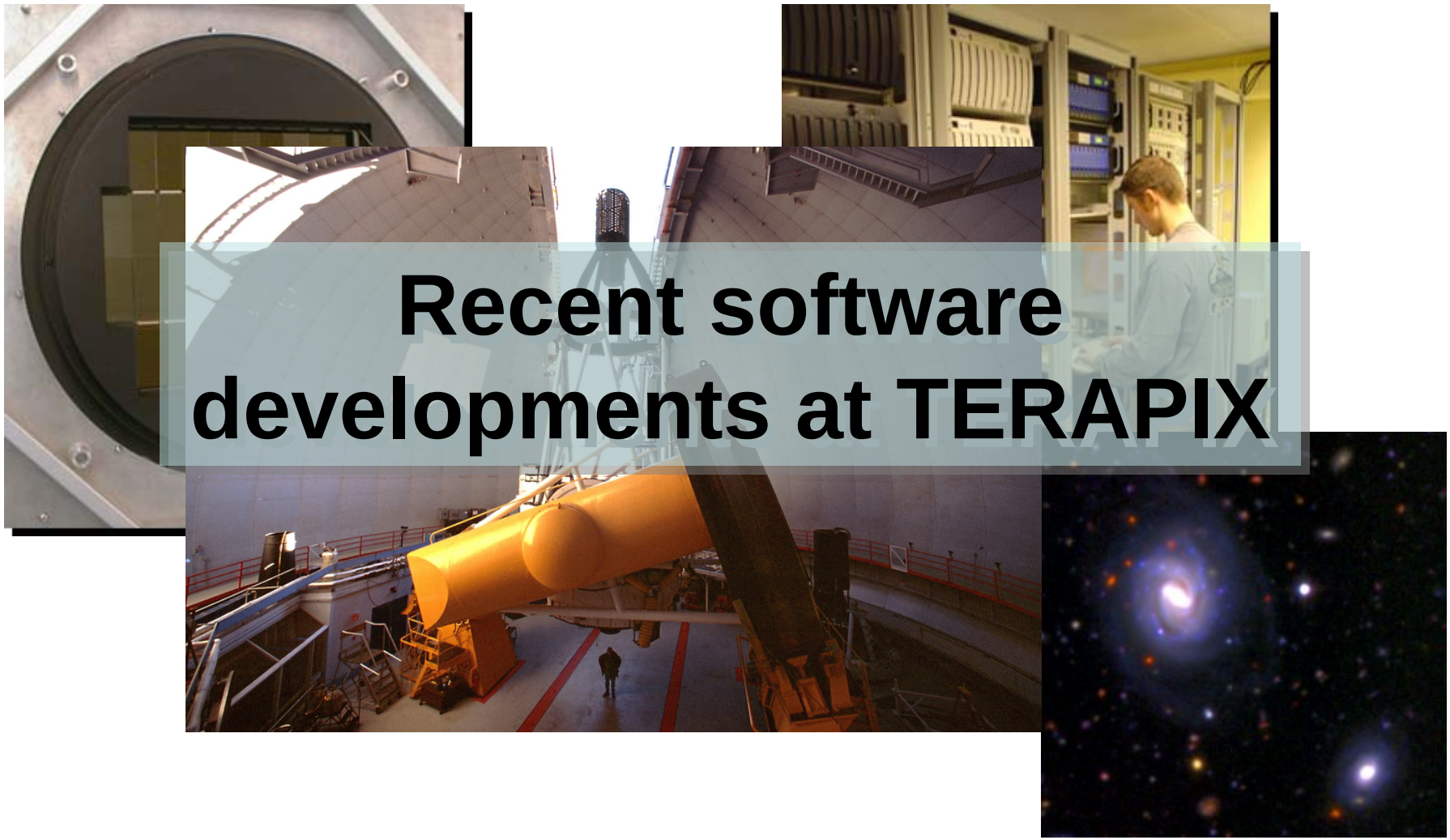


Recent software developments at TERAPIX

E.Bertin, (IAP & Obs. de Paris/LERMA)
A.Baillard, M.Dantel-Fort, L.Domisse, F.Magnard, C.Marmo,H.J.McCracken, Y.Mellier, A.Rojbi

Outline

- TERAPIX and the CHTLS
- Access to software and support
- Development plan
- New developments during 2006 (->T04)
- Ongoing software developments (-> T05?)

