“Education is the most powerful weapon which you can use to change the world” – and education is so important for the very young, a group that is often undervalued in this respect.

Nelson Mandela
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“People sometimes ask me when and how I first got interested in animals. I have to admit that seems to be an extraordinary question. I find it hard to believe that any normal child is born without that interest.”


Our Patron
Director’s Report

The landscape travelled by the MSC in 2011 was ever changing. The report that follows will clearly detail this path, with projects in the Melbourne region, as well as nationally and internationally. These programs were diverse and in depth, in many ways driven by requests from schools, museums, community groups, conference organizers and indeed by the research of staff in the Monash University community. In fact, the MSC has long term programs which serve primary and secondary curriculum demands and changes, as well as school holiday programs and our ongoing and rapidly growing CETEC Saturday Science Club. However, the MSC is delighted to have the nimbleness that allows us to take advantage of opportunity swiftly, a strength of a small, passionate and determinedly hard working team, with a minimum of bureaucracy.

As per normal with staffing changes over time, our part-time Administrative Assistant Colleen Wendt retired during 2011, and our Centre Coordinator and other staff maintained that position for the remainder of the year. Our volunteer staff continued to assist in many ways, for example in training and maintaining our preparation lab, where 50 million year old vertebrate fossils were “excavated” from the sedimentary blocks collected years ago in the open cut coal mines of north Queensland, material that had formed the basis for PhD dissertations and which once prepared is housed in the permanent collections of Museum Victoria.

Professor Patricia Vickers Rich, Director, Monash Science Centre, with friend in Argentina, on expedition (photo by M. Fedonkin)
Our contract presenters, who cover a diversity of science disciplines, were in continual demand, and applications to be a part of the MSC team continued to grow – interest in science communication as a profession is expanding remarkably. There was a solid increase in the public demand for better, more measured and in depth access to scientific information in order to make sense of the world, to understand natural phenomena and to interpret and make informed decisions about scientific issues. The findings of a 12 year assessment conducted by the National Education Longitudinal Study (NELS: 88) in the USA, quite unsurprisingly concluded that positive attitudes towards careers in science are formed significantly by out-of-school experiences, particularly in early adolescence – such as museum visits, taking part in science interest groups, watching well honed documentaries, and other out of the ordinary science related activities. This is exactly what the MSC has been good at providing for years – in Melbourne and Bendigo, in Kabul and Dili, and in many other places on the planet.

MSC staff participated in a number of national and international conferences, many as invited speakers and workshop organizers, and the MSC was approached on several occasions in 2011 to advise on museum planning, exhibition construction and design as well as curriculum development in a diversity of locations – Sri Lanka, Russia, Namibia, Singapore and Timor-Leste, amongst others. Our work with Kirsty Sword-Gusmão, Timorese President Jose Ramos-Horta and Padre Palomo of the Salesian Brothers, all in Timor-Leste, has led to maintenance of a major exhibition in Dili on geology (see letter from Ramos-Horta), the development of a Science Centre in Baucau and a regional exhibition in the highland town of Aileu. Other projects in Timor include the writing and later translation of children’s books on the long history of Timor into more than 15 languages, several especially aimed for early language training as youth enter Timor’s primary schools, as well as striving for the establishment of a permanent National Museum in that new country. International visitors from Timor-Leste, Africa, Russia and many other places, as well as from around Australia, have had staff training at the MSC. MSC staff also assisted in the training of Faculty of Science mentors, who had placement in primary and secondary schools to enhance science education, part of the In2Science program of the Faculty.

A read through this annual report will make it clear that a small team of people have had a solid and diverse impact on the imparting to children and the general public the usefulness of science in everyday life. The MSC does this effectively by making sure that the researchers doing the science are in direct contact with those diverse communities. It has been the purpose from the beginning of the Monash Science Centre and is a flame that will burn for the entire existence of this unique institution, which had this philosophy imparted by the Lawrence Hall of Science, set up by the Nobel Laureate, E. O. Lawrence at the University of California, Berkeley. This institution has mentored the MSC from its inception in 1993.

The MSC enshrines the concept so well crystallized by Nelson Mandela - “Education is the most powerful weapon which you can use to change the world” – and education is so important for the very young, a group that is often undervalued in this respect. This group is so very valued by the Monash Science Centre and sought out. My own life growing up on a small farm was forever changed by primary school teachers opening my eyes to science!
Education Report 2011

Executive Summary

In 2011, the Education Section of the Monash Science Centre (MSC) continued to strive for excellence in our programs and services offered to schools and the general public. MSC Education Staff follow best practice in terms of current teaching and learning theory by providing interactive, hands-on experiences for students, teachers and members of the community. As a key branch of the Science Centre, the goals of MSC Education are in line with *Inspiring Australia* – the national strategy for science engagement, and we maintain relationships with other organisations working in science education throughout the nation, with whom we work collaboratively.

Ongoing education programs and activities:
- School Based Classroom Teaching.
- School Holiday Programs during each of the four main school breaks.
- Science Lending Library Kits.
- Professional Development for Teachers.
- Family Science Nights.
- Water Science Project with the School of Biological Sciences, Monash University.
- CETEC Saturday Science Club, The Labrats!
- Preschool Science for the Monash Family Cooperative.

Special events in education 2011:
- Exhibitors at the STAV Primary School Conference in May.
- Science Communication workshops for secondary and tertiary students.
- Saturday Science Fair for disadvantaged students with Monash South Africa.
- Participation in 6th Science Centre World Congress, Cape Town, South Africa.
- Participation in the International Geological Correlation Program (IGCP) Project
  587 field conference, Namibia.

Ongoing collaborations:
- Partnership with *Mount Waverley North Primary School* to assist in the training of new staff and offers of participation in special programs.
- Collaboration with other Monash University faculties and organisations including, but not limited to, the Faculty of Science, Faculty of Education, Schools Access Monash, John Monash Science School and Community Engagement at Monash South Africa.
- Collaboration with organisations having a science education focus including but not limited to *Bendigo Discovery Science and Technology Centre, Questacon, Australian Institute of Policy and Science - Tall Poppies and the Australian Synchrotron*.

In 2011, the programs, activities and special events as outlined above reached and included:
- 26,975 preschool and primary school students.
- 845 secondary school students.
- 15 university students.
- 5 primary and secondary school teachers.

