AGILE Mission

Announcement of Opportunity
Cycle-1

October 1, 2007

Proposals due

Starting **October 1, 2007**
Ending **October 31, 2007 18:00 CET**

Data taking period

December 1, 2007 – November 30, 2008

Agenzia Spaziale Italiana
Unità Osservazione dell'Universo

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Introduction

This document provides information about the first Announcement of Opportunity (AO) for participating in the Guest Observer Program for the Gamma Ray Imaging Detector (GRID) on board of the AGILE satellite. AGILE (Astro-rivelatore Gamma a Immagini LEggero) is a Small Scientific Mission of the Italian Space Agency (ASI) dedicated to high-energy astrophysics. This document has been prepared on behalf of the AGILE Mission Board that oversees all the scientific matters related to the AGILE mission. The AGILE Mission Board is assisted by an AGILE Users Committee. The AGILE Users Committee represents the whole user community. All proposals submitted in response to this AO will be subject to an independent peer review by the AGILE Data Allocation Committee (ADAC). The ADAC is composed by: the Project Scientist (Chair), the PI (or his delegate) and three scientists (belonging to the international astrophysical community and appointed by the Director of the ASI Observation of the Universe Dept.). The ADAC will assign data rights for investigations of sources selected within the framework of the AGILE Guest Observer Program. The successful proponent will have exclusive access to the data for a period of one year. Target of Opportunity (ToO) observation may NOT be requested through this AO. However, ToOs can be requested at any time during the mission through the AGILE ToO Request Form available at the AGILE web[1] page at AGILE Data Center at ASDC. X-ray data from the Super-AGILE instrument cannot be requested through this AO. Results from this instrument will be posted regularly on the AGILE web pages at ASDC.

This document provides general background information about AGILE, describes the data policy, as defined in the AGILE Science Management Plan, and the mechanisms of the first AO.

[1] http://agile.asdc.asi.it/

1 Mission Overview

The AGILE satellite is designed to detect and image photons in the 30 MeV - 50 GeV and 20-60 keV energy bands, with excellent spatial resolution, timing capability, and an unprecedently large field of view covering ~3 sr (~60° radius) of the entire sky at energies above 30 MeV. Primary scientific goals include the study of AGNs, gamma-ray bursts, Galactic sources, unidentified gamma-ray sources, and diffuse Galactic gamma-ray emission.

In June 1997, the AGILE space program was proposed to ASI (for the Program for Small Scientific Missions) by a Team of scientists from INAF (former CNR) institutes[2], INFN laboratories[3], and several Italian Universities[4] (hereafter, the AGILE Team). The mission was selected in December 1997 for a Phase A study that ended in October 1998. Subsequently, ASI selected AGILE in June 1999. The Mission is part of the ASI Piano Aero-Spaziale Nazionale formulated in mid-2002 and approved by the Italian Ministry of Research. The satellite was successfully launched on April 23rd, 2007 from the Indian Space Center in Sriharikota ISRO (Chennai-Madras) by the PSLV-C8 rocket.

The AGILE scientific instrument is very compact and consists of a combination of two imaging detectors and other subsystems. The Gamma-Ray Imaging Detector (GRID, composed of a Silicon Tracker and a Calorimeter) covers the 30 MeV - 50 GeV energy range with a large field of view (~3 sr). A hard X-ray imaging detector (Super-AGILE) is coaxial with the GRID and operates in the hard X-ray range (20-60 keV) with a ~1 sr field of view. The instrument is completed by the Anticoincidence system, the Data Handling system and power supply. AGILE has been injected in a low-inclination (2.5 degree), quasi-equatorial and nearly circular orbit at 540 km altitude. The mission was approved for a nominal duration of two years. A brief summary of the AGILE scientific performance is given in section 1 and Table 1. A more detailed description will be given

[2] INAF/IASF-Milano, INAF/IASF-Bologna, INAF/IASF-Roma.

[3] INFN-Trieste, INFN-Roma 1, INFN-Roma 2.

[4] Università di Trieste, Università di Roma La Sapienza, Università di Roma Tor Vergata, Consorzio Interuniversitario per la Fisica Spaziale.

in the AGILE Observer's Handbook that will be issued in the near future.

The AGILE Science Program is primarily focused on a systematic observation of the Gamma-ray sky also providing a prompt response to gamma-ray transients and alerts for follow-up multi-wavelength observations. AGILE will provide crucial information complementary to the many space missions that are currently operational (INTEGRAL, XMM-Newton, Chandra, RXTE, Swift, Suzaku). Furthermore, it can support ground-based investigations in the radio, optical, and TeV bands. Quicklook data analysis and fast communication of new transients are implemented as an essential part of the AGILE Science Program and is carried out by a dedicated AGILE Data Center located at the ASI Science Data Centre (ASDC) within the ESRIN (ESA) establishment in Frascati (Italy).

