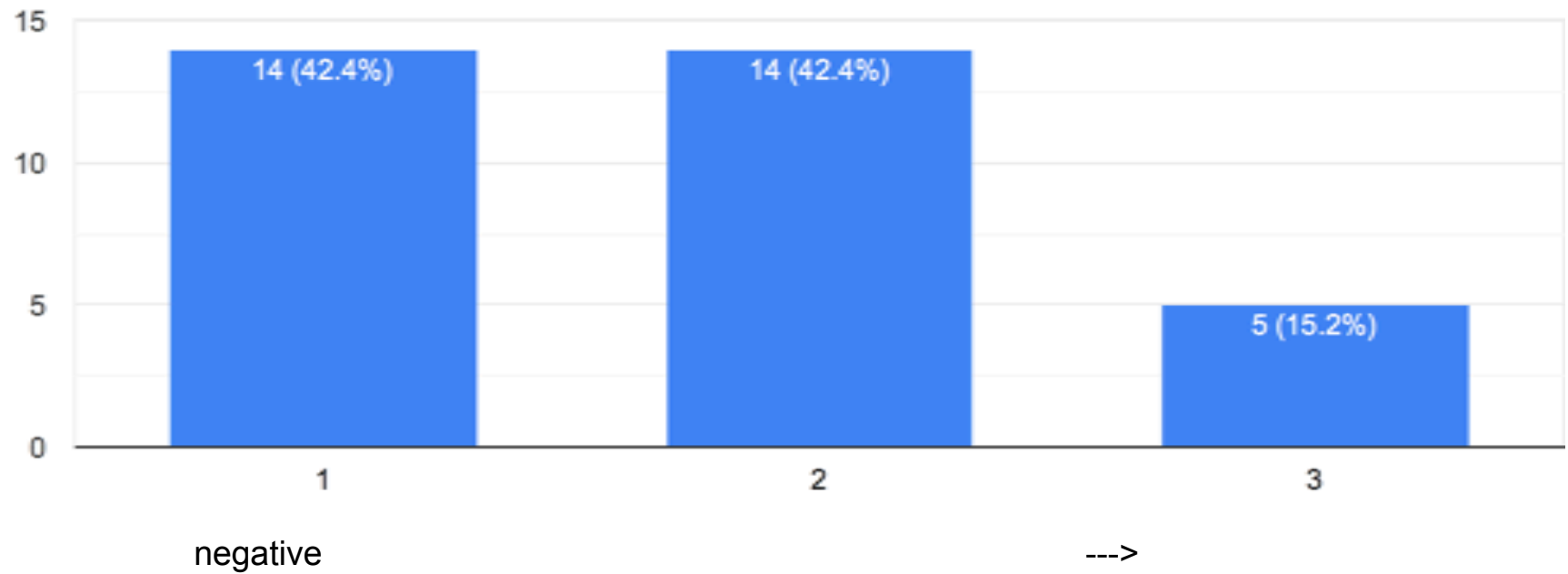


First Look at JWST Delay Survey Results

Johanna Teske
1 May 2019

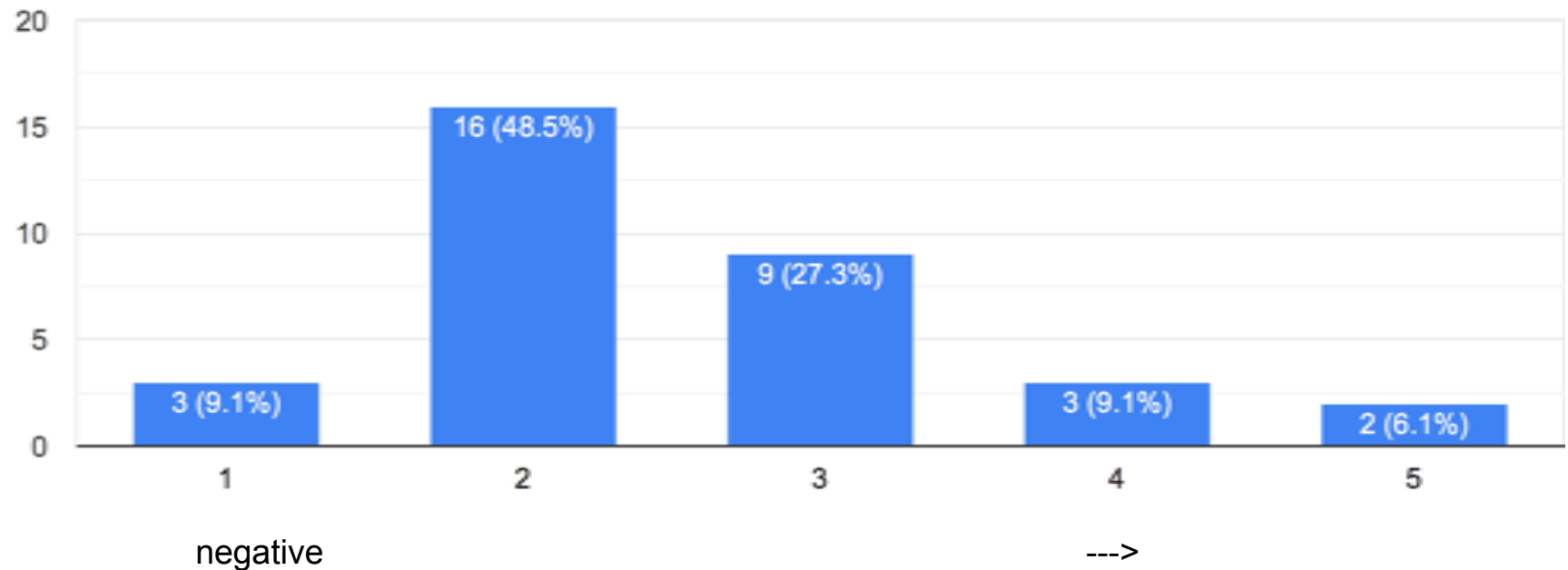
How is your immediate (<3 year) science plan impacted by the JWST delay?

