AGILE Data Center at ASDC: Data Analysis and Distribution

180.00

Carlotta Pittori (ASDC) on behalf of the AGILE Team and ADC

225.000

180.000

"AGILE: 2 years after": Milano, April 22-23, 2009

GPS satellite

PSLV

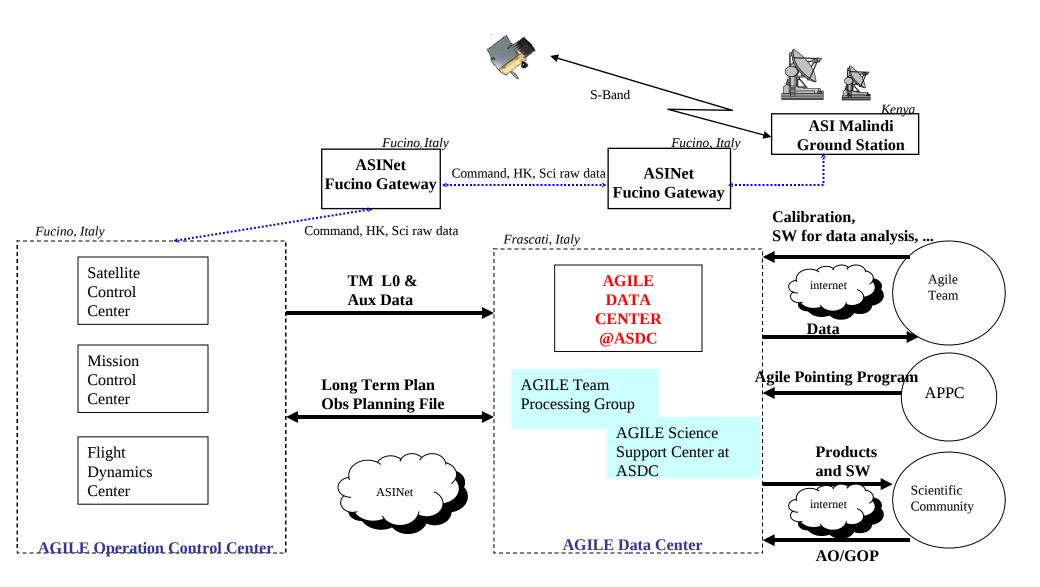


Malindi Ground Station

AGILE Mission Operations Center (Fucino)

ASI Science Data Center

AGILE GS Architecture

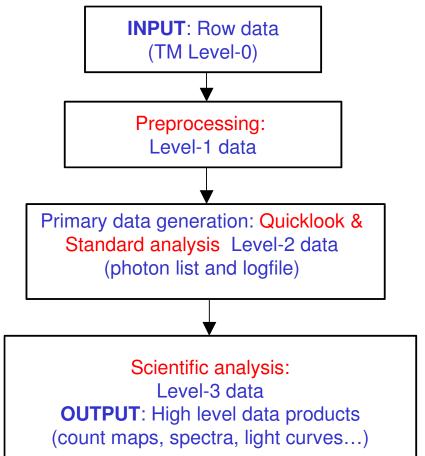


The AGILE Data Center at ASDC – ESRIN

• The ADC, based at ASDC-ESRIN, is in charge of all the scientific oriented activities related to the analysis and archiving of AGILE data:

From scientific telemetry (TM) Level-0:

- ✓ Preprocessing \rightarrow Level-1 data
- Quick-Look Analysis (transient detection)
- ✓ Standard analysis \rightarrow Level-2 data (photon list)
- Scientific analysis (source detection, diffuse gamma-ray background)
- Archiving and distributing all scientific
 AGILE data



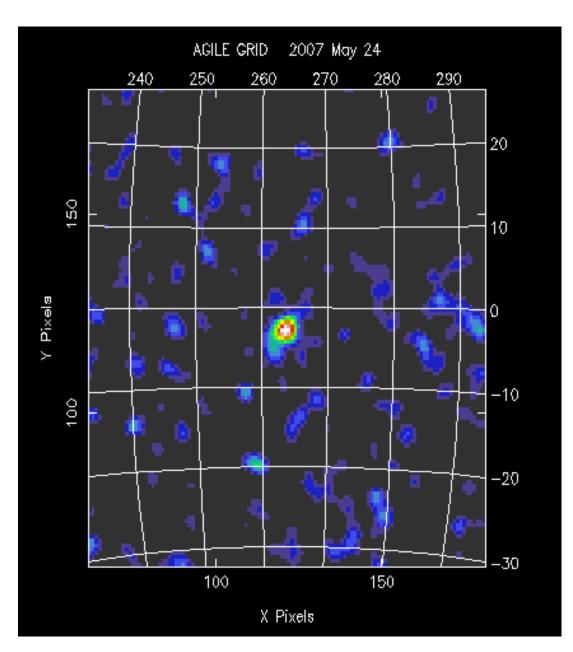
Summary of ASDC activities for AGILE: (from Agile Science Management Plan)

- Running the Quick Look Analysis
- Running the standard data reduction Analysis
- Performing, when necessary, the Interactive data Analysis
- Managing Announcement of Opportunities
- Contributing to the management of the AGILE Pointing Program
- Archiving all the data (raw, cleaned and calibrated, scientific)
- **Distributing** the data to the scientific community
- Providing scientific support to the users community
- Officially interface the project for both data and proposals via dedicated web pages
- Providing the standard software support for the data analysis

First AGILE GRID light ADC 24/5/2007

Commissioning Phase: AGILE Vela PSR Count Map

(~ 20000 s)



AGILE: 2 years in orbit

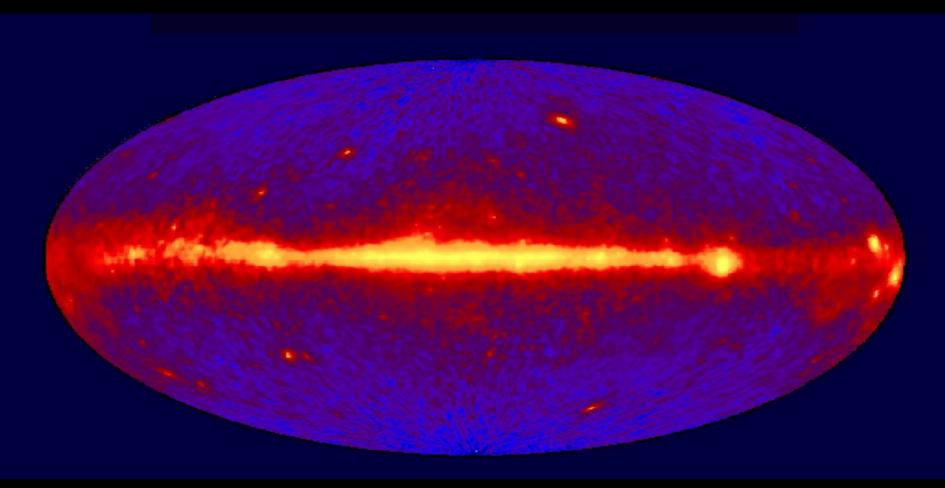
• AGILE demonstrates for the first time the covering of \sim 1/5 of the entire gamma-ray sky (FoV \sim 2.5 sr) with excellent angular resolution and competitive sensitivity.

• AGILE shows for the first time an optimal performance of its gamma-ray and hard X-ray imagers.

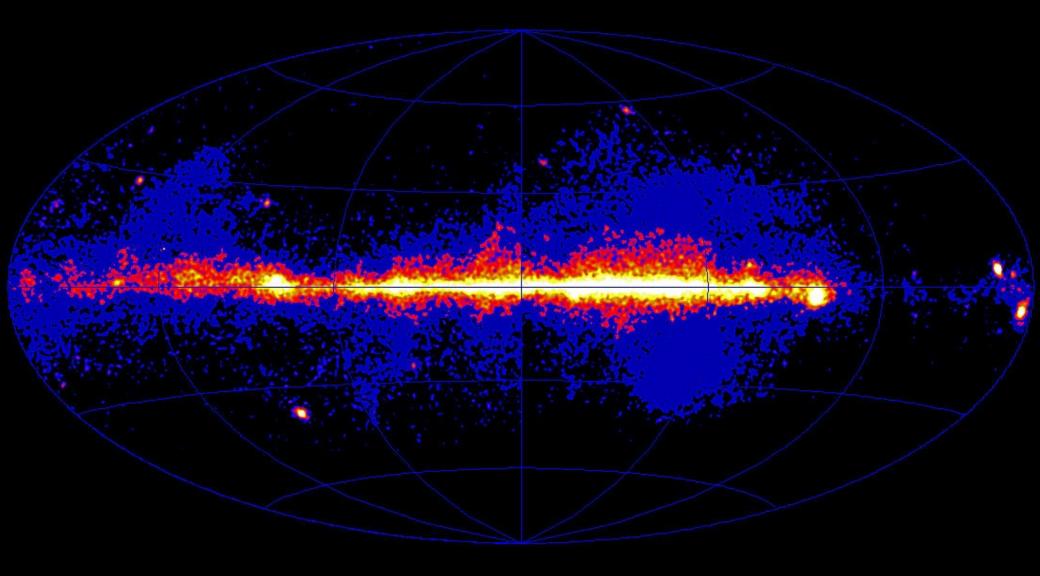
- 10290 orbits, April 21, 2009 (~ 94% Fine Pointings)
- Very good scientific performance

• Scientific program open to the community: Guest Observer Program Cycle-1 completed (Dec. 1, 2007 -Nov. 30, 2008). Cycle-2: started on Dec. 1, 2008.

