

## 中国航空航天与国防 China (Overseas) Aerospace and National Defense

### 中国民营火箭入轨载荷记录刷新，国际巨头垂直一体化布局加速

#### China Breaks Private Rocket Orbital Payload Record, International Giants Accelerate Vertical Integration

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#### 热点速评 Flash Analysis

(Please see APPENDIX 1 for English summary)

#### 事件

- 2026年3月30日，中科宇航力箭二号液体运载火箭在东风商业航天创新试验区发射成功，该火箭为CBC通用助推器构型，近地轨道运力12吨，500km太阳同步轨道运力8吨，本次发射搭载3颗卫星、总载荷超4吨，刷新中国民营商业火箭单次发射载荷最高纪录。
- 2026年4月3日，天兵科技天龙三号大型可复用液氧煤油火箭在东风商业航天创新试验区首飞，火箭起飞后飞行异常，发射任务失利，该火箭对标SpaceX猎鹰9号，近地轨道设计运力17-22吨，一子级规划垂直回收复用，目前故障原因正在调查。
- 2026年3月30日，Rocket Lab收购德国卫星激光通信企业Mynaric的交易获得德国监管部门批准，该收购于2025年启动，Mynaric为全球卫星激光通信核心器件供应商，收购完成后Rocket Lab实现火箭发射、卫星制造、星间激光通信的产业链整合。
- 2026年4月初，亚马逊启动对卫星通信公司Globalstar的收购洽谈，拟通过收购获取其在轨卫星、通信频谱及地面站资源，以推进其低轨卫星互联网项目Amazon Leo、与SpaceX星链形成竞争；此前苹果已入股Globalstar并锁定其大部分网络容量用于手机紧急卫星通信。
- 2026年4月2日，NASA阿尔忒弥斯2号任务由SLS火箭发射升空，搭载4名航天员执行绕月飞行任务，为人类自1972年阿波罗计划后时隔54年首次载人重返月球附近轨道，任务为绕月飞行、不实施登月与月球轨道驻留。
- 2026年4月7日，长征八号运载火箭在海南商业航天发射场点火起飞，以“一箭十八星”方式将千帆星座第七批组网卫星送入预定轨道，发射任务圆满成功。执行本次任务的长征八号为捆绑2个助推器的基本构型，700公里太阳同步轨道运载能力不低于5.5吨。
- 2026年4月9日，我国在太原卫星发射中心使用长征六号甲运载火箭，成功将卫星互联网低轨21组卫星发射升空，卫星顺利进入预定轨道，发射任务圆满成功。

#### 点评

SpaceX给商业发射市场带来压力，正在倒逼中美两侧的商业航天参与者加速演进——中国火箭运力与发射频次提升，美国巨头则借助资本整合加速向全栈系统提供商转型。

#### 一、中国民营火箭：中型运力门槛突破，路线分化效应加速显现

力箭二号首飞成功，以CBC集束构型刷新中国民营火箭单次入轨载荷纪录，力箭二号目前不回收状态下单次发射成本降至3万元/公斤。

在本次发射中，中科宇航在商业确定性与研发风险之间选择稳中求进。采购已成功执行多次任务的YF-102发动机，以工程成熟度优先替代技术激进堆叠，对有明确在轨时间节点需求的卫星运营商而言，可预期的交付窗口本身即构成确定性溢价，预计将在后续商业合同谈判中得到量化体现。

而天兵科技选择了高收益高风险路径，近地轨道(LEO)运力17至22吨，火箭一级配置9台自研天火十二发动机并联工作，直接对标美国SpaceX的猎鹰9号运载火箭。天火十二发动机一次性集成四十余项关键技术创新，单次首飞的工程验证压力本已处于较高水位；猎鹰9号历经六次失败方才确立可靠性基准。

重点关注标的为蓝箭航天朱雀三号。在当前中国民营火箭梯队中，朱雀三号技术较为领先，搭载自研发动机成功入轨，回收试验接近回收场边缘。2026年计划执行二次回收试验，若回收验证成功，蓝箭将完成成本结构重塑，提高其竞争力。

## 二、低轨星座高频发射频次提升

48小时内长征八号与长征六号甲相继完成组网发射任务，中国商业航天发射基础设施具备高频稳定交付能力。长征八号“新三垂测发模式”将总装流程前移至发射区，长征六号甲 14 天测发周期在同级别运载火箭中处于全球第一梯队，未来周级发射密度的可实现性。自 2024 年 8 月首批卫星入轨以来，千帆星座已累计完成七次“一箭十八星”发射。垣信卫星董事长已公开确认年内实现全球初步覆盖目标。市场预计在轨规模达 600 颗后，预计可释放的商业订单体量约 50 亿元。

