# The Science Support Center and the Science Tools

David Band – Science Lead, SSC

OUTLINE

- **The Role of the SSC**

- **The SSC's Responsibilities for Providing Science Tools**

- **The Relationship Between the LAT Team and the SSC**

- **What the SSC Hopes to Accomplish at This Meeting**

The Role of the SSC

- **The SSC is the interface between GLAST and the general scientific community.**

- **It is responsible for:**
  - **Providing data and analysis tools to the scientific community unaffiliated with the instrument teams**
  - **Running the guest investigator program**
  - **Supporting mission operations, primarily through maintaining the mission timeline**
  - **Archiving the mission data, eventually in the HEASARC**
  - **Supporting the dissemination of results through the SSC website, running conferences and contributing to public education**

- **The SSC consists of scientists, scientific programmers and support staff housed within LHEA at GSFC. The SSC is NOT responsible for the basic (i.e., Level 1) processing, and will not support a guest observer facility.**

GLAST

Members of the SSC
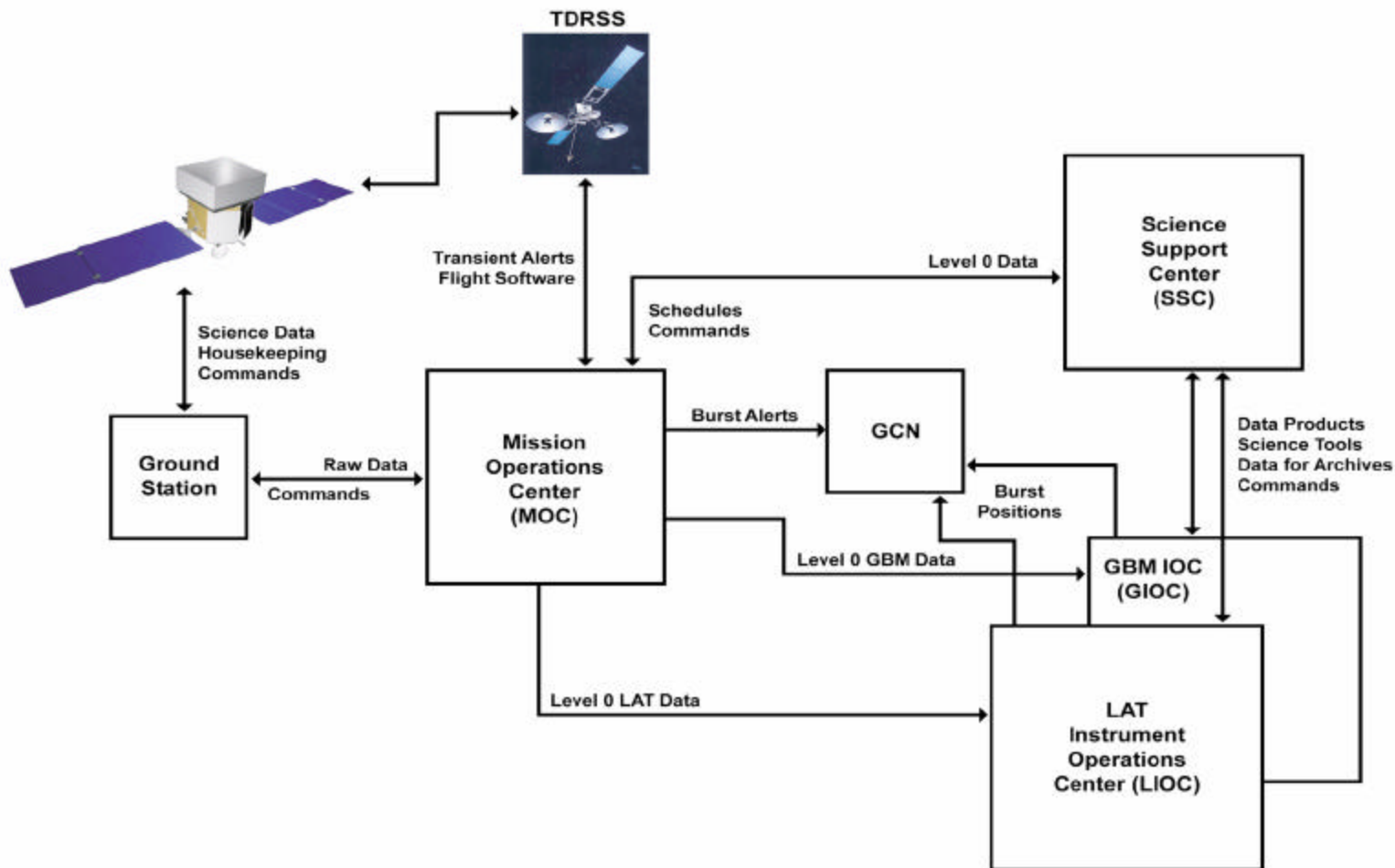
The following are present and future, full and part-time SSC members