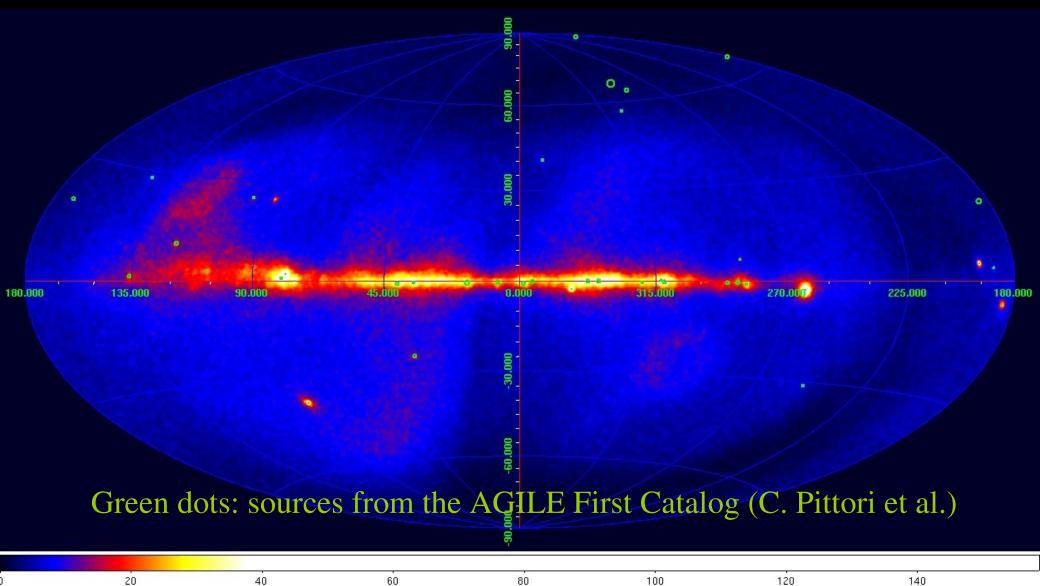
The EGRET gamma-ray sky (E > 100 MeV) 9 years lifetime: 1991 - 2000



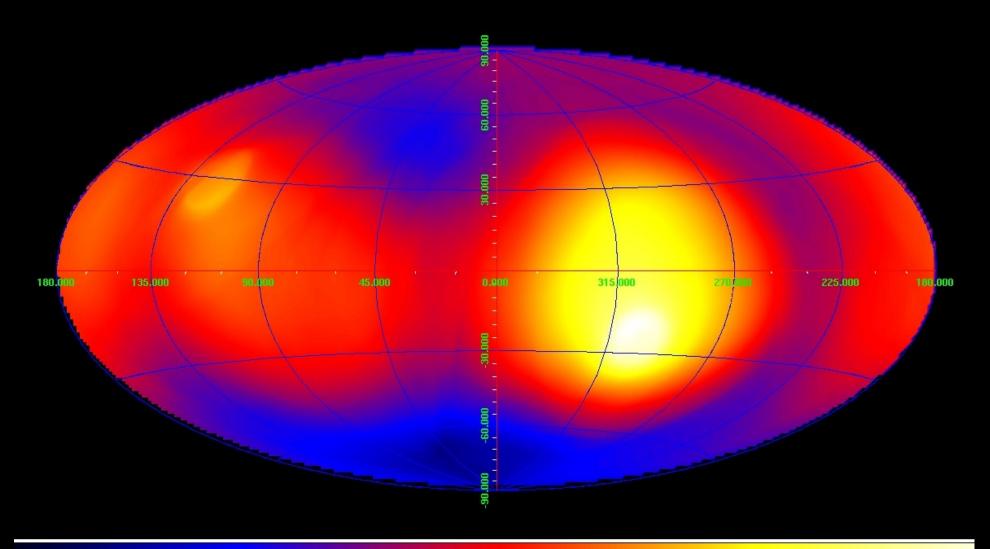
AGILE 1 year COUNT MAP (July 2007- June 2008)



AGILE 2-years COUNT MAP (July 2007- March 2009)



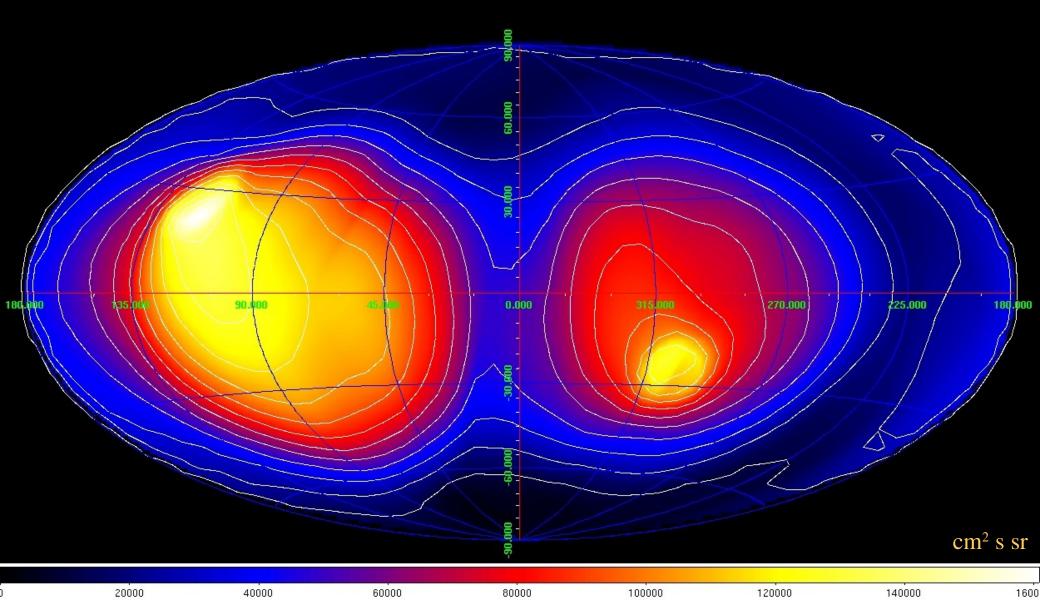
AGILE first year EXPOSURE MAP (July 2007- April 2008)

