

Table 1: The most important Iranian launch vehicles and launch systems

system	year of introduction	type	capacity/orbit	characteristics
Safir	2008	launch vehicle	LEO	based on the Shahab-3/Nodong-1; variants Safir-1, 1A, 1B, 1Bt; significant experience in multistage technology, telemetry, and flight control
Simorgh (Safir-2)	2010	launch vehicle	up to 250 kg, 500 km distance	four engines from the Safir family; transition to heavier launch vehicles
Saman-1	2017	orbital transfer system	transfer between orbits	Arash-20 solid-propellant propulsion system; autonomous navigation, cold-gas engines
Sarir	not known	planned launch vehicle	allegedly up to 1000 kg, 1000 km distance	only referred to in unofficial sources
Qased	2020	military launch vehicle (IRGC)	425–500 km	three-stage; launched Noor-1, Noor-2, and Noor-3
Qaem-100	2024	military launch vehicle (IRGC)	LEO	three-stage solid-fuel rocket; launched Soraya and Chamran-1

Table 2: The most important Iranian satellite programmes

satellite	year	launch system	function	characteristics
Sina-1	2005	Kosmos-3M (Russia)	remote sensing, communications	first Iranian satellite
Omid	2009	Safir	telemetry	first entirely domestic satellite
Rasad-1	2011	Safir	aerial reconnaissance	15.3 kg; approx. 150 m resolution
Navid	2012	Safir	cameras, weather data	50 kg microsatellite
Fajr	2015	Safir-1B	aerial reconnaissance	first Iranian satellite with cold gas propulsion
Noor-1	2020	Qased	military reconnaissance	first Iranian military satellite
Noor-2	2022	Qased	military reconnaissance	orbit approx. 500 km
Noor-3	2023	Qased	military reconnaissance	24 kg; resolution 4.8 – 6 m
Khayyam	2022	Soyuz (Russia)	high-resolution earth observation	600 kg; approx. 1 m resolution
Soraya	2024	Qaem-100	technology testing	record orbit of 750 km
Mehda	2024	Simorgh	technology demonstrator	launch together with Keyhan-2 and Hatef-1
Keyhan-2	2024	Simorgh	navigation technology	Salran CubeSat
Hatef-1	2024	Simorgh	IoT communication	Salran CubeSat
Pars-1	2024	Soyuz (Russia)	remote sensing	134 kg; three cameras
Chamran-1	2024	Qaem-100	orbital manoeuvres	60 kg; cold gas propulsion
Nahid-2	2025	Soyuz-2.1b	communication	110 kg; three-axis attitude control
Zafar-2	2025	Soyuz (Russia)	remote sensing	part of 2025 triple launch
Paya	2025	Soyuz (Russia)	remote sensing	agriculture, water resources, disaster preparedness
Kowsar-1.5	2025	Soyuz (Russia)	remote sensing/IoT	combination of Earth observation and sensor data networks

Graphic by Hessam Habibi Doroh

Table 3: Research rockets and biological missions

system	year	mission	characteristics
Kavoshgar-3	2010	mouse, turtle and worms	telemetry and re-entry tests
Kavoshgar-5	2011	monkey	suborbital biological mission
Kavoshgar-6	2013	monkey	up to approx. 120 km altitude
Pishgam	2013	monkey	first successful return of a primate

Table 4: Spaceports and ground infrastructure

site	location	function	characteristics
Imam Khomeini Space Launch Terminal (Semnan)	Semnan Province	main launch site	since 2017; Safir and Simorgh launches
Chabahar Space Port	Sistan-Baluchistan Province	future main launch site	strategic situation at the Gulf of Oman; fully operational by 2031/32 (planned)
Alborz Space Centre	Mahdasht (Karaj)	data centre and remote sensing	national data archive and remote sensing laboratory
Asadabad ground station	Hamadan	tracking and communication	part of the national network
Bumehen ground station	Tehran	tracking and communication	satellite control
Isfahan ground station	Isfahan	tracking and communication	national infrastructure
Mashhad ground station	Khorasan Razavi	tracking and communication	national infrastructure
Qeshm ground station	Hormozgan	tracking and communication	Persian Gulf
further stations	Semnan, Chabahar, Abadan, Khorramshahr	tracking and communication	national cover

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