

ANNOUNCEMENT OF OPPORTUNITY

LAUNCH OF SATELLITES ON THE DEMONSTRATION FLIGHTS OF *SPECTRUM* AND *RFA ONE*

IN COORDINATION WITH



ORGANIZED BY



FLIGHT OPPORTUNITIES



Prepared by: German Space Agency at DLR – Department Robotics, Digitalization and AI
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1. Introduction

The German Space Agency at DLR (hereinafter referred to as Agency) undertakes statutory tasks in the space sector on behalf of the German Federal Government. This includes the implementation of the space strategy of the Federal Government, the development and management of the national space programme, and the representation of the interests of the Federal Republic of Germany in space-related international bodies in accordance with the tasks assigned.

To boost commercial initiatives within the European launch sector and to enable competitive launch services, the European Space Agency (ESA) co-funds and assists the pre-commercial development of new European space transportation services within their *Commercial Space Transportation Services and Support* programme (C-STs, Boost!). Germany is the leading contributor of this ESA programme. The Agency implemented a national microlauncher competition to select launch services providers for receiving a support letter to apply for ESA's co-funding. End of April 2021, Isar Aerospace Technologies GmbH (Isar Aerospace) was selected as the winner of the first competition round and in April 2022 the Rocket Factory Augsburg AG won the second round of the competition. Thus, Germany supports their proposal for the co-funding of their demonstration flights to take place at the end of the year 2023.

As participation condition of the German microlauncher competition, both winners will offer launch opportunities for institutional and commercial payloads of up to 150 kg total mass including adapters and/or dispensers on each of their two demonstration flights of the *Spectrum* launch vehicle (Isar Aerospace) respectively the *RFA One* launch system (Rocket Factory Augsburg). The number of payloads per flight is not pre-defined. The selection of payloads will be done by the Agency in consultation with the launch services providers and ESA.

The standard launch services - as described in section 2.6 - will be free of charge for the selected payloads. Further services as well as non-standard services are to be discussed with the launch service provider and associated cost as well as own cost will have to be borne by the payload owners.

The objective of this Announcement of Opportunity is to select payloads for the second demonstration flight of the *Spectrum* launch vehicle (the payloads for its maiden flight in 2023 have already been selected in 2021) and for the maiden as well as the second demonstration flight of *RFA One*. The Announcement of Opportunity describes the conditions of the launch opportunities offered through the Agency for European small institutional and commercial payloads and briefly describes the conditions to submit a proposal for potential payloads.

2. Description of the opportunity

2.1 Launch Vehicles

Spectrum - designed, built and operated by Isar Aerospace Technologies GmbH. *Spectrum* can launch payloads of up to 1,000 kg to LEO. The two-stage launch vehicle is scheduled to have its first flight in 2023.

RFA One – designed, built and operated by Rocket Factory Augsburg AG. *RFA One* can deliver payloads of up to 1,300 kg to SSO. The three-stage launch system is scheduled to have its first flight in 2023.

2.2 General Conditions

This Announcement of Opportunity is open to any European institutional or commercial satellite customer of launch services having its seat in either the European Union (EU) or an ESA member state. For the sake of clarity, European institutional and commercial satellites refer to satellites operated by or for the benefit of the following entities, irrespective of the launch service procuring entities:

- National governments, agencies and other public entities and undertakings which are part of the administration of ESA member states and/or EU member states,
- Universities and public research centres of EU and ESA member states
- Teams of students from European universities,
- ESA,
- the EU,
- Private companies ([small- and medium-sized enterprises](#) including start-ups) of EU and ESA member states
- European international organisations, other than ESA, which are composed in terms of number of member states, mainly of ESA member states and/or EU member states.

Furthermore, a potential European institutional and commercial customer may provide more than one satellite or may syndicate with other potential institutional and commercial customers. In such case, the respective customers shall announce a consortium manager as sole negotiation partner and shall provide all necessary parts to accommodate payloads at their own expenses.

All potential European institutional and commercial customers meeting the requirements laid out in this Announcement of Opportunity are invited to submit their application, as per paragraph 3.2 of this document.

