Nikhef
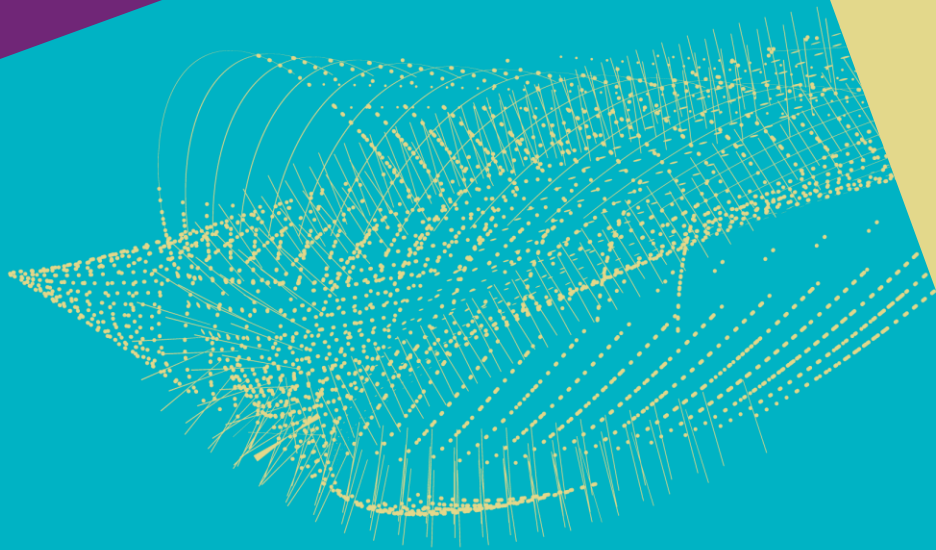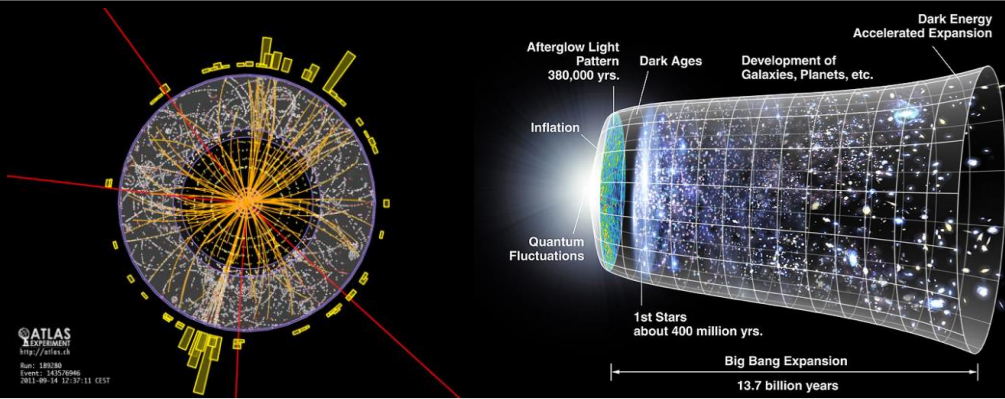
HEPIX FALL 2019 MEETING
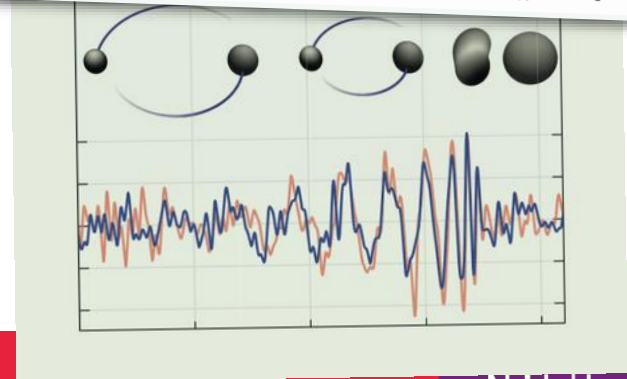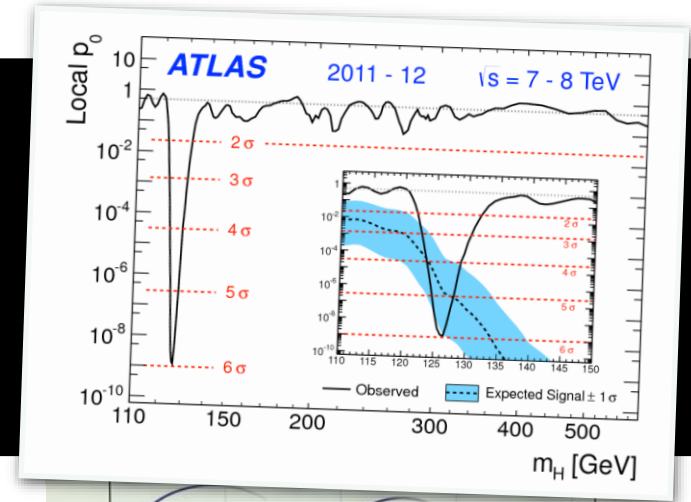
WELCOME TO NIKHEF

