

Venus Express

A European Venus Orbiter

ANNOUNCEMENT OF OPPORTUNITY

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VENUS EXPRESS MISSION SUMMARY

Scientific Objectives	To carry out a comprehensive study of the atmosphere of Venus, the plasma environment and its interaction with the solar wind, and to study certain aspects of the surface of the planet.
Payload	Mapping Spectrometer, Wide Field Imager, IR and UV Spectral Sounders, Plasma Analyser, Magnetometer, Radio Science. Total Payload mass ~ 90 kg.
Spacecraft	Spacecraft 3 axes stabilized 1.7x1.5x1.5 m ³ , 2x2.9m ² solar panels, Available power 970W, 12 Gbit Mass Memory, Data transfer to Earth 500 Mbit/day – 6500 Mbit/day, dry mass: ~660 kg ; propellant: 570 kg. Mars Express design adapted to Venus environmental conditions.
Launcher and launch date	Soyuz/Fregat; Launch Window: 26 October - 24 November 2005. Launch mass: ~ 1270 kg ;
Transfer Trajectory	Direct interplanetary Earth-Venus transfer orbit and hyperbolic Venus approach trajectory. Cruise duration: 5 months
Venus Orbit	Highly Elliptical Polar orbit pericentre 250-400 km, apocentre ~ 66000 km. Period: 24 hours, Inclination ~ 90°. Latitude of pericentre 78-90° N
Operations	ESA Mission Operations, ESA Science Operations and Archiving. Communications: X-band (65W); S-Band (5W) back up for emergencies. Primary ground station: ESA Cebreros. Operational lifetime at Venus: 2 Venus sidereal days (486 earth days), fuel dimensioned for a possible extension of another 2 Venus days.
Programmatics	Venus Express is the second flexible mission of ESA's scientific programme. ESA is providing the Spacecraft, a Soyuz type Launcher, and the Mission and Science Operations. Spacecraft supplier: Astrium SAS (F). Spacecraft Integration and Testing: Alenia (I). Launcher Supplier: Starsem (F/Rus). National space agencies of Europe are expected to provide support for science instruments operations. Additional international partners may participate at different levels.

1 SUMMARY AND SCOPE

After being left unattended for more than a decade Venus will soon be again the focus for detailed studies by an orbiting spacecraft. Venus Express is an ESA mission for an in depth study of the atmosphere and some specific aspects of the surface of the planet. The Venus Express spacecraft will perform precise determination of the atmospheric circulation and composition and study the interaction of the atmosphere with the interplanetary medium. For the first time the surface will be studied by using the Infrared windows through the atmosphere. Venus Express represents a unique opportunity for Europe to further enhance the experience of exploring the, in several respects, most Earth-like of the planets in our solar system, following the success of Mars Express. It is an outstanding science opportunity that can be implemented at relatively low cost and risk as the mission derives much of its design and the programmatic approach from the Mars Express and Rosetta Programmes. It is an opportunity that was clearly recognised by the scientific community and was seized upon by the Agency.

Venus Express was approved by the ESA Science Programme Committee (SPC) for a launch in November 2005 at its meeting in Paris on 4-5 November 2002. With less than three years from approval to launch Venus Express is, by far, the fastest developed scientific mission of ESA to date.

The spacecraft and its associated infrastructure is developed and will be operated by ESA while the PI provided instruments and all instrument related activities, including operations and data processing/archiving, are the responsibility of the participating institutions and their respective national agencies.

This Announcement of Opportunity (AO) solicits the participation of the scientific community in the *Venus Express* Programme to increase further the scientific return of the selected investigations and of the mission as a whole. Specifically, this AO addresses the participation of:

- **Interdisciplinary Scientists (IDS)**
- **Supporting Investigators (SI)**

This AO is open to all ESA member states and to any other country having an agreement with ESA. It is foreseen to nominate up to four IDS:s and an unspecified number of SI:s. Nomination does not imply any funding from ESA and each proposer is responsible for securing his/her own funding from other sources.

