

# Why Invest in Space Exploration & Innovation?

As of March 31, 2024

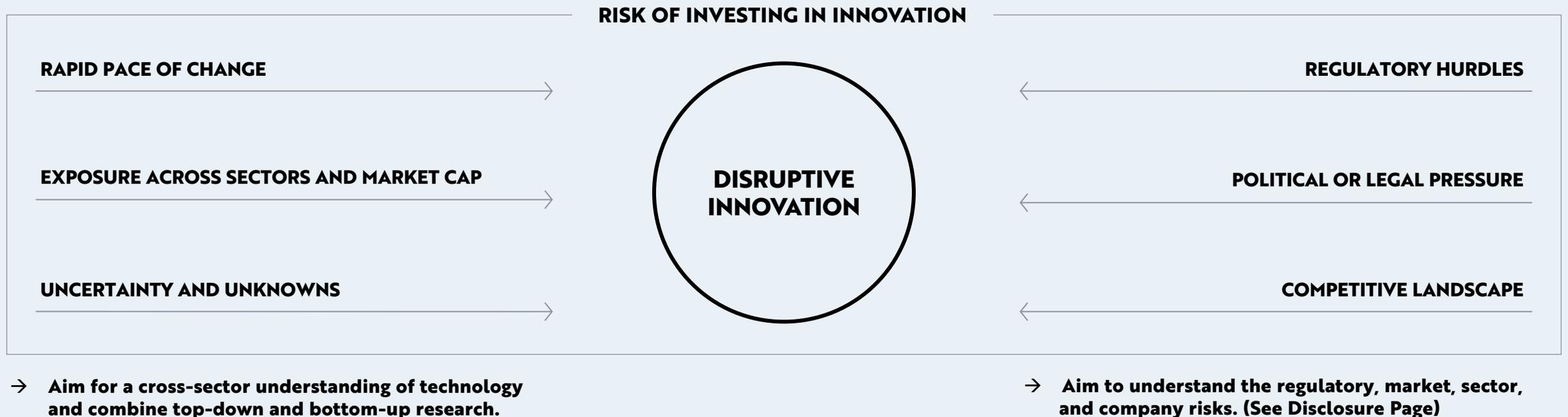




# Risks of Investing in Innovation

Please note: Companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so. ARK aims to educate investors and seeks to size the potential investment opportunity, noting that risks and uncertainties may impact our projections and research models. Investors should use the content presented for informational purposes only, and be aware of market risk, disruptive innovation risk, regulatory risk, and risks related to certain innovation areas.

Please read risk disclosure carefully.





# Definitions, Risks & Disclosure Associated with Space Exploration & Innovation

Aerospace is the branch of technology and industry concerned with both aviation and space flight. There are two main types of spaceflight: orbital and suborbital. An orbital flight circles the earth at least once, in a stable way. Suborbital flights are ones that may go into space, but then their path (or trajectory) carries them back to the earth.

**Disruptive Innovation Risk.** Companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so. Companies that initially develop a novel technology may not be able to capitalize on the technology. Companies that develop disruptive technologies may face political or legal attacks from competitors, industry groups or local and national governments. These companies may also be exposed to risks applicable to sectors other than the disruptive innovation theme for which they are chosen, and the securities issued by these companies may underperform the securities of other companies that are primarily focused on a particular theme.

**Software Industry Risk.** The software industry can be significantly affected by intense competition, aggressive pricing, technological innovations, and product obsolescence. Companies in the software industry are subject to significant competitive pressures, such as aggressive pricing, new market entrants, competition for market share, short product cycles due to an accelerated rate of technological developments and the potential for limited earnings and/or falling profit margins. These companies also face the risks that new services, equipment or technologies will not be accepted by consumers and businesses or will become rapidly obsolete. These factors can affect the profitability of these companies and, as a result, the value of their securities. Also, patent protection is integral to the success of many companies in this industry, and profitability can be affected materially by, among other things, the cost of obtaining (or failing to obtain) patent approvals, the cost of litigating patent infringement and the loss of patent protection for products (which significantly increases pricing pressures and can materially reduce profitability with respect to such products). In addition, many software companies have limited operating histories. Prices of these companies' securities historically have been more volatile than other securities, especially over the short term.

**Internet Company Risk.** Many Internet-related companies have incurred large losses since their inception and may continue to incur large losses in the hope of capturing market share and generating future revenues. Accordingly, many such companies expect to incur significant operating losses for the foreseeable future and may never be profitable. The markets in which many Internet companies compete face rapidly evolving industry standards, frequent new service and product announcements, introductions and enhancements, and changing customer demands. The failure of an Internet company to adapt to such changes could have a material adverse effect on the company's business.

**Semiconductor Company Risk.** Competitive pressures may have a significant effect on the financial condition of semiconductor companies and, as product cycles shorten and manufacturing capacity increases, these companies may become increasingly subject to aggressive pricing, which hampers profitability. Reduced demand for end-user products, under-utilization of manufacturing capacity, and other factors could adversely impact the operating results of companies in the semiconductor sector. Semiconductor companies typically face high capital costs and may be heavily dependent on intellectual property rights. The semiconductor sector is highly cyclical, which may cause the operating results of many semiconductor companies to vary significantly. The stock prices of companies in the semiconductor sector have been and likely will continue to be extremely volatile.

