

# TRACER STATUS AND STEPS TOWARDS MIGRATION WITH PHOENIX

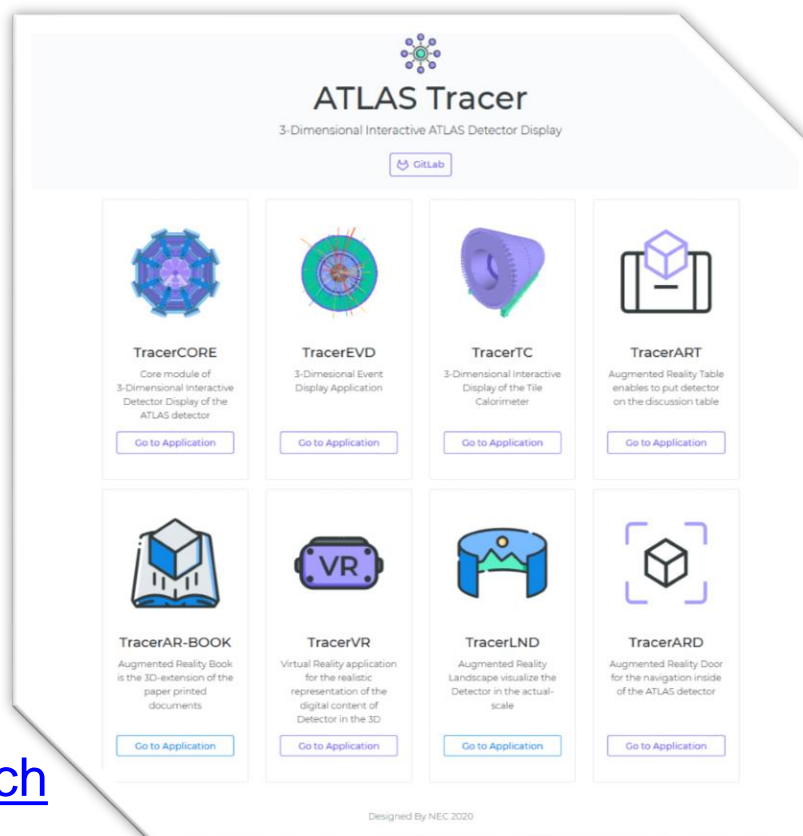
SHARMAZANASHVILI Alexander  
**Georgian Technical University**

KHELASHVILI Levan  
PHATARIDZE Lasha  
PIRTSKHALAVA Mariam  
KOBAKHIDZE Shota  
UDZILAURI Nikoloz  
**Georgian Technical University**

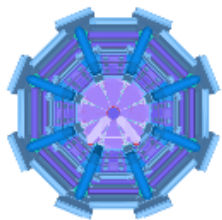
- I. About the Tracer
- II. Who are the Developers
- III. Tracer Development Process
- IV. About the Possible PHX-TRC Merge
- V. Our Proposal
- VI. About the Repository
- VII. ATLAS-GTU Collaboration Future

# I. About the Tracer

- TRACER is the framework of the visualization applications for the ATLAS
- It consists of eight subsystems – CORE, EVD, TCAL, ART, AR-Book, VR, LND and ARD