Part of the AGILE Science Program is open to Guest Investigators on a competitive basis as described in this Announcement of Opportunity.

1.2 Scientific Performance

The AGILE-GRID has been designed, developed and calibrated to obtain:

- **a very large field-of-view**, allowing simultaneous coverage of about 1/4 of the entire sky for each pointing (see figure 1);
- **excellent imaging capability in the energy range 100 MeV-50 GeV**, improving the EGRET angular resolution by a factor of 2 at 400 MeV;
- **a flux sensitivity for point sources** comparable to that of EGRET, taking into account the large total exposure that AGILE will reach because of its large field of view;
- **excellent timing capability**, with absolute time tagging of uncertainty near 2 μs and very small deadtimes $\sim$200 μs).

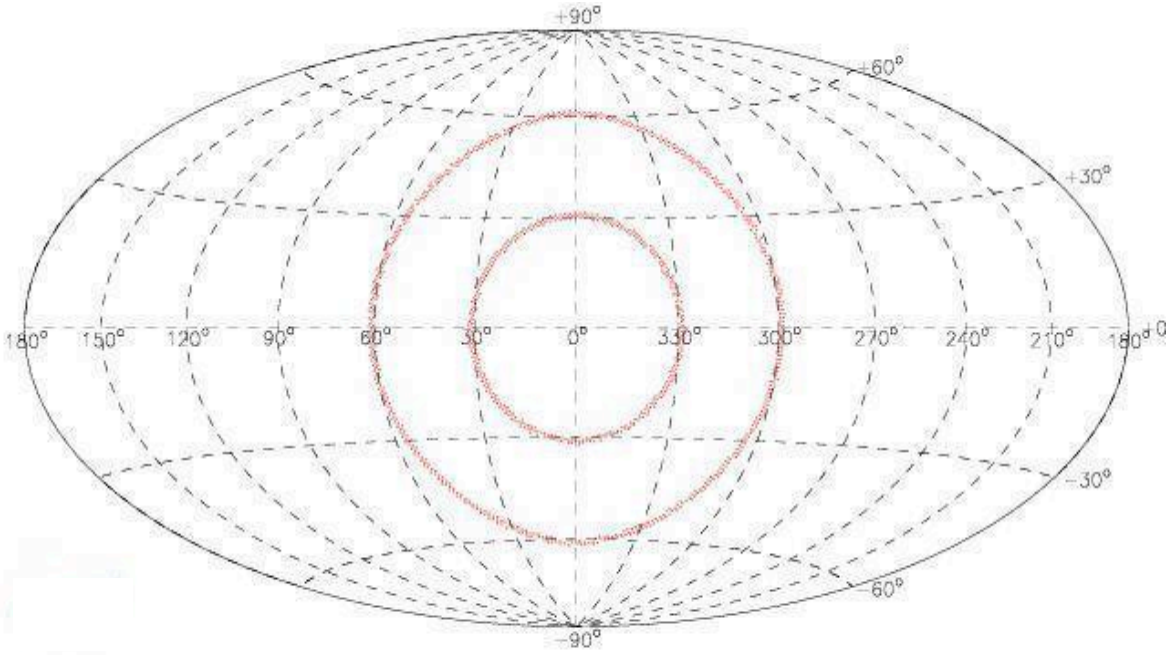

Figure 1: The Field of View of the AGILE-GRID instrument. The larger circle represents the entire field of view of about 60° radius, while the smaller circle shows the inner 30° region where the sensitivity is higher.

In addition to the GRID, an imaging coded mask detector system (Super-AGILE) provides a tool for the study of high-energy sources by combining simultaneous hard X-ray and gamma-ray data. Super-AGILE can provide important information including:

- **source detection and flux information in the energy range 20-60 keV** (15 mCrab sensitivity (5σ) for a 50 ksec integration time) to be obtained simultaneously with gamma-ray data;
- **accurate localization (~2-3 arcmins) of GRBs and other transient events** (for typical transient fluxes above ~1 Crab); the expected GRB detection rate in the FoV is $1-2$ per month;
- **excellent timing**, with absolute time tagging uncertainty and deadtime near 4 μs.

1.3 General Observing Information

ASI approved the AGILE mission for an initial period of 2 years, with the possibility of further extension. The present Announcement of Opportunity (AO1) covers a 12 months observation period starting on December 1st 2007.

