General news

Rubin-LSST

Emmanuel Gangler – LSST-France – November 22th 2021

Welcome to our new members !

- **Welcome to:**
  - On this room: Biswajit, Kirill, Roman, Kelian, Justine, Emeric, Denise, Morgan
  - and also: Leander, Gabriele, Martin, Etienne, Thierry, Enya
  - … More coming next year: Vincent, Didier, Cyrille

- Some background material:
  - S. Kahn Video presentation on Rubin (38 min)
  - An Introduction to Rubin (PCW Workshop Aug. 2021 59 mins)
  - Slides and Report for IN2P3 scientific council (Oct 27th 2020)

- Even if we don't have yet a Code of Conduct (see Gaëlle's talk)
  - Be kind and respectful of others ; no form of harassment or bullying will be tolerated

Welcome to our new members !

- Getting started: don't forget
  - to **check the starting pages https://doc.lsst.eu/**
  - to **register on LSST-L** (for INSU or CEA): still the main mailing list. Use it.
    - Or ***LSST-IN2P3-L*** (for IN2P3 data rights holders) mailing list. Low trafic.
  - to **register on Slack** lsst-france and LSSTC (main Rubin Slack)
  - to **join a scientific collaboration**
    - All collaborations are independent
    - For DESC, this is the join procedure, and the getting started page (for members)
    - Note : **updating Data Rights holder list is more challenging than expected**. Address back enquiries to me!

News from IN2P3

- IN2P3 prospectives workshop

  - Report and recommendations for Inflation and Dark Energy:

    - R2: Improve **cosmological exchanges**
      - → Cosmological Physics CoPhy GdR under maturation (discussion with INSU)

    - R3: Develop a scientific program enabled by **cross-correlation of probes.**
      - → cross-correlation with CMB, but also EUCLID/Rubin data combination

    - R4: Maintain a **program of projects of all scales**, from the largest international projects to mid- and small-scale projects.
      - → participation to ZTF II, but also StarDice

    - R5: Support **computing development** for upcoming, data-intensive experiments
      - → our implication at CCIN2P3

    - R7: **Complete LSST** and EUCLID as planned and ensure the **scientific return**
      - → the scientific return is important here !

News from IN2P3

- Renewal of IR grant
  - Infrastructure de recherche up to ~1M€/yr 2021-2025

- 2 new projects under LSST Master project:
  - **FINK broker selection by Rubin** ! (see Emille's Talk)
  - **ZTF II supported by ANR** award (see tomorrow morning)

- Our community keeps growing
  - 2 newly hired CNRS researchers in 2021
    - New openings for 2022 will be known ~Dec. 1st ; 8 CR positions in total; newly created "data science" section
    - Rubin-LSST France next priorities for IN2P3: APC, LPC
  - Permanent opening for computer scientist (Ingénieur de recherche) at CC-IN2P3 in 2022
  - New staff joining from other projects
  - Net increase in PhD students ! Now is a great time to start a PhD on Rubin/LSST/DESC !

