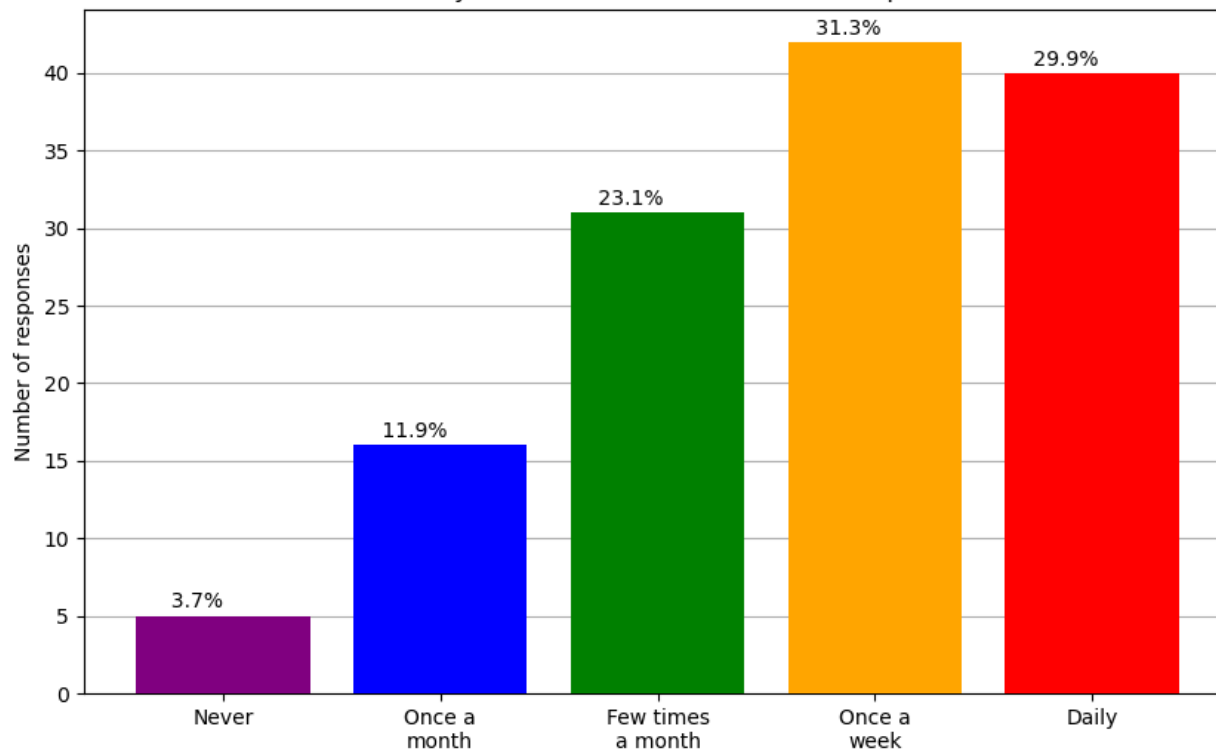
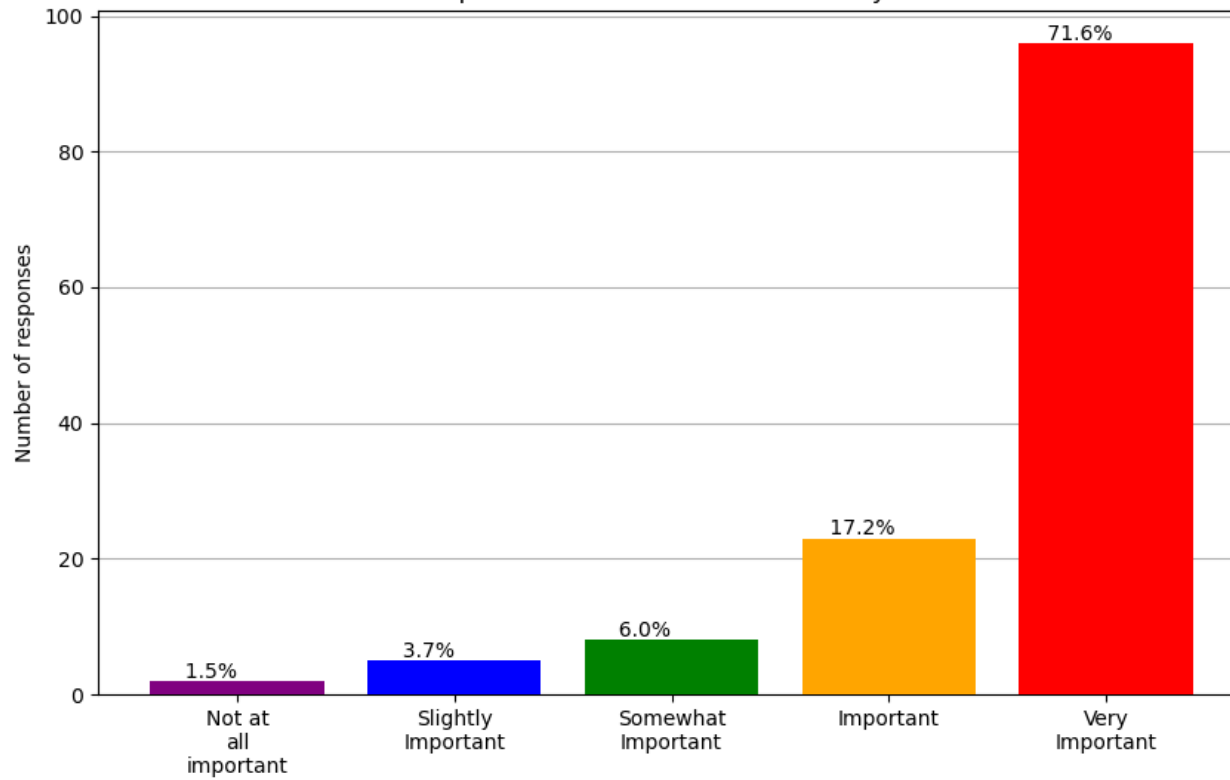


# HEASARC 2023 Survey Results

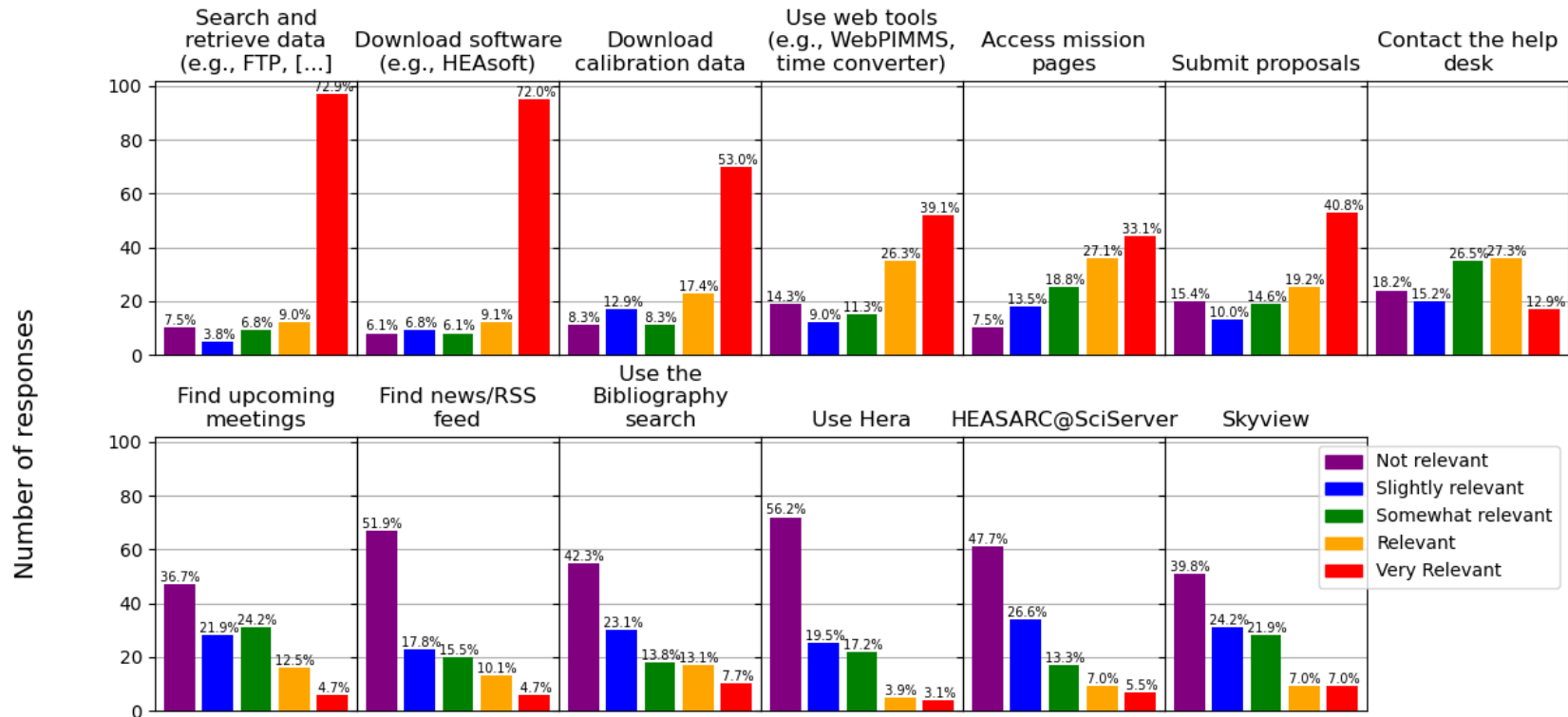
1. How often have you used HEASARC services in the past 12 months?