33 responses



How is your more long term (> 3 year) science plan impacted by the JWST delay?

33 responses



Are there science program(s) that the JWST delay will prevent you from accomplishing or make more difficult/costly?

- Mid-IR spectra of white dwarf debris disks
- Follow-up of several recently discovered transiting exoplanets will be delayed and the ephemeris uncertainty is large enough to require a longer observation window to ensure visibility
- It is clear that only JWST can get data about the key questions we have about physical processes in brown dwarf and gas giant atmospheres.
- JWST + Hubble UV transit spectroscopy for atmospheric characterization.
- Yes. Exoplanet Atmospheres since most of the data is ambiguous at best and we are just making things up at this point...AIO anyone?
- Yes; doing the science planned to do with, eg, HST, will take 10x the time to be made. Yes, JWST spectroscopy of planet atmospheres is limited with HST. JWST needed for CO₂, CO, NH₃ and small planets. Transiting exoplanet characterization is being held back in a major way while we wait for JWST. Many things that we hoped to do are just impossible until JWST launches.
- I have ideas about what can be accomplished with even nominal JWST transit spectroscopy data from the ERS, which is now delayed.
- My fellowship was granted to use JWST, so any further delay to launch will negatively affect the outcome of that 5 year grant
- It will significantly impact my research if the GTO/ERS teams are allowed to change their targets between now and Cycle 1. I had already written several Cycle 1 proposals (prior to the launch slip) for high value targets that were not in GTO lists. This work will be for naught if the targets get snapped up by GTO teams.
- Technically a tech demo, but yes, WFIRST CGI will suffer from the need to get JWST funding from somewhere. This will stretch out WFIRST, and stretching a program costs money. Since it's cost-capped, this will likely force some level of descopes. Exact damage is too early to tell. (I have no direct JWST science.)
- My research has comprised of simulations of JWST observations rather than actual data for the past two years. This could make meeting future deadlines extremely difficult and costly.

Are there science programs(s) that you will now have more time to prepare for/work on due to the JWST delay?

- [Finishing Spitzer observations and analysis.](#)
- More time for preparatory work for JWST cycle 1 GTO projects and GO proposals
- All of the proposals that I am currently planning.
- I'll have a chance to make more progress on developing theory and analysis techniques, before the data arrives. Yes. For example TESS discoveries will be key to optimize JWST observations. More realistic simulated observations will be done and novel data reduction techniques developed
- Yes, this gives me more time to work on TESS or non-exoplanet projects like LSST preparation. JWST delay gives more time to identify good TESS targets. Yes: exoplanet atmospheric characterization of TESS planets. → **Many responses related to this.**
- Yes. More focus on ground based observations of brown dwarfs and hi-res cross-correlation spectroscopy of exoplanets. We don't need no Jdubbs :)
- [Yes. With additional ALMA observations of planet-forming disks in hand, we will be better prepared to prioritize targets.](#)
- We (the field, and my group) were not ready for the 2018 launch date. My group's codes were not ready, and we had a backlog of over 10 unpublished papers. Late in the Spitzer mission, it became clear that we knew even less of Spitzer's systematics than we thought in 2016, which was already lower than earlier estimates, and some of those systematics had not been studied for JWST. This the raised the bar both for analyses still in the pipeline, redoing old analyses, and implications for JWST pipelines and planned data exercises in the ERS group. We will be MUCH better prepared for JWST's reality, whatever it is, with the delay.
- [Yes - I have longer to prepare my observations now \(I was on parental leave during the previous call\)](#)
- Yes. In particular, preparation with ground based telescopes that can aid as complements to JWST.

