

# Dinko Ferenček

## Curriculum Vitae

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### Personal Information

First Name Dinko  
Family Name Ferenček  
Date of Birth Jun. 11, 1983  
Place of Birth Zagreb, Croatia  
Citizenship Croatian  
Gender Male  
Marital Status Married, 2 children

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### Contact Information

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### Education

2006–2011 **Ph.D., Physics**, University of Maryland, USA (advisor Prof. Sarah C. Eno)  
Dissertation: [Search for Pair Production of First-Generation Scalar Leptoquarks in Proton-Proton Collisions at  \$\sqrt{s} = 7\$  TeV](#)  
2001–2006 **M.Sc., Physics**, University of Zagreb, Croatia (advisor Prof. Mirko Planinić/co-advisor Dr. Vuko Brigljević)  
Diploma thesis: *WZ Boson Production in Proton-Proton Collisions at  $\sqrt{s} = 14$  TeV*

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### Professional Experience

Since May 2021 **Senior Research Associate**, Ruđer Bošković Institute, Zagreb, Croatia  
CMS Experiment at the CERN Large Hadron Collider  
Nov. 2015–Apr. 2021 **Research Associate**, Ruđer Bošković Institute, Zagreb, Croatia  
CMS Experiment at the CERN Large Hadron Collider  
Sep. 2011–Oct. 2015 **Postdoctoral Research Associate**, Rutgers, The State University of New Jersey, USA  
CMS Experiment at the CERN Large Hadron Collider  
Jun. 2007–Aug. 2011 **Research Assistant**, University of Maryland, USA  
CMS Experiment at the CERN Large Hadron Collider

Aug. 2006–May 2007 **Teaching Assistant**, University of Maryland, USA  
Physics 121: Fundamentals of Physics I

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## Publications

As a member of the CMS Collaboration, I am a co-author on more than 1000 peer-reviewed articles published in international scientific journals<sup>1</sup>. Below is a list of selected CMS publications to which I made significant contributions.

### Selected Publications

- 2024 CMS Collaboration, “Measurement of simplified template cross sections of the Higgs boson produced in association with W or Z bosons in the  $H \rightarrow b\bar{b}$  decay channel in proton-proton collisions at  $\sqrt{s} = 13$  TeV”, *Phys. Rev. D* **109** (2024) 092011, [arXiv:2312.07562](https://arxiv.org/abs/2312.07562)
- 2023 CMS Collaboration, “Search for a massive scalar resonance decaying to a light scalar and a Higgs boson in the four b quarks final state with boosted topology”, *Phys. Lett. B* **842** (2023) 137392, [arXiv:2204.12413](https://arxiv.org/abs/2204.12413)
- 2021 Ferenčec D., Roguljić M., Starodumov A., “Production, calibration, and performance of the layer 1 replacement modules for the CMS pixel detector”, *Proceedings of The 29th International Workshop on Vertex Detectors (VERTEX2020)*, JPS Conf. Proc. **34** (2021) 010023
- 2020 Roguljić M., Starodumov A., Karadzhinova-Ferrer A., Ferenčec D., Ahmed A. A., Jara-Casas L. M., “Low dose rate  $^{60}\text{Co}$  facility in Zagreb”, *Proceedings of The 28th International Workshop on Vertex Detectors (VERTEX2019)*, PoS Vertex2019 (2020) 066
- 2019 Majer M., Roguljić M., Knežević, Ž., Starodumov A., Ferenčec D., Brigljević V., Mihaljević B., “Dose mapping of the panoramic  $^{60}\text{Co}$  gamma irradiation facility at the Ruder Bošković Institute – Geant4 simulation and measurements”, *Appl. Radiat. Isot.* **154** (2019) 108824
- 2018 CMS Collaboration, “Identification of heavy-flavour jets with the CMS detector in pp collisions at 13 TeV”, *JINST* **13** (2018) P05011, [arXiv:1712.07158](https://arxiv.org/abs/1712.07158)
- 2017 CMS Collaboration, “Search for dijet resonances in proton-proton collisions at  $\sqrt{s} = 13$  TeV and constraints on dark matter and other models”, *Phys. Lett. B* **769** (2017) 520, [arXiv:1611.03568](https://arxiv.org/abs/1611.03568)
- 2016 CMS Collaboration, “Search for narrow resonances in dijet final states at  $\sqrt{s} = 8$  TeV with the novel CMS technique of data scouting”, *Phys. Rev. Lett.* **117** (2016) 3, 031802, [arXiv:1604.08907](https://arxiv.org/abs/1604.08907)
- 2016 CMS Collaboration, “Search for heavy resonances decaying to two Higgs bosons in final states containing four b quarks”, *Eur. Phys. J. C* **76** (2016) 371, [arXiv:1602.08762](https://arxiv.org/abs/1602.08762)
- 2015 CMS Collaboration, “Search for narrow resonances decaying to dijets in proton-proton collisions at  $\sqrt{s} = 13$  TeV”, *Phys. Rev. Lett.* **116** (2016) 7, 071801, [arXiv:1512.01224](https://arxiv.org/abs/1512.01224)
- 2015 CMS Collaboration, “Search for pair-produced vector-like B quarks in pp collisions at  $\sqrt{s} = 8$  TeV”, *Phys. Rev. D* **93** (2016) 112009, [arXiv:1507.07129](https://arxiv.org/abs/1507.07129)
- 2015 CMS Collaboration, “Search for vector-like T quarks decaying to top quarks and Higgs bosons in the all-hadronic channel using jet substructure”, *JHEP* **06** (2015) 080, [arXiv:1503.01952](https://arxiv.org/abs/1503.01952)