2.3 Payload Classes

The maximum aggregated mass of the payloads eligible under this Announcement of Opportunity is 150 kg per flight. This includes pico-/nano satellites, stacks of pico-/nano satellites, as well as micro satellites meeting the mass requirement and fitting into the volume under the fairing which is specified in the respective rocket's Payload User Guides (PUG).

2.4 Technical Requirements

Each candidate mission shall comply with the design and flight environment requirements from the applicable version of the respective Payload User Guides. Please contact Isar Aerospace (launch@isaraerospace.com) respectively Rocket Factory Augsburg (launch@rfa.space) for the current version of their PUG.

2.5 Orbit

The following reference orbits* are being addressed:

	Launch – A	Launch – B	Launch – C
Altitude	400 km to 600 km	500 km	500 km
Eccentricity	0 to 0.2	0	0
LTAN	TDB	TBD	TBD
Inclination	SSO	SSO	SSO
Launch Window*	2 nd Half of 2023		1 st Half of 2024

*Disclaimer: all reference orbits and launch windows are subject to change and will be finalized when concluding launch service agreements between selected payload suppliers and the launch service provider.

Potential payload providers are therefore requested to explicitly identify, together with their preferred orbit, the flexibility of their payload to other possible orbits.

2.6 Standard Launch Services

The standard launch services for all flights will be free of charge to the selected customers:

- Assignment of a mission manager by the launch service provider
- Launch licensing
- Mission analysis (coupled load analysis, thermal, trajectory) and design
- Interface control
- Payload flight acceptance review (incl. range safety)
- Provision of payload processing facilities three weeks prior to launch with ISO 8 cleanroom conditions
- Payload encapsulation and integration to launch vehicle
- Environmental control under fairing for the time being encapsulated with ISO 7 cleanroom conditions
- Electrical connectivity during payload processing, launch vehicle assembly and on-pad operations
- Payload interface compliant with commercially available separation systems
- Provision of a standard electrical payload interface or integration of a customer provided electrical payload interface
- Launch operations and 3-axis or spin-stabilized payload separation
- Live launch webcast
- Payload separation command and monitoring
- Payload separation verification and orbit injection report (incl. state vectors) after mission end
- Post-Flight report after successful launch

Further standard launch services are to be discussed with the launch provider.

2.7 Associated Cost for the Applicant

Non-standard services and associated costs are to be discussed with the launch providers and own costs will have to be borne by the payload owners. Own cost may include but is not limited to (see Payload User's Guide):

- Dispenser
- Sequencer
- Transportation cost to the launch site
- Propellant loading services

2.8 Further Requirements and Constrains

Potential payload providers shall submit a preliminary compliance matrix versus the technical and operational requirements outlined in the PUGs. The PUGs will be distributed to all interested institutional and commercial customers on request by e-mail (launch@isaraerospace.com and launch@rfa.space).

In order to properly perform the feasibility analysis and consequently support the definition of possible aggregates of several light satellites, potential payload providers are required to provide - to the best of their knowledge - their response to the [questionnaire](#) in Annex 2 – Questionnaire as well as the preliminary technical compliance in Annex 3 – Preliminary Technical Compliance Sheet.

3. Application and Selection Process

3.1 Overall schedule

The intended schedule for the candidate missions reads as follows:

Launch Windows:	Planned for 2023	Planned for 2024
Release of the AoO:	June 20th, 2022	
AoO response submission:	until October 15th, 2022	until April 30th, 2023
Candidate final selection:	by November 30th, 2022	by June 30th, 2023
Closing of Launch Service Agreements:	until December 31st, 2022*	until September 30th, 2023*

*target dates

3.2 Responses to the Announcement of Opportunity

The applications of all potential payload providers are to be delivered to the Agency (digital submission is sufficient). Any written communication shall be addressed to:

German Space Agency at DLR
 Robotics, Digitalization and AI
 Mr. Andres Luedeke
 Königswinterer Str. 522-524
 53227 Bonn
 Germany
 E-Mail: mikrolauncher.payload@dlr.de

3.3 Application Process

The announcement process for the launch opportunities reads as follows:

