

## **Scientific Society Journals: the Publications of the Astronomical Society of Australia**

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In the 1950s and 1960s the increased specialisation of science led to the formation of discipline-based scientific societies. Some of these, among them the Astronomical Society of Australia, began their own refereed journals. The *Publications of the Astronomical Society of Australia*, that has now been continuously published by the Society for over 50 years, has undergone many changes in that time in response to the changes in the publication landscape. The method of production has advanced from manual to computer typesetting and from printed volumes to purely electronic publishing. The content of the journal has changed from short conference papers to formal research papers that now, under the impact of citation indices, face strict refereeing and are mixed with major invited review papers. Dedicated editors have maintained publication despite a preference from many members to publish in better known overseas journals as well as strong opposition from within the society to the costs involved in maintaining a research journal.

### **Introduction**

Up to the Second World War Australian scientists published their work either in overseas journals or in the journal of their local royal society such as those of the Royal Society of New South Wales or

the Royal Society of Victoria or in the *Proceedings of the Australian Association for the Advancement of Science*, after the association's formation in 1888.<sup>1</sup> After the war, to cater for the large increase in practising scientists in the country, the Council for Scientific and Industrial Research, the predecessor of the CSIRO, in conjunction with the Australian National Research Council, began publishing the Australian Journal of Scientific Research. This was published in two sections, Series A Physical Sciences and Series B Biological Sciences. By 1953 both had split into a number of specialist publications, with Series A replaced by the Australian Journal of Chemistry and the Australian Journal of Physics.<sup>2</sup>

Specialised societies also formed in this period as the number of practising scientists increased. For example, the Australian Mathematical Society formed in August 1956,<sup>3</sup> the Australian Institute of Physics in March 1963,<sup>4</sup> and the Astronomical Society of Australia in November 1966.<sup>5</sup> A few professional bodies though formed much earlier such as the Australian Chemical Institute in 1917.<sup>6</sup>

Some societies emulated their overseas counterparts in establishing refereed journals to give their members the opportunity to publish locally. The Australian Mathematical Society has not just one but three refereed publications, the *Journal of the Australian Mathematical Society*, the *Bulletin of the Australian Mathematical Society* and the *ANZIAM Journal*, in addition to a members' magazine. In contrast, the Royal Australian Chemical Institute only has a members' magazine though Australian chemists have CSIRO's *Australian Journal of Chemistry* available for publications. Similarly, the Australian Institute of Physics only has a members' magazine despite the discontinuation of CSIRO's *Australian Journal of Physics* in 2001.

Since the establishment of these society journals there have been huge developments in publishing. Authors no longer submit paper manuscripts to the editors but use digital methods such as the LaTeX document preparation system together with sophisticated online tools that improve typesetting and publishing workflow. The financial aspects of journals have become more important

so that distribution by exchange with the libraries of other institutions, as was done in the past,<sup>7</sup> quickly became unacceptable as funds from subscriptions were needed to cover costs.

The advent of citation indices that indicate how often a research article is referred to in subsequent publications and, from 1975, journal impact factors that use citation indices to allow comparison of the relative importance of journals in the same field,<sup>8</sup> was a revolution for publishing. These altered the thinking of journal editors about the type of papers they wanted to publish, as well as the thinking of authors about which journal to use for their publications. An important innovation is publishing online and thereby saving on printing and postage costs. Open Access, that is the publishing of papers that all readers can access without charge, is a challenging development for established journals. John Huchra, a former scientific editor of the *Astrophysical Journal*, suggests that the only way for journals to stay relevant is to maintain high quality refereeing and to identify 'value added' services such as the archiving of papers and data, and providing fully linked cross references.<sup>9</sup>

This paper takes the *Publications of the Astronomical Society of Australia* (PASA), originally called the *Proceedings of the Astronomical Society of Australia*, as a case study of a small society journal and examines how it has survived and even thrived through all the changes and challenges of publication for half a century.

### **The beginnings of PASA**

Initially, the ASA's publication was called the *Proceedings of the Astronomical Society of Australia*, reflecting its function of carrying brief versions of papers presented at scientific meetings of the society. The proceedings were established at the inaugural meeting of the new society held at Sydney University on the afternoon of Wednesday 30 November 1966. At the meeting the Inaugural Committee, a self-appointed group of leading astronomers that had made all the arrangements up to that point, presented a set of ten proposals. Proposal 9 related to publication:

The proceedings of the first meeting, including one-page accounts of contributed papers, shall be printed and published and circulated to members. It will be issued as the Proceedings of the Astronomical Society of Australia, Volume 1, No. 1, thus allowing for the possibility of continuing the series at subsequent meetings should the Council, after discussion with the Society, so decide. If it is resolved to continue publication in this manner, copies of the first Proceedings may be circulated internationally with invitations to outside bodies to subscribe to future Proceedings.<sup>10</sup>

Initially, Proposal 9 was quickly approved along with the previous eight proposals. However, later there was a 'very animated discussion' with a variety of concerns being expressed including the ability of members to bear the cost of publication and the adding of yet another journal to the list of scientific journals. There were also suggestions to publish instead in existing journals such as the *Australian Journal of Science* and the *Australian Journal of Physics*. However, there were objections to publishing in both of these journals; to the former that it did not have 'the desired circulation' and to the latter that its editor did not express an interest when asked about the possibility.

