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Dear Joe, George and members of the NED team,

This is a report of the Zoom telecon held on March 10 and 12 2021. The March 10th meeting was also attended by NASA Headquarters representatives Hashima Hasan (Program Scientist Astrophysics Data Archives) and Roopesh Ojha (Program Executive). The main agenda items were: 1) to hear the perspectives of the NASA representatives, 2) to get updates from the NED team on their latest activities, and 3) to hear of the timeline of the NED work for the next few years following the results of the 2020 Programmatic Review (which were discussed in detail at our July 2020 meeting). Prior to the telecon, NUC members were also contacted for feedback about the updated Best Practices document as well as a questionnaire about some new features both of which were also discussed at the telecon.   A summary of the key points discussed as well as a list of specific recommendations by the NUC are given below.

First of all, the members of the NUC would like to express how impressed we were at the large amount of work done since our last meeting in July 2020 — despite a very difficult year given the COVID pandemic. The NED team have kept up with their regular schedule for both data and software releases and continued development of new features and functionalities. Among the key new features we liked were the new "Search by Refcode" feature (which removes some duplication of functionality with ADS), the prominent link to the IRSA Finderchart, the improved SED functionality, the plan to extend the survey coverage overlays and critically, and the work to extend a local volume galaxy sample out to a distace of ~1 Gpc with a paper in the works to quantify the completenes of galaxies in the local universe (led by Dave Cook). This increased redshift completeness is also thanks to the recent ingestion of the 2MASS photo-z catalog. We liked the new tutorials and in particular the new example Python notebooks. One NUC member attended the recent AAS NAVO workshop and was pleased to see it was highly visible amongst the other programming workshops, well-attended, and very helpful in its guidance for accessing NED services. We were impressed at the significant increase in accessing NED via APIs over the past years as well as a direct result of this recent workshop. Facilitating accessing NED through multiple platforms besides the UI allows it to reach younger generations of researchers who primarily use Jupyter Notebooks, for example. We were also happy to hear of the updates to the 2013 Best Practices document (led by Tracy Chen) and especially of the fact that there is increased interest from the Journals to publicize this document. These are functionalities that

stem from prior recommendations or strong endorsements of the NUC and therefore we are heartened to see how closely the NED team follows our feedback!

We are very happy that besides the full funding of the InGuide request (which includes the ingestion of PanSTARRS) there is also in-principle approval for the OverGuide request for ingesting several very large catalogs (such as DESI) and further work on increasing the speed with which such catalogs are ingested. This is critical in terms of our number one recommendation — to keep NED current. Therefore we urge NASA HQ to allocate the indicated over-guide funding as soon as possible so that this work can begin!

In fact, the key point of discussion over the last several NUC meetings has been the need for NED to stay current in light of the dramatically increasing volume of data both in terms of the literature and the very large catalogs (VLCs). We applaud the continuing work by the NED team in speeding up this process (especially on the literature side) through the use of machine learning and re-structuring of the processes including "human parallelization" which are anticipated to cut the manual vetting work by half! But we all agree that there are key bottlenecks that still need to be addressed. First, authors need to follow the recommendations of the Best Practices document, which ideally will happen no later than the point of publication of an article in a journal — here the data editors can be critical partners. We applaud the continued efforts by the NED team to forge such partnerships. Secondly, we discussed earlier that NED should interface better with the teams behind anticipated large catalogs — not just wait for the public release thereof. To that effect, we were happy to hear that the NED team has indeed started doing so by reaching out to the Chandra team, as well as the DESI DR team. These steps will help reduce the current gap of several years between when a large catalog is first made public and when it is incorporated into NED.

Lastly, the issue of whether or not to ingest the *Gaia* catalog came up several times during this meeting. We agreed that ingesting the *Gaia* catalog per se is not a high priority since Gaia positions are already adopted in upcoming catalogs that are slated for ingestion into NED such as PanSTARRS and the Hubble Source Catalog. These will allow NED to move to the astrometric reference frame based on *Gaia*.

