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SUBMISSION TO THE SENATE INQUIRY ON THE AUSTRALIAN SPACE SCIENCE AND INDUSTRY SECTOR

My submission will be brief and cover three areas of interest:

1. Use of satellites by the ADF, NAO and associated agencies,
2. Promoting research and development through bounties and prizes, and
3. Long term legal and diplomatic considerations for promoting intersolar colonisation and industrialisation (ICI).

Use of Satellites by ADF, NAO, Customs *et al*

Australia lacks satellite surveillance capability. I support the submission from the National Space Society calling for Australia to develop this capability.

Such a capability would provide multiple uses:

- It would support the bipartisan strategy of stabilising and helping our neighbours in the “arc of instability”, by allowing us much greater insight into the activities in those countries;
- It would improve our ability to maintain border security insofar as satellite coverage is provided over our sea lanes of approach. A combination of satellites and UAVs would provide excellent coverage and greatly improve our ability to deter illegal fishing in our waters. It would also deter smugglers, particularly those trafficking in people.
- In the unlikely, undesirable but still possible scenario of a war in our region sometime in the future, including a war of aggression against Australia, this capability would provide a decisive advantage for ourselves and our allies.

The third point is quite important, as this sort of capability takes time to develop and has continuing costs of development as hardware fails or deorbits.

Promoting R&D through prizes and bounties.

The success of the X-Prize in the USA has demonstrated that high-profile prize programs in conjunction with research grants can promote much more research and development than grants can by themselves.

The USA is rapidly pulling ahead of the world in small-launch technology due to the X-Prize and the Lunar Lander Prize, which have brought several exciting small firms into the field where previously there were none. This sort of cheap, scalable and lightweight technology could change the way space economics works.

Australia could exploit this approach in one of two ways. We could develop our own series of prizes for space technologies. Alternatively we could join existing prizes, adding our own funds to the prize pool. The latter option is probably more cost-effective due to the existing momentum and PR

awareness of current prize schemes. If prizes are developed within Australia, consideration must be given to the legal and infrastructural needs of testing ranges where contestants can test their designs.

Promoting ICI through diplomatic and legal arrangements

We live in a place of astonishing plenty: the solar system. The resources of the space within industrial reach of the Earth are incredible, and in current economic terms, as good as infinite.

There are two major obstacles to the colonisation and industrialisation (ICI) of this space: the cost of launch and the inability to have private property in celestial bodies.

The first is not soluble through legal means. It will take sustained research and development to progressively lower the cost of launching matter into orbit. However the absence of traditional legal rights in objects in space presents an enormous barrier to businesses investing in lowering launch costs.

The current legal arrangement is dominated by the *Moon Treaty* and the *Outer Space Treaty*, both of which reflected a *de facto* Cold War agreement between the USSR and the USA not to become involved in a difficult, dangerous and ruinously expensive race to establish sovereignty over celestial objects in our solar system. However the time for that status quo has passed into history.

Australia should lead the way in reforming or replacing the treaties with a new arrangement aimed at granting homesteading rights to individuals or companies who send people to celestial bodies. Such a scheme must establish a simple and internationally-recognised system of property over celestial objects. There are many schemes proposed and many details to settle, but the essential commitment must be to creating a commercial and personal incentive to explore, occupy and exploit intersolar space. Australia has a track record of innovation in property rights (the Torrens System), and we can claim that mantle again.

The alternative is foolishness: to starve for resources while surrounded by incredible plenty. ICI would allow access to unlimited clean energy, which could be beamed down to the Earth. It would open up living space for potentially *trillions* (yes, trillions) of people in orbital colonies of the O'Neill-McKendree type. It could allow humankind to drastically reduce its footprint on the Earth while advancing living standards everywhere.

Some References:

<http://clubtroppo.com.au/2008/02/22/its-time-for-intersolar-space/>

<http://www.armadilloaerospace.com/n.x/Armadillo/Home>