

## **ADSUG Report 2018**

The third meeting of the Astrophysics Data System Users Group was held November 28-29, 2018 in Cambridge, MA. We welcomed two new members, Dr Dawn Gelino and Dr Jonathan Sick, and thank those rotating off - Dr Carrie Anderson and Dr Jake VanderPlas - for their service and Dr Kathryn Flanagan for completing her stint as the inaugural chair of the committee.

### **Kudos**

During the Users Group meeting, the ADS Team presented an overview on the general status of the project and updates on technical developments, including the transition to the new ADS User Interface, greatly expanded outreach activities for their users, as well as innovative planning for the future. It is clear that ADS remains an essential resource used by the entire astrophysics community; as the volume of shared text and data increases, this importance can only increase.

The Users Group was impressed by the quality of the Team's presentations, and feels that ADS has made excellent progress over the past year, and has been responsive both to the needs of the community and the specific recommendations made by the Users Group following the 2018 meeting. The ADS remains one of the best investments made to maximize the return from NASA Astrophysics missions and research supported by them.

The Users Group was gratified to see the number of the new staff who have joined ADS over the past year. Our impression is that the people who joined ADS recently have integrated well into the team and are making impressive contributions. They have taken ownership of their areas and, along with their more established colleagues, are thinking strategically about future directions.

Based on the presentations and discussion during the meeting, the User Group is confident that the ADS will continue to serve its users in the coming year. While there will be some challenges in the near term associated with the completion of the transition to the new ADS, the Users Group believes that ADS will continue to serve the community well and provide leadership in the coming year. The User Group thanks the entire team for their excellent presentations and discussion during the meeting.

### **Budget**

We acknowledge NASA's additional contributions in the last few years which have allowed a new level of stability and flexibility whose results are evident. While the current budget extending to the end of the Cooperative Agreement seems adequate, the ADSUG is concerned by the projected decrease in funding in 2021 followed by flat budgets for subsequent years.

Such an outcome would result in substantial loss of staff, expertise and capability. Moreover, as ADS acts an integrated system it is not clear that there are easily identified descopes that would accommodate these losses. We also note the growing size of the task which ADS faces, due to increasing publication rates and diversity of data sources, and the importance of long-term sustained funding. The ADSUG notes that NASA is getting more from ADS than expected; it is worth it!

We discussed the likely upcoming vacancy in senior leadership and the need for transition planning. In last year's report the ADSUG stated that, when the time comes, *'the project scientist position should be advertised with a substantial component of guaranteed research time.'* This requires additional support from NASA as the existing post is only funded half time. Urgent progress is required on this important issue. We unanimously reaffirm our support for a position including a research component, and the need for NASA to support it in addition to the existing budget.

Given the strategic nature of the role and the need to attract a wide field of prospective applicants, we suggest that consideration be given to establishing this as a 'tenured' (or federal scientist) position at CfA. This may take some time, especially given the opportunity a vacancy would present to think broadly about what the role of the project scientist might be in the future. The ADSUG believes that it is more important that the right role is created for the right person, than that a vacancy is filled immediately. However, funding should be secured urgently and the process started as soon as possible.

Furthermore, the committee strongly believes that time for independent and self-directed research is essential for all members of the ADS team, whether scientific or technical, and supports the management's efforts to explore ways to support this within existing funding arrangements. Such independent research always fuels the innovation and strategic vision that has made ADS a success.

### **Transition to 'New' ADS**

We encourage ADS to make the new ADS the obvious default as early as possible, and, recognising the risk of relying on very old and poorly understood code, to not delay the transition beyond the current May 2019 timeline. On a technical level, we encourage ADS to prioritize load testing to prove that the system is capable of scaling to the larger user base now on classic ADS. We are encouraged by the hard work already done since the last meeting on front-end performance issues, particularly around the speed of initial page load. We understand that some of the users still on classic may be there because of performance concerns and that such performance issues are even more critical to demographics of users with slower network connections. We encourage ADS to gather additional metrics about users on both classic and new ADS to test this hypothesis and to prioritize additional work on front-end performance optimizations. We applaud the work that has been done to promote ADS through blogs and social media, and we encourage ADS to continue this work to promote the transition.

## **Expanding Beyond Astrophysics**

The expansion of the ADS into exoplanet and planetary science research is greatly needed in this rapidly growing field. In April of last year, the ADS submitted a proposal to NASA to enhance its capability to support (exo)planetary research. Preliminary estimates call for a ~20% increase in staff to complete the tasks needed for full implementation of the data into the archive and support of the new user community. The ADSUG supports the full proposal and believes the request is a reasonable staff increase to adequately respond to this quickly expanding field. There is substantial support for inclusion of this data from the scientific community. Thus, the ADSUG embraces this expansion, and strongly encourages NASA to consider ways to fund this proposal.

## **Refactor of Front-End**

The codebase for the new ADS UI is approaching four years old, and three to five years is a reasonable timeframe in which to consider a refactor or renewal effort. We appreciate that the ADS team is already identifying possible scenarios for a refactor to improve both the ease with which the code can be updated, and its performance. We agree that a refactor along the lines that the team is considering is worthwhile in principle, but advise that the team approach this new project cautiously. We recommend that the team take more time in planning for a major refactor, informed by ongoing backend optimizations and functional improvements. We recommend that the ADS team not undertake this new effort until most or all of the remaining transition goals have been met, and until the open UI/UX engineer position is filled. We recommend that, in the short term, the team identify and deliver specific performance and usability improvements that can be implemented in an incremental fashion.

## **Software Citations**

Software citations are important for the health of software development communities in astronomy. We thank ADS for their excellent work through the Asclepias project to make this happen. At the meeting we discussed unresolved design issues, particularly around how citation metrics are rolled-up across versions of the software, and how these rolled-up metrics could be treated differently for different applications. We encourage ADS to lead the way in proposing and prototyping workflows for software citation and software citation metrics and to promote these solutions.

## **Future Directions**

The work ADS staff is currently doing on natural language processing, machine learning, and deep learning on both article text and the citation network is well justified and is a wise investment in the future. However, we encourage ADS to think more broadly about what it can be doing in the future to best serve the astronomical and broader scientific community. This could include not only harnessing modern data science practices to build better

recommendation and discovery engines, but also (e.g.) providing more powerful services to literature infrastructure (e.g. arXiv) and astronomical infrastructure (e.g. IRSA). Indeed, we suggest that ADS collaborate with sister archives in these endeavors.

This effort and the present status of ADS as fundamental astronomical infrastructure should be reflected in submissions to the upcoming decadal review. In addition to any contributions from ADS itself, we encourage our colleagues who are writing science papers to remember to note explicitly that their work depends on the ADS.

Yours faithfully

Chris Lintott, University of Oxford on behalf of the ADS Users Group