Internal Rubin-LSST France organization

- Remarks:
  - Institutional board: IN2P3 coordination
    - Centered on IN2P3 matters
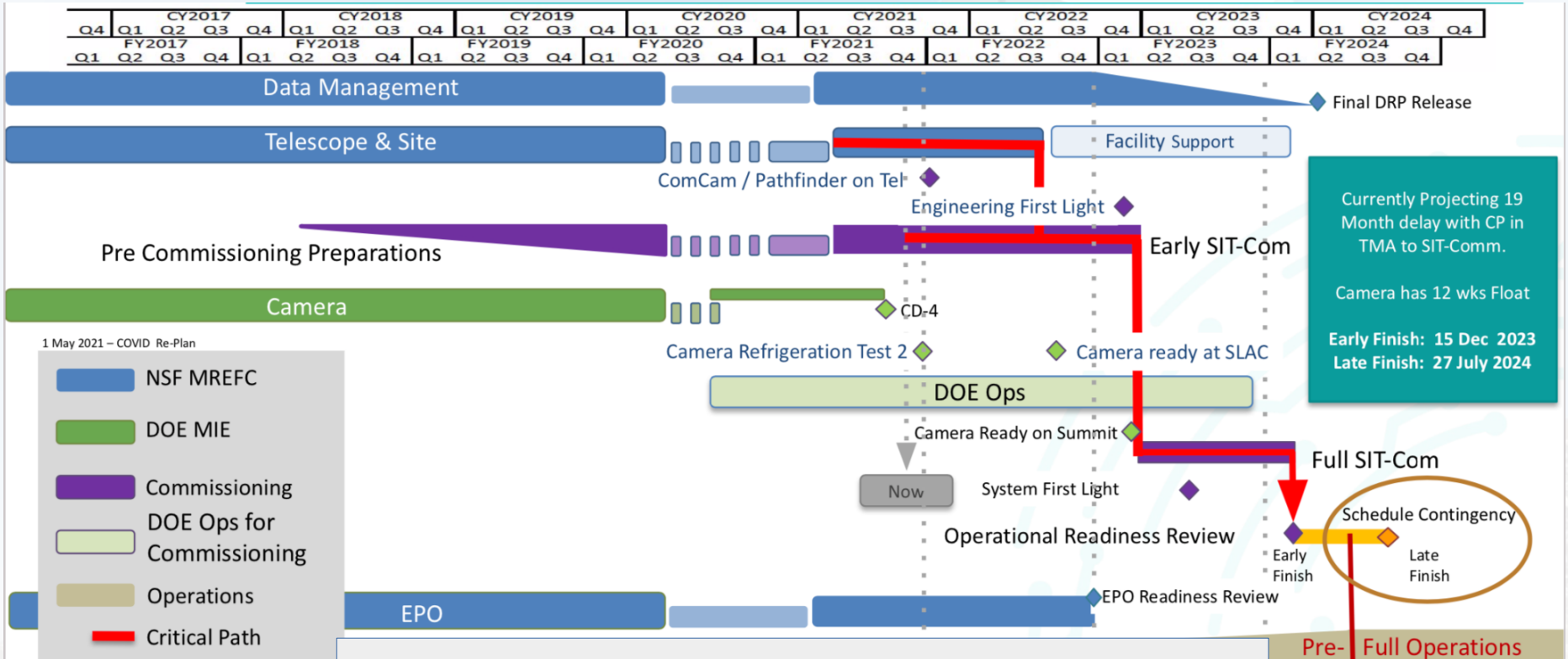   - + DESC news
- Hot topics:
  - **Commissioning:** see P. Antilogus talk
  - **Computing:** see D. Boutigny talk
  - **Science preparation**
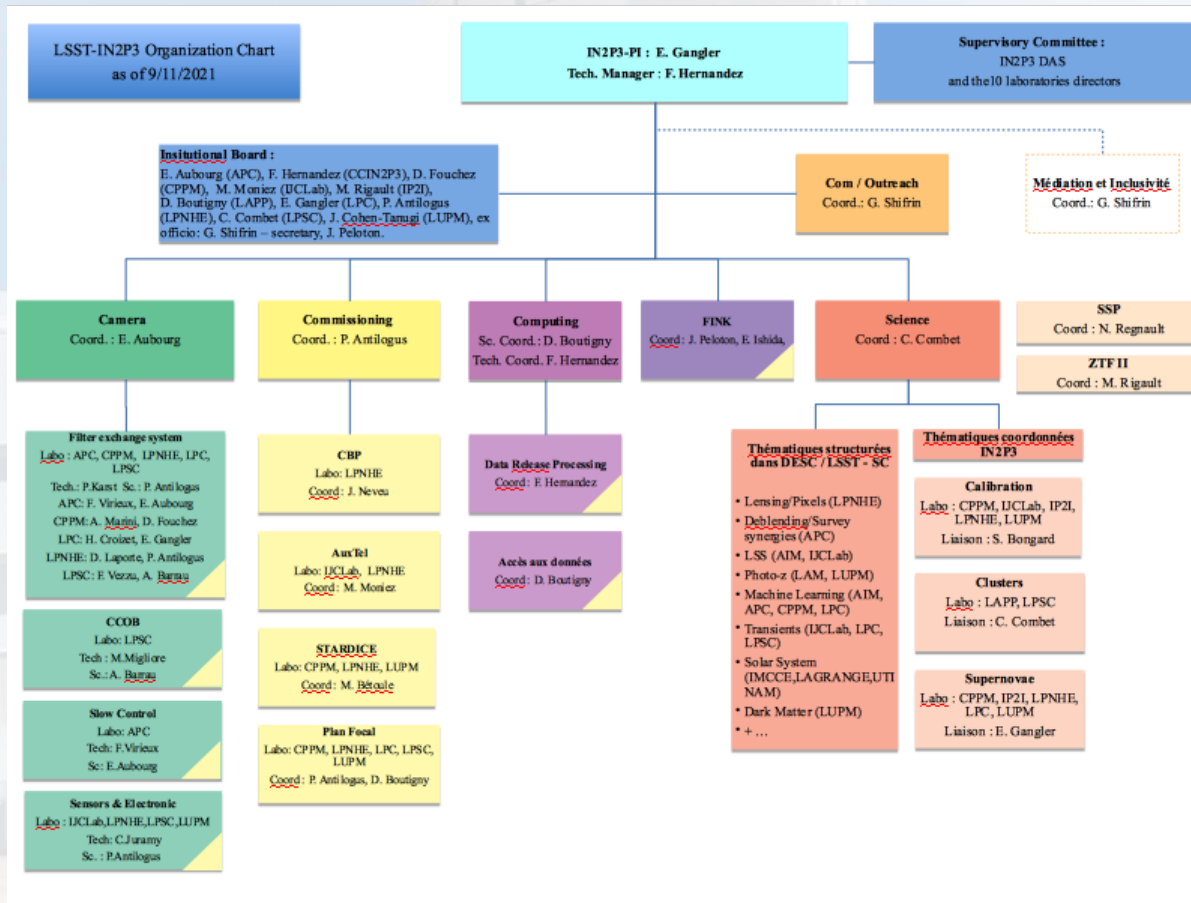
News from Rubin obs. and DESC