**Industrials Sector Risk.** The industrials sector includes companies engaged in the aerospace and defense industry, electrical engineering, machinery, and professional services. Companies in the industrials sector may be adversely affected by changes in government regulation, world events and economic conditions. In addition, companies in the industrials sector may be adversely affected by environmental damages, product liability claims and exchange rates. *Aerospace and Defense Company Risk.* Companies in the aerospace and defense industry rely to a large extent on U.S. (and other) Government demand for their products and services and may be significantly affected by changes in government regulations and spending, as well as economic conditions and industry consolidation. *Professional Services Company Risk.* Professional services companies may be materially impacted by economic conditions and related fluctuations in client demand for marketing, business, technology and other consulting services. Professional services companies' success depends in large part on attracting and retaining key employees and a failure to do so could adversely affect a company's business. There are relatively few barriers to entry into the professional services market, and new competitors could readily seek to compete in one or more market segments, which could adversely affect a professional services company's operating results through pricing pressure and loss of market share.

**Machinery Industry Risk.** The machinery industry can be significantly affected by general economic trends, including employment, economic growth, and interest rates; changes in consumer sentiment and spending; overall capital spending levels, which are influenced by an individual company's profitability and broader factors such as interest rates and foreign competition; commodity prices; technical obsolescence; labor relations legislation; government regulation and spending; import controls; and worldwide competition. Companies in this industry also can be adversely affected by liability for environmental damage, depletion of resources, and mandated expenditures for safety and pollution control.

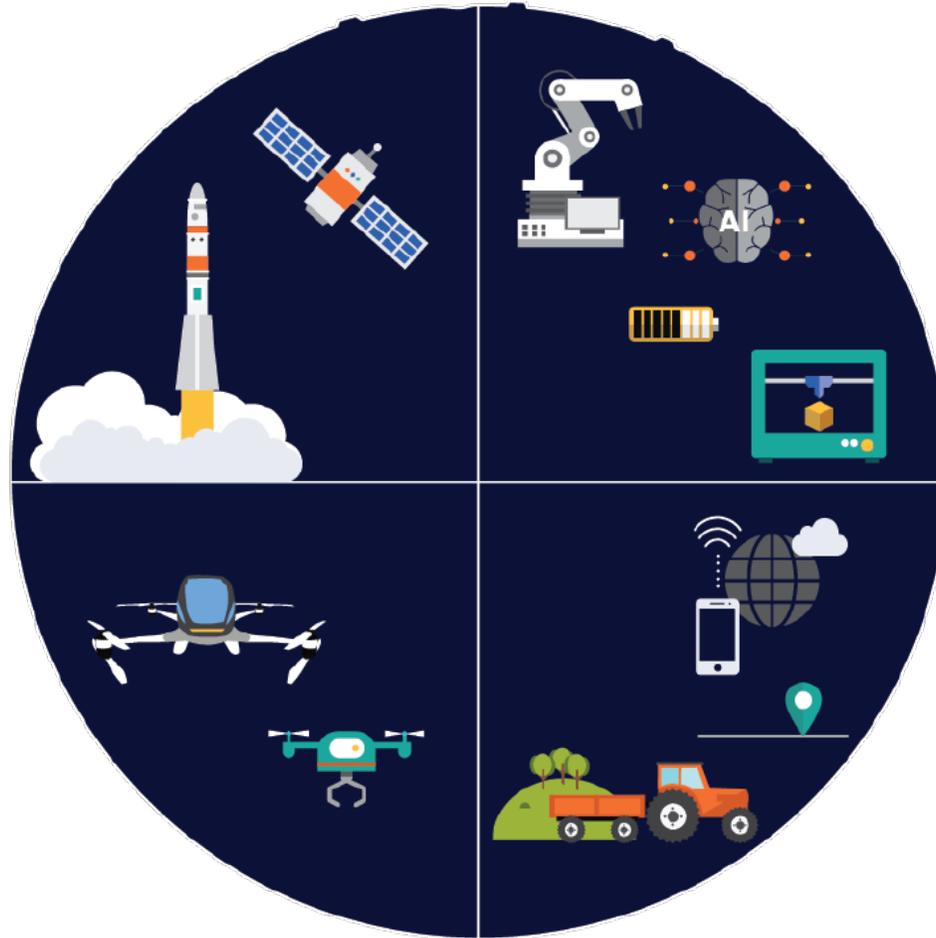


# ARK's Breakdown Of The Space Ecosystem

WHY INVEST IN SPACE EXPLORATION & INNOVATION?

## Orbital Aerospace

Companies that launch, make, service, or operate platforms in orbital space



## Enabling Technology

Companies that create the technologies required for successful value add aerospace operations

## Suborbital Aerospace

Companies that launch, make, service, or operate platforms in suborbital space

## Aerospace Beneficiaries

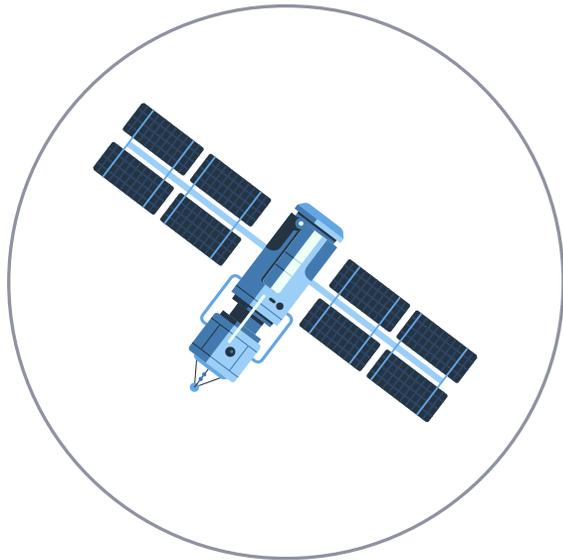
Companies that stand to benefit from aerospace activities