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<sup>1</sup>Source: INSPIRE-HEP literature database <https://inspirehep.net>

- 2015 CMS Collaboration, “Search for resonances and quantum black holes using dijet mass spectra in proton-proton collisions at  $\sqrt{s} = 8$  TeV”, *Phys. Rev. D* **91** (2015) 052009, [arXiv:1501.04198](#)
- 2014 CMS Collaboration, “Search for pair-produced resonances decaying to jet pairs in proton-proton collisions at  $\sqrt{s} = 8$  TeV”, *Phys. Lett. B* **747** (2015) 98, [arXiv:1412.7706](#)
- 2013 CMS Collaboration, “Search for narrow resonances and quantum black holes in inclusive and b-tagged dijet mass spectra from pp collisions at  $\sqrt{s} = 7$  TeV”, *JHEP* **01** (2013) 013, [arXiv:1210.2387](#)
- 2011 CMS Collaboration, “Search for First Generation Scalar Leptoquarks in the  $evjj$  Channel in pp Collisions at  $\sqrt{s} = 7$  TeV”, *Phys. Lett. B* **703** (2011) 246, [arXiv:1105.5237](#)
- 2011 CMS Collaboration, “Missing transverse energy performance of the CMS detector”, *JINST* **6** (2011) 09001, [arXiv:1106.5048](#)
- 2011 CMS Collaboration, “Search for Pair Production of First-Generation Scalar Leptoquarks in pp Collisions at  $\sqrt{s} = 7$  TeV”, *Phys. Rev. Lett.* **106** (2011) 201802, [arXiv:1012.4031](#)
- 2007 V. Brigljević et. al., “Study of di-boson production with the CMS detector at LHC”, *J. Phys. G* **34** (2007) N269-N295
- CMS Public Documents<sup>2</sup>
- 2016 CMS Collaboration, “Searches for narrow resonances decaying to dijets in pp collisions at  $\sqrt{s} = 13$  TeV using  $12.9 \text{ fb}^{-1}$ ”, *CMS Physics Analysis Summary* **EXO-16-032**
- 2016 CMS Collaboration, “Identification of double-b quark jets in boosted event topologies”, *CMS Physics Analysis Summary* **BTV-15-002**
- 2016 CMS Collaboration, “Identification of b quark jets at the CMS Experiment in the LHC Run 2”, *CMS Physics Analysis Summary* **BTV-15-001**
- 2015 CMS Collaboration, “Search for Narrow Resonances using the Dijet Mass Spectrum with  $42 \text{ pb}^{-1}$  of pp Collisions at  $\sqrt{s} = 13$  TeV”, *CMS Physics Analysis Summary* **EXO-15-001**
- 2015 CMS Collaboration, “First Results from Dijet Resonance Search using  $37 \text{ pb}^{-1}$  of proton-proton collisions at  $\sqrt{s} = 13$  TeV”, *CMS Detector Performance Summary* **DP-2015-017**
- 2013 CMS Collaboration, “Search for pair-produced vector-like quarks of charge  $-1/3$  in lepton+jets final state in pp collisions at  $\sqrt{s} = 8$  TeV”, *CMS Physics Analysis Summary* **B2G-12-019**
- 2013 CMS Collaboration, “Performance of b tagging at  $\sqrt{s} = 8$  TeV in multijet,  $t\bar{t}$  and boosted topology events”, *CMS Physics Analysis Summary* **BTV-13-001**
- 2013 CMS Collaboration, “Search for Heavy Resonances Decaying into  $b\bar{b}$  and  $bg$  Final States in pp Collisions at  $\sqrt{s} = 8$  TeV”, *CMS Physics Analysis Summary* **EXO-12-023**
- 2012 CMS Collaboration, “Search for b-jet Resonances in pp Collisions at  $\sqrt{s} = 7$  TeV”, *CMS Physics Analysis Summary* **EXO-11-008**
- 2010 CMS Collaboration, “Performance of Missing Transverse Energy Reconstruction in  $\sqrt{s} = 900$  and  $2360$  GeV pp Collision Data”, *CMS Physics Analysis Summary* **JME-10-002**