Table 1: AGILE Scientific Performance

Gamma-ray Imaging Detector (GRID)	
Energy Range	30 MeV – 50 GeV
Field of View	~3 sr
Sensitivity F(>100 MeV) (5σ in 10^6 sec at high Gal. lat., on-axis)	3×10^{-7} ph cm^{-2} s^{-1}
Angular Resolution (68% cont. radius at 400 MeV)	1.2°
Source Location Accuracy (S/N ~ 10; 90 c.l. radius at high Gal. lat.)	~15 arcmin
Energy Resolution	$\Delta E/E \sim 1$ (at 400 MeV)
Absolute Time Resolution	~2 μs
Hard X–ray Imaging Detector (Super-AGILE)	
Energy Range	20 – 60 keV
Field of view of each half detector (FW at Zero Sens.)	107°x68°
Sensitivity (5σ in 50 ks, on-axis)	~15 mCrab
Angular Resolution (sky pixel size on-axis)	~ 6 arcmin
Source Location Accuracy (for a source at 10σ)	~ 2-3 arcmin
Energy Resolution	ΔE=8 keV
Absolute Time Resolution	~ 5 μs

1.4 AGILE Pointing

The AGILE operations are subject to pointing constraints requiring that the fixed solar panels be always oriented within 3° from the Sun direction. The AGILE GRID and Super-AGILE detectors are co-aligned and point along the spacecraft +Y axis, orthogonal to the solar panels normal (+Z axis). The solar panels constraint is somewhat limiting the sky visibility. However, the part of the sky that is unaccessible at a given date is smaller than 3 sr (i.e., 1/4 of the sky). The allowed pointing directions lie on a great circle orthogonal to the Sun direction, whose orientation changes with time, so that the whole sky is visible during a six months period.

AGILE is operated by performing long observations, typically of 3-weeks duration, during which the pointing direction will slowly drift (at a rate of ~1 degree/day) in order to satisfy the tight solar panel constraints.
The large field of view and the low altitude orbit imply that, for most pointing directions, the Earth will (partially) occult the field of view. Thus the observing efficiency and exposure for a given source will vary, depending on its coordinates, and for most of the sky directions it will not be possible to obtain uninterrupted time coverage.

1.5 AGILE Data Flow

AGILE data are downloaded every orbit (about 95 minutes) at the ASI Ground Station of Malindi (Kenya) and are immediately sent to the Operational and Control Center (AOCC) in Fucino (Italy). After pre-screening, the raw telemetry is sent to the AGILE Data Center (ADC) generally within one hour and in any case before the data from the subsequent orbit becomes available in Malindi. The ADC is the scientific component of the AGILE ground segment and is part of the ASI Science Data Centre (ASDC). The ADC includes scientific personnel from both the ASDC and the AGILE Team. The ADC is in charge of the following tasks:

- quick-look data reduction analysis;
- standard data reduction analysis;
- new source validation;
- complete data archiving;
- management of the AGILE Guest Observer Program;
- data distribution to the scientific community;
- management of the official web page of the AGILE Mission;
- publication of the official AGILE and Super-AGILE Source Catalogues;
- distribution of standard products (positions, fluxes and daily light curves) of Super-AGILE sources.

Results of the Quicklook analysis for both the gamma-ray and hard X-ray data (detected sources, light curves) will be made available via the official AGILE web site at ADC.
AGILE GRID data (in the form of photon lists) and the corresponding calibration and ancillary files will be delivered to the users as standard FITS files. Software tools for the data analysis of GRID instrument will also be available via the ADC.

1.6 Announcement of Opportunity for the AGILE Guest Observer Program

AGILE is a Scientific Mission with a Guest Observer Program open to the astronomical community. Proposals led by Principal Investigators from any country worldwide can apply in response to the Announcement of Opportunity concerning data from the AGILE-GRID detector only, as specified in Section 2. Guest Observers will apply for data expected to be collected within a pre-defined Pointing Plan from December 1, 2007 to November 30, 2008. The AGILE Pointing Plan (APP) is necessary to exploit at best the large field of view optimizing simultaneous observations of several targets, and taking into account the satellite pointing constraints.

Guest Observer Proposal submission will start on October 1, 2007 and will end on October 31, 2007 at 18:00 CET.

Selection of proposals will be made by the AGILE Data Allocation Committee (ADAC) and it will based on scientific merit and other considerations, as specified in Section 4. Successful proposals will be notified to the Principal Investigator at the end of November 2007.

Specific tools will be provided by the ADC to help GOs in calculating observation dates and the expected exposure for any sky direction. Proposals can then be submitted to request AGILE GRID data only obtained in the APP.

2 Observational Program and Data Rights

2.1 The AGILE Pointing Plan for Cycle-1

The AGILE Cycle-1 period of scientific operations open to the Guest Observer Program starts on December 1 2007 and has duration of 1-year.

The AGILE Pointing Plan (APP; see ANNEX 1) reflects the need to achieve a good balance between Galactic and extra-galactic targets as well as optimal observability from both space- and ground-based facilities.

