

<b>Part A. PERSONAL INFORMATION</b>		<b>CV date</b>		19/05/2021
First and Family name	Judita Mamuzic			
Social Security, Passport, ID number	Y4486207W	Age	46	
Researcher codes	WoS Researcher ID	U-3509-2017		
	SCOPUS Author ID	31967722400		
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### A.1. Current position

Name of University/Institution	Universitat de València		
Department	Instituto de Física Corpuscular (IFIC) / Consejo Superior de Investigaciones Científicas (CSIC) - Universitat de Valencia		
Address and Country	IFIC, Parque Científico C/Catedrático José Beltrán, 2 (B-5-7), 46980, Paterna (Valencia)		
Phone number	+3463543512	E-mail	<a href="mailto:judita.mamuzic@ific.uv.es">judita.mamuzic@ific.uv.es</a>
Current position	INVESTIGADOR CONTRACTAT	From	01/09/2019
Key words	SUSY, BSM, Dark Matter, Neutrino Oscillations, Long-lived particles, Naturalness, Machine Learning, Trigger, Statistical combination, High Dimensional Sampling		

### A.2. Education

PhD	University	Year
Physics	Humboldt-Universität zu Berlin, Germany	2015
Diploma in physics	University of Mathematics and Natural sciences in Novi Sad, Serbia	2003

### A.3. Indicators of Quality in Scientific Production

- Total number of citations is 52461 (WoS), average number of citations/year during the postdoctoral period is 6127 (average 2016 – 2020 WoS).
- Total number of publications in the first quartile (Q1 by inCites of WoS) is 1011 and first decile (D1 by inCites of WoS 90-100 Average JIF Percentile Range) is 708.
- h-index is 104 (WoS).
- 1 PhD thesis supervised: [Yu-Ting Shen](#), University of Oklahoma, US, 2018.
- Supervision of 1 diploma and summer student, Valentina Ferrara, DESY, Berlin, 2018.

### Part B. CV SUMMARY (max. 3500 characters, including spaces)

I obtained my PhD thesis at the Humboldt University in Berlin, Germany, in 2015. I am enrolled as a Research Assistant at the IFIC / CSIC – UV since 2015, where I received a prestigious APOSTD grant in 2019. I have spent significant time at IFIC, DESY and CERN research centers. My main activity is within the ATLAS collaboration, and I participate in the DarkMachines effort in the search for dark matter using machine learning. Additionally, I was a member of MoEDAL and ILC collaborations. I received an accreditation by the Serbian ministry of science and education for a Research Associate in 2018.

My main scientific contributions are within the physics Beyond the Standard Model in ATLAS. I performed a first study at the LHC of a Non-Universal Higgs masses Model with gaugino mediation (NUHMG) [9] at 8 TeV using strong production and final states with jets and missing transverse momentum [5,7]. I worked on the analysis of strong production, with two opposite-sign leptons and missing transverse momentum [3,6], motivated by the 2-sigma excess seen in the 8 TeV data. I developed a new algorithm for the global p-value calculation, for analyses with overlapping signal regions. I coordinated the first interpretation of Non-Universal Higgs masses model (NUHM2) at the LHC, motivated by low electroweak



fine tuning, using a statistical combination of 2/3/4 lepton analyses in the electroweak production using 8 TeV data [8], and in collaboration with the Oklahoma team its analysis using higgsino production at 13 TeV [4].

Currently I am an analysis coordinator for the search using two same-sign or three leptons (SS/3L), and am involved in the first study at the LHC of a model with bilinear R-parity violation (bRPV) using electroweakino production, motivated by the neutrino oscillations. The topic of my research proposal is an advanced interpretation of all SUSY analyses using the Phenomenological Minimal Supersymmetric model (pMSSM), using unsupervised machine learning. I contributed to a study of high dimensional sampling [1] within the DarkMachines collaboration. I received a prestigious role of a SUSY Monte Carlo contact, and am responsible for the help in preparation of all signal samples for the ATLAS SUSY analyses.

I coordinated and developed a first version of ATLAS online trigger monitoring software for shifters and experts, called Trigger Presenter [10], which was used in data taking 2008-2018. I was an on-call trigger expert responsible for the trigger monitoring, and maintenance of the HLT data quality monitoring algorithms in 2008 - 2009. I performed Run control, online and offline data quality shifts in ATLAS, and was a Trigger Core Software Developer.

MoEDAL experiment is designed for a detection of electrically or magnetically charged long lived particles. I was involved in the study of search prospects for very long-lived electrically charged particles, within the SUSY framework [2].