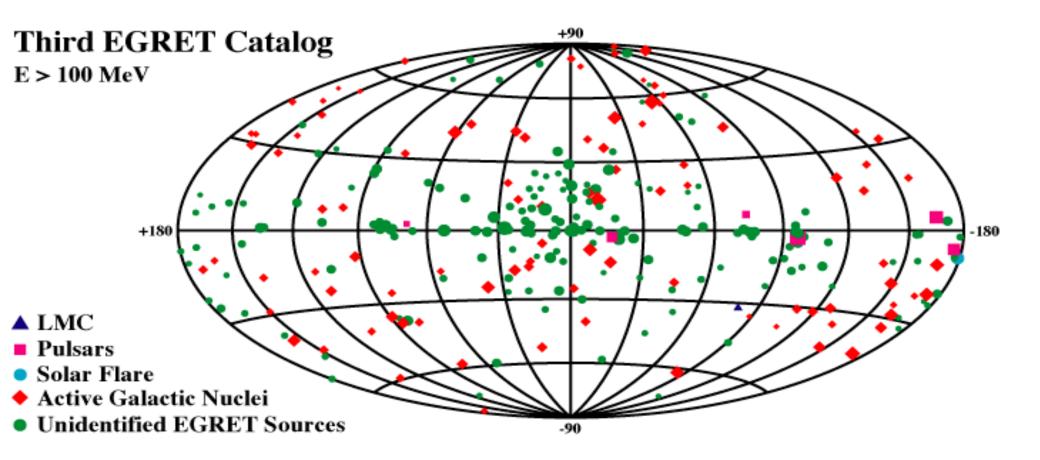


5000 10000 15000 20000 25000 30000 35000 CCM² S Sr

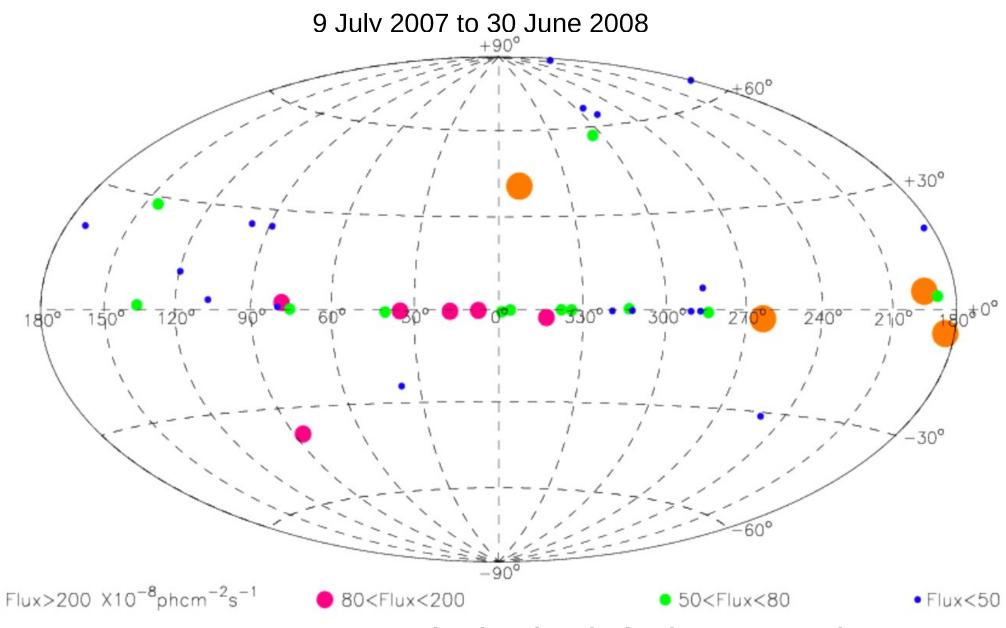
AGILE 2-years EXPOSURE MAP

(July 2007- March 2009)





AGILE First Source Catalogue



C. Pittori et al., submitted to A&A - arXiv:0902.2959

First AGILE Catalog: data analysis

AGILE pointings: predefined long exposures (10 - 30 days) drifting of about 1 degree per day with respect to the starting boresight direction to match solar panels constraints.

For the first AGILE catalog we adopted a **conservative analysis**, with a high-quality gamma event filter (filter F4 with relatively low effective area), optimized to select gamma-ray events within the central zone of the Field of View (radius of 30 degrees).

Merge of the entire "cleaned" dataset with healpix sky pixellisation.

AGILE source detection methods use a Maximum Likelihood (ML) analysis to derive the best parameters estimate for candidate sources, such as source significance, flux, and location.

High confidence detection:

- two independent automatic source detection strategies in cross-correlation
- statistical significance above 4 sigma
- manual refined analysis performed with a multi source likelihood analysis task

\Rightarrow 40 validated, high confidence AGILE sources

First AGILE Catalog of High Confidence Gamma-Ray Sources

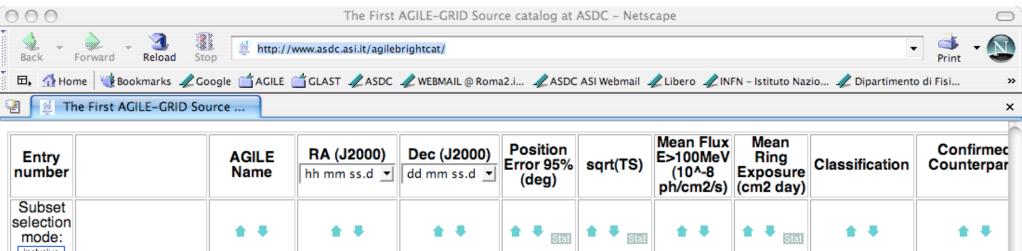
• Observations from 9 July 2007 to 30 June 2008 (first year of scientific operations)

40 high confidence sources E> 100 MeV:

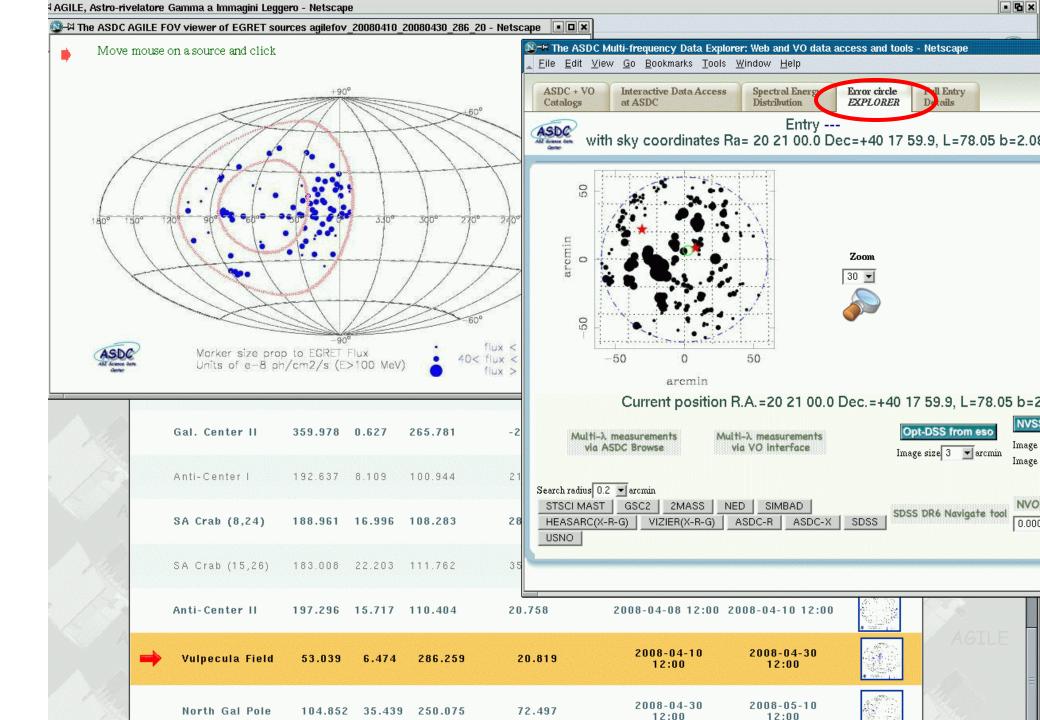
- 20 confirmed and candidate Pulsars,
- 13 Blazars (7FSRQ, 4BL Lacs, 2 unknown type),
- 2 possible HMXRBs,
- 2 possible SNRs,
- 3 Unidentified sources.

Revised version to be submitted to the A&A referee: 4 sources added from refined analysis of complex regions

Interactive on-line version of the The First AGILE Catalog from ADC web page http://agile.asdc.asi.it/

