

Special School Holiday Programs at the Carter Observatory

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Abstract: As an experiment, special holiday programs for primary school children were offered by the Carter Observatory during two different school holidays in 1995. One program focussed on Mars and the other on the Sun. This paper describes the two programs, expands on their strengths and weaknesses from different viewpoints, and (despite their overwhelming popularity) outlines the reasons why the Observatory has decided not to offer further holiday programs of this type in the foreseeable future.

Keywords: astronomy education

1 Introduction

Carter Observatory is the National Observatory of New Zealand, and was opened in 1941. One of its four functions is to provide an astronomical education service for school-age students, teachers, trainee teachers, amateur astronomers and interested members of the general public.

Although the Carter Observatory has had a long involvement in astronomy education (see Andrews 1988, 1991), there has been a major restructuring of its education service since 1992. This was precipitated by the acquisition of a small Zeiss planetarium and visitor centre, the introduction of a new government policy on funding ‘learning experiences outside the classroom’, and the appointment of new members of staff. In recent years, four different types of education programs have been offered by the Observatory:

- the schools program
- the training program
- ‘Overnight Extravaganzas’
- holiday programs.

All four have been collectively summarised by Orchiston (1995) and Orchiston & Dodd (1996), the schools program has been discussed by Leather et al. (1996), while Orchiston & Andrews (1995) reported on ‘Overnight Extravaganzas’. This paper provides details of the holiday programs offered by the Observatory in 1995.

Special holiday programs for children have long been a feature of science centres (see Danilov 1975, 1982; Grinell 1979), but they are only now beginning to assume importance for planetaria (e.g. Brunello

1995) and some public observatories (e.g. Lomb 1996).

2 The 1995 Holiday Programs

2.1 Introduction

In a recent rather short but very thought-provoking paper, Parker (1995) challenges planetarium professionals to develop programs and activities that offer: ‘... real mental engagement—role playing, problem solving, experimenting, questioning, fantasising, and discovering unknown capabilities. I’m also talking about real physical engagement—handling objects, exploring visual perception, moving around the theatre, playing games, and sensory stimulation.’ As if to reinforce this approach, the then-President of the International Planetarium Society, James Manning (1995) has stressed that diversification of activities and offerings is essential if the future well-being of the world’s planetaria is to be assured.

Since 1994, public planetarium sessions and audio-visual screenings have featured on weekdays during school holidays in the Carter Observatory’s Visitor Centre. In order to extend the range of activities available a decision was made to pilot special holiday programs for pre-teenage children during the 1995 May and August holidays. According to an old Chinese proverb, ‘Tell me and I’ll forget, show me and I may remember, but involve me and I will understand’ (see the preface to Smith 1984). Our aim, therefore, was to offer a range of activities and experiences that would stimulate and engage the students, and would generate excitement for and a greater understanding of astronomy. In other

words, we wanted to design programs that would be enjoyable and entertaining but at the same time prove educational (cf. Brunello 1992; Tidey 1995).

With these caveats in mind, a 'Project Team' was established to respond to this innovative challenge and plan, implement and evaluate two special Carter Observatory holiday programs.

2.2 'Spaceship Mars'

'Spaceship Mars' was the theme selected for the May holiday program, which ran in the audio-visual theatre on weekday mornings between 9.30 am and midday during the two weeks of the holidays. The first week was reserved for 8–11 year olds, and the second week for 5–7 year olds. An upper limit of 30 children and a charge of \$NZ9 was set for each session.

A two-fold A4 publicity brochure was prepared on the Observatory's computers, photocopied, and sent to 98 primary and intermediate schools in the central Wellington region. This was produced on red paper, red being the obvious 'house colour' for a Mars-related initiative. We asked all schools to include details of 'Spaceship Mars' in their next newsletter to parents. In addition, we promoted the holiday program on our two monthly radio programs, and placed advertisements in 11 suburban newspapers. All of these advertisements were in the Observatory's 'house style' of white lettering on a black background, with a sprinkling of decorative astronomical elements such as stars and a crescent moon. Media releases were also sent to all of these suburban newspapers, the city's two daily newspapers, all radio stations in the Wellington region, and the region's four television stations. In all, information about 'Spaceship Mars' was widely distributed throughout the 400,000 people living in the greater Wellington area.

