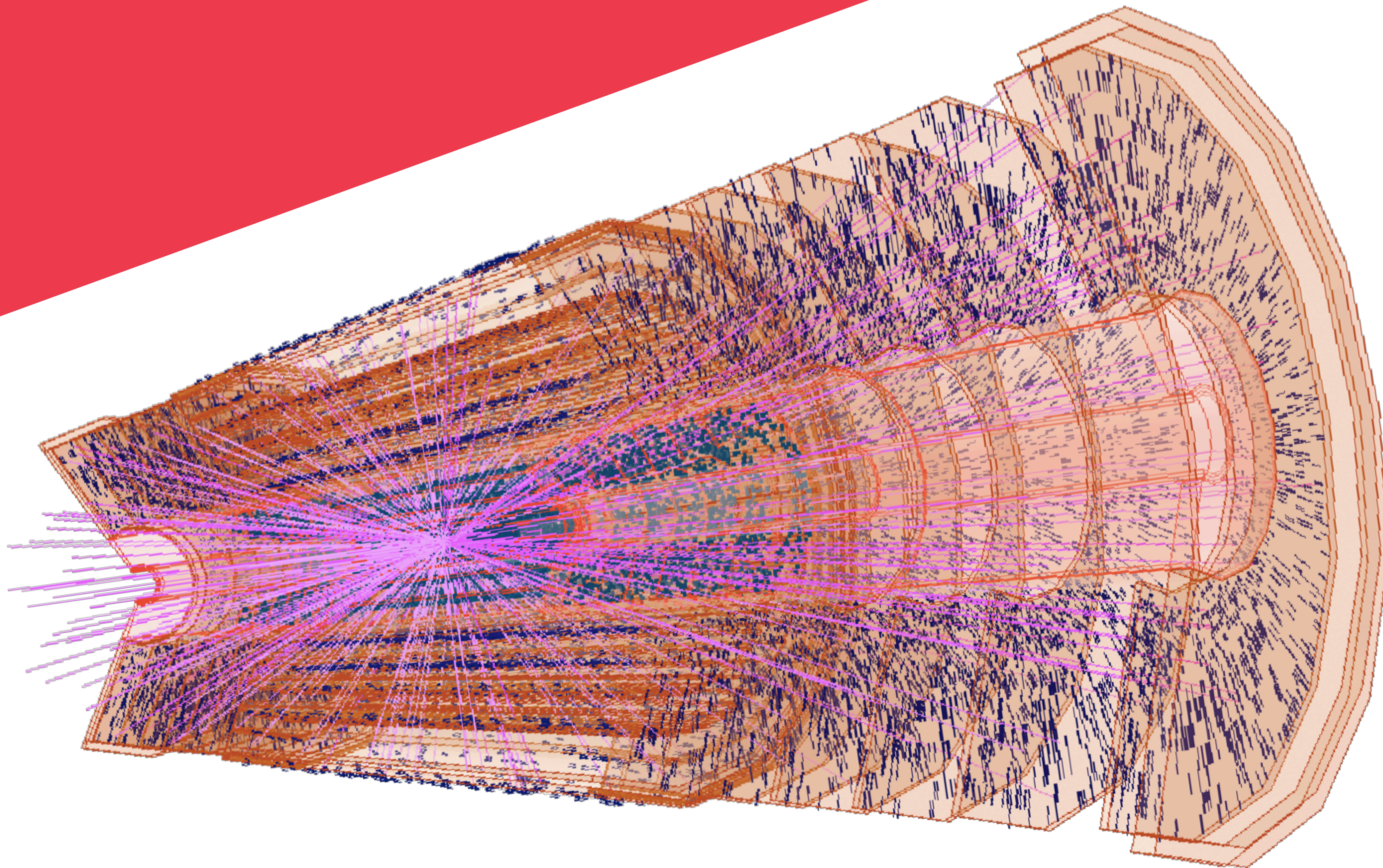


Nikhef

- INTRODUCTION
- RUN-2 COMPLETED
- PHYSICS
- UPGRADE



ATLAS

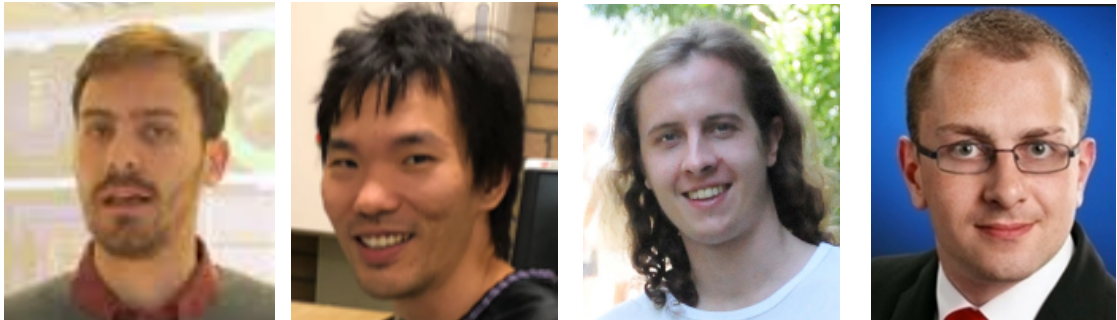
Nicolo de Groot

THE ATLAS GROUP

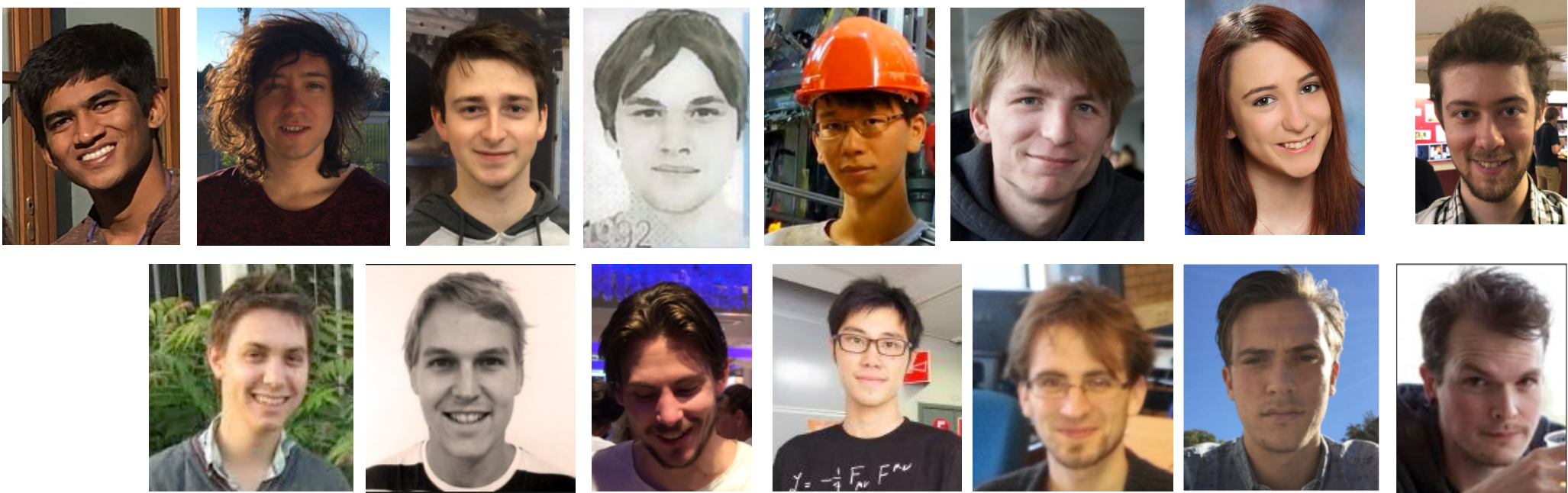
Staff
Postdoc
PhD



16 staff
(= ~14 fte)