Rubin schedule

- Survey likely start: *April 2024*
- CD4 (DOE): Camera Construction finished
- *Commissioning:*
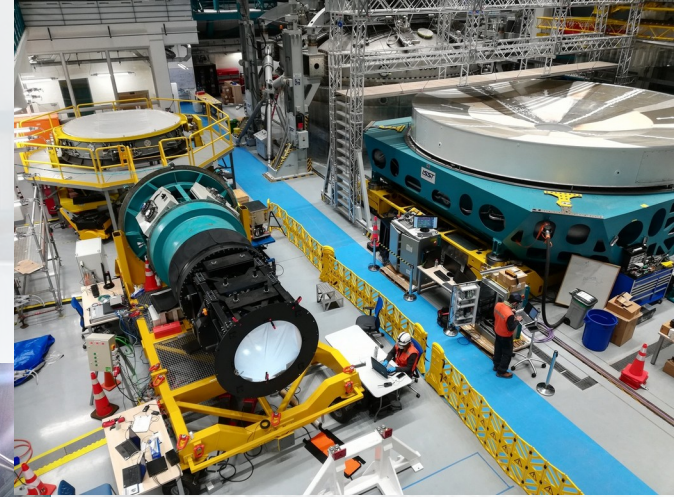 - 2022 test data on camera
  - 2023 camera on sky

Construction status

Telescope mount rotation
(by hand)

ComCam and mirror surrogates
in storage room
(by hand)

Dome almost 100% finished

Camera Status

LSSTCam entered the *Guinness book of records:*
- Largest lens
- Highest resolution camera

