STEREO Science Center

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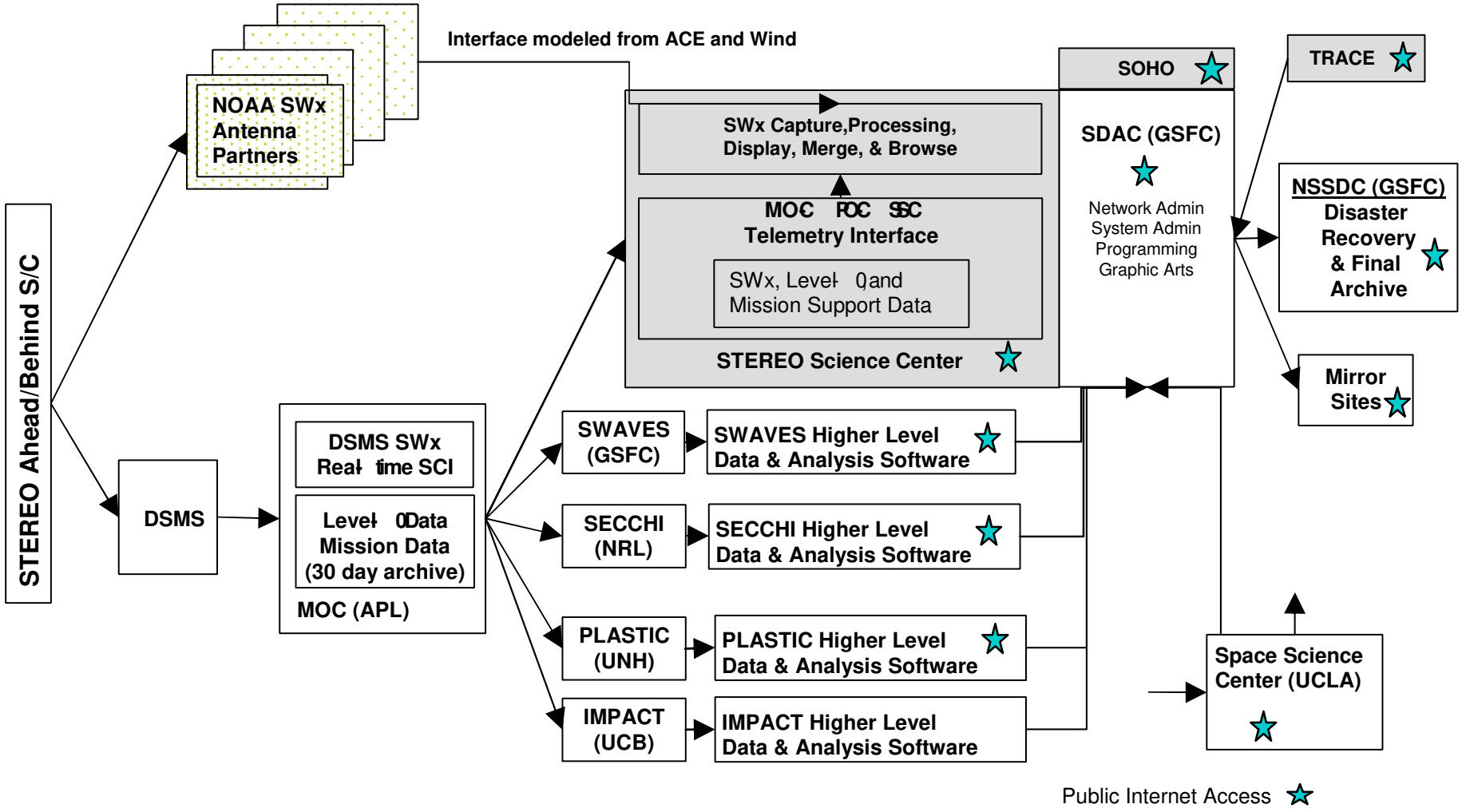
What is the SSC?

- The SSC performs the following functions:
  1. Collects telemetry and processed data, archives it, and serves it on the web.
  2. Receives beacon data from the DSN and NOAA antenna partners, processes it, and makes space weather products available in near real-time.
  3. Focal point for science coordination
  4. Focal point for education and public outreach.
- In addition, through interaction with the SOLAR Software Library, the SSC can act as a focal point for software coordination.