The main champion of Proposal 9 was CSIRO astronomer Paul Wild, who had been a radar officer in the British Navy during World War II, and joined the Radiophysics Laboratory in 1947. Using observations with solar spectrographs, Wild became an authority on solar bursts and later developed the well-known Culgoora Radioheliograph. His career culminated with his appointment as Chairman of CSIRO in 1978.<sup>11, 12</sup> During the meeting Wild insisted that 'the publication, if any, should be in the form of a journal that could be sold and referred to' and must have done so convincingly for a motion to rescind Proposal 9 was put but lost on a show of hands.

The next hurdle for the publication was the first Council meeting held on the evening of the same day as the inaugural meeting.<sup>13</sup> A number of alternatives to PASA were suggested. The newly appointed American director of Mt Stromlo Observatory in Canberra, Olin Eggen, wanted papers

from ASA meetings to be published in the established *Publications of the Astronomical Society of the Pacific* as was suggested in a letter to him by the journal's editor. Another suggestion was to publish the proceedings of the inaugural meeting as a one-off symposium publication. Eventually, these objections and suggestions were overcome and by a vote of 7 to 3 it was decided to carry on with Proposal 9. Wild became the convenor of a publication committee.

The publication of *Proceedings of the Astronomical Society of Australia* Volume 1 No 1 went ahead and by March 1967 172 copies had been distributed.<sup>14</sup> There were 100 full members of the society and 28 student members who would have received copies, while the remaining copies would have been used to publicise the new publication and seek additional subscriptions. The initial issue clearly indicated on its first page that it contained the papers presented at the inaugural meeting of the society from 30 November to 2 December 1966. A most apt quotation from Alice in Wonderland provided partial justification for publishing the proceedings of the meeting, 'I think that I should understand you better,' Alice said very politely, 'if I had it written down; but I can't quite follow you as you said it.'<sup>15</sup>

Wild, though happy to be editor, clearly did not want to be responsible for the mundane business side of running a journal. On the suggestion of the society's president, Harley Wood of Sydney Observatory, Wild contacted Sydney University Press to take over publication of PASA. After negotiations Sydney University Press did take over the production of PASA, charging a commission of 12.5% on the printing costs, but offering to waive that fee for at least the first issue.<sup>16</sup> However, these arrangements did not last long, as by 1969 SUP had undergone reorganisation and staff reductions with the result that the financial management of the journal was returned to the society.<sup>17</sup>

### **The McGee years**

With the completion of Volume 1 in 1971 Paul Wild passed the editorial baton to his CSIRO colleague Dick McGee (Figure 1). Richard Xavier McGee was born in Sydney and served in the RAAF as a navigator during the Second World War. After the war he graduated in physics and joined CSIRO Radiophysics. His first research project was at the CSIRO's field station at Dover Heights in Sydney where he conducted a sky survey using a 24-metre dish dug out of the cliff top and lined with chicken wire. This survey yielded a spectacular result in 1954, the discovery of the centre of the Milky Way Galaxy. McGee went on to use other radio telescopes including the 64-metre Parkes radio telescope that opened in 1964. For his research Sydney University awarded him a Doctor of Science degree in 1967.<sup>18</sup> McGee was to stay as editor of PASA for a record-breaking 18 years.

Sydney University Press proceeded to publish the six issues of Volume 2 of PASA from July 1971 to October 1976. The format was unchanged with two to four pages allocated to presenters of invited papers at ASA meetings and one page to presenters of shorter contributed papers. For the last few issues of Volume 2 Dick McGee was joined by a CSIRO Radiophysics colleague, John Whiteoak. There was a continuing concern about the cost of the publication as it was the society's major item of expenditure.<sup>19</sup> In 1976, at the request of the Council, the two editors looked into using camera-ready copy for producing the Proceedings to avoid the cost of typesetting. With camera-ready copy authors produce formatted text, tables and figures suitable for publishing. The camera-ready copy would then have to be pasted to a board that would be photographed with a special camera and printed with a photo-offset method. The editors found that getting authors to produce copy of sufficient quality would be difficult and that even with the supply of perfect copy their time would be consumed by the necessary pasting up process. This they were not prepared to do, stating that they had 'neither the time, facilities nor inclination to prepare these Proceedings for the camera-ready process'.<sup>20</sup> They did identify a possible saving by going directly to the printers Southwood Press and bypassing Sydney University Press, thereby saving the 12.5% commission. Volume 3, No 1 was the first issue published in this way.<sup>21</sup>

In his Editor's report to the 1983 AGM McGee mentioned that from Volume 5, No 1 published that year the PASA contents would be included both in *Current Contents for the Physical, Chemical and Earth Sciences* and in the *Science Citation Index*.<sup>22</sup> Inclusion in this index and the listing of the related impact factor was to take on crucial significance for later editors of the journal.

In 1985 Peter Robertson, then the editor of the *Australian Journal of Physics*, one of the group of science journals published by the CSIRO Editorial Service located in Albert Street, East Melbourne, published an article in PASA surveying Australian research in space physics, astronomy and astrophysics.<sup>23</sup> From a sample of 1166 papers published in the preceding six and a half years he found that only 28% were published in Australia, while 36% were published in Britain and the rest were spread over the United States and other countries. Utilising the statistics of his survey, Robertson came up with a proposal to bring PASA into 'the stable of national journals...which are jointly sponsored by CSIRO and the [Australian] Academy of Science'.<sup>24</sup> There were then ten of these national journals such as the Australian journals of physics, chemistry, botany and zoology. The idea was for 'Proc. ASA not to be replaced but transformed' with an increased number of pages and bi-monthly publication.<sup>25</sup> Robertson was invited to present the proposal before an ASA Council meeting on 13 May 1985 held during an annual scientific meeting at Monash University. However, after Robertson left the meeting the proposal was rejected.<sup>26</sup>

The proposal was dismissed despite concern about the future of the journal due to Dick McGee's impending retirement from Radiophysics in 1986. In a memo to the Chief of Radiophysics, Bob Frater, McGee estimated that he spent approximately \$5000 or 250 hours on producing the two PASA issues each year.<sup>27</sup> Plus there was \$600 spent each year by secretarial or administrative staff on distribution and handling invoices. All these costs were absorbed by Radiophysics, leaving the ASA with just printing costs and postage to pay.