Table 1. 'Spaceship Mars' program

Date	Activity
<i>Week 1 (8–11 year olds)</i>	
May 08	Painting: An adapted Martian, or A Martian city
May 09	Model: Help construct the model rocket
May 10	Games: Where is Mars?; Race to Mars Video: Science fiction
May 11	Design project: Terraforming Mars
May 12	Mural painting: Paint a Martian scene Painting: Paint the model rocket
<i>Week 2 (5–7 year olds)</i>	
May 15	Painting: My favourite Martian, or A Martian city
May 16	Story-telling: Space stories Drama: Use the model rocket to journey to Mars
May 17	Games: Where is Mars?; Race to Mars
May 18	Mural: Plan the mural figures
May 19	Mural painting: Paint the Martian mural

In planning the program a cross-curricula approach was adopted, with the intention of exploring astronautics, the solar system and the planet Mars. As Table 1 indicates, the program offered considerable variety. Through the painting and mural (painting) sessions the children were able to learn about characteristics of the Martian landscape. During 'construction' and painting of the 2-m high model rocket the children discussed spaceflight and rocket design; the younger children actually occupied the rocket during parts of their story-telling and drama sessions, in the process learning about rocket function and some of the problems that astronauts will encounter on a trip to distant Mars. While enjoying the various games the children were able to acquire information on Mars and the ways in which this planet differs from others in our solar system. The video session allowed older children to discuss the differences between 'science fact' and 'science fiction' in a Martian context. Finally, in their design project the older children discussed ways in which the current Martian environment will have to be modified (terraformed) in order for 'Earthlings' to be able to live there. It can be seen that, while most of the activities and projects offered an element of fun and enjoyment, all included a didactic aspect.

Most of the activities were carried out in the audio-visual theatre, although the mural painting sessions took place in the corridor leading off the foyer. Considerable lead-in preparation time was required for each day's activity or activities, and for the construction of the framework of the 'rocket'. In addition, one of the authors (RH) used material produced by the children during one session to paint in the background Martian 'landscape' in readiness for the next day's mural-painting session.

There was an excellent response to this holiday program, thereby justifying all of this staff effort. A total of 251 children attended during the two weeks, and the average daily attendance for 8–11 year olds was 27 while that for 5–7 year olds was 23.5. During each week a number of days were oversubscribed.

Supporting the 'Spaceship Mars' holiday program was the Observatory's first-ever Activity Booklet, of the same name, and this contained a range of solar system-related activities and games, plus 'Martian' recipes. One of the project members (KL) prepared this red-covered A4-sized 12-page booklet on the Observatory's computers, and it was then photocopied. The back cover featured the names of the holiday program sponsors.

A red-coloured 'Spaceship Mars' certificate was also prepared, and each child who participated in this holiday program was given one of these, together with a McDonalds' voucher, and a free entry ticket to a future day or evening public session at the Carter Observatory.

2.3 ‘Journey to the Sun’

‘Journey to the Sun’ was the theme selected for the August–September holiday program, which like the ‘Spaceship Mars’ program was also conducted on weekday mornings between 9:30 am and midday during the two weeks of the holidays. The first week was again reserved for 8–11 year olds, and the second week for 5–7 year olds. The upper limit for each session was retained at 30, and the daily fee was unchanged at \$NZ9.

Promotion of ‘Journey to the Sun’ followed much the same course as that outlined for ‘Spaceship Mars’, except that the blue-coloured A4 brochure was forwarded to a larger number of schools in the Wellington region, including some from the Hutt Valley and Johnsonville–Porirua area. This holiday program was also advertised in suburban newspapers and on the Observatory’s monthly radio programs, which by this stage had increased to three. A media release was again prepared for local newspapers, and radio and television stations.

