

## **AGILE Team Multiwavelength Program**

### **Guidelines for scientific collaboration between the AGILE Team and other observing Groups.**

AGILE Team – 31/01/05

#### 1. Scope of this Document

This document establishes the general guidelines for scientific collaboration between the AGILE Team and other Groups concerning the multiwavelength observing program related to the AGILE Mission. The AGILE Team is open to collaboration involving a joint use of gamma-ray/hard X-ray data produced by the AGILE Instrument with other data obtained by ground-based and space observatories, scientific consortia and single observers. The AGILE Science Management Plan (ASMP - v. 4.1, Feb. 9, 2004) agreed between the Italian Space Agency (ASI) and the AGILE Team (AT) regulates the data rights and flow of the AGILE Mission. The AGILE Team has data rights that are summarized in Sect. 2.1.

The scientific collaboration between the Team and other Groups concerns exclusively the use of data for which the AGILE Team has data rights.

#### 2. AGILE Scientific Programs and Data Right Policy

AGILE is a scientific Mission devoted to the observation of celestial sources with imaging capability in the 15 – 45 keV and 30 MeV – 30 GeV energy bands. According to the AGILE Science Management Plan, data of the gamma-ray imager (GRID) are considered for two different scientific programs:

- a) The AGILE Team Projects
- b) The AGILE Guest Observer Program (GOP)

All AGILE-GRID data will be subject to the proprietary rules normally applied to observatory-type space data: there will be a 1-

year proprietary period starting from the date the GOP observer or the AT scientist receives the data in a format that is suitable for analysis and subsequent publication. At the end of the proprietary period the data will be moved to an AGILE public archive and will therefore be available on-line, or through other appropriate data distribution means within the limits of the resources available. This policy is currently envisioned to be implemented by means of a suitable system developed and managed by the ASI Science Data Centre.

## 2.1 The AGILE Team Projects

The AGILE Team Projects consist of investigations that can be carried out and successfully completed through a systematic analysis of a large amount of data, and/or requiring unique instrumental expertise. The AGILE Team Projects are:

1. Diffuse Galactic Radiation
2. Extragalactic Background
3. A selected list of gamma-ray sources (to be specified in the first AO).
4. New gamma-ray sources (not listed in the 3<sup>rd</sup> EGRET Catalog)
5. Gamma-ray Bursts.

The AGILE Team and ASI (according to the ASMP) will prepare a Pointing Program for each observing cycle (typically 1 year) that will be made available to the astrophysics community several months before the start of the observing period.

## 3. The AGILE Multiwavelength Program supporting the AT Projects

Multiwavelength observations that are preceding, simultaneous and following gamma-ray observations by the AGILE satellite will greatly increase the scientific results of the Mission. The primary goal of the AT Multiwavelength Program is to jointly make use of data and information on specific high-energy sources in order to optimize the theoretical interpretation of the phenomena under study. An important possibility is also the coordination of the AGILE gamma-ray observations with ground-based and possibly space observations of a selected list of high-energy sources. This coordination can be obtained by a feedback between the Groups

and the AT concerning the AGILE Pointing Program.

Collaboration between the AT and other Groups will be based on identifying a specific single task of investigation and carrying out observations and data analysis aimed at optimizing the scientific return of the joint effort.

Table 1 shows possible scientific investigations that can be the subject of the AT scientific collaborations. We highlighted in boldface characters cases for which scientists external to the AT could play a leading research role.

Table 1

<i>Topic</i>	<i>Objective</i>	<i>Responsibility / External contribution</i>
<b>AGILE CATALOG</b>		
	$\gamma$ -ray sources validation. Creation and maintenance of the AGILE Source Catalog	Task under the AT responsibility
	Gamma-ray and hard-X-ray population studies	Task under the AT responsibility
<b>ACTIVE GAL. NUCLEI</b>		
	Long-term monitoring of known $\gamma$ -ray AGNs (e.g. 3C 279)	Task under the AT responsibility
<b><u>Open Task</u></b>	<b><u>Known TeV source detected only marginally by EGRET (e.g. Mkn 501)</u></b>	<b><u>TeV and/or soft X-ray trigger.</u></b>
	Intense $\gamma$ -ray flaring sources (e.g. PKS 1622-297)	Task under the AT responsibility
	$\gamma$ -ray emission from radio galaxies with superluminal radio jets (e.g. Cen A, 3C 120)	Task under the AT responsibility
	Multi- $\lambda$ monitoring of $\gamma$ -ray flares	Task under the AT responsibility

