CALET: processing complementary observations for Euclid

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(and COSMOS, UltraVISTA, CALET teams)

TERAPIX (1997-2017)

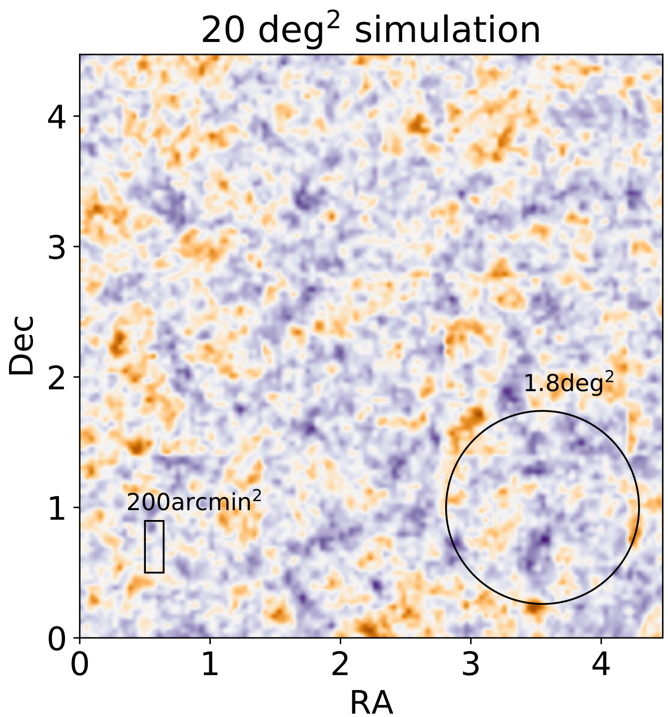
- National centre for image processing from wide-field mosaic cameras; CFHTLS and other surveys; PI data
- After CFHTLS, TERAPIX funded by CSA but questions raised concerning long-term viability of the project; HR pressure from Euclid
- CSA review; closure announced (Jan 2017); workshop organised to judge community interest in continuing the service (not much, in current form)
- Conclusions:
  - Strengths: TERAPIX expertise widely recognised but need to reduce PI data greatly reduced
  - Weaknesses: Not competitive for large surveys, Data center without production or associated science case hard to justify
  - Need to maintain and distribute TERAPIX-era code

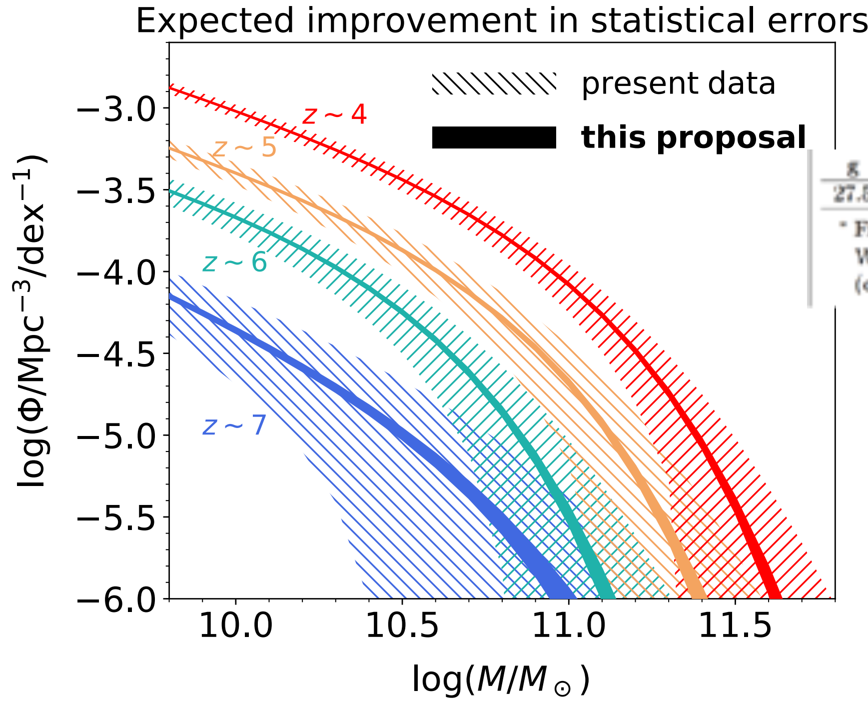
However…

- There clearly is still a need for mutualised processing; we still need to be close to the pixels (combine and calibrate data, extract catalogues)
  - **Experience shows most successful surveys are those in which astronomers remain closely associated to data production**
- So, are there small or medium sized surveys with great scientific potential which would allow us to maintain and extend and distribute the expertise gained at TERAPIX (code, data) and which don't conflict with Euclid HR requirements?