The immediate problem with the editorship was solved when Radiophysics indicated its willingness to support Dick McGee with office facilities after his formal retirement from the organisation.<sup>28</sup> He stayed on as editor until the completion of PASA Volume 8 Number 2, published

in 1989, having spent 18 years in charge of PASA. This record is unlikely ever to be matched. As an acknowledgement of the tremendous work he had done for the society, Dr McGee was elected to life membership at the 1990 Annual General Meeting held at the University of New South Wales.<sup>29</sup>

### **Editorial board established**

The forthcoming retirement of the long-term editor led to in-depth discussions within the society about PASA and its future. One decision was to establish an Editorial Board on the basis that the 'task of the Editor was more than could be imposed on one person'.<sup>30</sup> Volume 8 Number 2 was the last issue edited by Dick McGee, with the new Editorial Board taking over from the following issue, an issue proudly carrying the first image from the then new Australia Telescope on the cover. The Editorial Board consisted of Sydney University's Dick Hunstead, who was selected as he was on the Local Organising Committee of the 1989 ASA science meeting, Jim Caswell from CSIRO Radiophysics, Warwick Couch, then at the University of NSW, and Ravi Sood from the Australian Defence Force Academy. The 1989 AGM gave the clear guidance to the Editorial Board that the 'prompt publication of the AGM papers was the primary purpose of the Proceedings' and that outside contributions should not be sought. However, historical papers and book reviews could be considered.<sup>31</sup>

In 1990 the fifth Asian-Pacific Regional Astronomy Meeting took the place of the ASA's annual gathering. Attendees, many of whom had a first language other than English, were asked to submit their papers at or before the meeting. To cope with the expected large influx of papers, selected astronomers were requested to referee them on the spot. Despite this arrangement the Editorial Board was left with the task of rewriting the text and, in some cases, redrawing the included figures for many of the papers to try to bring them to an acceptable standard.<sup>32</sup> Most of the work was done by Hunstead and a new member of the Editorial Board, Michael Ashley from the University of NSW, with help from Couch and Katrina Proust, a solicitor who had been Secretary of the Anglo-Australian Telescope Board. To save costs the Editorial Board undertook the typesetting of

the required two thick issues, Volume 9 Nos 1 & 2, using the LaTeX document preparation system.<sup>33</sup> This was a difficult and time consuming task with the two-column layout of PASA being an extra complication that necessitated suitable macros to be developed from scratch.<sup>34</sup>

While the members of the Editorial Board were labouring over producing the two issues in spite of teaching and research commitments and worries that time spent on the journal would not assist in future promotion,<sup>35</sup> the feedback from the ASA Council was unhelpful. They considered that the Editorial Board set the standard of Volume 9 nos 1 & 2 unnecessarily high and that for future issues PASA could go to a 'cheap and nasty camera-ready type production' instead.<sup>36</sup>

Notwithstanding the Council's attitude, the Editorial Board wanted PASA to maintain a high production standard but were unwilling to continue with the necessary high level of unpaid work that was involved. To solve this impasse Peter Robertson, who was still the editor of the Australian Journal of Physics, was approached to see if CSIRO Information Services would be willing to take over the 'processing, proofreading and publishing' of PASA.<sup>37</sup> Initially, this approach came from the Editorial Board but later, at their urging, from the ASA President.<sup>38</sup>

The approach to CSIRO was successful and agreement was reached in 1993 for CSIRO Information Services, that was just becoming CSIRO Publishing, to take over the production of PASA for a trial period of two years from Volume 11 Number 1. As this was the first society journal that CSIRO Publishing<sup>39</sup> took on they did not yet have a standard contract so that ASA President David Allen was unimpressed, stating that, 'we are dealing with a bunch of amateurs when it comes to contracts'.<sup>40</sup> The Editorial Board was to be responsible for the acceptance of papers and to ensure that accepted papers were of a suitably high standard. CSIRO was to be responsible for production with authors encouraged to submit using the TeX document preparation program.<sup>41</sup>

The agreement exposed the ASA for the first time to the real costs of producing the journal. Costs specified in the agreement included editing/proofreading, artwork, typesetting, printing, marketing and overheads. CSIRO Publishing was to receive all the subscription income from institutional subscriptions, of which there were 258 at the time, while the ASA was to pay for the

costs of member subscriptions plus cover the remaining shortfall between income and production costs. These costs for the ASA were initially estimated as \$9658 and this extra expense led the ASA treasurer to recommend at the July 1993 AGM a 15 per cent increase in the membership fees.<sup>42</sup> By the second year of the agreement the budgeted ASA contribution had gone up to \$14,600, mainly due to a reduction in the number of subscribers.<sup>43</sup>

At the 1994 AGM the discussion on PASA was not directly about its cost but about its 'form and function'.<sup>44</sup> An influential member of the society, Ron Ekers, the Foundation Director of CSIRO's Australia Telescope National Facility, noted PASA's low impact overseas and suggested that it should be kept only as an unrefereed journal purely for Australian use. In the end the meeting gave the Editorial Board the task of consulting widely among the members. This the Editorial Board did with a survey that gave support to the continuation of the journal and also to a change of name from 'Proceedings' to 'Publications'.

