

SIAA White Paper: Advancing Australia in Space



Why a National Space Program?

- The ultimate mission:
- the development of a mature and self-sustaining Australian space industry
 - underpinned by world-class R&D
 - translating to high technology innovation
 - powered by a skilled, space-educated work force and
 - providing a level of national sovereignty and self-reliance.

Current Size of Sector

- The space sector in Australia currently produces annual revenue of A\$3-4 billion and has an estimated workforce of between 5,500 and 11,500
- This represents approximately 0.8% of the global space economy which was estimated to be worth US\$335 billion in 2015.

What are Australia's current space capabilities?

- space surveillance
- space weather monitoring and prediction
- analysing foreign Earth observation and remote sensing data
- applications of position, navigation and timing and satellite communications data
- designing and building small satellites and sophisticated satellite systems, platforms and missions
- space situational awareness and deep space tracking
- advanced and astrophysics, including enhancing the Square Kilometre Array
- space education

What is the Key Message?

A National Space Program, implemented by an internationally recognised space agency, is a critical element of any national strategy for the transition of the Australian economy.

Industry Growth Targets

The economic goal of a National Space Program should be:

- the doubling of our current share of the world space market in five years and
- capturing 4% of the world market within 20 years (a five fold increase in the industry's current global market share).

The changing space environment

- New commercial entrants - Space 2.0
- Technological change leading to miniaturisation and reduced launch costs for similar capability
- The impact of the internet on space communications and earth observation

Recent history

- 2008 - Senate Inquiry
- 2010 - 2013 Australian Space Research Program (ASRP)
- 2013 - Satellite Utilisation Policy approved by Cabinet
- 2014 - SIAA selected to host the 68th IAC in September 2017
- 2017 - QB50 satellites launched

Steps to Implementation

One:

A decision by the Australian Government to establish an Australian Space Agency, reporting direct to the responsible Minister

Two:

The appointment of an Interim Board of Management and a Space Agency Head

Three:

A foundation strategic plan addressing the following questions:

- How best to manage the whole of government coordination of the space sector
- Strategic priorities for the Agency with industry growth targets as suggested in the White Paper
- An investment and operational plan for the Agency





SIAA White Paper: Advancing Australia in Space

For more information:

Download White Paper at:
www.spaceindustry.com.au/news.php



WHITE PAPER:
ADVANCING AUSTRALIA IN SPACE

EXECUTIVE SUMMARY	1
1. INTRODUCTION	2
2. THE AUSTRALIAN SPACE INDUSTRY	3
3. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA	4
4. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S ECONOMY	5
5. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SOCIETY	6
6. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S ENVIRONMENT	7
7. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S CULTURE	8
8. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S DEFENCE	9
9. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SCIENCE	10
10. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S EDUCATION	11
11. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S HEALTH	12
12. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S INFRASTRUCTURE	13
13. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S ENERGY	14
14. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S TRANSPORT	15
15. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S TELECOMMUNICATIONS	16
16. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S AGRICULTURE	17
17. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S MINING	18
18. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S TOURISM	19
19. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S ARTS AND CULTURE	20
20. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SPORTS AND RECREATION	21
21. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S ENVIRONMENTAL MANAGEMENT	22
22. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S CLIMATE CHANGE	23
23. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S WATER RESOURCES	24
24. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S NATURAL RESOURCES	25
25. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S BIODIVERSITY	26
26. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S HERITAGE	27
27. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S LANDSCAPE	28
28. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S COASTAL AND MARINE RESOURCES	29
29. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S OCEANIC RESOURCES	30
30. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S ATMOSPHERIC RESOURCES	31
31. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S GEOSPHERIC RESOURCES	32
32. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S COSMIC RESOURCES	33
33. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SPACE RESOURCES	34
34. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S OUTER SPACE RESOURCES	35
35. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S DEEP SPACE RESOURCES	36
36. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S INTERPLANETARY RESOURCES	37
37. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S GALACTIC RESOURCES	38
38. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S COSMOS RESOURCES	39
39. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S UNIVERSE RESOURCES	40
40. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S MULTIVERSE RESOURCES	41
41. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S HYPERSPACE RESOURCES	42
42. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S METAPHYSICAL RESOURCES	43
43. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	44
44. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	45
45. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	46
46. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	47
47. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	48
48. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	49
49. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	50
50. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	51
51. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	52
52. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	53
53. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	54
54. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	55
55. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	56
56. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	57
57. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	58
58. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	59
59. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	60
60. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	61
61. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	62
62. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	63
63. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	64
64. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	65
65. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	66
66. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	67
67. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	68
68. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	69
69. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	70
70. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	71
71. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	72
72. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	73
73. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	74
74. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	75
75. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	76
76. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	77
77. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	78
78. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	79
79. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	80
80. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	81
81. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	82
82. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	83
83. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	84
84. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	85
85. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	86
86. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	87
87. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	88
88. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	89
89. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	90
90. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	91
91. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	92
92. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	93
93. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	94
94. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	95
95. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	96
96. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	97
97. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	98
98. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	99
99. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	100
100. THE AUSTRALIAN SPACE INDUSTRY'S CONTRIBUTION TO AUSTRALIA'S SUPERNATURAL RESOURCES	101

