

# SPACE SCIENCES

Canberra has a growing space science and space industry capability covering diverse areas in earth observation technologies, satellite communications, defence systems, debris tracking and interdiction technologies, and deep space observation.

Key institutions are as follows.

- **Canberra Deep Space Communication Complex:** This complex is part of NASA's international network of antennas that supports interplanetary spacecraft missions and radio and radar astronomy observations for the exploration of the Solar System and the universe. The network also supports selected Earth-orbiting missions.
- **Research School of Astronomy and Astrophysics (Mt Stromlo Observatory) at The Australian National University:** This is Australia's premier university centre for astronomical research directed towards advancing the observational and theoretical frontiers of astronomy and its enabling technologies. In 2008 it was placed in the world top 10 for space science and has trained

many of the world's leaders in astronomy. The Mt Stromlo Observatory is also a major participant in small satellite projects.

- **CSIRO Space Sciences and Technology:** The CSIRO Space Strategy focuses on the development and use of radioastronomy, partnering with Boeing and NASA in advanced aerospace technologies, developing applications for satellite navigation technology and using satellites to monitor environmental issues such as climate and water management.
- **Geoscience Australia:** This government agency is a world leader in providing geoscientific information and knowledge. Its National Earth Observation Group works with international satellite operators to provide global satellite imagery coverage and satellite imagery information and products, and delivers technical expertise to managers of satellite imagery data.
- **Defence Science and Technology Organisation:** This is the Australian Government's lead

agency charged with applying science and technology to protect and defend Australia and its national interests.

In February 2010, the Australian Government established the Space Industry Innovation Council, recognising the importance of space science to Australia and the contribution that space technologies can make to national security, climate change, weather, natural resource management, forestry and agriculture. The Council will provide strategic advice on innovation priorities and build connections with other organisations. Its Secretariat is based in Canberra.

### **Case Study: New Deep Space Network Antennas**

In February 2010, NASA officials commenced in Canberra the first phase of a new antenna-building project to improve Deep Space Network communications.

The decision to begin construction came on the 50<sup>th</sup> anniversary of US and Australian cooperation in space tracking operations. NASA expects to complete building the three 34 metre new-generation antennas by 2018.

# SPACE SCIENCES

CONTINUED

The new antennas, known as 'beam wave guide' antennas, can be used more flexibly, allowing the network to operate on several different frequency bands within the same antenna. Their electronic equipment is more accessible, making maintenance easier and less costly.

The new antennas can also receive higher frequency, wider bandwidth signals known as the 'Ka band'. This band, required for new NASA missions approved after 2009, allows the new antennas to carry more data than the older ones.

## **Case Study: Giant Magellan Telescope**

The Australian National University (ANU) has joined an elite group of research and teaching institutions that are undertaking a detailed design of the Giant Magellan Telescope (GMT).

The GMT, the product of over a century of astronomical research and telescope building by some of the world's leading research institutions, will open a new window on the universe for the 21<sup>st</sup> Century. Scheduled for completion around 2016, the GMT will have the resolving power of a 24.5 metre

(80 foot) primary mirror, far larger than any telescope ever built. It will produce images up to 10 times sharper than the Hubble Space telescope.

The telescope will answer many of the questions at the forefront of astrophysics today and will pose new and unanticipated riddles for future generations of astronomers.

The ANU's contribution to the telescope design and future instrumentation projects will take place at the Advanced Instrumentation and Technology Centre at Mt Stromlo in Canberra. The ANU and Astronomy Australia Limited have teamed to acquire a 10 per cent share of the GMT Observatory. Australian astronomers and scientists will use GMT to remain in the vanguard of international astronomical and astrophysical research.

## **Case Study: EOS Space Systems Pty Ltd**

Based in Canberra, EOS develops and produces products incorporating advanced electro-optic technologies for the aerospace market. EOS products are developed through internal research and development

programs based on EOS core technologies in software, lasers, electronics, optics, gimbals, telescopes and beam directors, optical coatings and precision mechanisms.

In space surveillance and control, EOS specialises in space information based on the use of EOS developed instruments and sensors to detect, track, classify and characterise objects in space. This information is required for both military and commercial space applications.



### **For further information:**

[www.cdsc.nasa.gov](http://www.cdsc.nasa.gov)

[www.anu.edu.au](http://www.anu.edu.au)

[www.csiro.au](http://www.csiro.au)

[www.ga.gov.au](http://www.ga.gov.au)

[www.dst.defence.gov.au](http://www.dst.defence.gov.au)

[www.eos-us.com](http://www.eos-us.com)

[www.business.act.gov.au](http://www.business.act.gov.au)

### **Canberra Connect:**

**Ph 1800 244 650 (Australia);**

**+61 13 22 81 (International)**

*"There is no better way to celebrate our 50 years of collaboration and partnership in exploring the heavens with the Australian Government than our renewed commitment and investment in new capabilities required for the next five decades."*

### **Badri Younes**

Deputy Associate Administrator  
Space Communications and Navigation  
NASA Headquarters