Total participants for 2011 = 27,875.

Education Staffing

In 2011, staff in the Education Team were:
- Sandra Thong, Senior Education Officer.
- Lydia Low, Senior Education Officer.
- In addition, the MSC employed up to 11 sessional presenters ranging in background and experience, from science teachers to scientists.
- At least 0.8 EFT of the MSC administration staff support.
In 2011, the Education Section of the Monash Science Centre (MSC) continued to strive for excellence in our programs and services offered to schools and the organisations working in science education throughout the nation, with whom we maintain relationships with other universities. The goals of MSC Education are in line with the national strategy for science engagement, and we maintain relationships with other educational institutions, including the following:

- Participation in 6th Science Centre World Congress, Cape Town, South Africa.
- Science Communication workshops for secondary and tertiary students.
- Collaboration with Australian Synchrotron.
- Collaboration with Questacon, Australian Institute of Policy and Science – Tall Poppies.
- Collaboration with Inspiring Australia.
- Partnership with Pre-School Access Monash, John Monash Science School and Community organisation.
- Participation in the International Geological Correlation Program (IGCP) Project.
- Saturday Science Fair for disadvantaged students with Monash South Africa.
- Family Science Nights.
- Professional Development for Teachers.
- Preschool Science for the Monash Family Cooperative.
- CETEC Saturday Science Club, The Labrats!
- Water Science Project with the School of Biological Sciences, Monash University.
- Family Science Nights (+SKA).
- Science Communication workshops for secondary and tertiary students.
- Recognition of Monash University as an institute at the forefront of current national and international scientific research.
- Promotion of science and Monash University to schools and community groups.
- Expand students’ perception of careers in science.

Education Programs - Overview

The educational benefits of Monash Science Centre programs include the following:

- Self-contained ‘hands-on’ science education sessions that can be delivered to schools as incursion activities.
- Scientific concepts placed in a meaningful context and linked to everyday life.
- School based sessions of no more than 30 students to ensure quality student - presenter interaction.
- Programs linked with current State & Federal curricula.
- Student and teacher access to quality expertise, specimens and equipment.
- Highly professional presenters with expertise in a wide range of science areas.
- Education sessions evaluated by supervising teachers and reviewed by MSC Senior Education Officers.
- Education sessions supported by teacher resource materials to ensure the experience is a meaningful part of unit planning.
- Facilities at the Monash Science Centre to support teaching and learning in schools.
- Opportunity for the community to learn directly from Monash University Research and Academic staff.

Additionally, Monash Science Centre education programs provide:

- Student recognition of Monash University as a possible choice for enrolment for future study.
- Recognition of Monash University as an institute at the forefront of current national and international scientific research.
- Promotion of science and Monash University to schools and community groups.
- Expand students’ perception of careers in science.

Summary of the number of education program participants by program and by the type of participant.

<table>
<thead>
<tr>
<th>Program</th>
<th>Pre-School Children</th>
<th>Primary School Students</th>
<th>Secondary School Students</th>
<th>Primary &amp; Secondary Teachers</th>
<th>University Students &amp; Staff</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>School Based Classroom Lessons</td>
<td>270</td>
<td>20,070</td>
<td>60</td>
<td></td>
<td></td>
<td>20,400</td>
</tr>
<tr>
<td>Science Lending Library Kits</td>
<td></td>
<td>4,680</td>
<td>150</td>
<td></td>
<td></td>
<td>4,830</td>
</tr>
<tr>
<td>School Holiday Program</td>
<td>1,300</td>
<td></td>
<td>120</td>
<td></td>
<td></td>
<td>1,420</td>
</tr>
<tr>
<td>Science Club</td>
<td>20</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>Family Science Nights (+SKA)</td>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>600</td>
</tr>
<tr>
<td>Water Science</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>300</td>
</tr>
<tr>
<td>Science Fair with Monash South Africa</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>140</td>
</tr>
<tr>
<td>Professional Dev. &amp; Science Communication Workshops</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>110</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>270</td>
<td>26,705</td>
<td>845</td>
<td>5</td>
<td>15</td>
<td>27,840</td>
</tr>
<tr>
<td>% of Total Participants</td>
<td>0.97%</td>
<td>95.92%</td>
<td>3.04%</td>
<td>0.02%</td>
<td>0.05%</td>
<td>100%</td>
</tr>
</tbody>
</table>

School Based Science Lessons

Of the total school based lessons in 2011:

- 680 hours of direct classroom teaching time was provided.
- 20,400 students participated in MSC science sessions.
- 136 different schools accessed the classroom lessons.
  - 51% government sector
  - 29% catholic sector
  - 20% independent sector
- Science lesson topics encompassed the four core areas of science education. Their popularity according to 2011 bookings are:
  - 21% biology
  - 26% physics
  - 29% chemistry
  - 24% earth and space science

The high popularity of the chemistry domain can be attributed to the International Year of Chemistry 2011 United Nations campaign.

Our most booked sessions each year are consistently ‘Watery Weather’ for Prep to Grade 2 and ‘Solids, Liquids and Gases’ for Grade 3 and 4, making up 15% and 14% of total bookings respectively.

The school based classroom sessions are designed specifically to meet the teaching and learning needs of primary school students and are linked directly to appropriate curriculum standards. Sessions focus on a ‘hands-on’ approach and provide students and teachers with a positive learning experience in science. Resource materials developed especially for teachers accompany each session, so the topic may be extended further and reach across the curriculum for integrated learning.
Teacher feedback is an integral part of how we continually update and improve our lessons. In 2011 we received many valuable and positive comments from teachers including:

“Excellent program – learned some new things and children enjoyed the activities!”

“All children were engaged in the activities. Being in groups provided opportunities for ongoing involvement and interaction.”

“Good introduction, questioning techniques and visuals provided. It helped students build on their existing knowledge.”

**Preschool Science**

In 2011 the MSC continued to teach hands-on science to the 4-5 year old Kindergarten children using the Monash Community Family Co-operative as a test ground. These workshops at the MSC in the Mary Macdonald Science for Kids space aim to provide a positive experience in science learning in early childhood as a foundation for future science education. Parents, grandparents, and friends visited with their children and enjoyed our Patron David Attenborough documentaries on show upstairs, had a play with “science toys” or read from our youth library on many science topics while comfortably settled in the bean bags.