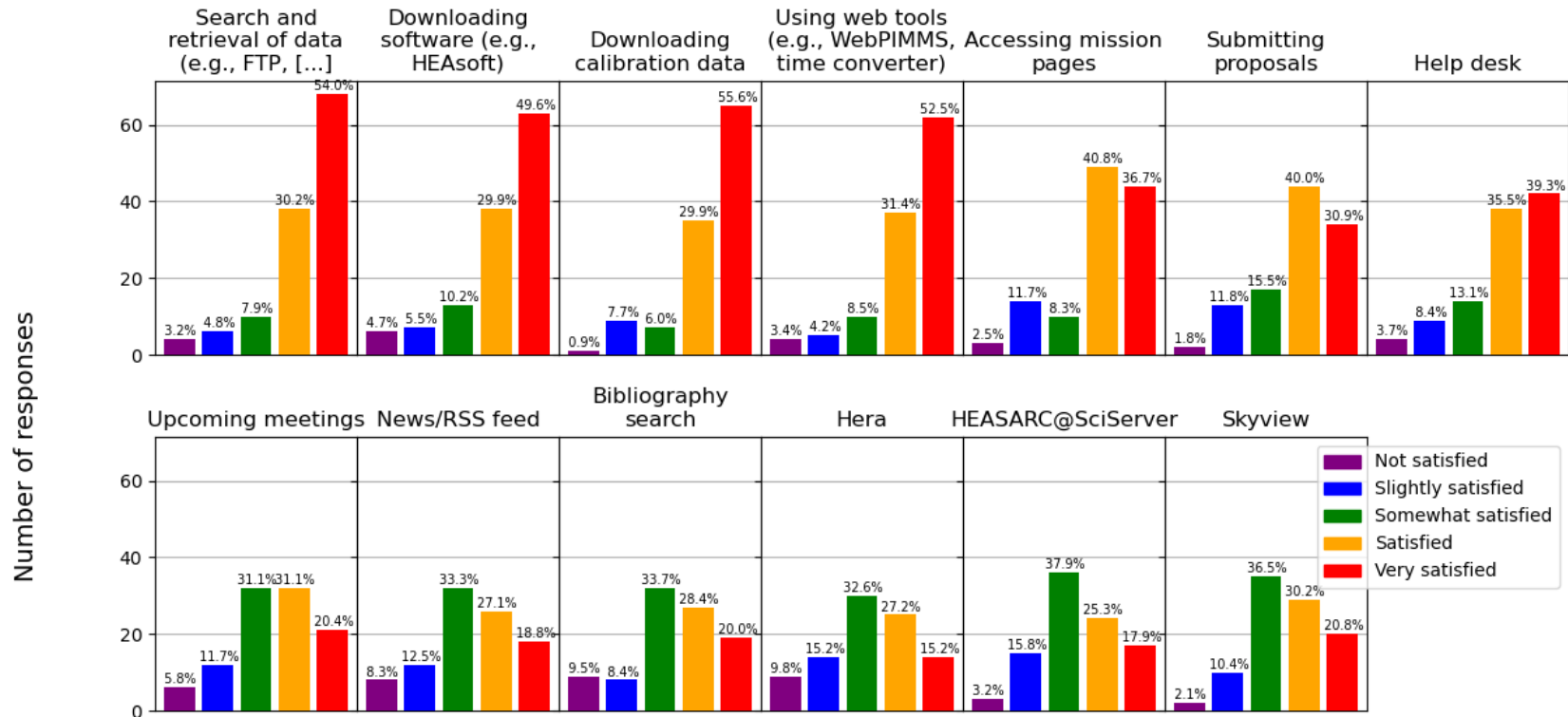
## 2. How important are HEASARC services to your work?



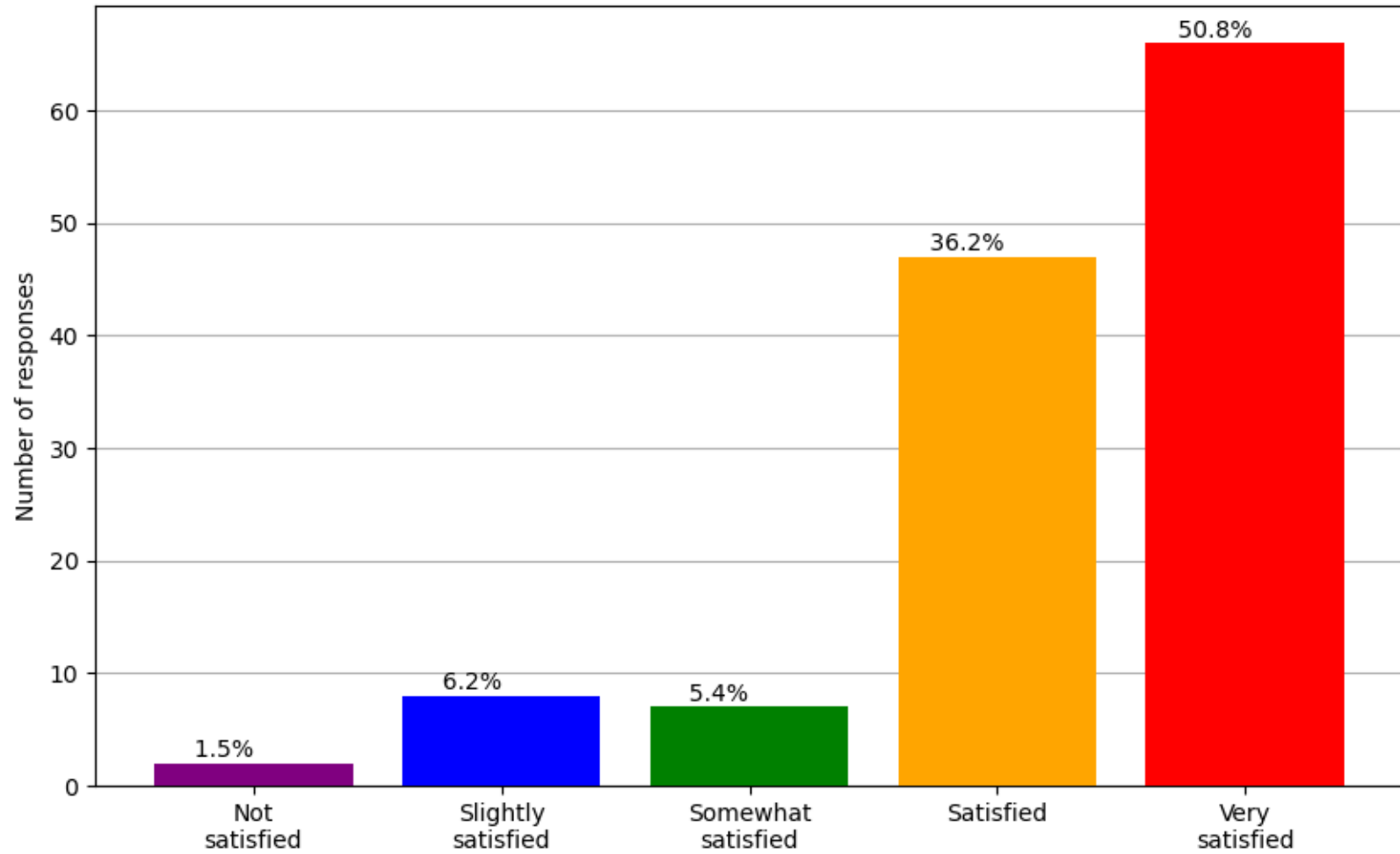
### 3. Please rank the relevance of the following services to your research:



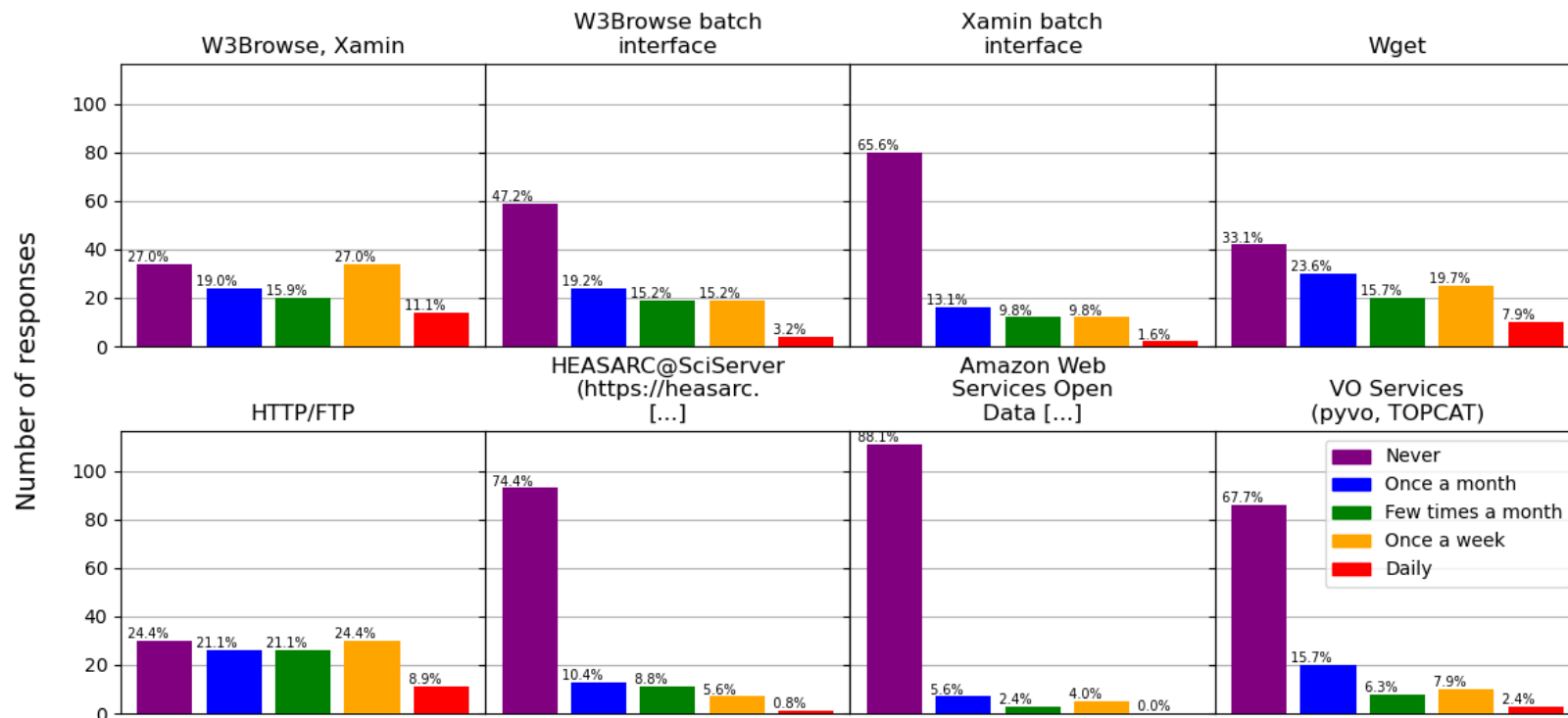
#### 4. How satisfied are you with the following HEASARC services?



