A teaser for the poster session

or summarizing 32 result-packed contributions in 30'

HEP applications 1/3

- **Design and construction of the CMS Outer Tracker for the Phase-2 Upgrade.**
  - **Irene Zoi** (FNAL)
  - Modules = 2 closely spaced sensors read out by 1 ASIC, strip-strip or pixel-strip

  ➢First results with pre-production devices and the different aspects taken into account during the QA

- **Performance and Design Validation of CMS Phase-2 Pixel Modules.**
  - **Giorgia Bonomelli** (ETH Zürich)
  - Quality Control (QC) procedure for 1x2 and 2x2 module prototyping and production

  ➢Impact on final design and test on recent prototype productions

- **Synchronous and Asynchronous Data Quality Control of the ALICE Inner Tracking System in the LHC Run 3.**
  - **Svetlana Kushpil** (Nuclear Physics Institute of the Czech Academy Science)
  - Quality Control system for 10 m^2 of MAPS: synchronous monitoring and asynchronous data reco

  ➢Results from fake-hits, FEE status, data integrity, cluster/track reco from ongoing Run3 operation

HEP applications 2/3

- **Towards the construction of the ATLAS ITk Pixel innermost layer.**
  - **Simone Ravera** (CERN)
  - 3D sensors to sustain $2x10^{16}$ n_{eq}/cm^2 and data transmission at 1.28 Gb/s

  ➢performance sensors after irradiation, outcome of assembly procedure & transmission test

- **Recent test beams results of ATLAS ITk pixel modules.**
  - **Md Arif Abdulla Samy** (University of Glasgow)
  - Pre-production sensors from various vendors

  ➢Test before and after irradiation with test beams

- **ATLAS ITk Production Database use and tools for ITk Pixels community.**
  - **Luka Selem** (LPSC Grenoble)
  - ~4000 modules while ITk is designed to have ~9,500 pixel modules (and ~18,000 strip modules)

  ➢General solution to manage large scale data explained with examples

HEP applications 3/3

- **Qualification and Characterization of Mupix11 sensor modules for the Mu3e Vertex Detector.**
  - **Thomas Zenger** (University of Zürich)
  - Ultra–thin monolithic silison pixel sensors with scintillating fibres and tiles
  - ➢ Qualification procedure and test results with discussion on data transmission

- **Early evaluation of the triggering capacity of an upgrade Vertex Detector for the of the Belle II experiment.**
  - **Mattéo Maushart** (IPHC Strasbourg)
  - 5 layer MAPS vertex detector with specific output for triggering with degraded granularity
  - ➢Simulated performance for track reconstruction at low momentum

- **Gain suppression studies at the CENPA tandem accelerator.**
  - **Simone Michele Mazza** (UC Santa Cruz)
  - Active target of PIONEER, 5D tracking, separation of energy deposits of pion decay products
  - ➢Response of low gain avalanche detectors (LGADs) to MeV-range deposits from a proton beam

Photon science applications

- **HEPS-BPIX4 : Process in 6M hybrid pixel detector design and engineering prototype for HEPS.**
  - **Zhenjie Li** (IHEP)
  - 5x8 modules with 150um×150um pitch, frame rate up to 1.2kHz at 20-bit dynamic range

  ➢Calibrations and characterizations were carried out at the BSRF

- **A prototype pixel readout chip with column-level ADC for high frame rate XFEL applications.**
  - **Shijie Lu** (Shanghai Institute of Microsystem and Information Technology)
  - 1 to 10 photons per pixel per X-ray pulse AND high repetition rate beyond 10kHz

  ➢Design and measurement results of the prototype chip including dynamic-gain-switching amplifier and 11 bits SAR-ADC

Radiation tolerance 1/2

- **Low dose gamma irradiation study of ATLAS ITk MD8 diodes and miniature strip sensors.**
  - **Marcela Mikestikova** (Institute of Physics, Czech Academy of Science)
  - ITk layer to sustain 1x10^{15} n_{eq}/cm^2 and 66 Mrad, bulk/surface current saturation with TID

  ➢Results of specific irradiation at low TID up to 100 kRad

- **Radiation damage effects in ATLAS Pixels and their simulations: status, results and and perspectives.**
  - **Marco Bomben** (APC Paris)
  - Charge collection loss in operating planar and 3D sensors

  ➢Details on algorithm to reproduce observations, especially clustering and higher-level objects reconstruction

- **Effect of 1 MeV neutron-irradiation on the electrical properties of Si-based diodes.**
  - **Joseph Bodunrin** (University of South Africa)
  - Undoped n-Si diodes with fluence up to 1x10^{17} n_{eq}/cm^2

  ➢I–V properties to investigate defects and understand radiation-hardness

Radiation tolerance 2/2

- **Thin LGADs as radiation-resilient sensors for 4D tracking.**
  - **Matteo Durando** (Torino University and INFN)
  - Thinner (15-45 μm) sensor for better time resolution, still sustaining large NIEL fluence

  ➢Results on FBK prototype tests with laser and charged particles

- **X-ray Irradiation Campaigns of the Monopix depleted monolithic active pixel sensors.**
  - **Lars Schall** (University of Bonn)
  - Large electrode LF-Monopix / small electrode TJ-Monopix for high rate / high radiation

