

**AIAA Space Economy:  
Stimulating Economic Growth Today & Tomorrow  
Russell Senate Office Bldg  
July 27 2009  
Washington, D.C.**

The following are twitter notes taken during the AIAA Space Economy: Stimulating Economic Growth Today & Tomorrow. The notes appear in reverse chronological order, so to read them as they were written, you should start with entry #81 and read to entry #1.

1. 1# Panel now over. Ciao!4:00 PM Jul 27th from TwitterBerry
2. A Nasa MMO gamelet will be available around Thanksgiving of this year.3:59 PM Jul 27th from TwitterBerry
3. Molly is complimentary of Doug's work at IPP documenting spinoffs, how nasa has rewritten textbooks, and things like Moon in Google Earth.3:58 PM Jul 27th from TwitterBerry
4. Nasa needs to do better to talk about and communicate the message of what plans and goals are.3:56 PM Jul 27th from TwitterBerry
5. Nasa not competing with emerging comm'l sector and comm'l sector should be the ones to take citizenry to space.3:55 PM Jul 27th from TwitterBerry
6. Q1: given Bolden"s comments, will Nasa allow passengers to ISS? A: not really, but Nasa has selected professional educators to fly.3:54 PM Jul 27th from TwitterBerry
7. Nasa spinoff database available online... Google it.3:52 PM Jul 27th from TwitterBerry
8. There have been contributions by Nasa technologies to sustainability, improving saving lives and improving quality of life around the world.3:50 PM Jul 27th from TwitterBerry
9. IPP bringing technology into NASA and sending it out to industry in health & medicine, public safety, transport, consumer goods, etc.3:47 PM Jul 27th from TwitterBerry
10. Now showing an Obama quote from NAS remarks.3:46 PM Jul 27th from TwitterBerry
11. This video is one of many from the 80s that IPP has digitized and will soon be available.3:44 PM Jul 27th from TwitterBerry
12. Watching a video of Ronald Reagan talk about spinoffs.3:43 PM Jul 27th from TwitterBerry
13. Great nations explore and spinoffs are the side benefits we try to maximize.3:41 PM Jul 27th from TwitterBerry

14. Spinoffs not the reason for the space program, but it helps relate to how space touches them personally.3:41 PM Jul 27th from TwitterBerry
15. Bolden quote about launching people into space. Nasa spinoffs benefit everyday life, as shown in NASA City and NASA@Home.3:39 PM Jul 27th from TwitterBerry
16. Sorry about lapse in notes. I got caught up in an email. Resuming now...3:37 PM Jul 27th from TwitterBerry
17. Tang, velcro, and teflon are not NASA spinoffs. Talking about how space stimulates growth.3:32 PM Jul 27th from TwitterBerry
18. End of panel. Closing remarks by Doug Comstock, Director of NASA IPP office.3:30 PM Jul 27th from TwitterBerry
19. Spinoffs are real, countable, tangible, traceable to multiple sources. But not useful as a foundation of argument for a long-term program.3:28 PM Jul 27th from TwitterBerry
20. Q2: dichotomy in debate re spinoffs. Do they really exist? A2: spinoffs may not be able to be directly traced to space investment.3:26 PM Jul 27th from TwitterBerry
21. Q1: how would we change discussion to use better economic metrics? A: we need to change dialogue of how we talk about economic growth.3:23 PM Jul 27th from TwitterBerry
22. We are seeing erosion of US advantage in aerospace. We need strong govt support.3:21 PM Jul 27th from TwitterBerry
23. There are technology spinoff offices at ESA and JAXA. AIAA has seen significant changes in membership demographics.3:20 PM Jul 27th from TwitterBerry
24. Space research has focused on developing and perfecting technologies and processes to unprecedented levels.3:16 PM Jul 27th from TwitterBerry
25. Patrick Liu: market analyst at AIAA. Space always funded at national level. Was too large for private sector. Investment cycles too long.3:13 PM Jul 27th from TwitterBerry
26. Editorial Comment: MM is a great oral presenter. Her charts do not do her verbal presentation skills justice.3:10 PM Jul 27th from TwitterBerry
27. Role of information and infrastructure. Administration directives will require space assets (carbon assessment in trees, dirt across US).3:07 PM Jul 27th from TwitterBerry
28. Economic vitality: role of intl cooperation. We need to be more strategic about when we should cooperate.3:05 PM Jul 27th from TwitterBerry
29. Protection of innovators and entrepreneurs is of central importance. (Mokyr)3:02 PM Jul 27th from TwitterBerry
30. The role of competition is hindered by this consolidation. But big companies can have a big R&D effort, as was the case with bell Labs.3:01 PM Jul 27th from TwitterBerry