1. The agency publishes the Announcement of Opportunity (see [Microlauncher Competition homepage](#))
2. The applicant submits a Notice of Intent via email to the agency, preferably until 15 July 2022 (see Annex 1 – Notice of Intent)
3. The applicant submits its application per email to the agency. The application comprises:
 - The Questionnaire (see Annex 2 – Questionnaire)
 - The Preliminary Technical Compliance Sheet. The information in this form must be agreed with the launch service providers (see Annex 3 – Preliminary Technical Compliance Sheet).
 - The confirmation that the applicant’s spacecraft and mission will be compliant with the DLR Space Debris Mitigation Requirements (see Annex 4 – Compliance with DLR Space Debris Mitigation)
4. The agency confirms the reception of the application, analyses the application for formal compliancy and informs the applicant about the result and the next steps

Further information on the microlauncher competition and the payload selection process can be found on the Agency's [Microlauncher Competition homepage](#) respectively the Agency's [Small Satellites Homepage](#). Any questions related to the filling out of the required form sheets can be posed anytime by sending an email to mikrolauncher.payload@dlr.de.

3.4 Selection Process

Based upon the responses to this Announcement of Opportunity, the potential payloads will be selected by a jury of experts. Following criteria will be considered:

Step 1 - Compatibility with the formal and technical criteria of this announcement

- Provision of full set of application documents by the applicant until 15 October 2022 respectively 30 April 2023
- Selection is based on following programmatic constraints:
 - Compliance with formal requirements referring to section 2
 - Compliance with mass and volume margins
 - Timeliness with frequency coordination (ITU) and further national registrations
 - Timeliness of satellite and conformity with launch window
 - Conformity with target orbit
 - Preliminary Technical compliance with the respective Payload User Guides
 - Compliance with DLR Space Debris Mitigation requirements

Step 2 - Agency selection of payloads

The agency may contact the applicant to streamline the information to be prepared for the evaluation, either via a virtual interview and/or further information requests. Selection will be evaluated based on:

- Mission uniqueness in terms of science and technology
- Satellite development status
- Alignment with European- and national strategies
- Attractiveness of the proposed mission (number of satellites, cooperation with other parties, transfer potential, complexity of payload integration and operability)
- Overall payload risk assessment

Step 3 – Final selection of payloads by jury members:

Independent jury members of the Agency evaluate the payloads based on the previous information

Final selection by the Agency will be performed after an exchange on technical and programmatic compatibility between the launch service providers and the selected applicants and formalized through written launch service agreements between the launch service providers and the final-selected applicants. There will not be any contract between either the Agency or the European Space Agency and the payload supplier(s).

4. Disclaimer of Liability

A legal entitlement to conclude a contract or to get any right against the Agency, ESA, or the launch services providers is not granted by this Announcement of Opportunity. No claim against the Agency shall arise at any time during the course of the abovementioned process.

This Announcement of Opportunity is limited to the selection of potential candidates of suppliers of European institutional and commercial payloads for the planned demonstration flights.

It can result in above described launch service agreements providing free-of-charge standard launch services to these selected payloads. Any other cost, including non-standard launch services, payload adapters or dispensers, and payload customers own cost will remain at the charge of the respective payload suppliers.

The Agency must not be held liable for any services within the framework of a potential subsequent contract. This includes, but is not limited to, the flight schedule, the flight operation, and the flight success.

Furthermore, the flight opportunity for the *RFA One* rocket is currently pending placement of the ESA C-STS Boost! programme contract between ESA and Rocket Factory Augsburg AG, currently expected to happen in Q3 2022. Isar Aerospace is already in contract with ESA for the second Spectrum flight under the C-STS Boost! programme.

5. Privacy Policy

The Agency will comply with data protection regulations when processing personal data and when passing on this data and will ensure this compliance by means of technical and organizational measures in accordance with the latest state of the art.

Information requirements according to Art. 13 General Data Protection Regulation (GDPR).

The following information provides you with an overview of the processing of your personal data (hereinafter referred to as "data") concerning the procedure surrounding the launch of satellites on a *Spectrum-* or *RFA One* demonstration flight and informs you of your rights.

