers (Nick’s wife), they really like HabEx because they think it would come out cheaper [than LUVOIR] so it would leave more room for probe class missions that the High energy folks get really stoked about. It’s good to have these different pipelines, the cheaper and less capable may be preferable.

Scott: 1 possible future is a less expensive flagship and a line of probes! Or we double the astrophysics line and do the really big flagship and a line of probes! I think we should bracket the possible futures and make sure we are as prepared as possible, rather than guess for 1 or the other.

Sally Heap: weigh in on the 8m vs. 12m, not persuaded that either is the [right] answer [for future exoplanet missions]. We’re not going to get many earth-size planets with either, so we should look at this as a pathfinder. GMT is seven 8m telescopes, and one can visualize something like this in space that would be definitive for habitable planets. Our recommendation should be a pathfinder.
Scott: we could potentially put this in the report, but…

Bern: Aki here: I disagree Sally

Dave Ciardi: WRT to this report, just say in this report that the STDT needs to address this from the POV of exoplanets, and start moving away from the advocacy of mission. We would be ok with LUVOIR if it can do the science.
Scott: we’re getting a little away from the point… let’s continue to talk about the structure of the STDT.

Dave Ciardi: We don’t have to define everything here in this report

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Aki: on quoting % [exoplanet participation] for the STDTs, there seems quite strong support. I am a strong supporter of that. The point is we don’t completely trust what will happen if we are minority

partners in LUVOIR. This is what Scott said happened in WFIRST. Paul doesn't have to do what we say, but we should say what significant representation looks like.

Shawn Domagal-Goldman: I'd like to hear from the Bern contingent on the international participation on this. They're at a meeting designed to help work that sort of thing out. Are there any developments?

Scott: Paul said he doesn't want specifics, so I see two options. 1) say what our concerns are, e.g. 20% exoplanet participation is significant enough representation.

Aki: speaking for myself, I want to also carry planetary science along with us. They're not called into this, so they may not know [what's going on].

Tom Greene: Comment re. representation: I think that we need enough people on an STDT to develop a robust exoplanet program without having a specific quota of people.

Bertrand Mennesson: My main concern regarding LUVOIR is to make sure that exoplanet science is driving the mission design. We can convey this in different ways in the report, through that exact statement and by recommending some minimum fraction of the LUVOIR STDT

Scott: 1 pushback I did get is that we ARE a minority science. But that may not be true in 10 years.
Aki: the fact that they are saying that [shows they think this is] a representative democracy, that isn't what we want. There ARE fewer of us [but it doesn't mean the science is lesser].

David: I agree with Aki. Strategically, we should ask for more than you expect to get. They'll push back, but then we may get a reasonably representation.

Shawn Domagal-Goldman: I'd argue we also need the planetary scientists to do the optimize the science we get from the mission.

SALLY HEAP: To quote from HDST report (p. 47), "HDST's primary goal is to detect and spectroscopically examine dozens of exoEarths in the stars HZs". So we have two teams with the same scientific goal. The difference is how to achieve that.

Scott: I suggest we clearly state our concern, in particular we are concerned with the makeup of the team. And the science goals of exoplanet is on par with cosmic origins and team makeup should reflect that. A minority of exoplanet scientist would not represent this.

David: strong overlap of both contingents.
Scott: Aki, can you write a paragraph to that effect?
Aki: ok.

Karl Stapelfeldt: We have analyses showing that exoplanets would need 2.5 years of the LUVOIR mission. If its lifetime is JWST-like (5 years requirement), that's half the mission to exoplanets and thus half the STDT should be exoplanet scientists

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Maggie: do we agree to put in a statement on financial support?

Scott: does anyone disagree?

Karl Stapelfeldt: STDT members always have travel funding paid, do not need to ask for that. Asking for salary would be a departure from past practice

Bern: Need salary
Bern: That's sort of the point

SALLY HEAP: Karl, When I was part of the TPF-C study, my salary was paid by TPF-C.

Shawn Domagal-Goldman: It's not just the soft money scientists. I've heard the same concern from University-based scientists that are not "soft money."