Euclid deep survey fields

- Euclid figure of merit limited by our understanding **systematic errors**
  - Shape measurement bias, photo-zed “C3R2” (ML techniques)
  - Deep ground based calibration data in deep VIS fields **essential to mission success.**
- Several of these surveys have started:
  - **Hawaii-2-0** (Sanders et al): **30n HSC, 10n Keck**
  - **Spitzer Legacy Survey** (Capak et al): **1yr of warm Spitzer time !**
- Currently **not processed** within current Euclid infra concentrating mostly on wider surveys, eg. CFIS, DES etc
- **FANTASTIC science opportunity: similar to COSMOS but x10 area!**



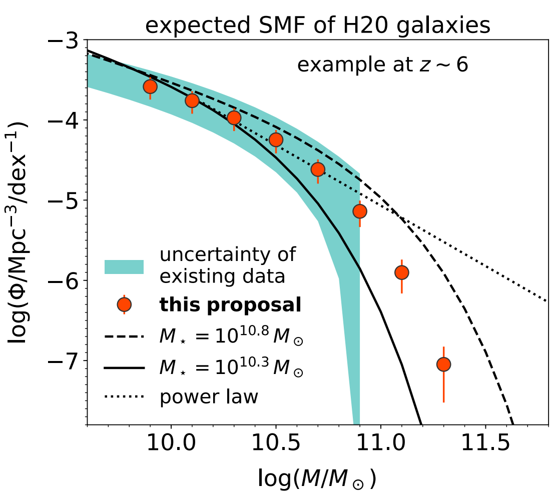


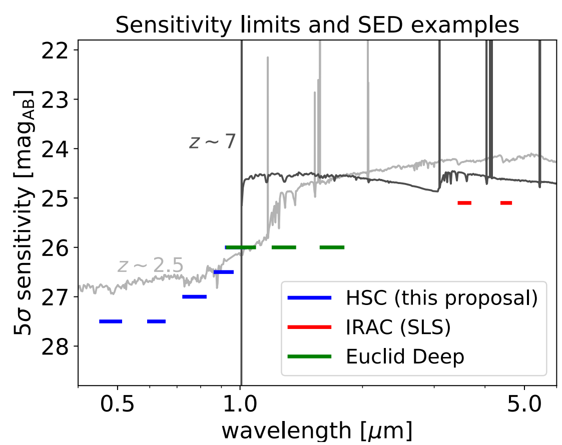
27.5	27.5	27.0	26.5	26	26*	24.8	24.7

* From *Euclid* Deep (operations start in 2021)
WFIRST will also cover this area at 26 mag 10
(operations start mid-2020s).

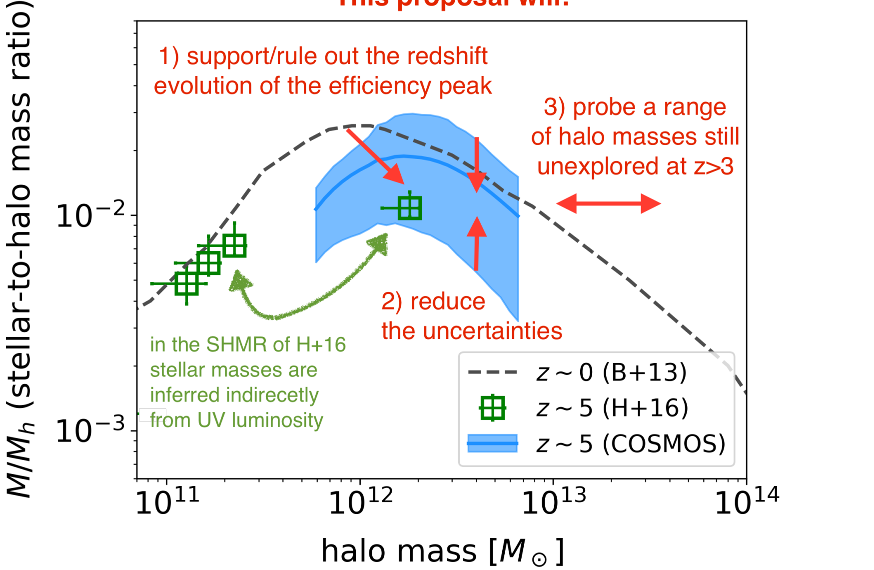
PI: D. Sanders, Capak + IFA, team

Hawaii-2-0 / Spitzer legacy survey





This proposal will:



CANDIDE and CALET: CALET

- Create a **structure and organisation** dedicated to processing ground-based associated observations (Infrared, optical, near-infrared for Euclid and other space-based missions: **CALET**
- **CALET** = Collaboration for wide-area astronomy linked to Euclid and other telescopes. See CALET.org
- Archiving at **IDOC** in IAS
- CALET may become part of OU-EXT and integrated in Euclid Infra

CANDIDE and CALET: CANDIDE

- **Hardware**: Initial DIM-ACAV, PNCG grants
  - **CANDIDE** = Computer for processNing Deep Imaging Data for Euclid; I/O optimised
  - **Operational** since Jan 2018
  - **Phase 2 underway**: Migrate TERAPIX hardware still under warranty; projected total disk around 1Pb
  - Now Hosting **SLS, CFIS, UltraVISTA** data; also Euclid SPV!
- **Manpower**:
  - Cluster maintained by **S. Rouberol** (Planck, Horizon); see candideusers.calet.org
  - **A. Moneti** closely involved in data processing
- Opening accounts for CFIS, SLS, H20: ~20 users!
- Open to extending to other collaborations …

Objectives

- Make **public data releases** for SLS, H20 and UltraVISTA/COSMOS surveys (at least)
  - Both images and **high level data products** like catalogues (e.g., COSMOS2015, Laigle et. al)
  - Data archived at IDOC / CDS
- Release code and documentation, including TERAPIX-era code (**preserve TERAPIX heritage**)
- Provide a data analysis and processing environment **close to the pixels** for interested parties

Prospects and conclusions

- CALET and CANDIDE **operational** and **processing data** (SLS, UVISTA, CFIS)
  - **Great interest** showed by the community to have access to these resources which are not supplied by other facilities
- Maintaining and operating CANDIDE requires $$$. How: CSA, PNCG, CNES?
- Adopt a **common strategy**, or separate requests for each survey? Labelissation? SO for ground-based followup?