The tasks of TERAPIX

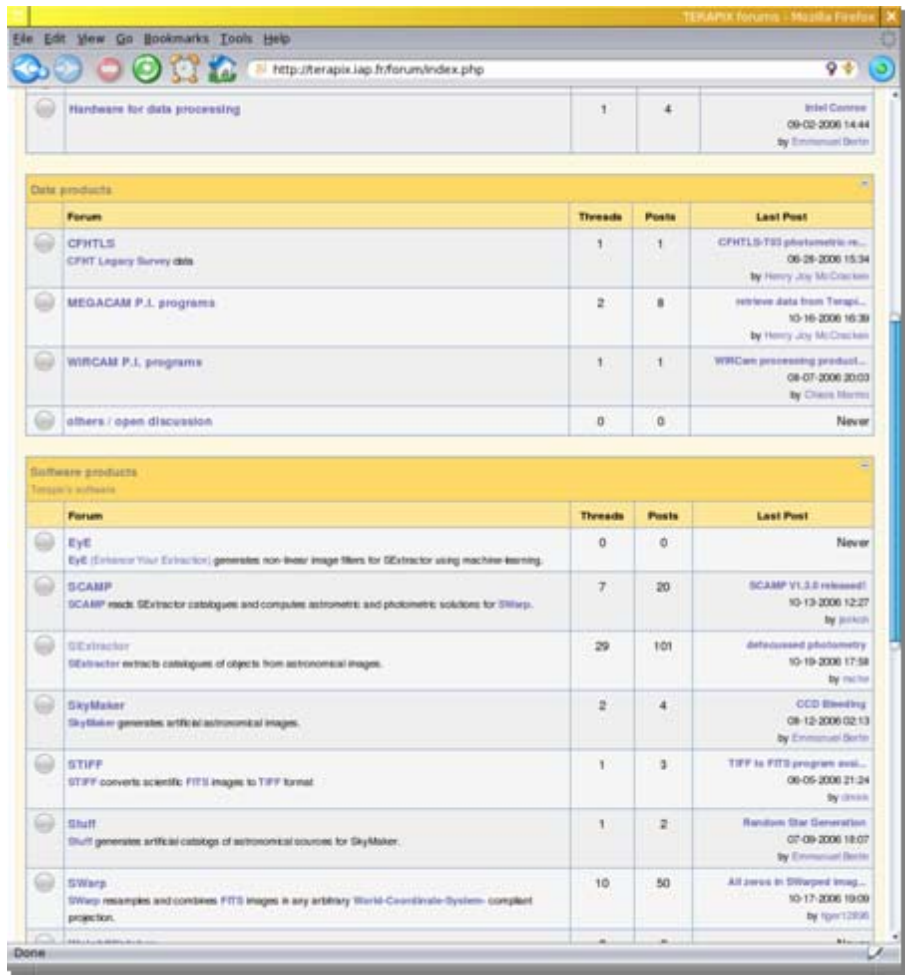
- Develop and distribute software tools required for the processing of MEGACAM data
  - Pre-processing done at CFHT (**Elixir**)
  - TERAPIX software is developed in-house and can be used on various kinds of data
  - Released as Open Source to the community
- Manage data and hardware
  - Compute/storage farm of 24 bi-, quad-, and octo-procs for processing
    - 240 Gflops peak
    - Direct access to the data with 100+TB of redundant storage
  - Cluster of 8 bi-pros available on request for data-intensive CFHTLS science
- Produce and release calibrated, resampled, co-added images, weight maps and catalogs on a regular basis.
  - 4th release (10TB) about to start
  - The achieved re-processing cycle time is presently 12 months
    - Goal is 6 months
  - Each release benefits from
    - Extended coverage
    - Complete re-calibration with increasing overlaps
    - Software upgrades and new features
  - The VeryWide part of the CFHTLS absorbs 75% of TERAPIX resources
- Provide support to members of the Canadian and French communities
  - Process P.I programs on request