Science management issues concerning the mission in general are addressed in the *Venus Express* Science Management Plan ESA/SPC(2005)21, rev. 1. Further information on scientific and technical aspects of the mission is available at the *Venus Express* web sites:

<http://sci.esa.int/venusexpress/>

http://www.esa.int/SPECIALS/Venus_Express/index.html

2 MISSION OVERVIEW

2.1 Introduction

Venus Express, an Orbiter for the study of the atmosphere, the plasma environment, and the surface of Venus was proposed to ESA in response to the *Call for Ideas* to re-use the Mars Express platform issued in March 2001. Venus Express, together with two other missions, Cosmic DUNE and SPORT Express, were selected for parallel Mission Definition Studies. These industrial studies, supported by expert science teams of the three missions, were conducted in parallel by Astrium-SAS (Toulouse, France) from mid-July to mid- October 2001. After study completion, the Venus Express mission was selected based on its science potential and as it best fitted within the given programme boundaries. The mission was eventually approved by SPC in November 2002.

Venus Express is a Principal Investigator (PI) type mission. In order to optimise the over all scientific output from the mission, the Venus Express Science Working Team (VSWT) is establishing the rules to balance the resource allocation for the different science investigations during the Venus operational phase.

ESA is responsible for the overall spacecraft and mission design, spacecraft procurement, spacecraft and payload integration, system testing, launch procurement, mission and science operations, acquisition and distribution of the science data and for the final data archive. The PIs are responsible for providing the scientific instruments and all services and activities related to these. This includes the operation of the instruments during flight, processing of the acquired data and preparations for the archiving. It is expected that the PIs will receive adequate funding for all activities by the corresponding national agencies.

2.2 Scientific Objectives

The scientific objectives of the Venus Express Mission [Ref. 1] are grouped into seven Scientific Themes, with the aim to carry out a comprehensive study of the atmosphere of Venus and to study to some detail the plasma environment of the planet and its interaction with the solar wind. Dedicated studies of the surface shall be performed as well. A detailed description of the background and justifications for the objectives are given in [Ref.2]. The science requirements are structured in accordance with the themes. The main Science Themes that have been defined are,

- Atmospheric Dynamics
- Atmospheric Structure
- Atmospheric Composition and Chemistry

- Cloud Layer and Hazes
- Radiation balance
- Surface properties and Geology
- Plasma environment and escape processes

The first three themes are divided in to sub-themes that refer to the upper, middle and lower parts of the atmosphere. The corresponding approximate limits for these regions are, above 110 km, between 110km and 60 km, and below 60 km.

In addition to the Science Themes, a number of major scientific questions have been formulated as a part of the science objectives. These questions to some extent go across the boundaries of the individual themes and studying them will ensure that the multi-disciplinary aspect of the mission is maintained.

- What is the mechanism and what is the driving force of the super-rotation of the atmosphere?
- Which are the basic processes in the general circulation of the atmosphere?
- What is the past and present water balance in the atmosphere?
- What is the role of the greenhouse effect in the past, present and future evolution of the planet?
- Is there presently volcanic and/or tectonic activity on the planet?

The answers to these questions, together with the comprehensive studies under the different themes, will lead to an improved understanding of the perhaps most fundamental question of all, namely, ‘Why is Venus so different from the Earth’, in spite of the similarities in terms of size, mass and distance to the sun?

2.3 Payload

The spacecraft is carrying a payload of seven scientific instruments with a total mass of approximately 90 kg. This payload addresses all the major science objectives, described in Section 2.2.

Given the short timescale as announced in the mission AO, which targeted a 2005 launch, existing experiments were encouraged in order to minimize costs and development time. Nevertheless innovative instruments were added when it could be demonstrated that adequate funding was in place and that they were technically mature. The payload was proposed as an integral part of the Venus Express mission proposal and as such, this same payload was studied in the initial competitive industrial study. A list of the selected instruments available from the Mars Express or Rosetta spacecraft and the new developments is shown in Table1.

Table 1: The instruments for Venus Express and their respective Principal Investigators.
Participating countries with hardware contribution in bold.

The Venus Express spacecraft was launched from the Baikonur Cosmodrome, Kazakhstan, on 9 November 2005 by a Soyuz/Fregat launch vehicle. The launch mass was about 1250 kg.

After launch, injection into earth escape trajectory and a five months cruise phase, the spacecraft will perform a sequence of orbit manoeuvres during the Venus approach phase (about 10 days prior arrival) to deliver it for the capture manoeuvre into an initially highly eccentric orbit (apocentre around 350000 km) at Venus. The arrival hyperbola will be such to inject directly into a polar orbit. The apocentre altitude will then be reduced in several steps by a series of manoeuvres at the pericentre. This procedure will be carried out with traditional chemical propulsion.