David Groep
October 2019

NIKHEF – SUBATOMIC PHYSICS, AT EVERY SCALE

**study the interaction and structure
of all elementary particles and fields**

- collider physics
- astro-particle physics

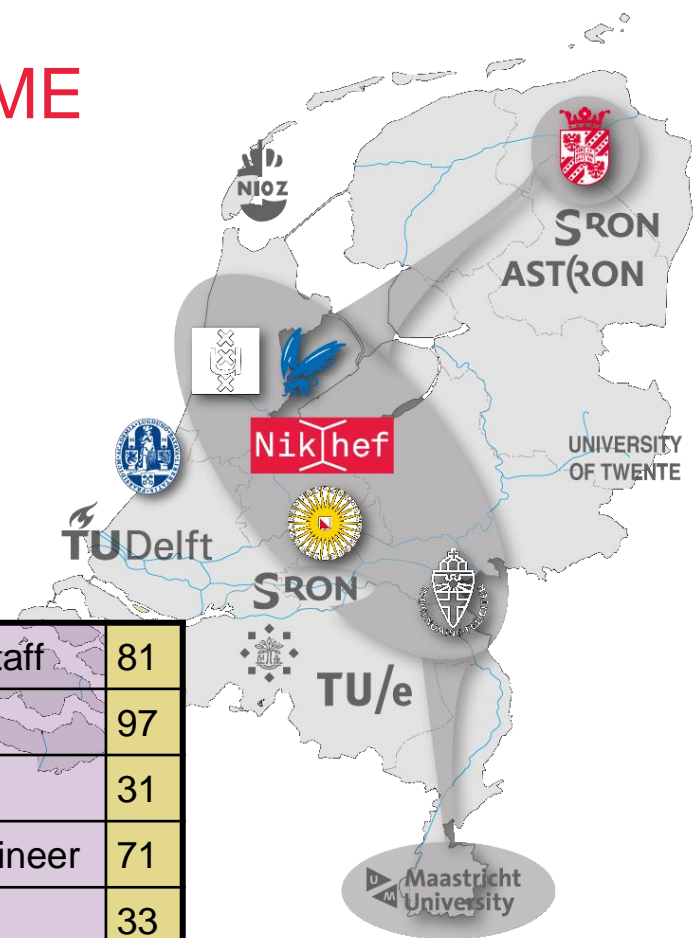*plus knowledge and technology transfer*

Nik|hef

A NATIONAL SCIENCE PROGRAMME

An NWO institute with university partners

- University partners in key positions
  - Leaders of the scientific programs
  - Comply with the Nikhef National strategy
- Added value Nikhef institute infrastructure
  - Technical competence and support
  - Large computing infrastructure
  - Long term strategy & commitment
- Gain focus and achieve mass
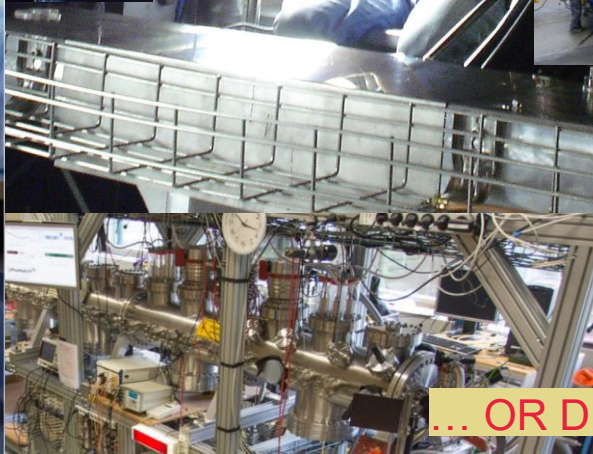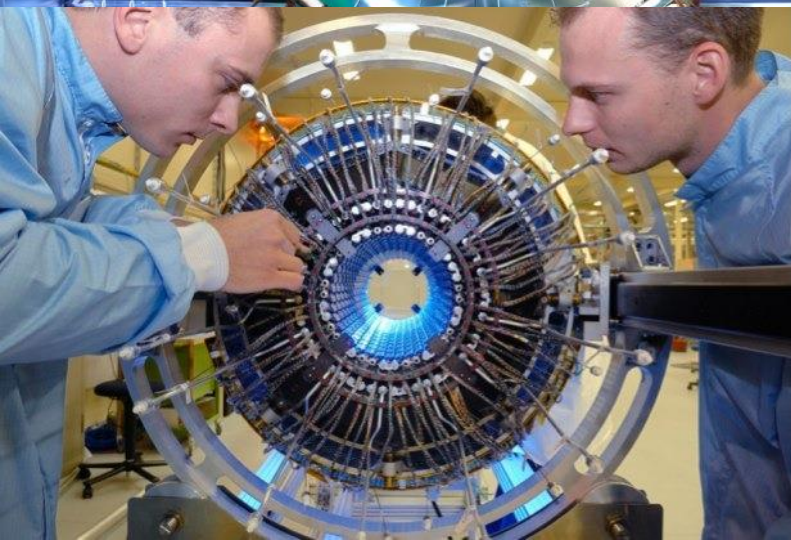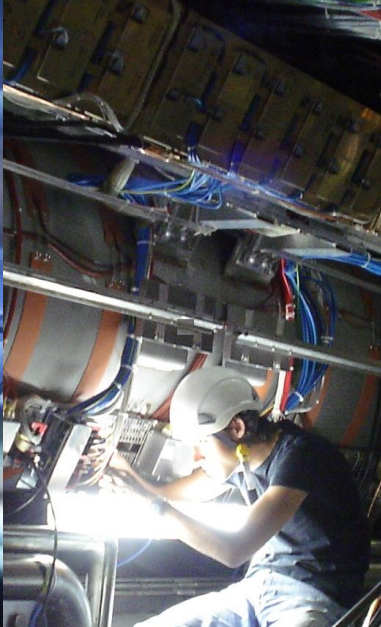 in world-leading expertiments