Access to software

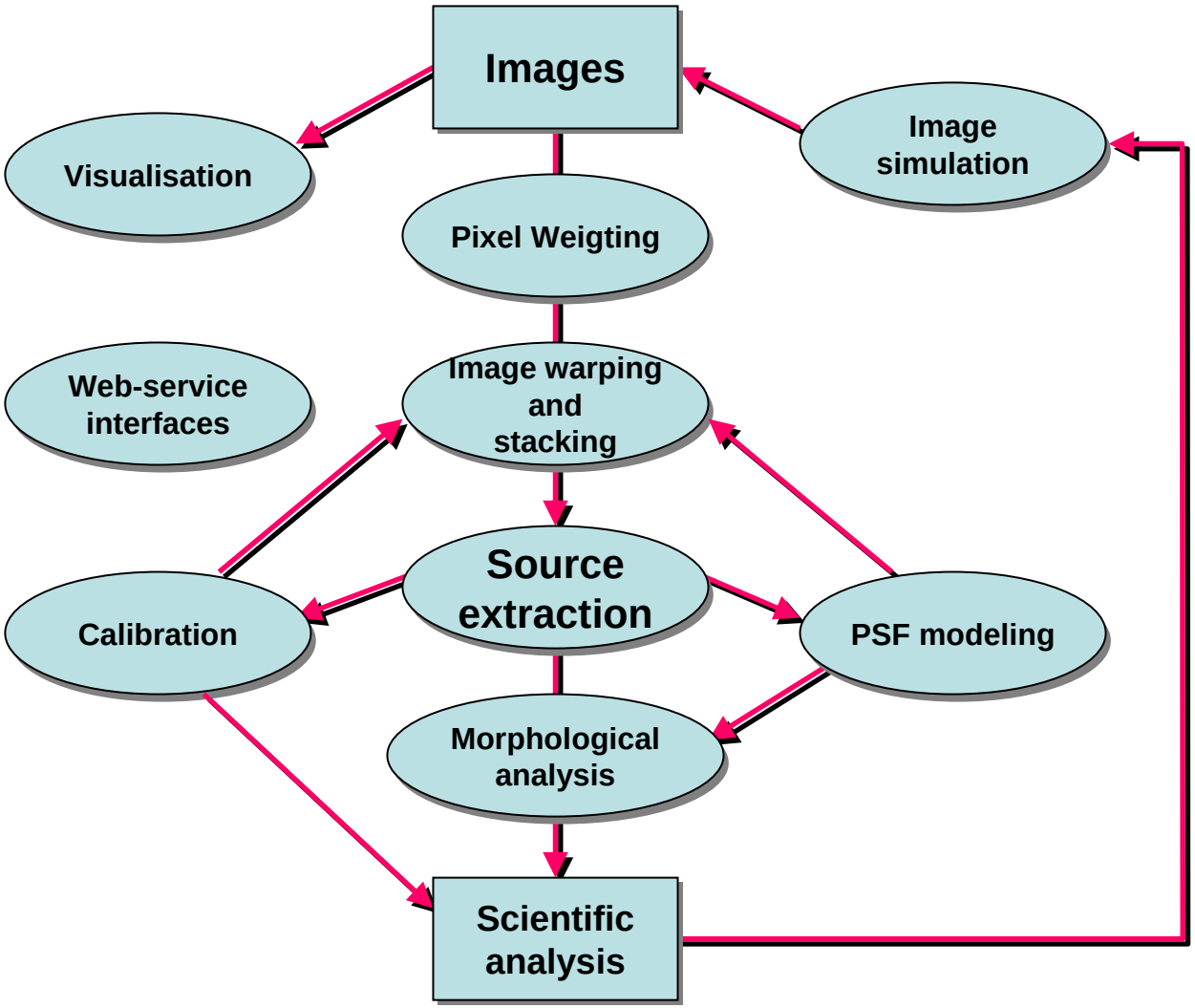
- What is distributed:
  - source packages
  - Binary, static Linux RPMs (both x86 32 et 64 bits, single and multi-threaded)
  - PDF documentation
- Public unstable versions:
  - accessible through our SubVersioN repository
  - http://terapix.iap.fr/wsvn
  - “on demand” re-packaging of intermediary versions