Our recommendations:
1) Keep up the great work in speeding up the ingestion of both literature and VLC data. This is key to keep current. The key steps toward that are described above.

2) 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.

3) Consider ways for NED to play an even bigger role in science outreach and education. For example, by making use of the Galaxy Zoo experience in creating classroom ready exercises/ tutorials at the Astro101 level. We discussed that this could be done either through seeking funding for a dedicated outreach/education position or by pointing out that such activities might be funded through external researchers's NSF grants as part of their Broader Impacts.

4) The NUC were asked by the NED about our opinion regarding an acceptable "bad data" (error rate) threshold. The current goal is to capture data as published with 99% accuracy (1% error rate), while the error rate

achieved with the automated probabilistic cross-matching is higher and varies with source density, and of course there are trade-offs in reliability vs. speed of ingestion. The NUC considers the reliability of NED to be a cornerstone achievement that should not be compromised! We also recommend making it easier for users to report an error. There is already a Helpdesk but perhaps it can be made more visible by making "error reporting" available on each page.

5) Continue to increase NED's visibility in particular in advertising new features and holdings. NED is already engaged in such efforts especially through its presence at AAS meetings as mentioned above as well as the ongoing NED Ambassadors program. But the key is to use multiple channels in order to reach the maximum number of people. We suggest perhaps making greater use of existing structures such as through the IPAC social media presence or an IPAC Newslettter.

6) NED should continue to play a central role in the larger efforts of making data findable, accessible, interoperable and re-usable. This is indeed why it is critical for NED to continue the critical work of cross-matching the large catalogs. For certain classes of data (e.g. light curves), even if NED cannot keep the data itself, it should make it known that the data exist and point to where it is stored. While we live in the era of large surveys, small observing programs are continuing. In this sense, we are sad to see funding for images/spectra ingestion stop. In the past, NED was the accessible repository for such data. Indeed, NED can look for future opportunities to bring back this support and more broadly advertise the role it can play in helping people with their data management needs, which is a requirement for NASA and NSF grants.

7) The NUC are excited about the role that NED can play in time domain astronomy. For example, we were glad to hear about about expanding the distances (spec'z and photo-z) to ~1 Gpc for the local volume sample used by the gravitational wave follow-up tool. Continuing to ingest large redshift catalogs is obviously critical in this effort. We suggest that NED publicize broadly (see point 5 above) its coverage out to ~Gpc and redshift completeness levels. This will help make NED the go-to service for helping the community find the host galaxies of optical and GW transient events. Separately, the team may consider investigating deeper integration of NED with central database for all optical transient surveys, the Transient Name Service (TNS; www.wis-tns.org). There may be opportunities to extend the host galaxy association software developed for GW follow-up (e.g., fast radio bursts) and to enable population studies of transient host galaxies.

8) Lastly, NED really needs to have more people so that it can maintain its position as the one-stop-shop for extragalactic data. Therefore in planning for future funding rounds, we suggest that the NED team should be bolder in asking for funding! Ultimately, we think the funding for NED should be more competitive with benchmark archives like the CDS.

In summary, we would like to express our appreciation for the fantastic work that the NED team are doing. We look forward to not only continuing to use NED in our research but thanks to its evolving functionality, also find new ways to use it for new discoveries!

The NED User's Committee
Dr. Rachael Beaton, NASA Hubble and Carnegie-Princeton Postdoctoral Fellow
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)
Dr. Andrea Prestwich, Smithsonian Astrophysical Observatory (SAO), Chandra X-ray Center
(was not able to attend the above meeting)
Dr. Anna Sajina, Tufts University, (**Chair**)
Dr. Ohad Shemmer, University of North Texas
Dr. David Schlegel, Lawrence Berkeley National Laboratory (was not able to attend the above
meeting)
Dr. Sabrina Stierwalt, Occidental College