This year I would like to continue the work on advanced interpretation of pMSSM model using Run2 data, and statistical combinations of electroweak searches. In the following four years, I would like to work on new physics searches using anomaly detection algorithms using Run3 data. In addition, I would continue my involvement in SUSY searches using standard techniques. In the future I would like to extend my activity towards unfolding for selections obtained by new physics searches, and effective field theory studies.

## Part C. RELEVANT MERITS

### C.1. Publications (including books)

- [1] DarkMachines High Dimensional Sampling Group (Balzs, Csaba et al.), 2021, A comparison of optimisation algorithms for high-dimensional particle and astrophysics applications, submitted to JHEP, [arXiv:2101.04525](https://arxiv.org/abs/2101.04525), pg. 1-50, authors 20/12.
- [2] Falea, Danel. et al., 2020, Prospects for discovering supersymmetric long-lived particles with MoEDAL, [Eur. Phys. J. C \(2020\) 80:431](https://arxiv.org/abs/2002.04311), pg. 1-12, authors 20/2.
- [3] ATLAS Collaboration (Aaboud, Morad et al.), 2018, Search for new phenomena using the invariant mass distribution of same-flavor opposite-sign dilepton pairs in  $\sqrt{s}=13$  TeV pp collisions with the ATLAS detector, [Eur. Phys. J. C 78 \(2018\) 625](https://arxiv.org/abs/1808.07248), pg. 1-38, 2842 authors.
- [4] ATLAS Collaboration (Aaboud, Morad et al.), 2018, Search for electroweak production of supersymmetric states in scenarios with compressed mass spectra at  $\sqrt{s}=13$  TeV with the ATLAS detector, [Phys. Rev. D 97 \(2018\) 052010](https://arxiv.org/abs/1808.07248), pg. 1-35, 2842 authors.
- [5] ATLAS Collaboration (Aaboud, Morad et al.), 2018, Search for squarks and gluinos in final states with jets and missing transverse momentum using 36 fb<sup>-1</sup> of  $\sqrt{s}=13$  TeV pp collision data with the ATLAS detector, [Phys. Rev. D 97 \(2018\) 112001](https://arxiv.org/abs/1808.07248), pg. 1-47, 2842 authors.
- [6] ATLAS Collaboration (Aaboud, Morad et al.), 2017, Search for supersymmetry in events containing a same-flavor opposite-sign dilepton pair, jets, and large missing transverse momentum in  $\sqrt{s}=13$  TeV pp collisions with the ATLAS detector, [Eur. Phys. J C 77 \(2017\) 144](https://arxiv.org/abs/1708.03826) pg. 1-40, 2842 authors.



- [7] ATLAS Collaboration (Aaboud, Morad et al.), 2017, Search for squarks and gluinos in final states with jets and missing transverse momentum at  $\sqrt{s}=13$  TeV with the ATLAS detector, [Eur. Phys. J. C 76 \(2016\) 392](#), pg. 1-29, 2842 authors.
- [8] ATLAS Collaboration (Aaboud, Morad et al.), 2016, Search for the electroweak production of supersymmetric particles in  $\sqrt{s}=8$  TeV pp collisions with the ATLAS detector, [Phys. Rev. D 93 \(2016\) 052002](#), pg. 1-50, 2842 authors.
- [9] ATLAS Collaboration (Aaboud, Morad et al.), 2014, Search for squarks and gluinos with the ATLAS detector in final states with jets and missing transverse momentum using 20.3 fb<sup>-1</sup> of  $\sqrt{s}=8$  TeV proton-proton collision data, [JHEP09\(2014\)176](#), pg. 1-52, 2842 authors.
- [10] ATLAS Collaboration (Aaboud, Morad et al.), 2008, The ATLAS Experiment at the CERN Large Hadron Collider, [2008 JINST 3 S08003](#), pg. 1-438, 2842 authors.

## C.2. Research projects and grants

- PGC2018-094856-B-I00, “Buscando pistas de Nueva Física a altas energías en el LHC/ATLAS y en colisionadores e+e-: alta precisión y búsquedas directas”, MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES. IP: Juan Antonio Fuster Verdú / Vasiliki Mitsou. (CSIC). 01/01/2019 – 31/12/2021.
- APOSTD/165/2019, “Small Excesses”, Generalitat Valenciana. Judita Mamuzic. (CERN). 01/09/2019 – 31/08/2021.
- FPA2015-65652-C4-1-R, “Contribuciones al experimento ATLAS del LHC, al programa de física, a la actualización del detector e I+D para futuros colisionadores”, MINECO. Ministerio de Economía y Competitividad. M., IP: Carmen García García. (CSIC). 01/01/2016 – 31/12/2018.
- Humboldt University in Berlin, grant for female early career scientists. Judita Mamuzic. (DESY). 01/04/2011 – 31/06/2011.