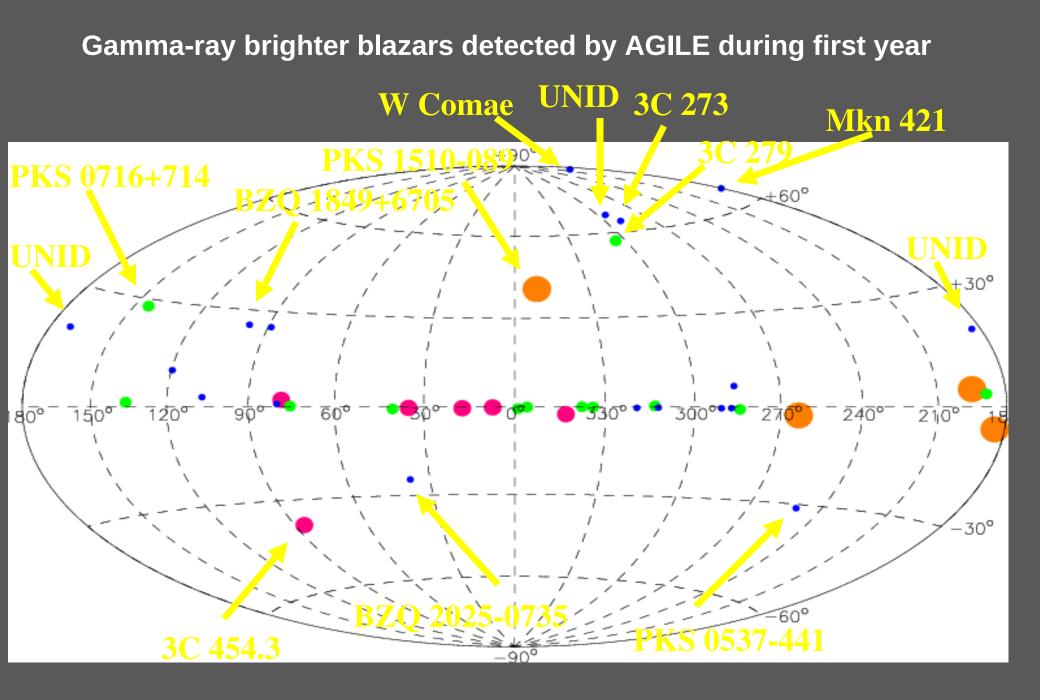


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ASSOC Data Explorer	1AGL J0006+7311	00 06 34.2	+73 11 06.6	0.63	5.1	23 +/- 5	3486	GammaPulsar*	CTA1
ASDC Data Explorer	1AGL J0242+6111	02 42 13.6	+61 11 06.7	0.64	5.3	54 +/- 12	1356	HMXRB	LSI+61303
ASSOC Data Explorer	1AGL 10535+2205	05 35 05.9	+22 05 41.7	0.09	47.2	220 +/- 15	3229	Pulsar	Crab
ASSOC Data Explorer	1AGL J0538-4424	05 38 29.6	-44 24 17.8	0.5	5.9	43 +/- 10	934	Blazar-BLLac	PKS0537-44
ASDC Data Explorer	1AGL J0617+2236	06 17 21.7	+22 36 14.2	0.27	9.9	69 +/- 9	3229	Unclassified	
ASSOC Data Explorer	1AGL J0634+1748	06 34 15.8	+17 48 27.7	0.05	63	320 +/- 10	3229	Pulsar	GEMINGA
ASDC Data Explorer	1AGL J0657+4554	06 57 29.2	+45 54 14.5	0.55	5.8	31 +/- 6	2288	Blazar*	
ASSOC Data Explorer	1AGL J0714+3340	07 14 29.4	+33 40 37.3	0.85	4.2	18 +/- 5	2978	Blazar*	
ASSOC Data Explorer	1AGL J0722+7125	07 22 22.9	+71 25 31.1	0.37	10.9	68 +/- 9	1614	Blazar-BLLac	S50716+71
ASSOC Data Explorer	1AGL J0835-4509	08 35 13.3	-45 09 09.0	0.09	41.7	780 +/- 32	933	Pulsar	VelaPSR
ASDC Data Explorer	1AGL J1022-5822	10 22 08.8	-58 22 17.0	0.36	10.1	59 +/- 7	5616	Unclassified	
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	ASDC Data Explorer ASDC Data Explorer	ASSC Data Explorer JOOO6+7311 ASSC Data Explorer Data Explorer JO242+6111 ASSC Data Explorer Data Explorer JO535+2205 ASSC Data Explorer JO538-4424 ASSC Data Explorer JO617+2236 ASSC Data Explorer JO634+1748 ASSC Data Explorer JO657+4554 ASSC Data Explorer JO657+4554 ASSC Data Explorer JO714+3340 ASSC Data Explorer JO722+7125 ASSC Data Explorer JO835-4509 ASSC Data Explorer JO835-4509 ASSC Data Explorer JO835-4509	ASSOC Data Explorer 1AGL J0006+7311 00 06 34.2 ASSOC Data Explorer 1AGL J0242+6111 02 42 13.6 ASSOC Data Explorer 1AGL J0242+6111 02 42 13.6 ASSOC Data Explorer 1AGL J0535+2205 05 35 05.9 ASSOC Data Explorer 1AGL J0538-4424 05 38 29.6 ASSOC Data Explorer 1AGL J0617+2236 06 17 21.7 ASSOC Data Explorer 1AGL J0634+1748 06 34 15.8 ASSOC Data Explorer 1AGL J0657+4554 06 57 29.2 ASSOC Data Explorer 1AGL J0714+3340 07 14 29.4 ASSOC Data Explorer 1AGL J0722+7125 07 22 22.9 ASSOC Data Explorer 1AGL J0835-4509 08 35 13.3 ASSOC Data Explorer 1AGL J0835-4509 08 35 13.3 ASSOC Data Explorer 1AGL J022-5822 10 22 08.8	45000 Data Explorer 1AGL J0006+7311 00 06 34.2 +73 11 06.6 45000 Data Explorer 1AGL J0242+6111 02 42 13.6 +61 11 06.7 45000 Data Explorer 1AGL J0242+6111 02 42 13.6 +61 11 06.7 45000 Data Explorer 1AGL J0535+2205 05 35 05.9 +22 05 41.7 45000 Data Explorer 1AGL J0538-4424 05 38 29.6 -44 24 17.8 45000 Data Explorer 1AGL J0617+2236 06 17 21.7 +22 36 14.2 45000 Data Explorer 1AGL J0634+1748 06 34 15.8 +17 48 27.7 45000 Data Explorer 1AGL J0657+4554 06 57 29.2 +45 54 14.5 45000 Data Explorer 1AGL J0714+3340 07 14 29.4 +33 40 37.3 45000 Data Explorer 1AGL J0722+7125 07 22 22.9 +71 25 31.1 45000 Data Explorer 1AGL J0835-4509 08 35 13.3 -45 09 09.0 45000 Data Explorer 1AGL J022-5822 10 22 08.8 -58 22 17.0	AGL OO 06 34.2 +73 11 06.6 O.63 AGL JO242+6111 O2 42 13.6 +61 11 06.7 O.64 AGL JO242+6111 O2 42 13.6 +61 11 06.7 O.64 AGL JO242+6111 O2 42 13.6 +61 11 06.7 O.64 AGL JO242+6111 O2 42 13.6 +61 11 06.7 O.64 AGL JO535+2205 O5 35 05.9 +22 05 41.7 O.09 AGL JO538-4424 O5 38 29.6 -44 24 17.8 O.5 AGL JO617+2236 O6 17 21.7 +22 36 14.2 O.27 AGSC Data Explorer JO634+1748 O6 34 15.8 +17 48 27.7 O.05 ASSC Data Explorer JO657+4554 O6 57 29.2 +45 54 14.5 O.55 ASSC	Assoc Data Explorer 1AGL JO006+7311 00 06 34.2 +73 11 06.6 0.63 5.1 Assoc Data Explorer 1AGL JO242+6111 02 42 13.6 +61 11 06.7 0.64 5.3 Assoc Data Explorer 1AGL JO242+6111 02 42 13.6 +61 11 06.7 0.64 5.3 Assoc Data Explorer 1AGL JO535+2205 05 35 05.9 +22 05 41.7 0.09 47.2 Assoc Data Explorer 1AGL JO538-4424 05 38 29.6 -44 24 17.8 0.5 5.9 Assoc Data Explorer 1AGL JO617+2236 06 17 21.7 +22 36 14.2 0.27 9.9 Assoc Data Explorer JAGL JO657+4554 06 34 15.8 +17 48 27.7 0.05 63 Assoc Data Explorer JAGL JO657+4554 06 57 29.2 +45 54 14.5 0.55 5.8 Assoc Data Explorer JAGL JO722+7125 07 22 22.9 +71 25 31.1 0.37 10.9 Assoc Data Explorer JAGL JO835-4509 08 35 13.3 -45 09 09.0 0.09 41.7 Assoc Data Explorer IAGL JO835-4509 08 35 13.3 -45 09 09.0 0.09<	Assoc Data Explorer 1AGL J0006+7311 00 06 34.2 +73 11 06.6 0.63 5.1 23 +/- 5 Assoc Data Explorer 1AGL J0242+6111 02 42 13.6 +61 11 06.7 0.64 5.3 54 +/- 12 Assoc Data Explorer 1AGL J0242+6111 02 42 13.6 +61 11 06.7 0.64 5.3 54 +/- 12 Assoc Data Explorer 1AGL J0535+2205 05 35 05.9 +22 05 41.7 0.09 47.2 220 +/- 15 Assoc Data Explorer 1AGL J0538-4224 05 38 29.6 -44 24 17.8 0.5 5.9 43 +/- 10 Assoc Data Explorer 1AGL J0538+424 06 38 29.6 -44 24 17.8 0.5 5.9 43 +/- 10 Assoc Data Explorer 1AGL J0617+2236 06 17 21.7 +22 36 14.2 0.27 9.9 69 +/- 9 Assoc Data Explorer 1AGL J0637+4554 06 637 29.2 +45 54 14.5 0.55 5.8 31 +/- 6 Assoc Data Explorer 1AGL J0657+4554 07 22 29.9 +71 25 31.1 0.37 10.9 68 +/- 9 Assoc Data Explorer 1AGL J0835-4509 08 35 13.3 </td <td>Assoc Data Explorer 1AGL J0006+7311 00 06 34.2 +73 11 06.6 0.63 5.1 23 +/- 5 3486 Assoc Data Explorer JAGL J0242+6111 02 42 13.6 +61 11 06.7 0.64 5.3 54 +/- 12 1356 Assoc Data Explorer JAGL J0235+2205 05 35 05.9 +22 05 41.7 0.09 47.2 220 +/- 15 3229 Assoc Data Explorer IAGL J0538-4424 05 38 29.6 -44 24 17.8 0.5 5.9 43 +/- 10 934 Assoc Data Explorer J0617+2236 06 17 21.7 +22 36 14.2 0.27 9.9 69 +/-9 3229 Assoc Data Explorer JAGL J0637+4754 06 34 15.8 +17 48 27.7 0.05 63 320 +/- 10 3229 Assoc Data Explorer JAGL J0657+4554 06 57 29.2 +45 54 14.5 0.55 5.8 31 +/- 6 2288 Assoc Data Explorer JAGL J0657+4554 07 12 2.9 +71 25 31.1 0.37 10.9 68 +/- 9 1614 Assoc Data Explorer JAGL J0722+7125 07 22 22.9 +71 25 31.1 0.</td> <td>Add Add Add</td>	Assoc Data Explorer 1AGL J0006+7311 00 06 34.2 +73 11 06.6 0.63 5.1 23 +/- 5 3486 Assoc Data Explorer JAGL J0242+6111 02 42 13.6 +61 11 06.7 0.64 5.3 54 +/- 12 1356 Assoc Data Explorer JAGL J0235+2205 05 35 05.9 +22 05 41.7 0.09 47.2 220 +/- 15 3229 Assoc Data Explorer IAGL J0538-4424 05 38 29.6 -44 24 17.8 0.5 5.9 43 +/- 10 934 Assoc Data Explorer J0617+2236 06 17 21.7 +22 36 14.2 0.27 9.9 69 +/-9 3229 Assoc Data Explorer JAGL J0637+4754 06 34 15.8 +17 48 27.7 0.05 63 320 +/- 10 3229 Assoc Data Explorer JAGL J0657+4554 06 57 29.2 +45 54 14.5 0.55 5.8 31 +/- 6 2288 Assoc Data Explorer JAGL J0657+4554 07 12 2.9 +71 25 31.1 0.37 10.9 68 +/- 9 1614 Assoc Data Explorer JAGL J0722+7125 07 22 22.9 +71 25 31.1 0.	Add Add



