123. Using ADS citations in a Latex file

WITH THE GOAL of passing along some of my own experiences, I'm going to deviate from my usual topic of scientific results from Gaia, and offer some suggestions about one aspect of using the ADS (Astrophysics Data System) bibliography in Latex documents. Specifically if you are including citations in the form:

```
\citet{2011A&A...525A..65P}
```

i.e. using the 19-character code provided by ADS as the `\bibitem` argument, you may learn nothing more here. But if you are using your own constructions, say (for the same paper) with your keyword of the form:

```
\citet{perryman+2011b}
```

or similar, you may find it useful to read on.

LET ME RECALL that, when submitting a preprint to the arXiv open-access archive (arxiv.org), authors have to submit the constituent files: including the Latex file(s), the bibliography file, and the individual figures. These are then compiled and presented as a reconstructed pdf document on the preprint server.

Navigating to the relevant ADS page, in this case

`ui.adsabs.harvard.edu/abs/2011A&A...525A..65P`

(this is hyperlinked, try it!) the window to the right offers the 'Full text sources' which, in the case of the arXiv content, (generally) includes `"arXiv eprint Open Access"` and `"arXiv article Open Access"`. Selecting the latter (far right) offers download of the generated pdf. But selecting `"Other formats"` allows download of the *source* files (.gz), including the Latex file(s) and the individual figures. One corollary is...

☞ *Don't include comments you don't want others to see!*

I MENTION ALL this because, in preparing these essays (and in the preparation of my Exoplanet Handbook which, for the 2018 Second Edition includes several thousand references), I know that considerably less than half of all astronomy authors use the 19-character code provided by ADS. More than half construct their own `\bibitem` key, as in the second example above. In which case, you may find the following of interest!

Using such *ad hoc* key formats invites various problems:

- it takes additional time and thought to construct, and it is prone to typo errors when using
- it is unwieldy when the initial reference is to a *preprint* (characterised by year of submission), and you wish to update to the *published* version (often characterised by the following year)
- it is awkward when co-authors add their own references which use a different key syntax, and perhaps even a different label for the same entry
- it is tiresome when, e.g., `perryman+2011b` needs to be re-labelled as `perryman+2011c` (or whatever)
- when new items are added to your bibliographic data base, it is often difficult (and time-consuming) to recall whether the item has already been included and, if so, with what keyword
- re-formatting references for submission to another journal (i.e. using another `.bst` style file) is aided by a well-constructed data base

I have noticed that papers using this type of keyword often contain incorrect references, albeit generally substituted by another paper by the same first author!

BUT THERE are also some very specific *advantages* in using the 19-character key that ADS has already created. These include:

- the ADS code is, by construction, **unique**
- this has the consequence that the types of problems noted above do not arise
- in particular, when adding new entries to a bibliography data base, it will be flagged if it is duplicate
- entries can conveniently be sorted by, e.g. year, journal, or first author
- the ADS construct serves as a useful mnemonic, as it encodes publication year, journal abbreviation, and lead author (first letter of) surname
- importantly, a rather seamless interface can be arranged between the Latex document, and the bibliographic data base, avoiding the need to type out, or copy-and-paste, the 19-character key

I will expand on some of these points below.

As a Mac user, I use BibDesk to manage and edit my bibliographies and references. It is an open-source software package which comes bundled with MacTex. It keeps track of both the bibliographic information and the associated files or web links. I have just short of 20 000 entries in my own data base, and this sort of size imposes no limitation on its efficient functioning.

This is not aimed as a tutorial on BibDesk, but let me nonetheless highlight some of its merits (skip to the next section if you are already a black-belt BibDesk user):

- the associated data file, `*.bib`, is a plain text file that can be opened by BibDesk (as a data base), or Latex (or other text editor), as appropriate
- it interfaces seamlessly with ADS, in the sense that single or multiple records from an ADS search can be exported (see the View option 'Export citation') to a `*.bib` file, by default to the file named `export-bibtex.bib`

  This new file can be dragged into an open BibDesk file (drag-and-drop to the 'Library' group at top-left), thereby adding any number of new ADS citations to your own pre-existing BibDesk data base
- since the 19-character ADS cite key is unique, if you add a reference that already exists in your data base, BibDesk will give a warning. Any duplicate entries are highlighted, in red, for further attention
- BibDesk itself offers intuitive searches, entry editing (e.g. changing a title to lower case), keyword assignment and editing, grouping, and selection; entry re-ordering (e.g. on cite key, title, first author, second author, ...) and various other tools
- panels show the ADS www entry (associated with the field `adsurl`), so you can select one or more entries in your data base, and go directly to the ADS abstract page (e.g. to verify it's the one you wanted)
- I should stress that your BibDesk file can contain *all* of your references, and not restricted to the references in your current Latex project; after 'Typeset Latex', the command 'Typeset BibTex' simply extracts those requested by the current Latex file
- an interesting github script (which I never managed to implement) is to find all astro-ph *preprints* in a BibDesk file, and update to the *published* version. The version `adsbibdesk`, developed by Jonathan Sick but now archived, can be found here

  A later implementation, `ads2bibdesk`, by Rui Xue, can be found here, although the 'preprint-update' mode is not yet functional according to the author

For non-Mac users, or those with some other preference, there is a comprehensive wikipedia tabulation of reference management systems, including BibDesk, EndNote, JabRef, Mendeley, and a dozen others, along with their principal attributes.

A particular advantage of integrating a Latex document with a BibDesk data base file is one that I have found especially useful.

With a specific script which I describe below, you can enter a word or phrase in your Latex file which is relevant to a paper in your BibDesk data base, and which you want to introduce as a `\cite` key in your document. This could be the name of one of the authors, or any (memorable) title word or string. For example, if you know that the paper you want to cite has "Perryman" as one of the authors (first or otherwise), or has the string "spin-orbit coupling" in the title, you can proceed as follows.

Type, then select, the required search string in your Latex file, press a chosen 'hot key combination' and, with your associated BibDesk file open, any paper containing that selection is highlighted in a new window. Select the paper(s) you want, and they will appear in your Latex file as `\citet{xxx}`, or `\citet{xxx,yyy,...}` if more than one is selected.

The macro that I have used is an AppleScript named "Insert BibDesk Citations", by Douglas Stebila. By installing it in TeXShop, you can press a hotkey and quickly lookup and insert citations from BibDesk into your LaTeX file in TeXShop. The script is available here, along with the author's instructions for including it.

The instructions there are several years old, and I suspect that the "addition from file" option is not supported in Mac OS11 or later (or the latest version of TexShop). So let me finally indicate how I solved this:

- the folder for new macros for the latest TexShop version(s) is /Users/xxx/Library/TeXShop/Macros, where "xxx" corresponds to your user directory
- I believe that only a single `Macros_Latex.plist` file is permitted there, so I simply added Stebila's script at the end of the existing `Macros_Latex.plist` file
- at that point, you can set your desired hotkey (see Stebila's instructions; I use his suggested Command–Option–C), then save and close

In addition to the usual Latex citations `\citep` and `\citet` (and related), the commands `\citepads` and `\citetads` (etc.) provide for citations directly hyperlinked to the ADS abstract page. They are now part of the AA LaTeX class for Astronomy & Astrophysics. Note that 'workarounds' are needed for multiple citations.

Perhaps if you find that adapting to the use of the 19-character ADS key, and in particular if being able to insert citations from BibDesk into your LaTeX file in TeXShop, indeed changes your (paper-writing) life, or if you manage to get the 'preprint-update' mode of `ads2bibdesk` to function at some point in the future ... do let me know!