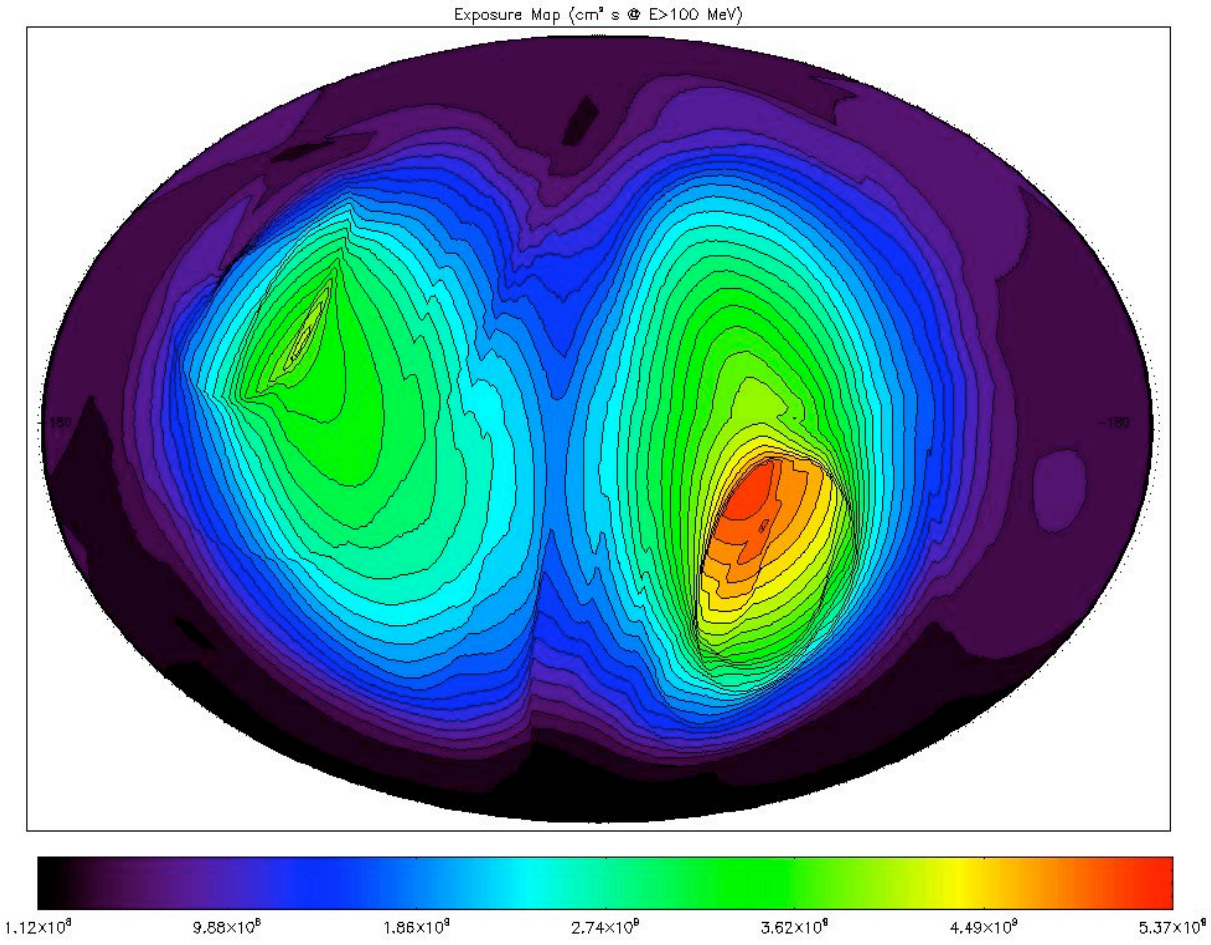

Figure 2: AGILE AO-1 GRID sky exposure map at the completion of the Cycle 1 observations.