31. Multipliers and Spinoffs are not great indicators. She's now showing industry consolidation charts.2:59 PM Jul 27th from TwitterBerry
32. Many Previous studies done by CBO. Molly is citing "Reinventing NASA" (CBO 1994) a lot.2:56 PM Jul 27th from TwitterBerry
33. Wants to use metric as vitality of the economy. Using study results of economic historians. Technological progress.2:54 PM Jul 27th from TwitterBerry
34. GDP Fails to include a lot of benefits attributed to space... New knowledge, cultural enrichment, etc.2:52 PM Jul 27th from TwitterBerry
35. Longer-term Economic growth defined and measured as output per capita over time. It's a known horrible measure.2:50 PM Jul 27th from TwitterBerry
36. Panel 2: Patrick Liu does market analysis for AIAA. Molly Macauley does economic research.2:49 PM Jul 27th from TwitterBerry
37. End of panel 1. Panel 2: Molly McCauley of Resources for the Future, and Patrick Liu, AIAA Market Analyst.2:38 PM Jul 27th from TwitterBerry
38. Q10: does investor confidence require large amounts of product coming back? A10: it depends. Different sectors req different considerations.2:37 PM Jul 27th from TwitterBerry
39. We need an industry BRAC b/c some space infrastructure isn't needed but has political infrastructure associated with it.2:35 PM Jul 27th from TwitterBerry
40. We're still one the most risk-tolerant societies around. A decent ROI will allow for plenty of risk (of investment).2:33 PM Jul 27th from TwitterBerry
41. Q8: How to get back to a culture of being risk-tolerant? A8: Pharma industry is very risk-averse. Bio-tech guys are more adventurous.2:29 PM Jul 27th from TwitterBerry
42. Comment: way back when, an investor wanted to build an entire orbiter but negotiations broke down b/c of magnitude of taxpayer investment.2:24 PM Jul 27th from TwitterBerry
43. Comment: NASA alumni league concerned w/lack of basic research.2:22 PM Jul 27th from TwitterBerry
44. Q7: to what extent can Atrogenetix use other microG capabilities (e.g. ZeroG). A7: cont suspension best alternative. It's a matter of time.2:19 PM Jul 27th from TwitterBerry
45. Q6; what happens if ISS is deorbited? A6: it would very sad if it was deorbited before we get to use it. We'd miss an enormous opportunity.2:17 PM Jul 27th from TwitterBerry
46. "In the 60s, NASA was the DARPA of the economy."2:15 PM Jul 27th from TwitterBerry
47. Q5: lessons for working with bio research? A5: have helped us work with extant infrastructure.2:15 PM Jul 27th from TwitterBerry

48. Q4: will Nasa create a Darpa-like organization? A: the press has picked up on this recommendation, but it's still early.2:13 PM Jul 27th from TwitterBerry
49. A3: NIH and NASA need to step up. Infrastructure-NASA is both interesting and glitzytech. Need to include 4 space domains (mil-civ-IC-comml)2:11 PM Jul 27th from TwitterBerry
50. A3: GPS answer-civil applications were built into GPS architecture from the start. NIH answer-NIH doesn't like small or large companies.2:06 PM Jul 27th from TwitterBerry
51. Q3: did civil space program play any role in GPS? Did NIH play a role in Astrogenetix? Does space infrastructure goal detract from support?2:02 PM Jul 27th from TwitterBerry
52. Core infrastructure of space will always require a govt role.2:00 PM Jul 27th from TwitterBerry
53. Q2: Does govt need to invest again in R&D as in the 1960s-1970s? A2: we need to invest but not in all areas. DoD is investing heavily.1:57 PM Jul 27th from TwitterBerry
54. Q1: can Astrogenetix expts be done with cubesats? A1: yes, but manned flights allows simplification of the hardware.1:54 PM Jul 27th from TwitterBerry
55. From VC perspective, from aviation industry, the use of prizes is a tool to attract capital. Grand prizes would not pass political muster.1:53 PM Jul 27th from TwitterBerry
56. Space industry is fragile and barbell shaped due to consolidation, mergers. Policy makers should figure out how to fill in middle.1:50 PM Jul 27th from TwitterBerry
57. The word "Spinoff" implies too tight a linkage between technology and product.1:48 PM Jul 27th from TwitterBerry
58. Global economic, security, health consideration require space assets most of the time. Space is a forefront user of technology (pusher).1:46 PM Jul 27th from TwitterBerry
59. Hard to claim that retail industries require space, but if space wasn't there, it might be painful but not critical. 5 yrs from now=diff ans1:44 PM Jul 27th from TwitterBerry
60. General economy just beginning to get enmeshed with space-based infrastructures. Cross-coupling of products (e.g. gps-enabled phones).1:42 PM Jul 27th from TwitterBerry
61. Traditional economic study open to attack. Looked at space as a utility. Space has only been accessible by the public recently.1:39 PM Jul 27th from TwitterBerry
62. Pierre Chao: was on the NRC study commission, also policy and industry analyst, and VC investor. As part of NRC group looked at economics.1:36 PM Jul 27th from TwitterBerry
63. MicroG is a new parameter we can explore and we don't know how it will benefit science ultimately.1:33 PM Jul 27th from TwitterBerry