## 三、美国巨头：垂直整合提速，核心能力边界扩张驱动估值重构

Starlink 已在低轨宽带服务市场建立起具有显著先发优势的运营壁垒，美国商业航天头部参与者的战略重心随之从发射能力竞争向全栈系统集成能力的构建加速迁移。

Rocket Lab 收购 Mynaric 获监管批准，公司垂直整合更进一步。Rocket Lab 近年来多次收购多家核心部件供应商，意在进一步推进发射、卫星和关键部件的一体化，走卖铲子+下矿双轮驱动路线。Rocket Lab 通过完成这一并购，完善了全产业链闭环，为公司未来承接大规模商业星座项目以及中长期自营星座打下坚实基础。Rocket Lab 的估值参照系应从纯发射服务商向航天系统集成商切换。

亚马逊拟议收购 Globalstar 的战略内核与之同构，但资产稀缺性维度更为突出。Amazon Leo 在在轨规模与服务覆盖深度上相对 Starlink 仍存在显著差距，而 Globalstar 所持有的 L/S 频段许可证覆盖全球数十个监管辖区，属于无法通过新申请路径短期复制的稀缺监管资产。收购路径可绕开周期冗长的频谱申请流程，并借助 Globalstar 现有 Direct-to-Cell 网络基础设施填补消费终端直连服务的能力缺口。交易一旦完成，亚马逊将形成频谱资产、卫星网络、AWS 云基础设施与消费终端的四层一体化能力架构，其战略演进路径与 Starlink 向综合通信基础设施延伸的逻辑高度对称。核心执行风险集中于苹果：约 85% 的网络容量已受现有协议约束，容量安排的重构谈判构成交易落地的关键路径依赖，需持续追踪谈判进展。

结合当前美国市场在 TACO 宏观背景下的 risk-on 情绪切换，商业航天在本轮行情中有两条具有不同风险收益特征的结构化机会主线。

其一，中国方面，看好国内卫星和火箭供应链核心价值量环节。中国低轨卫星进入高密度组网阶段叠加运力的稳步提升，将驱动相控阵天线、激光通信终端、星上处理芯片、星敏感器等卫星关键器件和火箭关键器件需求提升。上述细分环节兼具技术壁垒高及国产自主可控逻辑清晰等特征。

其二，看好美国完成商业闭环的全栈整合平台的估值重构机会。Rocket Lab 通过收购其供应商 Mynaric 降低成本，并进一步深化作为系统集成商的角色，有望迎来估值重构。

## 风险

常态化商业复用运营不及预期；收购进展不及预期。

**事件一:**

2026年3月30日，中科宇航力箭二号遥一运载火箭（PR-2）在东风商业航天创新试验区首飞发射成功，本次发射搭载3颗卫星（新征程01卫星、新征程02卫星和天视卫星01星）、总载荷超4.2吨，刷新中国民营商业火箭单次发射载荷最高纪录。

**点评:****力箭二号首发成功，实现民营火箭公司入轨重量的突破。**

力箭二号总长53米，起飞重量625吨，起飞推力753吨，500公里太阳同步轨道运载能力8吨，200公里近地轨道运载能力12吨，整流罩直径4.2米，芯级直径3.35米，重复使用次数大于等于20次。本次任务成功发射轻舟初样试飞船，首飞任务直接服务于国家重大战略和重大工程建设，未来有望成为支持轻舟货运飞船等低成本货运、低轨卫星组网等任务的主力火箭。

本次首飞任务主要验证三大关键技术：

- 1、CBC构型应用技术：作为我国首款采用CBC（通用助推器核心）构型的火箭，在研制过程中攻克了大捆绑载荷结构设计技术，将火箭各主要部分设计为独立模块，实现不同模块的高效复用与灵活组合，后续使用相同模块积木多样组合的形式，可支持0/2/4个捆绑构型，即光杆或捆绑2/4个液体助推器的灵活配置，覆盖近地轨道2吨至20吨运力区间，并可实现集束式回收。
- 2、大直径光圆筒贮箱结构与制造工艺技术：力箭二号一二级贮箱筒段均采用了光筒结构形式，是我国轴压最大的光筒贮箱。相较于传统网格加筋结构形式制造成本大幅下降。
- 3、大型整流罩平抛分离技术：为了增大整流罩内部使用空间，力箭二号的整流罩采用了有别于传统旋抛分离的平抛分离技术，使用3套独立的气瓶+冷气推冲装置作为分离能源，实现了分离速度大于5m/s。