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<sup>2</sup>Internally reviewed but not published in journals. Available at <https://cdsweb.cern.ch/collection/CMS>

2009 CMS Collaboration, “Offset Energy Correction for Cone Jets”, *CMS Physics Analysis Summary JME-09-003*

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## International Collaborations

Since 2006 CMS Collaboration at CERN

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## Memberships and Other Professional Activities

Since 2024 Croatian representative in the Plenary and Restricted European Committee for Future Accelerators (ECFA)

Since Feb. 2024 Peer review work for *Journal of Physics G* (accredited as IOP Trusted Reviewer)

Since Mar. 2018 Evaluator of yearly project reports for the Croatian Science Foundation

2022 ERC Remote Referee for the ERC-2022-STG call

Mar. 2021–May 2022 Evaluator of yearly project reports at the University of Rijeka

Apr. 2016–Jun. 2021 Member of Croatian Physical Society

Feb. 2011–Apr. 2016 Member of American Physical Society

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## Organization of International Conferences and Workshops

Sep. 30–Oct. 4, 2024 Member of the Organizing Committee for the [LHC Days in Split/Hvar](#) conference, Hvar, Croatia  
Chaired session “BSM: Part 1”

Jul. 14–16, 2023 Member of the Organizing Committee for the [HHH Workshop](#), Dubrovnik, Croatia

Oct. 3–8, 2022 Member of the Organizing Committee for the [LHC Days in Split 2022](#) conference, Split, Croatia

May 30–Jun. 3, 2022 Member of the Local Organizing Committee for the [Higgs Pairs Workshop 2022](#), Dubrovnik, Croatia

Oct. 13–18, 2019 Member of the Local Organizing Committee for [The 28th International Workshop on Vertex Detectors](#), Lopud, Croatia  
Chaired session “Tracking and vertexing”

Apr. 30–May 3, 2019 Member of the Local Organizing Committee for the [Game of Flavours - CMS Heavy Flavour Tagging Workshop 2019](#), Dubrovnik, Croatia  
Chaired session “CMS-only sessions: Infrastructure”

Sep. 17–22, 2018 Member of the Organizing Committee for the [LHC Days in Split 2018](#) conference, Split, Croatia  
Chaired session “Higgs boson physics: Part 2”

Apr. 11–13, 2018 Member of the CMS Organizing Committee for the [CMS Heavy Flavour Tagging Workshop 2018](#), Brussels, Belgium  
Chaired session “Boosted topologies and jet substructure”

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## Talks, Seminars, and Posters

Jul. 31, 2024 “Experimental perspective”, Mini workshop on HHH and other extended scalar sector signatures, Zagreb, Croatia

Feb. 21, 2024 “CMS and NA61 activities in Zagreb”, CROHEP Meeting, Zagreb, Croatia

- Oct. 10, 2020 “Production, calibration and performance of the layer 1 replacement modules for the CMS pixel detector”, Poster at VERTEX 2020: The 29th International Workshop on Vertex Detectors (online)
- Feb. 27, 2020 “Machine Learning in High Energy Physics”, Seminar of the Centre of Research Excellence for Data Science and Advanced Cooperative Systems ACROSS–DataScience, Zagreb, Croatia
- Dec. 9, 2019 “CMS activities in Zagreb”, CROHEP Meeting, Zagreb, Croatia
- Oct. 16, 2018 “Status report for Research Area 4: Multidisciplinary Data Intensive Applications, 4.1 Particle physics and astrophysics”, 3rd International Workshop on Data Science, Zagreb, Croatia
- Oct. 16, 2018 “Usage of Deep Neural Networks to Tag Boosted Higgs Bosons Decaying into Bottom Quarks”, Poster at the 3rd International Workshop on Data Science, Zagreb, Croatia
- Sep. 17, 2018 “Double Higgs boson searches overview”, LHC Days in Split, Split, Croatia
- Apr. 13, 2018 “Status of the double-b tagger”, CMS Heavy Flavour Tagging Workshop 2018, Brussels, Belgium
- Oct. 13, 2017 “Search for Heavy Resonance and Dark Matter Using Jets at the LHC”, Invited Talk at the 10th Meeting of the Scientific Division of the Croatian Physical Society, Baška, Island Krk, Croatia
- Nov. 30, 2016 “Machine Learning in High Energy Physics”, Poster at the First International Workshop on Data Science, Zagreb, Croatia
- Jul. 19, 2016 “Identification of b jets in boosted event topologies with CMS”, BOOST2016, Zürich, Switzerland
- Apr. 15, 2015 “Multijet Searches at the LHC: Run 1 Highlights and Prospects for Run 2”, UMD HEP Seminar, College Park, MD, USA
- Nov. 5, 2014 “Boosted Higgs and b-tagging and other tools/techniques”, BSM Higgs Workshop @ LPC, Fermilab, USA
- Aug. 19, 2014 “CMS b and quark/gluon tagging”, BOOST2014, University College London, London, UK
- Oct. 3 and 24, 2013 “b Tagging in Boosted Event Topologies (Parts I and II)”, High Energy Experimental Seminar, Rutgers, The State University of New Jersey, Department of Physics & Astronomy, Piscataway, NJ, USA
- Sep. 26, 2013 “Top/Higgs Tagging at the LHC”, LPC Workshop on Exotic Top Partners, Fermilab, USA
- Nov. 12, 2012 “LHC Searches with Jets and Photons”, Chicago 2012 Workshop on LHC Physics, Chicago, IL, USA
- Sep. 6, 2012 “Search for Physics Beyond the Standard Model in Fully Hadronic Final States with the CMS Detector at the LHC”, Division of Experimental Physics Seminar, Ruđer Bošković Institute, Zagreb, Croatia
- Jul. 11, 2012 “Latest Exotica Results with Jets in the Final State from the CMS Experiment”, Santa Fe 2012 Summer Workshop “LHC Now”, Santa Fe, NM, USA
- Mar. 19, 2012 “Hadronic Exotica Searches at CMS”, SEARCH Workshop, College Park, MD, USA
- Jun. 9, 2011 “Search for Pair Production of First-Generation Scalar Leptoquarks with the CMS Experiment at CERN”, High Energy Physics Seminar, Johns Hopkins University, Department of Physics & Astronomy, Baltimore, MD, USA

