

# Nikolina (Niko) ŠARČEVIĆ

@ nikolina.sarcevic@gmail.com @ n.sarcevic2@newcastle.ac.uk +447306126507  
N.Sarcevic.1 0000-0001-7301-6415 nikosarcevic  
nikolina.sarcevic NikoSarcevic linkedin.com/in/nikosarcevic  
Croatian and Serbian Citizen

## EDUCATION

- 2017 **Master of Science in Astrophysics, ASTROMUNDUS MASTER COURSE, Joint Degree**  
2014  
    > University of Innsbruck, AT, 1<sup>st</sup> semester  
    > University of Padua, IT, 2<sup>nd</sup> and 4<sup>th</sup> semester  
    > University of Goettingen, DE, 3<sup>rd</sup> semester  
    > Thesis done under supervision of prof. Alberto Franceschini and Simona Paiano, PhD  
    > Thesis title : **Population of Gamma-ray Sources in the Third Fermi-LAT Catalogue**  
Cosmology High Energy Astrophysics Stellar Physics String Theory Particle Detectors Spectroscopy
- 2014 **Graduate Astronomer, UNIVERSITY OF NOVI SAD, RS**  
2005  
    > Equivalent to BSc+1 year  
    > Thesis done under supervision of prof. Miodrag Krmar  
    > Thesis title : **Research of Photoneutron Energy Spectrum by <sup>115</sup>In Activation**  
Special Relativity General Relativity Nuclear Physics Cosmology Nuclear Medicine General Physics

## PROFESSIONAL EXPERIENCE

- 2024 expected  
September 2020 **Postgraduate Researcher, NEWCASTLE UNIVERSITY, UK**  
    > Mitigating theoretical uncertainties for weak lensing and galaxy clustering cosmology  
late time cosmology weak lensing statistics large scale structure modelling gravity
- June 2020  
November 2019 **Researcher, UNIVERSITY OF FREIBURG, Germany**  
    > Preparing a low-background experiment  
    > Detector, shielding, muon veto, DAQ, support structure design and setup  
    > Setup to be used for the advanced student lab  
NaI detector Radiation Shielding Muon Veto Scintillator DAQ
- November 2019  
October 2017 **Researcher, UNIVERSITY OF FREIBURG, Germany**  
    > Electric field simulations for XENONnT  
    > R&D of the field cage of the detector  
    > Design of the field shaping elements  
    > Research on problematic regions inside the TPC  
    > Electric field optimization  
    > Detector stability testing in terms of electric fields  
TPC R&D XENON Dark Matter Electric Field Simulations Electrodes FEM

## TEACHING, MENTORING, AND SUPERVISION

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- 2021 **Astrophysical Fluid Dynamics**| Marking and assessment, Master course, *Teaching Assistant*, Newcastle University
- 2021 **Algebra Multivariable Calculus & Differential Equations**| Teaching, marking and assessment, Undergrad course, *Teaching Assistant*, Newcastle University
- 2021 **Laboratory Physics 1 | Radioactivity**, Undergrad course, *Lab Assistant*, Newcastle University
- 2021 **Advanced Quantum & Atoms Molecules Nuclei & Particles | Marking and assessment**, Undergrad course, *Teaching Assistant*, Newcastle University
- 2020 **Methods for Differential Equations & Partial Differential Equations & Non-Linear Waves | Marking and assessment**, Undergrad course, *Teaching Assistant*, Newcastle University
- 2020 **Linear Analysis & Topology**| Marking and assessment, Undergrad course, *Teaching Assistant*, Newcastle University
- 2020 **Laboratory Physics 1 | Radioactivity**, Undergrad course, *Lab Assistant*, Newcastle University
- 2020 **Fortgeschrittenen Praktika II | Raman Effect**, Master course, *Lab Assistant*, University of Freiburg
- 2019 **Efficiency Studies for the MonXe Randon Emanation Chamber**, L. God, *Bachelor thesis co-supervisor*
- 2019 **Fortgeschrittenen Praktika I | I<sub>2</sub> Spectroscopy**, Undergrad course, *Lab Assistant*, University of Freiburg
- 2019 **Experimental Physik II**, Undergrad course, *Tutor*, University of Freiburg
- 2018 **Physiklabor für Fortgeschrittene | Hanle Effect**, Undergrad course, *Lab Assistant*, University of Freiburg
- 2018 **Astroparticle Physics**, Master course, *Tutor*, University of Freiburg