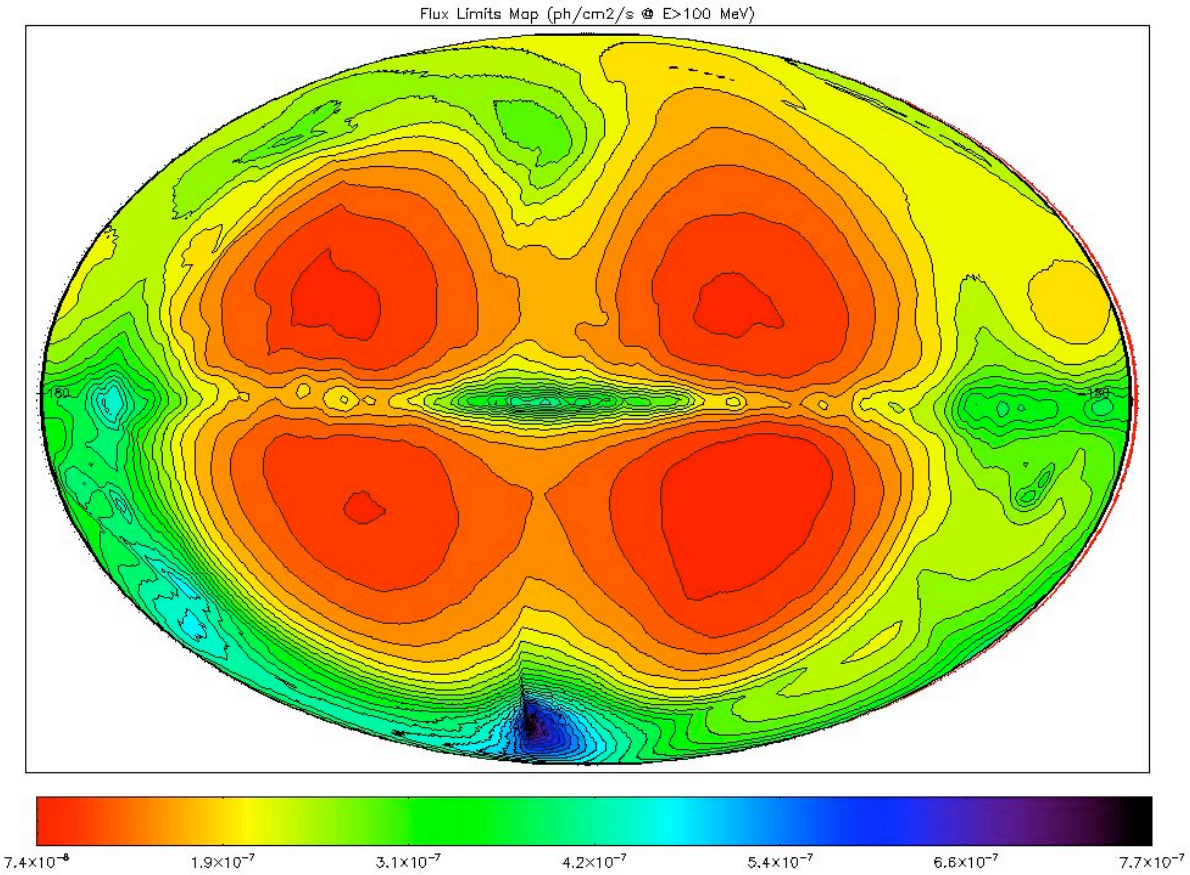

Figure 3: AGILE AO-1 GRID flux sensitivity map at the completion of the Cycle 1 observations.

The APP for Cycle-1 (first year) has been prepared taking into account several scientific and operational requirements such as:

- the maximization of the overall sky exposure factor reached at the end of Cycle 1 by limiting the observation of the sky regions more affected by Earth occultation;
- the optimization of visibility from ground-based observing facilities in order to enhance the opportunity of coordinated multiwavelength observations.

The expected sky exposures and the limiting GRID sensitivity, corresponding to the Pointing Plan, are plotted, for the entire sky, in Galactic coordinates in Figures 2 and 3. The exposure factor is expressed in units of cm^2 s and refers to energies > 100 MeV. The

plot takes into account the variation of the GRID effective area as a function of the position in the field of view and the effects of Earth occultation. The sensitivity map (Figure 3) takes into account the exposure factor and the background due to the diffuse gamma-ray emission (both extragalactic and Galactic).

During operations, the Pointing Plan, the associated sky exposure, and the sensitivity map are subject to possible changes, for example as a result of repointings due to Target of Opportunity (ToO) observations. In general, after a ToO the Plan will be resumed by performing the pointing foreseen at the end of the ToO. The effect of the ToO will therefore only replace some of the pointings foreseen at the time of the ToO and will not shift in time the execution of any other planned observation.

The Cycle-1 APP (see ANNEX 1) is also available in the AGILE AO documentation web page at ASDC. It provides for each pointing the initial coordinates of the center of the GRID field of view (the pointing direction drifts of about one degree/day in order to maintain the solar panels orthogonal to the Sun), the start date of the observations, and the list of known (3EG) γ-ray sources in the GRID field of view.

2.2 AGILE Scientific Programs and Data Rights Policy

Two types of AGILE scientific programs are foreseen:

1. the AGILE Team Projects
2. the AGILE Guest Observer Program

All AGILE data (i.e. both from the AGILE Team Projects and from the Guest Observer Program) are subject to the proprietary rules normally applied to observatory space data: there will be a one year proprietary period after which they will be available via the public AGILE Data Archive at the ASDC. The one year proprietary period starts from the date when the Guest Observer (or the AGILE Team) receives the data in a format that is suitable for analysis and publication.