Workshops included topics such as:

- Dinosaurs
- Kitchen Chemistry
- The Skeletal System

“Operations” can be performed on the “Human Torso” in the Mary Macdonald Science for Kids Area.
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School Holiday Program

The Monash Science Centre School Holiday Program continued its outreach with sessions running at full capacity throughout the year. The program was held over the four school breaks with a total attendance of 1300 children aged 5 to 14 years. The Serious Science component of the program, which catered exclusively for upper primary and early secondary school aged children, has increased in popularity by 400% since its inception in 2010. School holiday sessions covered many disciplines in science ranging from Physics to Biology, Chemistry to Earth Science and included such topics as:

- Volcanic Eruptions
- Special Effects: Chemistry of the Movies
- Our Place in Space
- A Veggie Good Plantation
- Newton’s First Law of Motion

Serious Science sessions included:

- Trebuchets (medieval catapults)
- Electric Motors
- Angry Planet
- Fog and CO2

Lending Library

During 2011 the Science Lending Library Program continued to be used heavily by Melbourne Metropolitan and Victorian Regional primary schools. The kits were accessed by:

- 34 primary schools with 11 of these schools borrowing multiple kits for different year levels.
- Approximately 4,680 primary school students.

Two Genetics Lending Library Kits were offered to secondary schools for one month or one school term loan. The development of these kits was funded by a Royal Auto Club of Victoria (RACV) grant. The kits were accessed by:

- 5 secondary schools throughout the Melbourne Metropolitan and Victorian Regional areas.
- Approximately 200 secondary school students who used content and activities in these kits.
Professional Development

In 2011, the Monash Science Centre catered for a group of international teachers for a unique professional development workshop for staff of the Sekolah Alam Indonesia, located in Jakarta.

The focus of the three hour session was two-fold: developing meaningful and interactive science lessons based on the resources available to the school, and implementing science inquiry skills in classroom lessons.

Learning experiences found within the Australian Biodiversity and Water Science education programs were explored, and participants found the activities easily reproducible, inspiring and useful in their classroom teaching.

In addition to providing workshops, MSC staff had their own opportunity to further their skills through professional development with Senior Education Officer, Sandra Thong receiving an Australian Science and Technology Exhibitors Network (ASTEN) Professional Development Fellowship. Sandra was granted funding to visit Questacon, Australia’s National Science and Technology Centre in March 2011 to observe and discuss a range of Questacon practices in science communication. This included initiatives for Indigenous science education, exhibition development and design, outreach to rural areas for Primary and Secondary Schools, centre-based programs and marketing to schools. Additionally, visits to the CSIRO Discovery Centre and the Australian National Centre for the Public Awareness of Science (CPAS) at Australian National University, illustrated a variety of programs encouraging science engagement. Questacon staff were generous with their resources and offered advice, knowledge and tactics from years of experience that were implemented into Monash Science Centre practices and programs where appropriate, and Sandra was able to pass on MSC success outcomes to Questacon.

Family Science Nights

MSC Family Science Nights reached more than 600 families in 2011 within 7 participating schools. Family Science Nights were partly based on MSC School Based Science Lessons. However, in 2011 MSC staff and volunteers presented a variety of highly customised events, including:

- **Switched on Science** at Canterbury Primary School for over 300 families to provide a positive experience in science learning. This science fair structure allowed children and parents to explore a range of hands-on chemistry and...
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- **Switched on Science** at Canterbury Primary School for over 300 families to provide a positive experience in science learning. This science fair structure allowed children and parents to explore a range of hands-on chemistry and physics activities at their own pace. Canterbury PS teaching staff assisted in the running of activities.

- **From Galileo to the SKA** at Mount Waverley North Primary School as part of a national project celebrating Australia’s involvement and potential hosting of the world’s largest telescope, the Square Kilometre Array (SKA). The evening lesson was attended by Grade 5/6 students and their parents, who built simple refracting telescopes, learned about radio astronomy, built paper model radio telescopes, erected a model telescope array, learned how to use a planisphere and explored the possibilities of the SKA. The event was supported by Discover SKA, an Australian Government initiative.

**MSC-CETEC LabRats Science Club**

The Monash Science Centre (MSC) – CETEC LabRats gained momentum in 2011 with 40 students, participating in 10 monthly sessions. Student enrolments doubled since the program’s launch in July 2010, and requests for participation in the 2012 program outstripped placements. We held a draw to determine participants, but in future we would like to expand the funding for this program to admit all who qualify.

The MSC – CETEC Labrats provides 10 – 14 year olds with the unique opportunity to interact with Monash University researchers. Nine scientists volunteered their time and expertise to introduce their research areas to students.
Labrats undertook regular monitoring of changes in lakes in the Monash Clayton area under the supervision of Lydia Low.

The MSC-CETEC LabRats was funded by CETEC Pty. Ltd. and Monash University to subsidise the cost of the program for families. COSMOS magazine kindly donated issues of their publication, and the Australian Synchrotron organized a visit to their facility.

International Year of Chemistry 2011

The International Year of Chemistry was celebrated by educational institutions worldwide in 2011. The MSC Education Services already boasts an impressive array of chemistry hands-on sessions and lending library kits, which were actively promoted and used throughout the year.

Chemistry school lessons certainly increased in popularity with a 29% in overall bookings for 2011. Chemistry lending library bookings were also high, making up 33% of total loans. These findings support efforts to highlight the international themes in science and technology by the United Nations, and closer to home by National Science Week themes.

Dr Allie Ford taught the MSC – CETEC Labrats about astronomy.
Water Science for Secondary Schools

In 2011, the MSC working with the School of Biological Sciences continued to offer Water Science for Secondary Schools as a stand-alone, user pays program. Three schools took part, with a total of 300 students.

The program focused on the effect on urbanisation on waterways. Students in this program visited Monash University and undertook field work at the Jock Marshall Reserve (JMR). Their job was to assess water quality of the JMR wetland system, learn directly from Monash University staff with extensive knowledge and experience in environmental monitoring practices. Schools were provided with resources that supported the program pre and post field work.

