

## Working Group WP2 for testing and characterization

We would like to structure the activities of the WP2 into several subgroups, and identify contact persons within the WP2 to help in the organization

In the short term, the WP2 activities will be focused on defining a common strategy, and define the scope of the various sub activities, which will then take care of the optimizing the strategy and carrying out the technical implementation.

### **General strategy and planning**

- Define general testing and strategy for the SVT (in coordination with the other working groups and profiting from the expertise of the various institutes/experts)
  - Identify the major contributions of the SVT WG2 team to the test of the MOSAIX ER2 and ER3 testing. Define activities based on realistic estimation of the available workforce
  - Define a plan for the preparation of the readout HW/FW/SW development for the test and characterization of the LAS sensors and the ancillary chips
- Define a plan for both bonded and wafer probe testing at each step of the testing and production phase
- Identify the quality matrix for each component/subdetectors (Inner Barrel, LAS for disks/OB, ancillary chips)
- Define a general strategy for irradiation studies and test beams (where/when irradiation studies will be performed, and for which component..)
- Take care of integrating new groups that want to contribute to the effort.

### **Common-tool activity: HW/FW development for readout:**

- Define the specs of readout and calibration electronics for the testing system
- Identify SVT-specific HW and FW components that SVT will develop and those that will be taken from the ITS3 R&D.
- Contact point for the procurement of electronic components (evaluation boards, links, ..)
- Institutes interested:
  - LBNL/UCB
  - LANL
  - ORNL
  - MIT
  - RAL
- **Contact:** to be defined

### **Common-tool activity: software development (sensors and ancillary chips):**

- Create the general testing framework used to include each subcomponent's testing software. The framework should be designed to be easily extended to the production software.
- Develop the needed control/test software for each subcomponent
- Develop analysis tools for each step of the characterization
- Institutes interested:
  - LBNL/UCB
  - ORNL
  - MIT

- Birmingham?
- RAL
- Liverpool
- CTU
- **Contact:**
  - to be defined

### **Operative-phase activity: Testing of sensors and ancillary chips**

This taskforce will take care of the testing of the tests of all the sensors (ER2, ER3, LAS prototypes, final version, and ancillary ASICs) on single-sensor and single AncASIC setups, with both DAQ setups, wafer probes, etc.

- Ancillary chip prototype testing
- Wafer probe sensor testing
  - High-frequency probing
  - Laser-based probing
- Wafer probe ancillary chip production testing
- Institutes interested:
  - LBNL/UCB (wafer-probe)
  - INFN
  - LANL
  - ORNL (wafer-probe)
  - Birmingham (wafer-probe)
  - RAL (wafer-probe)
  - Daresbury
  - Brunel
  - MIT (wafer-probe)
  - Liverpool
  - CTU (wafer-probe)
  - UIC
- **Contact:**
  - to be defined

### **Operative-phase activity: Irradiation/test beams:**

- Responsible for the actual irradiation procedure and for supporting the WP2 conveners in developing and implementing the test-beam activities.
- Led by a person in an institute that has access to an irradiation facility or a beam facility.
- Institutes interested:
  - LBNL/UCB
  - LANL
  - ORNL
  - Birmingham
  - RAL
  - Daresbury
  - CTU
  - UIC
- **Contact:**

- to be defined

### **Operative-phase activity: ER1:**

- Steering of the contribution of the SVT to the testing and characterization of the ER1 sensor. Ideally this person should be a member of ALICE, who could discuss which results can be shared with the SVT members.
- In the WP2 meetings, we would of course still provide the opportunity for individual groups to report on the individual activities with the Institutes interested:
  - LBNL/UCB
  - INFN
  - ORNL
  - Birmingham
  - Daresbury
  - Brunel
  - Liverpool
  - CTU
  - MIT
- **Contact:**
  - to be defined

Once the common tools will be finalized, we plan to restructure the activities of the WP2 to follow the subsystem structure of the final SVT detector.