- May 31, 2011 “Search for Pair Production of First-Generation Scalar Leptoquarks with the CMS Experiment at CERN”, High Energy Experimental Seminar, Rutgers, The State University of New Jersey, Department of Physics & Astronomy, Piscataway, NJ, USA
- May 1, 2011 “Search for Pair Production of First-Generation Scalar Leptoquarks in pp Collisions at  $\sqrt{s} = 7$  TeV”, APS Apr. Meeting, Anaheim, CA, USA
- Oct. 30, 2010 “Results of a Search for Pair Production of First-Generation Scalar Leptoquarks in pp Collisions at  $\sqrt{s} = 7$  TeV”, USLUO Annual Meeting, Fermilab, USA

## Grants and Awards

- Sep. 18, 2023–Sep. 17, 2027 Member of the [COST Action CA22130 - Comprehensive Multiboson Experiment-Theory Action \(COMETA\)](#) and the substitute Croatian representative in the action’s Management Committee
- May 2019–Mar. 2023 Mentor on a Croatian Science Foundation PhD grant DOK-01-2018 “Projekt razvoja karijera mladih istraživača - izobrazba novih doktora znanosti”, PhD student: Saswat Mishra
- Jun. 2017–Aug. 2022 Associate on the Croatian Science Foundation grant IP-2016-06-3321 “Hundred twenty five Megapixels to discover Fermionic Higgs couplings and New Particles at the Large Hadron Collider”, Primary investigator: dr. sc. Vuko Brigljević
- Dec. 17, 2019 Together with colleagues Benjamin Mesić, Tatjana Šuša and Vuko Brigljević among the recipients of the Ruđer Bošković Institute’s yearly award for the best scientific papers in 2018 for the publication of “Observation of Higgs boson decay to bottom quarks”, *Phys. Rev. Lett.* **121** (2018) 12, 121801, [arXiv:1808.08242](#)
- May 3, 2019 Financial support of the Croatian Ministry of Science and Education for applications to competitive projects based on the application to the H2020-MSCA-IF-2018 call (Total amount: 25 000 HRK)
- 2017–2018 Received [Cogito](#) (French-Croatian Hubert Curien Partnership Programme) grant for 2017–2018. Project title: “**ABC**: Advance **B** tagging in **CMS**”
- Apr. 25, 2018 Financial support of the Croatian Ministry of Science and Education for applications to competitive projects based on the application to the H2020-MSCA-IF-2017 call (Total amount: 40 000 HRK)
- Mar. 5, 2018 Awarded the Seal of Excellence for a proposal submitted under the Horizon 2020’s Marie Skłodowska-Curie Actions call H2020-MSCA-IF-2017 (Total score: 92.80%)
- Oct. 2017 Received [NVIDIA GPU Grant](#) (Titan Xp graphics card for development of b tagging algorithms based on modern machine learning techniques)
- Apr. 24, 2017 Financial support of the Croatian Ministry of Science and Education for applications to competitive projects based on the application to the H2020-MSCA-IF-2016 call (Total amount: 25 624 HRK)
- Apr. 24, 2017 Awarded the Seal of Excellence for a proposal submitted under the Horizon 2020’s Marie Skłodowska-Curie Actions call H2020-MSCA-IF-2016 (Total score: 89.20%)
- Apr. 2011 DPF Student Travel Award for the APS Apr. Meeting
- Oct. 2007 Received honorable mention for the Ralph Myers Teaching Award for excellence in teaching in the 2006-2007 academic year
- 2002–2006 Croatian Ministry of Science, Education and Sports Scholarship for exceptional students
- 2005 CERN Summer Student Programme Scholarship of the Croatian Ministry of Science, Education and Sports