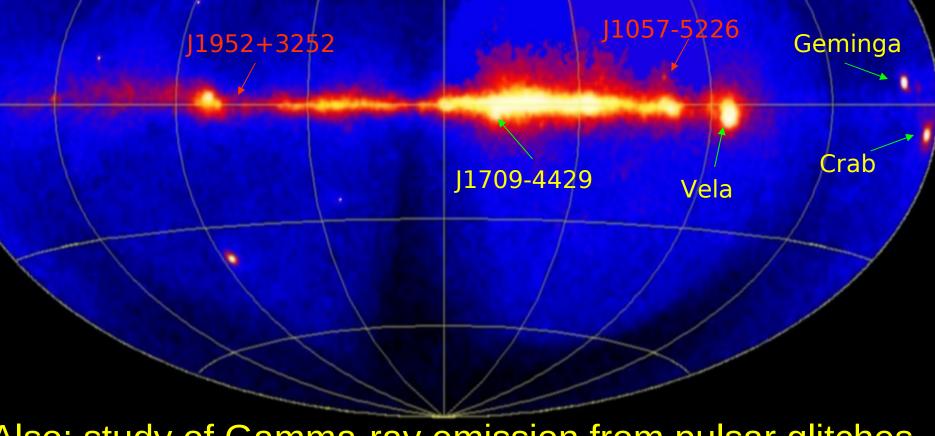
AGILE name	RA (J2000.0) (hh mm ss)	Dec (J2000.0) (dd mm ss)	LII (deg)	BII (deg)	"Pos. Error (95%) (deg)	sqrt(TS)	^b Mean Ring Exp (×10 ⁸ cm ² s)	^c Mean Flux & Error (×10 ⁻⁸ ph cm ⁻² s ⁻¹)	Classification	Confirmed Counterp.	Possible Counterp. & Other Names
1AGL J0006+7311	00 06 34.2	+73 11 06.6	119.65	10.6	0.63	5.1	3.01	23 ± 5	GammaPulsar*	CTA1	3EGJ0010+7309
1AGL J0242+6111	02 42 13.6	+61 11 06.7	135.88	1.13	0.64	5.3	1.17	54 ± 12	HMXRB	LSI+61303	3EGJ0241+6103
1AGL J0535+2205	05 35 05.9	+22 05 41.7	184.56	-5.63	0.09	47.2	2.79	220 ± 15	Pulsar	Crab	3EGJ0534+2200
1AGL J0538-4424	05 38 29.6	-44 24 17.8	250.44	-31.2	0.5	5.9	0.81	43 ± 10	Blazar-BLLac	PKS0537-441	3EGJ0540-4402 BZBJ0538-4405
1AGL J0617+2236	06 17 21.7	+22 36 14.2	189.04	3.07	0.27	9.9	2.79	69 ± 9	Unclassified	-	3EGJ0617+2238 IC443 PSRJ0614+2229
1AGL J0634+1748	06 34 15.8	+17 48 27.7	195.14	4.36	0.05	63	2.79	320 ± 10	Pulsar	Geminga	3EGJ0633+1751
1AGL J0657+4554	06 57 29.2	+45 54 14.5	170.73	20.11	0.55	5.8	1.98	31 ± 6	Blazar	—	BZUJ0654+4514 \$40650+45
1AGL J0714+3340	07 14 29.4	+33 40 37.3	184.12	19.1	0.85	4.2	2.57	18 ± 5	Blazar	—	BZUJ0719+3307 GB20716+332
1AGL J0722+7125	07 22 22.9	+71 25 31.1	143.89	28.06	0.37	10.9	1.39	68 ± 9	Blazar-BLLac	S50716+714	3EGJ0721+7120 BZBJ0721+7120
1AGL J0835-4509	08 35 13.3	-45 09 09.0	263.52	-2.79	0.09	41.7	0.81	780 ± 32	Pulsar	VelaPSR	3EGJ0834-4511
1AGL J1022-5822	10 22 08.8	-58 22 17.0	284.39	-0.98	0.36	10.1	4.85	59 ± 7	Unclassified	(C)	3EGJ1013-5915 PSRJ1016-5857
1AGL J1043-5931	10 43 24.7	-59 31 44.7	287.34	-0.59	0.68	5.2	4.85	26 ± 6	Unclassified	(C)	3EGJ1048-5840 EtaCar PSRJ1048-5937
1AGL J1058-5239	10 58 31.1	-52 39 47.5	286.15	6.49	0.30	8.7	4.85	29 ± 4	Unclassified		3EG J1058-5234 PSRJ1057-5226
1AGL J1104+3754	11 04 38.5	+37 54 33.6	180.48	65.16	0.66	4.7	0.51	42 ± 13	Blazar-BLLac	Mkn421	3EGJ1104+3809 BZBJ1104+3812
1AGL J1108-6103	11 08 43.6	-61 03 54.3	290.83	-0.63	0.57	6.1	4.85	30 ± 6	Unclassified	_	3EGJ1102-6103 PSRJ1119-6127
1AGL J1222+2851	12 22 39.7	+28 51 02.3	196.09	83.42	0.74	4.7	0.50	38 ± 11	Blazar-BLLac	WComae	3EGJ1222+2841 BZBJ1221+2813 ON +231
1AGL J1228+0142	12 28 59.5	+01 42 41.3	290.04	64.02	0.71	4.7	1.98	24 ± 6	Blazar-FSRQ	3C273	3EGJ1229+0210 BZQJ1229+0203
1AGL J1238+0406	12 38 31.0	+04 06 14.2	294.74	66.77	1.23	4.7	1.98	25 ± 6	Blazar-FSRQ	<u> </u>	3EGJ1236+0457 BZQJ1239+0443
1AGL J1256-0549	12 56 33.1	-05 49 42.6	305.27	57.02	0.32	10.2	1.98	65 ± 9	Blazar-FSRQ	3C279	3EGJ1255-0549 BZQJ1256-0547
1AGL J1412-6149	14 12 06.1	-61 49 32.5	312.3	-0.43	0.44	6.3	5.44	43 ± 7	Unclassified	(C)	3EGJ1410-6147 PSRJ1410-6132
					AGILE	E First	Source Cat	alogue •	arXiv:0902	2.2959	G312.4-0.4