All 6 filters arrived at SLAC

Filter exchange system fully operational
(more on this next talk)
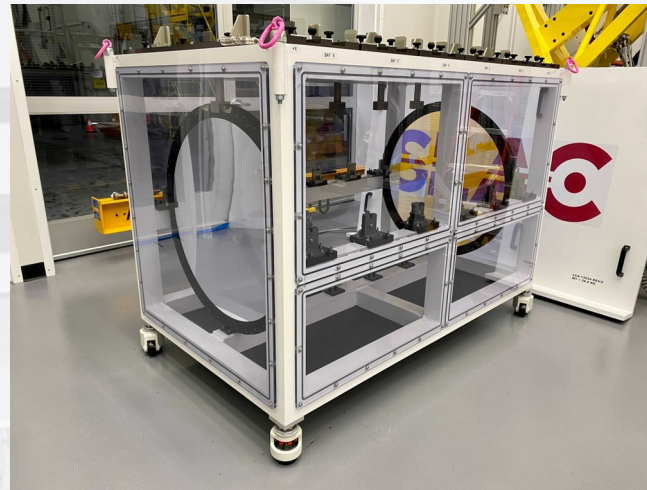
LSSTCam cryocooling
successful
EOtest in progress
(more on this Tues)

Commissioning

- The call :
  - Rubin Obs. released a call reserved to US and Chile
  - Thanks to good long-standing relations, Chuck Claver asked us to propose contributiuons
  - Important for us to **contribute before the Data Pre-Release** stage.
- Big success within IN2P3
  - 28 researchers
  - ~8 FTE/yr available
  - People available for full-time presence in Chile
- **Topics of interest:**
  - Hardware Calibration (Jeremy Neveu)
  - AuxTel (Marc Moniez)
  - Pixel-level, data quality and on sky calibration (Dominique Boutigny)
  - Object detection, weak lensing and deblending (Cyrille Doux)
  - System Optimization (Alexandre Boucaud)

Vera C. Rubin Observatory Timeline
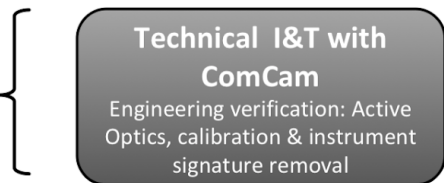
Commissioning

- How to engage ?
    - No need to wait for Chuck's anwser for starting contribution
    - Most topics already clear on the path forward
- **Pixel-level** is the largest group ;
    - Still needs **internal coordination** (7 labs)
    - Ramping up on expertise
        → Making good use of DESC SAWG group
        - Claire Juramy is now co-convener !
        - Follow the Confluence page (for instance : presentation by Yousuke)
        → Current EOtest campain is a good starter
        → Some data already at CC
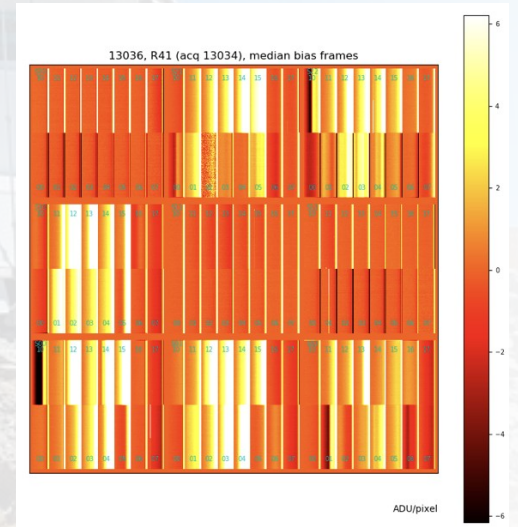
Example of bias stability studies

Data Releases planning

- DP0 = DESC DC2 simulated data
- DP0.1 data available at CC
  - RSP on hold since Bastien's departure
- **DP0.2 will be the CC priority for 2022**
  - Processing with gen3
  - **With DIA**
  - Shared processing test need to be conducted
- Note : DP data will be available long after the data will be taken
  - Entry point for SC-level commissioning
- No alerts (canned) before July 2023
 - Importance of **DESC Alert TT challenges**