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## Schools and Workshops

- Jun. 14–18, 2021 Attended 8th Thematic CERN School of Computing held online, theme of the school was *Scientific Software for Heterogeneous Architectures*
- Sep. 25–29, 2017 Attended 2nd International Summer School on Data Science (SSDS 2017) in Split, Croatia
- Jul. 18–22, 2016 Attended BOOST2016: 8th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in Zürich, Switzerland
- Aug. 10–14, 2015 Attended BOOST2015: 7th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in Chicago, IL, USA
- Aug. 18–22, 2014 Attended BOOST2014: 6th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in London, UK
- Aug. 11–16, 2013 Attended BOOST2013: 5th International Workshop on Boosted Object Phenomenology, Reconstruction and Searches in Flagstaff, AZ, USA
- Aug. 8–16, 2008 Attended CTEQ-MCnet Summer School on QCD Phenomenology and Monte Carlo Event Generators in Debrecen, Hungary
- Summer 2005 CERN Summer Student

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## Teaching, Supervising and Mentoring

- 2018, 2020, 2022, 2024 Lectured chapter “Introduction to MVA Methods” as part of the [Methods of Statistical Analysis and Pattern Recognition with Applications in Particle Physics](#) course for PhD students at the University of Zagreb (lecturer in charge: Assoc. prof. Vuko Brigljević)
- Jun. 2019–Mar. 27, 2023 Mentored Ph.D. student Saswat Mishra  
Ph.D. thesis: [Measurement of the cross section for associated production of the Higgs boson and an electroweak boson in final states with two b quarks and two leptons in proton proton collisions at the Large Hadron Collider](#)
- Fall 2021 As part of the “Fall student projects in the Division of Experimental Physics at RBI”, mentored undergraduate student Lovro Dulibić with the project “Triple Higgs boson production at the Large Hadron Collider”
- Fall 2021 As part of the “Fall student projects in the Division of Experimental Physics at RBI”, together with Tatjana Šuša co-mentored undergraduate student Nora Miljanić with the project “CMS Pixel Detector”
- Sep. 24, 2021 Mentored Lara Čalić, **mag. phys.**, Department of Physics, University of Rijeka  
Diploma thesis: [Triple Higgs boson production at the Large Hadron Collider](#)
- Nov. 2017–Sep. 2020 Mentored Ph.D. student Matej Roguljić (due to a stronger involvement in the analysis, mentorship transferred to a laboratory colleague Devdatta Majumder; remained as an unofficial co-mentor until Matej’s defense in Aug. of 2022)
- Fall 2018 As part of the “Fall student projects in the Division of Experimental Physics at RBI”, mentored undergraduate student Juraj Ovčar with the project “Study of the passage of an ion beam through the Token Bit Manager of the CMS pixel detector module ([Studija prolaska snopa iona kroz Token Bit Manager modula CMS piksel detektora](#))”
- Fall 2017 As part of the “Fall student projects in the Division of Experimental Physics at RBI”, together with Andrey Starodumov co-mentored undergraduate student Arian Iveć with the project “Study of the properties of the Readout Chip of the CMS pixel detector ([Proučavanje svojstava Readout Chipa CMS piksel detektora](#))”

- Jul. 14, 2017 Mentored Matej Roguljić, **mag. phys.**, Department of Physics, Faculty of Science, University of Zagreb  
Diploma thesis: [Development of an algorithm for identification of boosted Higgs bosons decaying in two b quarks using the upgraded CMS pixel detector](#)
- Jul. 8, 2016 Mentored Lucija Bajan, **mag. phys.**, Department of Physics, Faculty of Science, University of Zagreb  
Diploma thesis: [Search for dijet resonances at masses below 1 TeV in proton-proton collisions at a center-of-mass energy of 13 TeV at the Large Hadron Collider](#)
- 2011–2015 As a postdoc at Rutgers University, supervised on a daily basis several undergraduate and PhD students