力箭二号总指挥杨浩亮表示，目前不回收状态下单次发射成本降至3万元/公斤以下。火箭可实现年产20发的生产能力。力箭二号采购YF-102发动机在商业逻辑上是用成熟度换运力，其研发风险低、交付可预期。但其可扩展的集束式回收设计为未来成本下降预留了路径。对于急需确定性交付的卫星客户（如千帆、GW星座）而言，力箭二号的首飞成功使其成为一个低风险选项。此次首飞还搭载了轻舟初样试飞船，首飞任务直接服务于国家重大战略和重大工程建设。

**事件二:**

2026年4月3日，天兵科技天龙三号大型可复用液氧煤油火箭在东风商业航天创新试验区首飞，火箭起飞后飞行异常，发射任务失利，该火箭对标SpaceX猎鹰9号，近地轨道设计运力17-22吨，一子级规划垂直回收复用，目前故障原因正在调查。

**点评:****天龙三号首飞获取关键技术数据，高收益路径伴随高风险**

天龙三号直径3.8米，长度72米，起飞质量590吨，近地轨道（LEO）运力17至22吨，太阳同步轨道（SSO）运力10至17吨。火箭一级配置9台天火十二发动机并联工作，天龙三号预计实现一箭36颗互联网卫星组网发射，支持中国空间站大规模货物运输需求及中高轨卫星发射需求，直接对标美国SpaceX的猎鹰9号运载火箭。

本次首飞在真实环境下对关键技术开展了全面考核，获取了真实飞行环境下的关键数据。参考SpaceX，其Falcon 1, Falcon 9, Starship分别失败了3次、6次、6次，失败试验本身也是在积累宝贵的工程数据。相比力箭二号，天龙三号发动机技术自研，高集成度新技术堆叠，挑战较大。火箭配备的天火十二发动机拥有四十余项关键创新技术，包括在国内首次采用冷气多次起动技术、自燃点火技术、燃烧不稳定抑制技术、超大尺寸推力室不锈钢3D打印制造技术、涡轮盘热力组件3D打印技术等。

天龙三号高目标决定其首飞高收益的同时伴随高风险。如果验证成功，证明天龙三号从发动机到整箭都能由企业自主掌控，议价权和迭代速度都会大幅提升。本次故障发生在一子级飞行阶段，说明核心动力系统集成的挑战仍未解决。

对比之下，蓝箭航天是三家中最接近可复用商业闭环的企业。朱雀三号遥一运载火箭，一级采用9台天鹊12A液氧甲烷发动机，设计重复使用次数不低于20次，成熟后航区回收状态下近地轨道运载能力不低于18吨。2025年12月3日，朱雀三号成功入轨，火箭一级在超音速再入气动滑行阶段积累有效飞行数据，验证了冷气反作用控制系统与栅格舵的复合控制策略及制导算法，但在着陆段点火后出现异常，坠毁于回收场坪边缘，回收失败。预计2026年遥二箭将再次开展回收试验。

力箭二号确认商业航天进入中型运力时代

	力箭二号	天龙三号	朱雀三号
	中科宇航	天兵科技	蓝箭航天
<b>首飞基本信息</b>			
首飞时间	2026年3月30日	2026年4月3日	2025年12月3日
	成功	失利	基础型部分成功
首飞结果	将新征程01星、新征程02星（轻舟初样试飞船）、天视卫星01星送入预定极地轨道	火箭飞行异常，具体原因正在分析排查	二级入轨成功；一级着陆段点火后异常，回收失败
<b>运载能力</b>			
LEO 运力	12 吨	17 ~ 22 吨	基础型8~11.8吨；改进型12.5~21.3吨
SSO 运力	8 吨	10 ~ 17 吨	--
<b>构型与参数</b>			
构型	CBC 三芯并联（3CBC），两级	光杆两级串联	光杆两级串联
发动机	一级：YF-102 × 9（每芯级3台） 二级：YF-102V × 1	一级：天火-12（TH-12）× 9 二级：天火-12V（TH-12V）× 1	基础型：TQ-12A × 9；改进型一级：TQ-12B × 9 基础型：TQ-15A × 1；改进型：TQ-15B × 1
燃料	液氧 / 煤油 首飞一次性使用	液氧 / 煤油 首飞一次性使用	液氧 / 甲烷 首飞尝试回收失败
复用性	计划2028年实现集束回收；设计复用次数不少于20次	设计可垂直回收复用；设计复用次数不少于10-20次	设计可垂直回收复用；设计复用次数不少于20次