Volume 12, the first under the new name, also had a new editor or chair of the Editorial Board, Jenny Nicholls, who had a split position as Executive Officer of the Science Foundation for Physics (now the Physics Foundation) at the University of Sydney and as a research fellow in the Research Centre for Theoretical Astrophysics at the same university. In an editorial on page 1 of Volume 12 Nicholls discussed the results from the survey and indicated a number of changes, including that the acceptance of papers other than from the Annual Science Meeting would be publicised, that refereeing would be tightened up with two referees, possibly one from overseas, for each paper and that there would be one volume each year instead of individual volumes being spread over a number of years as previously.<sup>45</sup>

In addition to the changes mentioned above, there were a number of other positive developments for PASA during Nicholls' two-year term as editor. Among these was an increase in the number of submissions. Some of these were of unsolicited papers, that is, not associated with the Annual Science Meeting (ASM) but, more importantly, there were also papers submitted from science meetings held in Australia other than the ASM.<sup>46</sup> Special issues in PASA based on

conferences and workshops have continued to the present day. To accommodate the extra pages the number of issues per year was increased from two to three, starting with Volume 13 in 1996. As each extra issue represented a cost of about \$6000 to the society, partial recompense was to be sought from meeting organisers.

### **Going electronic**

By 1996 electronic publishing was becoming feasible and of great interest to PASA. At a special meeting after the 1996 AGM chaired by new editor Michelle Storey, it was clear that electronic publishing would be of special benefit to PASA as it would make it easier for overseas astronomers to access the journal and so help increase its visibility.<sup>47</sup> By the end of the year Storey provided a proposal for a trial electronic version of PASA that was to be set up by Dr David Mar, who happened to be available at the Australia Telescope National Facility for this purpose and had suitable expertise.<sup>48</sup> The cost to the ASA was to be \$8000, an amount that was to be matched by CSIRO Publishing. The following year Storey could report that the electronic version of PASA, known as el-PASA, was being produced in-house at CSIRO Radiophysics in addition to the usual print version from CSIRO Publishing.<sup>49</sup>

el-PASA provided the editor, the ASA and CSIRO Publishing with valuable experience with electronic publishing. By early 1999 the home page of the electronic version was being accessed about 10 times a day, a number that was probably an underestimate since readers could also access the electronic papers directly without being counted.<sup>50</sup> Going electronic did achieve its aim of increased visibility as indicated by the doubling of the two-year impact factor - a number that is calculated yearly from a formula based on the number of times articles during the previous two years were cited<sup>51</sup> - over the two years starting from 1999, as can be seen in Figure 2. However, it also created friction with CSIRO Publishing as its staff considered that providing free access to PASA papers online was contributing to a decline in institutional subscriptions.<sup>52</sup> Balancing the publisher's

need to protect subscription income against the desire of authors to maximise the readership of their papers is a difficult problem for all journals and, as will be seen, led PASA to a number of different compromises in later years.

At the end of 1999 there was a crisis for PASA. Michelle Storey, just as Jennifer Nicholls before her, had been employed by the Special Research Centre for Theoretical Astrophysics at the University of Sydney and had been generously allowed to spend the necessary time on PASA. However, the Centre was no longer funded after 1999 and hence Storey's salary was lost. In February 2000 a temporary solution was arranged with funding put together from a consortium of astronomical institutions: the Australia Telescope National Facility, the Anglo-Australian Observatory, the ANU and the universities of NSW, Sydney and Swinburne plus a contribution from the ASA. Mike Bessell, the ASA president, stressed that 'it was only Michelle's great work as editor over the past few years and the great electronic journal she created that made everyone aware that something important needed to be preserved'.<sup>53</sup>

The direct involvement of the six institutions in funding PASA led once again to discussions about its future. At the ASA AGM in July 2000 Storey made a number of suggestions including combining PASA with an Australian astronomy website.<sup>54</sup> The preferred option was one that had been worked out with CSIRO Publishing on the Thursday just before the meeting and hence referred to as 'the Thursday solution': PASA would become an electronic-only journal published by CSIRO Publishing, that would also develop an astronomy web portal. Going fully electronic was a brave but prescient decision that was not taken by any other of the main astronomy journals until the *Astrophysical Journal*, the *Astronomical Journal* and *Astronomy & Astrophysics* followed in 2015.

### **Managing Editors**

The subsequent agreement between the ASA and CSIRO Publishing included the employment of a Managing Editor, thus providing a long term solution for funding an editor. Michelle Storey was

offered this position, and she accepted. For 2001 CSIRO Publishing was to publish both an electronic and a print version of PASA with only electronic versions for subsequent years.<sup>55</sup> Despite going fully electronic in 2002, there was no sudden drop in expenditure as the reduction in printing and distribution costs, that had been only a small part of the costs of production in any case, was balanced by the inclusion of the salary of the Managing Editor. Hence, the contribution by the ASA in 2002/3 was a still substantial \$14,686, making up just under half of the society's gross expenditure for the year and equivalent to \$40.90 per member.<sup>56</sup> As part of the changes under the agreement the Editorial Board was disbanded and a new PASA Editorial Advisory Committee was set up with its chair, Russell Cannon, an ex-officio member of the ASA Council.