2.2.1 The AGILE Team Projects

The AGILE Team Projects consist of the following five items, which are *excluded* from the Guest Observer Program:

1. *Diffuse Galactic radiation.*
2. *Extragalactic background.*
3. *A selected list of gamma-ray sources (see ANNEX 2 of this document).*
4. *New sources not belonging to any well established class of gamma-ray sources (AGNs & Pulsars).*
5. *Gamma-ray bursts.*

These items, often requiring systematic analysis of large volumes of data and/or the unique instrumental expertise available within the groups directly participating to the program, are awarded to the AGILE Team in recognition of its contribution to the mission.

2.2.2 The AGILE Guest Observer Program

GRID data for sources not reserved to the AGILE Team can be requested within the AGILE Guest Observer Program. Guest Observers can request data for:

- **specific 3EG catalogue sources;**
- **pulsars;**
- **Active Galactic Nuclei.**

If a gamma-ray source is detected by the GRID at a position that is consistent with that of a requested object (i.e. the latter is inside the 90% confidence level error circle of the new gamma-ray source), the Guest Observer will receive the data.

The requested sources must be individually specified by means of their sky coordinates and name and there is a limit of ten (10) targets for each proposal.

If several objects, belonging to different accepted proposals, turn out to be within the error circle of a single new source, the GRID data of this source will be assigned to all GO's of the accepted proposals.

Proposals for large classes of sources, defined only by their global properties, will not be accepted. Such investigations, typically involving the analysis of a large quantity of data, will be feasible when the GRID data becomes public after one year.

2.3 Validated new gamma-ray sources in the AGILE GRID data.

A particular policy, described here, applies to newly discovered gamma-ray sources to guarantee that all AGILE results be treated in a uniform way concerning their statistical significance.

All sources which are not included in the latest version of the EGRET, AGILE or GLAST catalogues are considered *new gamma-ray sources.*
An updated list of AGILE validated new gamma-ray sources will be maintained on the official AGILE Mission Web pages at ASDC. Guest observers will receive their data after their accepted gamma-ray source(s) appear in the list of the AGILE-GRID validated detections.

2.4 Data distribution policy

Gamma-ray data of the AGILE-GRID will be distributed to successful Guest Observers in response to this Announcement of Opportunity.

The GRID data shall be distributed by the ASDC in form of high level data products, which form the basis for all of the subsequent scientific analysis. In particular, the GRID data will include event lists as well as all the necessary ancillary files and calibration products.
Successful Guest Observers will receive the data centred on the position of the accepted gamma-ray source. The size of the region will be sufficiently large to properly analyze the source of interest and to determine the background. The typical size of the region is fixed, but in some cases it may vary depending on the instrumental point spread function,

off-axis angle, field crowding, local diffuse emission, etc. In this respect, it must be noted that the GO does not have the right to publish any result concerning gamma-ray sources that may happen to be in the area of sky received but are different from those assigned to the GO by the AGILE Data Allocation Committee.
In case the source is not detected, the GO will receive: a) the data covering the source position, and b) a report from the ASDC including an upper limit as determined by a standard analysis procedure.

Super-AGILE data are not part of this AO.

2.5 Target of Opportunity policy

A few Target of Opportunity (ToO) observations will be carried out during the AGILE mission, subject to the pointing constraints mentioned in Section 1.4. The satellite has the capability of slewing to a position allowed by the solar panel constraints typically within 1 day.

It is not possible to propose for ToO observations in response to this Announcement of Opportunity.
However, any observer can propose a ToO at any time during the mission following the procedure indicated in the web page available at the AGILE Data Center at ASDC.
All decisions concerning the ToO feasibility and approval will be taken by the AGILE Mission Board.

The data rights of all ToO observation will belong jointly to the proponent and to the AGILE Team.

3 Proposal Preparation

3.1 Check Feasibility

The typical steps to be followed before responding to this Announcement of Opportunity are the following:

1. The observer should check if the source of interest is included in the list of the AGILE Team Source List (see ANNEX 2). Objects contained in that list cannot be part of the Guest Observer Program as well as sources not belonging to already known classes of gamma ray sources (AGNs, Pulsars and 3EG sources).
2. The observer should check whether the sky region containing the source(s) of interest is covered by the AGILE Pointing Plan (ANNEX 1) with an exposure factor (in units of cm^2 s) and expected sensitivity that are sufficient to achieve his/her scientific goals.

3.2 How to fill the Proposal Form

The proposal form must be filled through the AGILE web page at ASDC:

http://agile.asdc.asi.it/

The proposal Principal Investigator (P.I.) has to register himself/herself through a web form. The P.I. provides personal information (Name, Affiliation, Address, Phone number, e-mail). After this registration a user ID and a password are assigned to each PI. The same PI may prepare and submit different proposals using the same user ID and password. After the registration procedure the PI will access to the Proposal Form Preparation Tool and can start to prepare a new proposal.

