

Reza Goldouzian

Curriculum Vitae

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Main Research Interests

- Experimental high-energy particle physics
- Searches for new phenomena at particle colliders
- Particle detector instrumentation and performance studies
- Collider phenomenology and interpretation of experimental results

Professional Appointments

- 2026–Pres. **Associated Research Professor of Physics**, *University of Notre Dame*, Indiana, US
- 2021–2026 **Assistant Research Professor of Physics**, *University of Notre Dame*, Indiana, US
- 2018–2021 **Postdoctoral Researcher**, *University of Notre Dame*, Indiana, US
- 2015–2018 **Postdoctoral Researcher**, *Université Libre de Bruxelles*, Brussels, Belgium, *IIHE - Interuniversity Institute for High Energies (ULB-VUB)*

Education

- 2010–2015 **Ph.D. in Sciences – Particle Physics**, *Institute for Research in Fundamental Science (IPM)*, Tehran, Iran
- 2007–2009 **M.Sc. in Physics**, *Kharazmi University*, Tehran, Iran
- 2003–2007 **B.Sc. in Physics**, *University of Tabriz*, Tabriz, Iran

Awards & Honors

- 2025 **Breakthrough Prize in Fundamental Physics (CMS Collaboration)**, *Member of the CMS Collaboration recognized as part of the LHC experimental collaborations receiving the prize*
- 2013 **CMS Fundamental Physics Special Recognition Award**

Grants & Fellowships

- 2018 **DESY Fellowship**, *Deutsches Elektronen-Synchrotron DESY*, Germany, [Declined]
- 2018 **FNRS Chargée de Recherche**, *Université Libre de Bruxelles*, Belgium, [Declined]

Leadership & Coordination Roles

- 2024–Pres. **Convener of the B2G Res Subgroup**, *CMS Collaboration*
Coordination of a CMS B2G (Beyond Standard Model particles decaying to Higgs, top, and Gauge bosons) subgroup dedicated to heavy resonance searches.
– *Level-3 management role within the CMS experiment*

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

Technical Responsibilities

- 2019–2022 **NanoAOD Contact and Expert, CMS EGamma Group**
2019–2020 **EFT Contact, CMS Top Group**
2018–2023 **Simulation Validation Contact, CMS Phase-2 Tracker Trigger Group**
2017–2020 **Electron/Photon Contact and Expert, CMS Exotica Group**
2015–2017 **Monte Carlo Generation Contact and Expert, CMS TOP Group**
2014–2022 **Fastsim Calorimeter Contact and Expert, CMS Fastsim Group**

Mentoring & Supervision

- 2026–now **PhD Co-supervisor, Al Masud**, University of Notre Dame, US
2021–2025 **PhD Co-supervisor, Henry Yockey**, University of Notre Dame, US
2019–2022 **PhD Co-supervisor, Rachael Bucci**, University of Notre Dame, US
2016–2019 **PhD Co-supervisor, Wenxing Fang**, Université Libre de Bruxelles (Belgium) & Beihang University (China)
2016–2019 **PhD Co-supervisor, Xuyang Gao**, Université Libre de Bruxelles (Belgium) & Beihang University (China)
2011–2013 **M.Sc. Co-supervisor, Sepideh Kheirkhah**, Kharazmi University, Iran

Publications within the CMS Collaboration

As a member of the CMS Collaboration, I have contributed indirectly to over 1,000 publications (see full profile on [INSPIRE](#)). Major contributions to specific analyses and Physics Analysis Summaries (PAS)—which undergo full internal editorial review—are highlighted below:

- [1] CMS Collaboration, “Search for top quark Flavor-Changing Neutral Currents (FCNC) in multilepton final states using an effective field theory approach in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *CMS PAS TOP-25-015*, to be submitted to **Physical Review Letters**. [\[Main Author\]](#)
- [2] CMS Collaboration, “Search for pair production of heavy resonances in final states with a photon and large-radius jets in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *arXiv:2602.20477*, **Physical Review D** 113 (2026) 11. [\[Main Author\]](#)
- [3] CMS Collaboration, “Search for non-resonant new physics in high-mass dilepton events in association with b-tagged jets in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *arXiv:2506.13565*, **JHEP** 02 (2026) 141. [\[Co-Author\]](#)
- [4] CMS Collaboration with limited authorship, “Comparative performance analysis of LYSO+SiPM prototypes for the CMS barrel timing detector”, *arXiv:2410.08738*, **JINST** 19 (2024) P12020. [\[Co-Author\]](#)
- [5] CMS Collaboration, “Search for baryon number violation in top quark production and decay in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *arXiv:2402.18461*, **Physical Review Letters** 132 (2024) 241802. [\[Main Author\]](#)