Source: 中科宇航, 天兵科技, 蓝箭航天, HTI

国际可复用商业火箭

	猎鹰九号 Block 5	重型猎鹰（Falcon Heavy）	新格伦（New Glenn 7x2）
所属主体	SpaceX（美国）	SpaceX（美国）	Blue Origin（美国）
市场地位	全球商业发射市场主导者；2025年完成165次发射，再创年度纪录；Transporter SSO共乘为小卫星市场领导者	现役运力第二重（仅次于SLS）；主打重型GTO与军事任务；已完成11次成功发射，获NSSL认证	Blue Origin重型旗舰，正进行NSSL认证；2025年11月第2次飞行首次成功回收一级；已签约Amazon Kuiper、Eutelsat等客户
LEO运力	22,800 kg	63,800 kg	
LEO运力（复用）	17,500 kg	30,000 ~ 57,000 kg	45,000 kg
构型	二级（光杆一子级+二级）	三芯捆绑（1个强化芯级+2个猎鹰九号侧助推器）+二级	二级（一子级GS1+二级GS2）
发动机	一级：9 × Merlin 1D+ 二级：1 × Merlin 1D Vacuum 合计 10台	三个芯级：27 × Merlin 1D+ 二级：1 × Merlin 1D Vacuum 合计 28台	一级：7 × BE-4 二级：2 × BE-3U Vacuum 合计 9台
燃料	液氧煤油	液氧煤油	一级：液氧甲烷 二级：液氧液氢
复用性	一子级、整流罩可复用	两侧助推器通常回收；芯级多数任务芯级消耗或坠毁	一子级可回收

Source: SpaceX, Blue Origin, HTI

## SpaceX 在试飞中收集数据

日期	型号	任务	失败类型	经调查确认的原因
2006/3/24	Falcon 1	Flight 1 / FalconSAT-2	任务失败 (全损)	燃料管道泄漏引发火灾, T+41s坠毁。DARPA调查确认: 螺母因盐水腐蚀失效 (非未拧紧)
2007/3/21	Falcon 1	Flight 2 / DemoSat	任务失败 (全损)	燃料晃动 (fuel slosh) 及滚转控制问题, 二级发动机提前关机, 飞至约289 km后未能入轨
2008/8/2	Falcon 1	Flight 3 / Trailblazer	任务失败 (全损)	分离时序错误: Merlin 1C关机后残余推力使一级再次撞击二级, 两段均坠入太平洋。马斯克2008-08-06确认
2012/10/8	Falcon 9 v1.0	CRS-1	任务失败 (部分)	1号发动机T+79s失压关机, Dragon顺利送达ISS; 但因ISS安全门限二级无法二次点火, 副载荷Orbcomm OG2未达预定轨道全损
2015/6/28	Falcon 9 v1.1	CRS-7	任务失败 (全损)	T+139s: 二级液氧箱内固定氨气瓶的钢支撑杆断裂, 氨气瓶冲破液氧箱超压爆炸。NASA IRT调查: 设计错误, 使用工业级 (非航天级) 铸件, 额定10,000磅实以2,000磅失效
2016/9/1	Falcon 9 v1.2	AMOS-6	地面/发射前失败	加注推进剂时爆炸: 二级液氧箱内COPV衬层起皱, 固化液氧渗入被点燃。SpaceX 2017-01-02官方声明确认, 卫星同毁, SLC-40发射台严重损毁
2018/12/5	Falcon 9 Block 5	CRS-16	回收失败 (主任务成功)	一级栅格翼液压泵停转, 火箭进入滚转, 导致着陆偏离。
2024/7/11	Falcon 9 Block 5	Starlink Group 9-3	任务失败 (全损)	振动疲劳导致压力传感器管路开裂, 液氧泄漏, 二级无法执行第二次点火。20颗卫星释放至近地点约135 km轨道, 全部再入大气层。
2025/2/1	Falcon 9 Block 5	Starlink 11-4	离轨失败 (卫星成功部署)	少量液氧泄漏导致TVC管线冻结, 二级失去姿态控制, 无法执行离轨点火, 软件自动跳过并钝化二级。残骸2月19日无控再入, 碎片落至波兰
2023/4/20	Starship IFT-1	首次综合飞行测试	任务失败 (全损)	Super Heavy发动机舱推进剂泄漏引发火灾, 切断主飞控, 载具偏轨, AFSS自动引爆。发射台基础结构因无隔热层严重损毁。FAA 2023-09-08关闭调查, 确认63项纠正措施
2023/11/18	Starship IFT-2	第二次综合飞行测试	任务失败 (全损)	Super Heavy(B9)反推时多发动机关机, 在墨西哥湾90 km处被主动引爆。S25成功入太空, 但排气钝化阶段泄漏引发火灾, 前后飞控计算机断联, 解体
2024/3/14	Starship IFT-3	第三次综合飞行测试	任务失败 (全损)	Super Heavy(B10)返回时10台内侧发动机无法重点火, 在462 m处爆炸。S28成功上升并完成部分测试, 但因横滚速率过高未完成发动机再点火, 未实现软着水
2025/1/16	Starship IFT-7	第七次综合飞行测试	任务失败 (上级段)	S33(Block 2)发动机舱"阁楼"区域氧/燃料泄漏引发持续火灾, 多台发动机依次关机, 载具解体。SpaceX 2025-02-24调查结论: 飞行中谐振响应远超测试预期, 引发推进系统应力泄漏。B14成功被捕获 (第2次)
2025/3/6	Starship IFT-8	第八次综合飞行测试	任务失败 (上级段)	S34(Block 2)在T+8:04四台发动机提前关机, 失控解体于巴哈马/佛罗里达上空。FAA 2025-06-12调查: Raptor发动机硬件故障致推进剂意外混合点燃, 与IFT-7原因不同。B15成功被捕获 (第3次)
2025/5/27	Starship IFT-9	第九次综合飞行测试	任务失败 (全损)	S35(Block 2)上升正常, 但惰行阶段主燃料箱增压扩散器 (diffuser) 故障, 推进剂泄漏失去姿态控制, 无控再入印度洋上空解体。B14 (首次复飞) 因大攻角实验使结构承载力超出预测, 着陆点火时爆炸。为IFT-7/8/9连续第三次上级段失败