Why a National Space Program?

The ultimate mission:

- the development of a mature and self-sustaining Australian space industry
- underpinned by world-class R&D
- translating to high technology innovation
- powered by a skilled, space-educated work force and
- providing a level of national sovereignty and self-reliance.

Current Size of Sector

- The space sector in Australia currently produces annual revenue of A\$3-\$4 billion and has an estimated workforce of between 9,500 and 11,500
- This represents approximately 0.8% of the global space economy which was estimated to be worth US\$335 billion in 2015.

Recent history

- **2008 - Senate Inquiry**
- **2010 - 2013 Australian Space Research Program (ASRP)**
- **2013 - Satellite Utilisation Policy approved by Cabinet**
- **2014 - SIAA selected to host the 68th IAC in September 2017**
- **2017 - QB50 satellites launched**

The changing space environment

- **New commercial entrants – Space 2.0**
- **Technological change leading to miniaturisation and reduced launch costs for similar capability**
- **The impact of the internet on space communications and earth observation**

Why a National Space Program?

The ultimate mission:

- **the development of a mature and self-sustaining Australian space industry**
- **underpinned by world-class R&D**
- **translating to high technology innovation**
- **powered by a skilled, space-educated work force and**
- **providing a level of national sovereignty and self-reliance.**

What is the Key Message?

A National Space Program, implemented by an internationally recognised space agency, is a critical element of any national strategy for the transition of the Australian economy.

Current Size of Sector

- **The space sector in Australia currently produces annual revenue of A\$3-\$4 billion and has an estimated workforce of between 9,500 and 11,500**
- **This represents approximately 0.8% of the global space economy which was estimated to be worth US\$335 billion in 2015.**

Industry Growth Targets

The economic goals of a National Space Program should be

- the doubling of our current share of the world space market in five years and**
- capturing 4% of the world market within 20 years (a five-fold increase in the industry's current global market share)**

What are Australia's current space capabilities?

- space surveillance
- space weather monitoring and prediction
- analysing foreign Earth observation and remote sensing data
- applications of position, navigation and timing and satellite communications data
- designing and building small satellites and sophisticated satellite sensors, platforms and missions
- space situational awareness and deep space tracking
- astronomy and astrophysics, including co-hosting the Square Kilometre Array
- space education

Steps to Implementation

One:

A decision by the Australian Government to establish an Australian Space Agency, reporting direct to the responsible Minister



Two:

The appointment of an Interim Board of Management and a Space Agency Head

Three:

A foundation strategic plan addressing the following questions:

- **How best to manage the whole of government coordination of the space sector**
- **Strategic priorities for the Agency with industry growth targets as suggested in the White Paper**
- **An investment and operational plan for the Agency**

For more information:

Download White Paper at:
www.spaceindustry.com.au/news.php



**SIAA WHITE PAPER:
ADVANCING AUSTRALIA IN SPACE**

21 March 2017

Contents

Executive Summary	2
Introduction - Australia's Dependence on Space	3
The Size of the Australian Space Sector	4
The Industry Growth Opportunities for Australia	5
Current Government Space Arrangements in Australia	6
The Role of Government and the Economic and Social Benefits	9
A National Space Program for Australia	9
Advancing to an Australian Space Agency	11
Conclusion	11
Appendix - The UK and Canadian Precedents	13