Karl Stapelfeldt: The HQ model is that home institutions pay salary support for work on national committees. Works well for people at large institutes, not well for those at small ones.

Maggie: if we don't put in a statement, it would preclude a lot of people who don't have institutional support
Scott: can you write a paragraph? State the concern, and how to ameliorate.

Karl Stapelfeldt: Exo-S and Exo_C were prohibited from having foreign involvement . Would be nice if a new ITAR regime allowed a different policy.

Scott: international participation? This was Steve Unwin's thing.
Steve Unwin: Paul was concerned about having international members in a process leading to the Decadal. I suggest that they are invited to the meetings and then can take back information to their home institutions.
Scott: do we just make the meetings open?
Steve: similar in intent.
Scott: can you draft something about international participation?

Eric Smith: Regarding ITAR, we just went through extensive discussions with State Dept and DoD for JWST. It was clear that large optics would NOT be moved off ITAR list. We got the instruments moved over to Commerce EAR.

Scott: independent and uniform cost analysis is probably already covered.

Rus Beliokov: {missed this, sorry Rus, I think it was to do with more on the COPAG controversy}
Scott: optical/UIR community is not particularly interested in anything less than 8m, as they'll have JWST. That's reasonable. If you want to make progress, you want something new. It's not clear HabEx will do something new for them.

Karl Stapelfeldt: Habex might do wide-field optical imaging, this would be new from space
David Bennett: Karl, WFIRST will probably have one filter in the optical

Scott: as the next few years unfold, and we get a sense of what is capable, then discussions of the best strategy forward would be more well informed.
Aki: when you said that we have a resolution to this with COPAG chair, does he have the community lined up?
Scott: I can show you the exec summary and Ken said he'll run it past his EC. As far as I can tell, he has them lined, or he's going to line them up. So far Ken and his EC is on board with no prioritizing. It's clear a subset of the community is just no interested in HabEx. But it's not in our charge to deal with.

Bertrand Mennesson: regarding LUVOIR, make sure this mission can be for exoplanet science. We need to express that clearly. If the goals are clearly expressed, then the team will follow.

Scott: Bertrand can you work with Aki to work on the paragraph?

Shawn: want to verify that when we can, we should not assume solutions. So we want to say [exoplanet science needs to be] equitable, but not suggest 50%. For financial point, do we want to make sure we want to be valued, or is it to make sure folks from smaller institutions can participate? For the cost analysis, we should say what our concern is, not suggest aerospace or something as the people to do the analysis.
Scott: I agree
Maggie: I'm working with HQ [on the financial issue], it's beyond us [ExoPAG] to suggest solutions, but let's just make the point.

Scott: ok. Regarding cost analysis, we want the missions to be able to be compared directly at the end of the day.

Lucianne Walkowicz: I agree with Shawn-- explicitly justifying support is smart

Shawn: a lot of issues we are raising are from bad past experience. I'm wary of issues with costs estimates of past missions. It's something we should raise.
Scott: I will take a crack at this. There are concerns that previous missions were costed unrealistically.

SALLY HEAP: Scott: I agree with your point, but I don't think you'll get a transparent cost analysis.
Bern: By the way, we have no A/C here and it's a heat wave in Bern. The view is nice, tho.

Karl: Both probe studies had to manage to a cost cap, it's not clear these missions would have to, so it may be slightly different ways to manage. [important is] whether we get to iterate with the cost analysis process or not.

Scott: we can make the point, it's up to him [Paul].
Avi: in the previous study, the mission concepts were put together without [much] regard for cost. So when aerospace $ came out it was much larger [than expected]. We should go in with some idea of how the costing is going to be done.
Scott: the real concern is the costing is realistic, and how to achieve that.