## JOURNAL ARTICLES

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- [1] E. Aprile *et al.*, <sup>222</sup>Rn emanation measurements for the XENON1T experiment, (2020)
- [2] E. Aprile *et al.*, Projected WIMP Sensitivity of the XENONnT Dark Matter Experiment, (2020)
- [3] E. Aprile *et al.*, Observation of Excess Electronic Recoil Events in XENON1T, (2020)
- [4] E. Aprile *et al.*, Energy resolution and linearity in the keV to MeV range measured in XENON1T, (2020)
- [5] E. Aprile *et al.*, Search for Light Dark Matter Interactions Enhanced by the Migdal Effect or Bremsstrahlung in XENON1T, *Phys.Rev.Lett.* 123 (2019) no.24, 241803, arXiv:1907.12771
- [6] E. Aprile *et al.*, Light Dark Matter Search with Ionization Signals in XENON1T, *Phys.Rev.Lett.* 123 (2019) no.25, 251801, arXiv:1907.11485
- [7] E. Aprile *et al.*, XENON1T Dark Matter Data Analysis : Signal Reconstruction, Calibration and Event Selection, *Phys.Rev.D* 100 (2019) no.5, 052014, arXiv:1906.04717
- [8] E. Aprile *et al.*, The XENON1T Data Acquisition System, *JINST* 14 (2019) no.07, P07016, arXiv:1906.00819
- [9] E. Aprile *et al.*, Observation of two-neutrino double electron capture in <sup>124</sup>Xe with XENON1T, *Nature* 568 (2019) no.7753, 532-535, arXiv:1904.11002
- [10] E. Aprile *et al.*, XENON1T dark matter data analysis : Signal and background models and statistical inference, *Phys.Rev.D* 99 (2019) no.11, 112009, arXiv:1902.11297
- [11] E. Aprile *et al.*, Constraining the spin-dependent WIMP-nucleon cross sections with XENON1T, *Phys.Rev.Lett.* 122 (2019) no.14, 141301, arXiv:1902.03234
- [12] E. Aprile *et al.*, First results on the scalar WIMP-pion coupling, using the XENON1T experiment, *Phys.Rev.Lett.* 122 (2019) no.7, 071301, arXiv:1811.12482

## BOOKS

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- Current project M.Krmar **Viši Kurs Nuklearne Fizike (working title)**. Proofreader | Editor-in-chief | Prepress.
- 2013 M.Krmar. **Uvod u Nuklearnu Fiziku**. *Univerzitet u Novom Sadu*. Proofreader | Editor-in-chief | Prepress. ISBN 978-86-7031-250-0
- 2010 L.Marinkov. **Osnovi Nuklearne Fizike**. *Univerzitet u Novom Sadu*. Proofreader | Editor | Prepress. ISBN 978-86-7031-191-6

## </> SKILLS

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|                     |  |
|---------------------|--|
| OS                  | Linux, macOS, Windows                    |
| Programming         | Python, MATLAB, XMDS2                    |
| Astro Software      | SAOImageDS9, IRAF, Period04, TOPCAT      |
| WP                  | LaTeX, OpenOffice, MS Word               |
| Physics Simulations | COMSOL Multiphysics®                     |
| Misc                | HTML, Autodesk®Inventor, Adobe InDesign® |
| Languages           | English, Croatian, Serbian               |