# Satellites Could Bolster GDP Growth As Their Networks Launch And Leverage Data For Terrestrial Businesses.

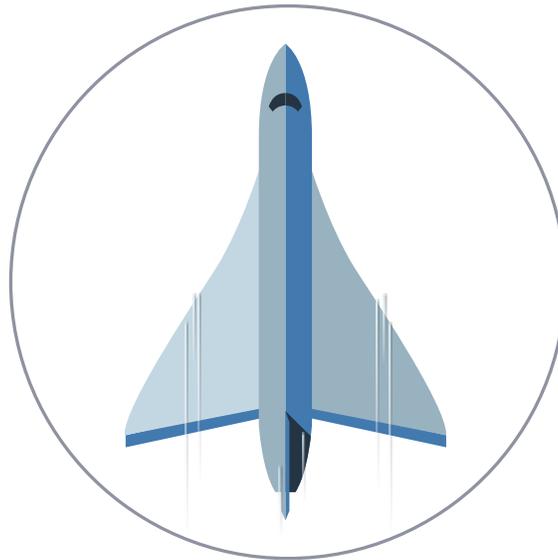
## Global Connectivity

Roughly 50% of the global population lacks internet connectivity, but with more satellites, cloud computing will go global.



## Hypersonic Point-to-Point Travel

As long-haul flight times collapse from 10+ hours to 2-3 hours, the global economy could transform.



## Multiplanetary Species

Humans have been living on the International Space Station for 20 years. Within a decade, humans could inhabit the moon and Mars.

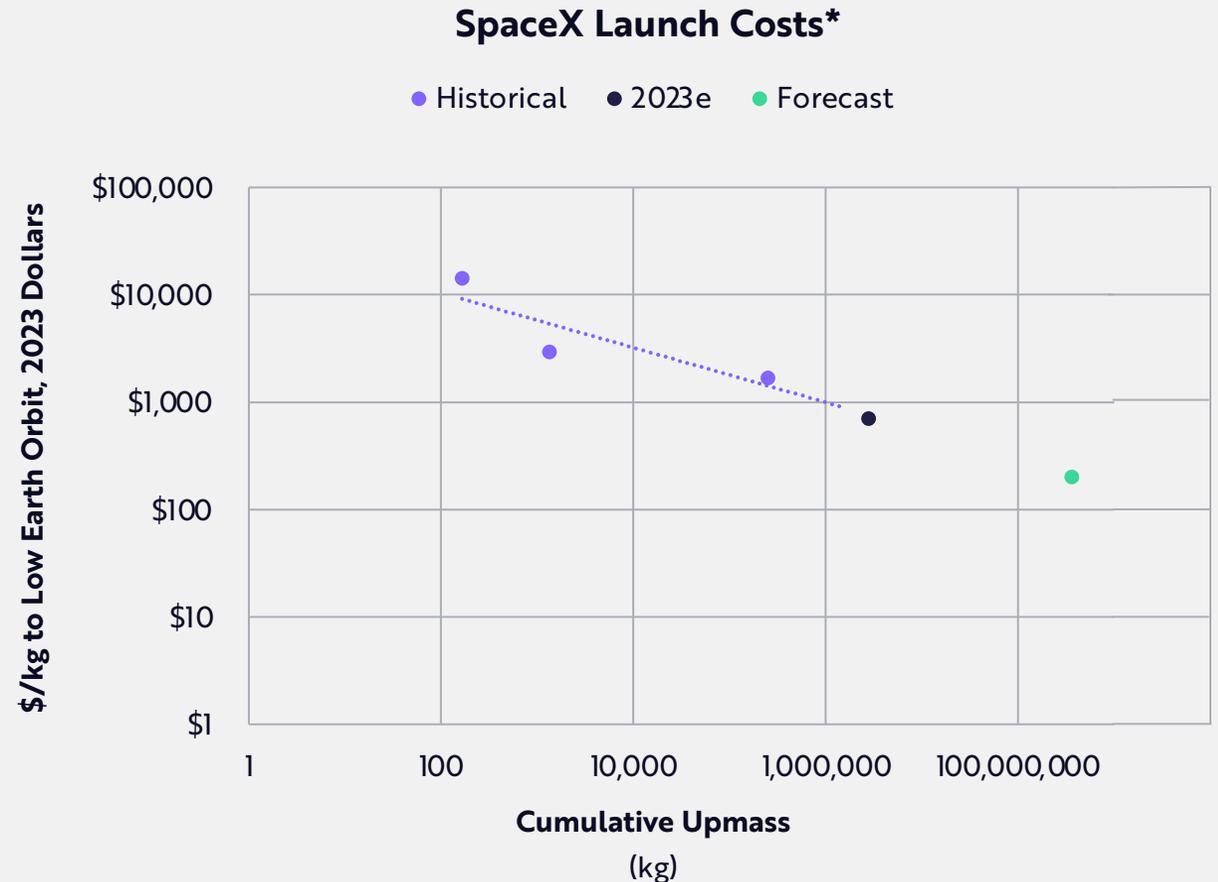
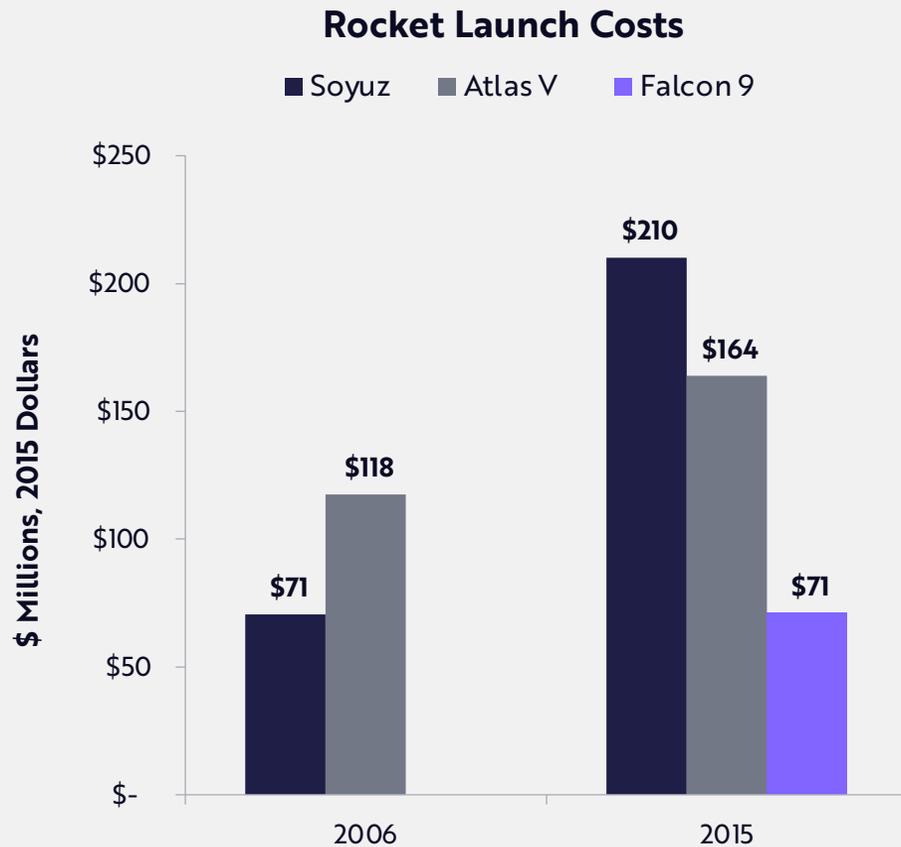