Scott: how does the HDST/ATLAST/THEIA fit in? I think these are specific examples of HabEx/LUVOIR missions, but do not represent the full range of what the STDTs would [should] study. We can choose to mention these as possible examples, but be clear that they don't represent the full range. Or we can just ignore them. Either is fine.
Bertrand: we should use them whenever it's to our advantage. Even HDST has said that the driving science is exoplanet science, so it's something we can use to strengthen our case.
Scott: I'm tempted to not mention these at all… anyone strongly disagree?
(crickets)

Scott: people should write up a paragraph on the [HabEx] science goals. David Ciardi, you had 3 bullet points for HabEx that's along the right level. I meant to include them, can you remind me?

Shawn Domagal-Goldman: I agree with Scott! (And by the transitive property, David.)

David: I went through all the emails from last month. [the goals are] 1) some kind of imaging detection of earth-like or earth sized planet. 2) Some attempt to detect biosignature. 3) Comparative planetology.
Scott: I think those 3 things are good broad goals for HabEx. For LUVOIR, you may alter that by saying direct imaging of "significant" number of earthlike planets, detection of bio signature and something on longer wavelengths, and also comparative planetology. With the idea that LUVOIR is aimed at a larger sample of earthlike planets.

Nick: Please don't put that we will detect biosignatures, we can say that we will search, but don't say we will find.
Christ Stark: how about we can constrain biosignatures?

Shawn Domagal-Goldman: 1. Direct imaging of an earth-sized/like planet in the HZ around a sun-like star 2. Detection of biosignatures in planetary atmospheres 3. Comparative planetology
Shawn Domagal-Goldman: ^ this was what I had in an email from David
Shawn Domagal-Goldman: I agree with Nick. We can wordsmith this.

Nick: another way of doing the 3rd bullet point, is the idea of putting biosignatures in context. Unless you have looked at a sample of planets, you may not be able to say anything about the signatures.

Shawn Domagal-Goldman: Proposed goal (via Chris Stark), LUVOIR goal might be to constrain abundance of biosignatures.

Scott: say something about disks?
{some discussion that was lost to me, sorry disks people}

Scott: ok, let's keep it broad, and not get into the niche science.
Scott: Shawn, Chris, Nick, Aki, David, can you guys work together to come up with big picture science goals for HabEx an LUVOIR that are distinct and captures the gist of the conversation? Who's leading?

Shawn Domagal-Goldman: David?
Bern: That's OK. I'm niche.

Shawn Domagal-Goldman: I'm on board.

Shawn: yeah, I can be the lead. We'll draft something that people can throw darts at.
Scott: yes, when I say to write something, I mean a draft for people to talk to.

Scott: Aki, can I ask you to do the same for the FarIR surveyor?
Aki: you already gave me that assignment
Scott: did you accept?
Aki: yes

Scott: Lucianne, can I assign you to do the same for the Xray mission?
Lucienne: I can help
Scott: Aki can you help contact Kevin France to help?

Amy Lo: I missed it, Kevin who?
Lucianne Walkowicz: I'm juggling LSST writing as well. Kevin France
Lucianne Walkowicz: Hey Aki, will you drop me & Kevin an email to get the ball rolling when you have a moment? Or I guess you can just tell him he's been "voluntold" in person

Scott: ok, I think we have some general consensus.

Josh Pepper: what we think we can say about biosignatures is fairly hazy. As time goes on, our understanding will probably change and I worry about emphasizing this as a key capability. Maybe that's a risk we're willing to take. Just want to bring it up.

Shawn: I think that's true, but we don't want to throw it away because we're not sure how it will work. But it's a major selling point, and with the public. Science community needs to be careful to set expectations, but we should not ignore it.

Scott: agreed. Combine with what Nick said about not knowing what's out there, as long as we have the caveat, this is the target.

David(?): Adding in comparative exoplanetology, and their atomospheric signatures, whether bio or not, is a much more solid thing we can detect. It's a much better handle on what we are doing.

Shawn Domagal-Goldman: There have been multiple calls for comparative planetology to be included, for multiple reasons. We'll include this in our draft.