Are there other NASA missions or programs that could help mitigate the impact of the JWST delay on your science? If so, which programs, and how could they help?

- [Spitzer extension](#) → **about a dozen of these responses**
- No other mid-IR missions are coming up in the near future.
- SOFIA HIRMES is an exciting new capability at longer wavelengths; however, on the current schedule, it is expected to commission in Fall 2020. (This just slightly before the current JWST launch date of March 2021). However, if JWST slips more, then HIRMES may become more important.
- 1. Extend Spitzer. 2. Neo-WISE continuation/support 3. Continue TESS beyond nominal 2-year mission.
- Increasing XRP scope would help mitigate JWST delay
- Explorer class missions would be good. FINESSE lost out to ARIEL sooo , so much for that...I guess we are just at the whim of the Europeans? Go Amerrrica...awesome. But we saw black holes, so that's cool.
- [Ground based observations at high spectroscopic resolution will help mitigate the impact of the JWST delay](#)
- There is now significantly more pressure on HST and Keck for transiting exoplanet science. It would be good to have additional observing time on these facilities to continue to build up to JWST.
- HST, IRTF, and TESS will provide important data and context before JWST launches.
- [yes, TESS GO programs, and HST, and ADAP](#)
- There is nothing to mitigate! The delay was critical to avoid wasting the first year or more of JWST mission with inadequate systematics control.

Are there additional scientific/observational/computational/community resources that could help mitigate the impact of/take advantage of the JWST delay on your science?

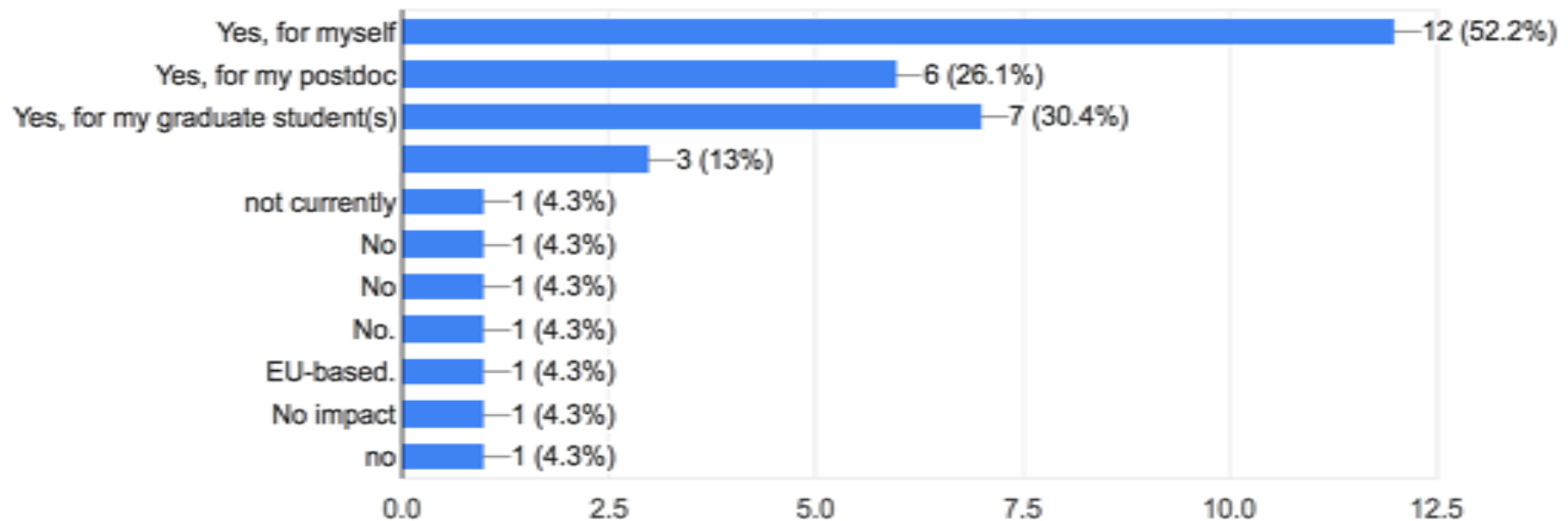
- Continued community efforts / organizing towards building compelling large-scale programs for once JW is operational. We should be building ambitious Legacy scale project plans now.
- We could strongly benefit from increased education/training/examples of modern data science / statistical analysis / machine learning methodology. Similarly, development of an open-source, exoplanetary atmospheric retrieval system with tutorials, cookbooks, examples, workshops, videos, etc. would be extremely valuable. Other training in exoplanetary analysis methods would also be valuable.
- It's an opportunity for ground based to step it up...their time to shine. This is it ..."lose yourself" and" eye of the tiger" should be playing for Nirspec/Carmenes/Spirau/Crires_ etc...). Maybe keck should put on an R>80K NIR spectrograph? Really? Again, Europe is WINNING (MAGA--Make Astronomy Great Again). Also, updating web-pages beyond the 1980s style would be good. Just hire a google person for a day....
- Yes post-docs working on optimization of data reduction, retrieval will allow to take advantage of JWST delay.
- [We should go full speed on the confirmation and characterization of TESS planets with existing facilities. The more we know about these systems the more we can do with JWST. → several responses like this](#)
- More readily available atomic and molecular absorption cross-sections as a function of wavelength, temperature and pressure.
- More ALMA observations will help us take better advantage of JWST.
- More facilities with high resolution NIR spectrographs to characterize exoplanet atmospheres.
- We need data exercises on simulated data. We need public tools for analyzing JWST exoplanet data. We need a forum for discussing these exercises and also actual results as we're doing them. The literature and even emails are way too slow.