Source: SpaceX, HTI

**事件三:**

2026年3月30日，Rocket Lab收购德国卫星激光通信企业 Mynaric 的交易获得德国监管部门批准，该收购于2025年启动，彼时 Rocket Lab 宣布拟以7500万美元现价加7500万美元对赌收购 Mynaric。Mynaric 为全球卫星激光通信核心器件供应商，对标美国 SDA（太空发展局）下一代安全星链主供商。经过为期一年的德国联邦经济和能源部的审查，该交易2026年一季度获批，Rocket Lab 预计交易将于4月完成。

**点评:****Rocket Lab 从运载火箭公司向全栈航天系统提供商持续演进**

Rocket Lab 通过收购 Mynaric 补齐星间与星地激光链路这一关键环节，持续深化发射+卫星制造+核心部件的垂直整合，为承接和自建星座与太空安全业务做能力铺垫。Rocket Lab 近年来多次收购多家核心部件供应商，意在实现发射、卫星和关键部件的一体化，走卖铲子+下矿双轮驱动路线。Mynaric 的激光链路终端是全球低轨星座、空间安全网络的核心基础设施之一，其技术可显著提升星间、星地链路带宽与抗干扰性。激光通信已成为星座运营商的供应链痛点——相关产品长期无法以高产量、可负担的价格供应。Rocket Lab 此前通过多次收购，已有将卫星子系统从小批量、长交期转变为大规模可负担供应的成功记录，此次收购 Mynaric 意在激光通信终端复制同样的路径。

Mynaric 成为 Rocket Lab 布局欧洲制造与市场的重要支点，交易完成后，Mynaric 的总部将继续设在德国慕尼黑，这将建立 Rocket Lab 在欧洲的第一个据点，并使公司能够扩大其支持德国和更广泛的欧洲太空计划的能力。

Mynaric 已是 Rocket Lab 的分包商，为 Rocket Lab 价值13亿美元的 SDA 主合同提供 CONDOR Mk3 光学通信终端，涵盖 Transport Layer-Beta Tranche 2 和 Tracking Layer Tranche 3，共生产36颗卫星。Mynaric 也是 SDA 其他合同的供应商，并且 Mynaric 和 Rocket Lab 拥有众多共同客户，包括商业星座运营商、卫星主承包商以及国防和民用政府机构。Rocket Lab 计划扩大 Mynaric 的生产规模并提高其现有制造能力的效率，从而增强客户对其终端按时按预算交付的信心。

**事件四:**

2026年4月初，亚马逊启动对卫星通信公司 Globalstar 的收购洽谈，拟通过收购获取其在轨卫星、通信频谱及地面站资源，以推进其低轨卫星互联网项目 Amazon Leo、与 SpaceX 星链形成竞争；此前苹果已入股 Globalstar 并锁定其大部分网络容量用于手机紧急卫星通信。

**点评:****亚马逊拟议收购 Globalstar: 频谱卡位与 LEO 一体化加速的战略逻辑**

亚马逊潜在收购 Globalstar，核心逻辑在于快速获取已授权频谱资产、现有在轨与地面基础设施，以压缩 Amazon Leo 商业化落地的时间成本，强化对 Starlink 的竞争态势。