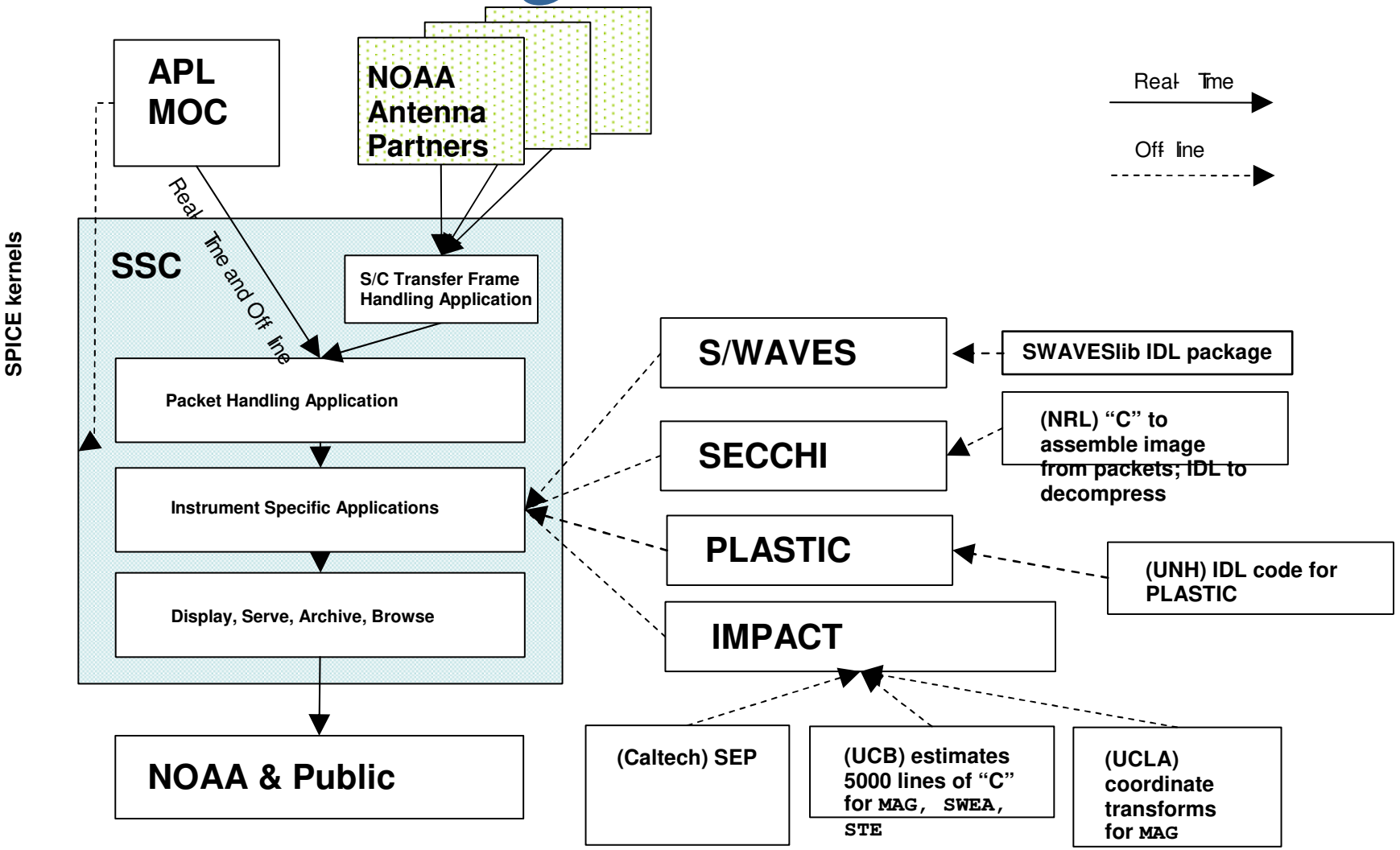
SSC Requirements

1.0	**Archive**
1.1	Obtain Level-0 and Mission Support data for permanent archive.
1.2	Obtain higher level data and analysis software from instrument working archives.
1.3	Insure that data and software are available to international scientific community (esp., European co-I contingent) and the public.
2.0	**Space Weather Beacon**
2.1	Capture real-time space weather beacon data from MOC during DSN contacts.
2.2	Capture real-time space weather beacon data from NOAA Antenna Partners.
2.3	Process, display, and provide an online browse archive of space weather data for mission lifetime.
3.0	**Focal point for science coordination**
4.0	**Focal point for E/PO/PAO**