How are you adjusting your science program to help mitigate the impact of/take advantage of the JWST delay (e.g., shifting students to different projects, taking more time to test analysis pipelines)?

- Working on other projects
- Shifting priorities to ground-based projects
- Collecting/studying targets so the best can be proposed
- I've been shifting students to other projects, often non-exoplanetary.
- I'm focusing even more heavily on theory investigations that will allow us to capitalize on JWST observations once the observatory launches. → [several responses like this](#)
- I had to let my postdoc go.
- Taking more time to develop pipelines and analysis tools. Tests will come, as well.
- [We are doing more modeling and simulations to be better prepared to frame proposals for JWST. Also, we're taking a retrospective look at all of the Spitzer data for exoplanets, and we're also deeply involved in HST exoplanet characterizations for hot Jupiters and exoNeptunes from TESS](#)

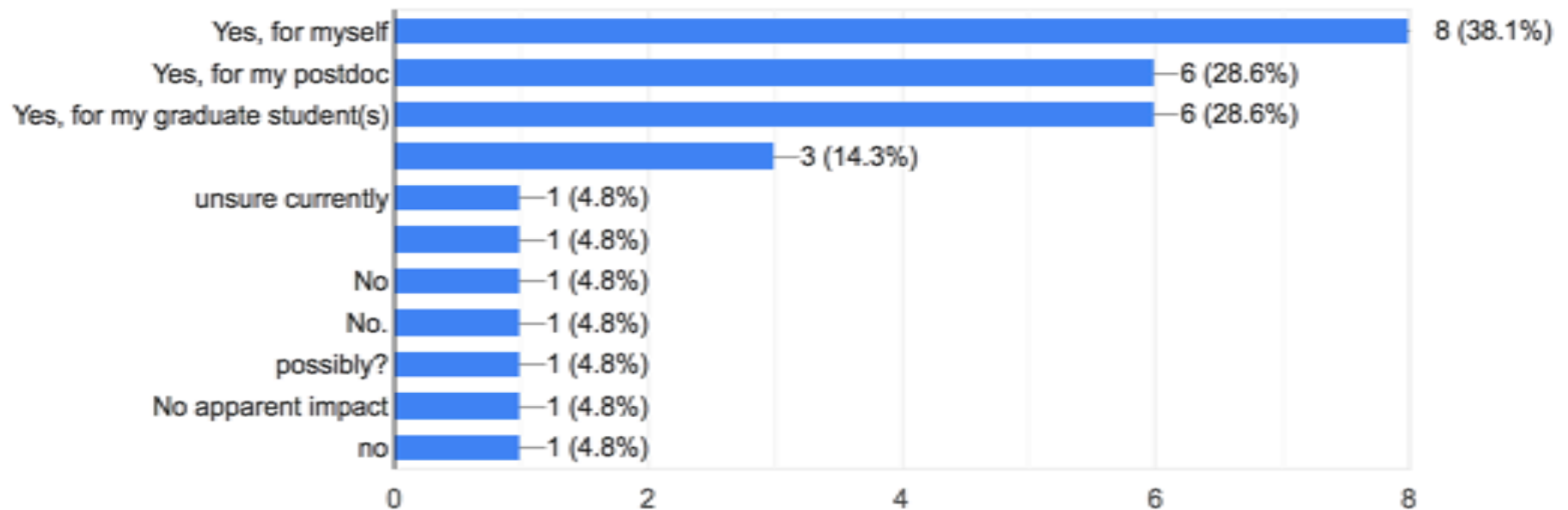
Is your immediate (<3 year) funding situation impacted by the JWST delay?