WHY INVEST IN SPACE EXPLORATION & INNOVATION?

Forecasts are inherently limited and cannot be relied upon. Source: ARK Investment Management LLC, 2023 based on data sourced from: Global connectivity source: [https://www.bondcap.com/pdf/Internet\\_Trends\\_2019.pdf](https://www.bondcap.com/pdf/Internet_Trends_2019.pdf), ISS source: <https://www.nationalgeographic.com/science/2020/10/humans-have-lived-on-international-space-station-20-years-straight/>. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results. "GDP" refers to Gross Domestic Product.

# Reusable Rockets Should Lower Launch Costs By An Order Of Magnitude...Or Two!

SpaceX's reusable rocket, Falcon 9, put an end to soaring launch costs. By reusing one Falcon 9 booster 19 times, SpaceX increased its annual launch cadence nearly 60% to 96 in 2023.



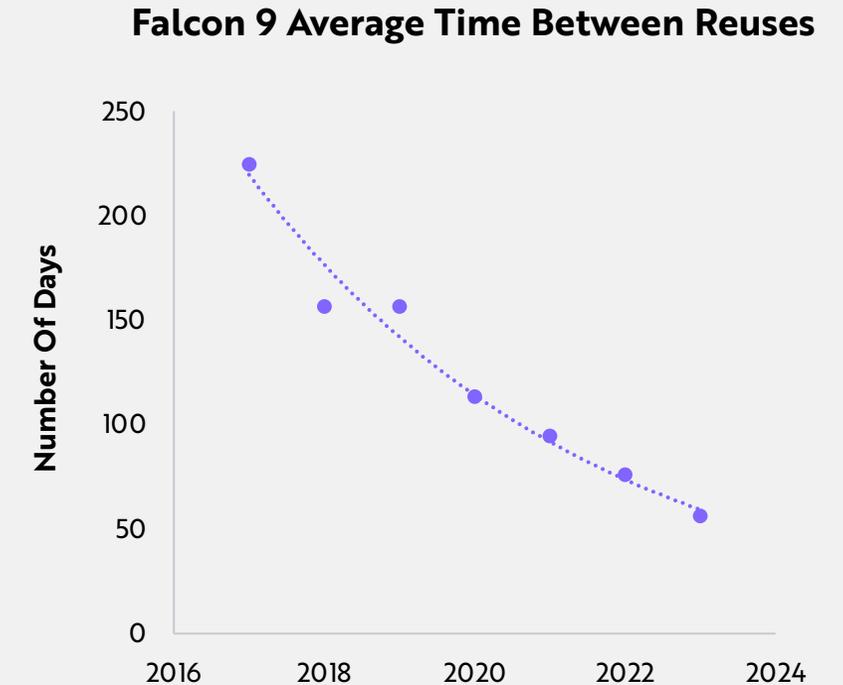
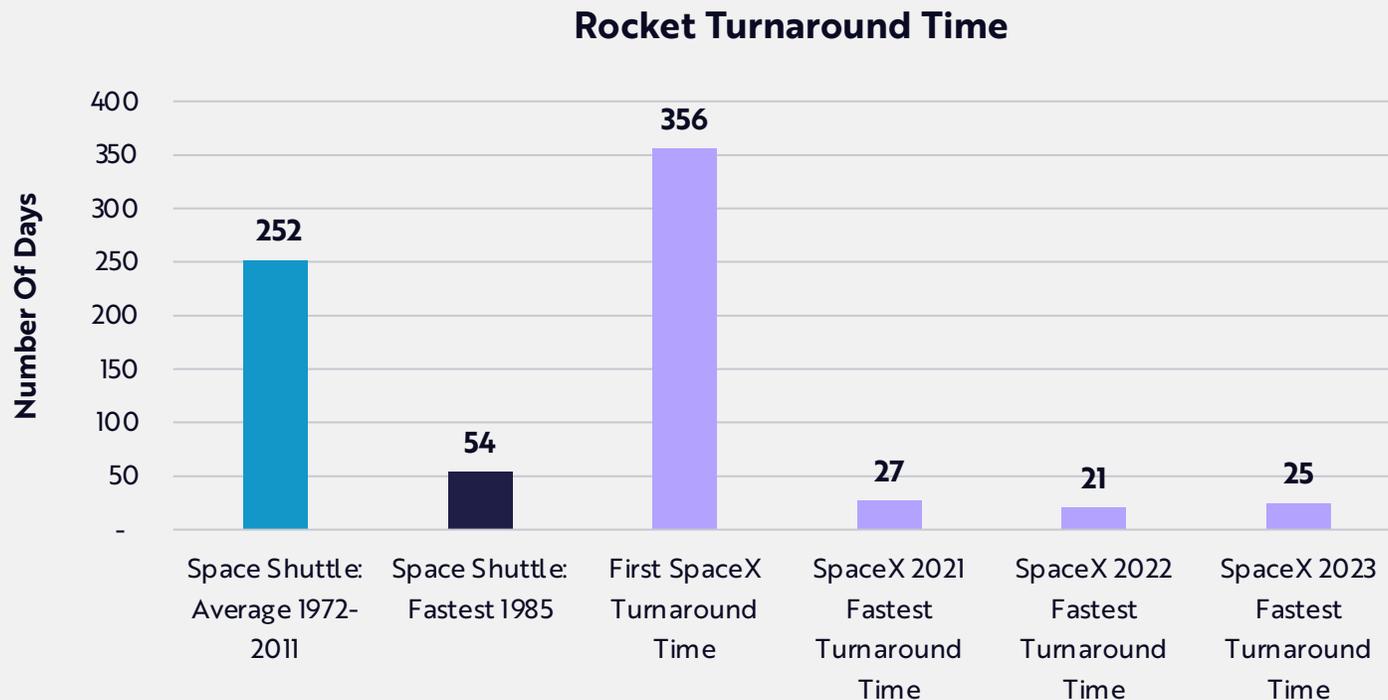
\*Forecast timeline dependent on the speed of development of SpaceX's Starship. Sources: ARK Investment Management LLC, 2024. This ARK analysis is based on a range of underlying data from external sources, which may be provided upon request. Forecasts are inherently limited and cannot be relied upon. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results.



# SpaceX Is Refurbishing Rockets In Record Time

When the Space Shuttle cost ~\$1.5 billion per launch, industry experts assumed that a reusable rocket would be impossible economically. SpaceX then flipped the script.

According to ARK's research, the first stage of the Falcon 9 cost <\$1 million to refurbish. Now, rocket turnaround time should be proportional to the cost required to refurbish a rocket booster, the key metric in tracking launch cost declines.