Scott: content of the table of mission parameters. We should adopt that FIR table

Avi: adding more mission parameter is already a contentious issue. The FIR people did it early in the beginning, but now it's generating controversy. The STDTs will be tasked to do this, so if we do it, we may be causing more trouble.
[someone]: More important that we suggest wording or overlap
Aki: but it sounded from the COPAG that they were planning to do a traceability matrix. I think that's [ridiculous].

Scott: I agree, and Ken agrees, it's well beyond the scope of our charter
Scott: here's our scope of HabEx. [shows the mission parameters chart]

Aki: UV doesn't appear here, COPAG wants to add something about that for HabEx
Scott: I will need some help from COPAG to add a bullet on UV
Aki: I think we should take out our wavelength numbers, and just put in optical near IR to be similar to the UV capable instrument bullet
Scott: put in, at least 0.5 to 1 micron?
Aki: if we put in specificity for the coronagraph wavelength range, it's not on par with the UV instrument part. Where we can avoid it, don't put in numbers.

Shawn Domagal-Goldman: I agree with Aki.
Lucianne Walkowicz: +1

Aki, Nick, Shawn: [discussion…] we're saying putting in general ranges, and then have the STDT work out the details of the wavelength range and details.

Shawn Domagal-Goldman: YES! +1 to Nick's point here.
Shawn Domagal-Goldman: on the exoplanet relevance of UV observations of the host star

Scott: I'll clarify. The important thing is that we make it clear this is not prescriptive nor defines the boundary, they [STDT] should do it themselves.

Shawn: We want to put in language that allows them to make trades. Paul told us not to take ownership, I don't think we should be defining the science…

Scott: 1 of the criticism I got is that we didn't define the COPAG science enough, but that's not our job. So we can refer to their [COPAG] report.

Karl Stapelfeldt 2: Don't specify resolution and wavelength coverage, just state UVOIR telescope with spectroscopy sufficient to characterize the habitability of exoplanetary atmospheres

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Scott: LUVOIR mission parameter.
Aki: there are science to be done longer than 2.5 microns… for this particular science we know there are science beyond 2.5 micron.

Shawn Domagal-Goldman: we can specify temperature instead of wavelength range here
Shawn Domagal-Goldman: i.e. not cryogenic
Shawn Domagal-Goldman: for LUVOIR

David Bennett: Keep in mind that best mirror coatings for a coronagraph have very poor UV reflectivity. The UV sensitivity might have to be sacrificed to have a high contrast coronagraph

Marshall Perrin: maybe just "at least 2 microns"?

Scott: for any given number, someone is going to object… either we put nothing down, and just science goals, or we put down something as general as we can make it and make clear it's not prescriptive.

Marshall: how about just say, or longer.

Aki: how about Far UV to Near IR.
Scott: I think people are overemphasizing the specificity of the numbers, but I'm happy to make it more general, and I'll do that.

Daniel: for LUVOIR, we want the mission to be capable of significant number of targets, which is also a mission operation constraint, so can we add that in here?
Scott: that's a science goal, so that's what Shawn et al. will write. Not sure we can write a mission parameter without being too prescriptive

Karl Stapelfeldt 2: I agree with Dave that reconciling UV and internal coronagraphy will a big task for both STDTs
Bern: That's not true about the mirror coatings. See THEIA study.

Chris: For LUVOIR, I'm not a fan of the lower aperture limit due to constraints of a single vs. segmented aperture. We should have overlap. These numbers dictate an architecture.

Shawn Domagal-Goldman: 6.7 is also a natural breakpoint, as Chaz pointed out at the last in-person meeting
Bern: Oops.

Scott: then they start merging into 1 mission! It's clear that Paul wants two clear price points. I think Paul wants it to be divided along aperture size and cost. We could take the table out, but then it would be more wishy washy.

Aki: isn't this what you said before about too much specificity and getting in a fight? Can I volunteer Chris for a draft statement?

Chris: I'm not opposed to numbers, I just want to give it more room so it's clear there are more options than segmented mirrors available.

Scott: we'll make sure we state something bold for these numbers not to be taken as gospel . I'll draft something up.

Scott: we're not going have a FIR and Xray [mission parameter] table. Do we agree?