During observations an attitude strategy will be used such that the instruments can be pointed towards nadir or to a prescribed direction not far from nadir. The earth communications are assumed to be done during missions phases in which the observation payload will not be operated (e.g. after pericentre) by turning the spacecraft to point the body-fixed high gain antenna into the Earth direction. The spacecraft has the required data storage and computing capacity for the necessary autonomous operations during the scientific observational phases that are carried out without ground contact.

2.5 Programme participation

The fast way of implementing the Venus Express mission required a fast selection of the scientific payload. The payload was therefore proposed and selected as an integral part of the mission proposal. This represents a substantial saving of time compared to previous study cycles of medium-size missions of the Scientific Programme.

In order to further enhance the scientific output of the mission the scientific community are herewith invited to participate in the Venus Express mission in two additional ways:

- **Interdisciplinary Scientist (IDS)** proposals may be submitted by individuals, in response to this AO, for carrying out research in the form of data analysis and modelling in support of the mission and enhancing the scientific expertise already available in the PI teams. These investigations shall in particular address the multidisciplinary nature of the Venus Express objectives. The selected IDSs will become full members of the Venus Express Science Working Team.
- **Supporting Investigators (SI)** will be encouraged to submit proposals for various studies in support of the mission, and to participate in the data analysis and to assist in the further dissemination of the data to new scientific groups and communities. This can include e.g. studies of physical and chemical properties of atmospheric gasses at Venus like conditions. Also ground based telescopic studies related to the on board investigations will fall in this category. These scientists will not become formal members of the VSWT but may attend the VSWT meetings.

All the above individuals together with the Principal Investigators will have to support a strong ESA communications and public relations effort during all phases of the mission.

2.6 Schedule

AO SCHEDULE	
Issue of AO for IDS and SI	31 January 2006
Letter of intent due	10 February 2006
Proposals due	15 March 2006
Evaluation phase	March-April 2006
Recommendations by peer review committee	Mid April 2006
SSWG/SSAC Review	April 2006
SPC selection of IDS and SI	May 2006

Table 2: Venus Express AO schedule

Letters of Intent (LoI) to ESA by potential IDS:s and SI:s are due on 10 February 2006.

The schedule for the complete AO cycle is given in Table 2. The baseline Venus Express programme schedule is outlined in Table 3.

VENUS EXPRESS PROGRAMME SCHEDULE	
Issue of request for proposal for Mars Express Re-use	March 2001
End of review process and recommendation to SPC. SPC recommendation for Pre-Phase B study to ensure feasibility.	November 2001
SPC conditional approval for implementation pending payload funding resolution	July 2002
Full SPC approval for implementation	November 2002
System Requirements Review	November 2002
Preliminary Design Review	March 2003
Critical Design Review	April 2004
Flight Acceptance Review	1 July 2005
Shipment to Baikonur	5 August 2005
Launch	9 November 2005
Arrival at Venus	11 April 2006
Mission Commissioning Review	July 2006
End of nominal mission	Sept 2007
End of extended mission (if approved)	Jan 2009

Table 3: Venus Express Programme Schedule

2.7 Status of the Project

Venus Express was launched on 9 November 2005. The spacecraft and its scientific Instruments, which are in an excellent condition, have passed the Near Earth Commissioning Phase and is now cruising in a heliocentric orbit towards Venus where it will arrival on 11 April 2006.

The new ground station at Cebreros, Spain, is ready and fully functional and is maintaining daily contact with the spacecraft. Plans for the initial science operations have been established.

3 INFORMATION ON PROGRAMME PARTICIPATION

3.1 General Requirements

The proposals for *participation in the Venus Express* Programme in response to this AO shall be made bearing in mind the scientific objectives of the mission and the performance of the instruments, as well as the operational constraints.