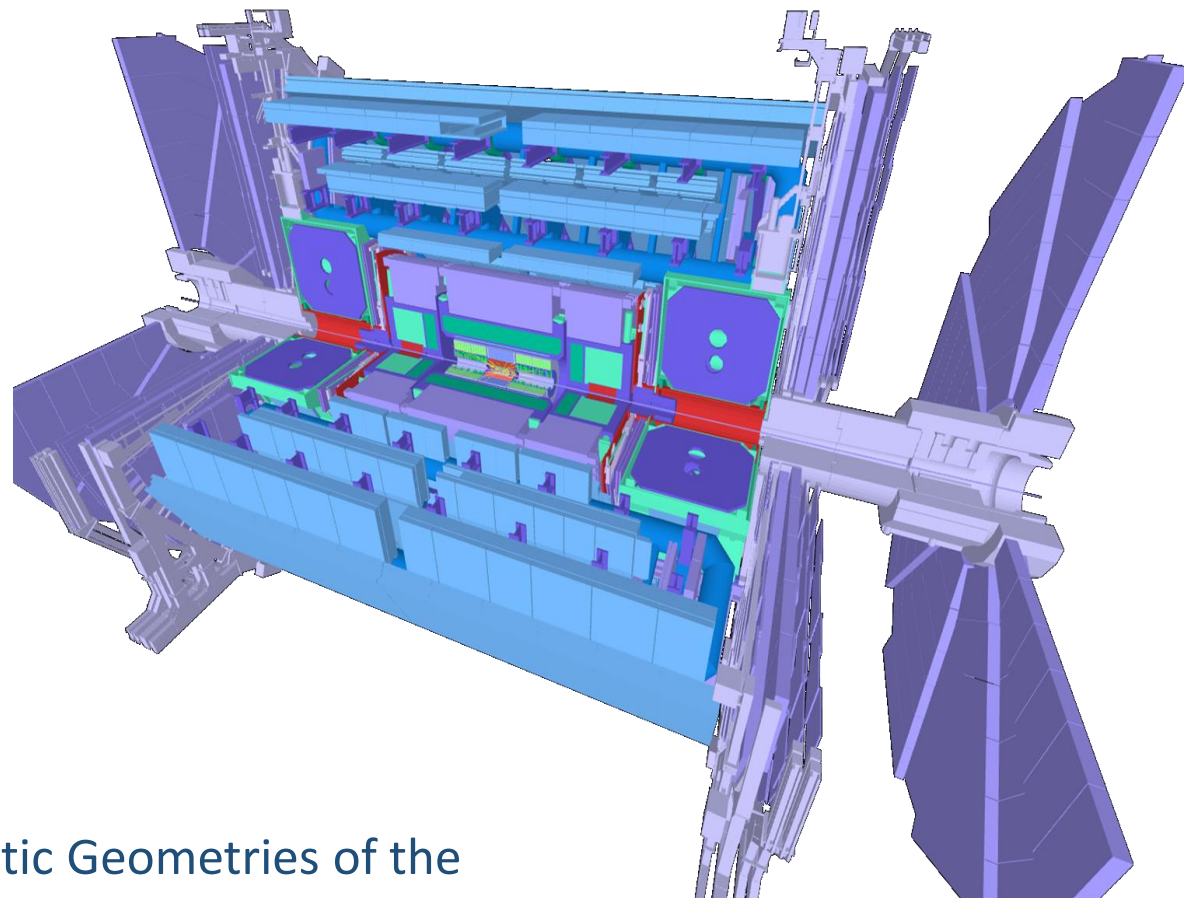
<http://tracer.web.cern.ch>



## TracerCORE

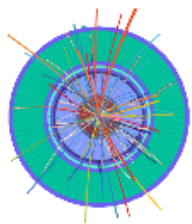
Core module of  
3-Dimensional Interactive  
Detector Display of the  
ATLAS detector

[Go to Application](#)



## ■ Advantages of Core:

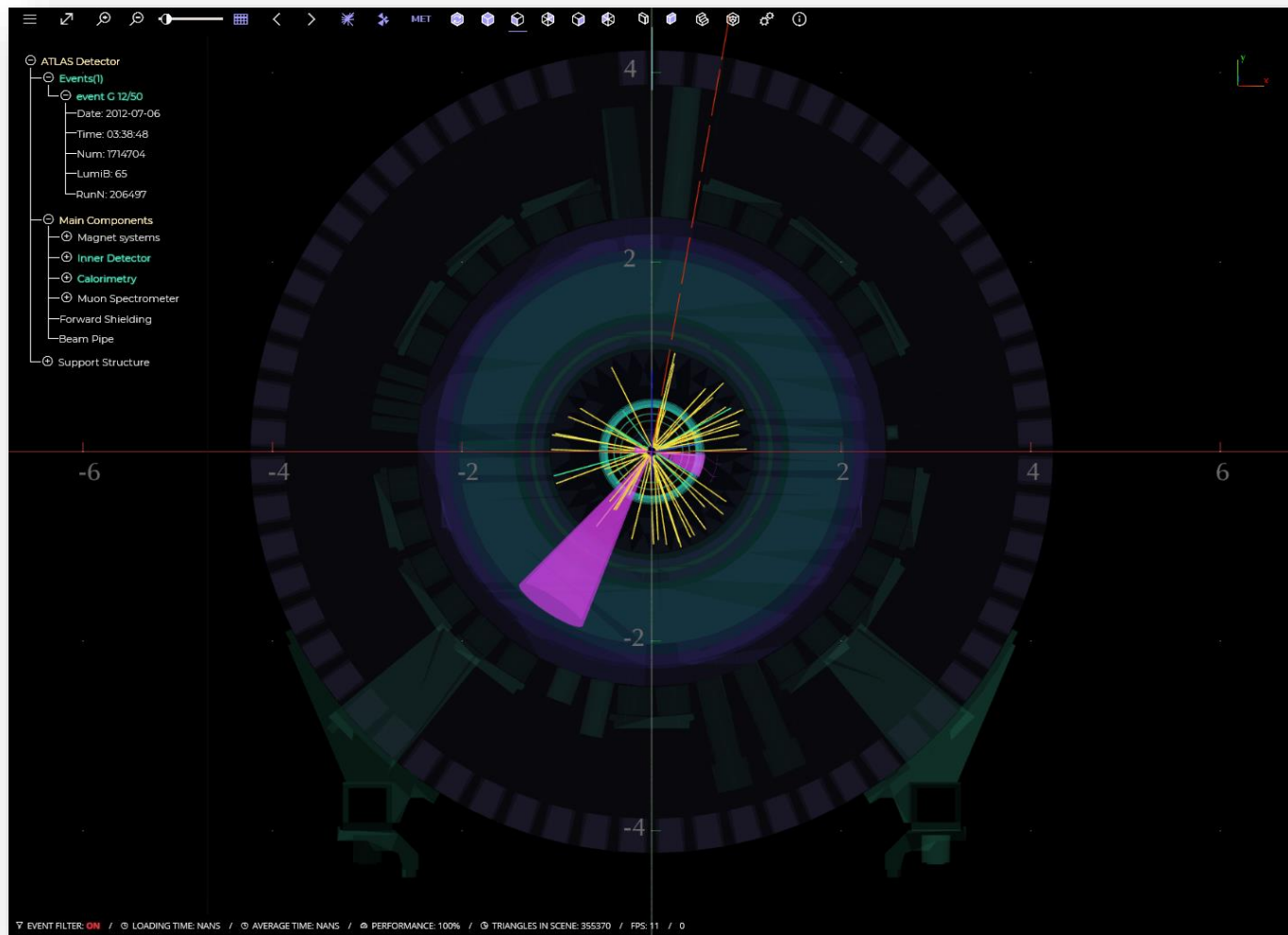
1. Detailed and Realistic Geometries of the all components of the ATLAS Detector
2. Realistic Geometry Cuts
3. High Performance
4. Well-developed Users framework