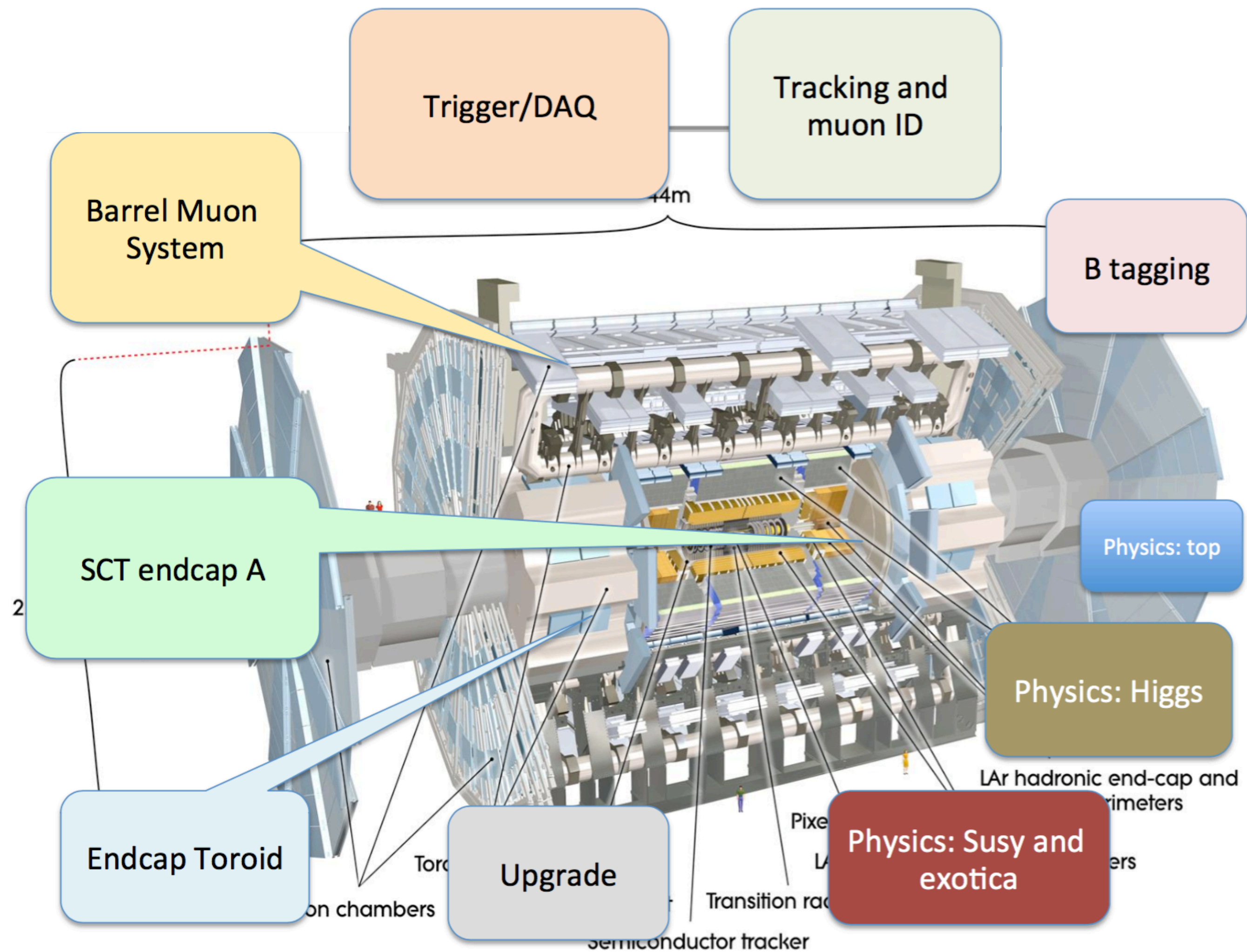


7 postdocs

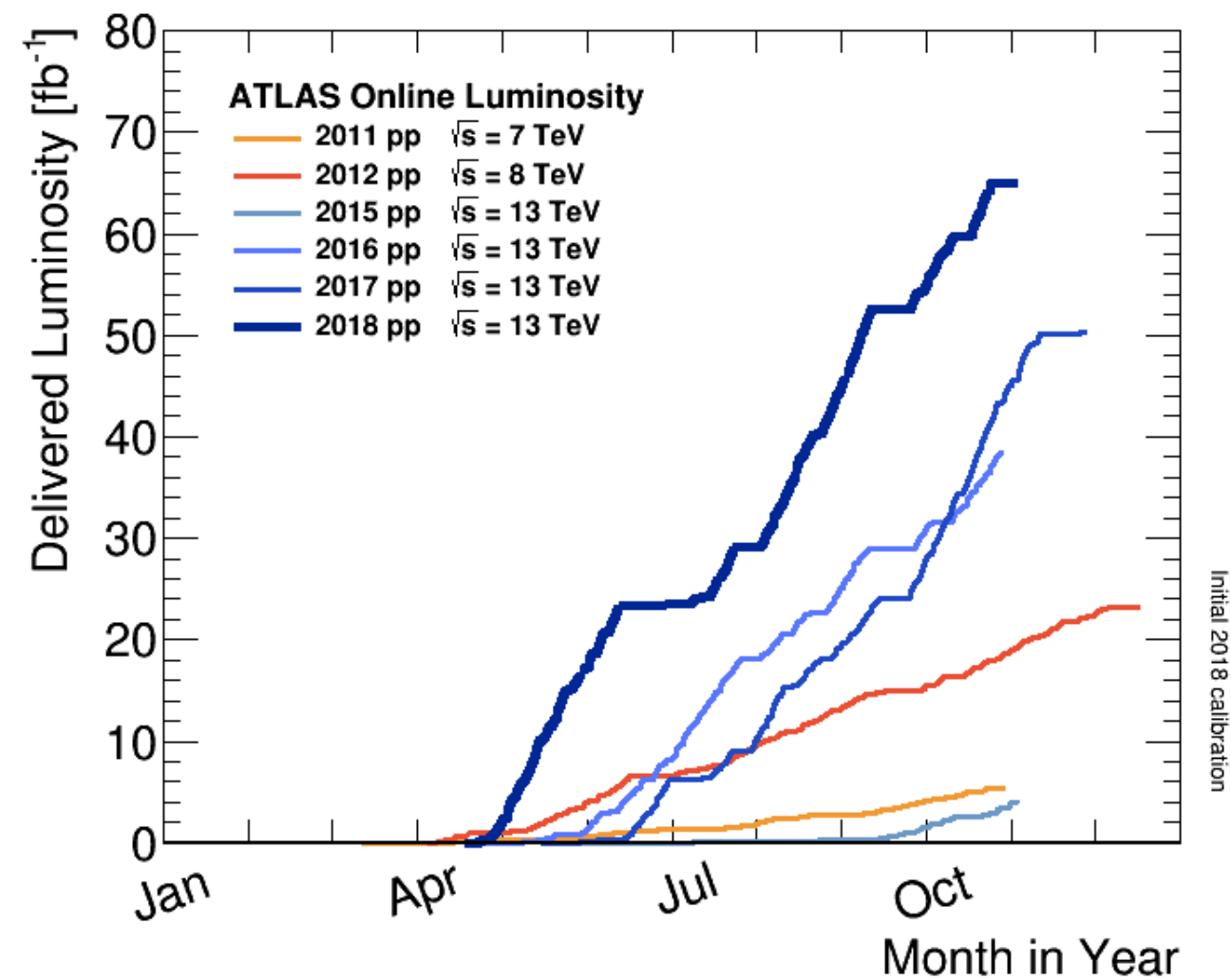


23 PhDs

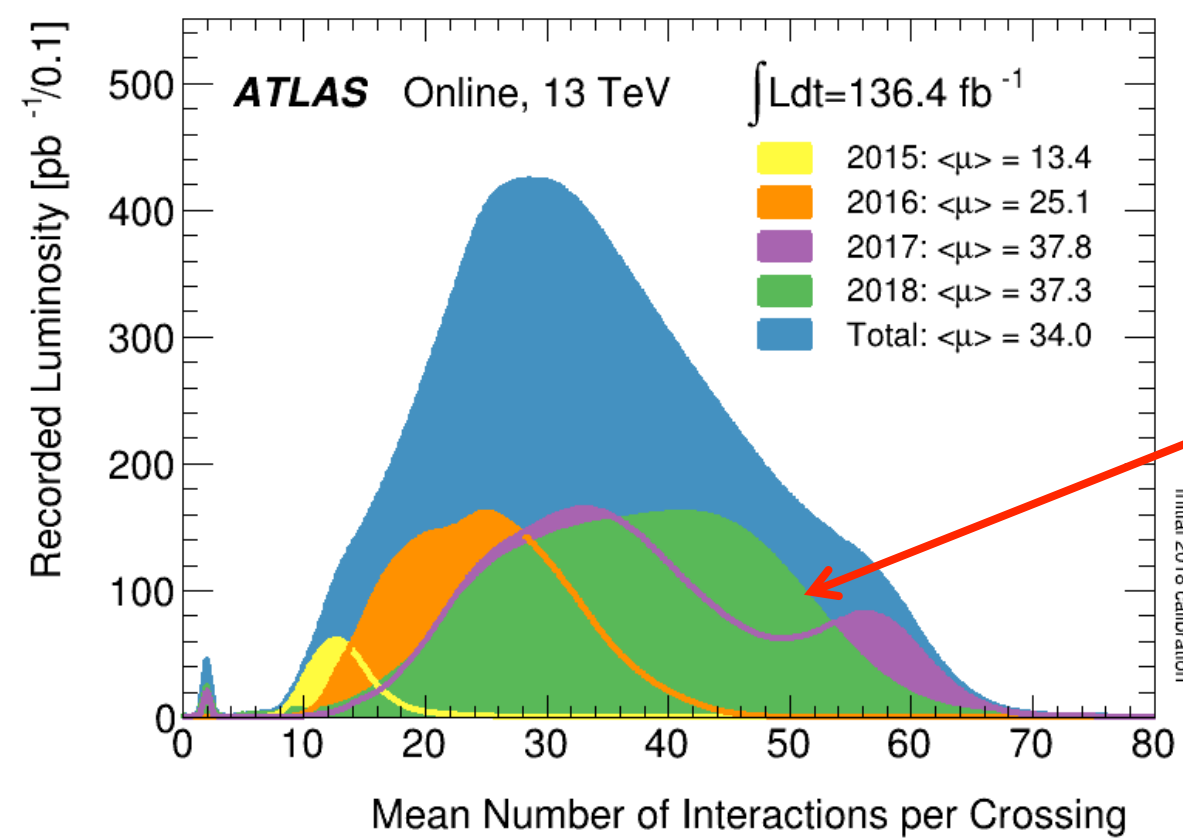
OVERVIEW OF NIKHEF CONTRIBUTIONS



2018 END OF RUN-2



- Rapidly rising luminosity and increased run-2 beam energy crucial to success of ATLAS physics program. **A wealth of data to analyze.**
- But higher occupancies & rates, faster radiation damage
- ATLAS must keep up by
 - ✓ Improving trigger and DAQ system
 - ✓ Adding and replacing detector systems



2017, 2018
37 average collisions
per bunch crossing

Nikhef

- Insetable B-layer
- New muon readout system
- Updated MET hardware triggers
- Muon Topology Trigger in L1