Rubin Baseline Data Release Scenario	Jun 2021 DP0.1 DC2 Simulated Sky Survey	Jun 2022 DP0.2 Reprocessed DC2 Survey	Jul-Sep 2023 DP1 ComCam On-Sky Data	Apr-Jul 2024 DP2 LSSTCam On-Sky Data	Feb-Jul 2025 DR1 LSST First 6 Months Data
Data Product					
Raw Images	☑	☑	☑	☑	☑
DRP Processed Visit Images and Visit Catalogs	☑	☑	☑	☑	☑
DRP Coadded Images	☑	☑	☑	☑	☑
DRP Object and ForcedSource Catalogs	☑	☑	☑	☑	☑
DRP Difference Images and DIASources	☐	☑	☑	☑	☑
DRP ForcedSource Catalogs including DIA outputs	☐	☑	☑	☑	☑
PP Processed Visit Images	☐	☐	☑	☑	☑
PP Difference Images	☐	☐	☑	☑	☑
PP Catalogs (DIASources, DIAObjects, DIAForcedSources)	☐	☐	☑	☑	☑
PP Alerts (Canned)	☐	☐	☑	☑	☑
PP Alerts (Live, Brokered)	☐	☐	☐	☑	☑
PP SSP Catalogs	☐	☐	☑	☑	☑
DRP SSP Catalogs	☐	☐	☐	☐	☑

SCOC draft phase 1 report: top recommendations

- define WFD footprint using ISM dust extinction
- adopt 1 snap for u-band visits
- obtain pairs of visits with different filters
- continue to explore rolling cadence scenarios

Onward to baseline v3!

DDFs : see talk by Philippe

baseline_v2.0_10yrs : Nvisits

100 200 300 400 500 600 700 800 900 1000
Number of visits
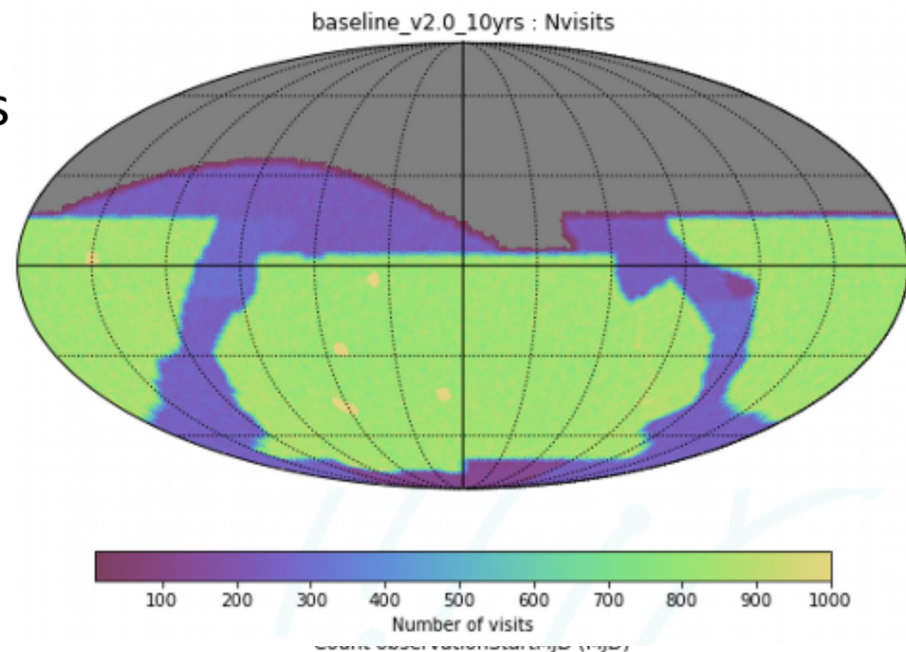
DESC news