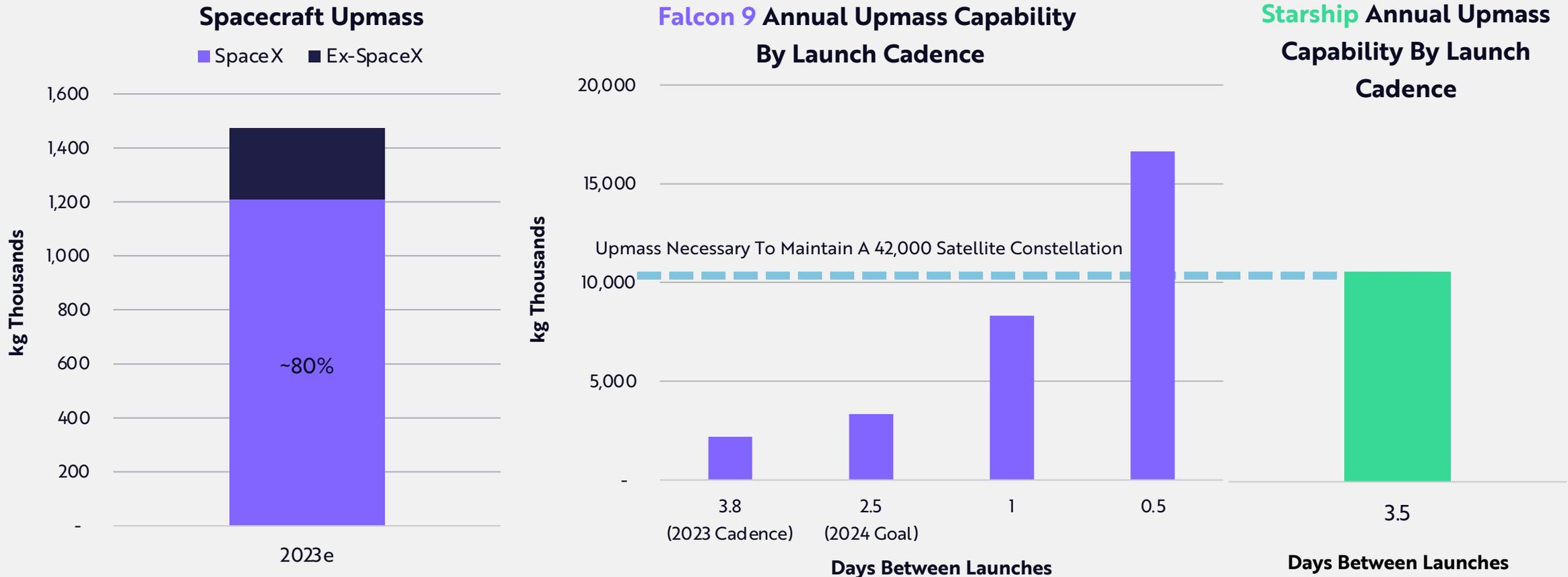


Sources: ARK Investment Management LLC, 2024, based on data from NASA 2023 and SpaceX 2023a, 2023b as of December 11, 2023. Forecasts are inherently limited and cannot be relied upon. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results.



# Starship Will Help The Starlink Constellation Achieve Its Potential

Starship's payload capacity to LEO is ~5x that of the Falcon 9. While impressive, given the five-year life of its satellites, Starship still will have to fly every 3.5 days to maintain its target constellation of 42,000 Starlink satellites. As of January 2024, SpaceX has a constellation of ~5,400 satellites.



Sources: ARK Investment Management LLC, 2024. This ARK analysis is based on a range of underlying data from external sources, including Brycotech 2023a, 2023b, 2023c, and McDowell 2024 as of January 23, 2024, which may be provided upon request. Forecasts are inherently limited and cannot be relied upon. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results.



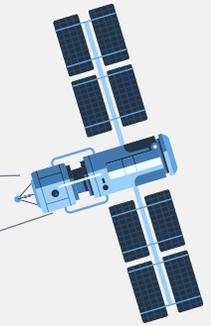
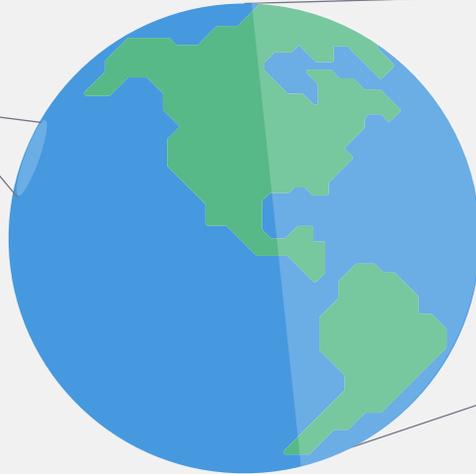
# Lower Satellite Launch Costs Should Enable Continuous Global Coverage With Low Latency

While latency precluded geostationary orbit (GEO) satellites from offering a compelling broadband internet solution, now thousands of low-cost, low earth orbit (LEO) satellites can provide service with low latency, continuous global coverage, and direct-to-mobile device connectivity.

## LEO

~300 miles  
<40 ms latency

Debris will fall back to earth within ~5 years



## GEO

~22,000 miles  
700 ms latency

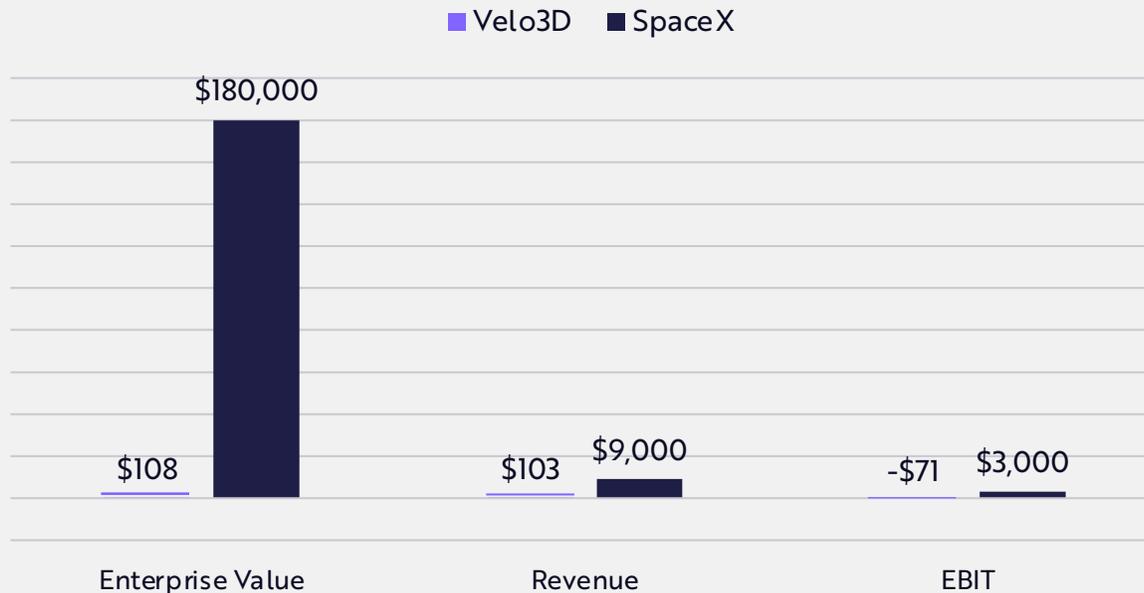
Debris will fall back to earth within 1,000+ years