## ☀ CONFERENCES, SCHOOLS, AND WORKSHOPS

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|           |   |
|-----------|---|
| Jan 2021  | IV ICTP-SAIFR School on Cosmology : Challenges for the Standard Cosmological Model   Virtual   Participant  |
| Jan 2021  | STFC Introductory Course in Astronomy for New Research Students   Virtual   Participant   |
| Jan 2021  | DEX XVII : 17th Durham-Edinburgh eXtragalactic Workshop   Virtual   Participant   |
| Dec 2020  | Latin American Workshop on Observational Cosmology   Virtual   Participant  |
| Dec 2020  | Workshop on New Trends in Dark Matter   Virtual   Participant   |
| Dec 2020  | 3rd South American Dark Matter Workshop   Virtual   Participant   |
| Oct 2020  | 3rd Global 21-cm Workshop   Virtual   Participant   |
| Sep 2020  | UK Cosmology Meeting, Virtual   Participant   |
| Sep 2020  | Cosmological Correlators   Virtual   Participant  |
| Jun 2020  | European Astronomical Society Annual Meeting, University of Leiden, NL   Virtual   Participant  |
| Jun 2020  | $H_0$ : Assessing Uncertainties in Hubble's Constant Across the Universe, ESO, DE   Virtual   Participant   |
| Jun 2019  | Patras Workshop on Axions, WIMPs and WISPs, University of Freiburg, DE   Participant  |
| Mar 2019  | DPG-Frühjahrstagung, Talk : Electric Field Simulations for XENONnT <sup>☞</sup> , RWTH Aachen, DE   Speaker   |
| Sept 2018 | RTG Fall Workshop, Poster talk : Electric Field Simulations for XENONnT <sup>☞</sup> , Hornberg, DE   Speaker   |
| Mar 2018  | Photosensors and Signal Processing in Particle Detectors, PRISMA Detector Lab, JGU Mainz, DE   Participant  |
| Sep 2017  | Compact Objects & Gravitational Waves, IMPRS-HD, Heidelberg, DE   Participant   |
| Jun 2017  | IDPASC School on Astrophysics, Cosmology, Astroparticles and Particle Physics, Asiago, IT   Participant   |
| Sep 2015  | European Radio Interferometry School, ESO, Garching, DE   Participant   |
| May 2014  | Sarajevo School of High Energy and Medical Physics, Talk : Research of Photoneutron Energy Spectrum by <sup>115</sup> In Activation <sup>☞</sup> , University of Sarajevo, BA   Presenter |
| May 2014  | Amaterska i Profesionalna Astronomija Srbije, Talk : Report on the Success of the Novi Sad School on Astronomy, Novi Sad, RS   Presenter  |
| Apr 2014  | 7 <sup>th</sup> Student Astronomy Workshop, Talk : Report on Student Workshop at Vidojevica Observatory <sup>☞</sup> , Astronomical Observatory, Belgrade, RS                             |
| Aug 2013  | Petnica School on Cosmology, Petnica Science Institute, RS  |
| Jul 2013  | Student Astronomy Practice, Vidojevica Observatory, RS  |
| Apr 2013  | 6 <sup>th</sup> Student Astronomy Workshop, Talk : Design and Working Principle of LINACs <sup>☞</sup> , University of Novi Sad, RS   |
| Jun 2009  | 3 <sup>rd</sup> Student Astronomy Workshop, Astronomical Observatory, Belgrade, RS  |