**(Future) Subsystem IB:**

**(Future) Subsystem OB:**

**(Future) Subsystem Disks:**

## Interests, institute by institute (updated April 26th)

### CTU Prague:

- **Contact person and email:**
  - Lukas Tomasek, [lukas.tomasek@fjfi.cvut.cz](mailto:lukas.tomasek@fjfi.cvut.cz)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - CTU team has been involved so far in lab testing of CE65 test structures with Fe55 source and X-ray fluorescence
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - wafer scale characterization of the ER2/ER3/LAS sensors with wafer-probe station and DAQ setup at CERN+CTU Prague in collaboration with ITS3 team
  - lab characterization of ITS3 MLR1, ER1, ER2, ER3, EIC LAS v1, v2 with with radioactive sources (Fe55 370 MBq) and X-ray fluorescence
  - test-beam participation for ITS3 sensor and LAS
  - possible organizations of irradiation campaigns and tests of detectors and FE electronics – in collaboration with our scientific partners @CTU/NPI/partner institutes (protons, neutrons, gamma ..)
  - contribution to the development of testing SW/FW/HW
- **Workforce available (please indicate both FTE, timescale):**
  - 1.0 FTE total combined of two electronic engineers/researchers responsible for the sensor testing and irradiation (from January/February 2024)
- **Equipment and other resources (test beam facilities etc.)?**
  - wafer automatic probe station MPI TS3000 with 300 mm high voltage (up to 1100 V) thermal chuck (temperature range -40 to 200 C).
  - Irradiation facilities and equipment in house and at external scientific partners:
    - CTU: X-ray source 120kV 36W, various table radioactive sources (Fe55, Am, Pu), slow and fast neutrons (AmBe, 14 MeV DT generator, small nuclear reactor).
    - Nuclear Physics Institute CAS Rez ([ujf.cas.cz](http://ujf.cas.cz)): reactor neutrons, 30 MeV proton, 23 MeV ion beam, electrons up to 25 MeV.
    - UJP Prague ([ujp.cz](http://ujp.cz)): gamma from Cobalt-60, long term collaboration with CTU.
  - External assembly in ARGOTECH Trutnov (wire and die bonding etc.) - long term collaboration with CTU.
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - Our CTU ePIC SVT group is not member of ALICE. Our group is interested in developing some collaboration with the ALICE ITS3 team. However, at the institute level, there are groups involved directly in ALICE and ITS3 as well.
- **Is your institute a member of any other LHC collaboration?**
  - Our group is a member of ATLAS.
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes, we are planning to collaborate on sensor ITS3/ePIC testing at CERN.

**LBNL:**

- **Contact person and email:**
  - Zhenyu Ye, [yezhenyu@lbl.gov](mailto:yezhenyu@lbl.gov)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - contributed 20 assembled DAQ boards to ITS3 for sensor characterization
  - contributed to ITS3 MLR1 sensor (DPTS) characterization in the lab at LBNL and test beam data taking and analysis
  - contributed to ITS3 ER1 sensor (babyMOSS) test system development and characterization at CERN
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - Short term plan: 5/2024-7/2024 perform baby MOSS test beam and radiation tolerance studies at LBNL
  - Longer term plan: contribute to ER2/ER3/LAS test setup development and characterization efforts
  - Production: sensor QA/QC
- **Workforce available (please indicate both FTE, timescale):**
  - Present: ~0.25 FTE staff scientist, ~0.25 FTE postdoc, ~0.5 FTE student
- **Equipment and other resources (test beam facilities etc.)?**
  - Berkeley Accelerator Space Effect (BASE) facility for radiation tolerance studies
  - Berkeley Lab Laser Accelerator (BELLA) center for test beam with electron energies up to a few GeV (to be investigated)
  - Probe station and other generic testing equipment
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - Yes
- **Is your institute a member of any other LHC collaboration?**
  - Our group is officially in ALICE. There is institutional involvement beyond ALICE e.g. in ATLAS by HEP.
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes. No permanent workforce stationed at CERN, but temporary visits including long-term travel are possible