# Thus Far, 3D Printing Has Benefited Users More Than Suppliers

SpaceX uses 3D printing every day to make parts for Starship's Raptor engines. Today, the operating margins of SpaceX's launch and satellite business are superior to those of any 3D printing supplier, like Velo3D (as shown below). Industrial companies benefiting from 3D printing could vertically integrate to sustain their competitive advantages.

**Velo3D And SpaceX  
2023 Estimates In Thousands**



**A SpaceX Super Heavy Booster With 33 Raptor Engines:**



Velo3D is a 3D-printer manufacturer specializing in support-free powder bed fusion. Enterprise Value is an economic measure reflecting the market value of a business. It is a sum of claims by all claimants: creditors and shareholders. Earnings before interest and taxes (EBIT) measures a company's net income before income tax and interest expenses are deducted. Sources: ARK Investment Management LLC, 2024, based on data from S&P Capital IQ, 2024. SpaceX Heavy Booster Illustration sourced from Ali 2021. Forecasts are inherently limited and cannot be relied upon. For informational purposes only and should not be considered investment advice or a recommendation to buy, sell, or hold any particular security. Past performance is not indicative of future results.



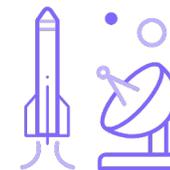


## 5 Reasons Investors Should Consider ARKX

1. **Exposure To Innovation:** Aims for thematic exposure to “Space Exploration”, including orbital and sub-orbital aerospace, enabling technologies, and beneficiaries of aerospace activities, such as agriculture, Internet access, global positioning system (GPS), construction, and imaging.<sup>1</sup>
2. **Growth Potential:** Aims to capture long-term growth with low correlation of relative returns to traditional growth strategies.
3. **Tool For Diversification<sup>2</sup>:** Offers a tool for diversification due to little overlap with traditional indices. It can be a complement to traditional value/growth strategies.
4. **Grounded In Research:** Combines top-down and bottom-up research in its portfolio management to identify space innovation companies and convergence across markets.
5. **Cost Effective:** Seeks to provide a lower cost alternative to mutual funds with true active management in an exchange traded fund (ETF) that invests in rapidly moving themes.

[1] Orbital Aerospace Companies are companies that launch, make, service, or operate platforms in the orbital space, including satellites and launch vehicles. Suborbital Aerospace Companies are companies that launch, make, service, or operate platforms in the suborbital space, but do not reach a velocity needed to remain in orbit around a planet. Enabling Technologies Companies are companies that develop technologies used by Space Exploration related companies for successful value-add aerospace operations. These operations include artificial intelligence, robotics, 3D printing, materials and energy storage. Aerospace Beneficiary Companies are companies whose operations stand to benefit from aerospace activities, including agriculture, internet access, global positioning system (GPS), construction, imaging, drones, air taxis and electric aviation vehicles.

[2] Diversification does not assure a profit. The information herein is general in nature and should not be considered financial advice. An investor should consult a financial professional regarding the investor’s specific situation.



# ARK Space Exploration & Innovation ETF – ARKX

ARK's Space Exploration & Innovation ETF focuses on "Space Exploration", including orbital and sub-orbital aerospace, enabling technologies, and beneficiaries of aerospace activities, such as agriculture, Internet access, global positioning system (GPS), construction, and imaging.

- Ticker: [ARKX](#)
- Fund AUM: [\\$259.3 Million](#)
- Typical Number of Holdings: [40-50 U.S. Equities/U.S.-listed ADRs](#)
- Expense Ratio: [0.75% \(Gross 0.79%\)](#)

| TOP 10 HOLDINGS                         | Weight (%)   |
|---|--------------|
| AEROVIRONMENT INC                       | 8.7%         |
| KRATOS DEFENSE & SECURITY SOLUTIONS INC | 8.5%         |
| TRIMBLE INC                             | 7.7%         |
| IRIDIUM COMMUNICATIONS INC              | 6.7%         |
| TERADYNE INC                            | 5.4%         |
| L3HARRIS TECHNOLOGIES INC               | 5.1%         |
| THE 3D PRINTING ETF                     | 4.9%         |
| KOMATSU LTD                             | 4.7%         |
| ARCHER AVIATION INC                     | 3.6%         |
| UIPATH INC                              | 3.5%         |
|   | <b>59.0%</b> |

| MARKET CAPITALIZATION | (%)   |
|-----------------------|-------|
| Mega (\$100B+)        | 12.7% |
| Large (\$10 - \$100B) | 42.3% |
| Medium (\$2 - \$10B)  | 31.3% |
| Small (\$300M - \$2B) | 4.1%  |
| Micro (\$50 - \$300M) | 9.0%  |

| PORTFOLIO COMPOSITION         | (%)   |
|-------------------------------|-------|
| Autonomous Mobility           | 41.8% |
| Intelligent Devices           | 17.6% |
| 3D Printing                   | 12.8% |
| Advanced Battery Technologies | 7.9%  |
| Neural Networks               | 5.9%  |
| Adaptive Robotics             | 5.8%  |
| Reusable Rockets              | 4.2%  |
| Next Gen Cloud                | 2.7%  |
| Digital Wallets               | 1.0%  |

| SECTORS                | (%)   |
|------------------------|-------|
| Industrials            | 53.5% |
| Information Technology | 26.1% |
| Communication Services | 8.8%  |
| Consumer Discretionary | 6.1%  |