3.2 Interdisciplinary Scientists

Proposals for Interdisciplinary Scientists (*IDS*) on the *Venus Express* mission are solicited via this AO. It is envisaged that a maximum of four IDS:s will be selected. The topics of the scientific areas addressed by the IDS shall be related to at least one but preferable more than one of the following Themes,

- Atmospheric Dynamics
- Atmospheric Structure
- Atmospheric Composition and Chemistry
- Cloud Layer and Hazes
- Radiation balance
- Surface properties and Geology
- Plasma environment and escape processes

Each IDS proposer shall have a solid experience in the field of the proposed investigation and may benefit from the active support of a team of scientific investigators and technical personnel in his/her home institute. The selection of the IDS's will be based on the excellence of the proposed investigation and on the scientific research and background of the proposer and their teams. The IDS will be selected in coordination with the Venus Express Principle Investigators. The PI:s will ensure that the IDS will have early access (i.e. within the six-month proprietary period) to the scientific data produced by the *Venus Express* instruments.

The IDS proposal shall include a broad overview of the themes addressed by the proposer. The objective of an IDS is to provide a truly interdisciplinary function, bringing together individuals and laboratories from a spectrum of scientific research. The proposed interdisciplinary topics shall be of outstanding interest to increase the scientific return of the Venus Express mission and thereby advance our scientific understanding of the planet Venus. The proposal shall include short curriculum vitae of the proposer and all participating personnel as well as a management structure and a financial statement.

The role of the IDS is, in addition to carrying out own research, to promote and coordinate the relevant research between the different individuals and groups involved. Where applicable, the IDS shall provide support and assistance to the relevant selected SI (see below) in order to allow these laboratories to make the most profitable use of the *Venus Express* data.

The IDS shall attend the Venus Express SWT meetings, and shall have a vote on equal footing with the PIs on all questions related to the mission and its scientific return.

The IDS shall provide active support to the Communications and Public Outreach activities of ESA, as defined in the Communications and Public Relations Plan.

3.3 Supporting Investigators

Proposals for Supporting Investigators (SI) associated to the *Venus Express* mission are solicited via this AO. There is no predefined limit to the number of Supporting Investigators to be selected. Supporting Investigators are solicited in three categories,

- For leading and executing laboratory investigations of material properties (i.e. gasses, and cloud particles) at physical conditions (temperature, pressure) in the ranges of interest, in support of the mission investigations.
- For leading and executing ground based observation campaigns supporting and enhancing the on board investigations.
- For carrying out specific studies with the data gathered on board, with the purpose of broadening the community involved in the data analysis. This may include studies by scientist not normally active in space research (f.ex. Earth geoscientists, meteorologists) and student projects.

Each SI proposal shall be led by a institute/laboratory representative. He/she may be supported by a team of scientific investigators and technical personnel in his/her home institute. These laboratories may include theory groups as well as experimental groups and/or data analysis groups. The selection of the SI will be based on the collective expertise residing in each particular laboratory and the relevance of their field of research with respect to their proposed activity.

The SI proposal shall include an outline of the relevant scientific field(s) addressed by the laboratory. The proposal shall also include short curriculum vitae of the laboratory

representative and other relevant personnel involved in managing the proposed activities, as well as a research and management plan. In case the SI proposal comes from a laboratory within a larger scientific institution, an endorsement from the head of this institution is necessary. An endorsement of the funding plan by the authority ultimately responsible should also be included.

The SI shall provide active support to the Science Communications and Public Outreach activities of ESA, as defined in the Science Communications and Public Relations Plan.

The SI will not be directly involved in the scientific management of the mission. Their interface to the mission may be provided by an IDS or a member of one of the PI teams. One of the main goals of the SI is to increase the involvement of Earth scientists in the mission and to cross-fertilize Planetary Science and Geosciences.

3.4 Data Rights and Scientific Data Archive

The ownership, access, use, and dissemination of raw and calibrated data resulting from the Scientific Instruments on Venus Express mission shall be governed by Chapter III, Section II paragraph 1 through 3 of the Rules on Information, Data and Intellectual Property, ESA/C/CLV/Rules 5 (Final), as adopted by the ESA Council Resolution on the Rules concerning Information, Data and Intellectual Property, ESA/C/CLV/Res. 4 (Final) [Ref 4]. The duration of the proprietary period as mentioned under paragraph 3 (b) in the referenced document shall be 6 month after reception of the data by the PI.

After this period, the scientific data products (both the raw data, together with relevant calibration data and the documentation necessary to use the data, and calibrated and processed data) from the mission shall become accessible by the scientific community. The Principal Investigator is responsible for the timely delivery of all products specified in Venus Express Archiving Interface Control Document (ICD). The funding for these activities are considered to be a part of the funding for the instrument cost at completion and therefore under the responsibility of the PI.

