



Reza Goldouzian

Curriculum Vitae

Main research interests

Direct and indirect searches for new phenomena at the LHC.
Simulations of the CMS hadronic calorimeter and tracker.
Collider phenomenology and reinterpretation of LHC results.

Current position

09/2021-now **Assistant Research Professor of Physics, University of Notre Dame, Indiana, US.**

Previous positions

09/2018-09/2021 **Postdoctoral Researcher, University of Notre Dame, Indiana, US.**

09/2015-09/2018 **Postdoctoral Researcher, Université Libre de Bruxelles, Brussels, Belgium (IIHE - Interuniversity Institute for High Energies (ULB-VUB)).**

Awards & Honors

2013 **CMS Fundamental Physics Special Recognition Award.**

Grants

2018 **DESY fellowship, Deutsches Elektronen-Synchrotron DESY, Germany, [Declined].**

2018 **FNRS Chargée de Recherche, Université Libre de Bruxelles, Belgium, [Declined].**

Leadership and responsibilities

2019-2021 **Convener of the top EFT subgroup, Coordination of a CMS TOP subgroup dedicated to the Effective Field Theory (EFT) interpretation of top-quark measurements, –a Level-3 management role in the experiment.**

2019-2020 **EFT contact of the CMS top group.**

2018-now **Simulation validation contact of the CMS phase-2 tracker trigger group.**

2017-2020 **Electron/photon contact and expert of the CMS Exotica group.**

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- 2015-2017 **Monte Carlo generation contact and expert of the CMS TOP group.**
2014-now **Fastsim calorimeter contact and expert of the CMS Fastsim group.**

University diploma

- 2010-2015 **Doctorate in Sciences - Particle Physics**, *School of Particles and Accelerators, Institute for Research in Fundamental Science (IPM), Tehran, Iran.*
Thesis title: *Search for anomalous single top quark production in association with a photon in pp collisions at $\sqrt{s} = 8$ TeV.*
Grade: Excellent.
- 2007-2009 **Master in Physics**, *Tarbiat Moallem University of Tehran, Tehran, Iran.*
- 2003-2007 **Bachelor in Physics**, *University of Tabriz, Tabriz, Iran.*

Mentoring experience

- 2016-2019 **Co-supervisor of a PhD student**, *Wenxing Fang*, from Université Libre de Bruxelles (Belgium) and Beihang University (China).
- 2016-2019 **Co-supervisor of a PhD student**, *Xuyang Gao*, from Université Libre de Bruxelles (Belgium) and Beihang University (China).
- 2011-2013 **Co-supervisor of a master student**, *Sepideh Kheirkhah*, from Tarbiat Moallem University (Iran).

Publications within the CMS collaboration

As a member of the CMS collaboration I have indirect contributions to more than 700 publications [INSPIRE]. In order to highlight my work within the experiment, here is the list of publications to which I made significant contributions. For CMS, the Physics Analysis Summaries (PAS) are treated as publications with a full editorial committee.

1. CMS Collaboration, "*Search for baryon number violation in top quark production and decay in proton-proton collisions at $\sqrt{s} = 13$ TeV*", CADI TOP-22-003, Under review, to be submitted to PRL, [main author].
2. CMS Collaboration, "*Search for new physics in top quark production with additional leptons in CMS Run II proton-proton collisions at $\sqrt{s} = 13$ TeV using effective field theory*", CADI TOP-22-006, Under review, to be submitted to JHEP, [co-author].
3. CMS Collaboration, "*Search for resonant and nonresonant new phenomena in high-mass dilepton final states at $\sqrt{s} = 13$ TeV*", CMS PAS EXO-19-019, arXiv:2103.02708, JHEP 07 (2021) 208, [main author].
4. CMS Collaboration, "*Search for lepton-flavor violating decays of heavy resonances and quantum black holes to $e\mu$, $e\tau$ and $\mu\tau$ final states in proton-proton collisions at $\sqrt{s} = 13$ TeV*", CMS PAS EXO-19-014, arXiv: 2205.06709 , submitted to JHEP, [co-author].