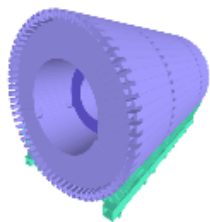
## TracerEVD

3-Dimensional Event Display Application

[Go to Application](#)



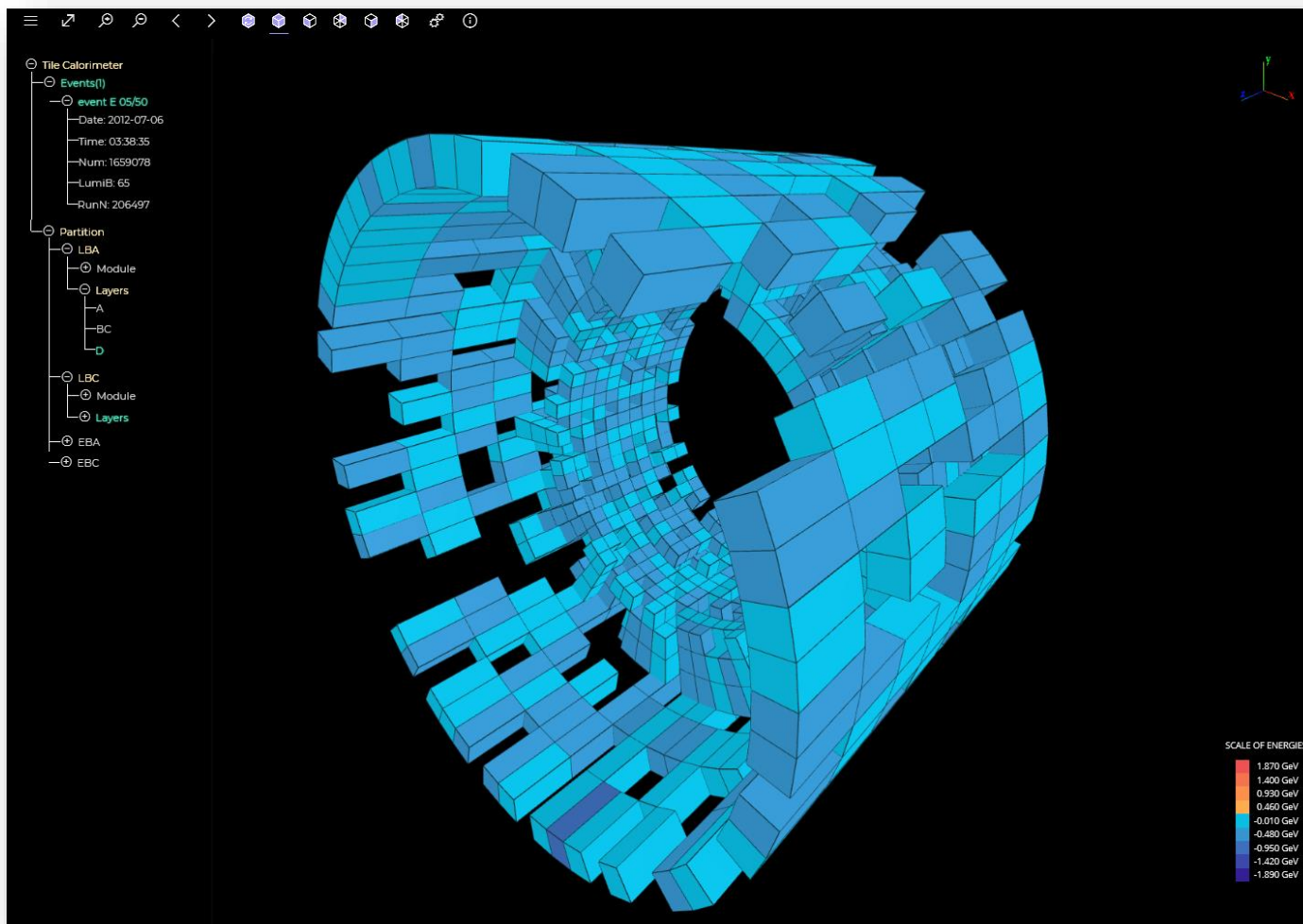
# About the Tracer/TCAL



## TracerTC

3-Dimensional Interactive  
Display of the Tile  
Calorimeter

[Go to Application](#)



SCALE OF ENERGIES:

1.870 GeV
1.400 GeV
0.930 GeV
0.460 GeV
-0.010 GeV
-0.480 GeV
-0.950 GeV
-1.420 GeV
-1.890 GeV



## TracerART

Augmented Reality Table enables to put detector on the discussion table

[Go to Application](#)



## TracerART

Augmented Reality Table

Interactive application for representation and learning of the ATLAS detector facilities



Android 

### Installation Guide

This guide will Help you install Tracer-ART on your Android Device

#### Requirements

- Device running Android OS 7.0 (Nougat) or newer
- Device that Supports AR-Core [\[List\]](#)
- At least 80MB free space on device
- Browser enabled to install unknown apps

Open this webpage on your Device

[Download APK](#)

Enable Camera Access

28 April 2020

Apple (iOS) 

### Installation Guide

This guide will Help you install Tracer-ART on your Apple Device

#### Requirements

- iPhone or iPad running iOS 11 or higher
- iPhone SE / 6S / 6S+ (2015) or newer
- iPad 5 / iPad Pro 2 (2017) or newer
- TestFlight App

Open this webpage on your Device

[Download APP](#)

Enable Camera Access

28 April 2020





## TracerAR-BOOK

Augmented Reality Book is the 3D-extension of the paper printed documents

[Go to Application](#)



## TracerARB

Augmented Reality Book

The application visualize content of the printed documents in 3D and gives additional information about the subject

Android 

This guide will Help you install Tracer-ART on your Android Device

### Requirements

- Device running Android OS 7.0 (Nougat) or newer
- Device that Supports AR-Core [\[List\]](#)
- At least 80MB free space on device
- Browser enabled to install unknown apps

[Download APK](#)

Enable Camera Access

Target your mobile device camera on the images below to activate 3D extensions



Dear Participant,  
Cognitive Festival in Georgia is scientific and educational event based on the CERN scientific research and innovation technologies.  
Festival includes 3 different events and sets objectives to provoke youth's interest in Fundamental research, engineering, IT technologies and mathematics.