<i>Topic</i>	<i>Objective</i>	<i>Responsibility / External contribution</i>
<b><u>Open Task</u></b>	<b><u><math>\gamma</math>-ray follow-up of sources flaring at other <math>\lambda</math></u></b>	<b><u>External trigger. AGILE will provide <math>\gamma</math>-ray monitoring</u></b>
	Duty-cycle and variability studies	Task under the AT responsibility
<b><u>Open Task</u></b>	<b><u><math>\gamma</math>-ray flare / radio jet connections</u></b>	<b><u>Needs VLBI intensive monitoring.</u></b>
<b>PULSARs</b>		
	Strong $\gamma$ -ray pulsars as Vela, Geminga and Crab	Task under the AT responsibility
	Secular flux variation of known $\gamma$ -ray pulsars	Task under the AT responsibility
<b><u>Open Task</u></b>	<b><u>High resolution timing analysis of pulsars' light-curves</u></b>	<b><u>Requires accurate radio ephemerids</u></b>
	Millisecond PSRs detected in $\gamma$ -ray	Task under the AT responsibility
	$\gamma$ -ray detection of known pulsars	Task under the AT responsibility
<b><u>Open Task</u></b>	<b><u><math>\gamma</math>-ray detection of unpublished new radio pulsars</u></b>	<b><u>Requires radio ephemerids</u></b>
<b><u>Open Task</u></b>	<b><u>Pulsar wind-nebulae</u></b>	<b><u>Requires multifrequency observations</u></b>
<b>DIFF. EMIS.</b>		
	Whole sky map and C/R distribution	Task under the AT responsibility
	Galactic Center refined studies	Task under the AT responsibility
	Molecular clouds, selected Galactic regions	Task under the AT responsibility
	Extragal. diffuse $\gamma$ -ray emission	Task under the AT responsibility
<b>UNID. SRCs</b>		

<i>Topic</i>	<i>Objective</i>	<i>Responsibility / External contribution</i>
	Identification of EGRET unidentified sources using the refined AGILE positions	Task under the AT responsibility
<u>Open Task</u>	<u>Identification of EGRET unidentified sources by means of multifrequency data</u>	<u>Requires multifrequency observations</u>
	Identification of new AGILE sources	Task under the AT responsibility
<b>GRBs</b>		
	High-energy studies of AGILE-triggered GRBs	Task under the AT responsibility
<u>Open Task</u>	<u>Non-AGILE triggered GRBs</u>	<u>External trigger. AGILE might provide, if possible, <math>\gamma</math>-ray monitoring</u>

#### 4. Guidelines for a scientific Collaboration

Coordinated multiwavelength observations shall be performed according to the following guidelines:

1. identification of a specific investigation for joint work;
2. unrestricted access to AT proprietary data and Group data for the purpose of a joint investigation encouraging real-time feedback between different groups;
3. shared gamma-ray and multiwavelength data, collected within the framework of an AT Collaboration, has to be treated as strictly confidential. Data obtained by the two groups cannot be distributed outside the Collaboration;
4. the AT and the other Group are free to publish independently their own data, if they decide to do so. In this case, the AT or Group communicates the decision to the partner with the commitment of not releasing any information that was in the meantime obtained by means of the ongoing Collaboration. Independent publishing of the results does not preclude the possibility of a joint publication with use of both data sets.
5. the AT and the other Group establish a joint publication policy (authorship and task assignment) on a case by case basis;
6. two “focal scientists” (one belonging to the AT and the other to the collaborating Group) are assigned to the investigation. The two scientists will have the duty of carrying out specific tasks within their groups and of coordinating the activity and the necessary data calibration.
7. the science analysis of AGILE gamma-ray data is expected to be coordinated by AT scientists;
8. the AGILE Team can share its data also with other Groups being part of different Collaborations. The AT encourages and foster collaboration among different Groups providing data for the same astrophysical sources. In case a joint collaboration of more than one Group and the AT cannot be established, the AT is free to make appropriate use of its data with the different Groups separately according to these Guidelines and following the commitment of data confidentiality.
9. Any conflict or problematic issue within the Collaboration will be resolved by the joint resolution of the AGILE PI (on behalf of the AGILE Science Board) and PI/Coordinator of the other Group.