Each proposal form must contain:

1. General Information regarding the PI (directly obtained through the registration form).
2. Title of the proposal.
3. Abstract of the proposal.
4. Scientific Category (Pulsars, AGNs and 3EG).
5. Co-Investigators list containing First Name, Last Name, Affiliation and Country of each Co-investigator.
6. Target List (max 10 objects) containing for each target: Source Name, RA, DEC, expected flux and a flag indicating the possibility of simultaneous observations with other instruments.
7. Scientific Justification to be sent in a separate file (pdf format only).

The on-line Proposal Form Preparation Tool allows users to visualize, save and make modifications to each proposal at any time before the final submission. The *"Submit Proposal"* button on the web form allows to submit the proposal to the queue for consideration and evaluation. Once the proposal has been submitted it may no longer be modified.

Please note that there are no GRID parameters defining the observation mode that the Guest Observer can choose.

3.3 Scientific Justification

The Scientific Justification must be prepared in a separate file (pdf format) and can not be longer than 3 pages (with font size not smaller than 11 pts) including figures, tables, references, and any other information that the PI considers useful for the proposal evaluation. The file has to be submitted electronically through the Proposal Form web page at ASDC.

The Scientific Justification must include:

a) Proposal title
b) PI name
c) Abstract
d) Scientific Motivation and Objectives
e) Target List reporting for each target:
    i. Feasibility
    ii. Availability of simultaneous observations (if any).

A template of the Scientific Justification Form will be available on-line by October 1st, 2007.

Since the AGILE Pointing Plan is predefined, there is no need to justify the amount of observing time required for a given target. In the Scientific Motivation and Objectives section the proponent must describe the expected results to be obtained for a given exposure time, and how this information can be used to study sources, constrain models, etc.. In particular, it is very important that the Scientific Justification form gives details about the use of the AGILE data in connection with a possible multiwavelength observation campaign and/or results of modelling/simulations, etc.. Such an information will be taken into account by the Agile Data Allocation Committee.

3.4 Coordinated and time-constrained observations

It is not possible to ask for time-constrained AGILE observations in response to this Announcement of Opportunity. However, the predefined AGILE Pointing Plan is known well in advance and this favours the organization of multi-wavelength campaigns (which are strongly encouraged). It is worth noticing that ToO observations may alter the APP in a substantial way. Nevertheless, after the ToO is completed AGILE will resume its nominal Pointing Plan (if possible due to the observing constraints). Because of a ToO, a scheduled observation of a gamma-ray source in a certain period could be significantly

shorter than expected or could not be performed at all. However, ToO observations will be limited in number during Cycle-1.

3.5 Triggered observations

It is possible to submit proposals asking for GRID data only subject to the occurrence of some particular state of the requested source. For example a GO might request the data only if the source of interest makes a substantial and sudden outbursts in the radio band. These proposals do not involve repointing of the satellite and/or any other change of the pre-planned operations. The proposal must clearly indicate the condition(s) under which the GRID data are requested. If the proposal is approved, it will be responsibility of the GO to inform the ASDC that the triggering condition has occurred. Please note that also in this case the GO can ask for a maximum of 10 sources.

3.6 How to submit a proposal

Proposals, prepared via web as described in the previous paragraph, can be submitted electronically via the ASDC web page **starting from October 1st, 2007**.
The deadline for proposal submission is:

October 31st, 2007 at 18:00 CET

Submitted proposals are collected and archived at the ADC in ASDC and then sent to the Agile Data Allocation Committee for evaluation.

4 Proposal evaluation

The Agile Data Allocation Committee (ADAC) is called to evaluate GOs' proposals and to assign data rights for the selected sources. The ADAC is composed of the ASI Project Scientist, the representative of the AGILE Team and three scientists appointed by ASI.

They will receive the submitted proposal as soon as the AO is closed. The proposal evaluation process will provide a higher score to that proposal which better exploit AGILE capabilities providing the larger scientific throughput (e.g. proposals involving: multi-wavelength observational campaigns, synergy between AGILE Grid and Super-AGILE, etc.). AGILE GRID data of the requested source(s) will be assigned to the Guest Observer.

The end of the evaluation process is foreseen by November 30th, 2007. The ADAC will then provide the list with the assigned sources within GOP to the ASDC and ASDC will notify PIs of the successful proposal.