Permament Staff	81
PhD students	97
Postdocs	31
Technical/engineer	71
Support	33

ACCELLERATOR
PHYSICS @CERN

… OR DECELLERATION @RUG

ASTROPARTICLE PORTFOLIO AT NIKHEF

European Strategy for Astroparticle Physics
APPEC–Astroparticle Physics European Consortium

Pierre Auger - cosmic rays

Xenon1T - Dark Matter

Adv VIRGO - Gravitational Waves

KM3NeT - neutrino detection

Welcome to Nikhef

Construct the Einstein Telescope in the Netherlands?

GRAVITATIONAL-WAVE TRANSIENT CATALOG-1

Extend the catalog of GW events
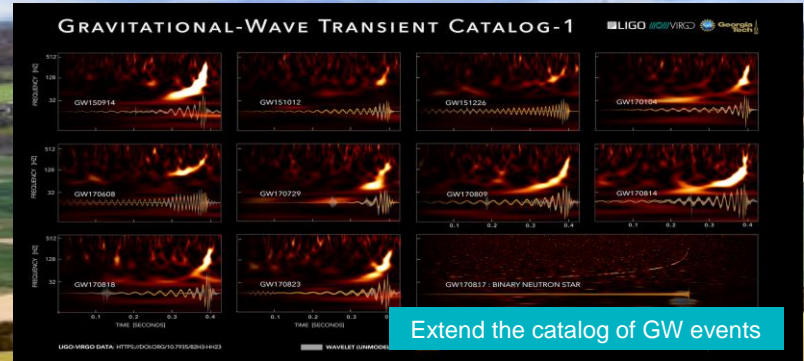
ET PATHFINDER
CONSTRUCTION IN COMING YEARS

NIKHEF AND COMPUTING – IBR LAN AND OUR WEB

```
WWW - World Wide Web at NIKHEF

   Help [1]      About this program, and the World-Wide Web

   NIKHEF [2]    NIKHEF information

   CERN [3]      CERN Information, ftp access to file server asis01.cern.ch [4]

   HEP [5]       High Energy Physics

   WWW [6]       The home page of WWW on info.cern.ch

   NETFIND [7]   World Wide User Lookup of email addresses

        [End]

1-7, Quit, or Help: 2
```