The last printed edition of PASA was Volume 18 Number 4, published in December 2001. An editorial signed by Russell Cannon explained that 'Without this move to electronic-only publishing, PASA would have had to cease production, or sharply raise subscription costs'. He stressed that access to past volumes would be maintained with archiving by both CSIRO Publishing and the CSIRO library service.<sup>57</sup> Additionally, the NASA Astrophysics Data System (ADS) was to display the abstracts of papers as they were published and a year after publication would make the full papers freely available. A possible unfortunate consequence of PASA becoming purely electronic was the decrease in institutional subscriptions from 210 a few years earlier to 150 in 2002 with a consequent hit to the financial viability of the journal. Storey attributed the drop to subscription agents misinforming subscribers that the journal had closed.<sup>58</sup>

In early 2003 Michelle Storey resigned after more than seven years as editor of PASA and her position of Managing Editor was advertised.<sup>59</sup> The ASA appointed Louise Hartley, who had a recent PhD from Imperial College, London and had been a postdoctoral fellow at the Space Telescope Science Institute. For the few months between Storey leaving and Hartley's arrival the role of editor was filled by John Lattanzio, who was the new chair of the Editorial Advisory Committee. Hartley began as Managing Editor from 1 July 2003, working 1.5 days a week. There was also a change in the CSIRO Publishing Production Editor as Peter Robertson left after the shutting

down of the *Australian Journal of Physics*, of which he had been editor, and Richard Hecker, who had been involved in academic physics and chemistry publishing in Germany, took over. The ASA was happy with both the new recruits with John Lattanzio reporting to Council on 27 November 2003 that, 'Louise seems to be enjoying the job, and seems to be doing it very well!' and that, 'Richard Hecker (Production Editor) is first class! Very enthusiastic and reliable. A very big help'.<sup>60</sup>

Hartley was full of ideas to raise the impact factor of the journal: one idea was to eliminate biography and history papers on the basis that they do not receive citations. Another suggestion was to introduce PASA Letters for short papers and to get them published online more quickly than normal ones. More issues on particular themes plus more invited reviews with top international authors were other suggestions.<sup>61</sup> After considerable debate the Editorial Advisory Committee decided not to ban biographical and historical papers entirely from PASA but to limit them to a maximum of five pages, that was felt to be sufficient.<sup>62</sup>

In 2005 the publishing contract was once again up for renewal. In addition to CSIRO Publishing a strong bid was put in by Blackwell Publishing, the publisher of the major astronomy journal, the *Monthly Notices of the Royal Astronomical Society*. Going with Blackwell would have meant a slightly lesser cost and possibly more international exposure thanks to their greater experience with physical sciences journals and cross-promotion with the *Monthly Notices of the Royal Astronomical Society*. One major stumbling block in ASA Council discussions about switching publishers was the role of the Managing Editor, whom CSIRO Publishing supported to the extent of 0.3 of the hours of a full-time position with normal employee benefits such as maternity leave.<sup>63</sup> Andrew Stammer, the CSIRO Publishing Journals Publisher, in discussions with the Editorial Advisory Committee chair John Lattanzio complained that CSIRO Publishing had employed Hartley and trained her as an editor so her services should not be utilised through another publisher. Moreover, 'Louise will be on her own as Editor if the journal is placed with Blackwell. I cannot over-emphasise this'.<sup>64</sup> Taking note of the effect on the editor and with a reluctance to change the status quo for relatively

minor advantages, the ASA Council decided to continue with CSIRO Publishing, signing a new agreement in July 2005 for the following two years.

Another survey of ASA members related to publishing and PASA was attempted in 2006. There was a good response of over a hundred members, with 62 voting 'strongly yes' for the continuation of PASA and only 11 voting 'strongly no'. Though the major interest was in topics related to research astronomy such as instrumentation and software, there was support at ~60% level to including astronomy education as well as history and biography. The major problem indicated by the survey was that ASA members were publishing most of their papers in more prestigious journals: 60% of respondents had one or more papers in the *Astrophysical Journal* per year, 67% had one or more papers in *Monthly Notices of the Royal Astronomical Society*, while only 19% had one or more paper in PASA.<sup>65</sup>

The lack of submissions became acute in 2006 with a large drop in submitted papers, despite a strong increase in the journal's impact factor during the previous year. The suddenness of the drop was considered to be related to the mooted introduction of a new way of measuring research output proposed by the Federal Government, the Research Quality Framework or RQF, which put extra pressure on scientists to publish in major journals. In 2006 in what was her last report to the ASA Hartley bluntly stated that for PASA, 'The major cause of concern is lack of support from the Australian astronomical community'.<sup>66</sup> It was her last report as she had resigned for family reasons and because there were other projects that she wanted to work on.<sup>67</sup>

### **Editors-in-Chief**

With the departure of the Managing Editor, once again a new model was adopted for PASA. The Editorial Advisory Committee was reconstituted as the Editorial Board, with its chair as Editor-in-Chief. Members of the Editorial Board now had more duties as CSIRO Publishing forwarded manuscripts received to one of them, who did an initial peer review, forwarded to a referee, if

appropriate, and handled the relevant correspondence.<sup>68</sup> They were also expected to solicit papers for PASA and were themselves expected to submit papers. To compensate the members for these extra duties they were paid an honorarium of \$3000, while the Editor-in-Chief received \$5000.<sup>69</sup> There was a new Production Manager as Hecker was made Journal Manager, a role that was to be the first point of contact with regard to PASA.

