



Personal Information

Date of birth: November 9th 1976
Nationalities: Serbia, Switzerland
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Profile

Expertise:

- Experimental & phenomenological aspects in particle physics, and statistical data analysis
- Detector technologies and instrumentation, control systems for large-scale experiments
- Coordination of research groups and projects, scientific writing, academic lecturing

Language fluency: Serbian (native), English (fluent), French (B1), German (A2)

Education

2011 Doctorate in Experimental Particle Physics

Swiss Federal Institute of Technology Zurich (ETHZ), Switzerland

2006 Magister degree in Elementary Particle Physics (3 years degree program)

Faculty of Physics, University of Belgrade, Serbia

2001 Diploma in Theoretical Physics (4.5 years degree program)

Faculty of Physics, University of Belgrade, Serbia

equiv. to Bachelor in Electrical Engineering (4 years degree program, w/o thesis)

Faculty of Electrical Engineering, University of Belgrade, Serbia

Employment

2019 – Associated Professor, Faculty of Physics, University of Belgrade

2020 – 2021 Visiting Lecturer & Scientist, Chinese Academy of Sciences, IHEP Beijing

2018 – 2019 Associated Research Professor, Faculty of Physics, University of Belgrade

2016 – 2018 Research Fellow, CERN, Geneva

2011 – 2016 Postdoctoral Researcher, IHEPA, University of Florida, Gainesville

2007 – 2011 Doctoral student, Institute for Particle Physics, ETH Zürich

2001 – 2006 Research assistant, VINCA Institute of Nuclear Sciences, Belgrade

Research Responsibilities, Services and Projects

2021 – Advisory and steering roles within CERN, LHC, and CMS projects

- **CERN Quantum Technologies Initiative Advisory Board** (2021 -)
Strategic advices on R&D and application of quantum technologies in HEP.
- **LHC Higgs WG Steering Committee** (2021 -)
Guidance on recommendations for Higgs boson properties measurements.
- **CMS Implementation Team on Diversity and Inclusion** (2021 -)
Recommendations on diversity & inclusion policies implementation at CMS.

Research Responsibilities, Services and Projects (continued)

2016 – 2021 Co-coordinator of Higgs boson physics groups in LHC Higgs WG

- **Higgs properties (WG2) group** (2019 - 2021) [100+ people]
Published studies & recommendations in 2 LHC H WG public documents.
- **Higgs cross sections sub-group** (2016 - 2019) [50+ people]
Published studies in CERN Yellow Report (ISBN 9789290834427).

2015 – 2023 Co-coordinator of physics analysis groups in CMS collaboration

- **Effective Field Theory interpretations** (2020 – 2023) [100+ people]
Preparation for 1st global EFT interpretations of CMS measurements.
- **Higgs Future sub-group** (2017 - 2019) [50+ people]
Published studies in 3 CMS TDRs & CERN YR (ISBN 9789290835493).
- **Higgs ZZ sub-group** (2015 - 2017) [30+ people]
Published measurements in 3 journals and 3 CMS PAS public documents.

2014 – Editorial and referral duties

- [Analysis Review Committee](#) for 8 analyses, [Principal editor](#) of 2 analyses
- [External reviewer](#) for the scientific journals EPJ C (1x) and JHEP (1x)
- [Co-editor](#) of CERN Yellow Reports (CERN-2017-002-M, CYRM-2019-007)

2011 – National and international HEP R&D projects and fundings

- [Bilateral France-Serbia project](#), IT S(ci)ENSE, 2023-2024
- [COMETA COST Action CA22130](#), Horizon Europe, 2023-2027, MC member
- [Multilateral Italy-Serbia project](#), RS19MO06, 2019-2021, PI
- [VBSCAn COST Action CA16108](#), EU Horizon 2020, 2018-2021, MC member
- [National project ON171019](#), MoESTD, Serbia, since 2011, participant
- [SCOPES projects](#), SNF SDC, Switzerland, 2005-2015, participant