Getting help

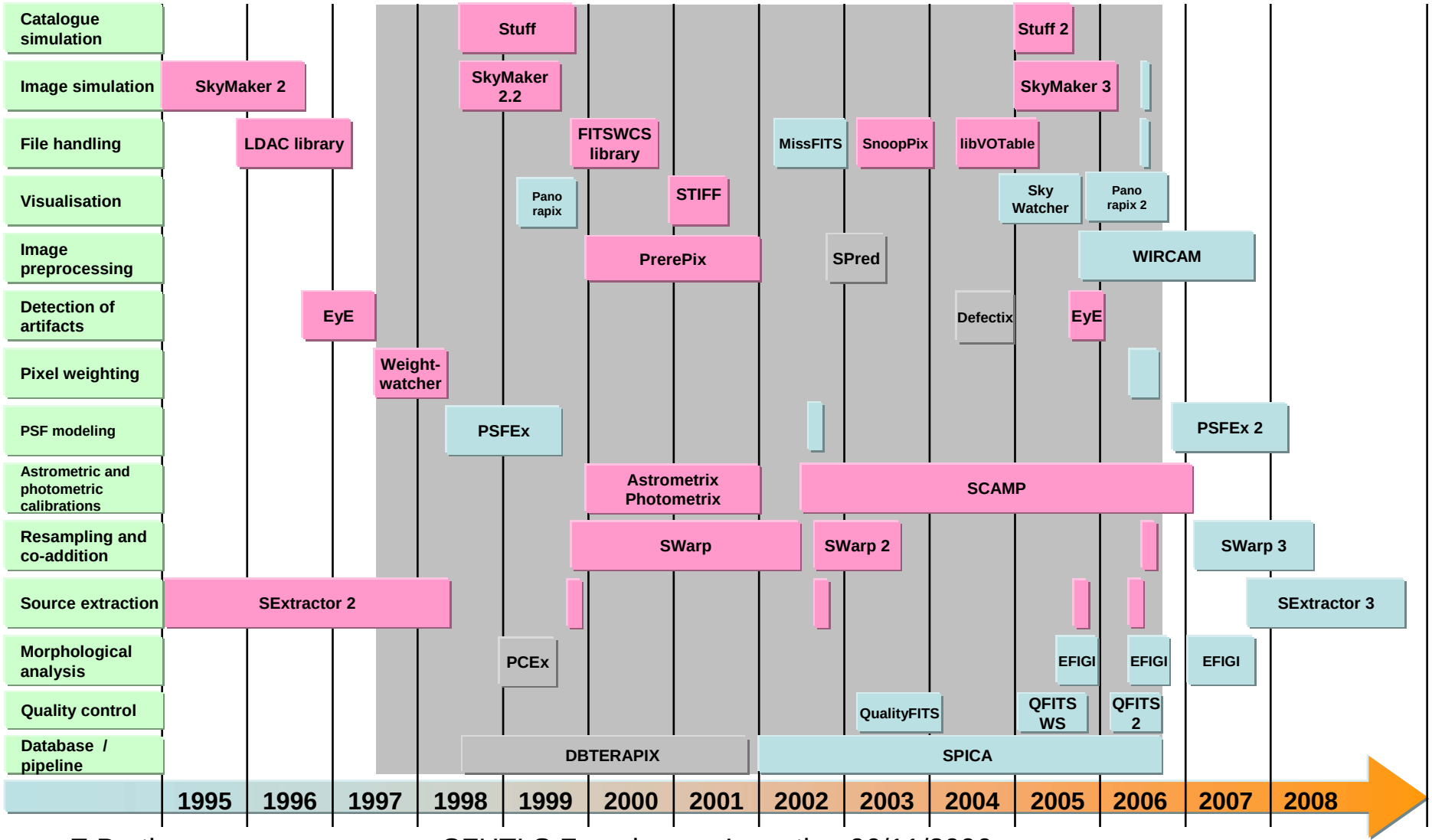
- Discussion forums
  - http://terapix.iap.fr/forum
  - MEGACAM
    - CFHTLS
    - P.I.
  - WIRCAM
  - TERAPIX software
  - software for astronomy
  - hardware for astronomy
  - private forums
    - ask if you want own forum!