- [6] 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”, *arXiv:2307.15761*, *JHEP* 12 (2023) 068. [Co-Author]
- [7] 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”, *arXiv:2205.06709*, *JHEP* 05 (2023) 227. [Co-Author]
- [8] CMS Collaboration, “Search for charged lepton flavor violation in top-quark production and decay in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *arXiv:2201.07859*, *JHEP* 06 (2022) 082. [Main Author]
- [9] CMS Collaboration, “Search for resonant and nonresonant new phenomena in high-mass dilepton final states at $\sqrt{s} = 13$ TeV”, *arXiv:2103.02708*, *JHEP* 07 (2021) 208. [Main Author]
- [10] 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”, *arXiv:2012.04120*, *JHEP* 03 (2021) 095. [Co-Author]
- [11] CMS Collaboration, “Search for new physics in top quark production in dilepton final states in proton-proton collisions at $\sqrt{s} = 13$ TeV”, *arXiv:1903.11144*, *Eur. Phys. J. C* 79 (2019) 886. [Main Author]
- [12] CMS Collaboration, “Search for high-mass resonances in the dilepton final state using proton-proton collisions at $\sqrt{s} = 13$ TeV”, *arXiv:1803.06292*, *JHEP* 06 (2018) 120. [Main Author]
- [13] 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”, *arXiv:1802.01122*, *JHEP* 04 (2018) 073. [Co-Author]
- [14] CMS Collaboration, “Search for high mass resonances in the dielectron final state”, *CMS PAS EXO-18-006* (2018). [Main Author]
- [15] 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”, *arXiv:1609.05391*, *Physics Letters B* 768 (2017) 57. [Co-Author]
- [16] 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]
- [17] CMS Collaboration, “Search for anomalous single top quark production in association with a photon in pp collisions at $\sqrt{s} = 8$ TeV”, *arXiv:1511.03951*, *JHEP* 04 (2016) 035. [Main Author]

Publications Outside CMS (Phenomenological Studies)

- [1] R. Goldouzian, M. Hildreth, “Probing effective operators in single top quark production in association with a lepton-neutrino pair”, *arXiv:2408.00476*, *Physical Review D* 110 (2024) 096013. [Main Author]
- [2] R. Goldouzian, et al., “LHC EFT WG Note: SMEFT predictions, event reweighting, and simulation”, *arXiv:2406.14620*, *SciPost Phys. Comm. Rep.* 4 (2024). [Co-Author]
- [3] R. Goldouzian, K.-F. Chen, “Tests of Charge-Parity Symmetry and Lepton Flavor Conservation in the Top Quark Sector”, *Universe* 9 (2023) 62. [Main Author]

- [4] **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]
- [5] **R. Goldouzian**, M. Hildreth, “LHC dijet angular distributions as a probe for the dimension-six triple gluon vertex”, *arXiv:2001.02736*, **Physics Letters B** 811 (2020) 135893. [Main Author]
- [6] 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]
- [7] **R. Goldouzian**, B. Clerbaux, “Photon initiated single top quark production via flavor-changing neutral currents at the LHC”, *arXiv:1609.04838*, **Physical Review D** 95 (2017) 054014. [Main Author]
- [8] **R. Goldouzian**, “Search for top quark flavor changing neutral currents in same-sign top quark production”, *arXiv:1408.0493*, **Physical Review D** 91 (2015) 014022. [Sole Author]
- [9] 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 (2014) 081B01. [Co-Author]
- [10] **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** 122 (2011) 1934–1937. [Main Author]

Selected Oral Presentations

- 2025 “New EFT topologies and ideas”, *CMS TOP PAG workshop*, Ghent, Belgium.
- 2024 “Top physics at CMS” (on behalf of the CMS Collaboration), *LHCDays2024*, Split, Croatia.
- 2024 “Different methodologies of EFT predictions”, *CMS Physics Days*, Geneva, Switzerland.
- 2024 “Search for baryon number violation in top quark production and decay using proton-proton collisions at $\sqrt{s} = 13$ TeV” (on behalf of the CMS Collaboration), *LHCtopWG2024*, Geneva, Switzerland.
- 2023 “LFU/LFV in precision measurement (EW, top)” (on behalf of the ATLAS and CMS Collaborations), *FPCP2023*, Lyon, France.
- 2022 “EFT interpretations in top quark events in CMS” (on behalf of the CMS Collaboration), *ICHEP2022*, Bologna, Italy.
- 2021 “Results on rare and BSM top quark interactions” (on behalf of the ATLAS and CMS Collaborations), *EPS-HEP2021*, Online.
- 2021 “Top EFT Interpretations describing CMS results” (on behalf of the CMS Collaboration), *LCWS2021*, Online.
- 2020 “Overview of SMEFT searches with Flavour Violation”, *CMS Workshop on Top Quark Physics*, Online.
- 2019 “Top properties and anomalous couplings” (on behalf of the ATLAS and CMS Collaborations), *TOP2019*, Beijing, China.
- 2019 “EFT interpretations of top quark measurements at the LHC” (on behalf of the ATLAS and CMS Collaborations), *LHCP2019*, Puebla, Mexico.

