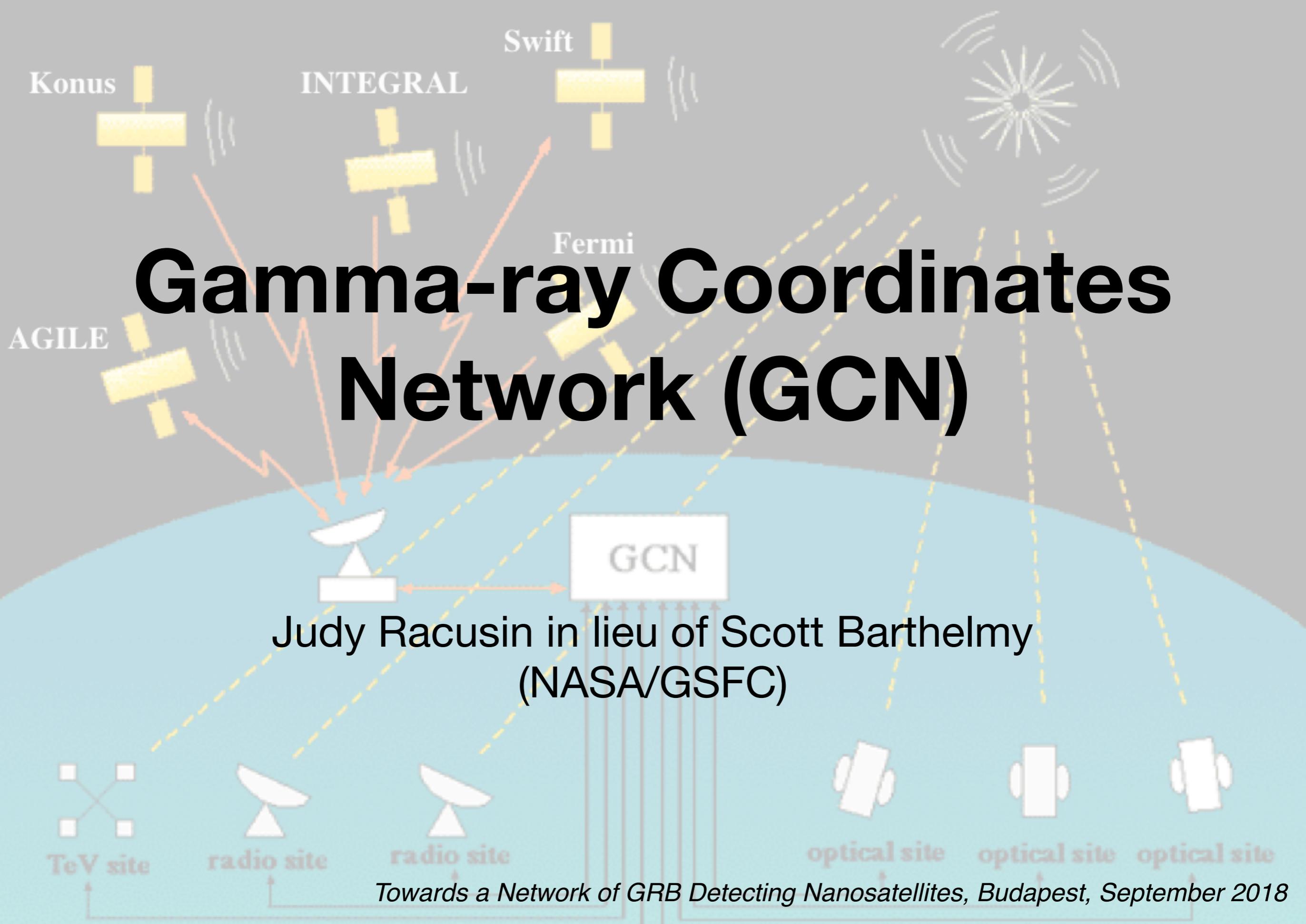


Gamma-ray Coordinates Network (GCN)

Judy Racusin in lieu of Scott Barthelmy
(NASA/GSFC)



GCN Functionality

- Automated distribution system for both machine-generated GCN Notices and human-generated GCN Circulars
- Standard communication tool in GRB missions for last ~30 years
- GCN is committed to:
 - Provide rapid collection and distribution of transients of all types (0.1 to 1 sec latencies),
 - Adding any new distribution methods/formats that the community desires.
- For more info: <https://gcn.gsfc.nasa.gov/>