AOILE name	RA (J2000.0) (lih mm ss)	Dec (J2000.0) (dd mm ss)	LII (deg)	BII) (deg)	"Pos. Error (95%) (deg)	sqrt(TS)	^b Mean Ring Exp (×10 ⁶ cm ² s)	"Mean Flux & Error (×10 ⁻⁸ ph em ⁻² s ⁻¹)	Classification	Confirmed Counterp.	Possible Counterp. & Other Names
1AOL J1419-6055	14 19 51-2	-60 55 11.2	313.47	0.13	0.31	7.5	5.44	52 ± 7	Unclassified	(C)	3E0J1420-6038 PSRJ1420-6048
1AGL J1506-5859	15 06 01.5	-58 59 13.5	319.52	-0.52	0.48	6.9	5.44	41 ± 7	Unclassified	-	PSRJ1509-5850
1AOL J1511-0908	15 11 38.5	-09 08 12.8	350.97	40.31	0.33	11.2	0.39	220 ± 32	Blazar-F8RQ	PK81510-089	3E0J1512-0849 BZQJ1512-0905
1AOL J1624-4946	162426.9	-49 46 51.9	334.09	-0.25	0.58	5.7	2.18	67 ± 13	Unclassified	_	PSRJ1623-4949
1AOL J1639-4702	16 39 05.5	-47 02 28.2	337.75	-0.15	0.53	6.4	2.18	76 ± 13	Undestified	-	3E0J1639-4702 PSRJ1637-4642
1AOL J1709-4428	17 09 12.6	-44 28 44.5	343.07	-2.64	0.20	13.8	2.18	120 ± 11	Polsar	PSRJ1709-4419	3E0J1710-4439
1AOL J1736-3235	173619.9	-32 35 00.8	355.85	-0.24	0.59	5.1	1.56	69 ± 15	Unclassified	(C)	3E0J1734-3232
1AOL J1746-3017	17 46 01.5	-301723.7	358.89	-0.78	0.68	4.4	1.56	66 ± 16	Unclassified	(C)	3E0J1744-3011
1AOL J1803-2255	18 03 11.8	-22 55 00.6	7.19	-0.36	0.49	7.6	1.56	110 ± 16	Unclassified	ŝ	3E0J1800-2338 PSRJ1803-2306
1AOL J1824-1414	18 24 35.2	-14 14 30.9	17.23	-0.65	0.8	6.4	1.56	90 ± 16	Unclassified	_	3E0J1823-1314 LS 5099 PSRJ1826-1334
1AOL J1836+5923	18 36 14.8	+59 23 30.4	88.84	24.99	0.17	15.6	5.52	45 ± 4	Unclassified	_	3E0J1835+5918 BZBJ1841+5906 \$41834+61
1AOL J1846+6714	18 46 19.6	+67 14 17.4	97.59	25.35	0.43	7.0	5.52	20 ± 4	Blazar-PSRQ	-	BZQJ1849+6705 4O66.20
1AOL J1857+0136	18 57 10.2	+01 36 42.6	35.02	-0.54	0.34	10.2	3.06	130 ± 14	Undestified	-	3E0J1856+0114 PSRJ1856+0113
1AOL J1908+0613	19 08 11.5	+06 13 29 3	40.38	-0.87	0.49	7.2	3.06	78 ± 12	Unclassified	-	3E0J1903+0550 PSRJ1905+0616
1AOL J2021+3652	20 21 25.3	+36 52 32.6	75.28	0.07	0.19	14.2	8.31	65±5	Pulsar	PSFJ2021+3651	3E0J2021+3716
1AGL J2022+4032	20 22 08.5	+40 32 13.4	78.37	2.04	0.12	23.4	831	120 ± 7	Unclassified	-	3E0J2020+4017 SNR Oanma Cygni
1AOL J2026-0732	20 26 30.7	-0732453	37.05	-14.55	0.53	6.9	3.06	39±7	Blazar-PSRQ	_	3E0J2025-0744 BZQJ2025-0735 PK82023-07
1AGL J2032+4102	20 32 27.7	+41 02 00.0	79.91	0.74	0.41	6.8	831	37 ± 6	Unclassified	-	3EQJ033+4118 CygX-3
1AOL J2231+6109	223107.1	+61 09 46.7	106.82	2.76	0.29	8.4	6.26	32 ± 5	Pulsar	PSRJ2229+6114	3E0J2227+6122
1AOL J2254+1602	22 54 10.3	+16 02 32.6	86.09	-38.3	0.17	23.0	1.16	200 ± 14	Blazar-FSRQ	304543	3E0J2254+1601 BZQJ2253+1608



Known EGRET Gamma-ray Pulsars (E>100 MeV)

Red: AO1 AGILE Guest Observer Program, yellow: AGILE Team



Also: study of Gamma-ray emission from pulsar glitches

AGILE Cat-1 detections: all EGRET pulsars + 2 new confirmed pulsars + 13 candidates

From Timing analysis: 3 new pulsars (Pellizzoni et al.) Fermi pulsars:

25 gamma-ray and radio pulsars (including 7 ms psrs)

13 gamma-ray only pulsars



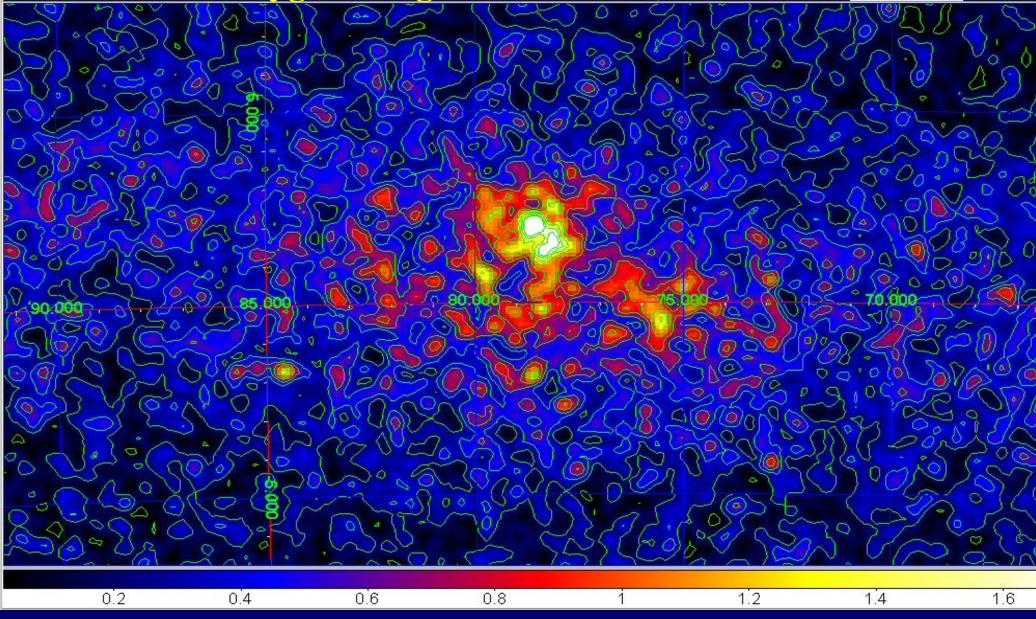
- + young pulsars discovered using radio ephemeris
 - pulsars discovered in blind search
 - millisecond pulsars discovered using radio ephemeris

Fermi High-confidence detections through 10/31/2008

AGILE study of galactic transients (see AGILE Galactic Working Group talk)

Cygnus Region: EGRET, VP 1-2-3-4 (1991-1996)

Cygnus Region: AGILE (Nov. 2 – Dec. <u>16</u>, 2007)



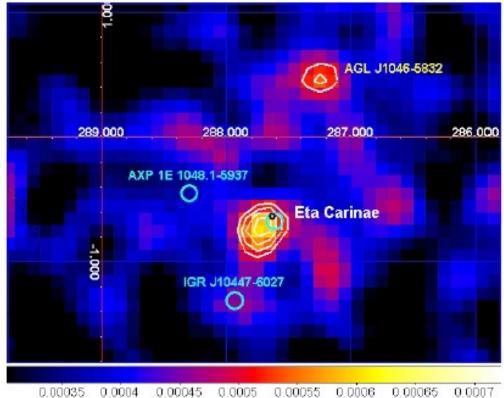
The Eta Carinae region

(see Viotti talk)

Extensive AGILE observations of the Galactic region hosting the Carina nebula and the remarkable colliding wind binary Eta Carinae (η Car)