- 1<sup>st</sup> event is IIPCOI masterclass for school children and 11 year university students
- 2<sup>nd</sup> event is the Workshop for teachers, lecturers and researchers
- 3<sup>rd</sup> event is Art@Science exhibition, where art works will be presented and discussed with the authors.

CERN Cognitive Festival will intensify connections of Georgian youth with advanced scientific schools and modern projects, expand their range of thinking and erudition. It is a unique opportunity to evaluate themselves with competition to peers from other countries, and create greater motivation for progress. It will stimulate their formation as a full-fledged members of free society.

Professor, SHARMANAZANASHVILI Alexander  
Chair of Festival





## TracerVR

Virtual Reality application  
for the realistic  
representation of the  
digital content of  
Detector in the 3D

[Go to Application](#)

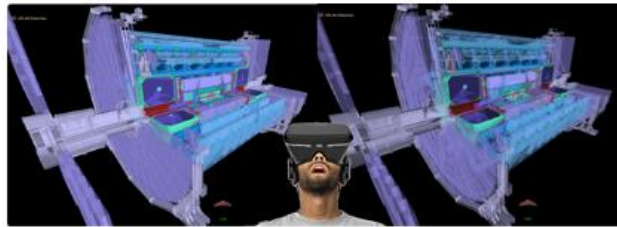


## TracerVR

Virtual Reality application

Comming soon

The application enables to consider the observer as  
a part of 3D scene and navigate inside the facility



Designed By NEC 2020



## TracerLND

Augmented Reality Landscape visualize the Detector in the actual-scale

[Go to Application](#)

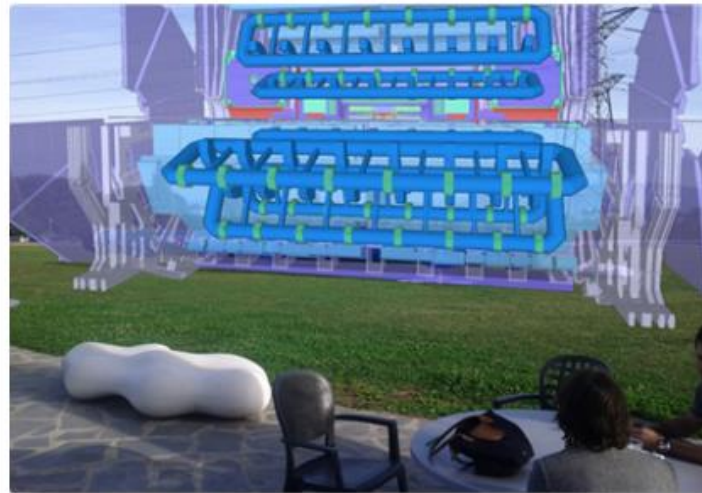


## TracerLND

Augmented Reality Landscape

Comming soon

The application visualize the facilities in the actual scale in the real-life environment



Designed By NEC 2020



## TracerARD

Augmented Reality Door  
for the navigation inside  
of the ATLAS detector

[Go to Application](#)

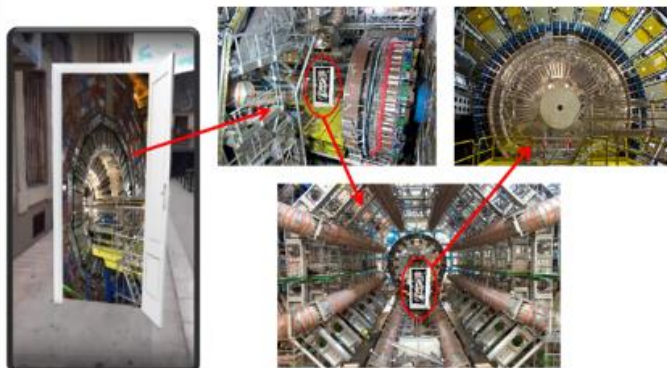


## TracerARD

Augmented Reality Door

Comming soon

The application puts virtual door in the real environment and lets you enter inside the ATLAS detector. It enables to organize virtual tours inside the cavern and learning the detailed detector facilities



Designed By NEC 2020

- Users community of the Tracer:
  - Outreach & Education
  - Physics Analyses
  - Subsystem groups like - Tile, Lar, Muons, Inner detector
  - Technical Coordination
  - Safety engineers
- Tracer is a complex application and consists of:
  - 142 modules with 31'132 code strings
  - 164 geometry models with 202.8Mb

## II. Who Are the Developers

- TRACER is the intellectual property of the GTU
- GTU funds 5 FTE and provides the office with all necessary equipment's and resources for the development of the Tracer
- Those 5 FTE's are:



KHELASHVILI Levan  
Engine programmer



PATARIDZE Lasha  
Events programmer



UDZILAURI Nikoloz  
GUI programmer



KOBAKHIDZE Shota  
Geometry Developer



PIRTSKHALAVA Mariam  
AR programmer

# III. Tracer Development Process



- We started Tracer development in 2015
- It was the idea of Eric LANCON and Simone CAMPANA – the software & Computing coordinators on those days
- They sent us to the ATLAS Outreach & Education with our experimental application of the 3D visualization
- Since there we have developed 31 releases
- Results were widely discussed on 21 workshops during the 2016-2020

- In the end of 2019 we have received strange proposal to stop development and put all developments into the other application

November 2019

ADDENDUM 4 to  
ATLAS AGREEMENT 366/2010

Page 5 of 6

#### WP 4: "XXXXXXXXXXXXXX"

Tracer is a javascript based event display which was initially developed as a way of visualising the geometry, but has since grown to become capable of showing event data too. Phoenix is a cross-experiment event display, based on the TADA event display, and has now been adopted as a HSF project (and is the only HSF event display).