Computing has long been at the core of Nikhef:
- February 1992: **nic.nikhef.nl**
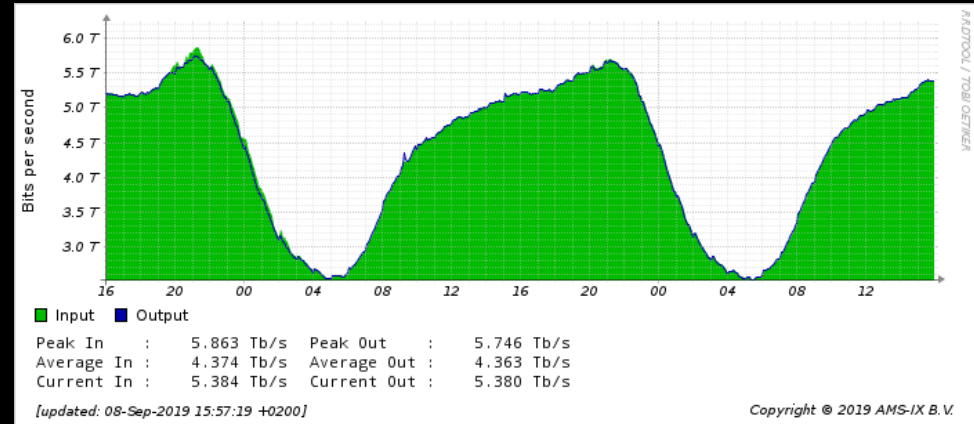