This project was initially funded by the Department of Education, Science and Training (DEST) as part of their Australian School Innovation in Science, Technology and Mathematics (ASiSTM) Program. The Monash University Freshwater Ecology Research Group provided support in the development of the program, training of Monash University Postgraduate Research Students, and access to the Jock Marshall Reserve.

Science Communication Workshops

The role of science communicators is gathering momentum as valued vocation and a more sought after career choice for many young people. Science Communication covers a broad spectrum of science disciplines, and Monash Science Centre had the opportunity in 2011 to offer their considerable experience in this field to help develop these skills in secondary school students and University students working in secondary classrooms. Workshops conducted by MSC in 2011:

- The Faculty of Science student ambassadors and In2science Peer Mentors are Monash University science undergraduates who assist in communicating science through volunteer work. The MSC designed and conducted a half day science communication workshop that focused on outreach and exhibitions. Students were asked to consider practices for translating research content, teaching children, teaching groups with English as a second language, designing displays and the general project management of exhibitions.

- Access Monash ran a selection of campus visits for year 8 students from schools participating in the Schools Access Monash Program. The MSC assisted by conducting science communication workshops with 90 students from Mount Erin College and Westernport Secondary College. The workshops focused on the benefits of kinaesthetic learning, or learning by doing, as an effective approach for communicating simple physiology of the human digestive system.

Education Promotion and Support

In the Media

MSC Education Programs, including the School Holiday Program and MSC-CETEC Labrats, continued to be highlighted in a range of publications during 2011. Glossy photographs and listings in What's On columns were featured in The Sunday Age M Magazine, Royal Auto Magazine, Melbourne’s Child, Monash Weekly and Waverley and Oakleigh Leader. A constant presence in popular publications continues to solidify the Monash Science Centre’s profile as a valuable and accessible educational organisation in the community of Melbourne.
Newsletter
The Monash Science Centre newsletters were circulated to over 1500 Government, Independent, Catholic primary and secondary schools, and Independent Educators in metropolitan and regional Victoria. 2011 saw the end of paper newsletters, with future newsletters to be emailed to schools and uploaded to online databases – one of our Green initiatives.

Conferences
In 2011, senior MSC education officers attended a range of conferences offering opportunities for local and global networking, seminars and workshops for professional development and promotion of Monash Science Centre as an excellent science outreach organisation.

The MSC showcased core educational programs at the Science Teachers Association of Victoria’s (STAV) Primary and Middle Years Science Teacher’s Conference at Darebin Arts and Entertainment Centre in May. The double stand exhibit informed conference attending teachers of our hands-on School Based Lessons, Lending Library Boxes, School Holiday Program and the MSC-CETEC LabRats Science Club. The conference proved an excellent networking opportunity for the MSC and a way to assess other organisations services and products.

The Director of the Monash Science Centre was an invited speaker at the Vision to Reality Conference, Queensland’s New Education Landscape organized by the Queensland Studies Authority in April in Brisbane. Her presentation Communicating Science in Outposts: Teaching Primary Science in Isolated Communities of the World, highlighted the strong commitment the MSC has to working in both politically delicate and isolated areas, such as the MSC programs in Afghanistan, Timor-Leste, southern Africa, and Saudi Arabia. She has been invited by the Iranian Government to advise on Science Centre development in that country during 2012.

In September the 6th Science Centre World Congress was attended by education and exhibition staff in Cape Town, South Africa. The MSC staff were able to build global relationships and learn of global science outreach programs. As a result the MSC made connections with science centres and outreach organisations in Belgium, the Netherlands, the UK, Canada and South Africa. Education staff presented in a poster session that examined the use of hands-on science as a means to connect and educate student groups from diverse ethnic and linguistic backgrounds. They also attended a variety of seminars examining topics including Indigenous education and knowledge, multicultural science learning, social media integration and science in sport.

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After taking part in the 6th International Science Centre Conference in southern Africa another nearby conference was attended, the UNESCO International Geological Correlation Programme (IGCP) Project 587 Conference held on Aar Farm in southern Namibia, an active Ediacaran field site. This project is led by Monash University academics. MSC staff examined and discussed onsite the current research on the environmental setting of late Precambrian Ediacaran organisms, more than 550 million years in age, which existed just prior to a major global disaster, leading to the extinction of much of the fauna and flora of the time. Consequently, an educational resource was developed that details the significance of the research, introduces Ediacaran species and describes the past and current Farm Aar environment as well as addresses the possible causes of such an apocalyptic event – and who were the survivors and the losers. This resource will be published in 2012 by the MSC, and used in Australia as well as Namibia.
Website – http://sciencecentre.monash.edu/

The MSC website has been an essential resource for teachers, students and the general public in 2011, with many people discovering or remaining updated on our programs using search engines and social media. Up to date information on community programs, including the School Holiday Program and the MSC-CETEC LabRats are posted regularly. Services for schools, including a wealth of downloadable educational resources, are available to teachers, as are copies of newsletters and annual reports. The MSC website provides links to the Dinosaur Dreaming Fossil Site Web page and remote access to resources for MSC Education Staff.

The above graph shows:
- the total number of web page visitors to the overall MSC website
- the total number of page views to the overall MSC website

The peaks in page visitors and webpage views correlate with trends in MSC Education Programs. The peak in website activity in March was likely a response to the release of the upcoming school holiday program and teachers booking school based sessions for term 2, generating our highest bookings for the year. The June peak in web activity is again a likely response to the School Holiday Program release and teacher bookings for term 3.

Total number of visitors to access MSC website in 2011 = 16,218.
Total number of page views of MSC website in 2011 = 59,718.

In line with Monash University’s new policies regarding the use of social media, Monash Science Centre’s online presence has grown to include a Facebook page. Linked to Monash University’s Facebook profile, other Monash departments and international Science Centres, followers have the opportunity to keep up to date with our programs and events, post ideas and contribute to our wall, whilst the MSC can share not only our own updates, but science news and research as it is reported in the media.
Partner Schools

The Monash Science Centre worked with Mount Waverley North Primary School throughout 2011 as a venue to train new MSC presenters. Teachers at Mount Waverley North were keen to promote science as curriculum essential and provided feedback for new MSC education staff and program development.