The data processing entity and thus the responsible entity within the meaning of the General Data Protection Regulation is:

Deutsche Raumfahrtagentur im Deutschen Zentrum für Luft- und Raumfahrt e.V. (DLR)
Königswinterer Straße 522-524
53227 Bonn
datenschutz@dlr.de

Where reference is made below to "we" or "us", this always refers to DLR. We process data in accordance with the provisions of the European Data Protection Regulation (hereinafter "GDPR") and the German Federal Data Protection Law (hereinafter "BDSG"). You can reach our data protection officer at the above address, with the addition "To the data protection officer" or at the above e-mail address.

Your data will be collected and processed to enable you to participate in the procedure concerning the launch of satellites on a *Spectrum-* or *RFA One* demonstration flight in accordance with the conditions of participation. For this purpose, we use your participation documents, the communication data contained therein as well as data of your employees on the basis of Article 6 para. 1 lit. b) GDPR. In order to participate in the procedure, we require all data from you that is necessary for the participation in the procedure concerning the launch of satellites on a *Spectrum-* or *RFA One* demonstration flight and the implementation of the launch and the fulfilment of the associated obligations or which we are obliged to collect. Your data will be shared on a strict need-to-know basis with ESA and experts of Isar Aerospace respectively Rocket Factory Augsburg involved in this process as well as the external expert jury. All external partners will commit to follow the procedures laid out in this section. We will not transmit the data to any third parties beyond.

The above data will be stored for a period of three years. You have the right to request information about the data stored by us at any time.

If data is incorrect or no longer up to date, you have the right to request its correction in accordance with Art. 16 GDPR. You also have the right to request the deletion of data pursuant to Art. 17 GDPR or the restriction of processing, Art. 18 GDPR. If you have provided data and the processing by means of automated procedures is based on your consent or on a contract, you have the right of data portability.

You may object to the processing of data pursuant to Article 21 GDPR if you do not wish to participate (for the future). Without the provision of the data, participation in an abovementioned launch event is not possible. Furthermore, you have the possibility to contact the responsible data protection authority, the Federal Commissioner for Data Protection, and to lodge a complaint if necessary.

In case of uncertainty, the German version of the announcement shall prevail over the English version.

Bonn, 20 June, 2022

6. Annex

6.1 Annex 1 – Notice of Intent

Notice of Intent

Launch Window: **2023**

2024

Name of the Organization: _____

Contact Person: _____

Organization Mailing Address: _____

Contact Telephone Number: _____

Contact E-Mail: _____

Name of the Payload/Mission: _____

Brief Description of the proposed Mission

Mission Objective: _____

Target Orbit: _____ [X] x [X] km, XX° Inclination, XX am/pm LTAN

Payload Mass: _____ X [kg]

Payload Dimensions: _____ [X] x [X] x [X] [cm x cm x cm] / [X] [U]