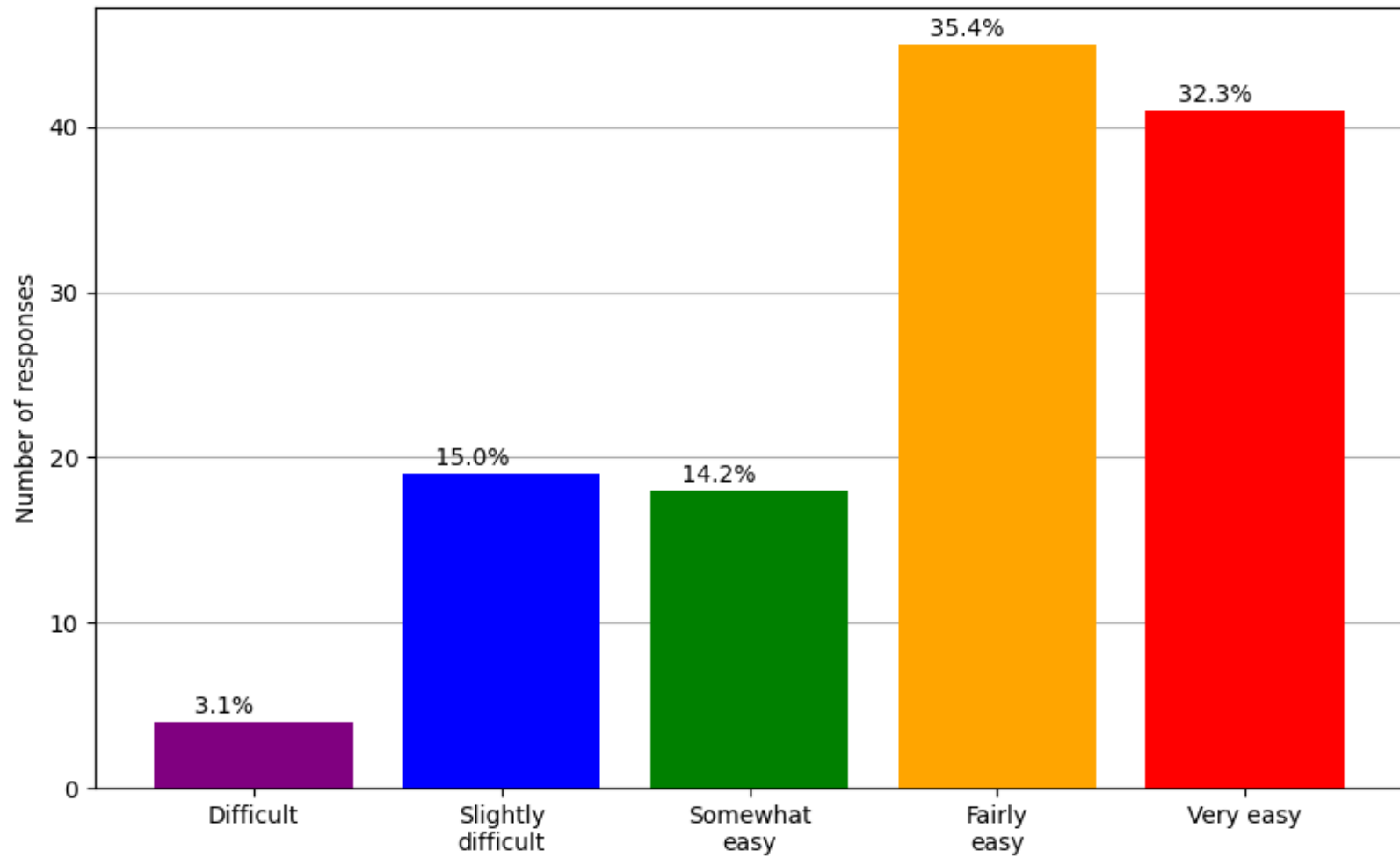
5. How satisfied are you overall with the HEASARC services?