Data Flow/SSC Block Diagram



Space Weather Beacon Processing



Software Tasks

- **moc_ingest**: Ingest telemetry from MOC
  - Partially completed, successful test
- **swx_ingest**: Ingest SWx telemetry from antenna partners
  - Draft MOU with NOAA
- **ftp_ingest**: Copy files from MOC
  - Baseline is to use Perl script “mirror”
- **swx_process**: Process space weather data
  - Requires software from instrument teams
- **ins_ingest**: Copy files from instrument teams
  - Use mirror or rsync?

Software Tasks (cont.)

- **Stereo_catalog**: Baseline is MySQL
- **stereo_bibliography**: To be defined
- **Web displays**
  - Space Weather Beacon
  - Latest Images and Plots
  - Where is STEREO?
  - Catalog interface
  - Planning timeline
  - SSC health monitor

SSC Current Status

- Amy Skowronek and Marc Despres from the SOHO project are working on programming.
  - *Successful R/T telemetry throughput test with the MOC in January 2004.*
- *Joe Hourcle has now joined the team. He's also working on the VSO, and will help us integrate the SSC into the VSO structure.*
- Emilie Drobnes is working on website design.
  - *http://stereo.gsfc.nasa.gov*
- A draft MOU with NOAA is available.

SSC website

External website

http://stereo.gsfc.nasa.gov/

Internal website

http://stereo.nascom.nasa.gov/intranet

Account: **SSC**

Password: **StereoSC**

Coordinates

- Recently acquired a sample SPICE kernel for STEREO A&B, together with the IDL interface to the SPICE software.
- Can derive position in the following coordinate systems (J2000):
  - **GEI**: Geocentric Equatorial Inertial
  - **GEO**: Geographic
  - **GSE**: Geocentric Solar Ecliptic
  - **HAE**: Heliocentric Aries Ecliptic
  - **HEE**: Heliocentric Earth Ecliptic
  - **HEEQ**: Heliocentric Earth Equatorial (Heliographic)
  - **Carrington** longitude
- Still researching the following coordinate systems:
  - **GSM**: Geocentric Solar Magnetospheric
  - **SM**: Solar Magnetic
  - **MAG**: Geomagnetic
- Others?

SolarSoft Library

- The Solar Software Library (SSW or SolarSoft) is a library of software routines used by a number of solar missions.
- The purpose is to foster software sharing, and combined data analysis. It also simplifies the distribution of software and ancillary (e.g. calibration, catalog) data.
- The emphasis is on IDL, but other languages can also be included for distribution. For IDL, SolarSoft also simplifies and standardizes the configuration process.
- Automatic scripts allow the user to keep software and ancillary data up-to-date.

http://www.lmsal.com/solarsoft/

SolarSoft Tree

- The basic SolarSoft tree has generic subdirectories, and subdirectories for each misson

  gen (generic software for all missions)
  soho
  stereo
  …

- Each mission has the same sub-structure

  soho
    gen (generic software for all instruments)
    cds
    sumer
    …

- Each instrument has several standard subdirectories

  cds
    data
    idl
    setup (setup scripts)

SolarSoft STEREO

- Have started the process of creating the STEREO part of the SolarSoft library.
- The library tree has the following directories:

  gen
  impact
  plastic
  secchi
  swaves
  ssc

- Each instrument team will control their own section of the tree, e.g. via a mirror from the home institution.

STEREO Science Operations Plan

- Have started a draft of the STEREO Science Operations Plan
- Not a required document, but does collect together information we are required to provide.
- Will contain information about the science planning process:
  - Overview of planning process and schedule
  - Nominal telemetry and space weather applications
  - Nominal SSR partition allocations
  - Planned Space Weather Beacon data description

Planning Process

- **Quarterly SWG meetings**
  - Main focus for long-range scientific planning
  - 3-month plan, starting in 1 month
  - Establishes telemetry (and SSR) allocations
  - Defines campaigns
- **Monthly Teleconference**
  - Refines details
  - Forecast DSN schedule available
  - Final definition of telemetry (and SSR) allocations
- **Weekly "Virtual Meeting"**
  - Either teleconference or electronic (e.g. e-mail), depending on requirements.
  - Conflict-free DSN schedule available