Mount Waverley North teachers, students and their families were exclusive participants in the MSC organized SKA event, as part of the national Discover SKA Project.

Sponsorship

Blundstone Sponsorship

The Blundstone Footwear Company has provided significant sponsorship for our education programs ($30,000 annually) as part of their long term commitment to education and the Monash Science Centre. This sponsorship has allowed us to develop new programs, while maintaining the quality and up to date educational content of all existing programs that bear the Blundstone brand.

Blundstone Education Programs in 2011:

- School Based Science Lessons.
- School Holiday Program.
- Teacher Professional Development.
- Major sponsor of Education Management.

CETEC Pty. Ltd. Sponsorship

CETEC Pty. Ltd. provided the MSC-CETEC LabRats Science Club with funds to cover staff salary and subsidise the program cost to participating children.

Conference Support

The Australian Committee of The International Geosciences Program funded by Australian Geosciences provided airfare and accommodation support for Monash Science Centre staff to attend two major conferences in Southern Africa, making it possible, with additional support from Monash University for our presentation on The Saturday School Science Festival at Monash South Africa.

In Kind Support

Expenses for equipment and consumable materials impact on users costs of many education programs. Donations and in kind support from the following companies helped reduce the costs of our education programs:
Special Events 2011

The Monash Science Centre was involved with a number of special events during 2011. Additionally, the Centre was booked by many University and Community groups for private functions, including the Monash Sustainability Institute, Water Sensitive Cities, Green Steps, the Science Faculty, Office of the Deputy Vice-Chancellor (Education), and private groups such as the Slovenian Community of Melbourne. The MSC is a popular location for community groups to meet and learn. During October and November, Perry Vlahos presented 2 four week courses entitled *Astronomy – an Introductory Guide*. The course was open to those with an interest in astronomy.

Monash South Africa’s Saturday School Science Festival

The Monash Saturday School (MSS) is a program run by student volunteers each Saturday, where 150 kids from local townships came to Monash South Africa to receive extra academic classes that compliment their school programs and enhance their understanding of a wide variety of subjects. In September 2011, the Monash Science Centre staff and volunteers from the UNESCO International Geosciences Program (IGCP587, www.geosci.monash.edu.au/precsite) assisted www.geosci.monash.edu.au/precsite MSS to coordinate and deliver a *Saturday School Science Fair* celebrating scholarly learning and provide a positive and unconventional experience in science education.

The *Saturday School Science Fair* ran from 9am – 3pm and was attended by approximately 150 local children ranging from levels Year 4 to Year 11. MSC representatives participated as science educators. Students rotated through the following activities:

- **Lab Coat Decoration** (Team Leader Peter Trusler, PhD student at Monash Clayton). Funding for the Lab coats was kindly donated by Dr Eugene Sebastian, Global Engagement.
- **Chemistry** - Making and exploring non-Newtonian fluids, building film canister rockets. The Alka Seltzer rocket ‘fuel’ was kindly donated by Bayer Aus/NZ. (Team Leader Sandra Thong, MSC)
- **Plants** – Examination of plant lifecycles and caring for seedlings. (Team Leader Jeffrey Smith, team member UNESCO IGCP587 and contract presenter MSC)
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- **Plants** – Examination of plant lifecycles and caring for seedlings. (Team Leader Jeffrey Smith, team member UNESCO IGCP587 and contract presenter MSC)
- **Digestion** - Breakdown of food and production of energy in the body. (Team Leader Lydia Low, MSC)
- **Gravity** – Jumping castle and rotocopters to demonstrate force. (Team Leader Corrie Williams, MSC)
- **Science Equipment** - Demonstration of the function of a variety of science equipment. (Team Leader Elizabeth Finkel, Alan and Elizabeth Finkel Foundation)
- **First Aid** – Science and Saving Lives, CPR and emergency procedures. (Team Leaders Patricia Vickers Rich, MSC and Claudia Holgate, Research Associate, Geosciences, Monash Clayton)

The jumping castle was a fun way to demonstrate force and gravity, Monash South Africa.
National Science Week Event

In August the Monash Science Centre opened its doors to the public for a special *Brains Matter* live audience podcast event that examined the World of the Elephant.

Pratap Pataikuni, known as “The Ordinary Guy” of Brains Matter interviewed Professor Roger Short, a Reproductive Biologist and Honorary Professorial Fellow in the Faculty of Medicine, Dentistry and Health Sciences at the University of Melbourne, who is widely accepted as the world’s foremost elephant expert. Professor Short’s lifelong research into the physiology and behaviour of the elephant and his invitation to younger generations to fight for elephant conservation were inspiring.

Melbourne University researcher Evan Bitter, followed Professor Short and discussed his recent work in Sir Lanka where he focused on the methods to assist in harmonious living for humans and elephants.

Finally, representatives of the *A Future With Elephants* organisation spoke about the challenges facing the Asian Elephant and the campaign for conservation.

Science Shaping Society

An exciting new lecture series *Science Shaping Society* was introduced in 2011. The lectures offered insight into historical, current and future impacts on society and proved very popular with local communities. This series was organized and managed by Jennifer Monaghan at the MSC and attracted a broad range of community, from brilliant young people to interested and lively adults.

Monash University guest speakers included Prof. Joe Monaghan, Associate Prof. Ros Gleadow, Dr. Rob Sparrow, Professor Ray Jarvis, Dr. Wouter Schellart, Associate Prof. David Paganin and Associate Prof. Bernd Meyer.

Topics discussed ranged from robots to philosophy, to food security and climate change.

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**Monash Science Centre 2011 Lecture Series**

**Science Shaping Society**

A track through the explosive growth of science and technology, and the consequent impact and implications on society now and in the future.