Globalstar 对于亚马逊有几方面的战略资产价值：

(1) 频谱资产稀缺性构成核心价值。轨道频谱属受监管稀缺资源，不可复制。Globalstar 持有的 L 频段与 S 频段许可证已在全球数十个市场完成监管认证，并配套现有地面基础设施，短期内难以通过自建方式替代。频谱许可的全球覆盖范围是本次潜在交易的核心溢价来源。

(2) 直接收购基础设施缩短部署周期。Globalstar 目前运营24颗第二代低轨卫星，并规划发射下一代星座；同时在全球部署逾20座地面关口站，可支撑即时商业化运营。上述资产有助于亚马逊显著压缩 Amazon Leo 的部署节奏与资本开支。

(3) 直连手机 (Direct-to-Cell) 填补关键能力缺口。SpaceX 已在该领域形成先发优势，而亚马逊目前在此方向存在明显缺位。Globalstar 作为苹果 iPhone 及 Apple Watch 紧急卫星通信服务的基础设施提供商，收购后亚马逊可直接切入消费级卫星直连市场。

亚马逊的战略意图为加速构建低轨+云+终端一体化能力。亚马逊围绕低轨卫星的布局自2018年 Project Kuiper 启动、2019年公开披露，于2020年获 FCC 批准后进入重资本投入期。若本次收购落地，亚马逊有望将 Globalstar 的低轨卫星网络与地面基础设施接入 Amazon Leo 星座，并结合 AWS 云计算能力，在频谱、网络、云与终端四个环节实现一体化运营，向空间网络+算力服务+数据应用的基础设施化商业模式演进——其路径与 Starlink 向基础设施化、服务化延伸的逻辑高度一致。

从行业视角看，本轮并购浪潮的实质是头部玩家凭借资本、技术与流量优势，争夺频谱授权、产业链控制权与未来空间数据业务主导权。网络层正逐步成为估值与盈利预期的核心支撑。

本次交易最大的结构性障碍来自苹果。Globalstar 已将近85%的网络容量预留给苹果，用于支持其紧急卫星通信服务；苹果同时持有 Globalstar 约20%股权。这意味着亚马逊在完成股权交割之外，还须就容量分配安排与苹果另行谈判，协议重构的复杂性与不确定性不可忽视。此外，需要关注跨境并购可能触发的反垄断审查。

后续关注重点：并购进程与监管审批节奏；苹果容量协议谈判结果；Amazon Leo 与 Globalstar 网络整合的技术路径与时间表；以及直连手机服务的商用落地能力。

**事件五:**

2026年4月2日，NASA阿尔忒弥斯2号任务由SLS火箭发射升空，搭载4名航天员执行绕月飞行任务，为人类自1972年阿波罗计划后时隔54年首次载人重返月球附近轨道，任务为绕月飞行、不实施登月与月球轨道驻留。

**点评:****大国博弈推动登月任务主线，催化月球商业服务及太空旅游项目**

NASA阿尔忒弥斯2号任务定位为验证猎户座飞船生命维持系统及深空能力的技术验证飞行，为后续载人登月任务奠定基础。值得关注的政策背景是，月球门户（Lunar Gateway）计划已于2026年3月被取消，显示NASA在预算压力下正进行资源集中，将投入向核心载人登月能力倾斜，而非分散于轨道基础设施建设。这一调整短期内对部分承包商形成压力，但中长期有利于登月主线的提速推进。

SLS火箭本次执行第二次飞行任务。其双固体助推器与四台RS-25发动机共产生约880万磅推力，成功将重达575万磅的整体系统送入深空轨道。SLS的高成本结构（单次约40亿美元）是市场长期诟病所在，但其作为阿尔忒弥斯计划不可替代的近期主力运载工具地位短期内不会改变。波音（BA）、洛克达因等核心供应商订单能见度维持稳定。

我们更关注本次任务对商业航天的催化效应。成功的载人深空验证将：

1. 加速月球商业服务（通信、运输、资源开采）、太空旅游项目的商业立案进程；
2. 为国防部深空态势感知项目提供背书，带动相关防务承包商。

**事件六:**

2026年4月7日21时32分，长征八号运载火箭在海南商业航天发射场点火起飞，以“一箭十八星”方式将千帆星座第七批组网卫星送入预定轨道，发射任务圆满成功。执行本次任务的长征八号为捆绑2个助推器的基本构型，700公里太阳同步轨道运载能力不低于5.5吨。本次任务由中国航天科技集团所属中国长城工业集团有限公司作为总承包商提供发射服务，这是长征系列运载火箭第636次发射。

