

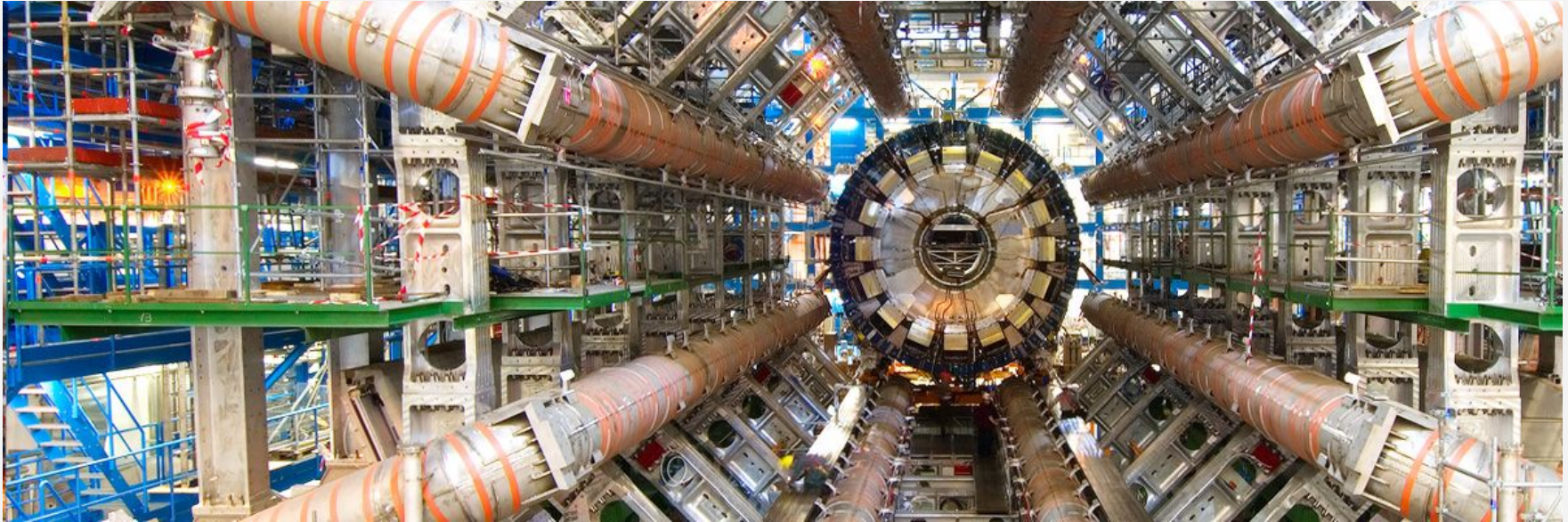
# Framework for Data Retrieval and Integration for ATLAS

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# ATLAS and Its Dynamic Environment



Fonte: <https://atlas.cern>

- **5869 members of 295 institutes in 43 countries**
- Students, physicists, engineers and technicians: geographically **dispersed**, different **time zones**, different **experiences**, high **turnover**

# The Need for Automation

The challenge is:

- Information **centralization**
- **Communication** between groups
- **Continuity** of workflows

The solution was:

- Automation → **Glance.**

## What is Glance?

- Technology agnostic framework to integrate data sources.
- Search queries can be posed to this data integrated environment, reducing the latency to get the information needed.
- Web user interfaces are easy to be developed on top of Glance, allowing the automation of many ATLAS-related processes.
- Migration from "super search" to a set of REST API services further improving its usability.

# The Glance Project

## ATLAS:

- 15 systems
- ~6k users
- +10 new tickets per week;
- Long-term project

Extended to other experiments  
(due to synergy):

- **ALICE**: 2 systems
- **LHCb**: 3 systems

The image displays a grid of 20 screenshots of various web-based systems used in the Glance project, categorized by experiment:

- ATLAS:**
  - Membership
  - Appointments
  - SCAB
  - Speakers
  - CBM
  - Thesis
  - PLOTs
  - Analysis/Phase 0
  - Papers
  - CONF notes
  - PUB notes
  - Equipment
  - Cables
  - Detector Parts
  - Rackwizard/Position
- ALICE:**
  - SAMS
- LHCb:**
  - Membership
  - Cables
  - Equipment
  - Membership

# The Glance Project Team & Resources

- 12 current developers (~30 developers over the project history)
  - ATLAS: 10
  - LHCb: 3
  - ALICE: 2
- Geographically scattered
- Mainly undergraduate (part-time) students from POLI / UFRJ
  - Scholarships
  - Internships
  - *In loco* internships
- 2 startups whose founders are COPPE alumni with ATLAS background
- Budget: 100,000 SFR/years (CERN + UFRJ)
- Contributions from other institutes (mainly UDINE / Italy and LIPE / Portugal)



# Analysis

- Supports ATLAS documents' lifecycle
- Automates email notifications
- Keeps track of documents and reviews stored in CERN Document Server.