- **Wednesday 13th April**
  - **Key Stages in the Growth of Science**
  - Professor Joe Monaghan

- **Wednesday 25th May**
  - **Food Security and Climate Change: How the Composition of Plants Could Be Different in the Future**
  - Associate Professor Ros Gleadow

- **Wednesday 22nd June**
  - **Myth Busting: Philosophy and Politics Talk to Science**
  - Dr. Rob Sparrow

- **Wednesday 27th July**
  - **Intelligent Robots in the Real World**
  - Professor Ray Jarvis

- **Wednesday 24th August**
  - **Our Dynamic Earth: Plates, Quakes and Subduction Zones**
  - Dr. Wouter Schellart

- **Wednesday 28th September**
  - **Gripping the Light Fantastical**
  - Associate Professor David Paganin

- **Wednesday 26th October**
  - **Computing Shaping Science Shaping Society**
  - Associate Professor Bernd Meyer

**Venue** Monash Science Centre, Blg 74 Normanby Rd, Monash University Clayton

**Time** 7pm

**RSVP** Places are limited. Call Jenny 9905 1370
**Dinosaur Dreaming 2011**

Inverloch is the Victorian coastal town near which the *Dinosaur Dreaming* site is located. About 145 kilometres (ninety minutes drive) from Melbourne, Inverloch is a very civilised place from which to do field research.

The site is a rocky shore platform called Flat Rocks, about five minutes’ drive from the township on a stretch of coast favoured by surfers and fishing enthusiasts. This is where the ancient Cretaceous mammal, *Ausktribosphenos nyktos*, was found in March 1997, still a puzzle to scientists as to which group of mammals it actually belongs! Dinosaurs and many other fossil animals and plants have been found here over the years, a biota that lived, at a time when Australia lay near The South Pole.

Each year school groups and tourists are invited to visit the site during the dig season during February, or by special arrangement at other times through the Monash Science Centre or the local coordinator for this project of Monash University, Ms Lesley Kool, who has managed this site from its beginnings.

For latest updates on work at the fossil site take a look at the *Dinosaur Dreaming* Blog.

Join the friends of Dinosaur Dreaming and be part of the discovery of an ancient world! Contact the Monash Science Centre [http://dinosaurdreaming.monash.edu/](http://dinosaurdreaming.monash.edu/)

Field Updates can be accessed through the Monash Science Centre Website [http://dinosaurdreaming.monash.edu/update2011.html](http://dinosaurdreaming.monash.edu/update2011.html)
Events in the MSC Exhibition hall

The MSC Exhibition Hall was the venue for several important events in 2011. On May 18, the Honourable Michael Kirby AC CMG launched a unique research and education alliance between Monash University and Oxfam Australia – the Oxfam-Monash Partnership. As a backdrop for this event, an Oxfam exhibition called Land is Life was installed and displayed in the hall for several weeks.

In July the Honourable Consul General of Republic of Slovenia for NSW launched From Dreams to Reality. Chronicle of Activities of Slovenians in Australia at the Time of Slovenian Independence compiled by Draga Gelt OAM. His Excellency Dr Milan Balažič, Ambassador Designate, Embassy of the Republic of Slovenia, Canberra and Alfred Brežnik, AM, The Hon. Consul General of the Republic of Slovenia for NSW provided the official greeting and launch. Draga Gelt was a long time graphics designer who worked for more than 20 years at Monash in the School of Geosciences and one of a significant group who managed the establishment of the country of Slovenia at the time of the dissolution of Yugoslavia. She has been a long time leader in the Slovenian community in Australia and has assisted in many of the publications released by the Monash Science Centre.

A lunch was held at the MSC exhibition hall in October as part of Monash University Indigenous Elders Day, one of a number of initiatives endorsed by the University Council to advance the educational and career aspirations of Indigenous Australians. This lively event was attended by approximately 120 people representing a wide range of Indigenous groups.
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Left: Monash University Chancellor, Dr. Alan Finkel speaking with participants at the Indigenous Elders Day Luncheon.

Bottom: The Indigenous Elders Day Luncheon.
Exhibition Report 2011

Travelling exhibits

- The *Wildlife of Gondwana Exhibition* closed in Darwin in March 2011 and was disassembled for transport to Victoria, where it opened later in the year in the Otways in the west of the State.

  While on display at the Northern Territory Museum and Art Gallery more than 41,183 people attended. While in Darwin, a private patron funded Daniel Roque Lee Gullawan to craft an artwork depicting two of the stars of the Wildlife of Gondwana exhibition, the giant lizard *Megalania* and the giant goose relative *Bullockornis*, in his art style of the Larrakeyah tribe of the Northern Territory. Roque produced a unique and stunning “bark” painting on fabric, which is now on loan for use in MSC exhibitions and will be first launched in 2012 in our exhibition under planning – *Great Crises in the History of Life*, a joint effort with the Monash Sustainability Institute.

  Daniel Roque Lee Gullawan

- *The Wildlife of Gondwana Exhibition* was again setup at Otway Dinosaurs venue near Apollo Bay in late 2011 to remain in place until the end of April 2012 at 313 Barham River Road, Apollo Bay.

  The setup crew included consultant Wayne Chatwin, Corrie Williams, Patricia Vickers-Rich and Martinho Ornai, a young museologist from Timor-Leste. Martinho spent two weeks at the MSC on a short term internship to gain experience in exhibition and education delivery. He helped install the exhibit in Apollo Bay, and then assisted in science communication workshops for Year 8 students. Currently, Martinho is in charge of the Explainers Group which
manages the *O Mundo Perdido Timor-Leste Exhibition* emplaced in the Presidential Offices in Dili, Timor-Leste. This is a joint project with the MSC and the Timor-Leste Government, the beginning of the new National Museum of Timor-Leste and funded significantly by a grant from ConocoPhillips with assistance from Monash University, and private donors.

**Daniel Roque Lee Gullawans’ painting of *Megalania* and *Bullockornis.**

Loading crates at the MSC to transport the *Wildlife of Gondwana Exhibition* to the Otways.

**Wildlife of Gondwana Exhibition** on show at *Otway Dinosaurs* venue near Apollo Bay.
The Wildlife of Gondwana Exhibition on show at Otway Dinosaurs venue near Apollo Bay is supported by Visions of Australia, an Australian Government Program supporting touring exhibitions by providing funding assistance for the development and touring of cultural material across Australia.

- Megalania and Genyornis skeletons travelled to the Monash Gippsland Campus for their Sci-Spy! Science Fair during Science Week in August 2011. Hundreds of people attended, and it was an excellent chance to share assets between Monash University campuses. This is an activity that the Monash Science Centre would like to continue to support as well as offer our skills in constructing cost effective exhibition construction and maintenance all across our campuses.