Planning and current Project Phase

Current Project Phase (e.g. Phase A, B, C, D): _____

Payload ready by: _____

6.2 Annex 2 – Questionnaire

CONTACT DATA						
Responsible Contact Person			Represented Institution			
Full Name			Name			
Role/Function			Address			
E-Mail						
Phone			Country			
MISSION OVERVIEW						
Mission Name and Abbreviation						
Mission Description						
Mission Objective						
Mission and/or Technological Uniqueness						
User(s) / Customer(s)						
SCHEDULE & PROGRAMME						
Planned Launch Date	Between _____ and _____		Number of Satellites			
Earliest Launch Readiness			Mission Lifetime [months]			
ITU Registration	<input type="checkbox"/> Not yet started <input type="checkbox"/> In Progress (since: _____) <input type="checkbox"/> Finished		Other national and/or international registrations	<input type="checkbox"/> Not yet started <input type="checkbox"/> In Progress <input type="checkbox"/> Finished <input type="checkbox"/> Not applicable		
CubeSat Dispenser	Project Schedule			Preferred Launch Opportunity		
<input type="checkbox"/> Provided by applicant <input type="checkbox"/> To be provided by Launch Provider (Rideshare) <input type="checkbox"/> To be determined <input type="checkbox"/> Not applicable	<input type="checkbox"/> Kick-Off <input type="checkbox"/> Mission Definition Review <input type="checkbox"/> Preliminary Requirements Review <input type="checkbox"/> Preliminary Design Review <input type="checkbox"/> Critical Design Review <input type="checkbox"/> Qualification Review <input type="checkbox"/> Launch Readiness Review			<input type="checkbox"/> Planned <input type="checkbox"/> Concluded: _____ <input type="checkbox"/> Planned <input type="checkbox"/> Concluded: _____ <input type="checkbox"/> Planned <input type="checkbox"/> Concluded: _____ <input type="checkbox"/> Planned <input type="checkbox"/> Concluded: _____ <input type="checkbox"/> Planned <input type="checkbox"/> Concluded: _____ <input type="checkbox"/> Planned <input type="checkbox"/> Concluded: _____		
<input type="checkbox"/> Launch A <input type="checkbox"/> Launch B <input type="checkbox"/> Launch C <input type="checkbox"/> No preferences ----- <input type="checkbox"/> Isar Aerospace <input type="checkbox"/> Rocket Factory Augsburg <input type="checkbox"/> No preferences						
TARGETED ORBITAL PARAMETERS ¹						
Type of Orbit (e.g. SSO)			Apogee ² [km]		to	
RAAN ² [degree]		to	Perigee ² [km]		to	
LTAN ² [degree]		to	Arg. of Perigee ² [degree]		to	
Inclination ² [degree]		to	Eccentricity ²		to	

¹ The payload will be provided a rideshare opportunity and is therefore constrained to the initially determined target orbit of the launch provider. Please provide information on the final orbit to be achieved for the mission.

² Please provide desired target as well as acceptable range in the form **target value [acceptable range]**

SATELLITE			
Mechanical Properties			
Wet Mass [kg]		Dry Mass [kg]	
Longitudinal Eigenfreq. [Hz]		Dimensions [cm] / [U]	
Lateral Eigenfreq. [Hz]		Interface ring diameter ["]	
Center of Gravity (CoG) position	$X_G: \text{_____} \pm \text{_____} \text{ mm}$ $Y_G: \text{_____} \pm \text{_____} \text{ mm}$ $Z_G: \text{_____} \pm \text{_____} \text{ mm}$	Moments of Inertia wrt. S/C ref. coordinate system where the S/C CoG is the origin	$\text{_____} \leq I_{xx} \text{ (kg.m}^2\text{)} \leq \text{_____}$ $\text{_____} \leq I_{yy} \text{ (kg.m}^2\text{)} \leq \text{_____}$ $\text{_____} \leq I_{zz} \text{ (kg.m}^2\text{)} \leq \text{_____}$ $\text{_____} \leq I_{xy} \text{ (kg.m}^2\text{)} \leq \text{_____}$ $\text{_____} \leq I_{yz} \text{ (kg.m}^2\text{)} \leq \text{_____}$ $\text{_____} \leq I_{zx} \text{ (kg.m}^2\text{)} \leq \text{_____}$
Separation		Propulsion	
Separation Adapter Type	<input type="checkbox"/> Clampband adapter <input type="checkbox"/> Clampband with umbilical connector <input type="checkbox"/> CubeSat Dispenser <input type="checkbox"/> Other (_____)	Propulsion System	<input type="checkbox"/> None <input type="checkbox"/> Chemical (solid/liquid) <input type="checkbox"/> Electrical <input type="checkbox"/> Other (_____)
Pref. separation directions wrt. S/C ref. frame	<input type="checkbox"/> None <input type="checkbox"/> To be provided separately	Propellant Name	
Separation Constraints (e.g. separation in Earth's shadow)	<input type="checkbox"/> None <input type="checkbox"/> To be provided separately	Density of Liquid [kg/m ³]	
Req. visibility duration for commissioning [s]		Propellant MEOP [bar]	
Max. angular rate and ΔV range for separation [°/s, m/s]		Fill Factor [%]	
Electrical & Thermal Characteristics			
Survival Temperature [K]	Min.	Max.	Volume Propellant Tank [l]
Temperature Regulation	<input type="checkbox"/> Active <input type="checkbox"/> Passive		Liquid Mass [kg]
Beginning of Life Power [W]			Pressurant Name
End of Life Power [W]			Density of Liquid [kg/m ³]
Battery Capacity [Wh]			Pressurant Mass [kg]
			Volume Pressurant Tank [l]
			Pressurant MEOP [bar]
MISCELLANEOUS			
Level of Cleanliness and Contamination (e.g. ISO 8)			S/C Sketch in stowed State incl. Reference Frame <div style="border: 1px solid black; height: 200px; width: 100%;"></div>
Accessibility Requirements and Constraints	<input type="checkbox"/> Not specified <input type="checkbox"/> To be provided separately		
Number of EGSE connectors required	<input type="checkbox"/> None <input type="checkbox"/> _____		
Number of connectors to the launcher required	<input type="checkbox"/> None <input type="checkbox"/> _____		
Ground Station Network Requirements	<input type="checkbox"/> Not specified <input type="checkbox"/> To be provided separately		
RF interface Requirements	<input type="checkbox"/> Not specified <input type="checkbox"/> To be provided separately		
In Flight EM Environment	<input type="checkbox"/> Not specified <input type="checkbox"/> To be provided separately		
On Ground EM Environment	<input type="checkbox"/> Not specified <input type="checkbox"/> To be provided separately		
Launch Campaign Requirements	<input type="checkbox"/> Not specified <input type="checkbox"/> To be provided separately		