64. Flown 9 other organisms and they exhibit microG behaviors like virulence. If microG was taken away, science would suffer greatly.1:32 PM Jul 27th from TwitterBerry
65. Partnered with Duke Univ for peer review necessary for vaccine development. Flown 3 more times and close to significant discovery.1:30 PM Jul 27th from TwitterBerry
66. Salmonella was selected for 1st expts. Highly virulent behavior in microG made it ideal for Shuttle environment. Found a gene for virulence.1:29 PM Jul 27th from TwitterBerry
67. Flew on last 5 Shuttled. Not on current STS. Manifested on next 7 STS flights. Not on ISS yet, just STS.1:28 PM Jul 27th from TwitterBerry
68. Formation of company due to designation of ISS as a Natl Lab. Entered into SAA for use of STS and ISS. Activities are Natl Lab Pathfinder.1:27 PM Jul 27th from TwitterBerry
69. It is a biotechnolog co engaged in biomarker discovery and microG drug development.1:25 PM Jul 27th from TwitterBerry
70. John Porter: Astrogenetix is purely commercial using STS to develop new vaccines, drugs, therapies in space. Spinoff company from Astrotech.1:24 PM Jul 27th from TwitterBerry
71. 3) Productivity- studies done that are narrow in focus looked at LtC signal. Savings due to use of GPS. Hard to quantify. 6B\$ over 20 yrs.1:21 PM Jul 27th from TwitterBerry
72. 2) Spinoff marketplaces- e.g. 50B\$ in recreation navigation. Value added applications. Geolocation services. GPS enabled phones.1:20 PM Jul 27th from TwitterBerry
73. Impact to economies 1) direct enabling technology- how PNT helps trade on a daily basis. Mapping, agriculture, delivery tracking, timing etc1:17 PM Jul 27th from TwitterBerry
74. Highly accurate timing very important, too. GPS is free, continuous, and world-wide. Augmentation systems are very important.1:15 PM Jul 27th from TwitterBerry
75. EM: Other systems see the benefit of GPS. There wil be 4 seperate GPS signals transmitting by 2015. Many resultant businesses.1:14 PM Jul 27th from TwitterBerry
76. Ed Morris: Economic benefits of space are important. Focus on PNT (aka GPS) and how it is critical to natl and global economies.1:12 PM Jul 27th from TwitterBerry
77. DL: What would happen if space technologies were taken away?1:10 PM Jul 27th from TwitterBerry
78. Panel 1; Ed Morris, exec Dir off ITT Space Systems Strategic BD. John Porter, CEO Astrogenetix. Pierre Chao, Renaissance Stratdgc Advisors.1:09 PM Jul 27th from TwitterBerry
79. Opening Remarks by Gen. Bob Dickman, Exec Director of AIAA. David Logsdon, Exec Dir of Space Enterprise Council to moderate the two panels.1:07 PM Jul 27th from TwitterBerry

80. AIAA panel Stimulating Economic Growth Today & Tomorrow in Russell Senate Office Bldg in Washington DC.1:04 PM Jul 27th from TwitterBerry
81. I plan to tweet notes from the AIAA Space Economy panel that starts at 1pm EDT.12:34 PM Jul 27th from TwitterBerry