GCN Products

Human-Generated Circular

Machine-Generated Notice

```
////////////////////////////////////
TITLE:          GCN/SWIFT NOTICE
NOTICE_DATE:    Wed 05 Sep 18 13:59:00 UT
NOTICE_TYPE:    Swift-BAT GRB Position
TRIGGER_NUM:    859421,   Seq_Num: 0
GRB_RA:         91.035d {+06h 04m 08s} (J2000),
                91.266d {+06h 05m 04s} (current),
                90.417d {+06h 01m 40s} (1950)
GRB_DEC:        -4.591d {-04d 35' 27"} (J2000),
                -4.593d {-04d 35' 35"} (current),
                -4.588d {-04d 35' 15"} (1950)
GRB_ERROR:      3.00 [arcmin radius, statistical only]
GRB_INTEN:      0 [cnts]   Image_Peak=1573 [image_cnts]
TRIGGER_DUR:    64.000 [sec]
TRIGGER_INDEX:  20000     E_range: 15-50 keV
BKG_INTEN:      0 [cnts]
BKG_TIME:       0.00 SOD {00:00:00.00} UT
BKG_DUR:        0 [sec]
GRB_DATE:       18366 TJD; 248 DOY; 18/09/05
GRB_TIME:       50266.45 SOD {13:57:46.45} UT
GRB_PHI:        162.21 [deg]
GRB_THETA:      42.86 [deg]
SOLN_STATUS:    0x13
RATE_SIGNIF:    0.00 [sigma]
IMAGE_SIGNIF:   10.32 [sigma]
MERIT_PARAMS:   +1 +0 +0 +6 +1 -0 +0 +0 -27 +0
SUN_POSTN:      164.30d {+10h 57m 11s} +5.69d {+06d 41' 30"}
SUN_DIST:       73.76 [deg]   Sun_angle= 4.9 [hr] (West of Sun)
MOON_POSTN:     106.56d {+07h 06m 13s} +20.93d {+20d 55' 36"}
MOON_DIST:      29.60 [deg]
MOON_ILLUM:     23 [%]
GAL_COORDS:     211.65,-12.61 [deg] galactic lon,lat of the burst (or transient)
ECL_COORDS:     91.17,-28.03 [deg] ecliptic lon,lat of the burst (or transient)
COMMENTS:       SWIFT-BAT GRB Coordinates.
COMMENTS:       This is an image trigger. (The RATE_SIGNIF & BKG_{INTEN, TIME, DUR
COMMENTS:       A point_source was found.
COMMENTS:       This does not match any source in the on-board catalog.
COMMENTS:       This does not match any source in the ground catalog.
COMMENTS:       This is a GRB.
COMMENTS:       This trigger occurred at longitude,latitude = 263.24,-6.55 [deg].
////////////////////////////////////
```

```
TITLE:  GCN CIRCULAR
NUMBER:  23201
SUBJECT: GRB 180905A: Swift detection of a burst
DATE:    18/09/05 14:07:32 GMT
FROM:    David Palmer at LANL <palmer@lanl.gov>
```

V. D'Elia (SSDC), A. D'Ai (INAF-IASFPA), J.D. Gropp (PSU),
J. A. Kennea (PSU), M. J. Moss (Georgia Washington University),
K. L. Page (U Leicester), D. M. Palmer (LANL) and B. Sbaruffatti (PSU)
report on behalf of the Neil Gehrels Swift Observatory Team:

At 13:57:46 UT, the Swift Burst Alert Telescope (BAT) triggered and
located GRB 180905A (trigger=859421). Swift slewed immediately to the burst.
The BAT on-board calculated location is
RA, Dec 91.035, -4.591 which is
RA(J2000) = 06h 04m 08s
Dec(J2000) = -04d 35' 27"

with an uncertainty of 3 arcmin (radius, 90% containment, including
systematic uncertainty). As is usual for an image trigger, no obvious
variation is visible in the immediately-available lightcurve.

The XRT began observing the field at 14:00:12.3 UT, 145.9 seconds after
the BAT trigger. XRT found a bright, uncatalogued X-ray source located
at RA, Dec 91.0602, -4.5724 which is equivalent to:

RA(J2000) = 06h 04m 14.45s
Dec(J2000) = -04d 34' 20.6"

with an uncertainty of 5.1 arcseconds (radius, 90% containment). This
location is 112 arcseconds from the BAT onboard position, within the
BAT error circle. No event data are yet available to determine the
column density using X-ray spectroscopy.