Research Activities and Experience

2018 – Associated (Research) Professor, Faculty of Physics, Belgrade

- **Detector R&D activities** & extension of expertise of Belgrade CMS group:
 - Development of [system for automatised large-scale testing of the readout electronics](#), as well as the [control and safety system](#) for the upgrade of CMS Electromagnetic Calorimeter (ECAL) [C1].
 - Application of [FPGA-based machine learning techniques](#) in HEP (particle identification, event classification, etc.).
 - Study of [ageing effects](#) and identification of optimised gas chemical composition for the upgrade of CMS Cathode Strip Chambers (CSCs).
- **Physics studies, measurements, and searches:**
 - Coordination of CMS group for [global EFT interpretation](#) of electroweak, top quark and Higgs boson physics measurements
 - Preparation of [public tool for parameterisation of EFT effects](#) with focus on vector-boson scattering and Higgs boson processes (4l final state)
 - Development/coordination of CMS [measurements of the Higgs boson properties](#) (mass, couplings, fiducial/differential cross sections) [A1,A2].
 - Coordination and steering of LHC Higgs WG group that establishes [recommendations for Higgs boson properties measurements](#) [B1].
 - Development of phenomenological and experimental tools/methods for probing for non-commutativity of quantum space-time using LHC data.

Research Activities and Experience (continued)

2016 – 2018 Research Fellow, CERN, Geneva

- Coordination of the CMS Higgs Future group studies of performance of the upgraded detector at HL-LHC (published in [3 CMS TDRs](#) and [\[B2\]](#)).
- Co-development of analysis tools for characterisation of e.m. and hadronic showers and study of High-Granularity Calorimeter (HGCAL) performance.
- Development of the analysis framework for calibration of energy response and study of resolution of hadron showers, including different schemas for pile-up subtraction, in HGCAL [\[C2\]](#).
- Coordination of LHC HXSWG sub-group that established recommendations for Higgs boson cross section measurements [\[B3, B4\]](#).
- Co-development of the method that improved precision of the Higgs boson mass measurement by about 10% using H \rightarrow 4l decay mode by performing the refitting of the lepton kinematics [student supervision].
- Coordination of physics analyses with Run-2 data within Higgs ZZ group.
- Coordination of the analysis that has improved the sensitivity to the small anomalous HVV interactions by exploiting correlations between the kinematics of the Higgs boson and associated jets [\[A3\]](#).

2011 – 2016 Postdoctoral Researcher, IHEPA, University of Florida, Gainesville

- One of the key persons in the analyses that led to the observation of the 125 GeV Higgs boson and measurement of its properties in its decay to four leptons [\[A6 - A8\]](#),
- Development of a matrix element method and the public software tool MEKD for characterisation of the spin and parity of the newly discovered boson (improvement in sensitivity to exotic states by up to 15%) [\[B6\]](#),
- Development of the method that significantly improves the sensitivity to the anomalous HZZ interactions by exploiting the interference between the amplitudes of anomalous and SM HZZ interactions [\[B5\]](#),
- Development and coordination of the analysis that led to the constraints on the anomalous HZZ interactions [\[A5\]](#),
- Development and coordination of the Higgs boson fiducial and differential cross section measurements using its decay to four leptons [\[A4\]](#),
- Observation of the Z \rightarrow 4l decays in pp collisions at 7TeV [\[A9\]](#),
- Study of the performance of the CMS CSCs, and development of the algorithms for an improved muon reconstruction in the presence of multiple hits within CSCs.

2007 – 2011 Doctoral student, Institute for Particle Physics, ETH Zürich

- Contribution to searches for supersymmetric particle signals in events with two same-sign leptons at the LHC [\[A10\]](#),
- Development of a general method for computing contamination from mis-identified and non-isolated leptons in multi-lepton final states,
- Integration and testing of the CMS ECAL, its calibration with the electron and pion test-beams, as well as commissioning and operation of ECAL within the CMS experiment,
- Design, implementation, installation and commissioning of the Control and Safety Systems for the ECAL detector at the CMS experiment [\[C3, C4\]](#).

Event Organisation

- **Organisation of international schools and conferences (IOC/LOC/IAC):**
 1. [CERN Accelerator School 2024](#), Belgrade, September, 2024 (in preparation)
 2. [Probing space-time properties at HEP experiments](#), Belgrade, May 29, 2023
 3. [11th LHC Physics \(LHCP\) conference](#), Belgrade, May 22-26, 2023
 4. [PRrecision Effective Field Theory School \(PREFIT20\)](#), DESY, Hamburg, 1-13 Mar, 2020
 5. [Series of Schools of High Energy Physics in Split and Sarajevo](#), in years 2015-2019
 6. [CERN Danube School on Instrumentation \(in PNP\)](#), Novi Sad, Serbia, 8-13 Sep 2014