## **INFN:**

- **Contact person and email:**
  - Rosario Turrisi, [rosario.turrisi@cern.ch](mailto:rosario.turrisi@cern.ch)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - test of MLR1 structures with source, test of irradiated chips at controlled temperature
  - test of bent structures
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - testing/optimization of the MLR/ER2/ER3 flat/bent structures
  - characterization of irradiated sensors
  - (Pavia in the next future) thermal cycles and aging test using climatic chamber
- **Workforce available (please indicate both FTE, timescale):**
  - PD: 1.00 FTE physicists: 2 staff, 1 post-doc, 2 phd
  - BA: 0.5 FTE physicists: 1 staff, 1 post-doc
  - TS: 0.5 FTE physicists: 1 staff, 1 post-doc (from Summer 2024)
  - PV: 0.3 FTE, physicists: 2 staff
- **Equipment and other resources (test beam facilities etc.)?**
  - clean rooms, setup for APTS/DPTS test
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - yes (BA, PD, PV, TS)
- **Is your institute a member of any other LHC collaboration?**
  - yes (INFN-PD: CMS, INFN-BA: CMS, LHCb, INFN-PV: ATLAS, CMS, INFN-TS: CMS, AMBER)
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - yes, yes (details tbd)

## **MIT:**

- **Contact person and email:**
  - Gian Michele, [ginnocen@mit.edu](mailto:ginnocen@mit.edu)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - MIT team participated to the first test beams of the MOSS sensor to extract efficiency and space resolution
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - characterization of the ER2/ER3/LAS sensors with wafer-probe station and DAQ setup at CERN in collaboration with ITS3 team
  - contribution to the development of testing SW/FW/HW
  - test-beams for ITS3 sensor and LAS
- **Workforce available (please indicate both FTE, timescale):**
  - 0.6 FTE of a CERN-based research scientist starting (from January 2024)
  - 0.2 FTE of a electronic engineer, who will also contribute to the finalization of the ER2 design and test (from January 2024)
- **Equipment and other resources (test beam facilities etc.)?**
  - wafer probe station 12 inches at CERN, available from spring 2024 (used for ITS3 tests)
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**

- MIT is not member of ALICE. The group is interested in developing some collaboration with the ALICE ITS3 team.
- **Is your institute a member of any other LHC collaboration?**
  - CMS.
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes, MIT usually has postdocs/students/scientists at CERN for LHC activities.

#### **LANL:**

- **Contact person and email:**
  - Xuan Li, [xuanli@lanl.gov](mailto:xuanli@lanl.gov)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - So far we are not involved in the ITS3 WP2.
  - LANL colleagues are involved in the eRD111 and eRD113.
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - Short-term: we plan to get one DPTS from ALICE and set up the lab test at LANL in 2024. If the mini-MOSS or MOSS sensor is available, we would like to expand the lab tests for the ER1 and ER2 sensors as well. A 8 ALPIDE stave telescope has been setup at LANL, which will be used to characterize the ER1, ER2 and potentially EIC LAS sensors.
  - Long-term: We have engaged LANL electronic engineers to contribute to the back-end integration of the EIC LAS, which could be further developed towards the full readout system of the SVT.
  - We plan to lead the irradiation tests of sensors and relevant readout modules at the LANSCE facility with 800 MeV proton beams
- **Workforce available (please indicate both FTE, timescale):**
  - Current: ~0.2 FTE engineer
  - Long-term: we plan to apply for new funding to support ~0.5 FTE scientist, ~0.5 FTE engineer, ~0.5 FTE postdoc/student.
- **Equipment and other resources (test beam facilities etc.)?**
  - LANSCE facility for irradiation tests.
  - MAPS R&D lab for sensor characterization and readout development.
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - LANL is a associated member of ALICE. We would like to achieve the access to the needed resources from the ALICE ITS3 for the SVT related work.
- **Is your institute a member of any other LHC collaboration?**
  - LANL is also a member of the LHCb collaboration.
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes. We need to apply for new funding to support workforce at CERN.

## ORNL:

- **Contact person and email:**
  - Jo Schambach, [schambachjj@ornl.gov](mailto:schambachjj@ornl.gov)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - readout coordinator for SVT. MLR1 DPTS testing. ER1 LEC serializer testing
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - characterization of the ITS3 sensor via calibration of the pixels with radioactive sources and X ray fluorescence
  - die-level characterization vs temperature and irradiation with CM300xi probe station
  - DAQ station for in-lab characterization
  - readout for probing card, gantry tooling developments for sensor and flex circuit handling and assembling
- **Workforce available (please indicate both FTE, timescale):**
  - 0.5 FTE, 2024-2030
- **Equipment and other resources (test beam facilities etc.)?**
  - 300mm probe station with thermal chamber, Flip-Chip bonder, TCT, irradiation with neutrons
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - We are part of the ALICE ITS and ITS3 collaborations
- **Is your institute a member of any other LHC collaboration?**
  - No
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes, we have a team of 2 staff and 4 students located at CERN