## 6. How often do you use these HEASARC interfaces or protocols?

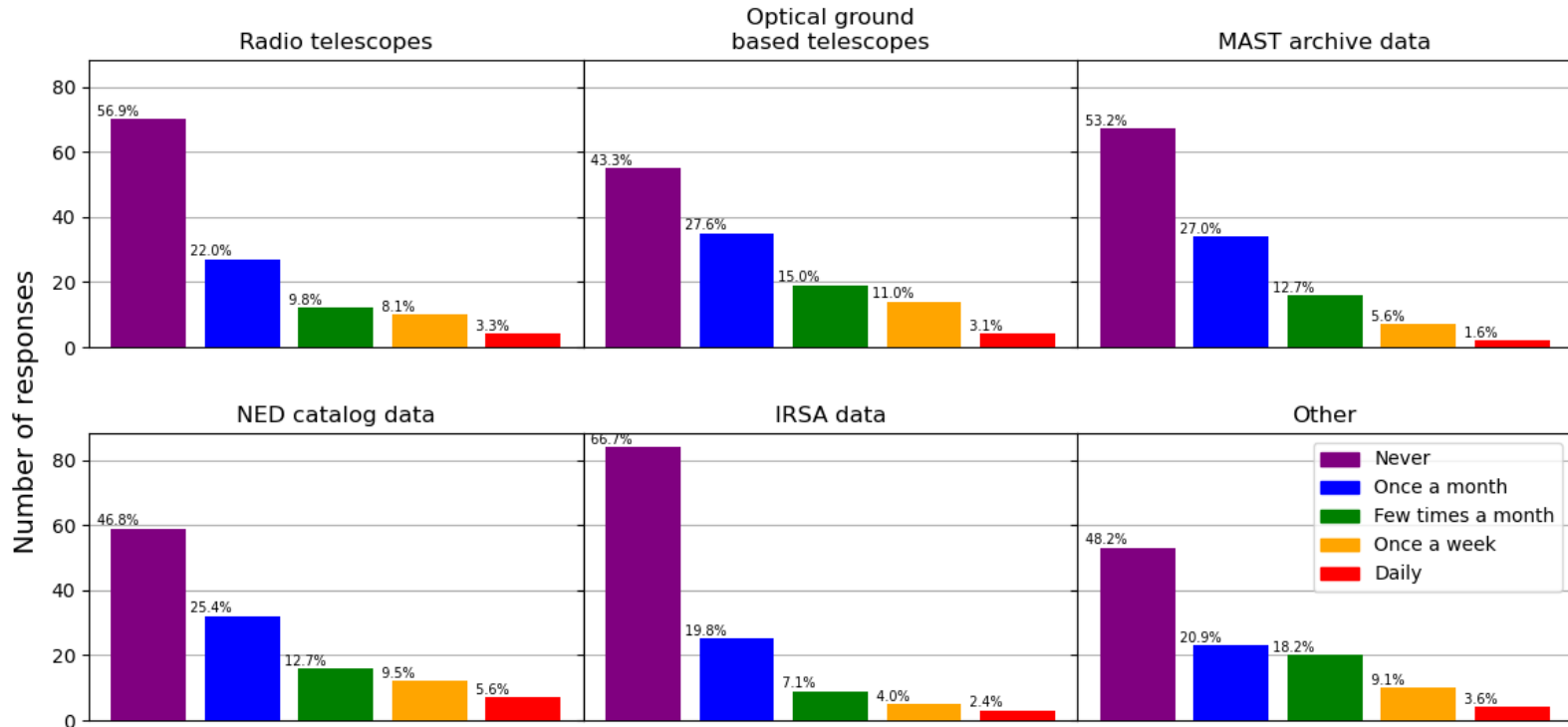


7. How do you rate the process to search and download data at the HEASARC?

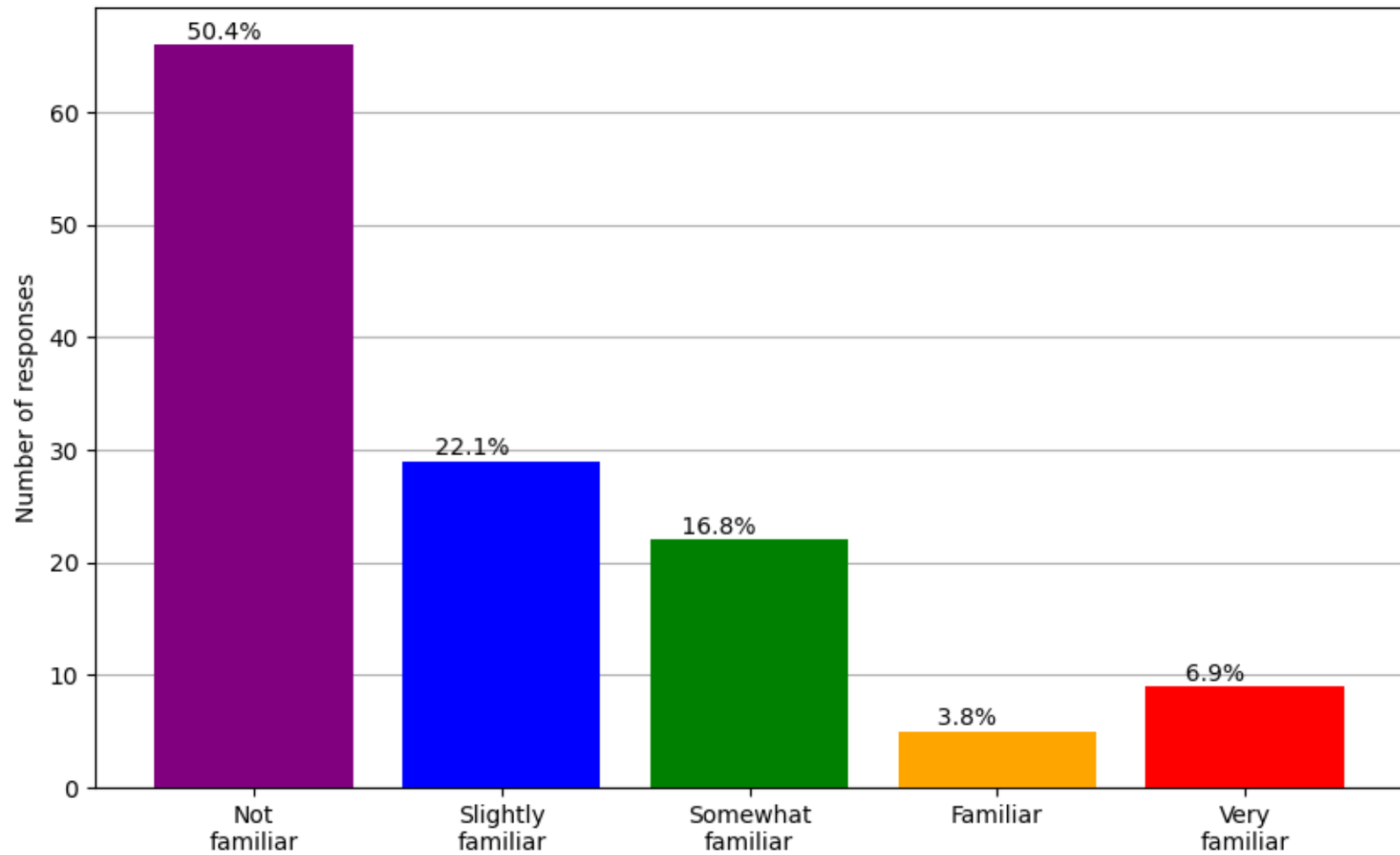




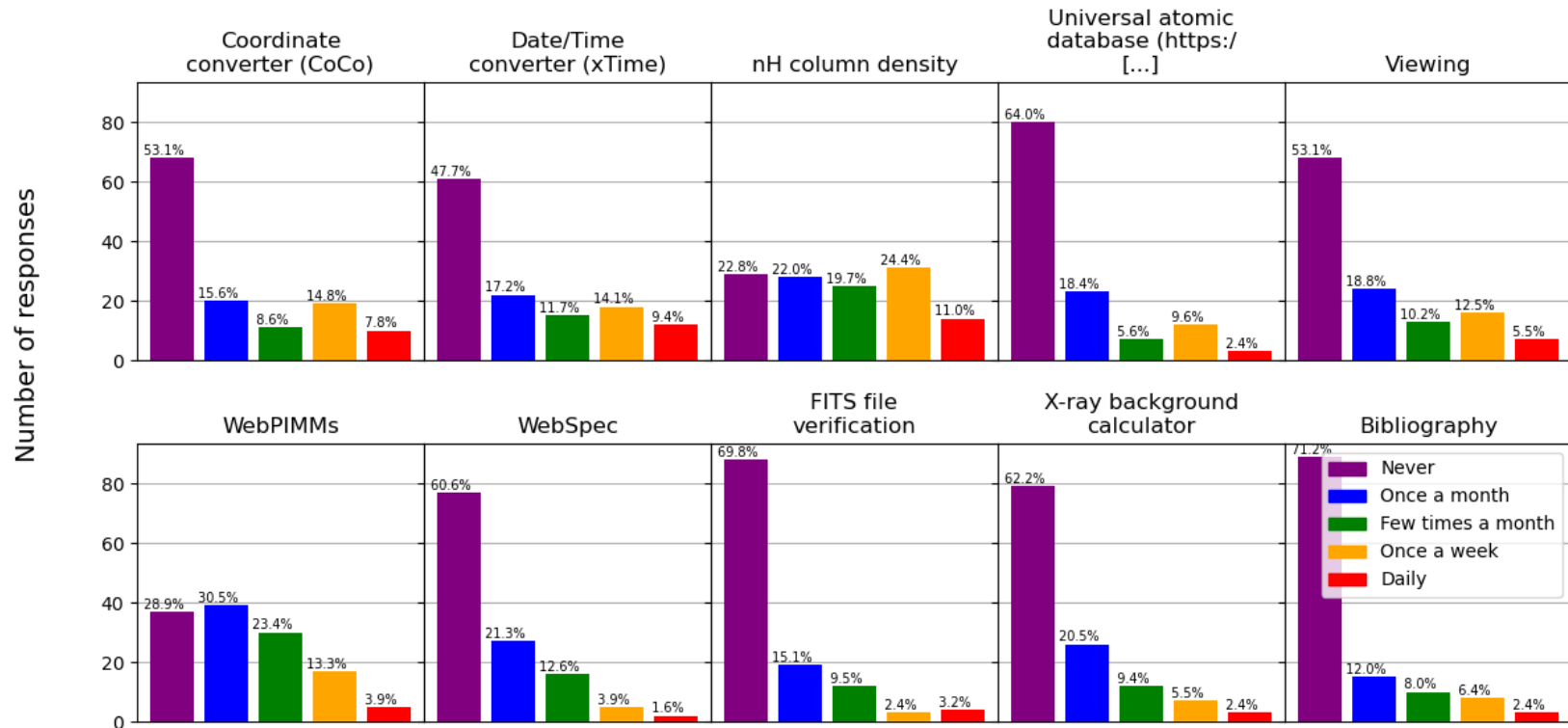
8. In your research, how often do you combine HEASARC data with different data sets from the following sources or archives?



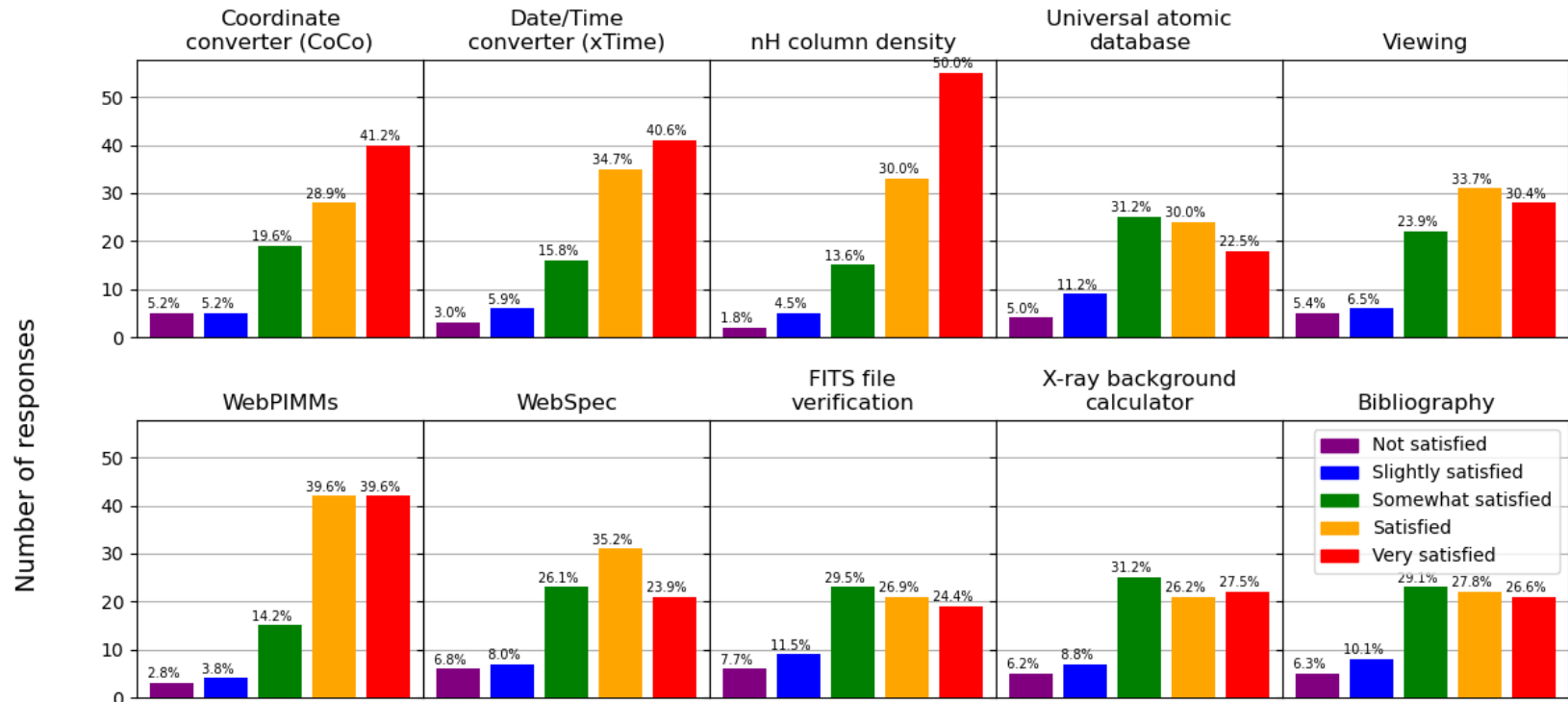
9. How familiar are you with Virtual Observatory (VO) interfaces (e.g. simple image access, simple spectral access, table access protocol) to HEASARC and other NASA data archives?



