SPACE INVESTMENT QUARTERLY

Q4 2018

The most comprehensive market intelligence – from the investors at the forefront
Welcome to the Q4 2018 edition of the Space Investment Quarterly. This time last year, we predicted that 2018 would be the Year of Small Launch, and it was incredible to watch that prediction come true. As the first small launch service began commercial operations, a number of others reached advanced stages of development, and $1.6B of equity investment in Launch helped finance these companies. Looking forward to the year ahead, the Small Launch market will continue to grow and mature, but with multiple crewed spacecraft coming online, 2019 will undoubtedly be the Year of Commercial Space Travel.

2018 was another remarkable year, filled with significant financial and technical achievements that show the continued development of the space economy. Nearly $3.0B of equity capital was invested in space companies globally in 2018, bringing the cumulative total to $18.0B invested into 412 space companies since 2009.

The Entrepreneurial Space Age has gone global. The U.S. continues to lead global investment in Space, accounting for 57% ($9.6B) since 2009. However, Q4 saw increased international participation with significant investments in Chinese, German, Singaporean, and Canadian companies. Importantly, China now accounts for 5% of total global investment since 2009, illustrating that private companies will play an important role in China's strategic space initiatives. In 2018 alone, $336M was invested in Chinese space companies, up 57% Y/Y. China also surpassed the U.S. in number of launches last year, for the first time in history.

Venture capital investment in Space is now a generally accepted theme, so we’ve included a special VC feature in this report to better understand these dynamics. Our research shows that since 2009, venture capital funds have invested nearly $4.2B into Space companies, with 70% of that capital deployed in the last three years. In 2018 alone, 114 VC funds made their first space investment, bringing the total number of VCs with a Space investment to 534. VC funds have primarily invested in Series A and B rounds, with a focus on Satellites and Launch. Space investments are particularly common among top-tier firms, as our new analysis reveals that 41% of the Top 100 firms now have at least one space investment.
**DAWN OF THE ENTREPRENEURIAL SPACE AGE**

**Equity Investments From 2009 To Present**

- **Governmental Space Age**
  - 1969: Apollo landed on the moon

- **Entrepreneurial Space Age**
  - 2009: SpaceX first successful launch of commercial payload
  - 2010: SpaceX Mach 10, launch prices reduce market transparency
  - 2012: SpaceX Dragon becomes first commercial space vehicle to launch with ISS
  - 2014: Nanoracks launches commercial deployment via ISS
  - 2015: SpaceX lands orbital booster, ushering in reusability
  - 2018: SpaceX Falcon Heavy vertical commercial space operations

**$18 B** Cumulative Investment in Space

**Number of Rounds**
- **Early-Stage**
  - **Investment** $690M
  - **Rounds** 126

**Investment Location**
- United States: 57%
- United Kingdom: 7%
- France: 6%
- China: 6%
- Singapore: 5%
- Canada: 4%
- Other: 20%

**Investment Source**
- Angel/Individual: $3 B
- Venture Capital: $1 B
- Corporate: $1 B
- Other*: $147 M

**Total investment in Q4 increased 55% over Q3, driven by growth in Venture Capital and Other (primarily Private Equity and Mutual Fund) inflows.**

**Full Year 2018 Equity Investments**

- **$2,972,167,715**

**Early-Stage**
- **Investment** $690M

**By Stage**
- Seed: 25%
- Series A: 18%
- Series B: 25%
- Series C: 6%
- Late Stage: 4%
- Other: 4%

**By Industry**
- Launch: 47%
- Satellites: 25%
- Planetary Markets: 18%
- Logistics: 8%
- Information & Research: 4%

The U.S. continues to lead global investment in Space, accounting for 57% ($9.6B) since 2009. However, Q4 saw increased global participation with significant investments in Chinese, German, Singaporean, and Canadian companies.

The Launch and Satellites industries continue to attract the most investment dollars, with $1.6B and $1.2B in 2018, respectively. However, we did see significant investments in Planetary Markets, Logistics, and Industries this year as the world sets its sights on the moon and prepares for more commercial activity in Earth orbit.

In Q4, we observed the familiar trend of Launch receiving the most investment dollars and Satellites generating the most activity through rounds raised. It's worth noting that we recorded investment activity across all industries in the space economy this quarter.

*Canadian companies.