**点评:**

发射节奏加快，千帆星座组网加速推进。千帆星座分三期部署：一期部署648颗卫星，提供区域网络覆盖；二期部署1296颗卫星，提供全球网络覆盖；三期规划超过1.5万颗卫星，提供多元业务融合服务。今年，长八系列火箭将开启高密度发射模式，持续助推我国低轨卫星互联网星座建设和商业航天高质量发展。本次任务大幅缩短了测发流程，提升了测发效率，为后续高密度发射任务的开展提供了有力支撑。自2024年8月首批组网发射以来，千帆已完成七次“一箭十八星”。

本次由长八在海南商业发射场执行，验证商业发射场常态化高频次运营能力。一号工位采用“新三垂测发模式”，将箭体分段垂直转运，总装在发射区完成——这一模式大幅降低了发射成本和厂房占用时间，未来有望实现每周一次发射的高密度任务需求。对比SpaceX猎鹰9高密度发射模式，中国商业航天正沿相似路径快速追赶。

600颗是商业化临界点，下游订单释放可期。千帆星座由上海垣信卫星科技有限公司负责建设运营，服务于“一带一路”沿线及中资出海企业的高速、低延时卫星宽带需求。垣信董事长张琦于2026年3月公开表示，星座预计年内实现全球初步覆盖。观察者网援引知情人士测算，在轨规模达600颗时，垣信将具备争取50亿元级商业订单的能力。结合泰国国家电信、巴西TELEBRAS、空客集团等已签署合作协议，以及2025年1月邮轮宽带首测成功，商业化进程有望加速。

**事件七:**

北京时间2026年4月9日3时38分，我国在太原卫星发射中心使用长征六号改运载火箭，成功将卫星互联网低轨21组卫星发射升空，卫星顺利进入预定轨道，发射任务圆满成功。

**点评:**

长征六号甲运载火箭由上海航天技术研究院承担总体研制工作，作为中国首型固液捆绑构型运载火箭，其近地轨道（LEO）运载能力不低于8吨，太阳同步轨道（SSO）运载能力不低于4吨。火箭全长约50米，起飞质量约530吨，芯级动力系统配置两台YF-100液氧/煤油发动机，并在箭体周侧对称捆绑四台固体助推器。从工程技术视角审视，CZ-6A的核心竞争力体现在以下两个维度：

1. 高效的测发响应能力。依托太原卫星发射中心智慧化发射工位的系统支撑，长征六号甲具备14天测发周期的快速响应能力，可有效匹配中低轨道卫星组网阶段的高密度发射节奏。就这一指标而言，其在全球同量级运载火箭中目前处于第一梯队。

2. 高度集成的智能化发射流程。长征六号甲在发射操作层面实现了三项国内首创：率先应用推进剂自动对接加注技术；率先引入零秒脱落连接器技术；并在加注流程启动后，首次实现发射场前端区域的全面无人值守状态。上述能力的综合应用，为支撑未来高频次持续发射奠定了重要的工程基础。

本次任务紧随 4 月 7 日长征八号执行千帆星座第七批组网发射之后，48 小时内中国低轨星座实现第二次连续入轨。自 2022 年 3 月完成首飞至今，CZ-6A 已积累起可靠的在轨飞行数据，工程成熟度已具备支撑批量化交付的能力基础。凭借 14 天的测发周期优势，该型火箭在同吨位运载平台中具备显著的任务响应速度，是低轨星座规模组网阶段不可或缺的核心承运平台之一。

## APPENDIX 1

### Summary

SpaceX has exerted pressure on the commercial launch market, forcing commercial aerospace players on both the Chinese and U.S. sides to accelerate their evolution. China has ramped up rocket payload capacity and launch frequency, while major U.S. aerospace players are accelerating their transformation into full-stack system providers through capital consolidation.

#### I. China's Private Rocket Sector: Breakthrough in Medium-Lift Threshold, Accelerated Route Differentiation

The successful maiden flight of Gravity-2 has set a new record for single orbital payload capacity among China's private rockets with its CBC clustered configuration. In its non-reusable configuration, the launch cost of Gravity-2 has been reduced to 30,000 RMB per kilogram. In this launch, CAS Space adopted a steady and progressive approach, striking a balance between commercial certainty and R&D risks. By procuring the YF-102 engine, which has successfully completed multiple missions, the company prioritized engineering maturity over aggressive technological stacking. For satellite operators with clear on-orbit timelines, predictable delivery windows themselves constitute a certainty premium, which is expected to be quantitatively reflected in subsequent commercial contract negotiations.