23 responses



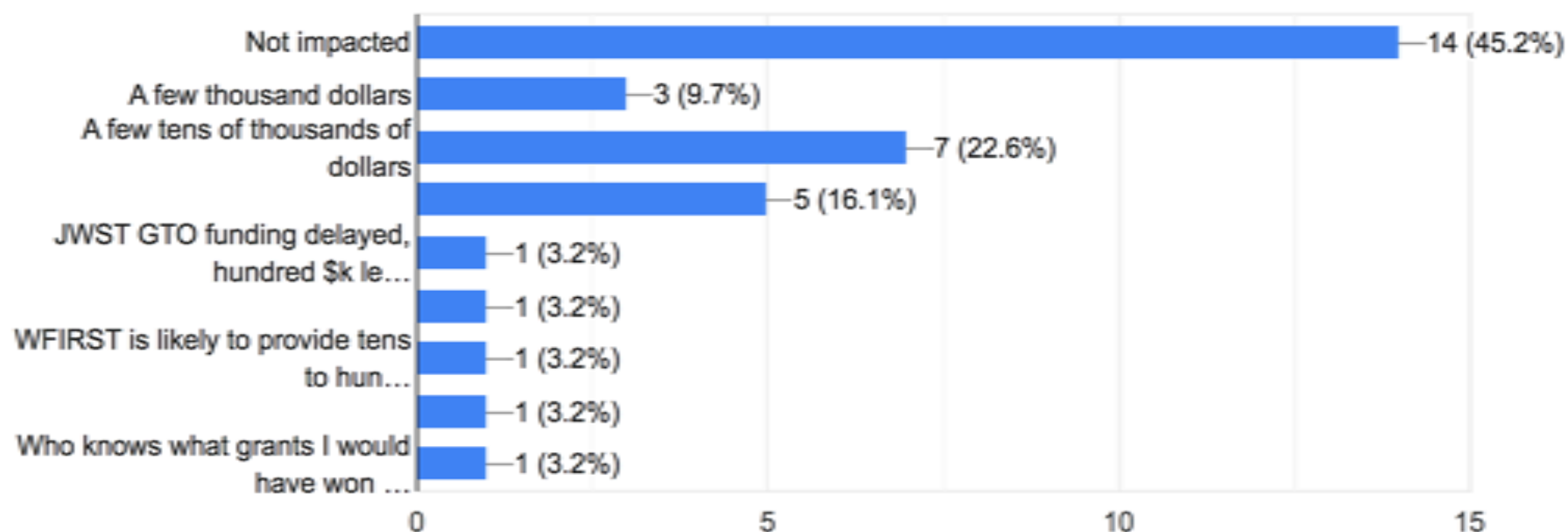
Is your more long term (>3 year) funding situation impacted by the JWST delay?

21 responses



At what level is your funding situation impacted by the JWST delay?

31 responses



How are you adjusting your funding program to help mitigate the impact of/take advantage of the JWST delay (e.g., seeking other funding from NASA, seeking other funding from NSF, seeking other funding from private sources)?

- Not taking on grad students or postdocs
- Exploring other topical areas and seeking funding through NSF/NASA/others. → **about half a dozen responses like this**
- Shifting priorities
- Requesting internal STScI resources to develop high contrast imaging for JWST IFUs (because there is not enough effort within the prime contract to do this). Not clear whether this effort will be approved because STScI may feel that it is not a good use of Director's Discretionary Funds. This funding is not suitable for students and postdocs but STScI staff members.
- Aggressively proposing to ROSES and Hubble
- Delaying the use of the some of the funding obtained
- I did get money for the ERS program to do some preparatory work and mitigate these issues. The main thing is that I am just working on different projects for now.
- I am writing proposals to build tools and improve analysis methods. Proposals for specific tools go to NASA. Proposals for general tools go to NASA and NSF. I would have done this with an on-time launch, as well, but also written data proposals. The tools will be better at launch, now.