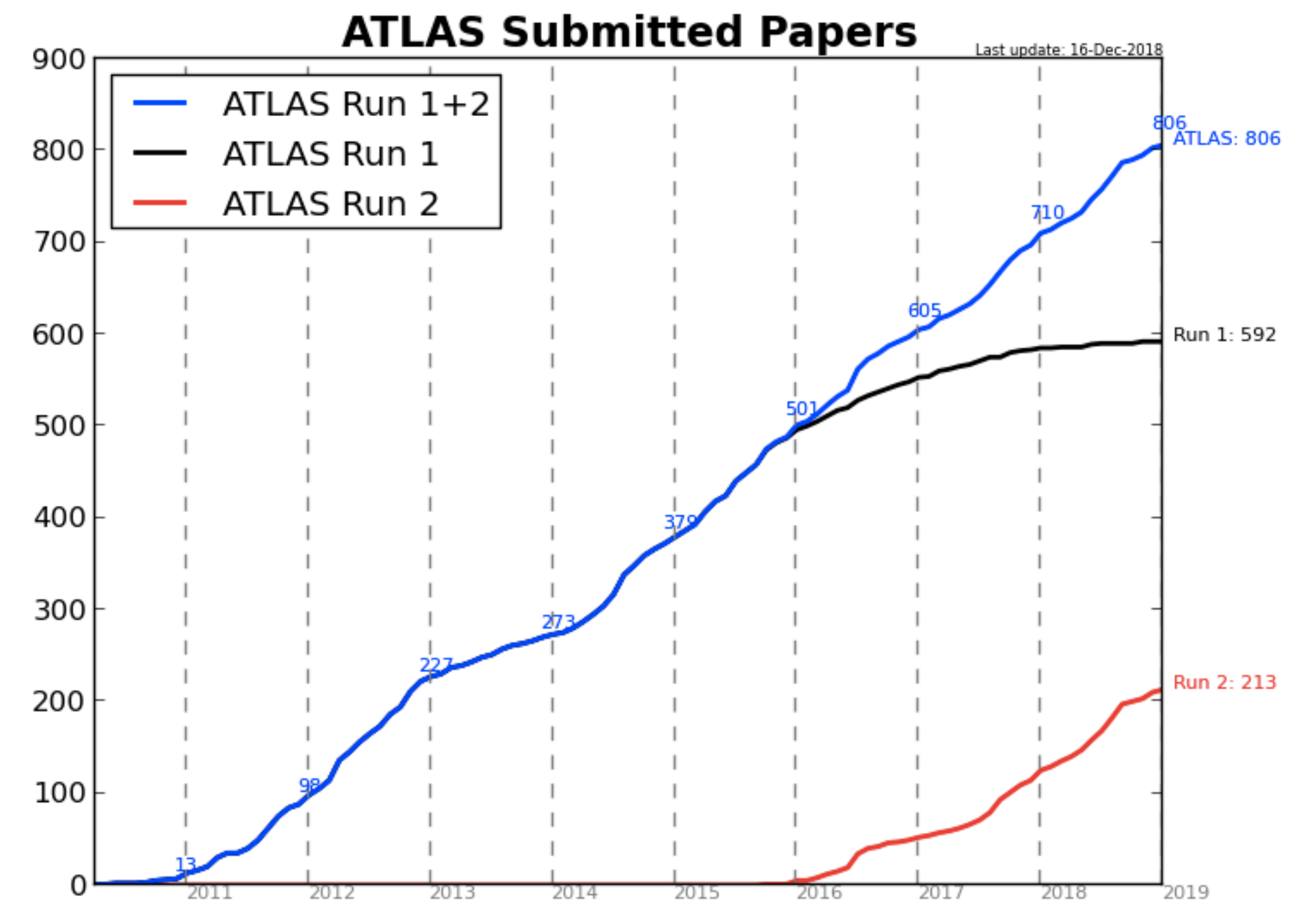
PUBLICATIONS 2018

Theses:

- **Antonia Strübig** - Finger on the trigger - SUSY in the focus
- **Tim Wolf** – Higgs from Top to Bottom. Discovery of the Higgs Boson Coupling to Top Quarks with the ATLAS Detector.



Articles



LEADERSHIP POSITIONS, GRANTS, AWARDS

Physics & general management

- Exotics Lepton+X subgroup [N. Illic 2018-2019]
- B-physics rare decays subgroup [M. Morgenstern 2018-2019]
- [Publication committee \(deputy\) chair \[P. Ferrari 2019-2021 \]](#)
- Statistics Committee [W. Verkerke 2018-2020]

Trigger, data preparation, performance

- Data Quality group convener [P. Ferrari 2016-2018]
- Muon Trigger coordinator [M. Morgenstern, 2017-2019]
- Trigger express stream coordinator [O. Igonkina 2014-2018]
- Felix Firmware coordinator [F. Schroeder]
- Felix Software coordinator [M. Donszelmann]
- Felix User Support coordinator [N. Illic]

Software & detector

- Muon MDT Coordinator [G. Bobbink 2014-2018]
- Flavor tagging software coordinate [F. Filthaut 2017-2018]
- Activity coordinator global structures ITk strips [M. Vreeswijk 2017 -]

Grants

- NWO VENI grant 2018 – N. Illic (250k€)
- NWO Projectruimte 2018 – P. Ferrari & B. Van Eijk (400k€)

Awards

- ATLAS Outstanding Achievement award – O. Igonkina
- CERN Fellowship – S. Alderweireldt



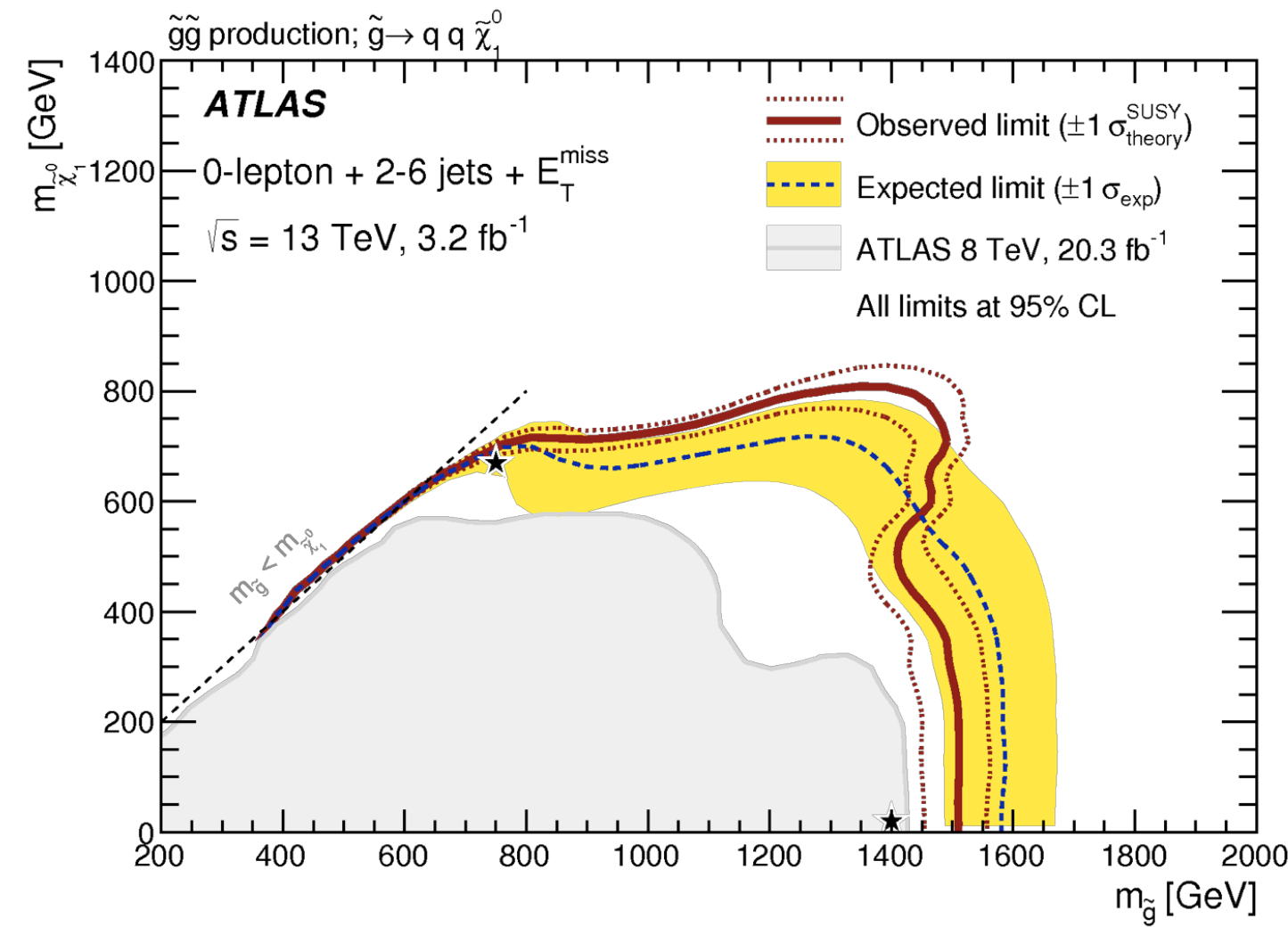
L1 topo – Atlas outstanding achievement award for Olya