#### Task description

ATLAS does not need two javascript event displays, so one general task is to port Tracer functionality to Phoenix. The exact specifics of how to do this will depend on a review of the Tracer code (which does not appear to be publicly viewable). The first task, which should happen immediately, is to share the Tracer code and together with Phoenix developers, work what can be ported.

Other tasks would include:

- Develop a lego plot for phoenix
- Get the existing JSON event dumper working as part of ATLAS live, so for run3 we can have 3D views of events in realtime
- Develop a javascript propagator, to reduce the amount of data which needs to be stored to visualise tracks
- Develop a way to compress the JSON / JiveXML data, in order to reduce filesizes

- This proposal provoked a negative reaction of the Tracer team and the rector of the GTU. Both disagreed it
- Then we received the edited version which set the general framework for the consolidation in development of a common application for ATLAS
- We agreed and signed Addendum-6 of AA366/10 for 2020

20 December 2019

ADDENDUM 4 to  
ATLAS AGREEMENT 366/2010

---

Page 7 of 8

**WP4: Consolidation of the Development of an ATLAS Web-based event Display**

ATLAS has access to two web-based javascript applications for displaying events and geometry, namely: Phoenix<sup>1</sup>, the Hep Software Foundation event display; and Tracer<sup>2</sup>.

**Task description**

The purpose of the work package is the merging of the ongoing developments into a single javascript event display and its subsequent development. In order to promote cross-experiment collaboration, the merged product must exist under the umbrella of the HEP Software Foundation's visualization group (and be open-source with a permissive license, preferably the HSF recommended Apache).

- Then it was Workshop on 23 of January 2020 organized by the ATLAS even display coordinator Sergei CHEKANOV  
<https://indico.cern.ch/event/862410/>
- All developers and DP team participated
- The workshop defined the places for both applications – Phoenix (PHX) as a cross-experimental application, hosted by HSF and Tracer (TCR) as an application for ATLAS, hosted by the ATLAS
- It was decided to develop the combined application for ATLAS under the name of Tracer
- Also, it was proposed to submit combined Tracer to the HSF
- It was agreed by all participants and the corresponding minute of the workshop was issued
- The decision of the workshop was in full compliance with the signed agreement

## Minutes of the Event Display meeting (Jan 23, 2020)

### Immediate action (next 3 months)

TRACER/PHOENIX (Lasha, Ed)

- Identify software components that can be combined. Preparation for merging the TRACER and PHOENIX projects under the name "TRACER" (PHOENIX is the HSF reserved name for a general detector visualisation library)

### Short-term plan (next 6 months)

TRACER/PHOENIX (contact: Lasha and Ed)

- Create a prototype of the combined event display on the basis of TRACER and PHOENIX, with the preliminary name "TRACER"
- Add an option to upload user's JiveXML. This enables a side-by-side comparison with ATLANTIS and VP1 (assuming ESD files are available)
- Verify that the software licensing meets all the requirements for the inclusion to HSF as an independent project (at least non-ATLAS specific part). Include this project to HSF, while keeping ATLAS-specific part under the ATLAS gitlab.

### Mid-term year plan (~1 year):

TRACER (Lasha, Ed)

- Validate TRACER against ATLANTIS/VP1 (task for physicists) and implement all needed changes to create a production quality TRACER for physicists (i.e. beyond outreach)
- Add JSON output for the RAW->ESD/JiveXML/JSON reco strip

### Long-term plan (1-2 years):

TRACER (Lasha, Ed)

- Full usability of TRACER for analysis
- Augmented reality features for the Web-Event display
- Transparent conversion of GeoModel to internal TRACER format that can be done by the end users
- Possibility to create high-resolution images for outreach
- Possibility for physics oriented plots (like eta-phi lego plots) using JSROOT

- This plan was presented on ATLAS weekly meeting February 4, 2020 <https://indico.cern.ch/event/884710/>
- We have developed working plan according to decision of the workshop and discuss it with DP and developers
- For the moment we are following that development plan
- We have prepared 12 updates of TracerEVD according to plan and have excellent feedbacks from the DP team
- Results of development were discussed:
  - TileCAL Week 02-14-2020 <https://indico.cern.ch/event/882474/>
  - ATLAS week Outreach parallel 02-26-2020 <https://indico.cern.ch/event/877343/>
  - TileCAL Week 06-19-2020 <https://indico.cern.ch/event/922957/>
  - ATLAS week Outreach parallel 06-24-2020 <https://indico.cern.ch/event/922635/>



- In mid of April 2020, we again received the proposal to stop development of Tracer and put it into the Phoenix  
<https://docs.google.com/document/d/1HB8eQjGsdqfOocYbAblvIERgMDKrIOwsUXkZAjPwPcM/edit>
- Backing to the initial idea presented in the end of 2019 and which was rejected
- It proposes, (citation) *‘...we need to merge the Tracer and Phoenix developments into a single javascript event display...’*; *‘... It (Tracer) becomes an instance of Phoenix...’*; *‘...development on Tracer core would stop...’*
- It is given plan how to proceed and sets timescale – end of May, end of June, end of July
- We have received enough aggressive emails from the people telling us (citation) – *‘On this, there is no scope for negotiation: Phoenix is a collaborative cross-experiment tool and as such, our role is to create the ATLAS instance of it and integrate our tools; ...This is the only basis on which we are willing to proceed...’*, etc.