- Installation of the forelimbs of the giant dinosaur Deinocheirus on loan to the Discovery Science and Technology Centre in Bendigo for six months, gave the MSC another opportunity to serve rural Australia and highlight Monash University as an educational destination. This prize specimen was on loan from a private patron, the result of a cooperative project with the Queen Victoria Museum and Art Gallery in past times, when the MSC and the QVMAG jointly toured The Great Russian Dinosaurs with the Paleontological Institute.

Many locals attended the Sci-Spy! Event at Gippsland Campus during Science Week.
Russian Academy of Sciences, Moscow, from 1993-1997. The MSC staff presented a lecture on Victorian dinosaurs in the lecture series, Science and Creativity, in October at the Discovery Centre.

Monitoring of Exhibitions

The Monash Science Centre has four international exhibitions that it installed in times past and continues to monitor and improve. The largest of these is the O Mundo Perdido Exhibition in Dili, Timor-Leste, where students from all over the country come to visit and receive lessons on the geologic history of Timor as well as investigate the sweep of life over more than 250 million years. The Timorese Government and private donors funded three educator positions in 2011 to maintain this exhibition, and in 2011 one of these teachers, Martinho Ornai, visited the MSC for further training. He also spent several months taking part in an English course supported by grant funds. Two other smaller regional exhibitions in Timor, one in Baucau and another in Aileu, are maintained by the MSC in cooperation with the Selesian Brothers, the Aileu Community Library and the Friends of Aileu associated with the Moreland City Council in Melbourne. These exhibitions initially were funded by significant support from the Australian Defence Force, ConocoPhillips, Monash University and the Timor-Leste Government. A further two exhibitions, one on Farm Aar in southern Namibia, a regional eco-tourist destination, and a second under development at the headquarters of the Saudi Geological Survey in Jeddah, remain outreach on a smaller scale.

Children from a local school in Dili learning about the geological history of Timor-Leste, taught by a teacher from the Alola Foundation. The O Mundo Perdido Timor-Leste is temporarily housed in the foyer of the Office of the President in Dili and will remain there until a permanent site for the new National Museum of TL is constructed. Major funding and assistance for this exhibition was provided by the Australian Defence Force and ConocoPhillips.

Deinocheirus in Bendigo, guarding the window!
An exhibition was on show in the Exhibition Hall, Building 74, Monash Clayton, titled *First Life: Persistence Pays*, adding to *Upstream Downstream*. The flow on of Peter Trusler’s Art in mid-December 2011, which was to remain on show until mid-2012. This exhibit highlights the 3 Emmy Awards won by the Atlantic Productions/BBC program *First Life* and the collaboration of Monash Science Centre Staff in conceiving this story on the origin of animals some 600 million years ago. Their persistence, along with that of MSC patron Sir David Attenborough, is what brought this award-winning documentary to fruition. Perhaps this is a first for Monash University!

The brochure for the exhibition at the President’s Offices in Dili used by visiting school groups. Staff from the MSC and Aileu at the regional exhibition at the Aileu Bibliotek. This exhibit is visited frequently by local school and tourists.

Three members of the Australian Defence Force met with *Tarbosaurus* in Dili (courtesy ADF)
In House Exhibitions

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The front page of the Scavenger hunt brochure produced for Upstream-Downstream

The cover of the *First Life* DVD, which won three Emmy Awards.

Sir David Attenborough with the three Emmy Awards for *First Life*. 
There was a perception that degrees from an Australian University are quite valuable, but with a reluctance to travel outside Africa (for both economic, cultural and family reasons), our Monash South Africa campus was of significant interest. This opportunity to promote Monash as a better educational destination is something that needs to be used by the Monash University recruitment unit. Every conference we attend and every exhibition that we launch offer a cost effective way to recruit.

Other activities

- Negotiations with the Paleontological Institute of the Russian Academy of Sciences for collaboration to tour an exhibition of original mammoth, dinosaur and primitive animal material from Russia, continued with a proposal to initiate this tour, launching at the Singapore Science Centre in 2013.

- Negotiations with the Art and Science Museum located at Marina Bay in Singapore for our developing exhibition, The Artist and the Scientists, highlighting Monash Alumnus and current PhD student, Peter Trusler continued under negotiation.

- MOU’s with the Vernadsky Geological Museum in Moscow and the Singapore Science Centre to share our teaching modules were crafted and submitted for signature.

The Monash Science Centre Trade Booth at the 6th Science Centre World Congress in Cape Town.

A detailed Prospectus for high profile Tours of the Precambrian of Australia and Namibia, sites where Monash University researchers are currently working was tabled with management at both the Singapore Science Centre and the Art and Science Museum at Marina Bay in Singapore. Both institutions are interested in offering these high level research tours, led by the researchers, as an extension activity for their sponsor base, with the idea that a significant part of the income generated would support research and science outreach at Monash University.

The MSC maintained a presence on the City of Monash Environmental Advisory Committee, and meeting space for this committee was offered at the MSC. Building 74 remained an icon for sustainable building and improvements were undertaken in 2011 with new solar panels added and a monitoring system set up by the Monash Sustainability Institute. Councillor/Mayor Greg Male acknowledged our participation in the crafting of the City of Monash Council Plan, which commits Council to meet the needs of the community, including sustainability measures (www.monash.vic.gov.au).

Career and Promotional Training

MSC Exhibition staff attended and presented at several training and career events during 2011. These included careers days at Korowa Anglican Girls’ School and Sacre Coeur, being on the SCI2010 Employment panel and conducting a Monash University Science Ambassadors training morning.

Two international conferences were attended by MSC staff to promote the Centre's activities and travelling exhibitions as well as Monash University as a educational destination and a research powerhouse. MSC provided a trade booth at both the Asia Pacific Science Centre Conference (ASPAC 2011) held in Guangzhou, China in May as well as the 6th Science Centre World Congress held in Cape Town in September.

Attendance at ASPAC 2011 was productive. Several possible venues for Monash Science Centre exhibitions resulted from networking at the conference, and attendance allowed continued contact with museum colleagues in institutions such as the Singapore Science Centre and the Thailand National Museum. Presence of Dr Corrie Williams, Exhibitions Manager, to this conference also gave the MSC a voice in exhibition planning within the ASPAC community.

