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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 in person at IPAC in Pasadena and over zoom on October 1, 2024. At this meeting we heard updates from the NED team on changes to the user interface to make it more user-friendly, a major system upgrade, improvements in cross-matching techniques, updates to the Gravitational Wave Follow-up Service, and other work done since our last meeting via zoom in June 2023. We also heard from Dr Roopesh Ojha at NASA Headquarters and discussed the outcomes of the 2024 Archive Review. Finally, we worked with the NED team to update their vision and mission statements.

We continue to be impressed with the multifaceted work the NED team does to provide the community with a robust, adaptable database and to facilitate open access to science. NED remains unique among other archives in providing multi-wavelength, cross-matched, and authenticated data that maximizes the science return from any NASA dataset. NED further continues to play a crucial role in enabling new NASA science as evidenced by the consistently high rate of published papers directly citing NED.

Two major strategic goals that continue to be discussed in NUC meetings are to streamline NED's ingestion of new datasets and to increase NED's role in time domain astronomy. The changing landscape in both of these areas makes these moving problems and the NED team continues to lead the field with advancements in their approach. The NED team reported on significant efforts towards both of these aims. Three major data releases since our last meeting in June 2023 introduced over two million new sources and redshifts representing the results of over 4100 publications. These impressive statistics are a direct result of the NED team's efforts to both communicate best practices to individual authors and journals and to work with the DESI team in advance of their first data release. Of those two million sources, ~200k were in the range of the NED Local Volume Sample. The NED team's quick and timely updates to the NED-LVS will maximize the global usage of NED by teams pursuing GW-EM follow-up efforts. Along with these efforts, the NED team also continues to make innovative updates to the cross-match algorithm, make progress on database restructuring, and introduce new search tools. We are also happy to see the NED team's continued prioritization of open access to science through their effective and well-attended talks and workshops at the annual AAS meetings.

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

Ingestion of New Datasets

1. Continue to pursue the ingestion of the most relevant large datasets. The NUC sees great value in NED being a place where a user can enter a Roman ID (for example) and find vetted, quality information on that galaxy. The NUC encourages the NED team to prioritize those large datasets that serve the science cases that make NED unique over those with the highest number of sources. For example, the NUC recommends a continued focus on surveys with redshifts over those with photo-z's which will be the focus of LSST.
2. Continue to streamline ingestion of new datasets by prioritizing only the most relevant data columns. The NUC appreciates the NED team's thoughtful approach to deciding which parameters to ingest from each large dataset.
3. Leverage connections within IPAC and the NUC to enable timely ingestion of new datasets, including potentially Euclid, SPHEREx, and Roman. When possible, participate in the working groups where the data algorithm plans are discussed to be as prepared as possible when the data is released.
4. Consider conducting a user survey to identify what functionalities of NED users rely on most. The Astrophysics Archives Programmatic Review proposal clearly defines important use cases that can only be done with NED, including cases for SED fitting and cross-matching. Are all of these use cases accessed equally? Or does one use case dominate over the others? The NUC offers to help design this user survey.

TDAMM Priorities

5. Investigate the possibility of a probabilistic host association for anything in the nightly alert transient stream. In the NUC's ideal use case, NED would be a "one-stop shop" for finding the most probable host galaxy for any type of transient (found via gravitational wave surveys, neutrino surveys, Roman, Rubin, UVEX, etc). Ideally a user would be able to customize the search with any prior information about the host starting with coordinates and then, if applicable, redshift and potentially other host parameters like star formation rate. The NUC recognizes that such a tool may be complicated to implement but believes it would have a broad impact.
6. Consider the implementation of a flag on the redshifts to indicate whether or not they are ambiguous. Such a flag would be helpful in the TDAMM use cases but also for general galaxy studies.

Expanding NED's Reach

7. Determine effective pathways for NED to be easily "plugged in" as a value-add to other science platforms. For example, investigate whether a parquet file can be delivered to Roman or Rubin to be added to their database tools. Such an approach would be more sustainable than developing an entirely new NED-specific science platform. As a start, the NUC thought the NED team's choice to integrate with the new Firefly release was a smart and strategic choice since Roman plans to use the same interface so users can become familiar with it.
8. Consider alternative funding sources, particularly for the strategies that involve the use of AI. The NUC was impressed by the efforts of the NED team to lead the field in exploring ways to use AI to ingest sources from the literature. Some potential sources of funding/support could be students or interns to conduct AI projects, MAST, or DOE

development funds. The NUC recognizes that these funding opportunities would not be self-sustaining but could be used to develop tools that are.

Community Outreach & Communication

9. Continue to pursue efforts to streamline ingestion of data from the literature. The NUC supports the NED team's plan to pursue a data capture tool as well as other efforts to communicate to authors how to make their datasets "NED-ready". For example, authors can be given an "open access science star" recognition that they can put in their data management plan when applying for grants or their science could be highlighted on the NED page.
10. Investigate ways to use the NED Ambassadors more effectively. One possibility is to incorporate the "teach-the-teacher" model of the NITARP and ALMA Ambassadors programs. NED Ambassadors could attend a workshop at IPAC where they are given the materials and background to host their own workshops back at their home institutions that familiarize their communities with NED (incl. specific NED use cases, best practices for publishing, how to use NED as a student learning tool, etc.)

Given the recent 2024 Archive Review, the NUC specifically discussed how the NED team could prioritize its TDAMM efforts to maximize NED's impact while staying within the budget. As described in points 5&6 above, the NUC sees NED being most impactful in probabilistic host searches. NED's strength is providing vetted knowledge of these hosts, and thus NED is uniquely posed to serve this need for the TDAMM community. Given the limited budget, the NUC endorses the effort to build a new Time Domain tab containing convenient links to past or ongoing transient events by leveraging APIs provided by distributed time domain services (e.g., ZTF and Rubin).

We are, as usual, incredibly impressed with the clever and resourceful work of the small NED team. This update was very responsive to the suggestions from the last NUC report and we appreciate the careful consideration of our past advice.

Sincerely,
The NED User's Committee
Dr Pauline Barmby, University of Western Ontario
Dr Rachael Beaton, Space Telescope Science Institute
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
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Dr David Schlegel, Lawrence Berkeley National Laboratory
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