## Birmingham:

- **Contact person and email:**
  - Laura Gonella, [laura.gonella@cern.ch](mailto:laura.gonella@cern.ch)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - Wire bonding of APTS chips for the ITS3 collaboration
  - Full lab characterisation of APTS chips from split 2 and split 3 (pulsing tests and Fe-55 tests), and comparison of results of all 4 splits; plots approved
  - Work on code for the analysis of the leakage current of the APTS chips; code finalised and uploaded on ITS3 repository
  - Wirebonding and testing of the RAL MLR1 circuits blocks; preparing for RAL ER1 circuit blocks testing
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - Testing of wafer scale sensors MOSS/baby-MOSS, MOSAIX, ER3; EIC-LAS; auxiliary chip (lab testing, participation in test beams at CERN and work on analysis,
- **Workforce available (please indicate both FTE, timescale):**
  - 1 PDRA, Long
  - 0.5 Engineer, James Glover (also working on powering)
  - 1 Technician, Eve
  - All until 2025; waiting for outcome of follow up grant for EIC construction
- **Equipment and other resources (test beam facilities etc.)?**
  - Clean rooms and lab
    - Wafer probing, wire bonding, assembly, metrology, environmental chamber,



- dry cabinet
- Proton irradiation line; upcoming (2025) neutron irradiation facility
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - Birmingham is an ALICE institute; none of the people mentioned here are ALICE authors
- **Is your institute a member of any other LHC collaboration?**
  - The particle physics group at Birmingham is also a member of ATLAS, LHCb, NA62, DUNE, ...
  - Laura Gonella is an ATLAS author
- **Are you interested in collaborating with R&D activities at CERN in collaboration to the ITS3 group? Can the group support the workforce at CERN?**
  - We can send people for short period of times to CERN (a few weeks every six months)

#### **RAL-PPD:**

- **Contact person and email:**
  - Fergus Wilson, [fergus.wilson@stfc.ac.uk](mailto:fergus.wilson@stfc.ac.uk)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - No work done yet as unable to get access to chips (not a member of ALICE)
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - Testing of MOSS/MOSAIX/ER3; EIC-LAS
  - Contribution to the development of testing SW/FW/HW
- **Workforce available (please indicate both FTE, timescale):**
  - 0.2 FTE for testing
  - up to 0.5 FTE over next 2 years for engineering/design support.
  - Access to TCAD, FPGA and DAQ support and effort on request.
  - All until 2025; waiting for outcome of follow up grant for EIC construction
- **Equipment and other resources (test beam facilities etc.)?**
  - wafer probes, wire bonders, laser systems, radiation sources
  - cleanrooms, metrology lab, x-ray irradiation, neutron irradiation facility (Chiplr)
  - IpGBT/VTRx+ setup, TLU, environmental chambers, cryo cooling, TCAD synopsis
  - test-beam experience at DESY and CERN; corryvreckan experience
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - No ; signed the CERN 65nm compliance letter for working on MLR1
- **Is your institute a member of any other LHC collaboration?**
  - ATLAS, CMS, LHCb
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes; can send people to CERN for a few weeks at a time or for test-beams.

#### **Daresbury Lab:**

- **Contact person and email:**
  - Marcello Borri, [marcello.borri@stfc.ac.uk](mailto:marcello.borri@stfc.ac.uk)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - Tests on MRL1 data transmission chip designed by RAL (complete)
  - Leading the tests on MLR1 DPTS chip via M.Buckland (close to completion)
  - Starting to test ER1 data transmission chip designed by RAL (started)
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**