The new contract with CSIRO Publishing was for five years, longer than on past occasions, with either side able to withdraw from the agreement with 12 months' notice.<sup>70</sup> The financial aspects were simplified in the contract with the ASA basically paying the honorariums, totalling \$23,000, to the members of the Editorial Board, while receiving a royalty payment of \$8000 from CSIRO Publishing. A major innovation was the inclusion of 12 Open Access papers each year for ASA members. These 12 papers would be freely available immediately on publishing, even to those without an institutional or personal subscription to the journal. In his February 2008 (incorrectly dated 2007) report to the ASA Council Richard Hecker emphasised that the inclusion of Open Access papers would signal that PASA was keeping up with the latest trends in publishing. As well, there were strategic reasons for providing Open Access such as that, 'These OA pages will be an incentive for joining or maintaining ASA membership and for ASA members to publish in their own journal'.<sup>71</sup>

By the end of 2008, when John Lattanzio was due to complete his term as Editor-in-Chief, the new Editorial Board model was helping PASA to recover from its low point two years earlier. While spontaneous submissions were still infrequent, high quality papers were submitted for special conference issues, in some of which an Editorial Board member played a key role in attracting submissions and then guest editing the issue. The high quality, fully refereed papers assisted in gaining citations, that are important with regard to the journal impact factor. The 24 papers published during 2008 received 91 citations as compared with 20 papers and 36 citations a year earlier.<sup>72</sup> These citations led to PASA gaining an impact factor of 2.56, its highest ever, and becoming CSIRO Publishing's highest impact journal as well as the highest impact non-medical journal in Australia.<sup>73</sup>

Bryan Gaensler, then an Australian Research Council Federation Fellow at The University of Sydney, took over as chair of the Editorial Board and Editor-in-Chief for a term of three years that was later extended for a further three. Gaensler's career was on a steep upward trajectory as he became an Australian Research Council Australian Laureate Fellow in 2011 and the founding director of the Australian Research Council Centre of Excellence for All-sky Astrophysics in the same year. With regard to PASA he hit the ground running with the presentation of numerous ideas to the ASA Council's February 2009 meeting.<sup>74</sup> One idea that was not accepted was to change the name of the journal from PASA. He considered that the earlier change from Proceedings to Publications did not go far enough to dispel 'the perception that this is a low-impact journal, whose papers lack the rigour compared to those appearing in other journals'.

Gaensler set out a three year strategic plan for the journal. It was already on stage two of the plan with the rejection of papers such as intermediate results and conference summaries, as these cited badly. The aim was to reach the final stage, one in which PASA became a well-accepted member of the 'second-tier' of astronomy journals, with rankings below some like *Monthly Notices of the Royal Astronomical Society* but above others like *Astronomische Nachrichten*. PASA, however, was to be distinguishable from the other journals by its 'status as an electronic-only journal, its rapid time to publication, its lack of page charges and its Australian flavour'.<sup>75</sup>

A major initiative for a series of prestigious reviews was presented to the ASA Council in a detailed proposal in July 2011.<sup>76</sup> After a thorough historical investigation of his character and worth, the reviews were to be called after William Dawes, the astronomer who arrived with the First Fleet in 1788 and built an observatory at what is now called Dawes Point on Sydney Harbour.<sup>77</sup> Previous models for such a prestigious review series were the Farrer Review Series from *Crop & Pasture Science* and the Turner Review Series from the *Australian Journal of Botany*, both published by CSIRO.<sup>78</sup> The Dawes Reviews were to be written by astronomers of international reputation at the invitation of the Editorial Board. They had to be 'substantial, rigorous and comprehensive' of 10,000-20,000 words in length and delivered within 12 months. The first person to be invited to write a

Dawes Review was Karl Glazebrook, the Director of the Centre for Astrophysics & Supercomputing at Swinburne University of Technology. His article, 'The Dawes Review 1: Kinematic Studies of Star-Forming Galaxies Across Cosmic Time', covered 47 pages of Volume 30 of PASA in 2013. This and subsequent reviews have met their aim of high quality, well cited articles with the first one gaining 50 citations in just under four years, while the second by Amanda Karakas and John Lattanzio on 'Nucleosynthesis and Stellar Yields of Low- and Intermediate-Mass Single Stars' was cited 130 times in just over three years.<sup>79</sup>

### **New publisher**

The contract with CSIRO Publishing to publish PASA was due to expire at the end of 2012. In preparation for this, proposals were invited from CSIRO Publishing and other publishers for the publication of the journal from 2013 onwards. Four proposals were received, from Cambridge University Press, the Institute of Physics, Springer and CSIRO Publishing, though the last rather reluctantly and only after numerous reminders.<sup>80</sup> Each of the three overseas publishers provided the possibility of a higher international profile and obtaining more institutional subscriptions to PASA, as well as a greater financial return. Cambridge University Press was chosen as the publisher with one of its advantages over the other overseas publishers being that it used the same ScholarOne editorial system that CSIRO Publishing was switching to, so minimising the impact of the change of publisher. An extra sweetener was that Cambridge University Press would offer ASA members a 20% discount on its extensive range of astronomical and other books. For Cambridge University Press taking on PASA may have been a strategic move to try to bring other, possibly higher profile astronomical publications into their group.<sup>81</sup>

The new five year contract with Cambridge University Press was signed at the July 2012 AGM by Kate Brooks, the ASA president, with the contract coming into force from the beginning of 2013.<sup>82</sup> The contract increased the number of pages to be published in PASA from 400 to 500 with a

maximum of 550, though the number of freely available Open Access papers to be published annually was reduced by half. This reduction in Open Access papers was a commercial decision by the publisher to try to balance the protection of subscription income against possible losses of readership and profile for the journal. Though the initial Cambridge University Press contact person was based in Singapore, in September 2013 Richard Hecker in Melbourne, who had been the Journal Editor for CSIRO Publishing but had since resigned, was appointed by Cambridge University Press as Commissioning Editor and became the contact for PASA.<sup>83</sup>