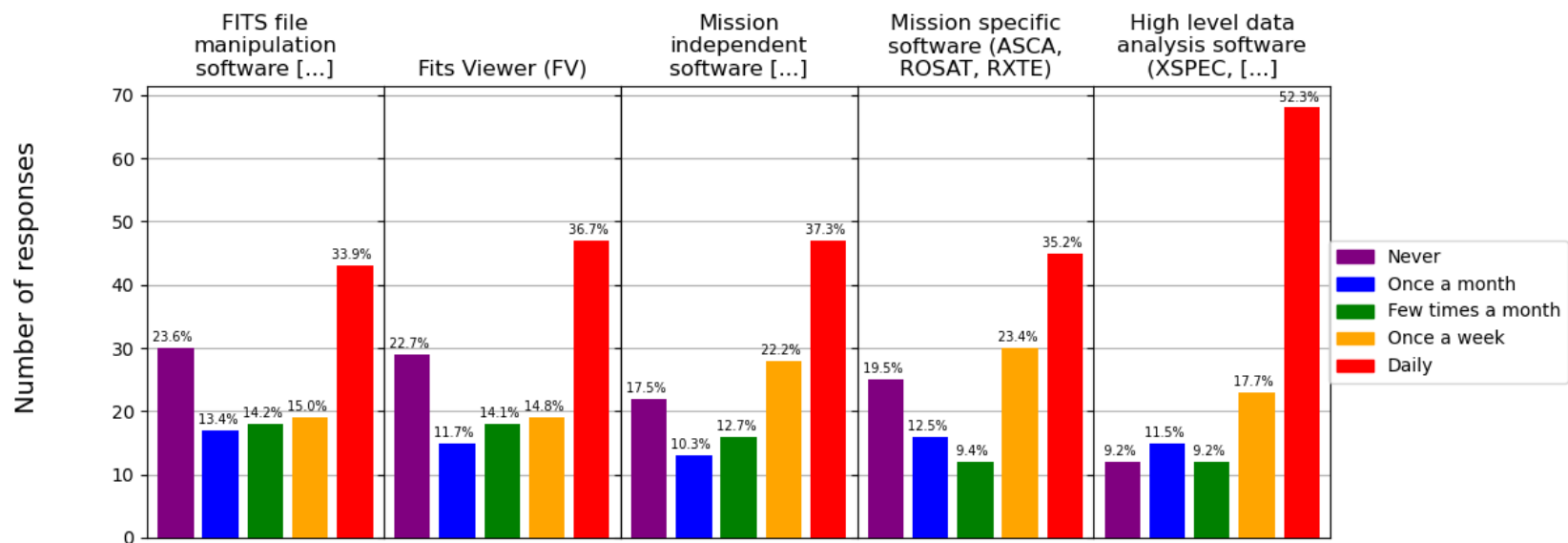
10. How often do you use the following HEASARC online tools (see the HEASARC Tools page for more details)?



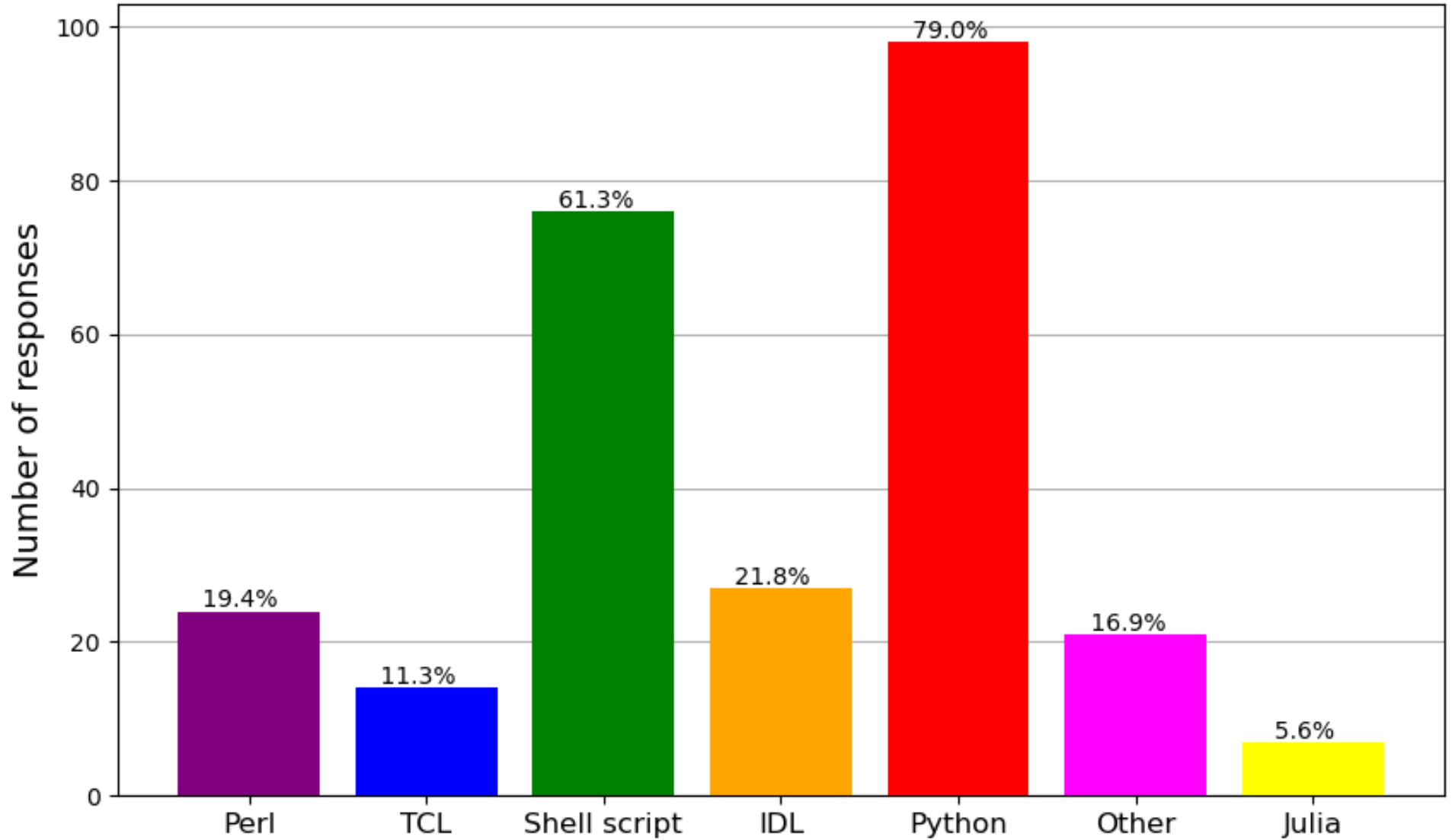
11. How satisfied are you with the HEASARC tools? (please refer to the HEASARC Tools page for more details)



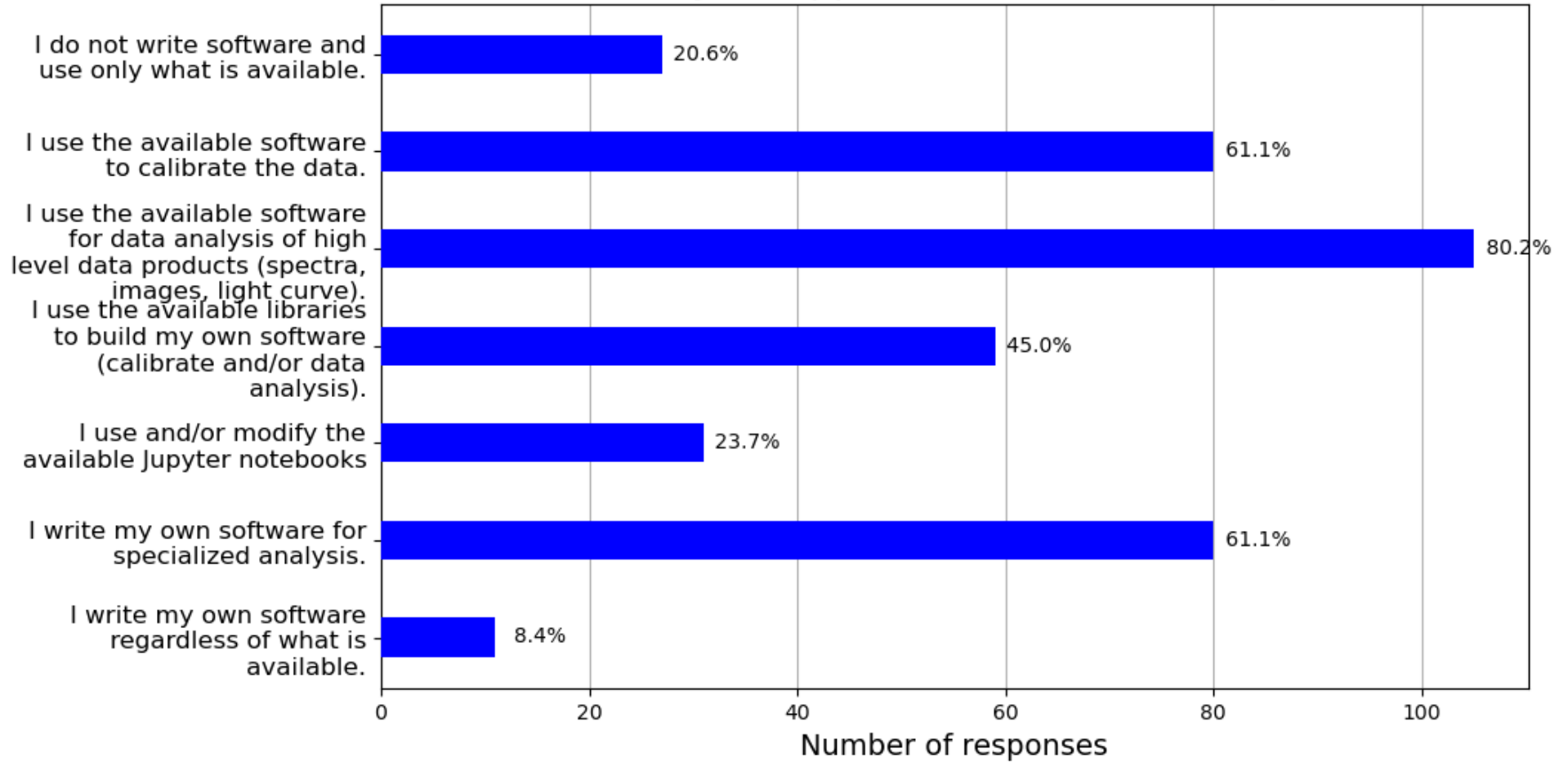
## 12. What HEASARC-provided software are you using in your research?