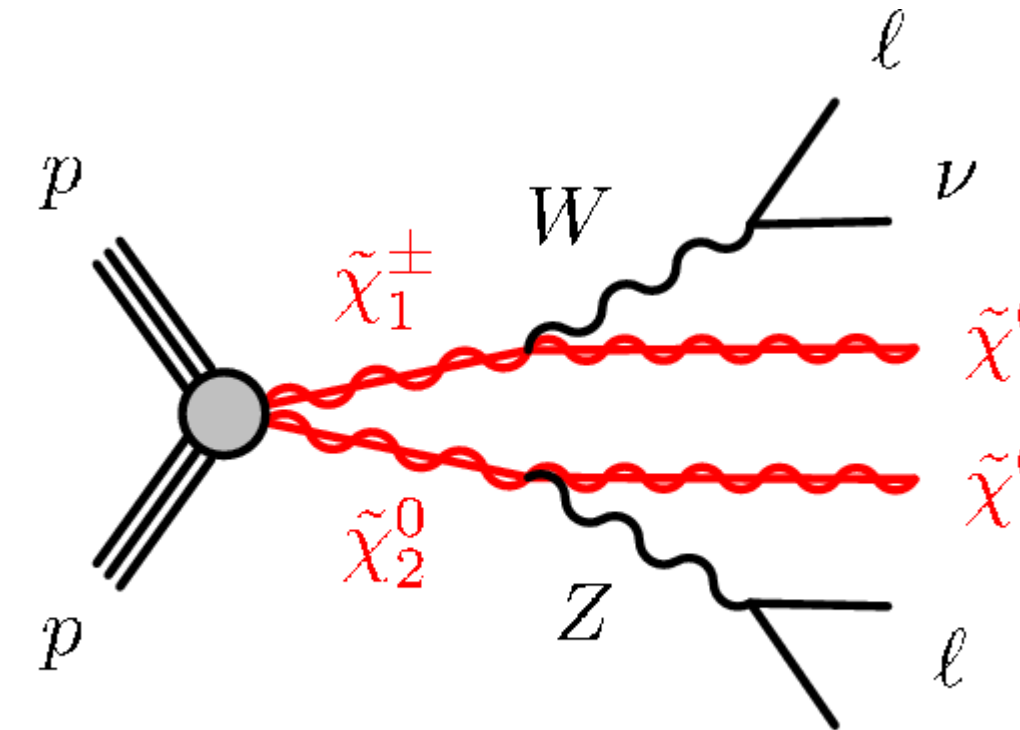
PHYSICS HIGHLIGHT: SUPERSYMMETRY

Early Run-2:

- SUSY with 0 leptons and MET
- 3d generartion SUSY

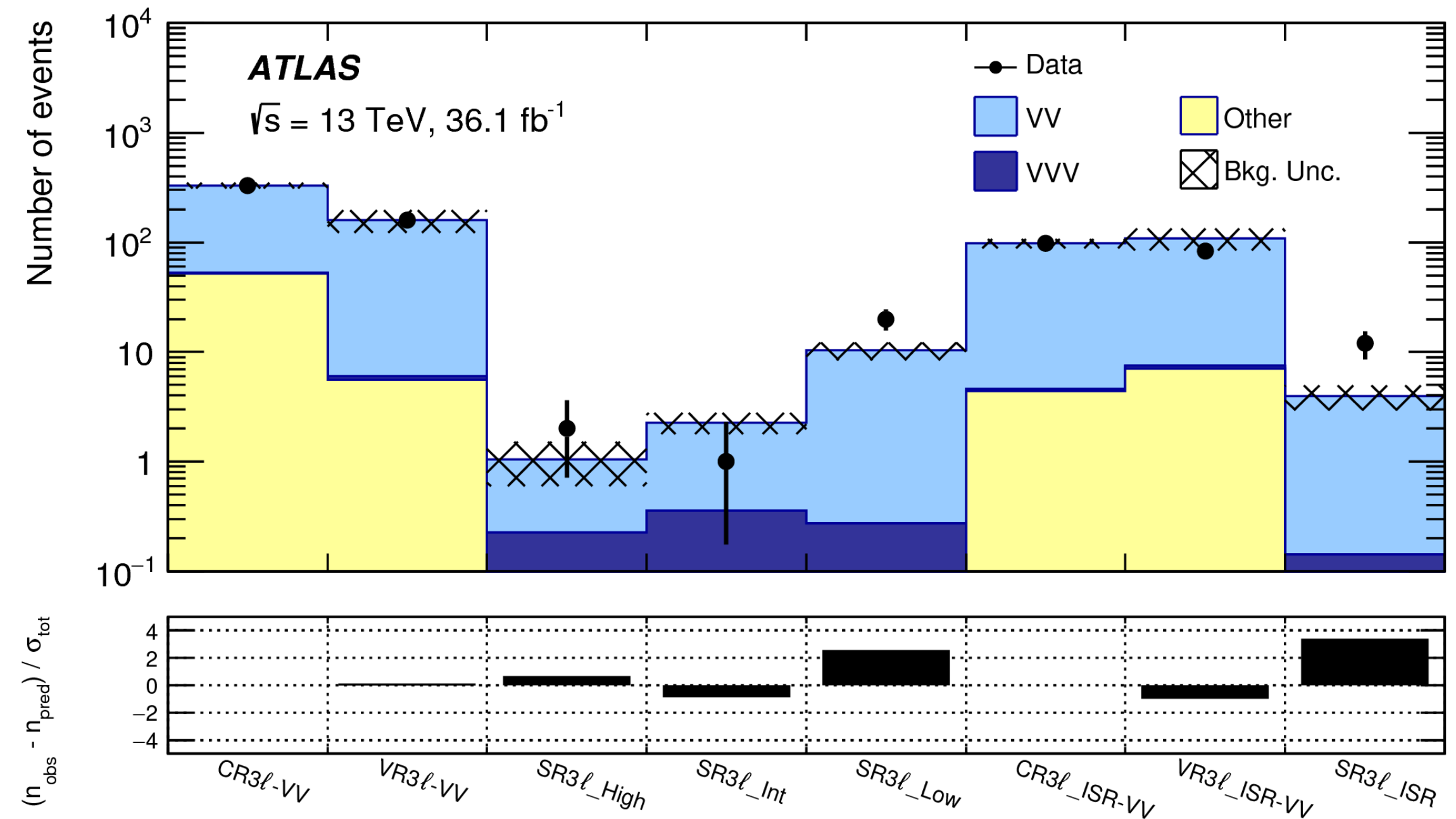


Z → tau mu



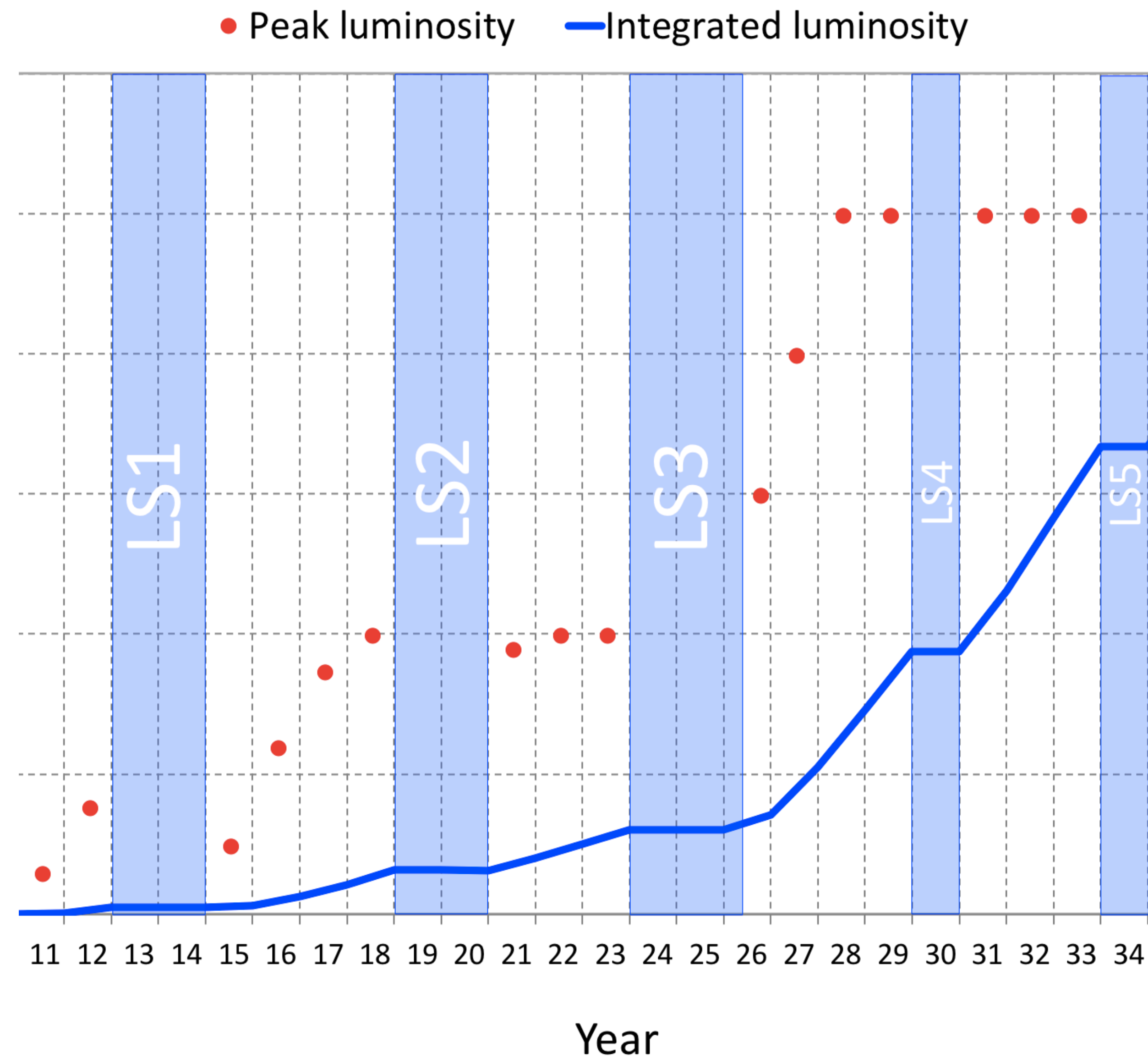
Now: Electroweak SUSY

- Multilepton final state
- Parameters favored by fits