- New management since July 2021
  - Growth of management team
    - More deputies : analysis for static and transient science ; 2 DOM
    - Note : if you have remarks about DESC management, I'm here to listen !
  - Onboarding international in-kind effort
    - Note: Euclid/DESC interest from European partners
  - Answering Rubin calls
    - Commissioning
    - Photo-z
  - **Preparing a Science Plan**
    - Goal is to define and focus on **Key papers at the horizon of DR2**
    - Important for us too ...
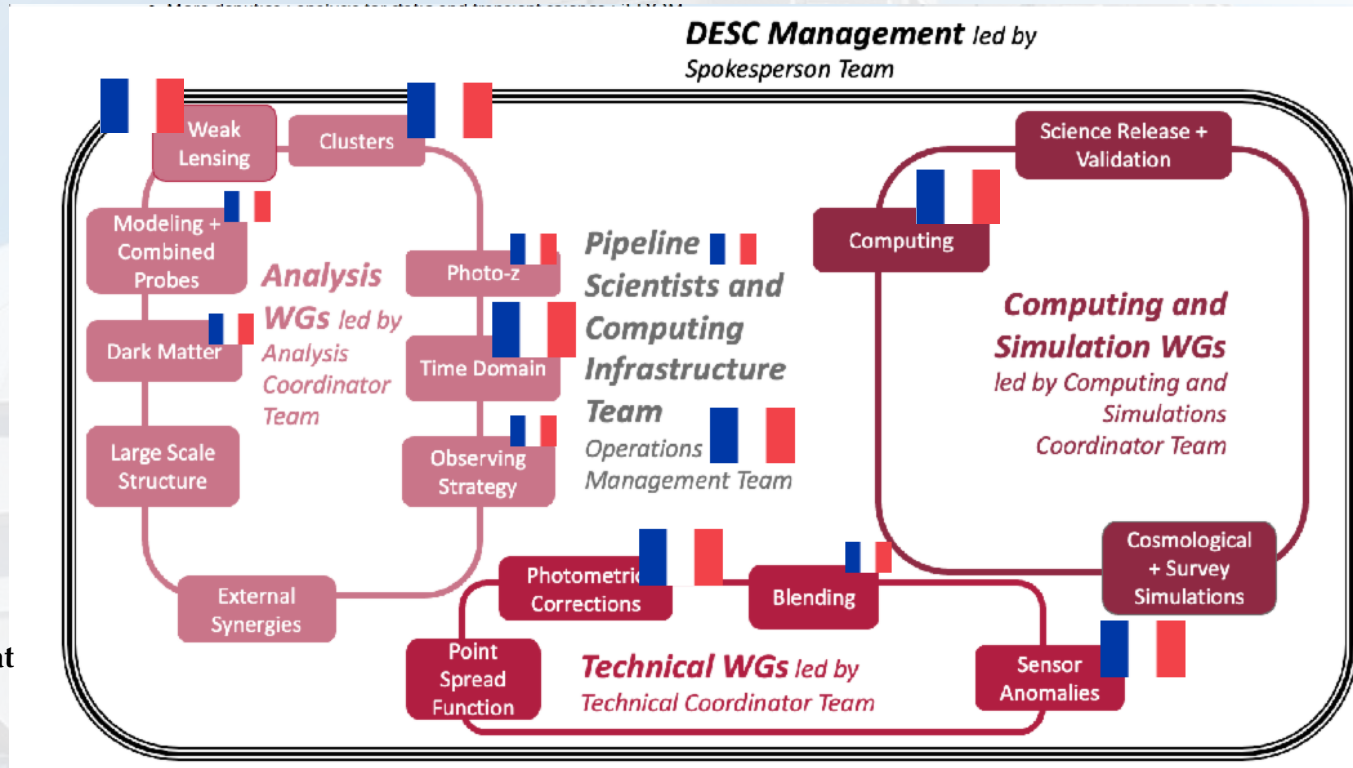
French contribution
French leadership

DESC news

- Growing French participation
  - 108 (+27) members / 1182
    - Includes inactive people (see Membership Revision Policy)
  - 32 Full Members / 236
    - Stable… If you contribute >~30 % of your time to DESC, you should consider becoming Full Member (**juniors are eligible too**)
  - 3 Builders / 33
    - Stable (we also have 11 Rubin builders who are also researchers)
- Service to DESC collaboration
  - Great French presence in nearly all DESC committees
    - Slow decrease on DESC Collaboration Council… Congrats to newly elected members ! (Céline, François)
  - French Working Group, Topical Team conveners and PS :
    - gradual shift from SN to Clusters…
      - For now: SAWG, PCWG, Alerts TT and CLMM TT, 2 PS in Time Domian and Clusters
      - -2 conveners in 1 year…

Supernovae within DESC ?