- Actually, idea of the cross-experimental application is interesting and challenging
- However, we disagree to change the content of the agreement and start execution of the new project in mid of the year
  1. It contradicts to the agreement AA366/10 Addendum 6
  2. It contradicts to the decision made by the event display developers and Data preparation group Workshop on 23<sup>rd</sup> of January 2020
  3. It contradicts to the development plan of the Tracer
  4. It contradicts to the ATLAS interests
  5. It contradicts to the GTU interests



# IV. About the Possible PHX-TRC Merge

- PHX-TRC merging topic brings many of misunderstandings and misinterpretations
- It is happening because the topic presented in the wrong way

*'...ATLAS has two web-based applications Phoenix and Tracer''*

*I have two equivalent bodies A and B*



*'...In order to avoid duplicated effort ATLAS need to merge them and continue with the single one'*

*Yes, why do I need two? I need one - either  $A=A+B$  or  $B=B+A$*



*'...Phoenix is a cross-experimental application supported by HSF*

*Then it is clear - I need just  $A=A+B$*



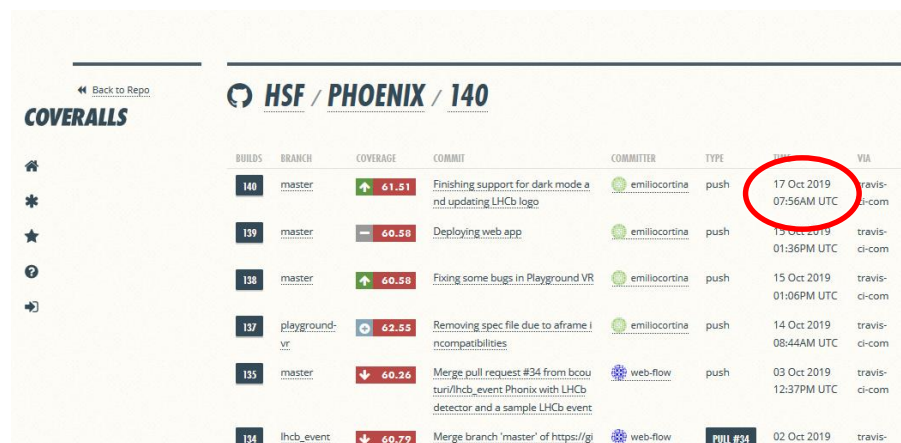
- In reality, PHX and TRC are not equivalent bodies
- They are much different despite the fact that both of them are web-based javascript visualization applications
- They have different:
  1. Status
  2. Development level
  3. Teams
  4. Development momentum
  5. Platforms

- PHX/TRC Differences/STATUS:
  - PHX is the cross-experimental application and belongs to the HSF
  - TRC is the ATLAS application and belongs to the ATLAS

- PHX/TRC Differences/Development Level:
- PHX is at the starting level of development. For the moment it is a more Demo version of the application which advertises the idea of the cross-experimental application. Good to obtain funding's, presentations, etc. but useless as an application
- Main developments are in front of PHX - these are, geometries, performance, geometry cuts, and user framework
- TRC is on the final stage of the development and need adjustment according to users feedbacks
- All 4 main ingredients are on the place

- PHX/TRC Differences/Development Team:
- PHX has 0.2 FTE development team. Plus, a couple of month student participation, funded by the GSOC
- Tracer has 5.5 FTE permanent staff funded by the Georgian Technical University

- PHX/TRC Differences/Development Momentum:
- PHX has no updates on the master repository during the last 9 months. It is a static body



COVERALLS

BUILDS	BRANCH	COVERAGE	COMMIT	COMMITTER	TYPE	DATE	VIA
140	master	61.51	Finishing support for dark mode and updating LHCB logo	emillocortina	push	17 Oct 2019 07:56AM UTC	travis-ci-com
139	master	60.58	Deploying web app	emillocortina	push	15 Oct 2019 01:36PM UTC	travis-ci-com
138	master	60.58	Fixing some bugs in Playground VR	emillocortina	push	15 Oct 2019 01:06PM UTC	travis-ci-com
137	playground-yr	62.55	Removing spec file due to aframe incompatibilities	emillocortina	push	14 Oct 2019 08:44AM UTC	travis-ci-com
135	master	60.26	Merge pull request #34 from bcourti/lhcb_event:Phonix with LHCB detector and a sample LHCB event	web-flow	push	03 Oct 2019 12:37PM UTC	travis-ci-com
134	lhcb_event	60.79	Merge branch 'master' of https://gi	web-flow	PULL #34	02 Oct 2019	travis-

- TRC is the dynamical body producing ~3 updates per month
- We have generated 21 updates in 2020. 12 of them belongs to the TracerEVD

- PHX/TRC Differences/Platform:
  - PHX uses AngularJS as coding platform which is the subset of the javascript. As a result, code executing by the browser is a machine, and not human-made
  - TRC uses pure javascript and thus, the browser is executing the human-made codes
  - It might be will have an influence on the performance. We don't know yet
  - TRC has optimized loaders ensuring high performance of the application. We don't know how they will behave if we put them on the angularJS
  - For sure the machine-made code could not be better than the human-made code, but we don't know yet what are the quantitative measures, how much worse they will be
  - Synchronization of the PHX/TRC platforms is the scope for the serious RD work