- Testing of wafer scale sensors MOSS/baby-MOSS, MOSAIX, ER3; EIC-LAS; IC blocks and auxiliary chips;
- Contribution mainly via lab-tests (electrical tests and radioactive sealed sources)
- Contribution to TID irradiations via in-house X-ray generator
- **Workforce available (please indicate both FTE, timescale):**
  - 0.2 detector physicists (M.Buckland)
  - 0.4 electronics engineer (A.Hill)
  - 0.3 electronics engineer (W.Helsby) or applied physicist (M.Borri)
  - 0.1 experimental physicist (R.Lemmon)
  - 1 engineer apprentice (available free of charge to the project)
  - Effort can be increased from 01/04/2025
- **Equipment and other resources (test beam facilities etc.)?**
  - Clean room
  - Radioactive sources: Fe-55, Sr-90 etc... and related motorised scanning station for large areas.
  - X-ray irradiation facility
  - Planning to procure a wire-bonding machine
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - Daresbury Laboratory is an ALICE institute; Matthew Buckland and Roy Lemmon are an ALICE authors.
- **Is your institute a member of any other LHC collaboration?**
  - No
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes, we would be available to work at CERN for up 4 weeks per visit, for a total of possibly 3 visits per year.

**Brunel:**

- **Contact person and email:**
  - Liliana Teodorescu, [Liliana.Teodorescu@brunel.ac.uk](mailto:Liliana.Teodorescu@brunel.ac.uk)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - Small involvement in APTS characterization through a Brunel student using Liverpool's facilities
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - Testing of MOSS/baby-MOSS, MOSAIX, ER3; EIC-LAS (lab testing and test beams)
- **Workforce available (please indicate both FTE, timescale):**
  - Expected funds for 1 technician from Spring 2024 to 2025
  - Further, waiting the outcome of grant for EIC construction
- **Equipment and other resources (test beam facilities etc.)?**
  - Facilities for lab testing
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - Not member of ALICE. Interested in developing some collaboration with the ALICE ITS3 team
- **Is your institute a member of any other LHC collaboration?**
  - other group not involved in ePIC/EIC is part of CMS
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes. Can send people for short period of times to CERN

### Liverpool:

- **Contact person and email:**
  - Marielle Chartier, [chartier@liverpool.ac.uk](mailto:chartier@liverpool.ac.uk)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - Wire bonding of APTS chips for the ITS3 collaboration (some bonding issues to be solved)
  - Sensor characterization for APTS with laboratory measurements in Liverpool and CERN, and test beams at CERN PS and SPS
  - Test beam data analysis and script development for APTS
  - Implementing the bent detector into Corryvreckan test beam data analysis framework
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - Lab tests and test beams (including data analysis) for the wafer scale sensors: MOSS/baby-MOSS, MOSAIX, ER3; EIC-LAS
- **Workforce available (please indicate both FTE, timescale):**
  - 0.4 PDRA total in 2024 and 2025 + hiring a new PDRA in 2024 asap for 1.5 FTE total in 2024 and 2025
  - 0.5 PhD student in 2024 and 0.25 for 2025
  - 0.1 Physicist
  - 1 FTE technician effort (exact FTE to be confirmed)
- **Equipment and other resources (test beam facilities etc.)?**
  - Clean room
  - Radioactive sources: Fe-55, Sr-90 etc
  - Wire-bonding machine
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**
  - Yes, full membership
- **Is your institute a member of any other LHC collaboration?**
  - Yes, ATLAS and LHCb
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Yes, can send people to CERN for a few weeks at a time or for test-beams + one PDRA currently based at CERN

### UIC:

- **Contact person and email:**
  - Austin Baty, [abaty@uic.edu](mailto:abaty@uic.edu)
- **Group's involvement in the ITS3 WP2 or ePIC SVT projects so far:**
  - No work done yet
- **Planned or desired contributions for the WP2 SVT working group in the future (2024-2025 and, if possible, beyond)**
  - contribution to the development of testing SW/FW/HW
  - DAQ testing setup for benchtop characterization
- **Workforce available (please indicate both FTE, timescale):**
  - 0.25 FTE postdoc (starting summer, 2024)
  - 0.5 FTE grad student (2024), with potentially more students over time
- **Equipment and other resources (test beam facilities etc.)?**
  - Lab space for testing setup
  - Close geographic proximity + institutional knowledge through our HEP group of FNAL team beam facility
  - Laser setup for charge injection studies of Si sensors
- **Are you a member or associated institute of ALICE? If not, do you have some agreement to work on the ITS3 project within ALICE?**

- no
- **Is your institute a member of any other LHC collaboration?**
  - CMS
- **Are you interested in collaborating to R&D activities at CERN in collaboration to the ITS3 group? Can the group support workforce at CERN?**
  - Potentially could make trips to CERN if the timeline also synergizes with CMS activities.