- What is the scientific strategy ?
  - We have **invested a lot in SN cosmology**
    - This is at the core of **ZTF II** participation (a success : ~25 % of our scientific FTE)
    - This is the basis of our ground work on **calibration**
  - *Is supernova science within DESC appealing ?*
    - Cadence is suboptimal, FoM is calibration-critical
      → importance of (early) DDFs (see talk by Philippe)
  - Are we investing enough in DESC for Supernova Science ?
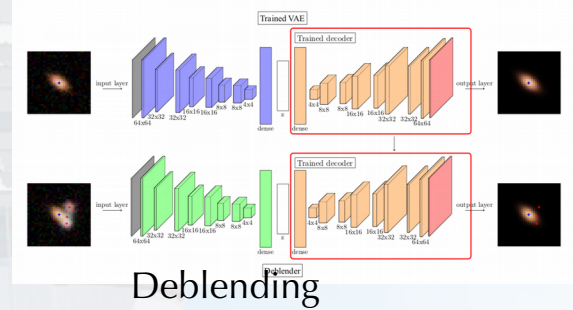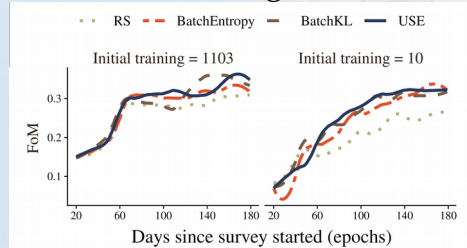- This is a major question for Rubin-LSST France scientific return…
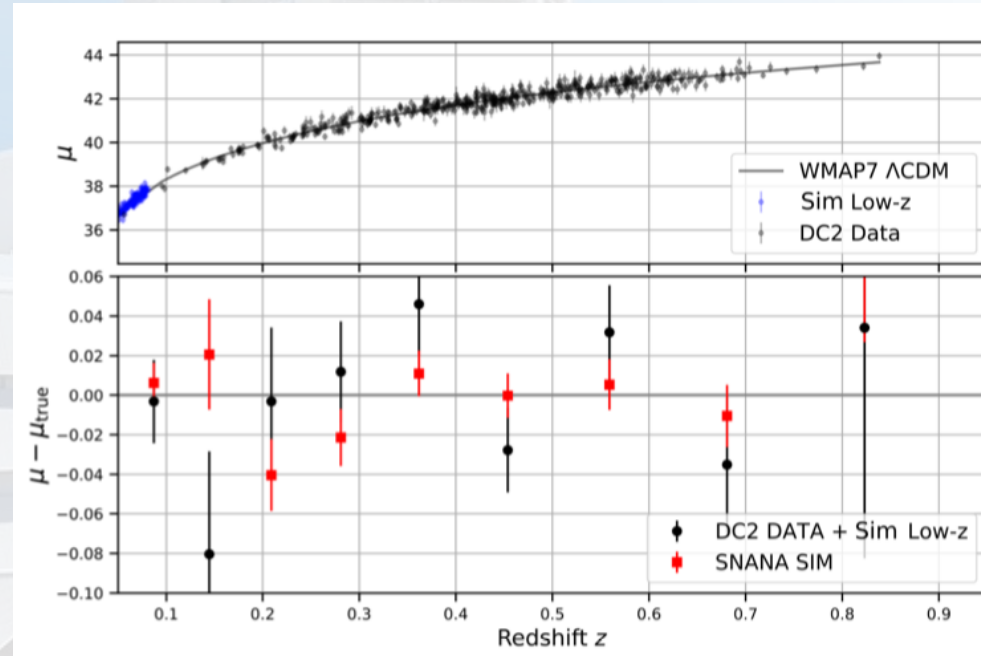
Sanchez, Kessler, Scolnic et al. 2021