The Science Operations Centre will prepare the final Venus Express Scientific Data Archive (VSDA) within one year of the receipt of the complete data sets from the individual Venus Express science investigations. The present standard for the Planetary Science Archive is compatible with the NASA Planetary Data System (PDS) standard. The VSDA will be freely accessible online for scientists in all member states and in any additional participating countries.

Irrespective of the proprietary period, any data that ESA considers useful for its communications and public relations effort shall be made immediately available to the Agency.

3.5 Communications and Public Relations Plan

The Venus Express mission is attracting much public interest. Hence, careful advance planning of communications and public relations activities are of great importance. Each Principal Investigator must provide material for public relations and other public communications (e.g. World Wide Web) in real time. Dedicated media and communications experts will coordinate such activity.

During the development phase of the mission, ESA supports a Web home page on the Venus Express mission as an information tool for the scientific community and the general public. After launch, a more elaborated home page will include the latest news on the mission as well as preliminary scientific results obtained by the instruments as soon as they become available.

ESA has overall responsibility for planning and carrying out Communications and activities related to Venus Express. A general outline of activities will be provided in the form of a Communications and Public Outreach Plan. This plan must be formally agreed and adhered to by the PIs. However, for the definition and detailed implementation of this plan, ESA will make use of professional communications and public relations experts who will be selected at an appropriate time of the mission. These experts will work under ESA supervision and in full coordination with the scientific individuals responsible for the mission (Project Scientist and Principal Investigators).

The active cooperation of all scientists involved in the Venus Express mission is essential for the success of the related CPR activities. For this purpose, the Project Scientist will initiate and identify opportunities for publishing project related progress reports and scientific results. CPR materials suitable for release to the public will be provided by the members of the VSWT upon their own initiative or upon request from the Project Scientist at any time during the development, operational and post-operational phases of the mission. The specific nature of this material, if not specified in the CPR plan, is to be defined at the appropriate time.

3.6 Contacts with ESA

Before submission of proposals, requests for clarifications should be addressed to both the following ESA staff (one copy to each):

M. Coradini
Solar System Missions Coordinator
ESA HQ (SCI-C)
8-10, rue Mario Nikis
F-75738 Paris Cedex 15
France

Tel.: +33-1-53697555
Fax: +33-1-53697236
Marcello.Coradini@esa.int

H. Svedhem
Venus Express Project Scientist
ESTEC (SCI-SB)
PB 299
NL-2200 AG Noordwijk
The Netherlands

Tel.: +31-71-5653370
Fax: +31-71-5654697
Hakan.Svedhem@esa.int

During selection, ESA may arrange meetings with individual proposers and/or groups of proposers for clarification of the proposal(s). In addition, a presentation to the ESA Peer Review Committee may be requested. All proposers should be prepared to travel to an ESA establishment for such meetings, to discuss scientific as well as management and/or financial aspects during the evaluation phase, if requested.

3.7 Letter of Intent

In order to facilitate the flow of information in the scientific community between the different disciplines and the possibility for potential individual proposers to get in touch with the appropriate laboratories, Letters of Intent (LoI) to ESA are due on 10 February 2006 by potential IDS:s and SI:s. The LoI should be addressed either electronically or by normal mail or fax to M. Coradini (ESA HQ) and H. Svedhem (ESTEC) at the addresses indicated above. Even if not mandatory, submission of an LoI is in the interest of the potential proposer. All questions that will be directed to ESA in relation to the AO and the respective answers will be distributed to the individuals that have submitted an LoI.

3.8 Proposal Content

Proposals shall respond to the Venus Express science and mission objectives and programme constraints described in this AO and shall provide all requested information to permit a complete evaluation.

The detailed guidelines given below are of concern mainly for the IDS proposals. For SI proposals, various items can be simplified when appropriate, taking into account that for IDS:s scientific excellence of the proposed investigations is paramount, while for SI the capability of carrying out the proposed laboratory investigation/ground based observation or the dissemination of the data and how to encourage its analysis in the community should be the main focus.

Each IDS or SI proposal should include five parts:

- **Part I: Cover page/Executive Summary**
- **Part II: Proposed Scientific Investigations**
- **Part III: Curriculum Vitae of IDS or SI Proposers**
- **Part IV: Management Structure and Funding Plan**
- **Part V: Letters of Endorsement**

Each part shall be written in English, shall be bound together and all pages shall be numbered. The relevant category (i.e. IDS or SI) should be clearly indicated on the cover page.