- 4x more data in full Run-2



ATLAS UPGRADES

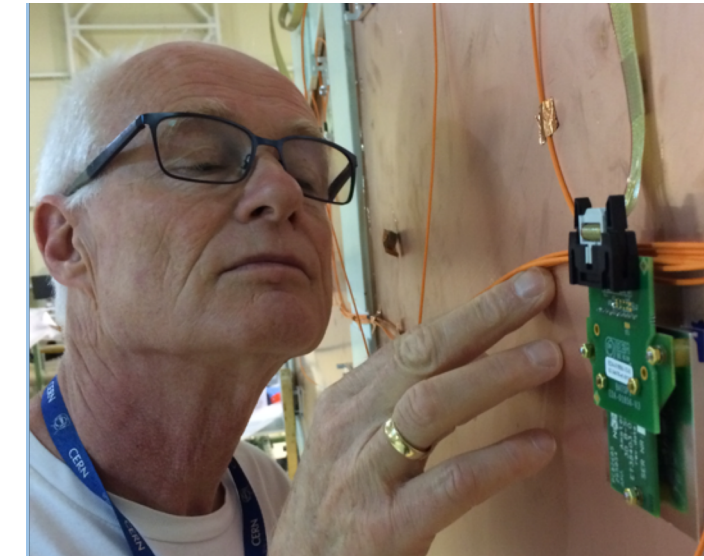
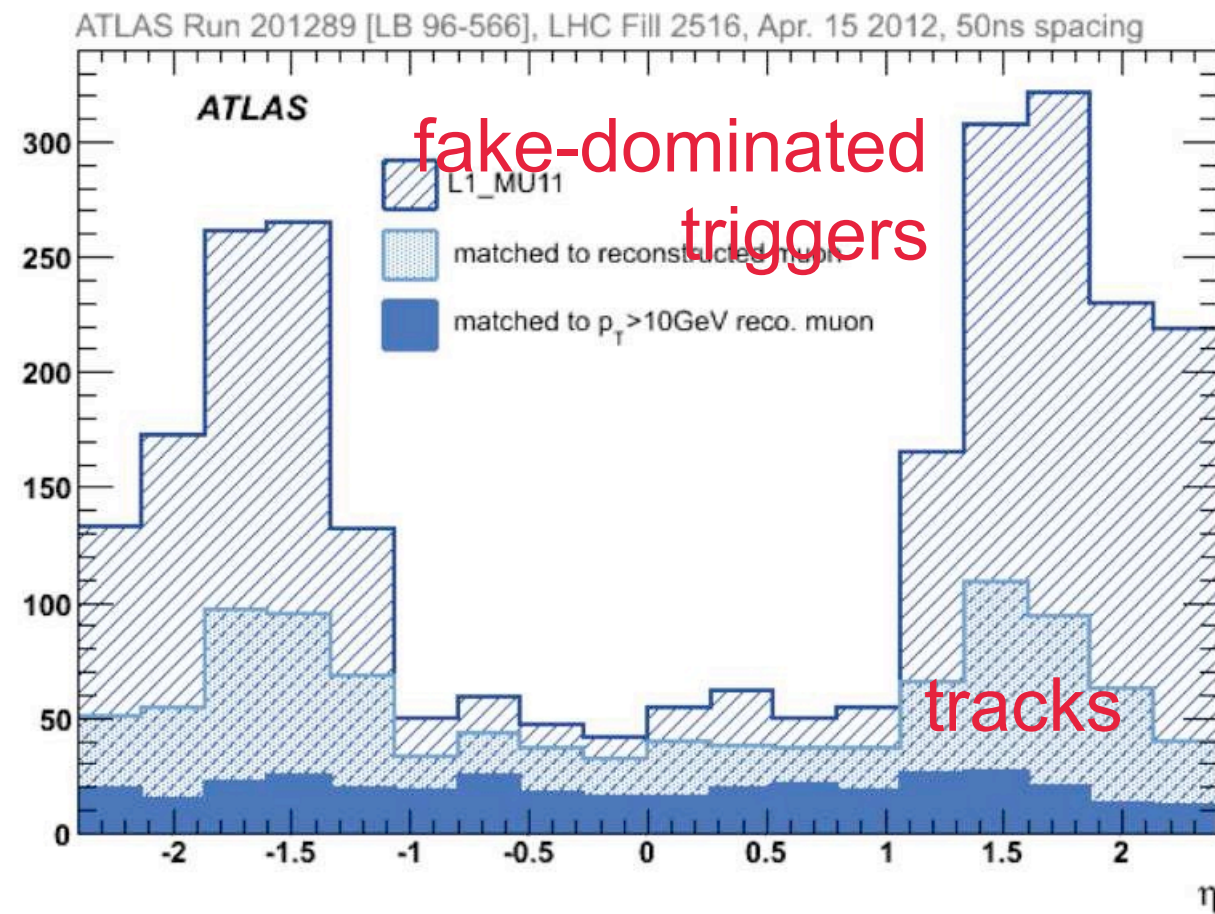
- Phase 1
 - New Small Wheels
 - FELIX for NSW
- Phase 2
 - ITk – Bob’s talk
 - FELIX everywhere
 - Muon Front-end electronics