Additional feedback

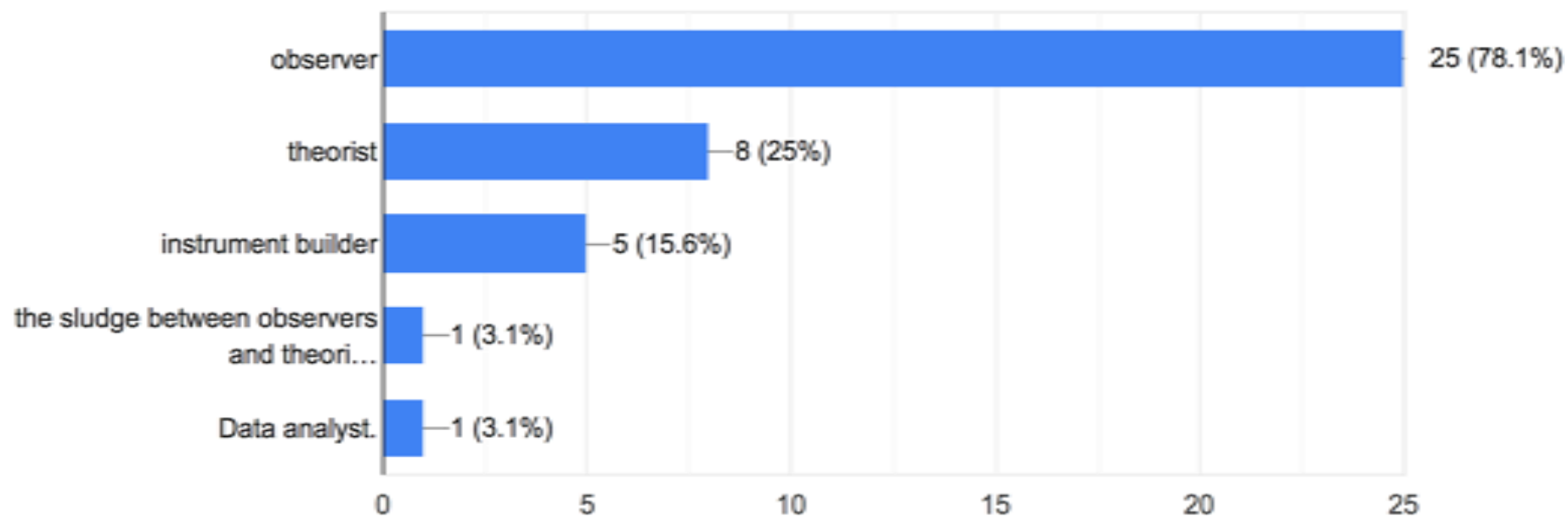
- **Specific actions JWST project could take** is an omitted topic. Since we have extra time, JWST project could increase community support through tools. For example, the JWST ETC has inconsistencies with instrument simulations. JWST project should be able to provide the community with a real simulation tool that will simulate the actual instrument exposures for a specific kind of target so that we can practice reducing the data including practicing extracting spectra. For point sources, this should be a relatively straightforward exercise. JWST project has requirements on pointing stability, detector flat fields, etc and they know the telescope overheads. We should be able to simulate the entire data set.
- While I am a theorist and the JWST delay does not obviously impact my funding situation in a negative way (and perhaps even impacts my science in a positive way), I am much more **concerned about my observer colleagues. Postdocs and grad students** whose next ~3 years were meant to be focused on JWST investigations are now needing to completely re-structure their science agendas and their funding plans. It's not clear to me what the solution to this situation is, **but I appreciate that this survey is at least collecting data on this issue.**
- Although I may be taking aim at my own foot (I'm good at that), **I feel there are way too many people in the exoplanet field for JWST to support.** It may produce great data, but it's just one telescope, if it works. A small fraction of the field will actually win telescope time. What happens to the rest of the observers?
- NASA does not focus on innovative, ground-based characterization projects. NSF is less focused on exoplanets, because of the spacecraft emphasis. **We need more resources to go into purpose-built, ground-based, exoplanet characterization instruments, including much better removal of the Earth's spectrum.** Even if this just takes the pressure off JWST by doing most of the hot Jupiters and brown dwarfs, that would be a great service to exoplanet science.
- **Also, NASA has dangerously put all its observational eggs in one basket. If JWST fails,** we will see a major downward space science budget restructuring, and perhaps the end of the agency, which already looks weak from the human spaceflight side. We should have multiple operating space telescopes, such that the loss of one does not devastate the field. We will lose one, eventually.

Are there other NASA sources of funding that could help mitigate the financial impact of the JWST delay on your work? If so, which programs?

- [Expanded XRP or ADAP, HST observations, and I'll mention Spitzer again.](#)
- XRP for exoplanet-related science, although this is a very competitive opportunity. Significant expansion of XRP should be considered. Exoplanet Exploration Program could also increase science community support.
- Another year of Spitzer to overlap with JWST would cost less than \$20M as I understand it.
- I wish there was a source of funding to prepare for JWST by building tools or pipelines that are not being addressed by the Science and Operations Center.
- [Increased ADAP or other program funding would help.](#)
- More funding attached with ground based obs. That would get more ingenious proposals and promote a more diverse pool of researchers.
- [The HST, Spitzer, and Keck funding should be kept strong so the transiting exoplanet characterization community can keep moving forward.](#)
- The JWST GO program will significantly increase the total amount of funding available to US astronomers. Having programs that effectively act like bridge funding would mitigate the delay.
- There's a bit of a funny arrangement about JWST data projects between ADAP (forbidden, no data in the archive), XRP (forbidden), and JWST (doesn't exist yet). XRP proposals have to talk about tools and preparation without writing that you'll analyze data when you get it. From first public data release (ERS) to first delivery of ADAP funds thereafter will be more than a year, more than 20% of the mission, presuming it's allowed. [Best would be to include a HEALTHY archival program in GO1 for the ERS data.](#) We want everyone to hit that with everything they've got. This will be costly, but is a necessary investment. The tiny budget of the ERS teams means the vast majority of team members will get no funding at all.

