Education

University of Rome and INFN *La Sapienza*   Rome, IT
Postdoctoral Research fellow   *Oct. 2019 – Sep. 2020*

    ○ **Project:** Probing the Higgs boson Yukawa coupling to bottom quarks using the ATLAS detector at the LHC.
       Advisor: Prof. M. Kado

University of Geneva   Geneva, CH
PhD in Particle Physics   *Oct. 2015 – Sep. 2019*

    ○ **Thesis:** Search for boosted Higgs boson and other resonances decaying into b-quark pairs using the ATLAS detector and studies of CMOS pixel sensors for the HL-LHC.
       Advisor: Prof. G. Iacobucci

University of Geneva   Geneva, CH
Master in Particle Physics; average mark: 5.9/6 (The U. of Geneva does not release a final mark)Oct. 2013 – July 2015

    ○ **Thesis:** Test-beam analysis and TCAD simulation of the HV-CMOS pixel technology proposed for the ATLAS experiment at the HL-LHC.
       Advisor: Prof. G. Iacobucci
       Dichiarata equipollente dall'Universitá di Roma Tor-Vergata

University of Rome Tor-Vergata   Rome, IT
Bachelor in Physics; 110/110   *Sept. 2010 – Sept. 2013*

    ○ **Erasmus student in Geneva:** from Feb. 2013 to Sept. 2013.
    ○ **Thesis:** Background studies for the measurement of the properties of the Higgs boson in the $H \to ZZ^{(*)} \to 4l$ channel at a center-of-mass energy of 8 TeV using the ATLAS detector at the LHC.
       Advisors: Prof.ssa Anna Di Ciaccio, Prof. G. Iacobucci

Research Projects

- **Since 2019: Advanced Machine learning for high energy physics [15-16]**

- **Since 2019: Boosted Higgs bosons in association with vector boson [14]**

- **2018-2019. Monolithic active pixel sensor with 50 ps timing resolution. [7]**

- **2018-2019: Di-b analysis [13]**

- **2017-2019: Boosted Higgs bosons in association with a jet [12]**

- **Since 2016. b-tagging in RUN 2. [8-11]**

- **2015 - 2018. HV-CMOS R&D for the ATLAS tracker at the HL-LHC. [1-6]**

Responsabilities within the ATLAS collaboration

MVA coordinator for Hbb/cc analyses   June. 2020 - ongoing
Analysis group of around 40 people   *CERN*

Convener of sub-group b-tagging algorithms   Oct. 2019 - ongoing
Performance group of around 30 people   *CERN*

Analysis contact di-jets & dib-jets   Oct. 2018 - Oct. 2019.
Analysis group of around 10 people   *CERN*

MAJOR TALKS IN ATLAS MEETINGS

Talks at ATLAS weeks, workshops, weekly and approvals

- **Summary of CP improvements in ATLAS**
  ATLAS Physics Workshop. Invited speaker.
  CERN, CH
  Dec. 2019

- **b-tagging from analysis prospectives**
  Exotics and Di-Boson ATLAS workshop. Invited speaker.
  Naples, IT
  July 2019

- **high p_T b-tagging**
  Joint FTAG & Tracking Workshop. Invited speaker.
  DESY
  July 2019

- **Boosted Higgs boson analysis**
  Physics plenary, approval talk.
  CERN, CH
  Nov. 2018

- **Challenges in b- and c-tagging**
  ATLAS physics workshop "Physics with 120 fb^{-1}". Invited speaker.
  CERN, CH
  Dec. 2017

- **Trackless b-tagging**
  Joint ATLAS Flavor Tagging and Higgs to bb workshop. Session convener & speaker.
  Stony Brook, US
  Oct. 2017

- **Flavour-tagging working points in RUN-II**
  Joint ATLAS Flavor Tagging and Higgs to bb workshop. speaker.
  Stony Brook, US
  Oct. 2017

- **release 21 algorithm developments in ATLAS**
  ATLAS Weekly
  CERN, CH
  May. 2017

- **Optimization and performance studies of the ATLAS b-tagging algorithms**
  FTAG plenary, approval talk
  CERN, CH
  May. 2017

- **Summary of CMOS results for ITk**
  ATLAS ITk Pixel sensor meeting
  Glasgow, UK
  Jan. 2017

TALKS IN NATIONAL AND INTERNATIONAL CONFERENCE AND INVITED SEMINARS

- **Search for boosted Higgs boson and other resonances decaying into b-quarks**
  Invited seminar, U. of Rome "Tor Vergata".
  Rome, IT
  July 2019

- **Hunting the Higgs boson at high energy using the ATLAS detector**
  Invited seminar, U. of Genova.
  Genova, IT
  April 2019

- **Searches for boosted low mass resonances decaying into b-quarks**
  LaThuile 2019, Les Rencontres de Physique de la Valle d'Aoste, Speaker.
  LaThuile, IT
  Mars 2019

- **Optimisation of the ATLAS b-tagging algorithms for the 2017 LHC data-taking**
  European physical society, poster presenter.
  Venice, IT
  Apr. 2017

- **TCAD Simulation of the HV-CMOS AMS 350 nm full-demonstrator**
  AIDA-2020 workshop on CAD and Geant4 simulations. Speaker.
  Marseille, FR
  May 2016