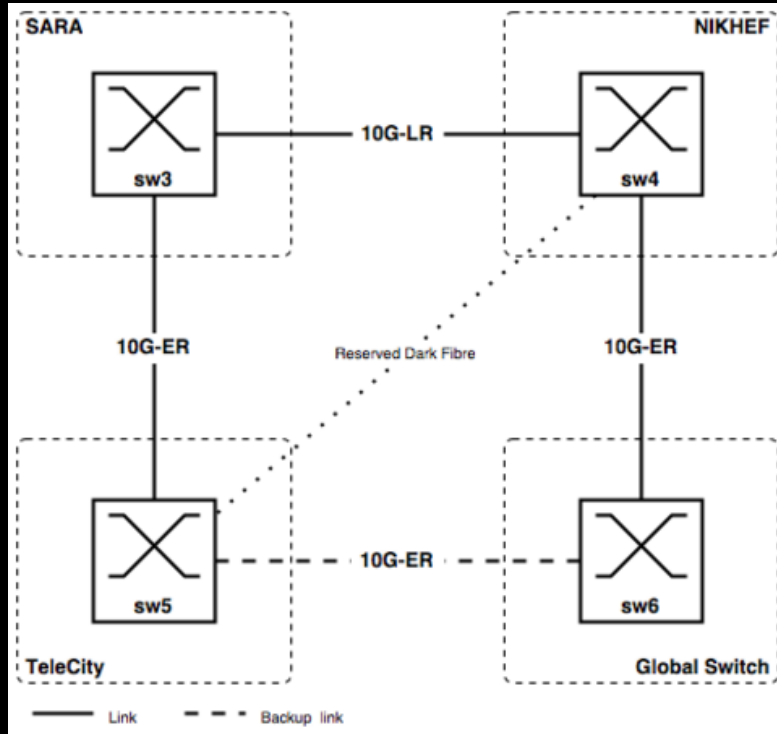- Early 1996:   **Nikhef Housing**
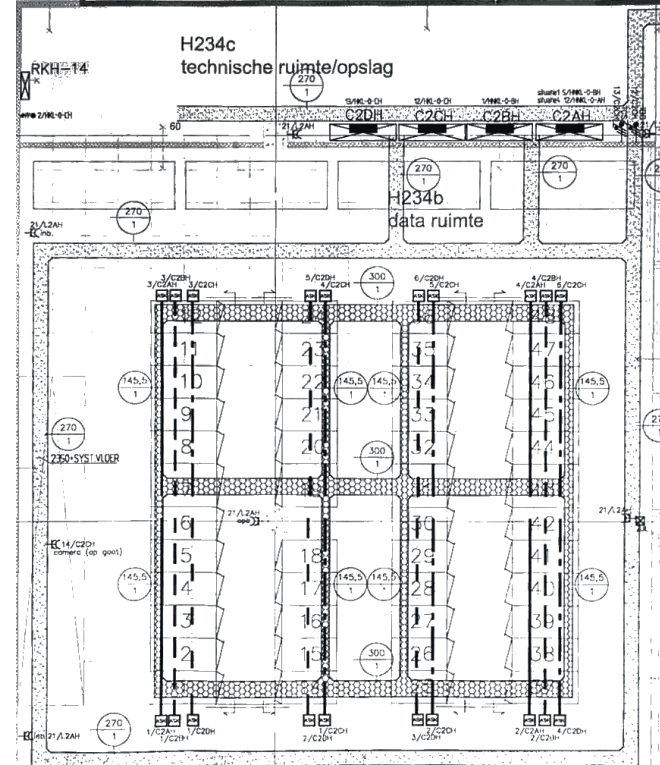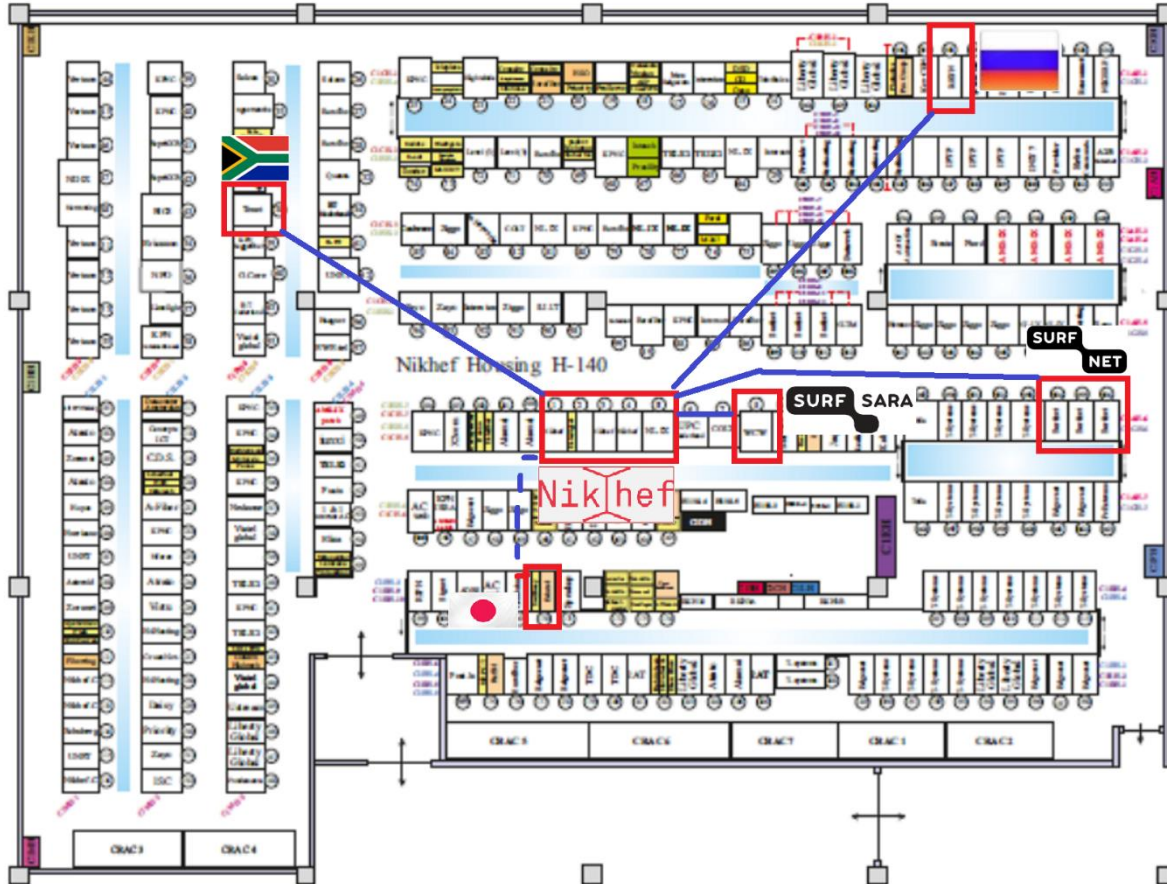