Note: Currently unknown parameters and specifications are to be specified as TBD. For further information, please contact the following email address: mikrolauncher.payload@dlr.de.

6.3 Annex 3 – Preliminary Technical Compliance Sheet

APPLICANT: _____

LAUNCH PROVIDER: _____

	REQUIREMENT	COMPLIANCE STATUS (C, PC, NC, N/A)	COMMENT
R-01	Payload maximum mass		
R-02	Payload maximum volume		
R-03	Payload complies with longitudinal frequency requirement		
R-04	Payload complies with lateral frequency requirement		
R-05	Qualification demonstrates the Payload can withstand specified Quasi-Static Loads		
R-06	Qualification demonstrates the Payload can withstand specified sine environment		
R-07	Qualification demonstrates the Payload can withstand specified acoustic and random environment		
R-08	Payload withstand RF environment generated by the launcher and the launch range		
R-09	Payload complies with RF emission policy		
R-10	Payload materials comply with the outgassing and contamination requirements		
R-11	Late access approach		
R-12	Payload dummy provision		
R-13	Compliance statement on absence of insurance on launch and mission		
R-14	Payload complies with attitude and separation constraints		
R-15	The Payload development plan and status comply with the launch schedule		

Location, Date

Signature Applicant

Location, Date

Signature Launch Service Provider

6.4 Annex 4 – Compliance with DLR Space Debris Mitigation

The DLR space debris mitigation requirements are applicable for all space mission projects funded by DLR Space Agency. The requirements are derived from international standards as well as internationally recognized guidelines.

The requirements document will be provided to applicants for the Microlauncher Payload Competition on request (please contact Dr. Jan Grosser, jan.grosser@dlr.de).

The provided requirements document contains copyright protected material and is intended to be used exclusively mission-internally. The distribution of the requirements documents or parts from it without prior permission by DLR Space Agency is prohibited.

..... Please submit this statement as part of your application

Mission Name: _____

Mission Responsible: _____

Organization Name: _____

Country: _____

I hereby certify that,

- I have received the DLR space debris mitigation requirements document,
- I will fully comply with the DLR space debris mitigation requirements,
- I will provide the necessary space debris mitigation documentation for review by the German Space Agency at DLR. The delivery dates for the documents have to be agreed with the German Space Agency at DLR at least six weeks after closing of the launch contract with the launch provider,
- I will not distribute the requirements documents or parts from it without prior permission by DLR Space Agency,
- I will take advantage of the corresponding advisory support from the German Space Agency at DLR.

Location, Date

Signature