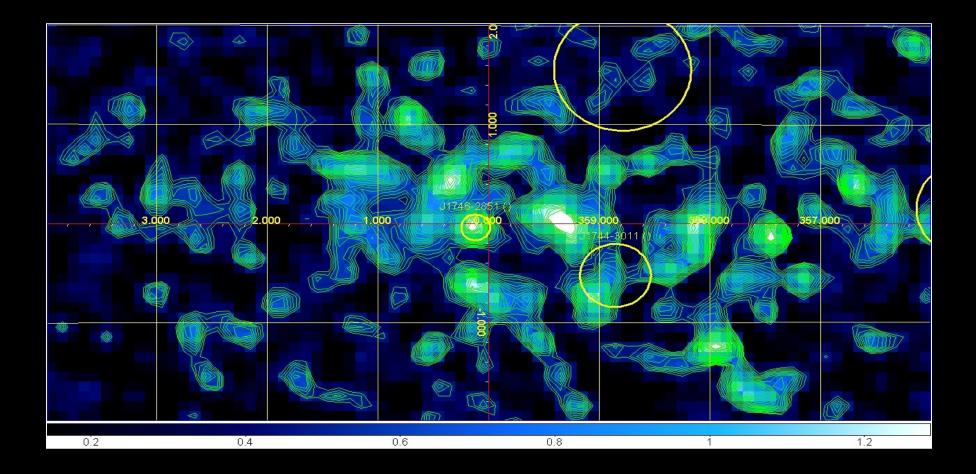
Complex region. Delicate multi source analysis needed.

Gamma-ray detection of the colliding wind massive binary system η Car with AGILE!



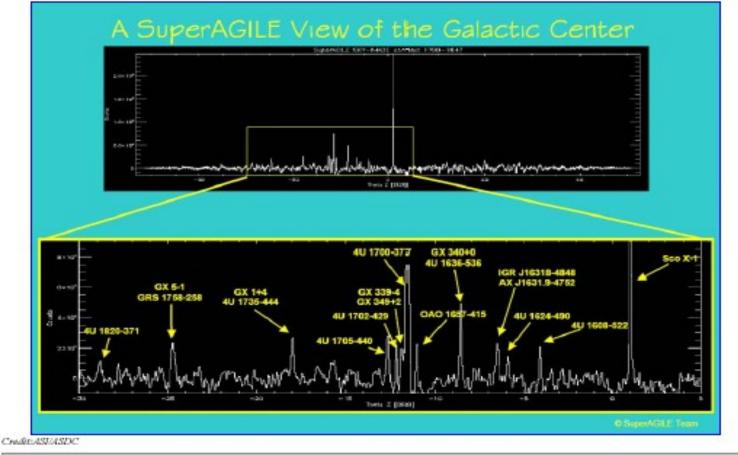
Tavani et al., accepted for publication on ApJ

AGILE's look at the Galactic Center GRID E > 100 MeV (March 2008)



The X-ray imager SuperAGILE:





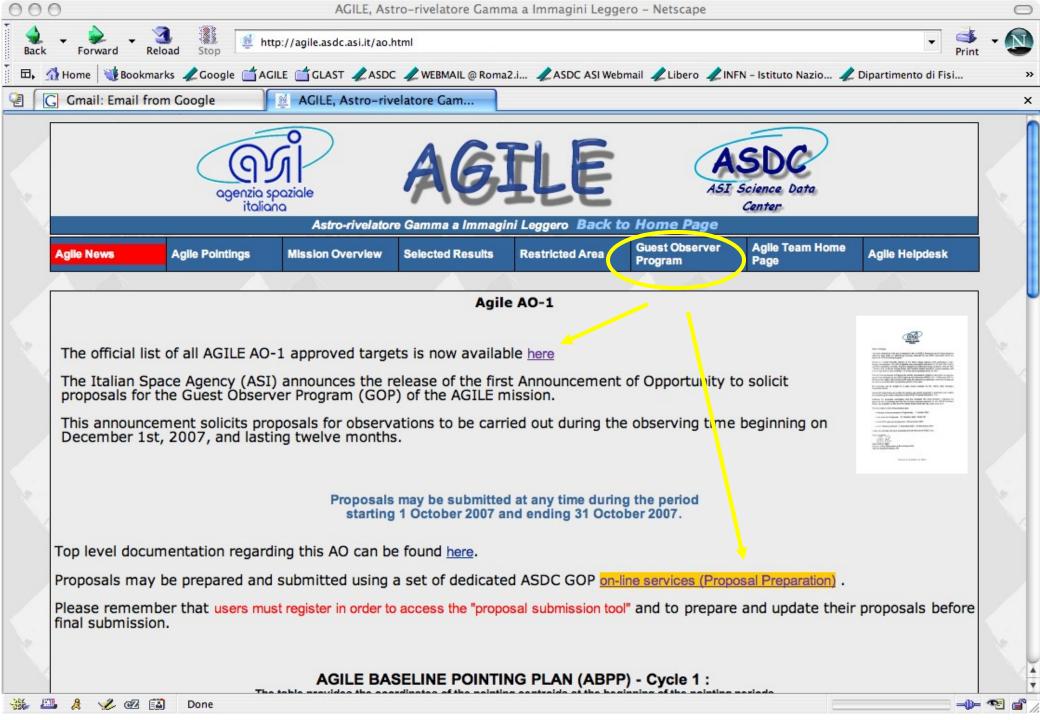
Grand Central Scan

Mysterious beasts lurk at the center of the Milky Way. They require new and varied methods to be monitored - no one knows when they will act up. A new observatory run by the Agenzia Spaziale Italiana called AGILE is one new tool in the astronomer's toolbox. AGILE (*Astro-rivelatore Gamma a Immagint LEggero*, which roughly translates as "Star imaging detector in Gamma-Ray Light") was <u>launched</u> on April 23, 2007 and is already returning important science during its check-out phase. The image above is a scan by the X-ray monitor on AGILE, called Super-AGILE (which roughly translates as "Above-AGILE"), dedicated to monitoring hard X-ray sources with high sensitivity. This scan, performed shortly after the launch of AGILE, identifies more than a dozen high energy sources (in the range 20-60 keV) in the Galactic center.

Impulsive events: GRBs and TGFs (see AGILE GRB working group talk)

• SuperAGILE detects several other GRBs in its energy band (20-60 keV) at a rate of about 1 per month while the AGILE Minicalorimeter (MCAL) observes about 1 GRB per week in the energy range 0.7-1.4 MeV on several time scales (Marisaldi et al.). GRID energies: only two GRBs up to now with HE component E > 50 MeV.

•The AGILE Minicalorimeter also detects very interesting events on timescales < 5 ms, which are currently under study as **Terrestrial gamma-ray flash candidates**



Scientific program open to the community: AO1 completed

Cycle-1 Guest Observer Program: Dec. 1, 2007 - Nov. 30, 2008

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🚮 Home 🛛 😻 Book	marks 🗶 Google		GLAST 🥠	ASDC 🥠	WEBMAIL @	Roma2.i	ASDC AS	I Webmail 🦼	Libero 🥠 INFN -	Istituto Nazio
🔅 Agile AO1 Ap	proved Targets									
genda			Agi	e AO	1 Ap	pro	ved Tar	gets		
roved Targets Sho	and the second second second	ew window								
Target Name	RA (J2000)	Dec (J2000)	RA (J2000)	Dec (J2000)		b P A	PI Name	Proposal ID	TargetClass	Title
3EG J0010+7309	0h 9m 36.48s	73 10' 55.20"	2.402	73.182	119.870	10.559	Diego Torres	39	3EG Sources	AGILE GRID observations of Unidentified EGRET sources likely related to supernov
J0030+0451	0h 30m 27.35s	4 51' 39.59"	7.614	4.861	113.141	-57.611	Andrea Possenti	6	Pulsars	Investigating the gamma-ray properties of a sample of northern radio pulsars
1ES 0033+595	0h 35m 52.55s	59 50' 6.00"	8.969	59.835	120.975	-2.978	David Williams	7	Active Galactic Nuclei	Multiwavelength Studies of Candidate TeV Blazars with AGILE
PSR J0108-1431	1h 8m 8.15s	-14 31' 47.99"	17.034	-14.530	140.927	-76.815	Patrick Weltevrede	21	Pulsars	Searching and studying gamma-ray counterparts of a sample of southern pulsars
1ES 0120+340	1h 23m 8.64s	34 20' 49.20"	20.786	34.347	130.346	-28.068	David Williams	7	Active Galactic Nuclei	Multiwavelength Studies of Candidate TeV Blazars with AGILE
J0205+6449	2h 5m 37.92s	64 49' 44.39"	31.408	64.829	130.719	3.085	Andrea Possenti	6	Pulsars	Investigating the gamma-ray properties of a sample of northern radio pulsars
PKS 0208-512	2h 10m 46.31s	-50 58' 58.79"	32.693	-50.983	276.055	-61.804	Elena Pian	13	Active Galactic Nuclei	Multiwavelength Variability of Gamma-Ray-Loud Blazars
J0218+4232	2h 18m 6.24s	42 32' 16.79"	34.526	42.538	139.508	-17.527	Andrea Possenti	6	Pulsars	Investigating the gamma-ray properties of a sample of northern radio pulsars
3C 66A	2h 22m 39.59s	43 2' 5.99"	35.665	43.035	140.143	-16.767	David Williams	7	Active Galactic Nuclei	Multiwavelength Studies of Candidate TeV Blazars with AGILE
J0323+5122	3h 23m 35.99s	51 22' 1 1.99"	50.900	51.370	145.636	-4.667	Vincenzo Vitale	31	3EG Sources	AGILE study of gamma ray sources possibly associated with the Gould Belt
B2 0321+33B	3h 24m 41.3s	34 10' 44.40"	51.171	34.179	155.727	-18.757	David Williams	7	Active Galactic Nuclei	Multiwavelength Studies of Candidate TeV Blazars with AGILE
Per OB2	3h 40m 0.0s	33 0' 0.00"	55.000	33.000	159.152	-17,765	Elena	36	3EG Sources	Search for gamma-ray emission