TERAPIX: An automated image analysis system

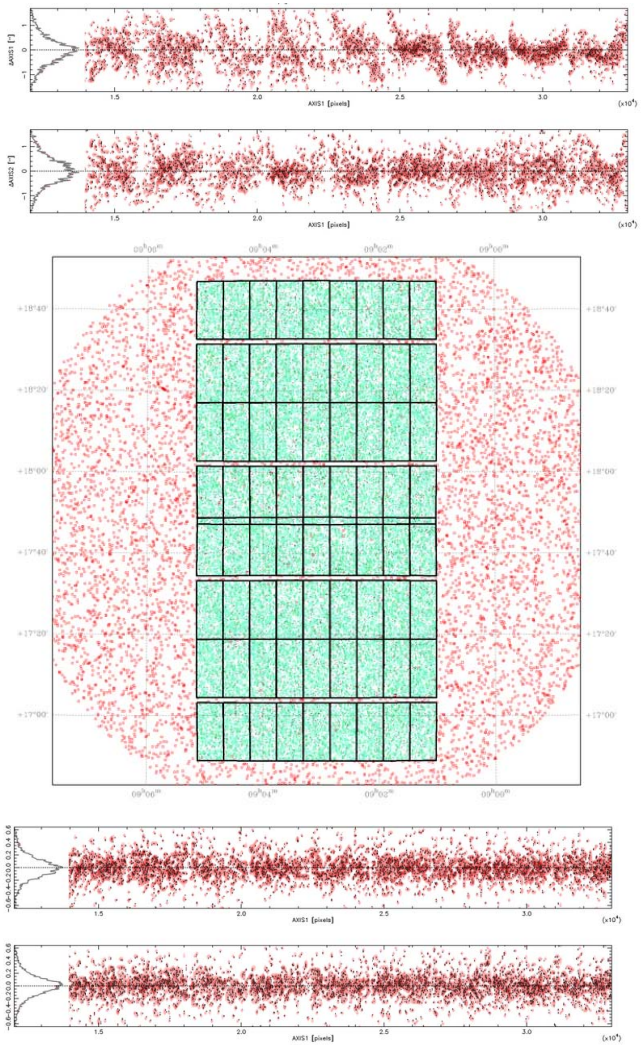


Development plan



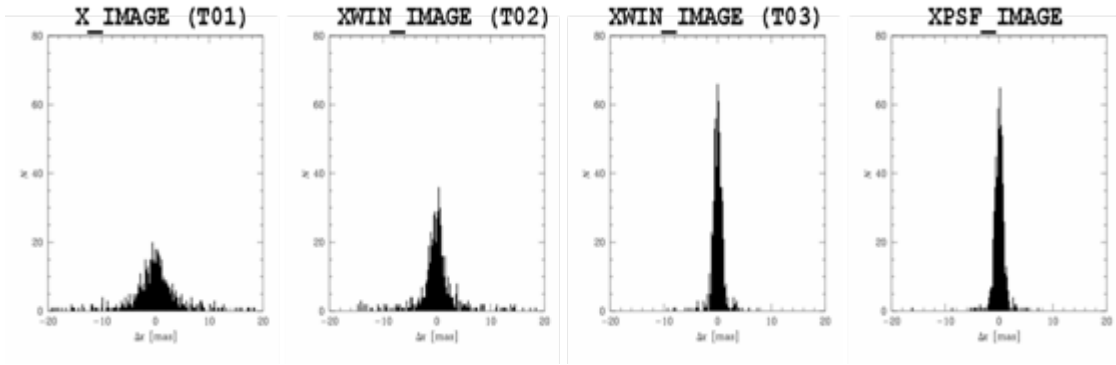
New developments during 2006 (->T04)

- Mostly improve robustness of the existing approaches
  - SCAMP (astrometric and photometric calibration software) released.
    - Average astrometric precision in T03:
      - 30mas RMS (pairwise) internal for sources with S/N > 100
      - 280mas RMS (pairwise) with respect to USNO-B1
  - testing by other users helped find bugs and improve algorithms
    - V1.3.2: recipes tuned to offer more robust behaviour in crowded fields and observing programs with poor dithering patterns.
      - balancing between internal and external positional constraints
    - Proper motions / light curves computed but not yet available in output
    - WIRCAM processing (C.Marmo)
      - helped discovering bugs and provided
    - QualityFITS improved (F.Magnard & C.Marmo)
    - Move to ICRS (at last)
    - XML-VOTable output of metadata
    - TERAPIX software used for various data challenges



Ongoing software developments (-> T05?)

- PSF-fitting photometry
  - Mostly improve photometry
  - PSF modeling and fitting have been in there since 1999!
  - Improvements and testing done by the Grenoble team (Ph. Delorme)
  - Deblending issue: Extragalactic science vs galactic science
  - Clever filtering or use the current deblending algorithm
- Homogenisation of the PSF