## OUTREACH AND VOLUNTEERING

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|              |   |
|--------------|---|
| 2020-present | <b>EuCAPT   Contributor</b> , Helping the organization with outreach within the astroparticle community |
| 2020-present | <b>UK Cosmo   Social Media team member</b> , UK Cosmo on Twitter  |
| 2020         | <b>Astrobites   Contributor</b> , Future Contributor for Serbian and Croatian                           |
| 2020-present | <b>Cosmology from Home   Organizer</b> , Online conference on cosmology                                 |
| 2020         | <b>CosmoCon<math>\beta</math>   Organizer</b> , Online conference on cosmology                          |
| 2019-2020    | <b>XENON Collaboration   Social Media team member</b> , XENON on Twitter, XENON on Facebook             |
| 2017         | <b>Novi Sad School on Astronomy   Coordinator and Lecturer</b> , ADNOS, Novi Sad, Serbia                |
| 2016         | <b>Novi Sad School on Astronomy   Coordinator and Lecturer</b> , ADNOS, Novi Sad, Serbia                |
| 2014         | <b>Summer Science Factory   Mentor</b> , Čakovec, Croatia   |
| 2014         | <b>Youth Science Camp   Mentor</b> , Tičan Observatory, Croatia   |
| 2014         | <b>6<sup>th</sup> Science Festival   Workshop Coordinator</b> , University of Novi Sad, Serbia          |
| 2013         | <b>Sinj Festival of Science   Guest Lecturer</b> , Sinj, Croatia  |
| 2013         | <b>Astronomski Magazin   Freelance Writer</b> , Novi Sad, Serbia  |
| 2013         | <b>Novi Sad School on Astronomy   Coordinator and Lecturer</b> , ADNOS, Novi Sad, Serbia                |
| 2013         | <b>Days of Astronomy   Project Founder and Lecturer</b> , ADNOS, Novi Sad, Serbia                       |
| 2013         | <b>Khan Academy   Translator</b> , Khan Academy Serbia  |
| 2013         | <b>5<sup>th</sup> Science Festival   Educator</b> , University of Novi Sad, Serbia                      |
| 2012         | <b>Researchers' Night   Educator</b> , University of Novi Sad, Serbia                                   |
| 2012         | <b>4<sup>th</sup> Science Festival   Educator</b> , University of Novi Sad, Serbia                      |
| 2009         | <b>1<sup>st</sup> Science Festival   Educator</b> , University of Novi Sad, Serbia                      |
| 2005-2017    | <b>Astronomical Society Novi Sad   Lecturer, Supervisor</b> , ADNOS, Novi Sad, Serbia                   |

## SCHOLARSHIPS AND SPONSORSHIPS

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|           |   |
|-----------|---|
| 2017      | IDPASC School, Sponsorship by INFN and University of Padova   |
| 2014-2017 | AstroMundus Master Course, Full Scholarship by the EU   |
| 2014      | Sarajevo School of High Energy and Medical Physics, Sponsorship by University of Sarajevo           |
| 2013      | Petnica School of Cosmology, Sponsorship by by ETH Cosmology Zurich, ICTP Trieste and SISSA Trieste |
| 2013      | Student Astronomy Workshop by Astronomical Observatory Belgrade                                     |

## MEMBERSHIPS

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|              |   |
|--------------|---|
| 2021-Present | LSST DESC : UK Junior Associate               |
| 2020-Present | European Astronomical Society                 |
| 2020-Present | Royal Astronomical Society, UK                |
| 2018-2021    | Deutsche Physikalische Gesellschaft, Germany  |
| 2017-2019    | XENON Collaboration                           |
| 2014-Present | Society of Astronomers of Serbia, Serbia      |
| 2005-Present | Astronomical Society Novi Sad "ADNOS", Serbia |

## INDEPENDENT COURSEWARE, CERTIFICATES, AND TITLES

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IELTS, academic, overall score 7.5  
**From the Big Bang to Dark Energy**, University of Tokyo @Coursera  
**Analyzing the Universe**, Rutgers University @Coursera  
**Confronting the Big Questions : Highlights of Modern Astronomy**, University of Rochester @Coursera  
**Introduction to Forensic Science**, University of Leicester @FutureLearn  
**Dino 101 : Dinosaur Paleobiology**, University of Alberta @Coursera  
**Scandinavian Film and Television**, University of Copenhagen @Coursera  
**Warhol**, University of Edinburgh @Coursera  
**Dental Technician**, Medicinska Škola, Šabac, Serbia