Cambridge University Press, like other major publishers, could sell more subscriptions to PASA because they could bundle journal titles into one package. Libraries have fought back against the power of large publishers by forming consortia that, among other roles, could negotiate with publishers for access to electronic journals on behalf of hundreds of libraries.<sup>84</sup> In an addendum to the PASA July 2014 (incorrectly dated 2013) report to Council, Hecker explained that most of PASA's institutional subscriptions were shifting to consortia sales.<sup>85</sup> By 2014 of the over 2000 institutions with access to PASA the vast majority were through consortia. Interestingly, the largest group of institutions with access to PASA were in Asia, followed by Africa including the Middle East and then the USA.

In the July 2014 report to Council Bryan Gaensler indicated that he would not seek an extension to his term as chair of the Editorial Board when his term was due to expire at the end of the year. This was unsurprising as he was moving to Canada to become the Director of the Dunlap Institute for Astronomy and Astrophysics. His replacement was Daniel Price, a theoretician from Monash University. Price summed up what Gaensler had achieved in his six years as PASA Editor-in-Chief

Building on the work of previous Editors-in-Chief, Bryan has done a tremendous job of lifting both the impact and reputation of PASA, lifting it from the ranks of sub-1.0 impact factor to

comfortably in the 'second tier' of Astronomy journals such as PASJ and PASP with Impact Factor in the 2.0–4.5 range.<sup>86</sup>

Under the editorship of Daniel Price PASA continued its upward path with a record two year impact factor of 4.095, based on citations in 2016 to papers published in 2014 and 2015.<sup>87</sup> Dawes Reviews and numerous themed issues were published. A new initiative was the opening of the PASA data store that allows authors to deposit up to 1Tb of data linked to a published paper. The association with Cambridge University Press is going well with a small profit (\$7412 in 2017) remaining for the ASA from royalty payments after payments are made to members of the Editorial Board.<sup>88</sup> Though the amount of profit from PASA is small, it represents a highly significant turnaround from earlier decades, during which the journal was a recurring drain on the finances of the society. A further contract, for five years, was signed with Cambridge University Press in 2017, in spite of disappointment that Richard Hecker had been made redundant so that all contact moved to the UK. Editor Daniel Price said of Hecker, 'His insights and analysis were greatly valued, and having a local contact for PASA was one of the key selling points for moving to Cambridge University Press from CSIRO publishing'.<sup>89</sup>

Daniel Price completed his term as PASA Editor-in-Chief at the end of 2017 and has been replaced by Melanie Johnston-Hollitt, a radio astronomer, who has just returned to Australia to take up a position at Curtin University in Perth, Western Australia, after nine years at Victoria University in Wellington, New Zealand. She is also Director of the Murchison Widefield Array and the CEO of a research company.

## **Discussion**

Why did the Astronomical Society of Australia persist with PASA despite its cost and the reluctance of the community to submit their best papers? Editor Jenny Nicholls summed up the case for PASA best in a preamble to the 1994 survey (Editorial board established section):

PASA was originally set up to give Australian publications in astronomy and astrophysics a recognizable profile, and it continues to contribute to this role. Australian research was, and still is, published in a wide variety of international journals. The PASA provides some balance, reflecting the overall breadth of Australian research in the one journal.<sup>90</sup>

In its first decades PASA was useful for keeping a record of the proceedings of ASA scientific meetings. In addition, it carried historical and educational papers that had no other outlet plus society business such as minutes of Council and annual general meetings. An important role for PASA was to allow an easy pathway for postgraduate students to publish their first research papers. More recently (Editors-in-Chief section) the emphasis has changed to maximising the journal's impact factor with the aim of boosting the profile of Australian astronomical research.

One of the major recent developments in astronomical publishing has been the widespread use of the arXiv preprint server (astro-ph) that allows authors to post their papers online before they go through the usual publishing process of refereeing, acceptance or rejection, and copy editing. As an extreme example of Open Access publishing, this development may seem like a serious challenge to the established journals. However, PASA and the other journals have managed to retain their usefulness to both authors and readers by following principles similar to the ones enunciated by Huchra and mentioned in the Introduction: maintaining high quality refereeing and providing value added services such as the PASA data store mentioned above.<sup>91</sup> In fact, posting papers to the arXiv preprint server has been found to boost citation rates for journals, including PASA, by a factor of two.<sup>92</sup>

Over the years there have been some significant and high citing papers published in PASA. On Cambridge University Press's webpage with the ten most cited articles in the journal,<sup>93</sup> the list is headed by a 2013 paper by Daniel Price, discussing a digital visualisation tool. The almost equal split between papers on techniques, instruments and research in the list demonstrates the wide spectrum of papers published in PASA. These high-citing papers have contributed to the improvement in the journal's impact factor in recent years, reaching the previously mentioned record value of 4.095 in 2016. As shown in Figure 2, the rise of its two year impact factor over the last two decades has moved PASA closer to the impact, and hence the reputation, of the main astronomical journals. However, PASA has not yet caught up and whether it can sustain the rise of the last few years or even maintain its current level will depend on top Australian researchers being willing to submit their high profile papers to the local journal instead of sending them to its better known overseas competitors.