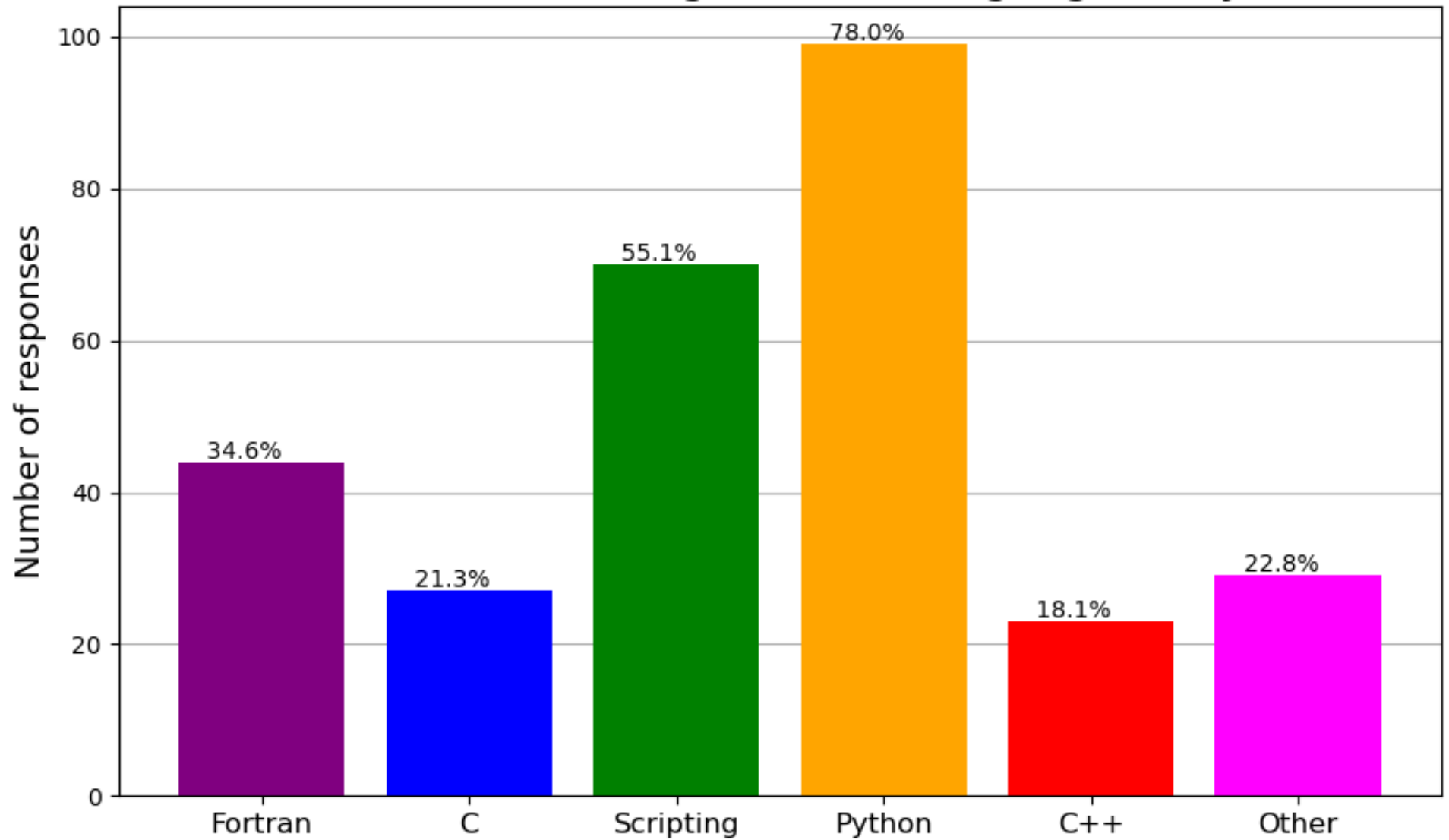
### 13. Which of the following scripting language(s) do you use?