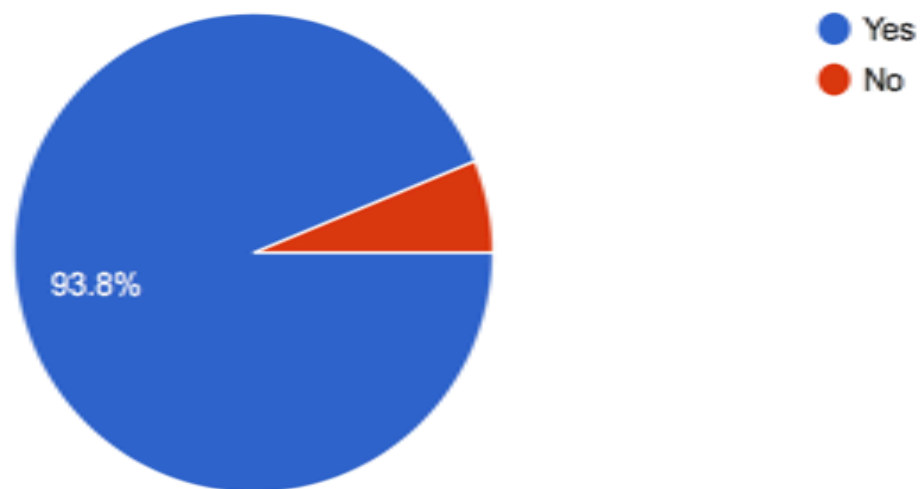
You consider yourself a/an... (check as many as you like)

32 responses



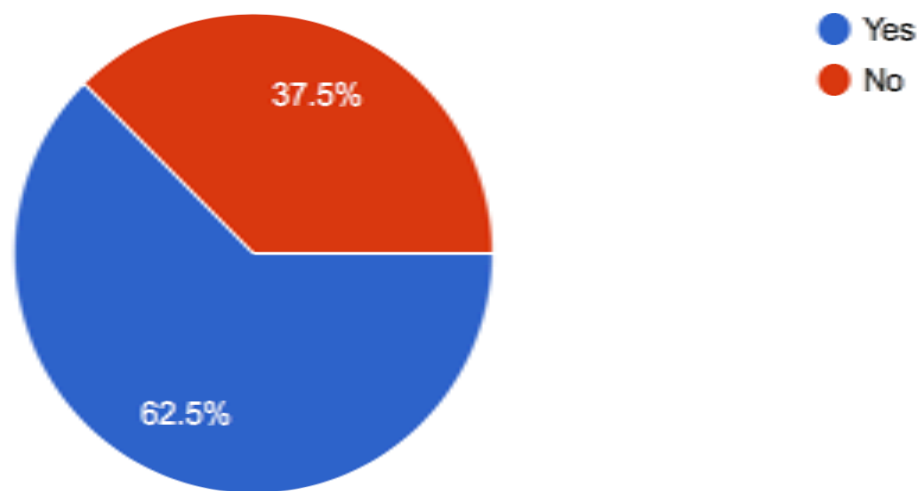
Are you planning to PI or Co-I JWST proposals when the telescope launches?