Lecturing and Student Supervision

- **Co-supervision of PhD, master and summer students (Belgrade, Florida, CERN):**
 - [Postgrad. students](#): J.Mitic (master, 2022-2023), E.Maricic (master, 2022-2023), L.Markovic (PhD, 2020-), Q.Guo (PhD, 2019-2023), B.Brkcic (master, 2018-2019), H. Mei (PhD, 2014-2018), V.Milosevic (mas., 2015-2016), M.Snowball (PhD, 2011-2014)
 - [CERN summer students](#): I. Bujanja (2018), O. Arzi (2017), N. Rho (2016), A. Polaczek (2016), I Novak (2014), D. Markovic (2007)
- **Courses at Faculty of Physics (2019-present):**
 - Elementary particles physics (under/post-grad.), Statistical & comp. methods (under/post-grad.), Particle detectors in HEP (post-grad), Particle accelerators (post-grad.).
- **Lectures and exercises at HEP schools (since 2012):**
 - [Split School of High Energy Physics](#) (Split 2015), [CMS Data Analysis School](#) (Fermilab & CERN 2014), [Trans-European School of High Energy Physics](#) (Petnica 2012)

Computing Experience

- High-level GPLs: C/C++, Python
- HEP tools & packages: CMSSW, CRAB, ROOT, SOFTSUSY, MEKD, MELA
- MC tools & generators: MadGraph5_aMC@NLO, POWHEG BOX, HRes, PYTHIA
- Math, DB, web DSLs: Matlab, Mathematica, SQL, HTML
- Symbolic GPLs: Assembly (Intel x86, PICmicro), STL/SCL (Siemens PLCs)
- SCADA systems & protocols: WinCC (PVSS), LabView, Modbus, telecontrol (IEC 60870-5)
- Virtualisation solutions: VMware Infrastructure, Parallels VDI
- Graphics & web design: Adobe suite (Photoshop, Illustrator, Dreamweaver, Flash)

Awards

- [Special distinction for excellence](#) at the CERN School of Computing, Saint-Malo, 2005

References

- **Dr Luca Malgeri**, EP Department, CERN, Switzerland luca.malgeri@cern.ch
- **Prof. Dr Guenther Dissertori**, ETH Zurich, Switzerland guenther.dissertori@cern.ch
- **Prof. Dr Andrey Korytov**, University of Florida, USA korytov@phys.ufl.edu
- **Prof. Dr Peter Adzic**, University of Belgrade, Serbia peter.adzic@cern.ch
- **Prof. Dr Paris Sphicas**, University of Athens and CERN paris.sphicas@cern.ch
- **Dr Tiziano Camporesi**, EP Department, CERN, Switzerland tiziano.camporesi@cern.ch

