



SCHOOL OF ARTS AND SCIENCES

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Dear Joe, George and members of the NED team,

This is a report of the NED Users Committee (NUC) meeting with the NED team held over Zoom on March 28 and 29 2022. At this meeting, we heard updates from the NED team on the new releases and other work done since our last meeting in March of 2021. In addition, we heard from Anthony Kremin, member of the DESI team on their upcoming data releases and their experiences collaborating with the NED team as a pilot to involve the survey teams themselves in facilitating the inclusion of very large catalog (VLC) data into NED. Finally, we heard a presentation on some key take aways relevant to NED from the 2020 Decadal Report "Pathways to Discovery in Astronomy and Astrophysics for the 2020s".

We, the NUC, continue to strongly believe in NEDs continued critical role in advancing extragalactic science. It is unique among other archives in providing multi wavelength, cross-matched, and validated data thus maximizing the science return from the data collected by any individual NASA instrument. NEDs role is in fact expanding in several key science domains as we point out below. But to continue to maintain its relevance, NED needs to speed up its ingestion of data from the literature as well as from VLCs — this was our top recommendation from our March 2021 report. To that effect, we were very excited to hear at this meeting about the collaboration with the DESI team pre-data release. This is a prototype for how NED can dramatically speed up the ingestion of VLCs data. We were also happy to see two other advancements in the efficiency and speed of data ingestion both of which are critical to keeping NED current. One of this is the implementation of new practices, including deployment of a machine learning application, to speed up identifying and preparing literature data for inclusion into NED, and a new version of NED's source integration pipeline that extends parallelization into data ingest, cross-matching, and vetting. The other is a pilot project with PASA (Publications of the Astronomical Society of Australia) where NED provided guidelines for two authors to prepare their data themselves in the format needed for ingestion into NED. Closely related to that we are very happy and congratulate the whole NED team on the revised Best Practices document being accepted for publication, on the day of our first meeting, March 28, 2022. The wider implementation of this document, whose initial version was prepared at the urging of the NUC, will be critical in the overall goal of speeding up the ingestion of data into NED as well as more broadly leading to higher quality science!

In addition, another key recommendation from the 2021 report was to increase the role that NED plays in TDA (Time Domain Astrophysics). To that effect we were very happy about two key developments. One was the new automated fiducial redshift determination which provides reliable redshifts that are continuously being improved with the addition of new data. This directly contributes to positioning NED to become the go-to service to quickly identify the most likely host galaxy for any transient event such as GW events. In that regard, we were also very happy to see the results of the Local Volume Survey (LVS) which showed that NED is more complete than the standard GWF (Gravitational Wave Follow-up) reference database out to ~ 1000 Mpc.

Lastly, we were happy to see continued improvements in the nuts-and-bolts operations of NED including database re-factoring and that the name server has been ported to a commercial cloud service (AWS) leading to reduced burden on local hardware and improved uptime.

Following what we heard and discussed at this meeting, our recommendations to the NED team are:

1. Make every effort to minimize the time delay between DESI Data Release and NED Data Release. This is an incredibly high-impact opportunity for NED and the advance co-operation of the DESI team is fantastic. Such collaboration with the teams will also bring in-depth expertise with the particular dataset. For example, the team experts would be able to warn of critical flags which say a redshift can be totally wrong - highly unreliable data are best not included (see point below).
2. Reach out to other archives (e.g. SDSS-IV which just recently had its final release) to establish the same type of partnership to get help from the teams themselves in getting their data in NED-friendly format. Having DESI and SDSS-IV as prototypes for how this works will enable the team to build towards a new model of collaboration with surveys where additional tasks for VLC integration could be shared.
3. Continue to press journals for cooperation in speeding up ingestion of data into NED. Ask all to link to the published Best Practices Document as well as link to a page on NED which provides an option for author-contributed data (following the experience with PASA). Also ask especially for the data editors to insist on vetting object names before publication (same as references are all vetted). NED should directly help with that by providing say a Jupyter Notebook that demonstrates how to do this vetting quickly and easily. We also recommend following-up on the experience with PASA, with another journal, e.g. PASP (Publications of the Astronomical Society of the Pacific) to build up experience with how best to approach author-contributed data. That experience will help in convincing the AAS journals to both take the above recommended steps and help authors publishing therein to choose to increase their work's visibility by contributing their data to NED themselves.
4. Write a paper describing the fiducial redshift decision tree. More redshifts on NED that are more automatically and systematically assigned will benefit the community greatly. But it is important the users clearly understand how the selection and prioritization is done.

5. Release the LVS (Local Volume Sample) catalog and LVS paper asap. Doing this well in advance of O4 will maximize the usage by GW-EM follow-up teams worldwide.
6. Consider adding NED host galaxy and NED fiducial redshift to alert packets in ZTF, Rubin etc. alert streams.
7. Consider regular rotating on/off the NUC. It would be good to rotate people out for fresh perspectives. NED should advertise for people interested in serving on NUC and look for gender, racial, regional, career-stage diversity. It would be excellent at this stage to bring somebody from the Rubin LSST and also a heavy user of JWST.
8. NED needs to continue articulating its overarching vision for the future, given the 2020 Decadal Survey recommendation to increase interoperability between the different archives. Here we would also like to also re-iterate our recommendation from our 2021 report (https://ned.ipac.caltech.edu/NUC/docs/2021Mar16_NUC_Report.pdf) "Full integration of NED capabilities into the planned NASA archives science platform is critical to the long-term success of NED. We strongly encourage NASA HQ to involve the NED team in the development process, and NED leadership to insist on such representation."

In conclusion, we are always impressed by the hard work and achievements of the small NED team who succeed in both maintaining and continuously improving NED as well as opening up new avenues to make it an even more invaluable resource for the whole extragalactic community. We are very pleased to see that recommendations made by the NUC are listened to and are being implemented as pointed out in several instances above.

The NED User's Committee

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Dr. Brad Cenko, NASA Goddard Space Flight Center and University of Maryland
Dr. Mansi Kasliwal, California Institute of Technology
Dr. Mark Lacy, National Radio Astronomy Observatory (NRAO)
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