- **Jay Norris—manager**
- **David Band—science lead**
- **Dave Davis—databases**
- **Yasushi Ikebe—calibrations**
- **Masaharu Hirayama—LAT scientist**
- **Dirk Petry—user services**
- **Jim Chiang—ambassador to LIOC**
- **Valerie Connaughton—GBM scientist, ambassador to GIOC**
- **Jerry Bonnell—GRBs/PR**
- **Bob Schaefer—databases**
- **Cathie Meetre—operations**
- **Sandhia Bansal—programmer**
- **Chun-Hui Pan—programmer**
- **2 more programmers**
- **Sandy Barnes—administrator**
- **JD Myers--webmaster**

The SSC's Responsibilities for Providing Science Tools

- **The SSC is required to make available to the general scientific community analysis software to derive astrophysical results from the reconstructed "photons." Among the guiding principles are:**
  - **Expensive proprietary software cannot be mandated (i.e., no IDL)**
  - **Files use FITS format following HEASARC standards**
  - **Support standard platforms (e.g., Windows and UNIX)**
  - **Multi-mission capabilities**
  - **Extensive documentation**
- **The SSC must also provide the community with tools for proposal preparation (e.g., observation simulators).**

- **The SSC's science tools architecture:**
  - **Major databases will be on the SSC's server**
  - **Software accessing these databases will run on the SSC's server through a web interface**
  - **Users will extract photons from the database on the SSC's server and download the resulting FITS file to the user's server**
  - **Users will download from the SSC's web interface a suite of tools that will run on the user's server**
- **A measure of the mission's success will be the output of scientific results facilitated by these tools!**

The Relationship Between the LAT Team and the SSC

GLAST

- **Initially:**
  - The LAT team was responsible for the "production of data analysis software" and the SSC for the "generation of high-level analysis tools" (see the AO)
  - The SSC was clearly responsible for giving the community a suite of tools, but no mechanism was provided for defining this suite
  - The SSC was going to be staffed by scientists with an interest and background in data analysis willing to work on the tools
- **Therefore an agreement was negotiated:**
  - The SSC and LAT team would form a software WG to define
    - The suite of analysis tools
    - The representation of the instrument response functions (IRFs)
    - The architecture of key databases, e.g., for photons
    - Software standards
    - Standards for the Level 1 pipeline

LAT-SSC Relationship, cont.

- The SSC will have a backup Level 1 pipeline
- SSC scientists will participate in developing the science tools
- The LAT team will manage the science tools development

- **The LAT-SSC Software WG has formed**
  - LAT members: Seth Digel (co-chair), Richard Dubois and Toby Burnett
  - SSC members: David Band (co-chair), Jay Norris and Bob Schaefer

- **LAT-SSC Software WG accomplishments:**
  - Draft list of science tools and their requirements
  - Coordination of photon database architecture experiments
  - Work on software standards, CALDB for storing the IRF files, the Level 1 pipeline

- **A similar WG is being formed between the GBM team and the SSC.**

GLAST

- **Although not yet chartered, a joint LAT-SSC WG will probably be responsible for the evaluation and acceptance of the science tools.**

- **Members of the SSC, the LAT team and GBM team worked together on the Data Products Working Group to define the data products that will be transferred between ground organizations. This WG's report includes draft descriptions of the data products.**

- **An SSC scientist (Jim Chiang) will be stationed at the LIOC. We have a similar arrangement with the GIOC.**

What the SSC Hopes to Accomplish at This Meeting

- **Consensus upon the likely components of the suite of science tools and a review of their requirements**

- **A tentative management structure to oversee the development of the science tools**

- **Formation of collaborations among LAT team members and SSC members to further define these tools, and explore the algorithms they may implement**