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5. CMS Collaboration, "Search for charged lepton flavor violation in top-quark production and decay in proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS PAS TOP-19-006, arXiv:2201.07859, accepted by JHEP, [main author].
6. CMS Collaboration, "Search for new physics in top quark production with additional leptons in proton-proton collisions at $\sqrt{s} = 13$ TeV using effective field theory", CMS PAS TOP-19-001, arXiv:2012.04120, JHEP 03 (2021) 095 [co-author].
7. CMS Collaboration, "Search for high mass resonances in the dielectron final state", CMS PAS EXO-18-006 (2018), [main author].
8. CMS Collaboration, "Search for new physics in top quark production in dilepton final states in proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS PAS TOP-17-020, arXiv:1903.11144, Eur.Phys.J.C 79 (2019) 11, [main author].
9. CMS Collaboration, "Search for lepton flavour violating decays of heavy resonances and quantum black holes to $e\mu$ pairs in proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS PAS EXO-16-058, arXiv:1802.01122, JHEP 04 (2018) 073, [co-author].
10. CMS Collaboration, "Search for high-mass resonances in the dilepton final state using proton-proton collisions at $\sqrt{s} = 13$ TeV", CMS PAS EXO-16-047, arXiv:1803.06292, JHEP 06 (2018) 120, [main author].
11. CMS Collaboration, "Search for a high-mass resonance decaying into a dilepton final state in pp collisions at $\sqrt{s} = 13$ TeV", CMS PAS EXO-16-031 (2016) [main author].
12. CMS Collaboration, "Search for narrow resonances in dilepton mass spectra in proton-proton collisions at $\sqrt{s} = 13$ TeV and combination with 8 TeV data", CMS PAS EXO-15-005, arXiv:1609.05391, Physics Letters B 768 (2017) 57, [co-author].
13. CMS Collaboration, "Search for anomalous single top quark production in association with a photon in pp collisions at $\sqrt{s} = 8$ TeV", CMS PAS TOP-14-003, arXiv: 1511.03951, JHEP 04 (2016) 035, [main author].

Publications outside the CMS collaboration (phenomenological studies)

1. R. Goldouzian, J. Han Kim, K. Lannon, A. Martin, K. Mohrman, A. Wightman, "Matching in $pp \rightarrow t\bar{t}W/Z/h + \text{jet}$ SMEFT studies", arXiv:2012.06872, JHEP 06 (2021) 151, [co-author].
2. R. Goldouzian, M. Hildreth, "LHC dijet angular distributions as a probe for the dimension-six triple gluon vertex", arXiv:2001.02736, Phys.Lett.B 811 (2020), [main author].
3. B. Clerbaux, W. Fang, A. Giammanco, R. Goldouzian, "Model-independent constraints on the CKM matrix elements $|V_{td}|$, $|V_{ts}|$ and $|V_{tb}|$ ", arXiv:1807.07319, JHEP 03 (2019) 022, [main author].
4. R. Goldouzian, B. Clerbaux, "Photon initiated single top quark production via flavor-changing

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- neutral currents at the LHC*", arXiv:1609.04838, Phys. Rev. D 95, (2017) 054014, [main author].
5. R. Goldouzian, "*Search for top quark flavor changing neutral currents in same-sign top quark production*", arXiv:1408.0493, Phys. Rev. D 91, (2015) 014022, [only author].
 6. M. Ghasemkhani, R. Goldouzian, H. Khanpour, M. Khatiri, M. Mohammadi, "*Higgs production in e^-e^+ collisions as a probe of noncommutativity*", arXiv:1407.3167, PTEP (2014) 081B01, [co-author].
 7. R. Goldouzian, M.H. Majles Ara, "*Induced focusing due to counter-propagation of a pair of bright and dark optical beams in self-defocusing Kerr media*", Optik - International Journal for Light and Electron Optics. V 122, Issue 21 (2011), [main author].

Articles published in conference proceedings

1. R. Goldouzian on behalf of the ATLAS and CMS collaborations, "*Searches for new resonances in dijet and dilepton final states with the ATLAS and CMS detectors*", proceedings, 53rd Rencontres de Moriond 2018: QCD and High Energy Interactions [Moriond/QCD2018] (2018).
2. R. Goldouzian, B. Clerbaux, "*Search for anomalous $tq\gamma$ FCNC Couplings in direct single top quark production at the LHC*", arXiv:1612.01795, proceedings, 9th International Workshop on Top Quark Physics [TOP 2016] (2016).
3. R. Goldouzian on behalf of the CDF, D0, ATLAS and CMS collaborations, "*Search for FCNC in top quark production and decays*", arXiv:1412.2524, proceedings, 7th International Workshop on Top Quark Physics [TOP2014] (2014).
4. R. Goldouzian for the CMS Collaboration, "*Search for anomalous single top quark production in association with a photon in pp collisions at $\sqrt{s}=8$ TeV*", proceedings, 37th International Conference on High Energy Physics [ICHEP] (2014).

Selected oral presentations

1. R. Goldouzian on behalf of the CMS Collaborations, "*EFT interpretations in top quark events in CMS*", ICHEP2022: 41st International Conference on High Energy Physics, Bologna, Italy, July 6-13 (2022).
2. R. Goldouzian on behalf of the ATLAS and CMS Collaborations, "*Results on rare and BSM top quark interactions*", EPS-HEP2021: European Physical Society Conference on High Energy Physics, 26-30 Jul 2021, online, July 26-30 (2021).
3. R. Goldouzian on behalf of the CMS Collaboration, "*Top EFT Interpretations describing CMS results*", LCWS2021: International Workshop on Future Linear Colliders, online, March 15-18 (2021).
4. R. Goldouzian, "*Overview of SMEFT searches with Flavour Violation*", CMS Workshop on Top Quark Physics, online, December 7-9 (2020).
5. R. Goldouzian on behalf of the ATLAS and CMS Collaborations, **plenary talk at the conference**, "*Top properties and anomalous couplings*", TOP2019: 12th International Workshop on Top Quark Physics, Beijing, China, Sep 22-27 (2019).