Table 2. ‘Journey to the Sun’ program

Date	Activity
<i>Week 1 (8–11 year olds)</i>	
August 28	Picture-making: The Sun; solar eclipses; shadow pictures
August 29	Craft: Make your lucky star; weave the Sun. Picture-making: tissue paper pictures
August 30	Games: Where is the Sun?; pen and paper activities Quiz: Solar brain-teasers Video: Science fiction
August 31	Design project: Nature’s solar panels Experiments: Puzzles involving light
September 01	Drama: Lost in space; Who shall we rescue?; On an alien planet
<i>Week 2 (5–7 year olds)</i>	
September 04	Picture-making: The Sun; tissue paper pictures
September 05	Story-telling: Traditional tales from different cultures Drama: Machines, robots, seasons and space
September 06	Games: Where is the Sun?; pen and paper activities Quiz: Solar brain-teasers Video: Science fiction
September 07	Craft: Make your lucky star; Weave the Sun
September 08	Experiments: Puzzles involving light Picture-making: Shadow pictures

This holiday program was designed, in the main, to explore the Sun and solar system, and it included an even wider range of activities than was offered during ‘Spaceship Mars’ (see Table 2). In preparing for the picture-making and craft sessions and while playing games, the children learnt about the physical characteristics of the Sun, solar eclipses and light,

and through the story-telling session they were provided with other cultural perspectives on the Sun and its place in the Universe. All of the video sessions were solar-oriented, and allowed the children to differentiate between ‘science fact’ and ‘science fiction’. Meanwhile, during the design program the older children looked at the critical role that sunlight played in sustaining plant-life. Through the quizzes, the children were able to display their newly-acquired knowledge and understanding of our nearest star. The ‘Experiments’ sessions focussed on sunlight, and light in general, and involved solar-viewing and experiments with prisms, lenses and diffraction gratings. Finally, the drama sessions employed video clips and role play to examine the differing impacts that our Sun and other suns (stars) would have on hypothetical space voyagers. The overriding objective, once again, was to provide a varied program that offered ‘edutainment’, that is, a mix of education and entertainment.

All activities were confined to the audio-visual theatre, except for viewing of the projected image of the Sun through the Observatory’s historic 23 cm refractor housed in the ‘Dome Room’.

Once again our holiday program proved very popular, with 297 children attending and full-houses most days. To cope this the demand, three of the Observatory’s part-time staff (all secondary school students) were brought in to assist.

A second Activity Booklet, *Journey to the Sun*, was prepared by one of the part-time staff to support this holiday program, and although this also ran to 12 pages, it contained a lot more information and activities than its predecessor. Once again, the sponsors’ names featured on the back cover.

On the final day of their participation, blue-coloured ‘Journey to the Sun’ certificates were given to all participants, along with the ever popular McDonalds vouchers and Carter Observatory free entry tickets.

3 Discussion

One of the most attractive features of the May holiday program was the model ‘rocket’ which the children helped ‘build’ (by constructing papier mache walls over a wire mesh base and then painting these walls), and then used in a simulated journey to Mars. The rocket was designed so that a number of children could comfortably sit inside it, and it therefore had to be sturdy and safe. It also had to be easy to dismantle, so that it could be removed from the theatre immediately after the holidays were over. During ‘Spaceship Mars’, the ‘rocket’ proved popular, and it was easy to include it in the second holiday.

In hindsight, were the two holiday programs a success? The emphatic answer would have to be ‘yes’. For the participating children, informal discussions

with them at the time (i.e. anecdotal 'surveys') revealed that they felt that the daily programs offered variety, were interesting and enjoyable, and provided them with useful astronomical information. They also appreciated the new Activity Booklets, McDonalds vouchers and program certificates, and welcomed the chance to return to the Carter Observatory free of charge at a later date to view a new planetarium program and/or audio-visual show.

Parents told us that they also were happy with the programs, which provided them with an additional holiday option at a price comparable to or slightly lower than that charged by other Wellington institutions (such as the Dowse Art Museum, the Museum of New Zealand, and the Wellington Zoo). They saw competent engaging staff talking about astronomy in an imaginative way, and viewed the programs as good value for money.

The sponsors also were happy with their involvement. Although entry fees covered the day-to-day direct costs of the programs, corporate support was vital if the two holiday programs were to be financially viable. The all-up retail value of the combined sponsorship contributions for the May holiday program was about \$NZ1,000 and for the August program around \$NZ1,100. After each holiday program we prepared a 3–4 page report for the sponsors, and from subsequent discussions with them it was apparent that they were glad to have been associated with a dynamic new educational initiative offered by New Zealand's National Observatory. They were satisfied with the ways in which their involvement in the two holiday programs was promoted, with the extensive public exposure that they obtained through media coverage of the programs, and with having their names on all advertisements, Certificates, publicity brochures and Activity Booklets. They also appreciated that the two Activity Booklets would continue to bring their names before the public long after the completion of both holiday programs.

