

Report from the NICER Users Group Meeting - February 2023

The NICER Users Group (NUG) heard updates from the NICER team on February 24, 2023 and met on February 28, 2023 for follow-on discussion. The NICER team provided updates on the status of the mission and operations, the Guest Observer Facility, data analysis software and calibration. Overall, the NUG were very pleased with the many positive actions from the NICER team.

Data analysis software & data distribution

There have been significant recent updates, including pipeline produced spectra and light curves, and a new background modeling tool (SCORPEON). Moreover, there are now 39 analysis threads, many of which are new.

The NUG applauds the efforts of the NICER team, and views these latest updates as highly impactful - the pipeline produced spectra and light curves allow for an easier 'on ramp' for new users and a quick way for users to assess new data.

The flexibility of the new SCORPEON background model is also welcome, and promises a powerful approach to fitting data even when the background is high. SCORPEON is obviously a more advanced approach and so initially harder from new users to get into. Does the NICER team have a recommendation for a background model for new users to begin with (easy to use, yet robust)?

There was a suggestion to add links to the xspec FAQs and/or xspec Facebook group from the NICER pages, for those who want additional help with spectral fitting.

Calibration

The NUG was pleased to hear that the NICER team was able to hire an additional ½ person to help with cross-calibration efforts, and to hear about the plans for addressing the previously noted differences between the Crab spectra from different missions. On behalf of the community, the NUG thanks the calibration team for their continued hard work and excellent progress.

Execution of the GO programs and balance of resources

The NUG was impressed with the significant increase in submitted proposals from 107 in Cycle 4 to 136 in Cycle 5. It is also very positive to see the increased joint proposal options, which will allow a broader range of science to be successfully addressed with NICER.

In discussing the GO program it was noted that NICER gives a large portion of time to Directors Discretionary Time requests. This is highly valuable since one of NICER's great strengths is its flexibility to monitor transient events. However, it may potentially impact the number of GO proposal submissions, since it is possible to get time outside of the regular proposal cycle. This is important to consider when looking at proposal submission metrics. The NUG suggests the NICER team to keep track of which science highlights come from DDT requests rather than the GO program.

The NUG discussed whether the ~\$40,000 funding per successful proposal is sufficient funding. It was noted that this is not sufficient to support a graduate student for a full year, and also falls significantly below the funding amount for other missions, such as NuSTAR. NICER data sets comprise of many individual spectra, all of which have to be carefully analyzed to get the background modeling right and thus analysis of a NICER dataset is generally more complicated than analysis of a NuSTAR dataset, so the reason for the disparity in funding is not clear.

In discussing the GO proposal submission process it was noted that having the justification for the proprietary period done during the anonymous part of the review is not in the spirit of dual anonymity. Often proposers request a proprietary period when a graduate student will be involved in the analysis. However, student involvement may bias the reviewer positively or negatively. The NUG would suggest keeping the discussion of the justification for the proprietary period until after names are revealed and when the Team Expertise document is being evaluated to avoid any bias either way.

Increasing the NICER community

The NICER team requested the NUG discuss how to continue to increase the size of the NICER community.

The biggest barrier for new users is learning how to analyze NICER data, and it is important to have the right resources for this. The NUG is happy that the recent updates to the pipeline and the improvements to the data analysis threads and background modeling shows that things are on the right path. Having recommendations on how to combine data (e.g. for getting deeper spectra of fainter targets such as AGN), would be a valuable additional thread.

Continuing efforts to advertise NICER among the community is important. NICER is well known within the high energy community, but a broader audience could be reached by utilizing venues such as <https://astrobites.org/>.

The NICER workshop in Fall 2022 was highly successful in attracting new users (given the increase in proposal submission), and running another one of these, or having a summer school would be valuable.

NICER's DEIA efforts

The NUG was pleased to hear that a DEIA statement has been prepared and should appear on the NICER website soon. It is excellent to hear that a NICER team member attended the National Society for Black Physicists meeting.

If funding was available, one suggestion would be to consider running a graduate student workshop, with no registration fee, and have support for travel for students from minority serving institutions or first generation students. Preference could also be given to students from non-R1 institutions.

NUG Members:

Ed Cackett, Chair (Wayne State University)

Tomaso Belloni (INAF - Osservatorio Astronomico di Brera)

Dennis Bodewits (Auburn University)

McKinley Brumback (Caltech)

Kristen Dage (McGill University)

Mariano Mendez (University of Groningen)

Pragati Pradhan (MIT)

Andrea Sanna (University of Cagliari)

Krista Lynne Smith (Southern Methodist University)