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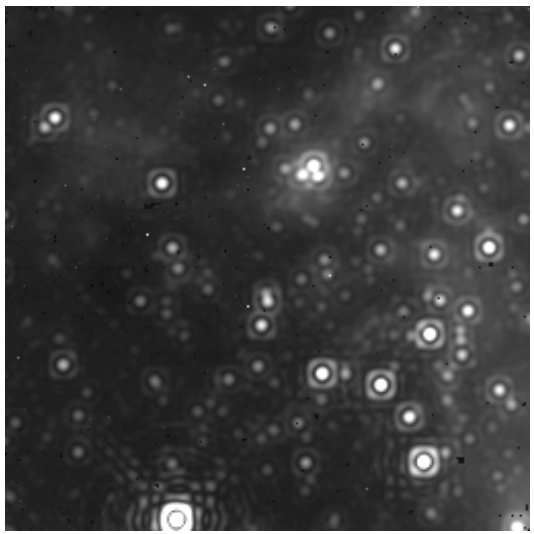
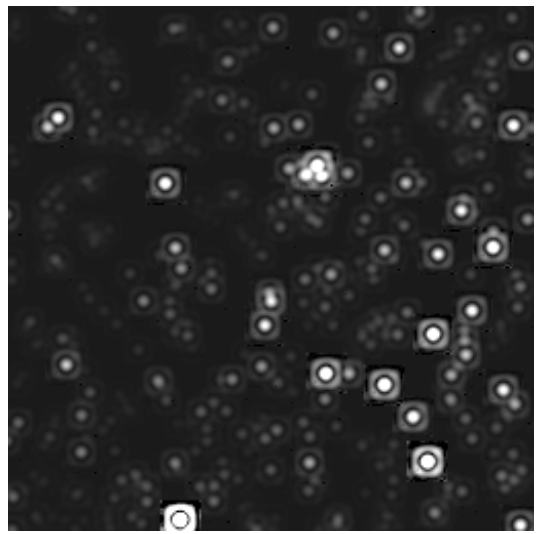