32 responses



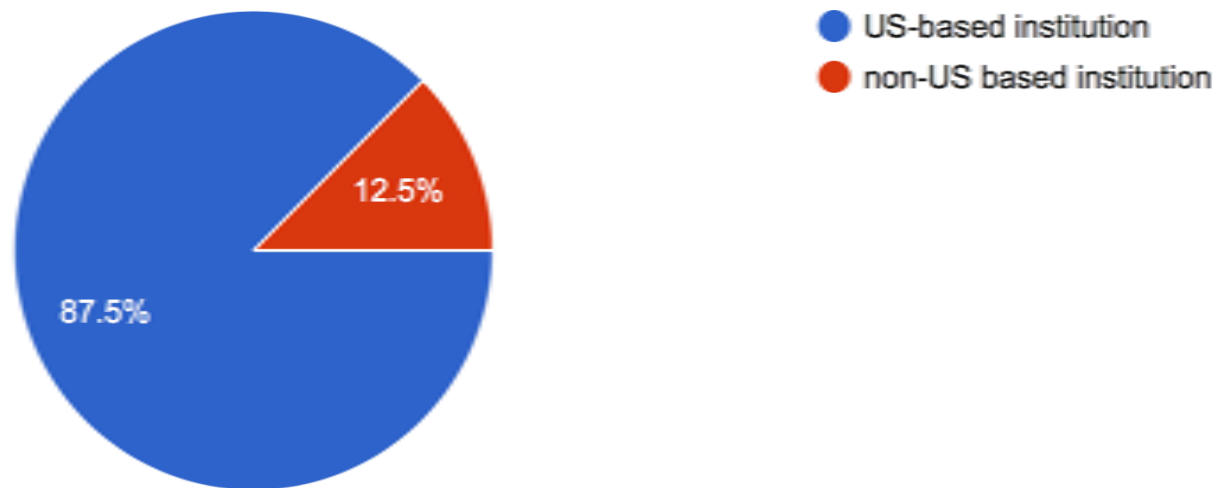
Are you currently a member of a JWST GTO or ERS team?

32 responses



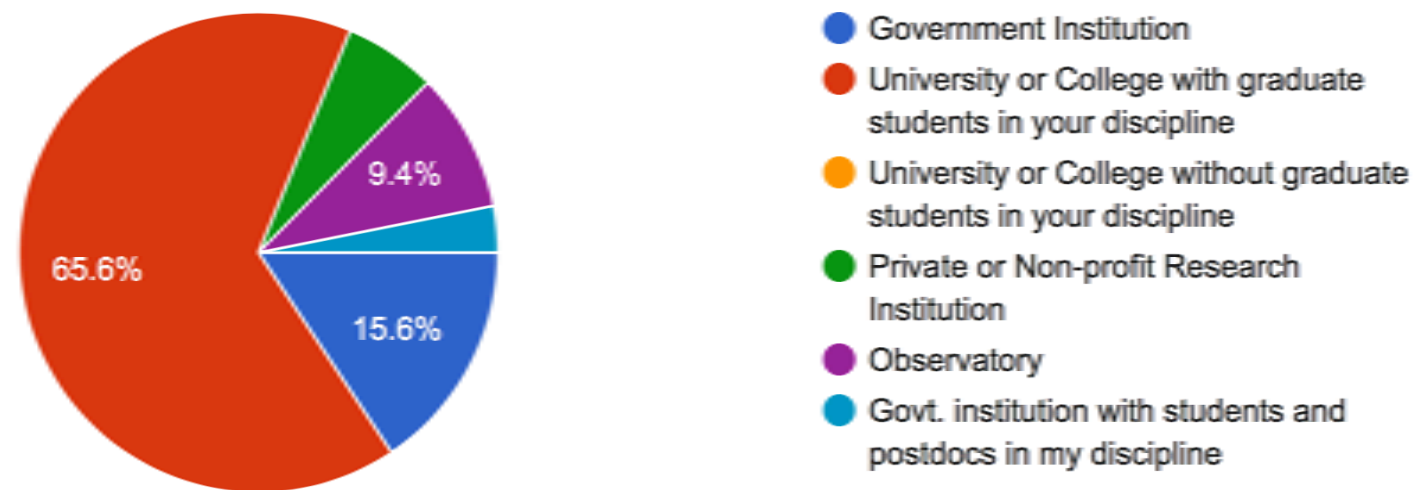
At what type of institution do you work? (part I)

32 responses



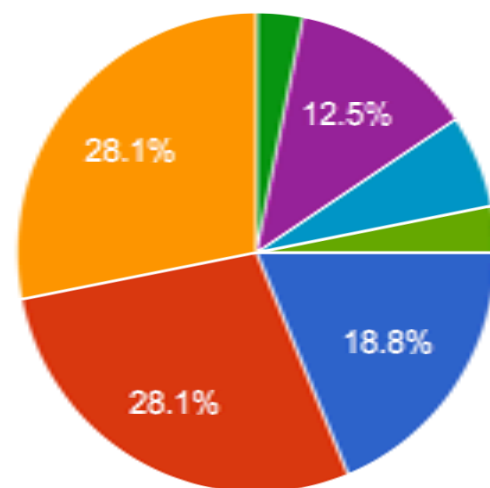
At what type of institution do you work? (part II)

32 responses



What is your career stage?

32 responses



- Senior staff/faculty or equivalent
- Mid-level staff/faculty or equivalent
- Early career staff/faculty or equivalent
- First postdoc
- Second or more postdoc
- Graduate student
- Undergraduate student
- closer to mid-level than Senior