A wealth of French contributions

HSC DIA real/bogus
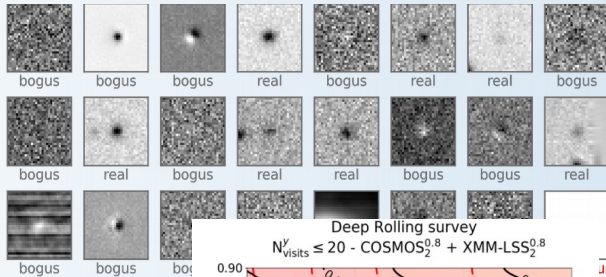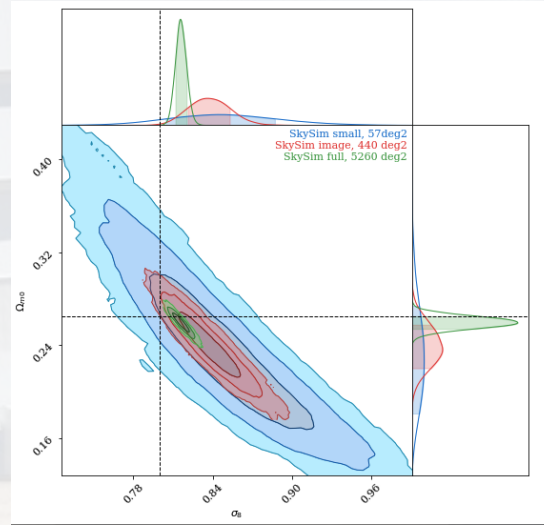
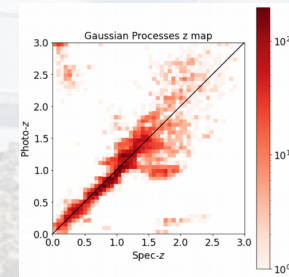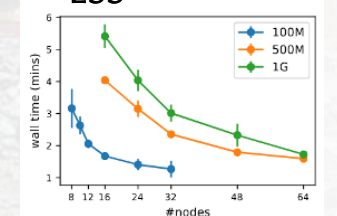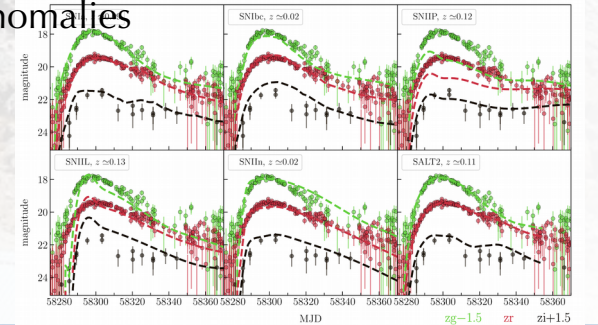Active learning...

Deblending

Cluster Mass Modeling

Photo-z

LSS

DDF Cadence

Anomalies

PSF centroids

Emmanuel Gangler – Rubin-LSST France in nebulis

The path forward

- **Commissioning** and **computing** are the obvious next steps
  - IN2P3 success of call on commissioning
    - Pending Rubin Obs' feedback
    - I would like to see more **internal organization for pixel-level commissioning**
  - DP0.2 computing will be demanding

- Preparing for science should be on radar
  - Very good involvement within DESC… (Bravo Clusters ! But not only…)
  - Some points requiring attention:
    - French **supernova effort** erosion in DESC. → Effort needed to be leaders on this science.
    - Promoting **technical work** at DESC-wide level (PSF, calibration…) → this can be done within Project
    - Use of FINK **for DESC** (current lack of FTEs)
    - Use of CC resources for DESC analysis ?

- **Exciting times for students:** starting PhDs will see first LSST data !

Acronyms

- AGN: Active Galaxy Nuclei
- CCOB: Camera Calibration Optical Bench
- ComCam: Commissioning Camera
- DESC: Dark Energy Science Collaboration
- DC2: DESC Data Challenge 2
- DP0,DP1,DP2 : Data Preview 0,1,2
- EPO: Education and Public Outreach
- FTE: Full Time Equivalent
- FINK: The French broker (not an acronym)
- LSS: Large Scale Structures
- LSST: Rubin Observatory Legacy Survey of Space and Time

- LSSTCam: LSST Camera
- LSST – SC: LSST Science collaboration
- MoA: Memorandum of Agreement
- MW: Milky Way
- PCW: Project and Community workshop
- PI: Principal Investigator
- RSP: Rubin Science Platform
- SCOC: Survey Cadence Optimizing Committee
- SSP: Subaru Supernova Project
- ZTF: Zwicky Transient Facility