In contrast, Tianbing Technology has chosen a high-risk, high-reward path. Its rocket boasts a low Earth orbit (LEO) payload capacity of 17 to 22 tonnes, with its first stage equipped with nine domestically developed Tianhuo-12 engines operating in parallel, directly competing with SpaceX's Falcon 9 launch vehicle. The Tianhuo-12 engine integrates more than 40 key technological innovations in a single design, placing already high engineering validation pressure on its maiden flight; notably, the Falcon 9 required six failed attempts to establish its reliability baseline.

A key company to watch is LandSpace with its Zhuque-3 rocket. Among China's current private rocket players, Zhuque-3 is technologically advanced, having successfully reached orbit with a domestically developed engine and conducted recovery tests near the recovery zone edge. A second recovery test is planned for 2026. If the recovery verification succeeds, LandSpace will reshape its cost structure and enhance its competitiveness.

#### II. Increased High-Frequency Launches for LEO Constellations

The Long March 8 and Long March 6A completed constellation deployment launches within 48 hours, demonstrating that China's commercial aerospace launch infrastructure is capable of stable, high-frequency delivery. The Long March 8's "new three-vertical launch and test mode" moves the assembly process forward to the launch zone, while the Long March 6A's 14-day launch and test cycle ranks among the global first tier for its class, supporting the feasibility of weekly launch densities in the future.

Since the first batch of satellites entered orbit in August 2024, the Qianfan Constellation has completed seven launches featuring "one rocket carrying 18 satellites". The chairman of Yuanxin Satellite has publicly confirmed the goal of achieving initial global coverage within the year. The market projects that once the on-orbit scale reaches 600 satellites, it will unlock commercial orders worth approximately 5 billion RMB.

#### III. Major U.S. Players: Accelerated Vertical Integration, Valuation Restructuring Driven by Expanded Core Capability Boundaries

Starlink has established a significant first-mover operational moat in the low Earth orbit broadband service market. As a result, the strategic focus of leading U.S. commercial aerospace players has rapidly shifted from competition in launch capacity to building full-stack system integration capabilities.

Rocket Lab's acquisition of Mynaric has received regulatory approval, further advancing the company's vertical integration. In recent years, Rocket Lab has acquired multiple core component suppliers, aiming to deepen integration across launch services, satellites, and critical components, pursuing a dual-driven strategy of "selling shovels and mining". Through this acquisition, Rocket Lab has completed its full industrial chain closed loop, laying a solid foundation for undertaking large-scale commercial constellation projects and developing its own medium- to long-term proprietary constellations. Rocket Lab's valuation benchmark should shift from a pure launch service provider to an aerospace system integrator.

Amazon's proposed acquisition of Globalstar follows a strategically analogous logic, yet with greater emphasis on asset scarcity. Amazon's Project Kuiper still lags significantly behind Starlink in on-orbit scale and service coverage depth. However, Globalstar holds L/S band licenses covering dozens of regulatory jurisdictions worldwide, representing scarce regulatory assets that cannot be quickly replicated through new applications. The acquisition route bypasses the lengthy spectrum application process and leverages Globalstar's existing Direct-to-Cell network infrastructure to fill the capability gap in direct consumer terminal connectivity.

Upon completion of the transaction, Amazon will form a four-layer integrated capability architecture encompassing spectrum assets, satellite networks, AWS cloud infrastructure, and consumer terminals, with a strategic evolution path highly symmetrical to Starlink's expansion into integrated communications infrastructure. The core execution risk centers on Apple: approximately 85% of network capacity is constrained by existing agreements, and renegotiations for capacity restructuring represent a critical path dependency for the transaction, requiring ongoing monitoring.

Against the backdrop of shifting risk-on sentiment in the U.S. market under the TACO macro framework, commercial aerospace presents two structural opportunity themes in the current market cycle, each with distinct risk-return profiles.

First, on the Chinese side, optimism surrounds high-value core segments of the domestic satellite and rocket supply chains. As China's low Earth orbit satellites enter a high-density networking phase alongside steady improvements in launch capacity, demand will rise for key satellite and rocket components including phased array antennas, laser communication terminals, on-board processing chips, and star trackers. These segments feature high technological barriers and clear logic for domestic independent controllability.

Second, opportunities exist for valuation restructuring among U.S. full-stack integration platforms that have achieved commercial closed-loop operations. By acquiring supplier Mynaric, Rocket Lab has reduced costs and further solidified its role as a system integrator, positioning itself for potential valuation restructuring.

Risks: The normalisation of commercial operations may not proceed as anticipated; progress on acquisitions may not meet expectations.

## 附录 APPENDIX

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