Aki: the FIR community tied their own hands by voting on an architecture… for the ExoPAG, we have a vested interest in interferometry, right?

Scott: in the additional missions considered, we will say something about TPF-I, to cover that. Will probably ask Nick Cowen to write something.

Nick: Yessir.

Lucianne Walkowicz: Folks I'm going to have to go to a meeting here momentarily (thus going against my prior advice about not leaving the room or someone will assign you something)

Scott: (while go over the executive summary)
Any issues?
(crickets)

Scott: wow! No one has issues?

Scott: (while going over the rest of the report and assigning homework):
{in bullet form, is easier to understand}

- Additional large missions: Nick + Aki, need something about TPF-I and interferometry development, Mark Swain on Large Transit characterization mission.
    - Repeat Interferometry needs under the FIR mission
- Probe class missions: Scott
- Suggestions for STDT structure: see assignment to come later
- Summary and conclusion: Scott
- Process & procedure: Scott

Scott: can we have the inputs by Aug 1st?
(no vehement disagreements from peanut gallery)
{anyone really still reading this?}

Shawn: do we want to put out an additional inputs solicitation?
Scott: you want to take charge?
Shawn: David and I have been looking at 3 options, email, message board, wiki, any thoughts?
Scott: I think a Wiki would be great
David: I can set up the Wiki soon at IPAC here.
Shawn: sounds good, we may want a message board in the future, but wiki is good

Gary: intentional use of “finder” vs. “imaging” for HabEx?
Scott: no, typo.

{review actions, goodbyes, the end}

<u>Chat window dump</u>

Bern: Hey ho, Bern is on Adobe Connect. Working on the sound.

Scott Gaudi: We have the Bern contingent!

Bern: Yes, we can hear you.

Shawn Domagal-Goldman: I can hear you, at least, Scott.

Bern: No cheese. Just wine and crisps.

Bern: Attendance here in Bern: Aki Roberge, David Ciardi, Daniel Apai, Nick Cowan, Avi Mandell, Maggie Turnbull, Bill Sparks, Steve Unwin

Peter Plavchan: Peter PLavchan called in from hotel...

Bern: Oh we do have cheese.

Bern: And Mark Clampin

Amy Lo: thanks for the attendees list

Amy Lo: if you're gonna type in chat, would be great for the Bern folks to identify themselves if possible

Shawn Domagal-Goldman: Amy, are you taking notes of the conversation again?

Bern: Unless otherwise stated, the Bern typer is Aki

Amy Lo: yeah, I'm taking notes, and I'll attribute all Bern comments to Aki =)

Shawn Domagal-Goldman: Thanks, Amy!!

Bern: Oh, please don't. ;)

David Bennett: It would be nice to have more details on this COPAG SIG2 "pushback" on HabEx. Who was complaining and what did they say?

Steve Unwin: Scott: This is Steve Unwin. Regarding probes. DO we know what Paul plans to do with probe receommendations?

Bern: More in Bern: Rus Belikov, Eduardo Bendek

1380215539: Scott - can you put the topics of discussion back up ...?

Bern: No takers on the bet

Shawn Domagal-Goldman: That was a decent description of the push-back.

Shawn Domagal-Goldman: A lot of this revolves around the specific numebers in the HabEx architecture example Scott has been using in the slides on the mission.

1380215539: Can we move down the hand-raised list please?

SALLY HEAP: My handwaving icon is frozen. I'd like to commen on 8m vs 12m

1380215539: Scott: can you put the discussion points back up?

1380215539: thanks

David Bennett: Just because you are parnoid doesn't mean that you are wrong.

SALLY HEAP: Could someone raise his/her hand for me?

Tom Greene: The decadal survey never intended WFIRST to be solely - or even mostly - a dark energy mission!

Bern: More than one Bern person wants to speak

David Bennett: Right, Tom, but the dark energy advocates don't see it that way

Tom Greene: Dave, I don't doubt that, but the record shows that dark energy probes went nowhere (think JDEM, SNAP), until dark energy + exoplanet microlensing + GO wide field was all rolled together.