The screenshot shows the ATLAS Analysis web application interface. At the top, there is a navigation bar with the ATLAS logo, the word "Analysis", a search bar with the placeholder text "search for publications...", and several utility icons (home, document, graduation cap, bar chart, and user profile labeled "atglance"). Below the navigation bar is a breadcrumb trail: "ATLAS > Analysis". The main content area is titled "Welcome to ATLAS Analysis" and features a grid of menu items:

- Phase 0** (represented by a group of people icon):
  - Search
  - Submit New Analysis/Phase 0
  - Request Editorial Board
  - Emails' Editor
  - Clone Analysis/Phase 0
  - Search for Triggers
  - List of Triggers Used
- Papers** (represented by a document icon):
  - Search
  - Submit New Paper
  - Request Editorial Board
  - Emails' Editor
  - Submit a Draft in CDS
- CONF notes** (represented by a microphone icon):
  - Search
  - Submit New CONF note
  - Request Editorial Board
  - Emails' Editor
- PUB notes** (represented by a group of people icon):
  - Search
  - Submit New PUB note
  - Emails' Editor
- Plot** (represented by a bar chart icon):
  - Search
  - Submit New PLOT
  - Emails' Editor
- Documentation** (represented by a document icon):
  - Go to Analysis Documentation

At the bottom of the page, there is a footer with the CERN logo and the text "Accelerating science", the text "The GLANCE Project", and a red button labeled "report an issue".



# Membership

- System to mainly manage ATLAS's:
  - Personnel
  - Institutes
  - Authorship
- Member's profile gathers all information from other systems in one place
  - Contract dates
  - Appointments
  - Analysis papers
  - Given and future talks
  - Operational Task Planning data
  - Thesis
  - Volunteer for talks
- Institutes and Funding Agencies
- Plot generator

The screenshot shows the ATLAS Membership web interface. At the top, there is a green header with the ATLAS logo and the text "ATLAS Membership". A search bar is located to the right of the header, containing the text "search for members & institutes...". Below the header, there is a navigation menu with "ATLAS" and "Membership" options. The main content area is titled "ATLAS Membership" and is divided into several sections, each with a list of links:

- Members**
  - My profile
  - Super search
  - Register new ATLAS member
  - Exception lists
  - Register Inspires and ORCIDiS
  - Mentors list
- Institutes**
  - ATLAS Institute Tree (AIT)
  - Super search
  - Register
  - External Institutes
  - Activities - Projects
- Qualification**
  - My qualification
  - Super search
  - Qualification Tracking
- Authorlists**
  - Generate author list
  - Author lists
- Associates**
  - Register new non-ATLAS member
  - (STA) Short term associates
  - (MCJ) Monte-Carlo authors
  - (ACE) Analysis Consultants and Experts
- Funding Agencies**
  - Select Funding Agency
  - Acknowledgement for papers
- Lists**
  - Acknowledgement for papers
  - Appointment Memberships
  - Author lists
  - Editorial boards
  - Exception lists
  - External institutes
  - Institutes (Activities - Projects)
  - Mentors
  - Professional status
  - Theses
- Plots**
  - Active members

At the bottom of the page, there is a green footer with the text "CERN Accelerating science" on the left, "The GLANCE Project" in the center, and a "report an issue" button on the right.

# Glance Main Users

- ATLAS deputy spokesperson
- Physics coordinators
- Publication Committee chairs
- ATLAS Secretariat
- Authorship Committee
- Physics Office
- Resource Coordinator
- Technical Coordination
- TDAQ Upgrade Project Leader

# Project Roadmap

- Intense work on requirements gathering
  - Identify common use-cases across different user groups.
  - Anticipate unmapped functionalities.
  - Lead stakeholders to a more generic proposal.
- Highly configurable solutions
  - Configuration files usage to deploy interfaces.
  - Use-cases encapsulation to promote reusable code.
- Modular implementations
  - Services available to be consumed by different applications.
  - Modules versioning to allow evolving resiliently.
- Computing Intelligence
  - Natural language processing strategies for guiding ATLAS Management.
  - Machine learning for relevant content recommendation.



# Technical Roadmap

- Refactoring the code base
  - Over 15 web applications running for ATLAS.
  - Technical debt acquired over more than 5 years.
  - Refactoring at every new implementation or fix.
  - Big project requests are great opportunities for change.
- Infrastructure maintenance
  - Remote work and diverse development environments.
  - Complex setup for applications to run properly.
  - Docker usage to produce out of the box environments.
  - Consistency and portability.
- Knowledge perpetuation
  - Several discussions over requirements and technical aspects.
  - Adoption of an integrated documentation tool to centralize references.
  - Knowledge production philosophy.
  - RFC - Requests for Comments.

# Glance Spin-Off

- The very own existence of the 2 startups involved in this project
  - TWIST
  - NEMESYS
- Tuberculosis diagnosis related applications
- Data quality projects
- COVID-19 related endeavors

Obrigado!