PASA's impact factor is based on small numbers of papers in comparison with those of the leading astronomical journals, the output of some of which dwarfs that of PASA. In 2016 there were 62 papers published in PASA (see Figure 3). In comparison the American Astronomical Society's *Astrophysical Journal* in the same year published 3812 papers, despite expensive page charges. *Monthly Notices of the Royal Astronomical Society* carried 3307 papers, while *Astronomy & Astrophysics* carried 1873. *Publications of the Astronomical Society of the Pacific* is smaller than the three giants of astronomical publishing mentioned above but is still larger than PASA with 115 papers in 2016. Even the one journal that PASA has in recent years passed in two year impact factor, the *Publications of the Astronomical Society of Japan*, publishes more papers than PASA: in 2016 it carried 154. With the exception of *Astronomy & Astrophysics*, all the above journals, like PASA, are published by astronomical societies with the help of major publishing houses.

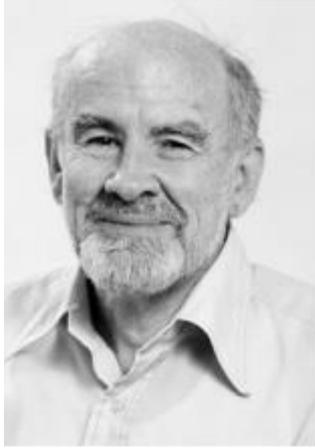
PASA, as the journal of a small scientific society, has had many challenges to its survival, some from within the society and some from outside due to the huge changes in the technology of printing journals, as well as in their marketing. First as the *Proceedings of the Astronomical Society of*

*Australia* and later as the *Publications of the Astronomical Society of Australia*, it has not only survived for over 50 years but is now thriving. Consequently, it is well placed to face the many challenges likely in its next half-century.

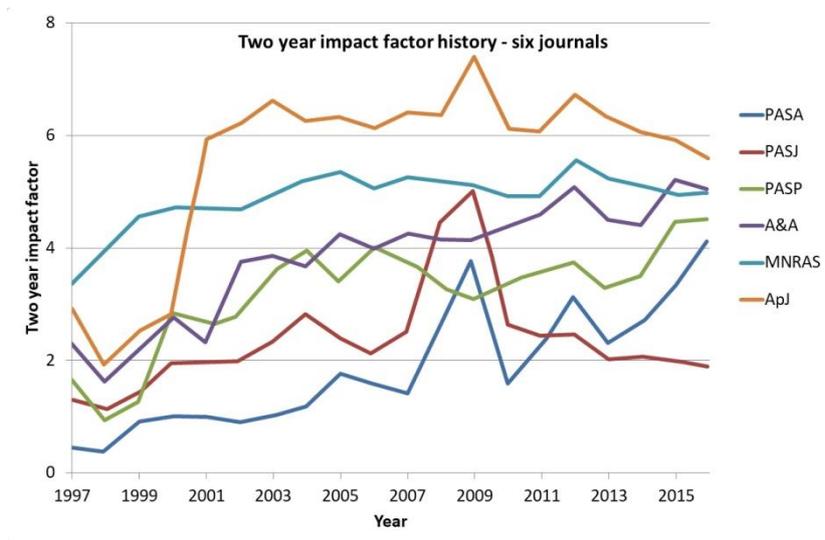
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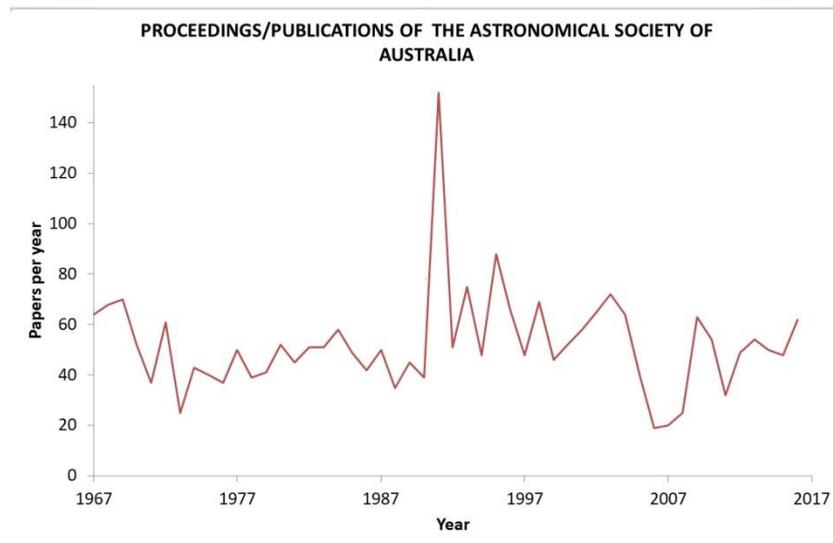
### **Figure captions**



**Figure 1.** Dick McGee in 1983. Courtesy CSIRO Radio Astronomy Image Archive.



**Figure 2.** The two year impact factor history of PASA and its main competitors: Astrophysical Journal (ApJ), Monthly Notices of the Royal Astronomical Society (MNRAS), Astronomy & Astrophysics (A&A), Publications of the Astronomical Society of the Pacific (PASP) and Publications of the Astronomical Society of Japan (PASJ). Diagram Daniel Price/Nick Lomb.



**Figure 3.** The number of articles published in PASA per year since the start of the journal. The large number of papers from the 1990 Asian Pacific Meeting is clearly shown, as is the dip in submissions starting in 2006. Diagram Nick Lomb.

### Conflicts of interest

The author is a long-time member of the Astronomical Society of Australia. The society provided some financial support for the preparation of this paper.

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