- **Characterization results with CCPDv4 capacitively coupled to FEI4**
  Joint Swiss and Austrian Physical society conference, Speaker.
  Geneva, CH
  Apr. 2016

- **Reconstruction, analysis and simulation of the FEI4 telescope**
  Beam Telescopes and Test Beams Workshop 2015. Speaker.
  DESY, GE
  Jan. 2015

- **Test-Beam Results of the AMS-180nm CCPDv4**
  11th Trento Workshop on Advanced Silicon Radiation Detectors. Speaker.
  LPNHE, Paris
  Feb. 2015

Doctoral schools and Workshops

- **Flavour Tagging Workshop 2020. Organizer.**

- **School on TCAD simulations. Rutherford National Laboratory (UK), 2016.**

- **School on Silicon detectors. Laboratori Nazionali di Legnaro (IT), 2015.**

- **CHIPP winter school. Sorenberg, (CH), 2017.**

- **CERN school of physics, Maratea (IT), 2018.**

Academic Awards

- **Talk "*flavor tagging from analyses prospectives*" awarded best talk of the Exotic/HBDS workshop (2019).**

- **Poster on HV-CMOS results awarded with a price for most original research at CHIPP school (2017).**

- **Master's Award of Excellence from the Faculty of Science of the University of Geneva (20.000 CHF).** Excellence Fellowship program open to outstanding and highly motivated students who wish to pursue a Master of Science degree in one of the disciplines covered by the Faculty.

- **Summer student at U. of Geneva and PSI (Zurich):** Development of a scintillating fiber tracker for the $Mu3e$ experiment at PSI. Advisor: Dr. A. Bravar

Teaching

- PhD Course - Physics at the LHC organized with Dr. M. Bauce and Prof. M. Kado 2019/2020.

- Tutor of the course (in french): Electrodynamics I (Oct. 2015/16/17/18 – Feb. 2015/16/17/18). U. of Geneva. Bachelor in Physics.

- Tutor of the course (in french): Electrodynamics II (Mar. 2015/16/17 – June 2015/16/17). U. of Geneva. Bachelor in Physics.

- I have assisted supervising 2 CERN summer students.

- Master thesis co-advisor: C. Badiali: A truth tagging algorithm based on Neural network for the VHbb analysis.

- Master thesis co-advisor: L. Santi: A Pflow algorithm using CNN.

Publications, notes and proceedings with personal contribution

- **Hardware, HV-CMOS:**

1. The FE-I4 Telescope for particle tracking in test-beam experiments. B. Ristic et al. arXiv:1603.07776, JINST 11 (2016), no.07, P0700

2. Results of the 2015 test-beam of a 180 nm AMS High-Voltage CMOS sensor prototype (main editor). F.A. Di Bello et al. arXiv:1603.07798. JINST 11 (2016) no.07, P07019.

3. Test-beam measurement of ams H35 HV-CMOS capacitively coupled pixel sensor prototypes with high-resistivity substrate. M. Benoit et al. JINST 13 (2018) no.12, P12009.

4. Development of a modular test system for the silicon sensor R&D of the ATLAS Upgrade H35 full sensor results. H. Liu et al. arXiv:1603.07950, JINST (2017) no.12, P01008

5. Test-beam results of irradiated ams H18 HV-CMOS pixel sensor prototypes (main editor). F.A. Di Bello et al. arXiv:1712.08338, JINST (2017), no. 06, P0817.

6. Charge collection in irradiated HV-CMOS detectors. M. Benoit et al. JINST(2016) P04007

7. A 50 ps resolution monolithic active pixel sensor without internal gain in SiGe BiCMOS technology. JINST (2019) P11008

- **b-tagging and analysis work:**

8. *b*-tagging optimisation for 2016 13 TeV data. ATL-PHYS-PUB-2016-012

9. Optimisation of the ATLAS b-tagging algorithms for the 2017 LHC data-taking. PoS(EPS-HEP2017)733. Proceeding.

10. Optimisation and performance studies of the ATLAS b-tagging algorithms for the 2017-18 LHC run, ATL-PHYS-PUB-2017-013. (main editor).

11. Measurements of b-jet tagging efficiency with the ATLAS detector using $t\bar{t}$ events at $\sqrt{s} = 13$ TeV. JHEP08(2018)089

12. Search for boosted resonances decaying to two b-quarks and produced in association with a jet at $\sqrt{s} = 13$ TeV with the ATLAS detector. ATLAS-CONF-2018-052.

13. Search for resonances decaying to two b-quarks at $\sqrt{s} = 13$ TeV with the ATLAS detector. arXiv:1910.08447v1

14. Measurement of the associated production of a Higgs boson decaying to *b*-quarks with a vector boson at high transverse momentum in *pp* collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector. ATLAS-CONF-2020-007

- **Machine learning:**

15. Towards a Computer Vision Particle Flow. arXiv:2003.08863

16. Efficiency parametrization with Neural Networks. arXiv:2004.02665

SKILLS

- **Programming:** C and C++, Python, Bash, ROOT, Synopsis Sentaurus.
- **Languages:** Italian (mother tongue), english (fluent), french (basic).

OUTREACH

I have participated to the following outreach activities:

- **La Nuit de la science 2017, Geneva**
- **Seminar at Liceo Scientifico "E. Fermi", Gaeta, April 2017: "Un viaggio nel mondo dei quanti"**
- **La Nuit de la science 2016, Geneva**