  ➢Results of TID tolerance with lab and beam tests

- **Charecterization of CMOS sensor using X-ray irradiation.**
  - **Anusree Vijay** (IIT Madras)
  - MALTA sensor behaviour after irradiation with high intensity X-ray source at various fluence

  ➢ Electrical characterization results, DAC behaviour with various sensor thicknesses

Electronics

- **Caribou: A versatile data acquisition system for silicon pixel detector prototyping.**
  - **Younes Otarid** (CERN)
  - Versatile: multiple collaborative frameworks & bench-top and test-beam qualifications

  ➢Current system architecture, capabilities, examples of projects, and foreseen system upgrade

- **A small area 11-bit SAR ADC for integrating pixel detectors at high repetition rate XFELs.**
  - **Zizhao Ji** (Shanghai Institute of Microsystem and Information Technology)
  - Small: 0.026 mm^2, Integration: 1 ADC within a 4 × 4 pixel group, High rate 125 kHz

  ➢Design and measurement results of prototype chip

- **A Column-level ADC designed to CMOS image sensors.**
  - **Ping Yang** (Central China Normal University)
  - 12-bit 5MS/s low-power Cyclic ADC using 180nm process

  ➢Test results from prototype chip

Integration

- **ATLASPix3 Serial powering and multi-chip module studies for future HV-CMOS tracker.**
  - **Marco Hübner** (Hochschule RheinMain Wiesbaden)
  - Telesceope with 4 layers including quad-sensors

  ➢Detailed electrical characterisation of regulators and serial powering

- **Design, performance and future prospects of vertex detectors at the FCC-ee.**
  - **Fabrizio Palla** (INFN Pisa)
  - Single-hit resolution of ~3 μm and a material budget as low as 0.25% of X_0 per detection laye

  ➢Status of the R&D on fully engineered vertex detector including curved reticule-size sensor

- **Integration Concept of the CBM Micro Vertex Detector.**
  - **Franz Matejcek** (Goethe-University Frankfurt)
  - MAPS-based multi-layer system operating in vacuum with 0.3-0.5% X0 material budget

  ➢Solutions, preparation of materials, dedicated assembly procedures and quality assessment steps

Timing with pixels

- **Design and production of timing optimised 3D silicon sensors for future LHC experiments and beyond .**
  - **Jixing Ye** (Università di Trento and TIFPA)
  - Performace goal: 20 ps and 1*10^{17} 1 MeV n_{eq} /cm^2 with simplified geometry and smaller pitch / current proto

  ➢Results of optimisation with TCAD simulation

- **DC resistive read-out silicon sensors for future 4D tracking: recent advancements and first prototypes characterization.**
  - **Roberta Arcidiacono** (Università del Piemonte Orientale and INFN Torino)
  - Resolutions: few μm and ~30 ps with large (150-200 μm) pixels

  ➢ Transient Current Technique characterization of first prototypes

- **Ghosts as self-sustained avalanches in Ti-LGADs with different self-quenching times: Linking experimental data, hypotheses and simulations.**
  - **Gordana Lastovicka Medin** (University of Montenegro)
  - Concern: atypical self-induced signals with extremely large amplitude also extended in time

  ➢Results on irradiated samples and hypothesis based on simulation

Monolithic active pixel sensors 1/2

- **DuTiP Vertex Detector for Belle II Upgrade and ILC.**
  - **Yamada Miho** (Tokyo Metropolitan College of Industrial Technology)
  - Monolithic pixel sensor proto fabricated in Lapis semiconductor 200 nm FD-SOI technology

  ➢Status of characterisation & development prospects

- **Testing small scale devices for ALICE ITS3 upgrade.**
  - **Alessandro Sturniolo** (University of Messina and INFN-Catania)
  - analogue and digital MAPS proto in 65nm for 5 µm resolution, 10 kGy TID, 10^{13} n_{eq}/cm^2 NIEL

  ➢Detailed results from lab in beam tests demonstrating requirements can be matched

- **Performance studies of the CE-65v2 MAPS prototype structure.**
  - **Alessandra Lorenzetti** (University of Zürich)
  - Exploration of MAPS with 65 nm process with 15, 18, 22.5 µm and standard or modified process

  ➢Details of beam test results for postion resolution and detection efficiency

Monolithic active pixel sensors 2/2

- **Topmetal-M3: a position and time sensitive MAPS with delay line readout.**
  - **Chaosong Gao** (Central China Normal University)
  - Delay-line readout scheme with column-level TDC for <100 ps timing in 32x26 µm pixel pitch

  ➢Test result from prototype

- **Optimization of monolithic pixel sensors for high energy physics applications using 3D TCAD simulations.**
  - **Giulio Borghello** (CERN)
  - Sensor designed in modified process to decrease capacitance, improving timing and radiaition tolerance

  ➢Optimisation to sustain fluence above $1x10^{15}$ n_{eq}/cm^2

- **TCAD and charge transport simulations of MAPS in 65nm for the ALICE ITS3.**
  - **Isabella Sanna** (CERN)
  - Understanding the collection performance of 65 nm process with TCAD combined with Garfield++

  ➢Comparison between simulations and X-ray from ^{55}Fe measurements