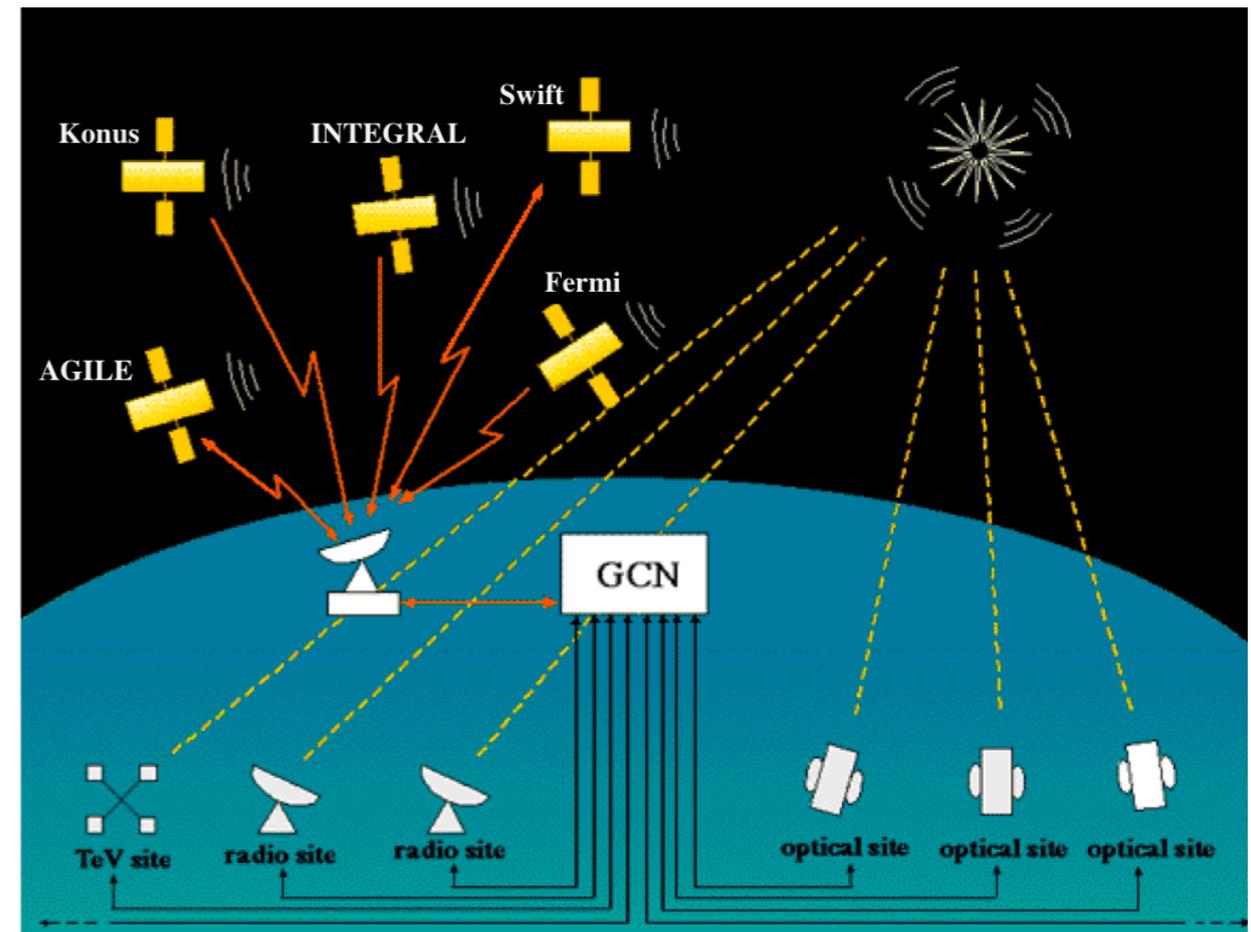
The initial flux in the 2.5 s image was 2.03e-09 erg cm⁻² s⁻¹ (0.2-10
keV).

UVOT took a finding chart exposure of 135 seconds with the White filter
starting 153 seconds after the BAT trigger. No credible afterglow candidate has
been found in the initial data products. The 2.7'x2.7' sub-image covers 100% of
the XRT error circle. The typical 3-sigma upper limit has been about 19.6 mag.
The 8'x8' region for the list of sources generated on-board covers 100% of the
XRT error circle. The list of sources is typically complete to about 18 mag. No
correction has been made for the expected extinction corresponding to E(B-V) of
0.60.

Burst Advocate for this burst is V. D'Elia (delia AT sscd.esi.it).
Please contact the BA by email if you require additional information
regarding Swift followup of this burst. In extremely urgent cases, after
trying the Burst Advocate, you can contact the Swift PI by phone (see
Swift TOO web site for information: <http://www.swift.psu.edu/too.html>.)

GCN Properties

- Statistics:
 - Distributed Notices to ~650 “sites”
 - Collects ~70 different Notice types from 7 different missions/projects
 - Distributes Circulars to ~1100 recipients



How to get involved?

- Recent Methods additions in the last few years:
 - Has private subnet capability (eg. L-V in the O1 and O2 era, and sub-threshold in the O3 era; and AMON private and public types)
 - Has 9 different VOEvent servers (plus the original central socket/email server).
- Always looking for:
 - New customers, and
 - New sources of Notices to distribute. Eagerly look forward to incorporating whatever your Nanosats will produce