- 2019 "EFT interpretations using top quarks", *Physics Plenary Session, CMS week*, CERN.
- 2018 "Searches for exotic physics at CMS" (on behalf of the CMS Collaboration), *QCD 18*, Montpellier, France.
- 2018 "Searches for new resonances (lepton, jets) at ATLAS and CMS" (on behalf of the ATLAS and CMS Collaborations), *53rd Rencontres de Moriond*, La Thuile, Italy.
- 2017 "High mass Z' search in ee channel", *CMS Exotica Workshop 2017*, Brussels, Belgium.
- 2017 "Search for new physics via single top quark production", *CMS Workshop on Top Quark Physics*, CERN.
- 2017 "Single Top Quark Properties Measurements" (on behalf of the ATLAS and CMS collaborations), *TOP2017*, Braga, Portugal.
- 2016 "ATLAS and CMS top measurements and re-use for constraining BSM" (on behalf of the ATLAS and CMS collaborations), *CERN*.
- 2016 "The Di-boson excitement at the LHC", *Subatomic Physics Workshop*, Louvain-la-Neuve, Belgium.
- 2016 "Discussion about signal modeling and MC", *3rd CMS Single Top Workshop*, Strasbourg, France.
- 2014 "Search for FCNC in top quark production and decays" (on behalf of the CDF, D0, ATLAS and CMS collaborations), *TOP2014*, Cannes, France.
- 2014 "Search for FCNC in single top and photon production", *1st CMS Single-Top Workshop*, Napoli, Italy.
- 2013 "Search for flavour changing neutral current in top quark events in pp collisions" (on behalf of the CMS Collaboration), *Second IPM Meeting on LHC Physics*, Tehran, Iran.

Internal Peer Reviewer for CMS Analyses

- [1] CMS Collaboration, "Probing the flavour structure of dimension-6 EFT operators in multilepton final states", *JHEP* 03 (2026) 140. **[ARC Member]**
- [2] CMS Collaboration, "ttW production with Run 3 data", *TOP-25-014 under review*. **[ARC Member]**
- [3] CMS Collaboration, "Search for Higgs compositeness effects in high-mass dilepton final states", *EXO-25-001 under review*. **[ARC Chair]**
- [4] CMS Collaboration, "Constraints on standard model effective field theory for a Higgs boson produced in association with W or Z bosons ...", *JHEP* 03 (2025) 114. **[ARC Chair]**
- [5] CMS Collaboration, "Search for a standard model-like Higgs boson in the mass range between 70 and 110 GeV in the diphoton final state...", *Phys. Lett. B* 860 (2025) 139067. **[ARC Member]**
- [6] CMS Collaboration, "Search for charged-lepton flavor violation in the production and decay of top quarks using tripleton final states...", *Phys. Rev. D* 111 (2025) 012009. **[ARC Member]**
- [7] CMS Collaboration, "Search for a heavy resonance decaying into a top quark and a W boson at $\sqrt{s} = 13$ TeV", *B2G-21-005*, PAS public. **[ARC Member]**
- [8] CMS Collaboration, "Search for an excited lepton that decays via a contact interaction to a lepton and two jets...", *JHEP* 05 (2020) 052. **[ARC Member]**

- [9] CMS Collaboration, "Search for excited leptons in $\ell\ell\gamma$ final states in proton-proton collisions at $\sqrt{s} = 13$ TeV", *JHEP* 04 (2019) 015. [ARC Member]
- [10] CMS Collaboration, "Measurements of $t\bar{t}$ differential cross sections in proton-proton collisions at $\sqrt{s} = 13$ TeV using events containing two leptons", *JHEP* 02 (2019) 149. [ARC Member]
- [11] CMS Collaboration, "Search for a standard model-like Higgs boson in the mass range between 70 and 110 GeV in the diphoton final state...", *Phys. Lett. B* 793 (2019) 320. [ARC Member]