1996, Nikhef H1.40
the yellow Ethernet cable is the WCW local area loop for the International Backbone Router (IBR-LAN)

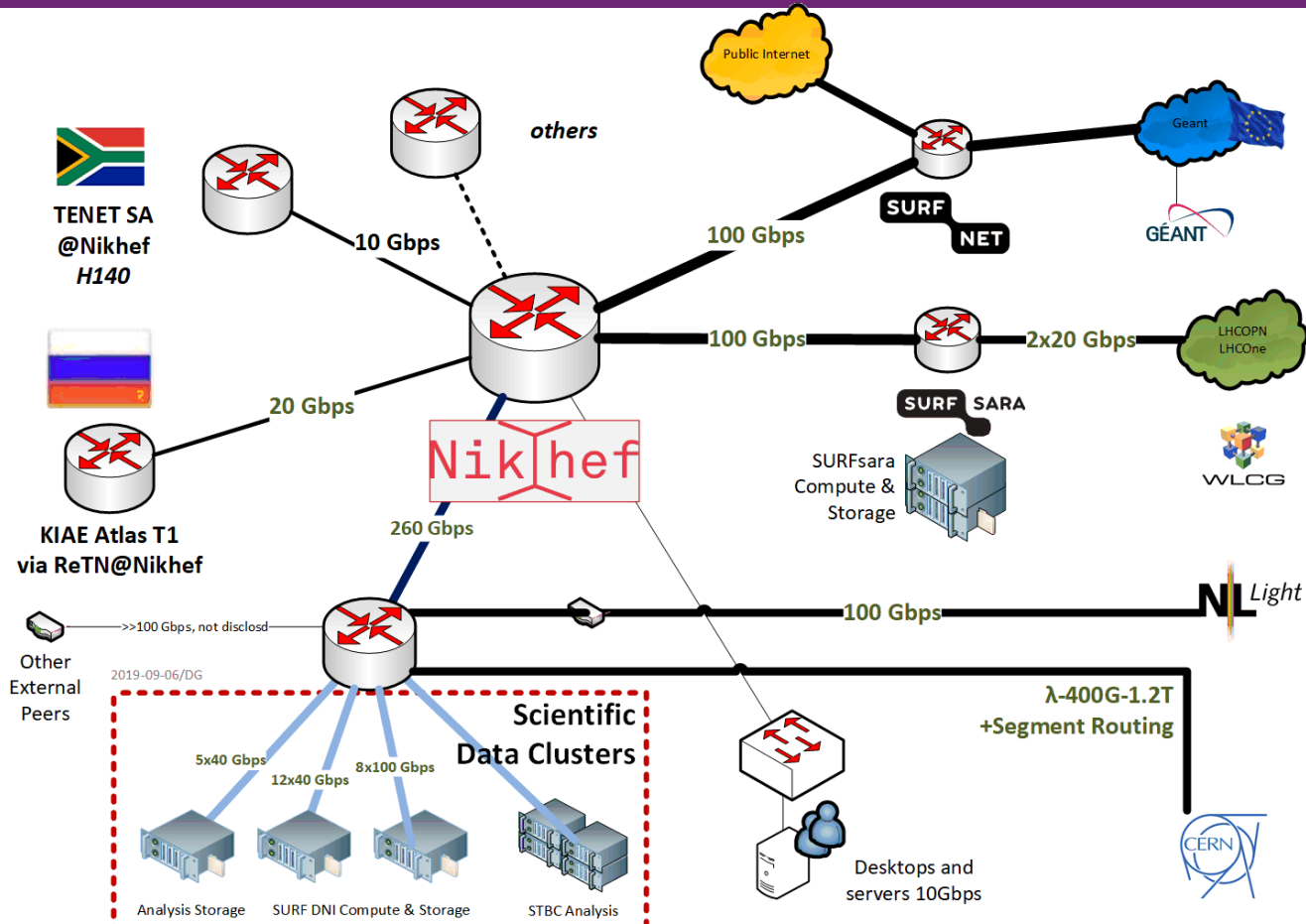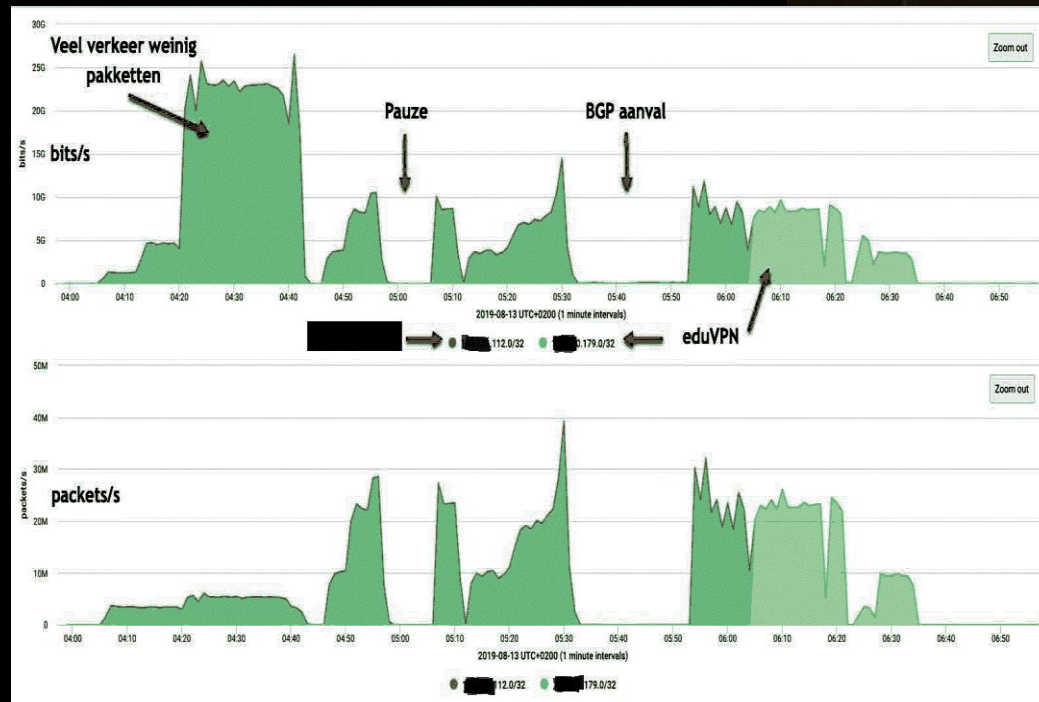traffic graph: *aggregate AMS-IX NL TRAFFIC ON SEPT 9, 2019*
ABOUT 20% OF THE AMS-IX TRAFFIC IS AT NIKHEF, OUT OF 16 LOCATIONS TOTAL
SOURCE: HTTPS://STATS.AMS-IX.NET/