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## Media and Outreach

- Feb. 20 and 22, 2024 Mentor and lecturer at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- Nov. 3, 2023 Mentor and lecturer at a special “CMS Masterclass” outreach event organized for high school physics teachers at Ruđer Bošković Institute, Zagreb
- Oct. 25, 2023 Member of the physics round table at WISe (WorkIn’ Science) job fair organized at the Faculty of Science, University of Zagreb
- May 9, 2023 Mentor and lecturer at a special “CMS Masterclass” outreach event organized for high school physics teachers at Ruđer Bošković Institute, Zagreb
- Mar. 21 and 22, 2023 Mentor and lecturer at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held at Ruđer Bošković Institute, Zagreb. Featured in the Croatian Radiotelevision’s central news on Mar. 22, 2023
- Mar. 15 and 17, 2022 Mentor and lecturer at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- Nov. 30, 2021 Appearance in the TV show “Znanstveni krugovi”, Croatian Radiotelevision (Hrvatska radiotelevizija)
- Jun. 28, 2020 Statement for the newspaper article “[Superudarač od 100 km](#)” in Večernji list
- Mar. 2 and 4, 2020 Mentor and lecturer at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- Apr. 16–19, 2019 Co-organized and guided a visit of Zagreb physics students to CERN
- Feb. 25 and Mar. 11, 2019 Mentor and lecturer at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- Oct. 29, 2018 Guest in the radio show “Okrugli stol ponedjeljkom”, Croatian Radio 3 (Hrvatski radio 3)
- Oct. 10, 2018 Guest in the radio show “Drag mi je Platon”, Croatian Radio 1 (Hrvatski radio 1)
- Oct. 9, 2018 Appearance in the TV show “Znanstveni krugovi”, Croatian Radiotelevision (Hrvatska radiotelevizija)
- May 8, 2018 Live video interview from CMS Control Room at the LHC Point 5 with students from Stjepan Radić Elementary School in Brestovec Orehovički, Croatia
- Mar. 19, 2018 Mentor at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held in [Prva gimnazija Varaždin](#), Varaždin
- Feb. 20, 2018 Mentor and lecturer at the “[International Masterclasses – Hands on Particle Physics](#)” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- Oct. 7, 2017 Panel speaker at the symposium organized as part of the contemporary art [Touch Me Festival 2017: The Invisible Around Us](#) held in Zagreb



- Apr. 27–28, 2017 Guided Zagreb physics students during their visit to CERN
- Apr. 27, 2017 Appearance in the TV show “Treći element: Dimenzije prostora i materije”, Croatian Radiotelevision (Hrvatska radiotelevizija)
- Apr. 3, 2017 Mentor and lecturer at the “International Masterclasses – Hands on Particle Physics” outreach event for high school students hosted by Biskupijska klasična gimnazija Ruđera Boškovića s pravom javnosti at the University of Dubrovnik, Dubrovnik
- Mar. 24, 2017 “The dark side of the starry sky (and can LHC shed some light on it) [Tamna strana zvjezdanog neba (i može li nam ju LHC rasvijetliti)]”, Virovitica Town Library (Gradska knjižnica i čitaonica Virovitica), Virovitica
- Mar. 24, 2017 Mentor and lecturer at the “International Masterclasses – Hands on Particle Physics” outreach event for high school students held in Gimnazija Petra Preradovića, Virovitica
- Mar. 10 and 31, 2017 Mentor and lecturer at the “International Masterclasses – Hands on Particle Physics” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- May 14, 2016 “The dark side of the starry sky and how can LHC shed some light on it (Tamna strana zvjezdanog neba i kako nam ju LHC može obasjati)”, Open Days at Ruđer Bošković Institute, Zagreb
- Mar. 25, 2016 “Busy bees”, Fermilab at Work
- Mar. 14, 2016 Mentor and lecturer at the “International Masterclasses – Hands on Particle Physics” outreach event for high school students held in Gimnazija Požega, Požega
- Feb. 19, 2016 Mentor and lecturer at the “International Masterclasses – Hands on Particle Physics” outreach event for high school students held at Ruđer Bošković Institute, Zagreb
- Feb. 15, 2016 “Looking for signs: dijet resonances”, Fermilab at Work
- Nov. 23–24, 2015 Guided Zagreb physics students during their visit to CERN
- Apr. 2, 2015 “Dinko Ferencek (Ph.D. ’11, Physics) Talks Particle Physics”, UMD CMNS News
- Jan. 30, 2015 “One measurement, many implications”, Fermilab Today, Frontier Science Result: CMS
- Jan. 17, 2013 “A Search for ‘God particle’: A Story of Unification”, Croatian Hour, Embassy of the Republic of Croatia, Washington, DC, USA
- Feb. 25, 2011 “First supersymmetry results from the LHC”, Fermilab Today, CMS Result
- Feb. 11, 2011 “CMS joins the hunt for leptoquarks”, Fermilab Today, CMS Result of the Month
- Apr. 29, 2010 Guided Croatian physics students during their visit to the CMS Analysis Center at CERN
- Jun. 19, 2009 “Welcome o CERN” presentation for a group of mechanical engineering students from Zagreb visiting CERN
- May 1, 2009 Guided Zagreb physics students during their visit to the CMS detector at CERN