Steve Unwin: SCott: that answers my question about Probes, thanks.

Bern: Aki here: I disagree Sally

Bern: Yes, but David is first

Shawn Domagal-Goldman: I'd like to hear from the Bern contingent on the international participation on this. They're at a meeting designed to help work that sort of thing out. Are there any developments?

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Bern: That's sort of the point

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Amy Lo: Bern is breaking up a little

Karl Stapelfeldt: Exo-S and Exo_C were prohibited from having foreign involement . Would be nice if new ITAR regime allowed a different policy.

Karl Stapelfeldt: Habex might do wide-field optical imaging , this would be new from space

David Bennett: Karl, WFIRST will probably have one filter in the optical

Eric Smith: Regarding ITAR, we just went through extensive discussions with State Dept and DoD for JWST. It was clear that large optics would NOT be moved off ITAR list. We got the instruments moved over to Commerce EAR.

Lucianne Walkowicz: I agree with Shawn-- explicitly justifying support is smart

SALLY HEAP: Scott: I agree with your point, but I don't think you'll get a transparent cost analysis.

Bern: By the way, we have no A/C here and it's a heat wave in Bern. The view is nice, tho.

Shawn Domagal-Goldman: I agree with Scott! (And by the transitive property, David.)

Shawn Domagal-Goldman: 1. Direct imaging of an earth-sized/like planet in the HZ around asun-like star 2. Detection of biosignatures in planetary atmospheres 3. Comparative planetology

Shawn Domagal-Goldman: ^ this was what I had in an email from David

Shawn Domagal-Goldman: I agree with Nick. We can wordsmith this.

Shawn Domagal-Goldman: Proposed goal (via Chris Stark), LUVOIR goal might be to contrain abundance of biosignatures.

Shawn Domagal-Goldman: David?

Bern: That's OK. I'm niche.

Shawn Domagal-Goldman: I'm on board.

Shawn Domagal-Goldman: I have Aki Roberge, David Ciardi, and Nick Cowan for that drafting. Am I forgetting someone?

Amy Lo: Chris Stark

Lucianne Walkowicz: Thank you Aki I appreciate that

Amy Lo: I missed it, Kevin who?

Lucianne Walkowicz: I'm juggling LSST writing as well. Kevin France

Amy Lo: thx

Lucianne Walkowicz: Hey Aki, will you drop me & Kevin an email to get the ball rolling when you have a moment? Or I guess you can just tell him he's been "voluntold" in person

Shawn Domagal-Goldman: There have been multiple calls for comparative planetology to be included, for multiple reasons. We'll include this in our draft.

Shawn Domagal-Goldman: I agree with Aki.

Lucianne Walkowicz: +1

Shawn Domagal-Goldman: YES! +1 to Nick's point here.

Shawn Domagal-Goldman: on the exoplanet relevance of UV observations of the host star

Karl Stapelfeldt 2: Don't specify resolution and wavelength coverage, just state UVOIR telescope with spectroscopy sufficient to characterize the habitability of exoplanetary atmospheres

Shawn Domagal-Goldman: we can specify temperature instead of wavelength range here

Shawn Domagal-Goldman: i.e. not cryogenic

Shawn Domagal-Goldman: for LUVOIR

David Bennett: Keep in mind that best mirror coatings for a coronagraph have very poor UV reflectivity. The UV sensitivity might have to be sacrificed to have a high contrast coronagraph

Marshall Perrin: maybe just "at least 2 microns"?

Karl Stapelfeldt 2: I agree with Dave that reconciling UV and internal coronagraphy will a big task for both STDTs

Bern: That's not true about the mirror coatings. See THEIA study.

Shawn Domagal-Goldman: 6.7 is also a natural breakpoint, as Chaz pointed out at the last in-person meeting

Bern: Oops.

Lucianne Walkowicz: Folks I'm going to have to go to a meeting here momentarily (thus going against my prior advice about not leaving the room or someone will assign you something)

Bern: We are outa here! Thanks!