Nikhef Housing - touching the net

Direct peering infra for 'big data'

EVALUATING RESILIENCE TO CYBERATTACK – *IN A COOPERATIVE WAY*

NIKHEF AND COMPUTING AS AN INFRASTRUCTURE

The Nikhef Data Processing Facility

- **nic.nikhef.nl** in February 1992
- Nikhef **Housing** since 1996
- EU **DataGrid** in 2000 *(jointly with SARA)*
- Worldwide LHC Computing Grid (WLCG) 2004
- **BiGGrid,** 2008
- natl. e-Infrastructure coordinated by **SURF**: 2013

Services at Nikhef and SURFsara are part of the **Dutch National e-Infrastructure** supporting WLCG, Virgo/LIGO, WeNMR, Project MinE (ALS), DUNE, DarkMatter, …

BiG Grid
the dutch e·science grid

Nik|hef

A TRULY SHARED NATIONAL E-INFRASTRUCTURE
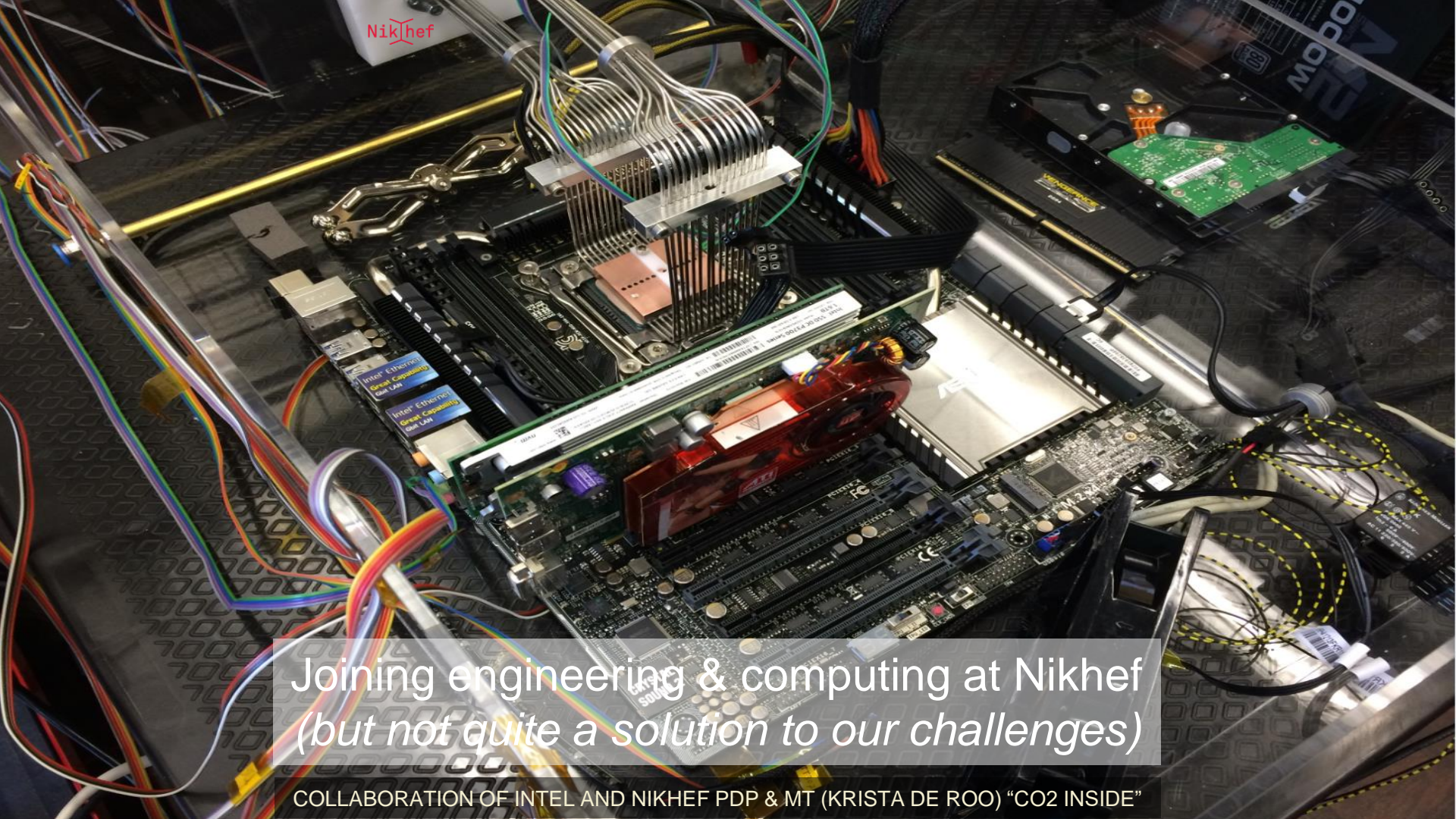
NDPF voview short 1 October 2018
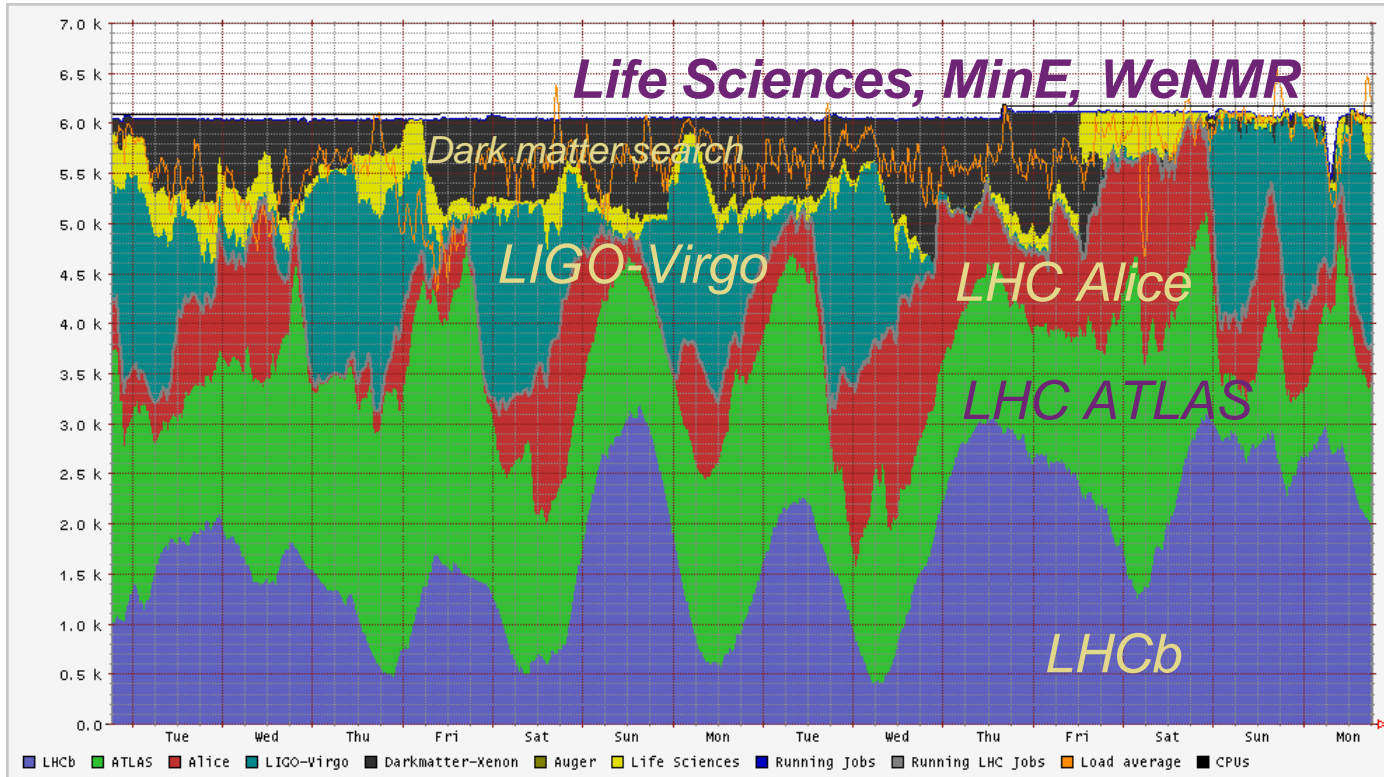
FUNDAMENTAL SCIENCES E-INFRA NL

Consolidating our national flagship infrastructures throughout the 2020's

- next generation LHC experiments
- KM3NeT processing
- SKA Regional Centre

proposed size 28 M€ for 2021-2025
a multi-community infrastructure
for multi-messenger science

Joining engineering & computing at Nikhef
(but not quite a solution to our challenges)

COLLABORATION OF INTEL AND NIKHEF PDP & MT (KRISTA DE ROO) "CO2 INSIDE"