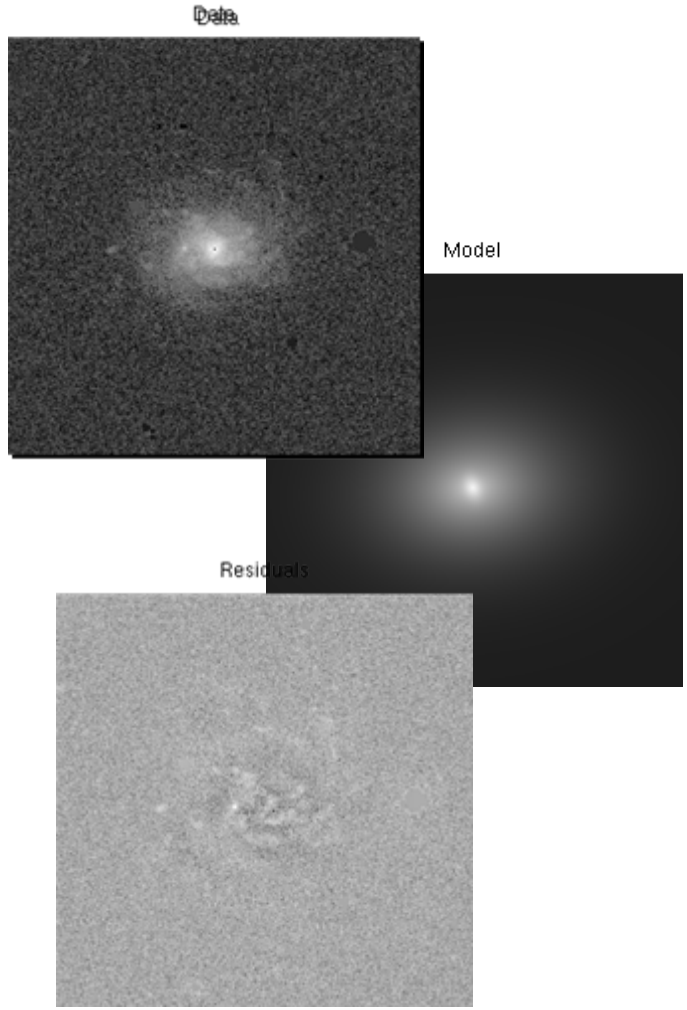


reconstructed



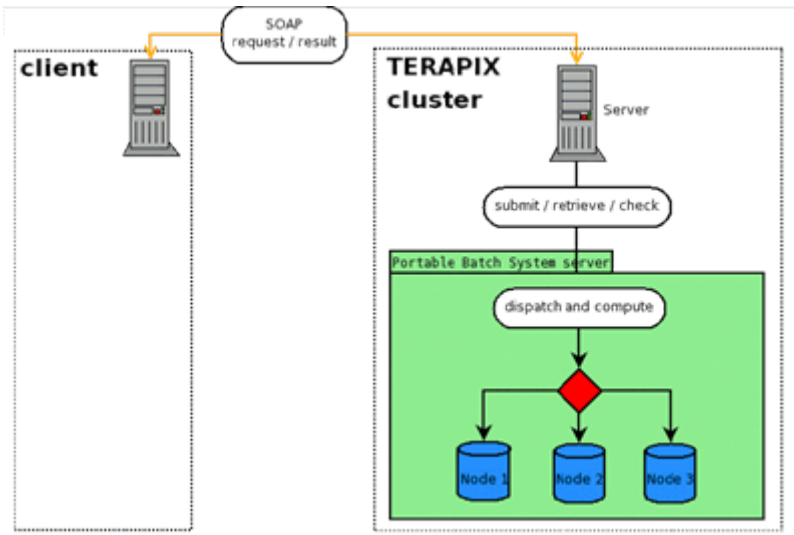
Ongoing software developments (-> T05?)

