

Heritage Committee: Summary of Report Topics

The Heritage Committee draws from a wide population of astronomers, and consequently covers a broad spectrum of interests. Under half of the members are actively involved in the topic of the Committee's White Paper (the preservation and digitization of historical observations and accompanying records), though all are sympathetic to the efforts being expended to that end.

Astronomy owns and has maintained a large legacy of observations (almost exclusively photographic), dating back over 100 years and preserved (in conditions varying from very good to unacceptable) in some 30–40 observatory plate stores worldwide. Canada's collections of significant size are those at the DDO and the DAO. The Heritage Committee understands their value to science, and champions efforts to recover the information from those plates (and associated records) in scientifically useable form for community use.

During the last 7 years the subject of Time-Domain Astronomy has burgeoned. Most of the huge modern surveys address very faint objects and are searching in the first instance for distant, high-energy 'transient' events; further observations of similar events from the same objects will provide indispensable clues as to the nature of the physics responsible. Complementing these developments is a growing realization of the need to monitor the cosmos for much longer than the currency of a particular survey mission, and thence of value of astronomy's large legacy of historical observations. Until electronic detectors became the workhorse detector in the 1980s observations were made photographically, so an interest has been growing in creating electronic versions of collections of photographic plates. In Canada the DDO collection, now housed in the U of Toronto, is in a static state, but efforts did commence to digitize the DAO collection, which contains about 93,000 Cassegrain spectra from the 1.8-m telescope dating back to 1918, and 16,000 coude spectra from the 1.2-m dating from 1963. Progress updates on that project have feature in the CASCA reports frequently.

Digitizing photographic plates needs skill, since the science that can be extracted depends critically upon the quality and properties of the scanner, and upon how the procedures are handled and how well they are understood. All of the DAO plates are spectra, which demand a custom-built scanner and careful training to digitize correctly. The DAO has maintained a PDS microphotometer, a machine that is slow but sure and ideal for this purpose. Its upgrades now employ state-of-the-art technology but it has lacked the prime supporting technologist ever since the untimely death of Les Saddlemyer in 2017. A few thousand spectra had already been scanned, mostly from the coude collection, and many of those are now available via the CADC.

As a prerequisite to digitizing the contents of a plate collection one needs to be able to search the contents on-line. Details about exposures made at the DAO were entered into log-books, which have been kept carefully. However, the details are hand-written, and the only feasible method to digitize that information was to key it in by hand. A retired night assistant has been doing that, and the Contents Catalogues from both telescopes can now be searched through the CADC. Details of the progress of this project have also featured frequently in Committee reports on the CASCA website. A number of meetings, conference sessions and workshops on the topic of rescuing astronomy's heritage in ready-to-use electronic forms have been held in Canada and overseas (averaging 1 per year), with Committee members as participants if not as organizers, and under the auspices of the IAU, the AAS, CASCA, the AIP, the Library of Congress and others. Associated articles have been published, some under the broader banner of the rescue of scientific data from all the natural sciences, in an effort to keep this challenge before the rest of the community.

Unfortunately, budgetary restraints have halted the scanning of DAO plates. The Committee has appealed frequently to the CASCA community for support to inject fresh energy into this commonly-owned resource, but without effect so far. One hope is that, as the need for access to historical observations sees greater demand worldwide, renewed action will be possible before it becomes so late that the expertise necessary to understand the scanning processes is lost. A major change in community priorities will be needed to ensure the future of this irreplaceable element of astronomy's past, even though the resources required are minuscule compared to the demands of new projects. More worrying is the passage of time, the loss of extant knowledge, and the steady deterioration of the materials.