Part I: Cover page/Executive Summary

- Cover Page

The Cover Page shall include:

- The title of the proposal
- The name, address, telephone and fax numbers and e-mail address of the Proposer
- An indication if the proposal concerns Interdisciplinary Scientist or Supporting Scientist
- If NASA funding is being requested for the proposal, it should be clearly stated on the Cover Page.

- Executive Summary

The Executive Summary shall include the title of the proposal, the names and institutions of the investigators and summary information. The following aspects shall be addressed within the 2-page limit:

- Scientific Background of Relevant Field(s)
- Scientific Objectives of Proposed Investigations
- Proposed Investigation in Context of the Venus Express Mission (IDS only)
- Scientific Analysis Plan

- Science Operations (IDS only)
- Coordination between IDS and Principal Investigators (IDS only)
- Young scientists involvement and dissemination of data, if applicable(SI only)
- Curriculum Vitae
- Management Structure and Funding Plan

Part II: Proposed Scientific Investigations

Part II of the proposal shall not exceed 15 single-spaced typewritten A4 pages, including illustrations, without reduction, and excluding table of contents. It shall be self-explanatory and shall contain all information needed for an evaluation of the proposal in the categories of Interdisciplinary Scientists or Supporting Investigator. The proposal shall adhere to the following table of contents:

- Table of Contents
- Scientific Background of Relevant Field(s)
- Scientific Objectives of Proposed Investigations
- Proposed Investigation in Context of the Venus Express Mission
- Scientific Analysis Plan
- Coordination between IDS and Principal Investigators (IDS only)
- Young scientists involvement and dissemination of data, if applicable(SI only)

Each of the topics listed in the table of contents is detailed hereafter.

- Table of Contents

As per the list in this chapter.

- Scientific Background of Relevant Field(s)

The section on Scientific Background shall provide a synthesis of the current knowledge and understanding of the relevant broad scientific discipline described in this AO. The major questions in the field shall be addressed.

- Scientific Objectives of Proposed Investigations

The scientific objectives of the proposed investigations should be explained, as applicable, in view of their relevance to our understanding of the past, present and future of the atmosphere, surface and plasma environment of Venus.

- Proposed Investigation

The section on the proposed investigations should focus on their relevance with respect to the Venus Express mission and its scientific instruments. It shall be described on which type of data the investigation will be based and from which instruments these data shall be derived.

- Scientific Analysis Plan

The section on Scientific Analysis Plan shall contain a detailed description of the procedures or techniques involved in the analysis of the data, its volume, people

supporting the investigation, etc. Equipment to be used in the investigation should be listed here.

- *Venus Express Science Operations*

The section on Venus Express science operations should describe, if any, specific requirements on the spacecraft or on the science and/or mission planning which may be necessary to obtain the data upon which the observations are based.

- *Coordination between IDS and Principal Investigators*

The section on coordination between IDS and Principal Investigators should explain how each partner sees their and each other's role in the working relationship.

- *Young scientists involvement and dissemination of data*

This section should outline plans for involvement of young scientists and students.

Part III: Curriculum Vitae of IDS and SI

Detailed curriculum vitae of IDS proposers and key support personnel (in case of IDS proposals) as well as laboratory representative and relevant Supporting Investigator personnel (in case of SI proposals) should be listed here. A publication list should also be included together with a reproduction of one major relevant scientific paper.

Part IV: Management Structure and Funding Plan

The Management Structure to be implemented by the IDS for all aspects of the proposed investigation should be described in this section. The responsibilities of all IDS support team members should be detailed and an organisational chart shall be provided. The fraction of the time available for this investigation shall be given for each person. This section shall include:

- A schedule for the proposed investigation.
- A description and justification of all IDS team member responsibilities.
- Named key personnel with responsibilities and related experience.
- Description and justification for the proposed scientific analysis plan and schedule.
- Funding plan indicating the resources that can support the proposed activities.

In particular, the funding plan shall include justifications of:

- Internal manpower resources
- Other institute resources
- Total funding requirements

The relevant funding authorities should get a copy of this funding plan included in the proposal and ESA should be given the complete name and address (including email, telephone and fax) of these authorities for later verification.