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## Computer Skills

Operating Systems	Experience with administration of Linux and Microsoft Windows operating systems
Office Automation	L <sup>A</sup> T <sub>E</sub> X, LibreOffice/OpenOffice, Microsoft Office
Programming Languages	C/C++, Python, knowledge of Fortran at the reading level, comfortable with shell scripting
Version Control	Experience with CVS, SVN, and Git
Analysis Tools and Packages	ROOT, RooFit, TMVA, Mathematica

Batch Systems	Experience with Condor and LSF
Event Generators	Experience with Pythia and MadGraph event generators
CMS Software Tools	Extensive experience with CMSSW, CRAB, and PAT

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## Languages

Croatian	Native
English	Full professional proficiency

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## CMS-related Experience

ARC Duties	<p>Served as an ARC member for HIN-12-003, EXO-12-042, JME-13-002, EXO-13-008, B2G-14-002, HIN-14-007, B2G-14-001, JME-14-002, HIN-15-012, B2G-16-003 (ARC Chair), JME-16-003, EXO-16-045 (ARC Chair), B2G-17-009, EXO-17-011, B2G-17-004 (ARC Chair), EXO-17-019, HIN-18-002, FTR-18-004, EXO-18-011, HIG-18-027, TOP-18-012, SMP-18-013, HIG-19-017, B2G-19-005, B2G-19-002 (ARC Chair), B2G-20-011 (ARC Chair), TOP-22-010</p> <ul style="list-style-type: none"> <li>○ As part of the HIN-12-003 review, proposed a novel trigger combination algorithm that minimizes the statistical uncertainties for data collected using several prescaled triggers. The algorithm has later been used in HIN-14-007 and HIN-15-012</li> </ul>
Editorial Duties	Served as the editor for the combined EXO-11-094 + EXO-11-008 <a href="#">paper</a>
CWR Institutional Reviews	Contributed to the Institutional Review of HIG-11-027, BTV-12-001, EXO-12-016, BPH-13-004, HIG-13-004, HIG-13-021, SUS-13-019, HIG-13-024, EXO-12-053, B2G-16-013, HIN-16-006, B2G-17-005, EXO-19-004, SUS-19-013, B2G-21-004
Since Oct. 2020	Serving as a L3 co-convenor of the Pixel Calibration & Local Reconstruction group
Since Jun. 2019	Involved in a measurement of the VHbb process using the full Run 2 data (HIG-20-001)
Jul. 2017–Sep. 2020	Involved in quality assurance of CMS pixel modules with the goal of building and testing modules for a replacement of the innermost layer of the Phase-1 CMS pixel detector. Work done in close collaboration with colleagues from Paul Scherrer Institute, ETH Zürich and Helsinki Institute of Physics.
Jan. 2015–Mar. 2020	Served as RECO and PAT contact for the BTV POG
Oct. 2016–Dec. 2019	<p>Served as EOS space manager for the Exotica PAG</p> <ul style="list-style-type: none"> <li>○ Developed a set of software tools for managing the EXO EOS space at CERN (<a href="https://gitlab.cern.ch/ferencek/ExoEosTools">https://gitlab.cern.ch/ferencek/ExoEosTools</a>)</li> </ul>
Dec. 2018–Oct. 2019	<p>Involved in the design, construction and operation of a test setup built at the <math>^{60}\text{Co}</math> irradiation facility at RBI for low dose-rate irradiation of the RD53A readout chip prototype for pixel detectors at the HL-LHC. Work done in close collaboration with colleagues from CERN.</p> <ul style="list-style-type: none"> <li>○ Proposed the original idea of developing a simulation of the <math>^{60}\text{Co}</math> irradiation facility based on the Geant4 package that was extensively used in the design phase of the test setup. The simulation was validated against experimental measurements of the absorbed dose using ethanol-chlorobenzene dosimeters</li> <li>○ One of my main tasks was the design and construction of an uninterrupted dry air supply for the test setup</li> </ul>

