Nashwan Sabti

Physics · PhD Candidate

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Education

PhD in Theoretical Physics — *King's College London, UK*
Research field: Particle physics and cosmology — *2018 - present*

Master of Science in Theoretical Physics — *Leiden University, The Netherlands*
Thesis: "Heavy Neutral Leptons during the Big Bang Nucleosynthesis epoch" — *2016 - 2018*
GPA: 9.0/10 (Cum Laude)

Dual Bachelor of Science in Physics and Astronomy — *Leiden University, The Netherlands*
Thesis: "Constraining cosmological parameters using the CLASS code" — *2013 - 2016*
GPA: 9.0/10 (Cum Laude)

Teaching and Working Experience

Teaching undergraduate courses — *King's College London*
Teaching assistant — *2018 - present*
1st year Labs, 3rd year particle physics.

Mentoring A-level student with a research project — *King's College London*
Supervisor — *May 2019 - Sep 2019*
Mentored an A-level student in producing an academic piece of work as part of the Realising Opportunities programme.

Development and guidance of research topic for secondary school students — *Leiden University*
Supervisor — *Dec 2016*
Supervised pupils with a project that involved calculation of the mass of the black hole in the centre of the Milky Way using orbits of stars nearby Sgr A*.

Imaging and analysis of astrophysical data — *Leiden University*
Project lead — *May 2015*
Project involved imaging and photometric analysis of the Cosmic Horseshoe gravitational lensing system using the Isaac Newton Telescope at the Roque de los Muchachos Observatory in La Palma with the goal of estimating the dark matter abundance within the lens.

Organisational Experience

Latest advances in the physics of BBN and neutrino decoupling — *King's College London/TUM*
Co-organiser — *April 2021*
Co-organised a 2-day online workshop on our current understanding of the physics of Big Bang Nucleosynthesis and neutrino decoupling. Speakers from both theoretical and experimental fields were invited to give a talk. See also this Indico link.

PhD seminar series — *King's College London*
Co-organiser — *Feb 2021 - May 2021*
Co-organised a local PhD seminar series, where PhD students could talk about their work and train their presentation skills.

Computing Skills

Proficient: Python, Mathematica, LaTeX
Basic: C++

Languages

Fluent: English, Dutch
Intermediate: Arabic
Basic: Russian

Awards and Certificates

Hendrik Casimir Prize *Dec 2017*
Awarded by the Casimir Research School for best performance during the Master's program in physics.

Young Talent Encouragement Award *Nov 2014*
Awarded by the Royal Holland Society of Sciences and Humanities for best performance during the first year of the Bachelor's program in physics.

Papers

On the arXiv preprint

1. A
2. B
3. C
4. D

Accepted for publication

5. N. Sabti, J. Alvey, M. Escudero, M. Fairbairn and D. Blas, *Implications of LUNA for BBN and CMB constraints on MeV-scale Thermal Dark Sectors*, to appear in JCAP [2107.11232].

Published

6. A. Boyarsky, M. Ovchynnikov, N. Sabti and V. Syvolap, *When FIMPs Decay into Neutrinos: The $N_{\rm eff}$ Story*, Phys. Rev. D 104, 035006 [2103.09831].
7. J. Alvey, N. Sabti, V. Tiki, D. Blas, K. Bondarenko, A. Boyarsky, M. Escudero, M. Fairbairn, M. Orkney and J. I. Read, *New Constraints on the Mass of Fermionic Dark Matter from Dwarf Spheroidal Galaxies*, MNRAS 501 (2021) 1, pp. 1188-1201 [2010.03572].
8. N. Sabti, J. B. Muñoz and D. Blas, *First Constraints on Small-Scale Non-Gaussianity from UV Galaxy Luminosity Functions*, JCAP 01 (2021) 010 [2009.01245].
9. N. Sabti, A. Magalich and A. Filimonova, *An Extended Analysis of Heavy Neutral Leptons during Big Bang Nucleosynthesis*, JCAP 11 (2020) 056 [2006.07387].
10. J. Alvey, N. Sabti, M. Escudero and M. Fairbairn, *Improved BBN Constraints on the Variation of the Gravitational Constant*, Eur. Phys. J.C80.2 (2020), p. 148 [1910.10730].
11. N. Sabti, J. Alvey, M. Escudero, M. Fairbairn and D. Blas, *Refined Bounds on MeV-scale Thermal Dark Sectors from BBN and the CMB*, JCAP 01 (2020) 004 [1910.01649].

Presentations

Talks

1. 2021 Meeting of the Division of Particles and Fields of the American Physical Society (DPF21), Florida State University, 13/07/2021
   – *When FIMPs Decay into Neutrinos: The $N_{\rm eff}$ Story*
2. PPC 2021: XIV International Workshop on Interconnections between Particle Physics and Cosmology, University of Oklahoma, 15/05/2021
   – *Cosmology with UV Luminosity Functions*

3. First EuCAPT Annual Symposium, 06/05/2021
   – *Cosmology with UV Luminosity Functions*
4. MPA Cosmology Seminar, MPA Garching, 30/03/2021
   – *Probing Small-Scale Non-Gaussianity with UV Luminosity Functions*
5. High-z Galaxy Evolution Meeting, Harvard-CfA, 08/02/2021
   – *Cosmology with UV Luminosity Functions*
6. KCL PhD Seminar Series, 08/02/2021
   – *How do FIMPs that can decay into neutrinos affect $N_{\rm eff}$?*
7. London Cosmology Discussion Meeting, 21/01/2021
   – *What BBN can tell us about thermal dark sectors*
8. CTA Dark Matter Journal Club, 12/11/2020
   – *New Constraints on the Mass of Fermionic Dark Matter from Dwarf Spheroidal Galaxies*
9. UK Cosmology, University of Sheffield, 22/09/2020
   – *Probing Small-Scale Non-Gaussianity with UV Galaxy Luminosity Functions*

Posters

1. COSMO 2021, University of Illinois, 02-06/08/2021
   – *When FIMPs Decay into Neutrinos: The $N_{\rm eff}$ Story*
2. Weak Interactions and Neutrinos 2021, University of Minnesota. 07-12/06/2021
   – *When FIMPs Decay into Neutrinos: The $N_{\rm eff}$ Story*
3. RAS Early Career Poster Exhibition 2020, 14-28/09/2020
   – *First Constraints on Small-Scale Non-Gaussianity from UV Galaxy Luminosity Functions*