

Astronomical Libraries in South Africa

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Abstract. We present an overview of the two astronomical libraries in South Africa, examine their common challenges and provide recommendations to deal with these challenges.

Overview

South Africa has a strong astronomical heritage. Its major astronomical libraries are based at the South African Astronomical Observatory (SAAO) in Cape Town and the Hartebeesthoek Radio Astronomy Observatory (HartRAO) in Krugersdorp, which serve the optical/infrared and radio astronomical communities respectively. Both institutions are national research facilities administered by the South African National Research Foundation (NRF). Despite this link, these institutions and their libraries operate independently. Each library caters to the specific needs of its user community, totalling approximately 50 scientists collectively.

South African Astronomical Observatory

The history of the SAAO starts at the founding of the Royal Observatory at the Cape of Good Hope in 1820 — the first scientific institute in sub-Saharan Africa. The observatory was established to map the Southern skies and to provide the crucial time signals required for maritime navigation. By the 1970s, the major observatories in South Africa merged to form the SAAO, with its headquarters located at the historic Royal Observatory site. All major telescopes of the merged observatories were relocated to a hilltop close to Sutherland in the Northern Cape. The observing plateau is now populated by 13 telescopes, all maintained by the SAAO, including the 11 meter Southern African Large Telescope (SALT).

The library at the SAAO began with the arrival of the first Royal Astronomer in the 1820s, who brought books with him to the new observatory. The SAAO Library, now the national library for astronomy and space science, is also located at the historic Royal Observatory site in Cape Town. The library has a collection of approximately 13,000 items, including more than 800 journal titles which have been collected over time through a publications exchange programme with astronomical facilities around the world. The library has a unique richness of pre-twentieth-century journals, with the core astronomical journals starting at volume 1.

Hartebeesthoek Radio Astronomy Observatory

HartRAO began as the Deep Space Station 51 built by NASA at Hartebeesthoek in 1961. In 1974, during the post-Apollo era, NASA withdrew from South Africa and the Deep Space Instrumentation Facility was closed. A new era for the facility started when an engineer and six technicians were tasked by the Council for Scientific and Industrial Research to transform the facility into a radio astronomy observatory, thus establishing the first radio astronomy observatory in Africa (Gaylard & Nicolson 2007). The space geodesy programme at HartRAO developed as a result of participation in global geodetic Very Long Baseline Interferometry experiments and the installation of Global Positioning Systems (GPS) receivers as part of the International GPS Service network. With the addition of a disused NASA Satellite Laser Ranger, HartRAO became a very important geodetic co-location site in the world.

When NASA withdrew in 1974, they left behind a large collection of flight log books, Deep Space Network (DSN) reports and technical memoranda as well as a collection of astronomy monographs and journals. The office stacked with these documents was converted into a library, catering to the resource needs of the engineers, technicians and astronomers working at the facility. In 1985, the historical DSN documents no longer in use were moved to an archive to make room for the rapidly expanding monograph and journal collections.

Common Challenges

Budgets and Exchange Rates

These two national facility libraries are operating with shrinking budgets which have not kept pace with the increase in costs. Both spend over 80% of their library budgets on journal subscriptions, resulting in very few books being purchased. Diminishing book acquisitions have had a negative impact on the libraries in meeting the information needs of a growing user community which includes astronomers, postgraduate students of the successful National Astrophysics & Space Science Programme (NASSP), and engineers involved in the SALT and Karoo Array Telescope (MeerKAT) projects.

The library budgets are also negatively impacted by the fluctuation in the exchange rate and the weakness of the South African Rand (ZAR) relative to the major currencies. The dramatic decline of the South African Rand in 2008 necessitated the termination of certain journals subscriptions at HartRAO. At the SAAO, extra funds were allocated to the library to avoid the cancellation of journals.

Journals and Cost-Saving

Currently both libraries subscribe to the same 29 journal titles, amounting to approximately ZAR 200,000. Included in this duplication are subscriptions to the five core astronomy journals in both the print and online formats.

Due to the economic downturn, both institutions have had to implement drastic cost-saving measures in 2009. A review of subscription agent agreements resulted in a change of agents at both libraries. This measure saved thousands of Rand in agent fees alone.

The migration to online journals would be another major cost-saving measure to consider. However, South Africa has restrictive regulatory Internet connectivity, which

has had adverse effects on the transmission of scientific information and data. The slow download speeds have hampered the successful use of online journals.

Recommendations

Efficient management of journal subscriptions has become imperative for the sustainability of the astronomy libraries and this can only be achieved through cooperation. Not only will this reduce the individual library expenses but it will also optimise and extend information resources across the two institutions. As the two facilities are geographically separated, such collaboration will only be possible through the sharing of electronic resources.

Consortia

The two astronomy libraries should enter into a library consortial agreement. The types of consortia to be considered are:

- Open Consortia — A self-funded model based on the homogeneity of subjects between the two astronomy libraries, which would include common publications (Patil et al. 2007).
- Centrally Funded Consortia — Agreements with publishers are negotiated by the parent organisation, the NRF, on behalf of the seven national facilities. This would be useful for multi-disciplinary publications for the diverse scientific research areas of these facilities.
- National Consortia — NRF involvement in the South African National Research Information Consortia (SANRIC) will be beneficial for the astronomy libraries in that it will enable collective bargaining and effective resource sharing. The astronomy libraries could further benefit from various national site licence initiatives.

Cross-access

For the consortium to work, the libraries would have to implement a system whereby researchers of both facilities could access electronic resources at either of the institutions. However, the importance of sufficient bandwidth for fast and effective Internet access will be critical for the successful use of these electronic resources.

Conclusion

Understanding the growing scientific demand for improved Internet connectivity, the South African government, through the Department of Science and Technology (DST), has been working on a high-speed network dedicated to research and institutions of higher education. At the time of this writing, both astronomical facilities have been linked to the South African National Research Network (SANReN), a crucial part of the national cyber-infrastructure initiative. The marked increase in Internet bandwidth, resulting in faster download speeds of online journals, has had a positive effect on the libraries.

References

Gaylard, M.J., Nicolson, G.D. 2007, African Skies/Cieux Africains, 11, 49
Patil, Y. M., et al. 2007, *ASP Conf. Ser.*, Vol. 377, in *Library and Information Services in Astronomy V*, eds. S. Ricketts, C. Birdie & E. Isaksson (San Francisco: ASP), 405



Alberto Accomazzi, Karolina Zawada, Shireen Davis and Glenda Coetzer at the GMRT lunch party (Photo: E. Isaksson)