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6. [R. Goldouzian](#) on behalf of the ATLAS and CMS Collaborations, **Parallel talk at the conference**, "*EFT interpretations of top quark measurements at the LHC*", LHCP2019: 7th Conference of Large Hadron Collider Physics, Puebla, Mexico, May 20-25 (2019).
7. [R. Goldouzian](#), **plenary talk at the CMS week**, "*EFT interpretations using top quarks*", Physics Plenary Session, CMS week, CERN, February 4-8 (2019).
8. [R. Goldouzian](#) on behalf of the CMS Collaboration, **plenary talk at the conference**, "*Searches for exotic physics at CMS*", QCD 18: 21st International Conference in Quantum Chromodynamics, Montpellier, France, July 2-6 (2018).
9. [R. Goldouzian](#) on behalf of the ATLAS and CMS Collaborations, **plenary talk at the conference**, "*Searches for new resonances (lepton, jets) at ATLAS and CMS*", 53rd Rencontres de Moriond 2018: QCD and High Energy Interactions (Moriond/QCD2018), La Thuile, Italy, March 17-24 (2018).
10. [R. Goldouzian](#), "*High mass Z' search in ee channel*", CMS Exotica Workshop 2017, Brussels, Belgium, November 30 – December 2 (2017).
11. [R. Goldouzian](#), "*Search for new physics via single top quark production*", CMS Workshop on Top Quark Physics, CERN, November 14-15 (2017).
12. [R. Goldouzian](#) on behalf of the ATLAS and CMS collaborations, **plenary talk at the conference**, "*Single Top Quark Properties Measurements*", 10th International Workshop on Top Quark Physics, TOP2017 Braga, Portugal, September 17-22 (2017).
13. [R. Goldouzian](#) on behalf of the ATLAS and CMS collaborations, **plenary talk at the conference**, "*ATLAS and CMS top measurements and re-use for constraining BSM*", (Re)interpreting the results of new physics searches at the LHC, CERN, December 12-14 (2016).
14. [R. Goldouzian](#), "*The Di-boson excitement at the LHC*", Fundamental interactions: at the boundary of theory, phenomenology and experiment, Louvain-la-Neuve, Belgium, June 17 (2016).
15. [R. Goldouzian](#), "*Discussion about signal modeling and MC*", 3rd CMS Single Top Workshop, Strasbourg, France, June 2-3 (2016).
16. [R. Goldouzian](#) on behalf of the CDF, D0, ATLAS and CMS collaborations, **plenary talk at the conference**, "*Search for FCNC in top quark production and decays*", 7th International Workshop on Top Quark Physics, TOP2014 Cannes, France, July 2-9 (2014).
17. [R. Goldouzian](#), "*Search for FCNC in single top and photon production*", 1st CMS Single-Top Workshop, Napoli, Italy, December 19-20 (2014).
18. [R. Goldouzian](#) on behalf of the CMS Collaboration, "*Search for flavour changing neutral current in top quark events in pp collisions*", Second IPM Meeting on LHC Physics, Tehran, Iran, October 7-11 (2013).

Internal peer reviewer for CMS analyses

- 2022 **CMS Collaboration**, *Search for a heavy resonance decaying into a top quark and a W boson at $\sqrt{s} = 13$ TeV*, HIG-20-002 , under review.
- 2020 **CMS Collaboration**, *Search for a standard model-like Higgs boson in the mass range between 70 and 110 GeV in the diphoton final state in proton-proton collisions at $\sqrt{s} = 13$ TeV*, HIG-20-002 , under review.
- 2019 **CMS Collaboration**, *Search for an excited lepton that decays via a contact interaction to a lepton and two jets in proton-proton collisions at $\sqrt{s} = 13$ TeV*, EXO-18-013, JHEP 05 (2020) 052.

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- 2018 **CMS Collaboration**, *Search for excited leptons in $\ell\ell\gamma$ final states in proton-proton collisions at $\sqrt{s} = 13$ TeV*, EXO-18-004, JHEP 04 (2019) 015.
- 2017 **CMS Collaboration**, *Measurements of $t\bar{t}$ differential cross sections in proton-proton collisions at $\sqrt{s} = 13$ TeV using events containing two leptons*, TOP-17-014, JHEP 02 (2019) 149.
- 2017 **CMS Collaboration**, *Search for a standard model-like Higgs boson in the mass range between 70 and 110 GeV in the diphoton final state in proton-proton collisions at $\sqrt{s} = 8$ and 13 TeV*, HIG-17-013, Phys.Lett.B 793 (2019).

Event organization

- 2017 **CMS Exotica Workshop 2017**, member of the local organizing committee, Brussels, Belgium, November 30 – December 2.