Part V: Letter of Endorsement

Two letters of endorsements shall accompany the proposal

- A Letter of Endorsement from the Head of the university or institute, endorsing that the proposed activities may be carried out at the proposed facilities and that adequate logistic support and infrastructure will be available to the staff concerned.
- A Letter of Endorsement of the funding plan by the funding authorities. Each proposer is responsible for submission of a copy of the proposal directly to his/her funding authorities.

3.9 Proposal Submission

ESA requests the provision of both a hardcopy and an electronic version of the proposals. Hardcopy proposals shall be submitted to ESA in accordance with the list in Chapter 3.8. All parts shall be bound together. The proposals must be received at both ESA HQ and ESTEC not later than 15 March 2006. The proposer shall notify (by fax or e-mail) the addressee listed below:

- When the proposal has been mailed, stating the actual mailing date.
- The details on the electronic form of the proposal, if not submitted via email.

For the hardcopy version ESA HQ will confirm in writing that the proposal has been received. The addressee listed below should be contacted in case the confirmation is not received two weeks after submission. The electronic version shall be in Microsoft Word format.

Copies (including all parts of the proposal) should be sent to both the following ESA staff:

1 hardcopy to:

(+ Electronic version)

M. Coradini
ESA HQ (SCI-C)
8-10, rue Mario Nikis
F-75738 Paris Cedex 15
France

Tel.: +33-1-53697555
Fax: +33-1-53697236
Marcello.Coradini@esa.int

1 hardcopy to:

(+ Electronic version)

H. Svedhem
ESTEC (SCI-SO)
PB 299
NL-2200 AG Noordwijk
The Netherlands

Tel.: +31-71-5653370
Fax: +31-71-5654697
Hakan.Svedhem@esa.int

3.10 Evaluation Process

ESA will assess the IDS and SI proposals against scientific and managerial criteria to be defined by the evaluating committee. A Peer Review Committee will be nominated by the ESA Solar System Working Group (SSWG). The Peer Review Committee will be chaired by the SSWG Chairman. Both the scientific and managerial assessment processes may include meetings with the proposers individually and/or collectively to clarify details.

At the end of the Evaluation Phase and after confirmation of the funding and endorsement by the relevant funding sources, the Peer Review Committee will recommend up to four IDS:s. The number of recommended SI:s is not fixed and will depend on the character and the quality of the individual proposals. Based on the advice of the SSWG and SSAC, the recommendation will be presented by the Executive to the SPC for approval. Following selection by the SPC, ESA will confirm participation of IDS:s and SI:s in the *Venus Express* Programme.

4 ACRONYMS

AO	Announcement of Opportunity
Co-I	Co-Investigator
CPR	Communications and Public Relations
CPRP	Communications and Public Relations Plan
EID	Experiment Interface Document
EGSE	Electronic Ground Support Equipment
ESA	European Space Agency
ESOC	European Space Operations Centre
ESTEC	European Space Research and Technology Centre
FOP	Flight Operations Plan
IDS	Interdisciplinary Scientist
IVEWG	International Venus Exploration Working Group
ITT	Invitation to Tender
LOI	Letter of Intend
MGSE	Mechanical Ground Segment Equipment
NASA	National Aeronautics and Space Agency
PDD	Payload Definition Document
PDS	Planetary Data Systems (NASA)
PI	Principal Investigator
PS	Project Scientist
PSA	Planetary Science Archive
SDT	Science Definition Team (Study Phase)
SMP	Science Management Plan
SPC	ESA's Science Programme Committee
SSAC	ESA's Space Science Advisory Committee
SSWG	ESA's Solar System Working Group
TRP	Technology Research Programme (ESA)
VMOC	Venus Express Mission Operations Centre
VSWT	Venus Express Science Working Team
VSDA	Venus Express Science Data Archive
VSOC	Venus Express Science Operations Centre

5 REFERENCES

[Ref 1]	Venus Express Science Requirements Document	VEX-RSSD-SP-002_1_0
[Ref 2]	Venus Express Mission Definition Report	ESA SCI(2001)6, Oct. 2001
[Ref 3]	Venus Express Mission Requirements Document	VEX-EST-RS-0022_2_0
[Ref 4]	ESA Council Information Document	ESA/C(2002)3
[Ref 5]	Venus Express Science Management Plan	ESA/SPC(2005)21, rev. 1.