## Therefore:

- PHX and TRC are not equivalent bodies. PHX is far behind to TRC
- All consideration about their merging and continuation with the one single application is WRONG
- PHX and TRC should stay as independent bodies
- All speculations about the duplication of works is wrong for TRC. There is nothing which PHX can do and TRC can not (exception is JiveXML file) . It is true for PHX and my strong advice to the PHX developers is to try to find consensus with us and not compete with us
- Only portation of some functionalities from TRC to PHX is possible
- This requires a good consensus

# V. Our Proposal

- We think PHX have 2 ways to progress: either find big consensus with all event-display developers of the other experiments for the portation of their applications into the PHX, or stay as an aggressive body and duplicate others developments in the PHX.
- PHX can not be an aggressive body. Without consensus with other developers, it is a dead project
- It is proposed, in 2020 we stay with our development plans and not stressing situation with the generation of contradictions
- In parallel to the TRC development, TRC/PHX developers will make an RD work to be prepared for the possible new project
- At the end of 2020, we meet each other again and verify if PHX reach a big consensus with the other developers and it is a viable project; if PHX/TRC developers did successful RD work and if ATLAS and GTU find a new formula for the collaboration
- Then starting from 2021 we will participate in TRC->PHX portation project

# VI. About the Repository

- Tracer repository was the subject of heavy discussions at the end of the 2019 because it was closed
- This topic was placed in the agreement with the request to '*...provide access to the tracer git repository*'
- Once the agreement was signed Tracer repository was released
- Later we took Apache license for the Tracer and it becomes Open source software
- Now everybody can take Tracer parts and use them inside of their projects and also people can contribute into the Tracer development by cloning repository -> preparing their developments into their own branches -> and preparing Merge Requests for the Master updates
- Control of the Merge requests are in the Tracer developments hands
- This is normal practice to all open source applications

<https://gitlab.cern.ch/asharmaz/tracer>

The screenshot shows the GitLab interface for the 'tracer' repository. The left sidebar contains navigation options: Project overview, Details, Activity, Releases, Repository, Issues (0), Merge Requests (1), CI / CD, Operations, Packages, Analytics, and Settings. The main content area displays the repository details for 'tracer' (Project ID: 91588) by Alexander Sharmazanashvili. It shows 77 commits, 15 branches, 0 tags, 1 GB files, and 1 GB storage. The repository description is '3-Dimensional Interactive ATLAS Detector Display'. Below this, there are buttons for 'History', 'Find file', 'Web IDE', and 'Clone'. A recent merge commit is shown: 'Merge branch 'LA135' into 'master'' by Alexander Sharmazanashvili, authored 22 hours ago. Below the merge commit are buttons for 'Add README', 'Apache License 2.0', 'Add CHANGELOG', 'Add CONTRIBUTING', 'Enable Auto DevOps', 'Add Kubernetes cluster', and 'Set up CI/CD'. A table of files and folders is displayed, with 'subsystem' and 'LICENSE' highlighted by red circles. The table has columns for Name, Last commit, and Last update.

Name	Last commit	Last update
framework/css	tc-draft	1 month ago
resources	Merge branch 'LA135' into 'master' LA135 - fixed PRELOAD and Light/Contr...	22 hours ago
subsystem	Merge branch 'LA135' into 'master' LA135 - fixed PRELOAD and Light/Contr...	22 hours ago
.DS_Store	changed Brightness slider Step from 0.25 to 0.5	2 days ago
LICENSE	Add new file	1 month ago
README.md	Initial commit	1 month ago
index.html	links	3 weeks ago

- In mid of May 2020, we have received a new request to move Tracer into the new, non-native repository where we are not maintainers
- It means that control of the master repository will be gone from our hands and some external people will have rights of update repository without asking us permission
- That means we have to lose responsibility for the Tracer development
- We will stay always negative to this idea

# VII. ATLAS-GTU Collaboration Future



- ATLAS and GTU don't have the MoU. They are collaborating under the agreement AA366/10
- It was a good agreement, started in 2010 when we were newcomers for Software & Computing community (Thanks to Dario)
- The agreement has a list of work packages that are considered every year and then the decision is coming how to continue. So we are somehow on the 'market' place every year
- 10 years ago it was natural because we were newcomers with poor confidence in success, but now many things have been changed
- Unfortunately, ATLAS middleware management is changing every year and sometimes decision are in the hand of people who are not aware in depth what we are doing and what are the outcomes

- We have worse cases at the end of 2019. We still don't have answers, why two successful working packages were stopped by the management, putting ATLAS groups, our collaborative partners, together with us in big frustration
- Packages stopped in 2019: WP3: "Improve ATLAS software quality" with the collaboration of ASCIG and WP4: "Development of Interactive Detector Display Software Application for Visualisation and Maintenance of Detector Subsystems" with the collaboration of TileCAL
- Despite the management decision we, together with ATLAS groups decided to continue collaboration in 2020
- Now we have successful results but our work is outside of the agreement. This is not the normal situation and it is happening because the weak formula of collaboration

- WP4: “Development of Interactive Detector Display Software Application for Visualisation and Maintenance of Detector Subsystems”, Collaboration partner: TileCAL
- In 2019 it was very productive work of TileCAL groups together with the Georgian team for the identification of the technical requirements. It was done after several iterations and finally, 64 requirements have been formed.
- Then it was built the working plan for 2 years where those 64 requirements were prioritized and distributed into the 12 releases of future TracerCAL
- In September 2019 the development of R01 was started, and the 1<sup>st</sup> draft was discussed having positive feedback from the TileCAL community
- Results are discussed on:

*TileCal Week Computing, CERN 14 June, 2019* <https://indico.cern.ch/event/824267/>

*TileCal Week Computing, CERN 4 October, 2019* <https://indico.cern.ch/event/852194/>

*TileCal Week Computing, CERN 14 February, 2020* <https://indico.cern.ch/event/882474/>

*TileCal Week Computing, CERN 19 June, 2020* <https://indico.cern.ch/event/922957/>

- Minute of Round table discussion <https://indico.cern.ch/event/922957/>

## MINUTES

of TRACER discussion on the TileCal Week Computing, Friday 19 Jun 2020

**Attended:** Sanya Solodkov, TileCAL team; Oleg Solovyanov, TileCAL team; Pawel Jan Klimek, TileCAL team; Sjarhel Harkusha, TileCAL team; Iouri Smirnov, TileCAL team; Pavol Bartos, TileCAL team; Juraj Smiesko, TileCAL team; Tibor Zenis, TileCAL team; Alexander Sharmazanashvili, Georgian team; Lasha Pataridze, Georgian team; Levan Khelashvili, Georgian team; Nikoloz Udzilauri, Georgian team; Archil Surmava, Georgian team; Besik Kekelia, Georgian team; Marlam Pirtskhalava, Georgian team; Niko Tsutskiridze, Georgian team;

**Listen:** A.Sharmazanashvili's information about the TracerTC development status in the ATLAS-GTU collaboration agreement. Reporter presented working plan discussed on TileCAL week on 4th of October 2019 <https://indico.cern.ch/event/852194/>. He reminded the audience of the starting points of the project - first it was the interest of Oleg & Sanya for the development of web-based visualization tool for the TileCAL, similar as it was developed by the Georgian team in those days for the ATLAS Outreach & Education. Then there were several discussions on the level of the wish lists and then it followed the Georgian team's presentation on the TileCAL week in Tbilisi, October 2018 in front of the whole TileCAL community, where the people expressed the huge interest in the development of such a tool. As a consecutive reaction, the ATLAS Software & Computing Coordinator Davide Constanzo decided to put a separate working package about the development of TracerTC web-based application for the TileCAL in the ATLAS-GTU 2019 agreement. In 2019 it was very productive work of TileCAL groups together with the Georgian team for the identification of the technical requirements. It was done after several iterations and finally, 64 requirements have been formed. Then it was built the working plan for 2 years where those 64 requirements were prioritized and distributed into the 12 releases of future TracerTC. In September 2019 the development of R01 was started, and the 1st draft was discussed having positive feedback from the TileCAL community. At the end of 2019 new software & computing management decided to cut the working package put in frustration both, the TileCAL groups and the Georgian team. So 2020 was continued without the working package about the TracerTC. Both parties decided not to break the successful working on the TileCAL week on 14th of February 2020 <https://indico.cern.ch/event/882474/> and the TileCAL week on 19th of June 2020 <https://indico.cern.ch/event/922957/>.

**Expressed an opinion:** Sanya SOLODKOV : Tracer TCAL will allow end-users to visualize various information related to TileCal on top of 3D view of the calorimeter It can be energies in a cell (similar to other event displays as it's already implemented), but it can be also dE/dx maps or calibration constants or anything else (from a file provided by the user). I believe such possibility is very useful, but it doesn't exist in any other ATLAS viewer, which shows only ATLAS event, but do not show any auxiliary information. Pawel Jan KLIMEK expressed his satisfaction with the quality and usefulness of the tool. It already fulfills several requirements requested by TileCal group. TracerTC seems to be useful for visualization of TileCal data on a cell level.

**Decided:** TracerTC is an important application for the TileCAL and TileCAL groups are keen to have such a tool helping them in their work. There might be a possible overlapping with other tools. However, for the moment, it is the only tool in ATLAS working in web browsers, never requiring the installations and compatible with all hardware and software platforms. Thus, it makes TracerTC as the easiest to use and widely implemented application in the future. Also, the majority of those 64 requirements are unique and not supported by the other tools. Therefore, the round table concluded:

1. Continue development of TracerTC
2. Ask ATLAS management and GTU management to find a solution with the cut status of the working package and ensure the normal working conditions for the TileCAL and the Georgian teams

- WP3: “Improve ATLAS software quality” Collaboration partner: ASCIG
- Georgian team have developed the Coverity scanning process of Athena repository and delivering weekly defects to the authors
- Then Georgian team developed the same process for the Cppcheck with the preparation of Jira tickets for authors and provide weekly scans
- Later Georgian team developed modules for the automated scanning
- Now Georgian team is working on the individual MR scanning process and its automation
- Results are discussed on:

*Software Quality Meeting 28 February, 2019* <https://indico.cern.ch/event/802412>

*ASCIG Weekly 21 November, 2019* <https://indico.cern.ch/e/849774>

*S&C Week ASCIG 12 February* <https://indico.cern.ch/event/881125/>

*ASCIG Weekly 30 April 2020* <https://indico.cern.ch/event/890203>

*S&C Week ASCIG 12 February* <https://indico.cern.ch/event/925741/> Event Display Meeting 01 July 2020

- Georgian team have proved the competence in 2 fields - visualization and geometry modeling
- ATLAS has a strong team in GTU delivering results that no one can deliver in ATLAS. We don't want to put ourself on the 'market' again this year
- We don't consider to continue the collaboration in 2021 under the previous formula
- We would like to ask ATLAS and GTU management, together with the Georgian team, to find a good formula for the creation of stable collaboration and normal working condition
- We have 6 months ahead of us which is more than enough to proceed in the right direction

Thanks for the attention