From a Carter Observatory perspective, the two holiday programs were judged an overall success, despite some concerns. We felt they were well supported by the children of Wellington; ran smoothly; represented a significant development of the non-schools education program; and generated good publicity about the Observatory and its educational programs. While many children have since made use of their free entry tickets to the Observatory, only time will tell whether this initial flush of interest will translate into a long-term interest in astronomy or even a decision by some to pursue tertiary studies and perhaps a career in science or technology. If there was a downside, it was the time-consuming nature of the two programs. During school holidays the education staff are always busy, but on these two occasions they were hard pressed finding

enough time to do the necessary preparation for the up-coming school terms. The two special holiday programs also drew education and public astronomy staff away from conducting the usual planetarium sessions that are run during school holidays, thus creating an initial staffing problem (which was solved during the second program by bringing in part-time members of staff). Finally, by occupying the audio-visual theatre each morning during the two school holidays, we were not able to run continuous screenings of the audio-visual show 'Galileo: A Space Odyssey', thereby denying ordinary visitors a part of the total package supposedly included in their entry fee. When planning the special holiday programs we realised that this was bound to inconvenience some visitors, but we did not anticipate that a number would decide not to visit at all once they learnt of the situation. This not only represented lost revenue but was bad from a public relations viewpoint, and it was these two considerations more than any others which eventually led to our decision to defer special holiday programs.

4 Conclusion

In 1995 two different holiday programs for primary school age children were offered by the Carter Observatory. Both were self-funding, were well supported, and generated considerable positive media coverage for the Observatory. However, the on-going public astronomy programs were jeopardised, and it was eventually decided that no further special holiday programs should be offered until an alternative space and additional resources can be found for them.

Notwithstanding the Carter Observatory situation we believe, whenever resources allow it, that special holiday programs should be part of the public menu of every astronomical observatory or planetarium which offers public astronomy and/or educational programs. Through holiday programs, astronomy can be communicated in a non-threatening, enjoyable and entertaining way, encouraging some children to eventually consider a career in science. In the long-term, holiday programs have the potential to contribute significantly towards the improved scientific literacy of the general population and eventually provide an electoral base that is more sympathetic to the public funding of science and technology.

Postscript: In 1997, following the addition of a new Education Officer to the staff and the availability of a new activities room, a special school holiday program for 5–11 year olds was run successfully during the July school holidays, and a further program is scheduled for the October holidays.

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Andrews, F. 1988, *Southern Stars*, 33, 86

Andrews, F. 1991, *PASA*, 9, 174

Brunello, C. M. 1992, *The Planetarian*, 21, 1, 10

Brunello, C. M. 1995, *The Planetarian*, 24, 1, 8

Danilov, V. J. 1975, *Curator*, 18, 87

Danilov, V. J. 1982, *Science and Technology Centers* (Cambridge: MIT Press)

Grinnell, S. (ed.) 1979, *A Stage for Science: Dramatic Techniques at Science–Technology Centers* (Washington: Association of Science–Technology Centers)

Leather, K., Andrews, F., Carter, B., Hall, R., & Orchiston, W. 1996, *IAU Colloquium 162* (London)

Lomb, N. 1996, *IAU Colloquium 162* (London)

Manning, J. G. 1995, *The Planetarian*, 24, 4, 8

Orchiston, W. 1995, in *Astronomical Handbook for 1996*, ed. W. Orchiston, B. Carter & R. Dodd (Wellington: Carter Observatory), 59

Orchiston, W., & Andrews, F. 1995, *The Planetarian*, 24, 4, 15

Orchiston, W., & Dodd, R. 1996, *PASA*, 13, 165

Parker, S. K. 1995, *The Planetarian*, 24, 2, 9

Smith, A. 1984, *The Mind* (London: Hodder and Stoughton)

Tidey, S. 1995, *Astronomy Now*, 7, 9, 37