AGILE AO1:

- **Submitted proposals: 29**
- **Approved/P. Approved: 24**
- **Requested Targets: 122**
- **Approved Targets: 100**
- Pulsars: 39
- AGN: 31
- **3EG sources: 30**

Cycle-1 GOP Schedule

- SW build GO 1.0 + test dataset: *released on May 22, 2008*
- Cycle-1 data distribution:
- first delivery (17 OBs) on June 5, 2008
- second delivery (3 OB) on July 17, 2008
- last complete data release on Dec 23, 2008



AGILE Cycle-2 Baseline Pointing Plan: December 1, 2008 - November 30, 2009

Pointing number	Start date	End date	Pointing name	LII	BII	weeks
1	01 Dec.08	20 Dec.08	Cygnus Field 4	82.7	-10.1	3
2	20 Dec.08	15 Gen.09	Cygnus Field 5	95.7	-10.2	3.5
3	15 Gen.09	28 Feb.09	Cygnus Field 6	105.1	10.5	6
4	28 Feb.09	25 Mar.09	Gal. Center 4	350.5	12.7	4
5	25 Mar.09	01 Apr.09	Crab Field	190.6	3.3	1
6	01 Apr.09	15 Apr.09	Aquila Field 1	15.0	-8.8	2
7	15 Apr.09	30 Apr.09	Aquila Field 2	51.1	0.6	2
8	30 Apr.09	15 Mag.09	Cygnus Field 7	66.8	0.0	2
9	15 Mag.09	31 Mag.09	Vela Field 1	256.6	0.8	2
10	31 Mag.09	15 Jun.09	Virgo Field 1	237.0	59.4	2
11	15 Jun.09	25 Jun.09	Cygnus Field 8	92.8	-10.0	1.5
12	25 Jun.09	15 Jul.09	Cygnus Field 9	99.7	-20.1	4
13	15 Jul.09	12 Aug.09	Cygnus Field 10	112.2	9.6	4
14	12 Aug.09	31 Aug.09	Vela Field 2	307.2	0.3	3.5
15	31 Aug.09	10 Sep.09	Norma Field 1	343.6	10.3	2
16	10 Sep.09	22 Sep.09	Gal. Center 5	0.3	10.5	2
17	22 Sep.09	30 Sep.09	Crab Field 2	187.0	-0.8	1
18	30 Sep.09	15 Oct.09	Aquila Field 3	10.6	-7.3	2
19	15 Oct.0-9	31 Oct.09	Aquila Field 4	60.1	10.4	2
20	31 Oct.0-9	30 Nov.09	Cygnus Field 11	65.1	0.2	4

AGILE AO2:

- **Submitted proposals: 15**
- 14 PI, 74 co-PI
- **Requested Targets: 93**
- Pulsars: 21
- AGN: 62
- **3EG sources: 10**
- AO2 DAC valutation: on-going (results within the end of this month - TBC)

AGILE Public Data Distribution Schedule

- Public SW build + test dataset: May 8, 2009
- Publication of Cycle-1 data:
- first public delivery (17 OBs): June 5, 2009
- second delivery (3 OBs): July 17, 2009
- complete Cycle-1 data release: Dec 23, 2009

cientific Observation (SO)				1. 2.0			a state		
	SO Name	Num. Of Obs. Blocks	Rqstd Start Date (UTC)	Rqstd End Date (UTC)	Initial RA (deg)	Initial DEC (deg)	Total Time (s)	Content Type	Note
o 🖍 🖬 📈 🗗 🗙 🔿	Cygnus Field 5	1	2008-12-20 12:00:00	2009-01-12 18:00:00	334.096	44.049	2008800.000	NORMAL	ABPP2 =95.698 b=-10.471 Note: ACCORCIATO, precedenti coor RA,Dec=334.096,44.049 Par=220.28 con fine al 2009-01-15 12:00:00
o 🖍 B 🖌 B 🗙 4	ToO Carina Field	7	2009-01-12 18:00:00	2009-01-19 18:00:00	161.669	-59.861	604800.000	тоо	ToO su =287.859 b=-0.691 Target EI:a Carina: =287.6 b=-0.6 Delta=0.2 deg
o 🖉 d 🖌 🔁 🗙 🗳	Cygnus Field 6	2	2009-01-19 18:00:00	2009-02-28 12:00:00	325.749	68.106	3434400.000	NORMAL	ABPP2 =105,322 b=10.745 OB 6700 dal 2009-01-15 annullato e POSTPOSTO con OB 671 per ToO precedente =106.75 b=11.375
							8		l=349.755
9 🛛 8 🗸 6 🗙 6	Galactic Center 4	2	2009-02-28 12:00:00	2009-03-31 12:00:00	247.204	-29.033	2678400.000	NORMAL	b=13.586 OB 6800 I=349.853 b=13.432 Prolonged: dal 2009-03-31 dal 2009-03-25 al 2009-03-31
9 🛛 8 🖌 4 🗶 4	Crab Field	2	2009-03-31 12:00:00	2009-04-07 12:00:00	102.703	31.710	604800.000	NOFIMAL	OB 6810 per la PKS 1510 ABPP2 l=190.746 b=2.855 OB 6900 l=190.89 b=3.121 Shifted: start dal 2009-03-325 al 2009-03-31 per prolungamento OB precedente end dal 2009-04-07
🖻 🜌 El 💋 🔁 🗶 🍜 102 Pro X	Aquila Field	з	2009-04-07 12:00:00	2009-04-30 12:00:00	288.881	-19.310	1987200.000	NORMAL	ABPP2: ABPP2: DB 7000: [=14.945 b=-8.246 ABPP2: ABPP2: I=50.381 b=1.109 OB 7100: I=50.919 b=0.442 Postponed a seguito dello shift precedente start dal 2009-04-01 al 2009-04-07
New	-					-			

Final remarks on AGILE First Catalog :

• The AGILE First Catalog includes only high-significance sources characterized by a prominent mean gamma-ray flux above 100 MeV when integrated over the total exposure period 2007 July - 2008 June and it is not a complete sample due to the non-uniform first year sky coverage.

• The AGILE-GRID spatial resolution reached with long exposures is substantially better than that of EGRET, and the total exposure accumulated by AGILE in several sky regions, particularly near the Galactic plane, is comparable with that obtained by EGRET in 6 years effective time.

• Cat-1 exposure mostly in the Carina-Crux and in the Cygnus regions, with relatively low exposure at the Galactic center. This explains the relatively small number of sources in the Galactic center region included in this First Catalog.

• With the one-year long integration time scale only sources with "steady" flux values above ~ $20 \ 10^{-8}$ ph cm⁻² s⁻¹ are detected over 4 sigma. Source detections during flaring state and determination of peak fluxes are not included in this Catalog and will be the subject of a forthcoming publication.

• This should be taken into account when comparing with the results of the Third EGRET Catalog which includes detections over 4 sigma in each of the EGRET viewing periods during its effective 6-year lifetime.

• AGILE in the First Catalog detected five sources that were not present in the 3EG Catalog: 3 Blazars and 2 candidate pulsars.

• A variability study of the sources of the First AGILE Catalog over different timescales is in progress (F. Verrecchia et al. 2009).

THE END