1. Cumulative non-governmental equity invested.
2. Other includes Foundations, Private Equity, Sovereign Wealth Funds, Mutual Funds, Crowdfunding, etc.
3. Early Stage is comprised of Pre-Seed, Seed, and Series A rounds.
4. Late Stage is comprised of Series D and Liquidity Rounds.
5. “Other” includes non-traditional investments and self-financing from Jeff Bezos, Robert Bigelow, Richard Branson, and Elon Musk, who we have classified as individual investors providing large investments (hundreds of millions) in their own companies during unclassified round.
INVESTMENT ACTIVITY

Select Space Angels Portfolio Fundraising Full Year 2018

<table>
<thead>
<tr>
<th>COMPANY</th>
<th>ROUND</th>
<th>AMOUNT</th>
<th>LEAD</th>
</tr>
</thead>
<tbody>
<tr>
<td>SpaceX</td>
<td>Liquidity</td>
<td>$500,000,000</td>
<td>Fidelity Investments</td>
</tr>
<tr>
<td>SpaceX*</td>
<td>Undisclosed</td>
<td>$273,199,776</td>
<td>Baillie Gifford</td>
</tr>
<tr>
<td>Vector Launch*</td>
<td>Series B</td>
<td>$70,000,000</td>
<td>Kodem Growth Partners, Morgan Stanley</td>
</tr>
<tr>
<td>ICEYE</td>
<td>Series B</td>
<td>$35,000,000</td>
<td>True Ventures</td>
</tr>
<tr>
<td>World View</td>
<td>Series C</td>
<td>$26,500,000</td>
<td>Accel Partners</td>
</tr>
</tbody>
</table>

This quarter, five Space Angels portfolio companies raised capital. SpaceX closed $273M of a $500M round. At a $35.5B valuation, this makes SpaceX the second most valuable private company in the world behind Uber.1 Vector* raised a $70M Series B, led by Kodem Growth Partners and Morgan Stanley, to scale Vector-R production and accelerate the development of Vector-H, the company’s larger payload model. Space Angels portfolio companies accounted for 41% of total non-government equity investment raised this quarter.

Top 10 Market Investments Full Year 20182

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</tr>
<tr>
<td>Global Eagle</td>
<td>Liquidity</td>
<td>$150,000,000</td>
<td>Searight Capital</td>
</tr>
<tr>
<td>Spaceflight</td>
<td>Series C</td>
<td>$150,000,000</td>
<td>Thales Alenia, Telespazio, Mitsui</td>
</tr>
<tr>
<td>Rocket Lab*</td>
<td>Series E</td>
<td>$140,000,000</td>
<td>Australia Future Fund</td>
</tr>
<tr>
<td>Thermo Companies</td>
<td>Liquidity</td>
<td>$100,000,000</td>
<td>Thermo Capital</td>
</tr>
<tr>
<td>iSpace</td>
<td>Series A</td>
<td>$90,225,000</td>
<td>Matrix Partners China</td>
</tr>
<tr>
<td>HyperSat</td>
<td>Undisclosed</td>
<td>$85,000,000</td>
<td>Incentrum Group</td>
</tr>
<tr>
<td>OneSpace Tech</td>
<td>Series B</td>
<td>$70,112,793</td>
<td>CICJ Jitali Equity Funds</td>
</tr>
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Top Exits Full Year 2018

<table>
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<th>BUYER</th>
<th>AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orbital ATK</td>
<td>Northrop Grumman</td>
<td>$7,900,000,000</td>
</tr>
<tr>
<td>Threex Advanced Composites</td>
<td>Toyos Industries</td>
<td>$1,513,000,000</td>
</tr>
<tr>
<td>HyperSat</td>
<td>$7 Group</td>
<td>$110,000,000</td>
</tr>
<tr>
<td>Spectracast</td>
<td>$134,000,000</td>
<td></td>
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Cumulative Exits by Sector

Exits remain driven by Satellites, given that this is an established market with scores of new companies coming online and many cash-rich incumbents looking to outsource innovation to Space ventures. However, 2018 did see a very significant Launch exit with Northrup Grumman’s $7.8B acquisition of Orbital ATK.

Cumulative Number of Venture Funds Investing in Space

Venture capital interest in Space continues to climb to new heights. Our research shows that 114 firms made their first investment in space this year, bringing the total to 534. Accel Partners, Andreessen Horowitz, and Playground Global were three notable first-time Space investors this year.

Percentage of Venture Capital Rounds by Stage

Venture rounds in 2018 were mostly concentrated at the early stage (Seed and Series A), but Series B rounds increased 250% of total transactions. The trend demonstrates that the graduation of early-stage companies is supported by “smart” money.

TOTAL VENTURE CAPITAL INVESTMENT

$4.2B

NUMBER OF TOP 100 VCs WITH 1+ SPACE INVESTMENT

222

SHARE OF COMPANIES RECEIVING VENTURE CAPITAL INVESTMENT

54%

VENTURE CAPITAL ACTIVITY 2009-2018

Since 2009, venture capital firms have invested $4.2B into space companies. VC interest in Space has hit an inflection point in the last three years, with 70% of capital being deployed from 2016-2018. During this period, investment has been concentrated at the Series A and Series B rounds, accounting for 60% of total capital deployed.