5 Helpdesk

A Helpdesk service is provided to AGILE Users for the entire mission duration. It is located at the ASDC and answers to all the questions regarding the mission, instruments, data, data analysis software, data archive, etc. Helpdesk can be contacted sending an e-mail to: *agile_helpdesk@asdc.asi.it*

If you have question about the AO please contact:

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ANNEX 1: AGILE BASELINE POINTING PLAN AO-1

(Centroid coordinates shown in the table refer to the beginning of the pointing periods)

Point. N.	Start Date	End Date	Pointing	L II	B II	RA (J2000)	DEC (J2000)
1	01/12/07	15/12/07	Cygnus Field 1	89	9.9	304	53.5
2	15/12/07	08/01/08	Virgo Field	264	56.5	172	0
3	08/01/08	01/02/08	Vela Field	283	-6.8	147	-62.5
4	01/02/08	14/02/08	South Gal. Pole	240	-50	58	-37.8
5	14/02/08	01/03/08	Musca Field	303	-9	192	-71.9
6	01/03/08	30/03/08	Gal. Center	332	0.	244	-50.9
7	30/03/08	10/04/08	Anti-Center	193	8.1	101	21.7
8	10/04/08	30/04/08	Vulpecula Field	53	6.4	286	20.7
9	30/04/08	10/05/08	North Gal. Pole	105	35	250	72.4
10	10/05/08	30/06/08	Cygnus Field 2	74	0.3	304	35.9
11	30/06/08	31/07/08	Antlia Field	282	9.9	162	-47.8
12	31/07/08	31/08/08	Musca Field	293	-7.7	165	-68.5
13	31/08/08	15/09/08	Norma Field	328	0.	238	-53.8
14	15/09/08	30/09/08	Gal. Center	358	3.3	262	-28.7
15	30/09/08	10/10/08	Anti-Center	191	6.1	98	22.0
16	10/10/08	31/10/08	Aquila Field	39	0.	285	5.2
17	31/10/08	30/11/08	Cygnus Field 3	70	6.1	295	35.5

ANNEX 2: AGILE Team Source List

AGILE Team Source List – Cycle-1 AO		
NAME	**Gal. Long.**	**Gal. Lat.**
PULSARS		
PSR J0835-4510	263,55	-2,79
PSR J1709-4429	343,1	-2,69
PSR J1513-5908	320,32	-1,16
PSR J0534+2200	184,56	-5,78
PSR J0633+1746	195,13	4,27
PSR J0737-3039	245,24	-4,5
PSR J0900-3144	256,16	9,49
PSR J1833-1034	21,5	-0,89
PSR J1744-1134	14,79	9,18
PSR J1524-5625	323	0,35
PSR J1531-5610	323,9	0,03
PSR J1740+1000	34,01	20,27
PSR J2043+2740	70,61	-9,15
PSR J1105-6107	290,49	-0,85
PSR J1016-5857	284,08	-1,88
PSR J2229+6114	106,65	2,95
PSR J1718-3825	348,95	-0,43
PSR J1420-6048	313,54	0,23
PSR J1124-5916	292,04	1,75
PSR J1809-1917	11,09	0,08

PSR J1357-6429	309,92	-2,51
PSR J1617-5055	332,5	-0,27
PSR J0940-5428	277,51	-1,29
PSR J1549-4848	330,49	4,3
SPECIAL REGIONS		
Galactic Center Region	-10 to 10	-10 to 10
Large Magellanic Cloud	280,46	-32,88
Small Magellanic Cloud	302,79	-44,29
3EG SOURCES		
3EG J0241+6103	135,87	0,99
3EG J0617+2238	189	3,05
3EG J0848-4429	264,5	-0,46
3EG J1639-4702	337,75	-0,15
3EG J1704-4732	340,1	-3,79
3EG J1714-3857	348,04	-0,09
3EG J1735-1500	10,73	9,22
3EG J1823-1314	17,94	0,14
3EG J1824-1514	16,37	-1,16
3EG J1826-1302	18,47	-0,44
3EG J1835+5918	88,70	25,10
3EG J1837-0423	27,44	1,06
3EG J1856+0114	34,6	-0,54
3EG J2020+4017	78,05	2,08
3EG J2033+4118	80,27	0,73
3EG J1027-5817	284,94	-0,52

ACTIVE GALACTIC NUCLEI		
1ES 1426+428	77,49	64,90
1ES 1959+650	98,00	17,67
3C 120	190,37	-27,40
3C 273	289,95	64,36
3C 279	305,10	57,06
3C 454.3	86,11	-38,18
BL Lac	92,59	-10,44
Cen A	309,52	19,42
HB89 0537-441	250,08	-31,09
HB89 0716+714	143,98	28,02
HB89 1730-130	12,03	10,81
M 87	283,78	74,49
PKS 0528+134	191,37	-11,01
PKS 1622-29	348,82	13,32
PKS 1830-211	12,17	-5,71
TXS 1510-089	351,29	40,14
1ES 1921-293	9,34	-19,61
1ES 2344+514	112,89	-9,91
HB89 0836+710	143,54	34,43
NGC 6251	115,76	31,20
PKS 2209+236	82,24	-26,09
HB89 2230+114	77,44	-38,58
HB89 0736+017	216,99	11,38
HB89 1739+522	79,56	31,75
HB89 2005-489	350,37	-32,60
NRAO 0190	197,20	-28,46
PKS 1622-253	352,14	16,32
HB89 1127-145	275,28	43,64
HB89 1406-076	333,88	50,28