### 14. Which is/are your approach(es) to data analysis software?

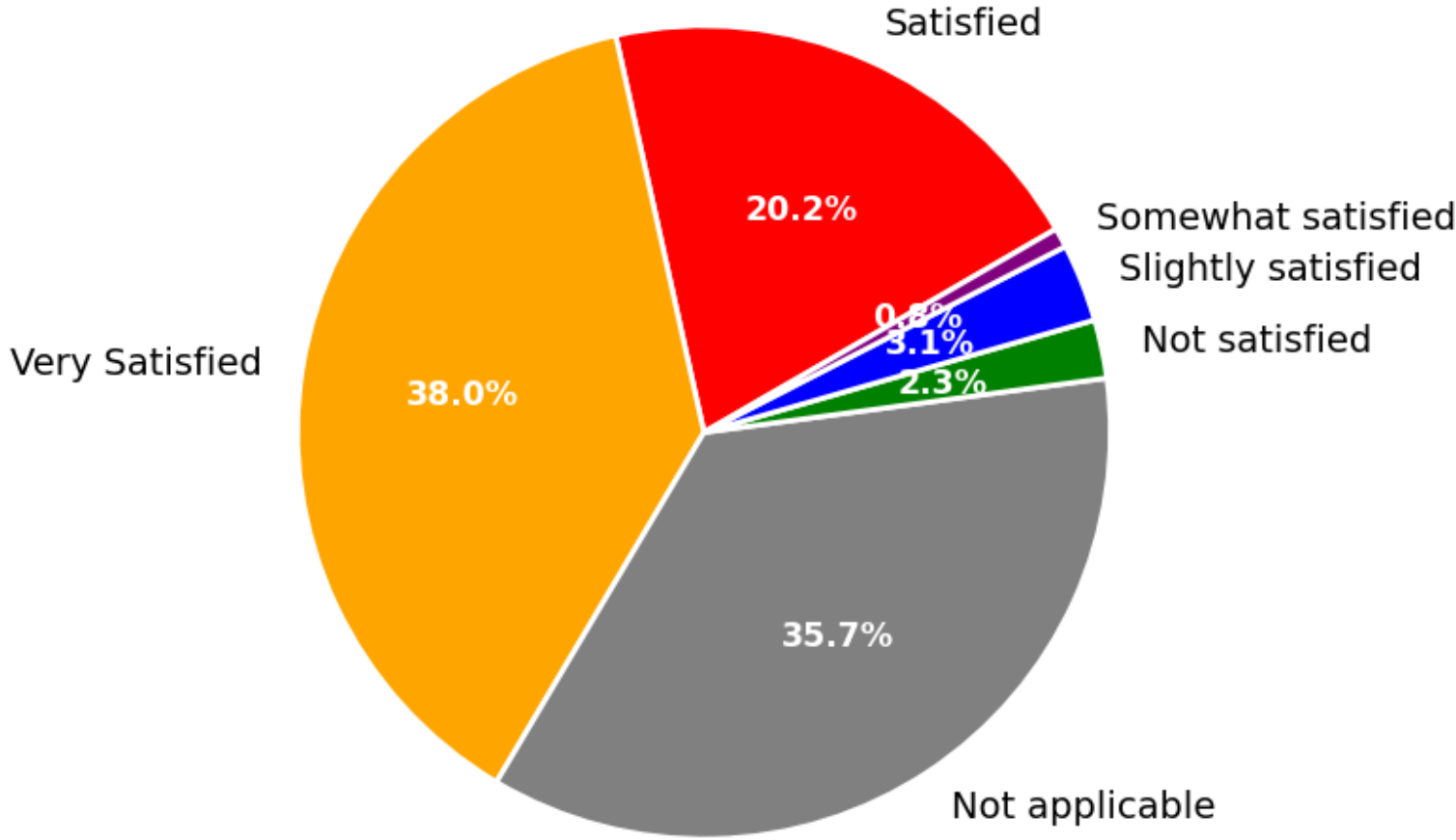


# 15. Which of the following software languages do you use?

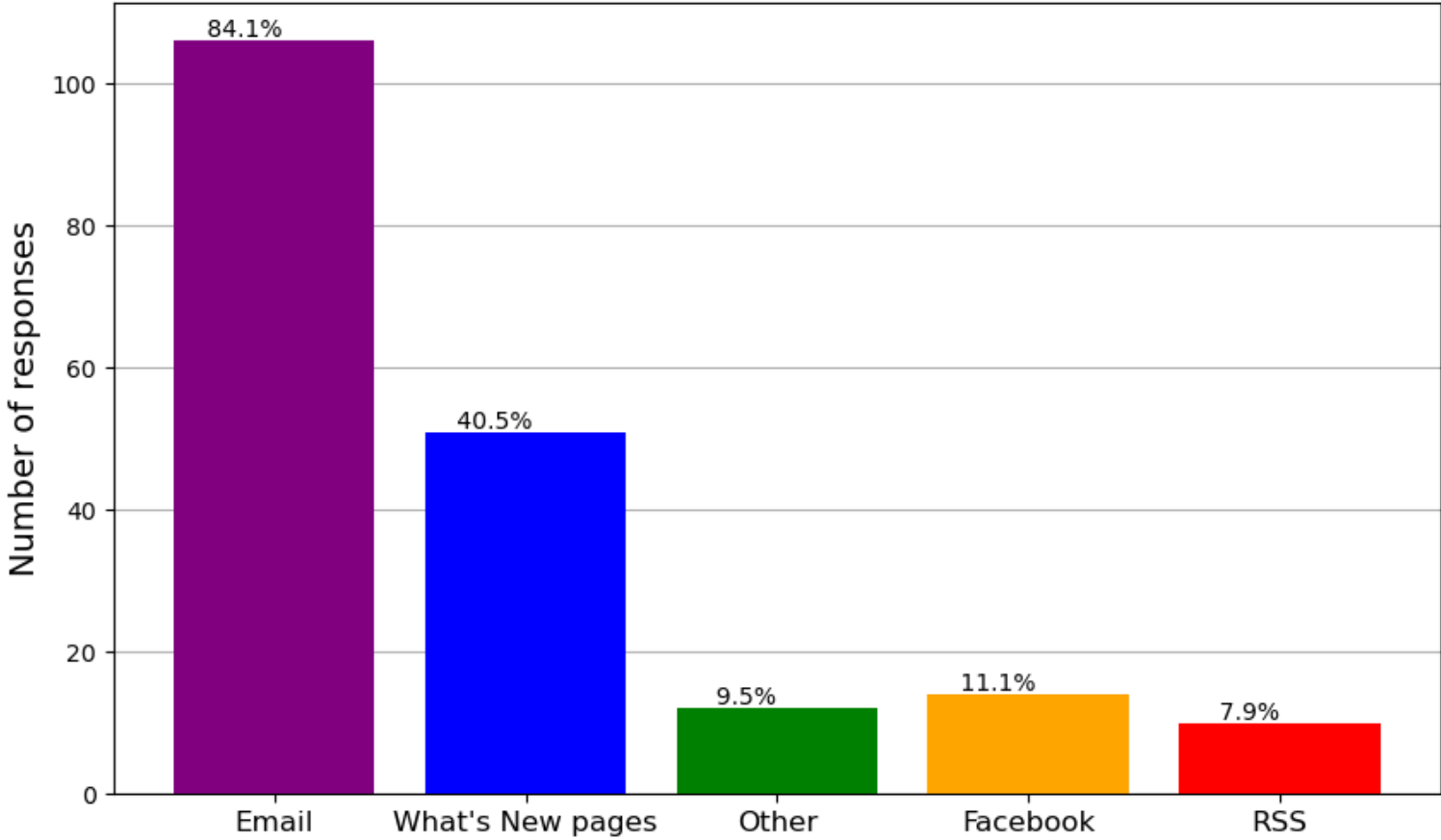




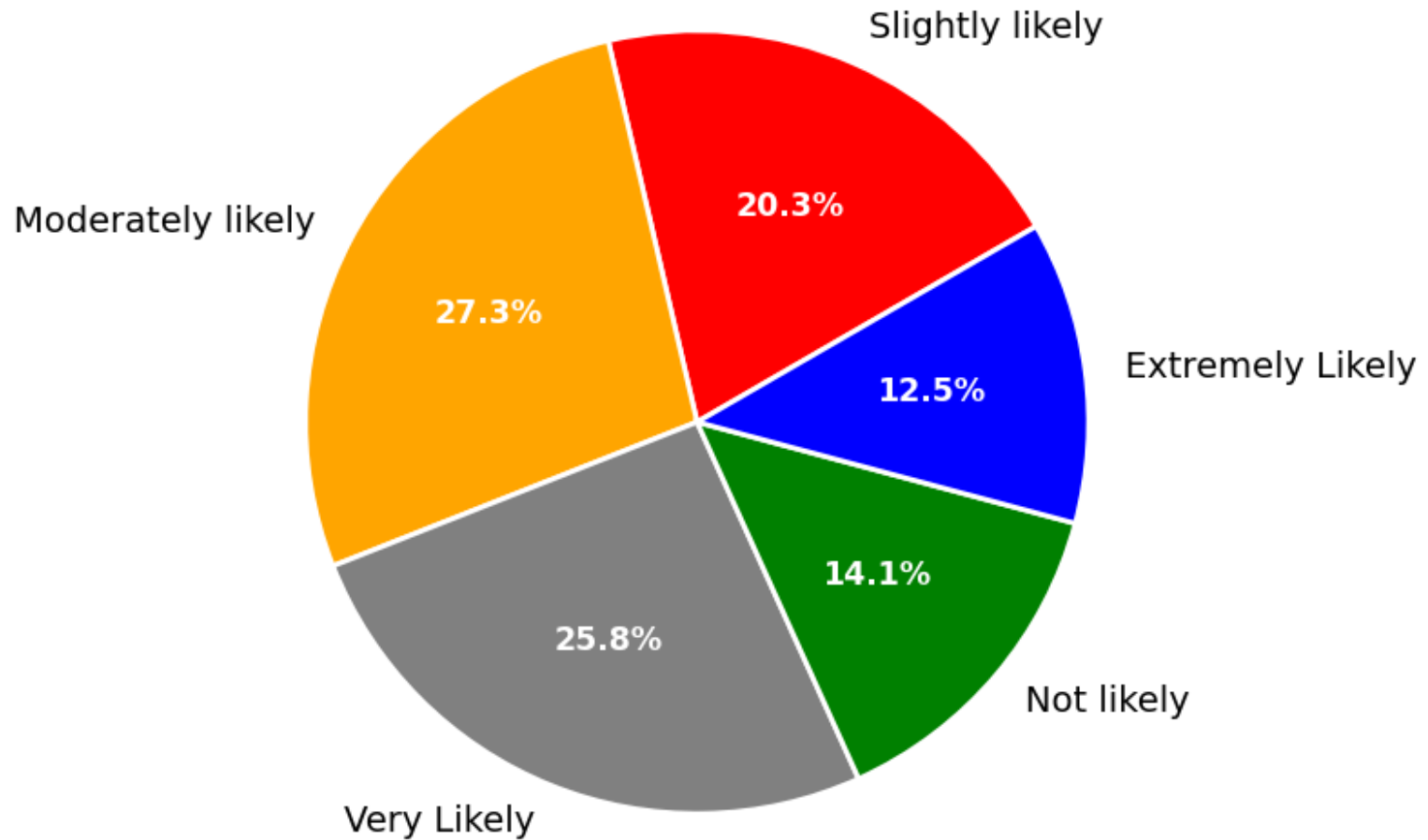
16. When contacting the HEASARC help desk, were problems resolved to your satisfaction by the help desk?



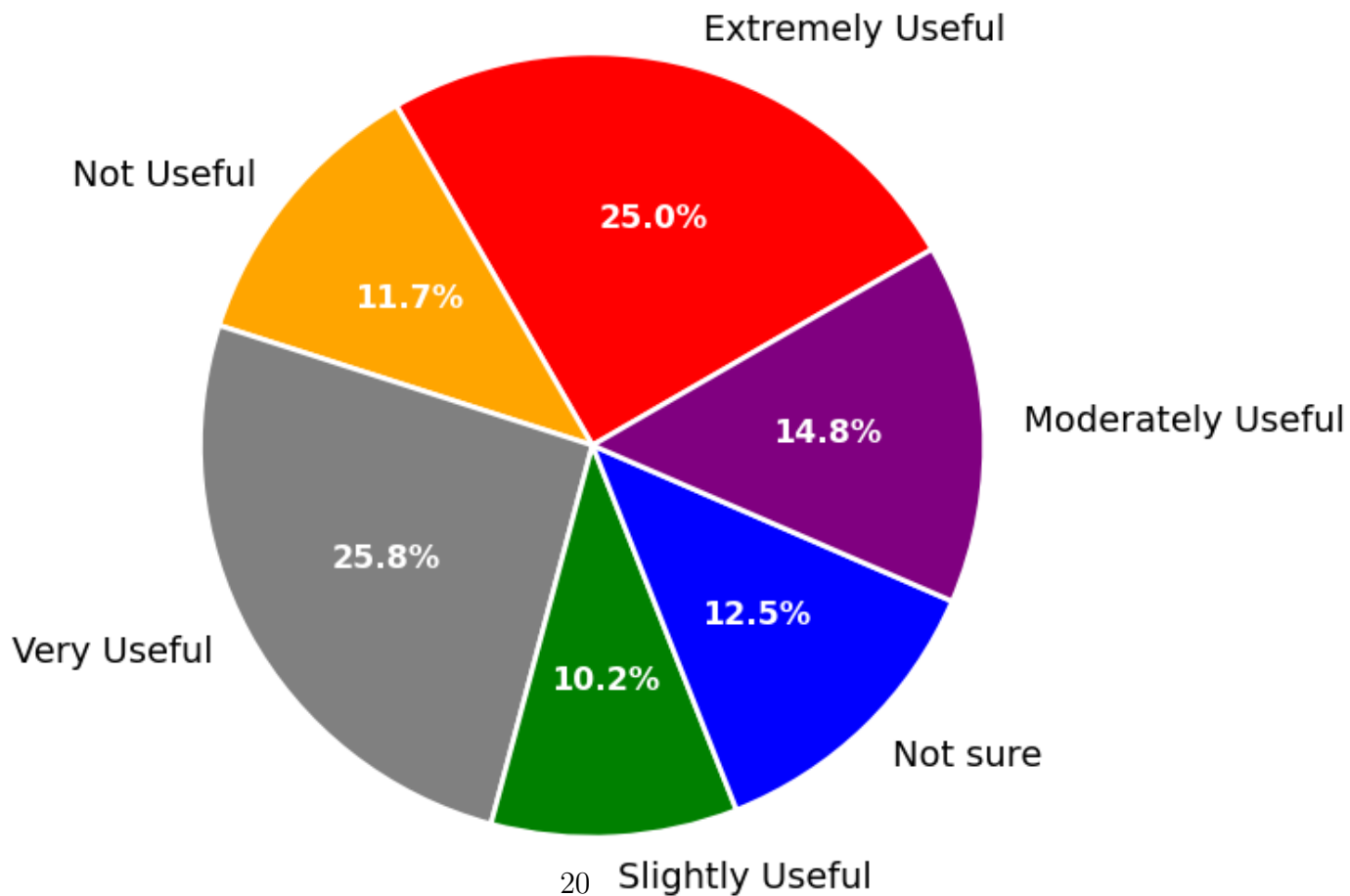
17. How would you like to learn about new HEASARC services or community events?



18. How likely would you be to contribute high level data products (images, spectra, lightcurves, other), catalogs or software derived from your research to the HEASARC?



19. The HEASARC is considering providing a data product specifically designed for use in large-scale data analysis (such as AI/ML), e.g., a data set containing all spectra collected by a specific observatory in a common format. How useful would this be for you?