Our data shows that the number of VC rounds at Growth and Late Stages are concentrated within the Satellites (63%) and Launch Industry (28%). However, at the Early Stage (Pre-Seed, Seed, Series A) we see a much greater diversity of industries represented. We believe this dynamic shows that as the Satellites and Launch Industries mature, and VC portfolio companies graduate, VCs are expanding their space exposure to include other industries.

Consistent with the overall flow of capital into the space economy, VCs have focused primarily on the Satellites and Launch industries. However, VCs appear more overweight in Satellites. Since 2009, investment into the Satellites industry represents 57% of total capital deployed by VCs, compared to 46% of total capital deployed by all investor types.

Of the $2.4B deployed into the Satellites industry, $0.9B (40%) has gone to companies in the Earth Observation sector. We suspect this sector is more palatable to generalist VCs because, compared to Launch companies, they are relatively less capital intensive and the path to revenue is shorter. Pure-play Earth Observation Analytics companies have been particularly attractive to VCs for their hardware-free, SaaS-like business models.

The $1.5B of investment into the Launch industry is almost entirely concentrated in Small and Heavy Launch, with 97% deployed between the two sectors. With SpaceX dominating Heavy Launch in terms of total capacity, new entrants in Small Launch, like Vector+ and Rocket Lab, have attracted venture capital investment for their flexible and frequent launch business models, benefiting from the growing smallsat market.

Since 2009, VC firms have participated in 455 investment rounds, of which 114 (25%) occurred in 2018 alone. Of the total, 355 (74%) rounds were in the Earth Observation sector, with the other 175 (46%) split amongst Manufacturing & Components, Operations & Ground Segment, Communications, and PNT. The Launch industry accounted for 72 rounds (16%) of total VC investment, with 60 rounds (83%) going to the Small Launch sector. Just 48 investment rounds (11%) went to emerging industries like Industrials, Logistics, and Planetary Markets.

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2018 was another remarkable year for space. With an additional $3.0B of equity investment, there has now been $18.0B invested into 412 space companies since 2009. This past year we witnessed the realization of commercial Small Launch vehicles and, with $1.6B invested in the Launch industry in 2018, we will continue to see this sector mature in the year ahead.

The investment landscape is experiencing increasingly global growth, with significant rounds in Chinese, Canadian, Singaporean, and German space companies. Venture capital interest in space is growing rapidly, with 70% of venture capital’s total $4.2B investment deployed in just the last three years. The Space Angels team is evaluating high-quality investment opportunities from around the globe and across all sectors - particularly in robotics, secure communications, and deeper in the satellite value chain. As we look forward to the Year of Commercial Space Travel, we invite you to join us as we fuel the future.

SELECT PORTFOLIO MILESTONES

- Astrobotic named one of nine companies in the NASA Commercial Lunar Payload Services Program, with participants eligible for up to $2.6B in awards over the next ten years
- The FCC approved SpaceX’s Starlink constellation, the first time the FCC has allowed a U.S.-licensed satellite constellation to provide broadband services through low-Earth orbit satellites
- On the SmallSat Express, SpaceX launched and deployed 64 satellites from 34 companies and 5 Space Angels portfolio companies were onboard (Planet, HawkEye 360, ICEYE, ATLAS and Accion Systems)
- ICEYE receives a €10M grant from Business Finland, a Finnish trade and economic development agency
- Kepler Communications received approval from the FCC for its 140 Ku-band satellite constellation

ADDITIONAL RESOURCES

The Space Angels Podcast regularly interviews commercial space entrepreneurs and industry experts, providing insight into the opportunities and risks of early-stage space investing.

Information Central dives deeper into the commercial space economy covering major sectors, innovative technologies, and public-private partnerships.

Are you ready to invest in the most compelling space startups?

APPLY NOW

Space Angels launched the Space Investment Quarterly in October 2017 with the aim of uncovering insights about investing in the space economy. The data shown in this report is gathered from a number of sources across many categories, and no single piece of data can be added to our databases until confirmed by multiple sources. Our reported data is subject to change over time as previously undisclosed deals are added to our database. Below is a select list of our data sources:

- Investment Databases
  - Pitchbook
  - Crunchbase
  - Mattermark
  - CB Insights
- Crowd Platforms
  - AngelList
  - SeedInvest
  - Kickstarter
  - Indiegogo
- Confidential Sources
  - Diligence Process
  - Company Management
  - Co-Investors
  - Commercial Partners
  - Government Partners
- Public Announcements
  - Press Releases
  - SEC Filings
  - Events
- News
  - TechCrunch
  - Bloomberg
  - CNBC
  - Fortune
  - SpaceNews

ABOUT

Space Angels is the leading source of capital for early-stage space ventures. Founded in 2007, our portfolio includes many of the most prominent entrepreneurial companies in the sector. Through a robust and streamlined web platform, Space Angels provides unparalleled deal access and comprehensible intelligence to its accredited investor members, making it easy to discover, select, and invest in the most compelling space startups.

ASSETS

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