- Sep. 2012–Jun. 2019. Made key contributions to the development and commissioning of subset b tagging used in Higgs and top tagging algorithms employed in searches for new physics in boosted event topologies. Also made key contributions to the development and commissioning of double-b tagging algorithm used for Higgs tagging.
- Mar. 2018–Apr. 2019. Participated in several beam test campaigns at the Tandem Van de Graaff accelerator at RBI to study single event upsets in the Token Bit Manager chip of the CMS pixel detector module
- Developed software tools for running the data acquisition chain and catching single event upsets (<https://gitlab.cern.ch/CMS-IRB/PixelTools>)
- May 2016–Nov. 2018. Served as a Pixel Tracker Detector On-Call (Pixel DOC) expert shifter
- Jul. 2014–Jun. 2017. Involved in a search for dijet resonances in pp collisions at  $\sqrt{s} = 13$  TeV
- Jan. 2016–Aug. 2016. Served as a L3 co-convenor of the Exotica Jets+X Working Group (successor of the Multijets Working Group)
- Oct. 2014–Dec. 2015. Served as a L3 co-convenor of the Exotica Multijets Working Group
- Apr. 2012–Jul. 2016. Maintained a “bump hunt” limit setting tool used in Exotica dijet analyses for setting Bayesian upper limits (more information available at <https://twiki.cern.ch/twiki/bin/view/CMS/DijetLimitCode>)
- Jul. 2015. Prepared and led the *b*-tagging HATS@LPC held at Fermilab, USA
- Jan. 2015. Prepared and led the *b* tagging and *EXO Dijet Resonances* exercises at the *CMS Data Analysis School 2015* held at Fermilab, USA
- Jan. 2013–Dec. 2014. Served as a L3 co-convenor of the BTV POG Algorithms and Software Subgroup
- Maintained b-tagging software framework and documentation, served as RECO and PAT contact and was in charge of code integration
  - Contributed to studies of the b-tagging performance in the context of CMS detector upgrades for the HL-LHC
  - Made key contributions to the rewriting of the b-tagging software framework as part of the CMS preparations for LHC Run 2, making it possible to run b-tagging algorithms from a reduced event data format and retaining the same level of flexibility as in Run 1
  - Developed jet flavor definition based on the *ghost association* of generator-level hadrons/partons to reconstructed jets which is now the default jet flavor definition at CMS (more information available at <https://twiki.cern.ch/twiki/bin/view/CMSPublic/SWGuideBTagMCTools>)
  - Wrote extensive documentation on applying b-tagging efficiency scale factors to simulated events (more information available at <https://twiki.cern.ch/twiki/bin/viewauth/CMS/BTagSFMethods>)
- Sep. 2012–Sep. 2013. Involved in a search for vector-like bottom quark partners in single-lepton final states (B2G-12-019)
- Aug. 2012–Dec. 2014. Involved in a search for paired dijets (EXO-12-052)
- Dec. 2011–Dec. 2013. Served as a b-tagging object expert for the Exotica PAG and an Exotica PAG contact person for the BTV POG

- Sep. 2011–Apr. 2013 Designed and carried out a search for b-jet resonances in pp collisions at  $\sqrt{s} = 7$  TeV (EXO-11-008) and remained involved in a related search at  $\sqrt{s} = 8$  TeV (EXO-12-023)
- Jan. 2011 Prepared and led the *MET and High-MET Event Scan Exercise* at the *CMS Data Analysis School 2011* held at Fermilab, USA
- 2009–2011 Involved in a search for pair production of first-generation scalar leptoquarks in *eejj* and *eνjj* channels
- Actively contributed to development of software analysis tools
  - Acquired extensive experience with the Physics Analysis Toolkit (PAT)
  - Experience with producing private Monte Carlo samples and preparing generator card files for the official Monte Carlo production
  - Experience with all steps of the analysis, from ntuple making to producing final limit plots
  - Performed optimization of the final event selection criteria
  - Presented [pre-approval talk](#) for the *eνjj* channel analysis
- 2010–2011 Involved in a scan of high-MET events
- From Jan. to May 2011, coordinated a high-MET event scan effort within the MET Working Group (more information available at <https://twiki.cern.ch/twiki/bin/view/CMS/MissingETScanners>)
- Nov. 2009–Sep. 2010 Developed and maintained a JetMET history DQM tool (more information available at <https://twiki.cern.ch/twiki/bin/view/CMS/JetMETHistoryDQM>)
- Feb. 2009–Jul. 2010 Based at CERN performing the following HCAL service work activities:
- Responsible for HCAL pedestal tuning
  - Worked on HCAL DQM code development
  - HCAL test beam 2009: worked on wire chamber calibration and was in charge of setting up the test beam DQM (<https://twiki.cern.ch/twiki/bin/view/CMS/TestBeam2009>, <https://indico.cern.ch/event/65028/contribution/2/material/slides/0.pdf>)
  - During the last 12 months at CERN served as one of the on-call HCAL operations experts
  - During the last 4 months at CERN served as one of the HCAL Prompt Feedback Group contacts
  - In Jun. 2010, served as an HCAL Operations Coordinator
  - Within the HCAL Noise Task Force, worked as one of the main developers of the HF noise cleaning algorithms later included in the standard event reconstruction
- Late 2009–Early 2010 Contributed to MET commissioning studies with first collision data at  $\sqrt{s} = 900$  and 2360 GeV
- Aug. 2009–End of 2009 Worked on DataMixer validation (more information available at <https://twiki.cern.ch/twiki/bin/view/CMS/DataMixerValidation>)
- Summer 2008–End of 2009 Worked on the offset (L1) jet energy correction (more information available at <https://twiki.cern.ch/twiki/bin/view/CMS/OffsetCorrection>)
- Presented [pre-approval](#) and [approval](#) talks for the JME-09-003 analysis

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Last updated: October 23, 2024