Selected Publications

- **Physics analyses - CMS Collaboration (author/editor or significant contribution):**
 - A.1 *Measurements of inclusive and differential cross sections for the Higgs boson production and decay to four-leptons in proton-proton collisions at 13 TeV*, JHEP 08 (2023) 040 [[significant contribution](#)].
 - A.2 *Measurements of production cross sections of the Higgs boson in the four-lepton final state in proton-proton collisions at 13 TeV*, EPJC 81 (2021) 6 [[significant contribution](#)].
 - A.3 *Constraints on anomalous Higgs boson couplings using production and decay information in the four-lepton final state*, Phys. Lett. B 775 (2017) 1-24 [[coordinator](#)].
 - A.4 *Measurement of inclusive and differential fiducial cross sections for Higgs boson production in the $H \rightarrow 4l$ decay channel in proton-proton collisions at 7 and 8 TeV*, JHEP 1604 (2016) 005 [[editor](#)].
 - A.5 *Constraints on the spin-parity and anomalous HVV couplings of the Higgs boson in proton collisions at 7 and 8 TeV*, Phys. Rev. D 92 (2015) 1, 012004 [[editor](#)].
 - A.6 *Measurement of the properties of a Higgs boson in the four-lepton final state*, Phys. Rev. D 89 (2014) 9, 092007 [[main author](#)].
 - A.7 *Study of the Mass and Spin-Parity of the Higgs Boson Candidate Via Its Decays to Z Boson Pairs*, Phys. Rev. Lett. 110 (2013) 8, 081803 [[main author](#)].
 - A.8 *Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC*, Phys. Lett. B 716 (2012) 30 [[significant contribution](#)].
 - A.9 *Observation of Z decays to four leptons with the CMS detector at the LHC*, JHEP 1212 (2012) 034 [[main author](#)].
 - A.10 *Search for new physics with same-sign isolated dilepton events with jets and missing transverse energy at the LHC*, JHEP 1106 (2011) 077 [[main author](#)].
- **Particle physics phenomenology:**
 - B.1 LHCHXS working group (with P.Milenovic), *Simplified Template Cross Sections - Stage 1.1*, LHCHXSWG-2019-003 (2019)
 - B.2 HE/HL-LHC working group (with P.Milenovic), *Report on the Physics at the HL-LHC, and Perspectives for the HE-LHC*, CERN-2019-007 (2019) [[editor](#)].
 - B.3 P. Milenovic et al., *Adding pseudo-observables to the four-lepton experimentalist's toolbox*, JHEP 1810 (2018) 073
 - B.4 LHCHXS working group (with P.Milenovic), *Handbook of LHC Higgs Cross Sections: 4. Deciphering the Nature of the Higgs Sector*, CERN-2017-002-M (2017) [[editor](#)].
 - B.5 P. Milenovic et al., *The role of interference in unraveling the ZZ-couplings of the newly discovered boson at the LHC*, Phys. Rev. D 89 (2014) 3, 034002
 - B.6 P. Milenovic et al., *Precision studies of the Higgs boson decay channel $H \rightarrow ZZ \rightarrow 4l$ with MEKD*, Phys. Rev. D 87 (2013) 5, 055006
- **R&D for CMS experiment and its Phase-2 upgrades:**
 - C.1 R.J. Estupinan et al. (with P.Milenovic), *Phase-II Upgrade of the CMS Electromagnetic Calorimeter Detector Control and Safety Systems for the High Luminosity Large Hadron Collider*, to be published in Proceedings of ICALEPCS2023, Cape Town, 2023
 - C.2 CMS Collaboration (with P.Milenovic), *The Phase-2 Upgrade of the CMS Endcap Calorimeter*, CERN-LHCC-2017-023 (2017) [[significant contribution](#)].
 - C.3 P. Milenovic et al., *Implementation and performance of the detector control system for the electromagnetic calorimeter of the CMS experiment*, peer rev. Proceedings of ICALEPCS2007, Knoxville, 2007
 - C.4 P. Milenovic et al., *Performance of the CMS-ECAL Safety System for Super Modules SM0 and SM1*, NIM A 554 (2005) 427

Selected Conferences and Seminars

- **Communications in international conferences and seminars:**
 1. *Towards global Effective Field Theory interpretations at Hadron Colliders: Experimentalists' wish-list*, [invited talk at Ultimate Precision at Hadron Colliders 2019](#), Orsay, Paris, 25 November - 6 December 2019
 2. *Effective Field Theory interpretations in Higgs boson physics (LHC HXS WG2 activities)*, [invited talk at Higgs Days 2019](#), Santander, 16-20 September 2019
 3. Higgs Physics prospects at the HL-LHC, [invited talk at Higgs Couplings 2018](#), Tokyo, 26-30 November, 2018
 4. Fitting Effective Field Theories for Higgs boson measurements in CMS experiment, [invited talk at EFT workshop](#), Durham, 7 September, 2017
 5. *Higgs boson physics results at LHC and prospects for physics performance at HL-LHC*, [talk at Linear Colliders workshop series](#), SLAC, 26-30 June 2017
 6. *Recommendations on the Higgs boson fiducial/differential cross section measurements at LHC*, [invited talk at Les Houches WS "Physics at TeV Colliders"](#), 5-23 June 2017
 7. *Higgs boson cross section measurements and differential distributions at the LHC*, [talk at LHCP 2015](#), Saint Petersburg, Russian Federation
 8. *Constraints on anomalous HVV interactions*, [invited talk at Higgs+Jets 2014](#), Durham, United Kingdom
 9. *Combination of results on the Higgs Boson in all Decay Channels and Measurement of its Properties at CMS*, [talk at LHCP 2014](#), Columbia University, New York, USA
 10. *Unraveling the HZZ couplings: Role of interference effects and more*, [talk at After the Discovery 2014](#), 7-17 April 2014, Benasque, Spain
 11. *Spin-parity analysis in the CMS Experiment*, [invited talk at Higgs Days 2013](#), 16-20 September 2013, Santander, Spain
 12. *Measurement of the Higgs-like boson properties in $H \rightarrow ZZ \rightarrow 4l$ decays with ATLAS and CMS*, [HEP seminar at University of Florida](#), Gainesville, USA, 2013