There was, likewise, strong interest shown at the MSC exhibition booth at 6th Science Centre World Congress in Cape Town, most of which was from prospective students to Monash University along with other Science Centre teaching staff requesting MSC assistance and advice concerning activities to use in their Centres. Having an exhibition trade booth allowed many people to become aware of the MSC and Monash University. Most delegates were not aware of Monash University, but once informed about the University, many had great interest in our Johannesburg campus, details of which our staff were able to provide.
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A team from the MSC, the School of Geosciences and Museum Victoria provided lectures and a workshop at the South Australian Museum for Palaeontology Week in late March and early April, 2011, sponsored by the Government of South Australia and Heathgate.

Activities involved providing a master class in casting fossil material, evening lectures for the general public and discussions in a lounge atmosphere with late Primary and Secondary students about careers in science.

The MSC was approached to advise on the feasibility of designing and assisting in the set up of a museum in Colombo, honouring the well known science fiction writer, Arthur C. Clarke. A previous trip to Clarke’s residence of several decades revealed a rich collection of archives, and a second trip requested by the Arthur C. Clarke Trust was planned for early 2012, including production of a documentary on his life in Sri Lanka at Barnes Place.

Photo of Val Ekanayake, Steven Spielberg, Harrison Ford and Arthur C. Clarke, part of the Clarkeives that will form the basis of a Museum in Clarke’s honour. Photo in Colombo residence of Clarke (courtesy of H. & V. Ekanayake).
Serendipaceratops arthurclarkei – a model constructed by MSC staff and staff at Geosciences Australia in past times – which graces one of the shelves in the library of A. C. Clarke in Colombo. Clarke was delighted to have a dinosaur named after him, as his introduction to this group as a young boy was what tweaked his interest in science (courtesy of H. & V. Ekanayake).

The front of the brochure for Dinosaurs Live!

- The Monash Science Centre was requested to advise on aspects of Dinosaurs Live! an exhibition that was launched at the Singapore Science Centre in October. The MSC Director presented several lectures and provided high level tours of this exhibition, as well as providing a report for enhancement of this exhibition.

Media Examples
- Colac Herald, By Alison Martin, 30 December 2011. Article and Photo. Dinosaur fossils inspire tourists.
- Colac Herald, By Carla Okai, 4 November 2011. Article and Photo. Dinosaur exhibition to boost Otways tourism.
- Latrobe Valley Express. 18 August 2011. Photo and Article. Big Bite
- Weekly Times. By Alex Sampson, 28 November 2011. Article and photo. Dinosaurs on show in Apollo Bay
A touch of magic

Dinosaur exhibition could boost tourism

EXHIBITIONS REPORT

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Tough by nature

MONASH SCIENCE CENTRE
ANNUAL REPORT 2011 [p32]
Publications

Versions of the *O Mundo Perdido Timor-Leste* children’s book (both simple and complex) were produced in the following languages for 2011. This book, originally written by then President of Timor-Leste, Jose Ramos-Horta and Patricia Vickers-Rich, was first published in 4 languages – Tetum, Portuguese, English and Chinese. Over the years it has been translated into more than 15 languages, and further languages are underway. It is a book about the geological history of this island country in the dynamic Malay Archipelago, and Ramos Horta has been pleased to see the many translations, for it not only introduces youth to geology but, the youthful country of Timor-Leste to the world.

|---------------|--------------------------|----------------------|

Front page of the different language versions of *O Mundo Perdido Timor Leste* children’s book by Jose Ramos Horta and Patricia Vickers Rich (German, Russian, Basikano, French, Tamil, Arabic, and Slovenian release for 2011)
Jose Ramos Horta and Patricia Vickers-Rich, authors of *O Mundo Perdido* Timor Leste children’s book

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- Russian simple ISBN 978-0-7326-2437-8
- Tamil complex ISBN 978-0-7326-4017-0
- Slovenian simple ISBN 978-0-7326-2431-6

Front page of the different language versions of *O Mundo Perdido* Timor Leste children’s book by Jose Ramos Horta and Patricia Vickers Rich (German, Russian, Basikano, French, Tamil, Arabic, and Slovenian release for 2011)
## Monash Science Centre
### Revenue and Expenses by Project 2011

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<td><strong>Totals for 2011</strong></td>
<td><strong>-85,429</strong></td>
<td><strong>-710,717</strong></td>
<td><strong>755,100</strong></td>
<td><strong>-37,626</strong></td>
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</tbody>
</table>

### Major Grants / Donations
- **Blundstones** $30,000.00
- **CETEC** $5,000.00
- **Private donations** $16,500.00

(UNESCO International Geological Correlation Program & private donations for conference attendance).
### Monash Science Centre

**Revenue and Expenses by Project 2011**

<table>
<thead>
<tr>
<th>Project/Fund</th>
<th>2010 Carry Forward</th>
<th>2011 Revenue</th>
<th>2011 Expenditure</th>
<th>31/12/2011 Balance</th>
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</tbody>
</table>

**Major Grants / Donations**

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### SIGHTINGS

**Where Art and Science Meet**

Australian artist Peter Drury has a talent for portraying holographic creatures and the landscapes in which they live in imagery consistent with the best scientific evidence available. His engineering illustrations have appeared in books, science exhibitions, and world-renowned products and are featured in the new exhibition: *The Artist and The Scientist*. This exhibition is an exploration of the intersection between art and science, and how they can be used to inspire and inform each other.

The Artist and The Scientist Exhibition, under development in 2011.

### Review of art provided for *The Artist and The Scientist Exhibition*, under development in 2011.
Monash Science Centre

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Australia

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Email science-centre@monash.edu

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Centre Coordinator: Mrs. Jennifer Monaghan, B.A.
Administrative Assistant: Mrs. Colleen Wendt
Exhibition Manager: Dr. Corrie Williams, B.Sc., MSc. (prelim), PhD.
Senior Education Officer: Ms. Sandra Thong, B.A. hons., B.Sc.
Education Officer: Ms. Lydia Low, BSc, PGDE
Senior Contract Staff: Mrs. Jacinta Hubble, B.Ed., M.Ed.

Contract Staff:

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Mr. Mark Blaxall
Mr. Adam Brown
Dr. Cathy Corrick, Ph.D., M.Sc., B.Sc.
Mr. David Hocking
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