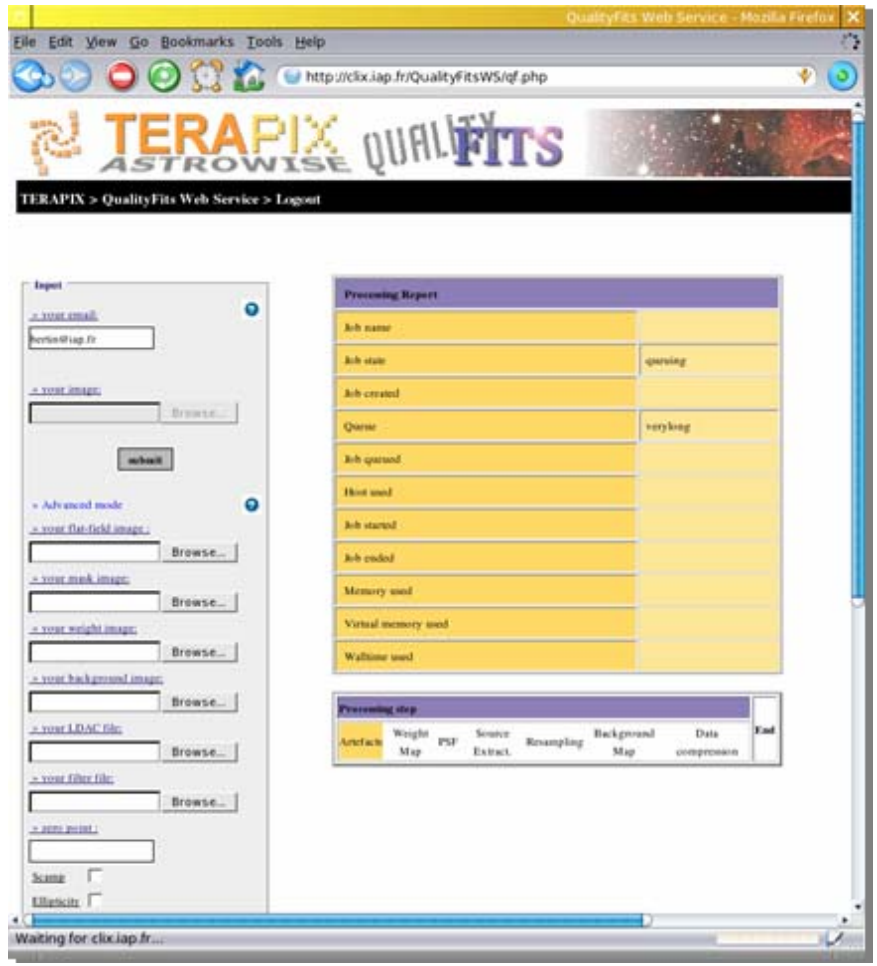
- Galaxy profile-fitting
  - Development done in the framework of the EFIGI project (with M. Arroyo@LTCI)
  - Analytical profiles
    - Single Sersic
    - Sersic + exponential (12 free parameters)
  - Currently a few seconds per 2GHz core
    - Goal is <100ms per core
  - Detection of additional morphological attributes later (Q4 2007)
  - Suitability for lensing studies needs to be assessed



Web Services

- Step towards an online pipeline
- Offer computing time available on the TERAPIX pipeline cluster between releases
- Make programs that require a complex installation easier to use.
- Gigabit connection expected at IAP
- V.O. compliancy
- Restricted to tasks with a reasonable amount of I/Os
  - no coaddition of distant data
- Prototype developed by J.-C. Malapert
- Release date depends on available manpower





TERAPIX

terapix.iap.fr/forum