MUON NSW (2019-2020)



- ATLAS must keep up by
- ✓ Improving trigger and DAQ system
- ✓ Adding and replacing detector systems



Tristan du Pree
Project Leader

Nikhef Atlas
group visiting
NSW construction site



Nikhef

- B & T sensor system
- Felix DAQ system
- Software ROD
- Implementation in simulation software

Status NSW:

Various production delays due to HV problems with MM and industrial production printed circuit board. May install only one wheel in LS2 !

FELIX (FRONT-END LINK EXCHANGE) TDAQ 2019-2025

Flexible, modular, universal DAQ system for event data, timing and trigger control

- Nikhef is one of the main developers of FELIX (firmware and software coordinator)
- First deployment in ATLAS foreseen in 2020 (NSW & L1)

Nikhef

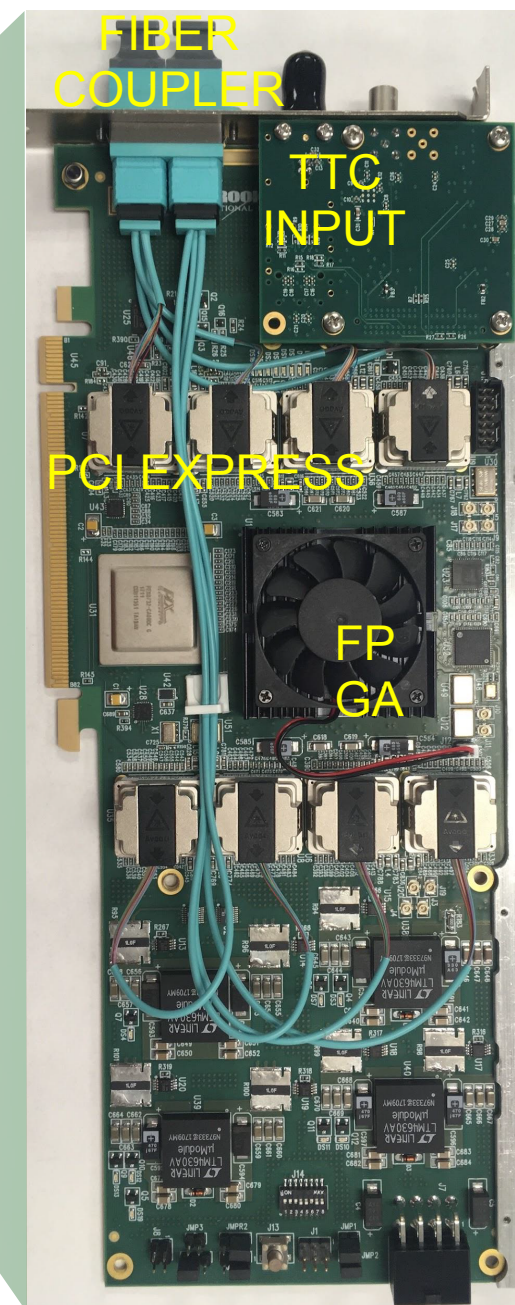
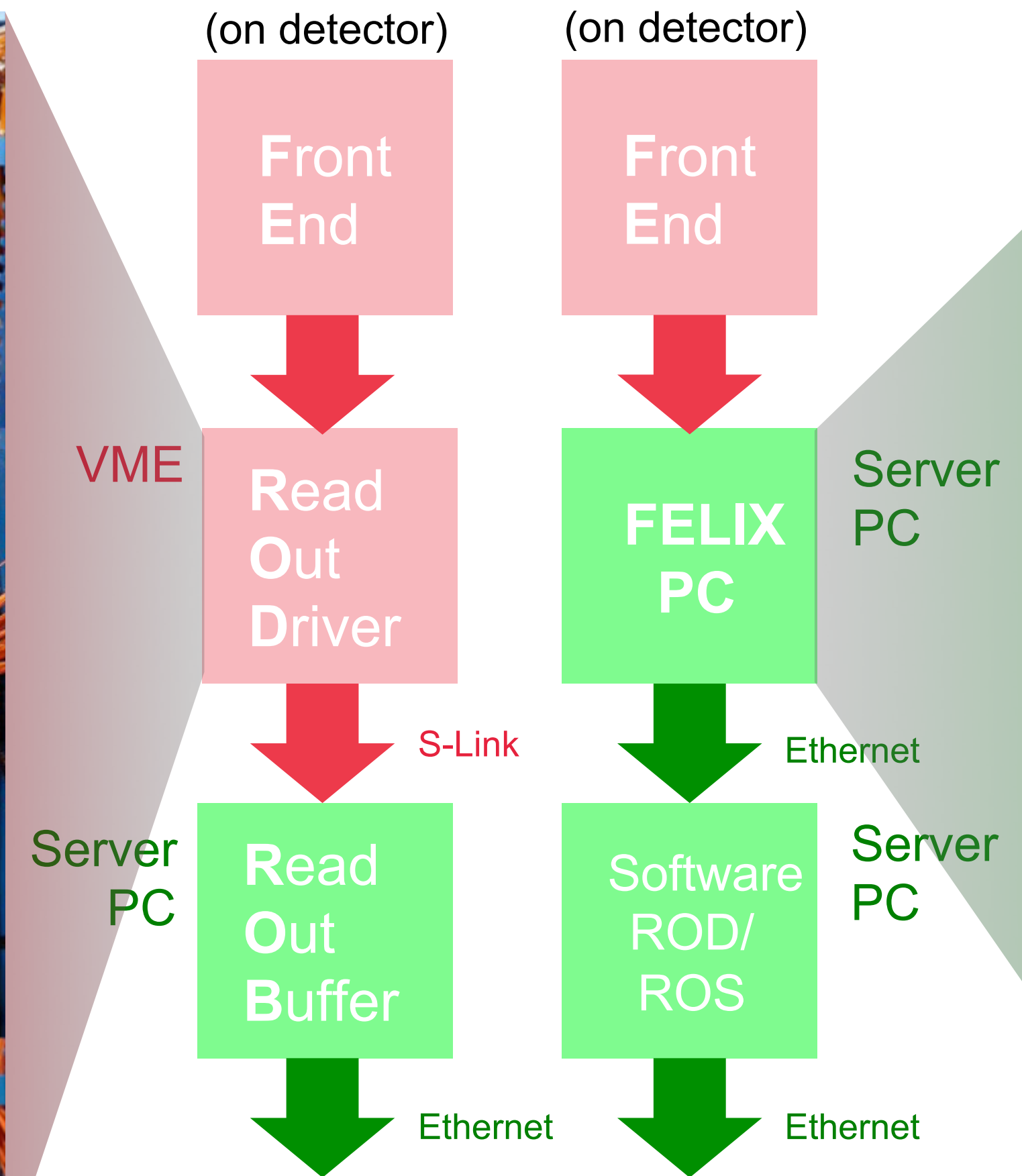
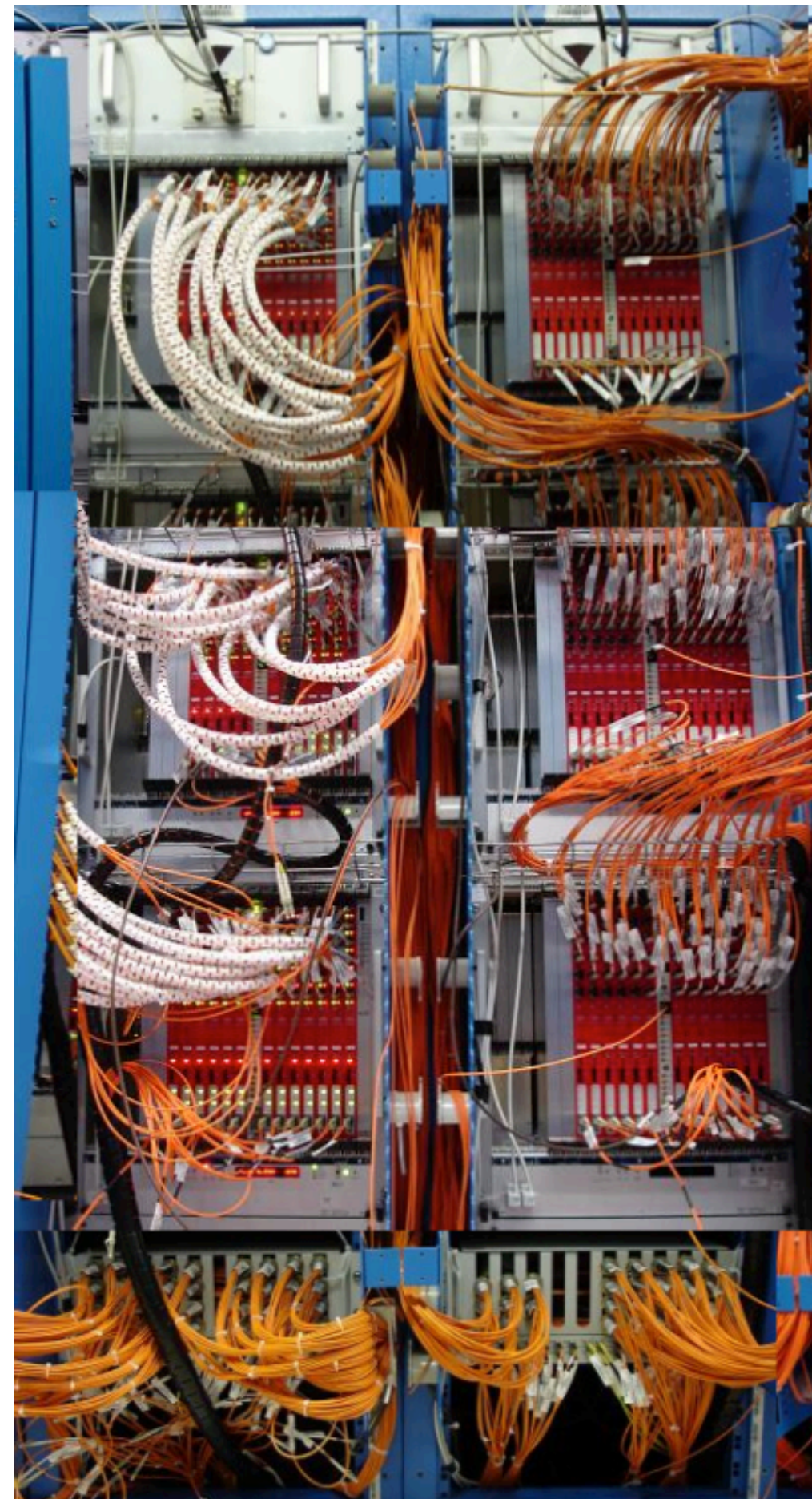
- Felix firmware
(F. Schreuder
FW coordinator)

- Felix software
(M. Donszelmann
SW coordinator)

(N. Ilic – User Support)



Jos Vermeulen
outgoing
Project Leader



FELIX TDAQ 2019-2025



Phase-I deployment (2019-2020)

Scope: Muon NSW, LAr/Calo trigger = ~100 Felix cards, ~2K links

Status: tendering I/O cards done, prototype production started;
tendering server PCs started, installation in 2019

Production Readiness Review part 1 completed

Phase-II deployment (2024-2025)

Scope: all ATLAS subsystems = ~550 Felix card, ~11K links

Challenge 10 times higher readout rates L0 (Front-End electronics).

Status: TDR approved, current planning:

Q4 2018: I/O Card baseline technology identification.

Q3 2019: Specification Review

Q3 2022: Production Readiness Review,

Q4 2023: Installation Readiness Review

Felix Spinoffs

- FELIX for ProtoDUNE experiment
- ISOTDAQ School 2017
- OliScience startup company (A. Borga – ET dept)



TODAY



ITK UPGRADE
BOB VAN EIJK



LEPTON FLAVOR VIOLATION
TERRY CHAN



H \rightarrow WW POLARIZATION
LUCREZIA BRUNI



HIGGS HIGHLIGHTS AND OUTLOOK
BRIAN MOSER



ATLAS CONFIDENTLY
RIDING INTO 2019 AND
RUN-3