## C.3. Previous work experience

- 2015–2019 Postdoctoral Research Assistant at Instituto de Física Corpuscular / Consejo Superior de Investigaciones Científicas - University of Valencia (IFIC / CSIC - UV), Valencia, Spain.
- 2006–2015 PhD student at DESY, supported by DESY and the Institute of Nuclear Sciences “Vinča”, Belgrade, Serbia, based in DESY and CERN.
- 2006 Junior Research Assistant, HEP Group Vinča, INN Vinča, Serbia.

## C.4. Accreditation

- 2018 Promotion by the Serbian Ministry of Science and Education to a Research Associate in the field of mathematics and natural sciences - Physics at the INN Vinča, Serbia.

## C.5. Coordination

- 2020–current Supersymmetry Monte Carlo Production Contact in ATLAS. Support for all MC requests within the SUSY group, ~300 members.
- 2019–current Analysis coordinator for the Supersymmetry searches with two leptons of same-sign or three leptons in ATLAS, team of 14 members.
- 2013–current Informal coordinator for Non-universal Higgs masses (NUHM2) model.
- 2011–2015 Informal coordinator for Non-universal Higgs masses with gaugino mediation model (NUHMG).
- 2006–2009 Trigger on-call expert, informal Trigger Presenter coordinator and developer, TDAQ HLT online monitoring algorithms maintenance.

### C.6. Assessment and organizing committees

- 2017–current Participation in the institute reading for analyses in physics Beyond the Standard Model.
- 2016 Local organizing committee for the [5th MoEDAL Collaboration Meeting](#), IFIC, Valencia.
- 2014 Local organizing committee for the LCWS14, [International Workshop on Future Linear Colliders in Belgrade](#), Serbia.
- 2012 Local organizing committee, Mini ROOT Tutorial at INN “Vinca”, Belgrade.

### C.7. Conferences, workshops, seminars

- 1 / 2 Talks at international/national conferences and workshops on behalf of ATLAS and CMS.
- 1 / 9 Talks at international/national conferences, workshops on behalf of ATLAS.
- 1 Other talks at international/national conferences and workshops.
- 5 / 1 Posters at international/national conferences and workshops on behalf of ATLAS.
- 1 Tutor for multiple subjects at the summer school.

### C.8. Extended stays in research centers

- 2015–current IFIC / CSIC - UV, Spain (4.5 years IFIC, 6 months CERN), work on Supersymmetry and trigger core software in ATLAS.
- 2011–2015 CERN, Switzerland (5 years), work on Supersymmetry for the PhD thesis.
- 2009–2011 DESY, Germany (2 years), work on Supersymmetry for the PhD thesis.
- 2008 CERN, Switzerland (6 months), work on the online trigger monitoring in ATLAS and “Trigger Presenter” program, maintenance of data quality monitoring algorithms for ATLAS High Level Trigger, on-call trigger expert.
- 2006–2008 DESY, Germany (1.5 years), work on the online trigger monitoring in ATLAS and “Trigger Presenter” program.
- 2006 INN “Vinca”, Belgrade, Serbia (6 months), work on the ILC project.

### C.9. Outreach activities

- 2019 [CERN Open Days 2019](#), CERN, Geneva, Switzerland.
- 2019 [EXPOCIENCIA 2019](#), IFIC/CSIC, Valencia, Spain.
- 2016 [EXPOCIENCIA 2016](#), IFIC/CSIC, Valencia, Spain.
- 2013 [CERN Open Days 2013](#), CERN, Geneva, Switzerland.
- 2013 [Mini Workshop on High Energy Physics](#) for kids, CERN, Switzerland.
- 2012 Visit of the Serbian president, CERN, Geneva, Switzerland.
- 2010 “Raspustiliste”, annual science workshop for kids, Novi Sad, Serbia

### C.10. Membership of scientific societies

- 2007–current Member, Research Network “Deutsche Physikalische Gesellschaft”, Germany.
- 2013 Member, Research Network “European Physical Society”, Europe.
- 2003–current Member, Research Network “Drustvo Fizicara Srbije”, Serbia.