**Q 20. Please enter any additional comments: e.g., details on questions above, feedback on additional software, tools, or data products (e.g. to support AI/ML-based research or other large scale data analysis), future HEASARC implementation, or any other comments that you would like to provide.**

- “once a month” is too frequent; access of xspec/libraries for external use is about 1/yr.
- 1) HEASARC needs a website upgrade - website is outdated, confusing, and things 95% of users do not care about take up the prime real estate of the website (e.g. history). Students starting in the field struggle because of this convoluted and outdated website. 2) XSPEC/heasoft needs a USER GROUP that is NOT on facebook. User group/place to ask questions needs to be public and searchable and not require the user to sell their data to a 3rd party company like facebook. 3) Suggestion: HEASARC page is often the first page someone who wants to do X-ray analysis lands on. You could probably make X-ray astronomy as a whole more accessible and used by colleagues in other fields more often if you really put in the thought and re-design the website so it is clear, transparent, modern feeling, easy to navigate, and also provides resources on how to get into high energy analysis.
- mostly use for retrieving archival data - fast and efficient
- Data storage and retrieval at HEASARC is generally suffering from the issue of having years of crap build up, it really needs to be broken down and restarted. I realize this would be a herculean (perhaps sisyphian) effort. For example, I applaud the recent move to place HEASARC data in S3 buckets, but was extremely disappointed that no effort was made to try to unify the structuring of those archives to improve accessibility of those data. Essentially it’s just the HEASARC FTP interface dumped onto S3. Building tools to access those data require learning the weird quirks of every decision made poorly over the last 40 years. APIs are poorly documented, non-uniform and difficult to discover.

At this time of leadership change at HEASARC, it needs to take a good look at itself and consider what steps it can take to move sustainably into the future. Bold choices need to be made to streamline and improve HEASARC accessibility.

Some steps are encouraging, for example the beta of Xamin looks like it might actually finally not be completely awful, but has a long way to go to prove itself. Talk of Jupyter Notebooks is a mixed bag IMHO, Jupyter is still a programming language at the end of the day, and I find that astronomy's wholesale move to Python has come with it a troubling issue that those who are not comfortable being computer programmers now find it more complex to perform data analysis than when tools were shell based. This is ignoring the issue that Jupyter Notebooks, as great as they are, are very much "du jour" and might look as dated and old fashioned in 10 years as HEASARC's w3browse looks today.

I encourage HEASARC to fully embrace the cloud based future, and provide real, easy to use, well documented and uniform methods to access data, and genuinely accessible analysis tools.

I also encourage HEASARC's new leadership to take steps to move to more sustainable method of keeping up with the times. Much of HEASARC has been allowed to rot over 20 years. A sustainable plan of action to not let this happen again needs to be put in place.

- Can you please bring back Cygwin support for HEASoft? Or provide instructions using a different method for Windows users? I know that there aren't many of us, but it was very helpful to have a local copy of HEASoft running (I mainly used XSpec) on my local laptop as opposed to now where I have to ssh into a workstation to run a Linux implementation of XSpec.
- I typically use HEASARC to find what X-ray observations are available for a particular object.
- Data for large scale data analysis could be extremely useful. However, there are often many processing/analysis decisions made (e.g. how are the LC or spectra binned) that dramatically impact performance and need to be considered very carefully. They can often also be science case dependent.
- WebSpec really needs an option to do all XMM EPIC cameras at once. Every October I bounce off of it when I want to do some quick simulations for the XMM deadline.
- I'd like to see that all major high-energy astrophysics software can be run remotely, especially for undergraduate students, without the need for a local installation.

- Julia is not a scripting language. It is a high performance scientific programming language like FORTRAN.

HEASARC should consider developing and providing better software for its users. For example, the FermiTools software is 30 year old technology. It is slow and cumbersome to use and makes analyzing Fermi data tedious and time consuming. There are now better ways to develop software.

- HEASARC is awesome ! Please continue being awesome :)
- It would be great if the HEASARC will be able to implement the data and analysis software from previous mission such as HETE-2, Ginga (GBD/ASM/LAC). I think that such data are still useful for GRB studies and long-term behaviour of Galactic bright sources.
- I write data analysis tools in Julia language, it would be very useful to provide Julia interface to HEASOFT, like that available for python.
- My answers indicate that I don't use or know a lot of HEASARC tools (Webspec, Chronos, skyViewer, CoordinateConverter, etc.). It's not that I dislike them, but that they often duplicate what I do with mission-specific tools. For example, as an avid Chandra and XMM user, I use SAS and CIAO tools for most of my daily work. Then, even when I want to inspect a fits file from other missions, I would open it in tools I'm already familiar with (e.g. CIAO's "dm1ist") instead of going to yet another tool like fitsviewer that offers essentially the same functionality. Similarly, Skyview (which I did not know about before this survey) seems to be overlapping with ds9 for querying archives and overlaying images or with web-based tools like ESASky or Aladin. In general, I feel that some of HEASARC's tools are somewhat dated. That starts from WEBPIMMS (which I often use for proposals), which has a 90's style PHP look and a UI that always tips me up. Why do I have to enter the energy range as "0.3-5.0" and it's not recognizing ".3-5.0"? Similarly, fitsview as a desktop application was, when I last used it, based on some GUI framework that looked like an eye sore. On the other hand, some of HEASARC's offerings are absolutely novel, and breaking ground in how they make capabilities accessible to many researchers - I'm thinking of the ease of using notebooks and HEASARC data in SciServer.

I recommend to take a hard look (which is, I guess, why you made this survey) and to retire some software and applications to focus effort on what's important. In that "hard look" also consider when

resources are already offered by others and don't have to be duplicated by HEASARC; that won't work without alienating a few users who like this or that tool but in the long run we'll all benefit from better tools overall. While funding is given at the national level, as a researcher, I use WebPIMMS even when I write XMM proposals and ESASky when I write proposals for US missions.

- migrating from Python to Julia
- I am retired so rarely use heasarc
- Refresher overview workshops (live or recorded) on HEASARC tools might be helpful.
- HEASARC does a great job, but over the years there is just way too much information on each page!!
- You should give an option to say N/A instead of 'not satisfied' for software I've stated I never used. The frequency of usage also goes from once a month to never. Perhaps consider adding 'several times a year'?
- fix pyxspect-it doesn't work. Also, most of the fermi bursts are missing their rsp2 files. But the gbmdatatools, gdt, and swifttools are much more useful because they have dedicated, USER-FRIENDLY interfaces, jupyter notebooks, and help pages. Maybe you could take a page from their book.
- Need archive mode for single event type data, i.e. cosmic rays, gamma rays.
- HEASoft is very good. More example of how to use would improve how quickly I become productive. Especially with the Python wrappers.
- If the online tools could be updated to fit modern day website standards that would be nice :)
- The heasoft tools are very difficult to use and the documentation is very poor. Furthermore, if the HEASARC aims to make their data/software compatible with current AI/ML research efforts, the HEASARC needs to significantly invest in modernizing their platforms for accessing data, such that it can be done programmatically, and their software, so it can be parallelized for high performance computing AI/ML analyses.



- It's very helpful to have very simple properties of observations, such as mean countrate, easily available (e.g. quickly accessible in a HEASARC Browse search).
- HEASARC is extremely useful in my daily research and teaching
- The reason HEASARC maintains the archive of high energy missions, and not the NSSDC was that the benefit of having high-energy astronomers maintain the mission data was an essential added benefit. I think that this should remain the core mission of the HEASARC. As such, documentation and maintaining accessibility of the data should have highest priority, as well as maintaining and upgrading software for mission analysis. I understand there are voices to homogenise the data products in some way to make AI efforts cheaper, but that will no doubt mean a loss of some essential details somewhere. Likely different for different missions. At a minimum those issues should be well-documented, because 30 years from now other people will have taken the mantle of maintaining and caring for the mission data of the past, and they should be able to easily understand what has been done (probably the LLM will need that as well to properly inform).
- For all the missions and each of their instruments, specifically Swift there must be a detailed manual describing how to download the data then how to process and analyse it manually so that if any further modifications are required with the processed data by the user, that can be performed. All the main packages along with their versions must be provided with a list of background packages or dependency packages along with their supportable versions on Windows/Linux/MAC.
- Improved help files for some ftools, like coordinator, pointxform - e.g. more details on how they work under the hood; improved description of some caldb file formats like teldef files/alignment files and how they are used. Unify keyword use between ftools - e.g. use of RA\_NOM, Dec\_NOM, RA\_PNT, DEC\_PNT, DATE-OBS, DATE-END, MJD-END etc, especiall ximage. update the FITS File Format Recommendations and WCS keywords for modern practises; shouldn't extractor update MJD-OBS, MJD-END, etc if the time range covered by an event file shrinks?
- HEASARC Needs to develop more open APIs to allow better access to the archive.

- The most annoying thing is the inconsistent naming of the sources, even within the same table. Regarding question 4: I answered “somewhat satisfied” every time I would have of ”Not applicable” (which I would have selected for all the services I never use)
- I hope HEASAR is getting better and better.
- I have been using HEASARC for over 3 years and I am extremely satisfied with using it, specially with all the cookbooks which are available and also good descriptions about the various commands have been provided. I would like to extend my special thanks to the support team for their quick responses. Improvements can me made on the extraction while extracting spectra and lightcurves in bulk for multiple observations. If we can make a pipeline inbuilt software for such process it will be extremely useful and also will save time, that being said the HEASOFT is a 10/10 software.
- I love ya guys!
- I would like to see improved documentation for TCL scripting within HEASARC software (e.g. in xseltcl and xspec)
- In future surveys, maybe include an option between “once a month” and “never”...?
- Important to provide software support for both old and new computers.
- Maybe a HEASARC specific high energy “school” would be useful. Some of the tools listed in this survey seem useful, but I was never shown or taught how to use them. I only learned how to use tools that were specific to the instrument I was using.
- HEASARC has many tools but it’s very difficult to find anything on the cluttered website. It would be really good to clean and update the website. Many tools are now easily replaced by astropy. Maybe similarly to NED you could have more python interfaces? It was funny to see Facebook as an option, people my age don’t use Facebook, so please don’t use Facebook for anything. Also you should have provided some option for less often than once a month but not never in a lot of questions.
- Yes

- make HEASoft MUCH easier to compile
- More documentation required for several HEASARC services like Sciserver, FTOOLS, heasoftpy

21. What is your primary occupation/role?