Holdings are subject to change and should not be considered as investment advice, or a recommendation to buy, sell or hold any particular security. It should not be assumed that an investment in the securities identified was or will be profitable. As stated in the ARK ETFs' current prospectuses, the net expense ratio for ARKX is 0.75%. The gross expense ratio is 0.79%. ARK has voluntarily agreed to waive a portion of its management fee payable by the Fund in an amount equal to any management fees it earns as an investment adviser to the affiliated fund(s) in which the Fund invests. The fee waiver arrangement will continue through at least 11/30/2024.



# Thematic Strategies Focused on Disruptive Innovation



**ARKK**  
ARK Innovation ETF



**ARKX**  
ARK Space Exploration & Innovation ETF



**ARKW**  
ARK Next Generation Internet ETF



**PRNT**  
The 3D Printing ETF



**ARKQ**  
ARK Autonomous Tech. & Robotics ETF



**IZRL**  
Israel Innovative Technology ETF



**ARKG**  
ARK Genomic Revolution ETF



**ARKF**  
ARK Fintech Innovation ETF



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Factsheet, prospectus, and latest performance reports are available for download on our website: [ark-funds.com/investor-material](https://ark-funds.com/investor-material)



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*Investors should carefully consider the investment objectives and risks as well as charges and expenses of an ARK ETF before investing. This and other information are contained in the ARK ETF prospectus and summary prospectus, which may be obtained by visiting [www.ark-funds.com](http://www.ark-funds.com). The prospectus should be read carefully before investing.*

*Investing in securities involves risk and there's no guarantee of principal.*

**Fund Risks:** The principal risks of investing in ARKX: **Equity Securities Risk.** The value of the equity securities the Fund holds may fall due to general market and economic conditions. **Foreign Securities Risk.** Investments in the securities of foreign issuers involve risks beyond those associated with investments in U.S. securities. These risks are greater in emerging markets. **Industrials Sector Risk.** The industrials sector includes companies engaged in aerospace and defense, electrical engineering, machinery, and professional services. Companies in the industrials sector may be adversely affected by changes in government regulation, world events and economic conditions. In addition, companies in the industrials sector may be adversely affected by environmental damages, product liability claims and exchange rates. **Information Technology Sector Risk.** The information technology sector includes companies engaged in internet software and services, technology hardware and storage peripherals, electronic equipment instruments and components, and semiconductors and semiconductor equipment. Information technology companies face intense competition, have limited product lines, markets, financial resources or personnel, face rapid product obsolescence, are heavily dependent on intellectual property and the loss of patent, copyright and trademark protections may adversely affect the profitability of these companies.

**Aerospace and Defense Company Risk.** Companies in the aerospace and defense industry rely to a large extent on U.S. (and other) Government demand for their products and services and may be significantly affected by changes in government regulations and spending, as well as economic conditions, industry consolidation and other disasters. For other risks regarding the fund please see the prospectus. There can be no assurance that the ETF will achieve its investment objective. The ETF's portfolio is more volatile than broad market average. **Disruptive Innovation Risk.** Companies that ARK believes are capitalizing on disruptive innovation and developing technologies to displace older technologies or create new markets may not in fact do so. Companies that initially develop a novel technology may not be able to capitalize on the technology. Companies that develop disruptive technologies may face political or legal attacks from competitors, industry groups or local and national governments. These companies may also be exposed to risks applicable to sectors other than the disruptive innovation theme for which they are chosen, and the securities issued by these companies may underperform the securities of other companies that are primarily focused on a particular theme. **Special Purpose Acquisition Companies (SPAC) Risk.** A SPAC is a publicly traded company that raises investment capital for the purpose of acquiring or merging with an existing company. Investments in SPACs and similar entities are subject to a variety of risks beyond those associated with other equity securities. Because SPACs and similar entities do not have any operating history or ongoing business other than seeking acquisitions, the value of their securities is particularly dependent on the ability of the SPAC's management to identify a merger target and complete an acquisition.

Additional risks of investing in ARKX include market, management and non-diversification risks, as well as fluctuations in market value and NAV. Shares of ARKX are bought and sold at market price (not NAV) and are not individually redeemed from the ETF. ETF shares may only be redeemed directly with the ETF at NAV by Authorized Participants, in very large creation units. There can be no guarantee that an active trading market for ETF shares will develop or be maintained, or that their listing will continue or remain unchanged. Buying or selling ETF shares on an exchange may require the payment of brokerage commissions and frequent trading may incur brokerage costs that detract significantly from investment returns.

Portfolio holdings will change and should not be considered as investment advice or a recommendation to buy, sell or hold any particular security. Please visit [www.ark-funds.com](http://www.ark-funds.com) for the most current list of holdings for the ARK ETFs.

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