Anna Małgorzata Suliga | Curriculum Vitae

Niels Bohr Institute – Blegdamsvej 17 – Copenhagen 2100, Denmark

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Education

2018–present: **PhD candidate in Astroparticle Physics**
Expected graduation date: August 2021
Niels Bohr Institute, University of Copenhagen, Denmark
Thesis topic: Non-standard neutrino physics in the compact astrophysical sources
Supervisor: Associate Professor Irene Tamborra

9 Jul 2018: **Msc in Physics with specialization in Astrophysics**
Niels Bohr Institute, University of Copenhagen, Denmark
Thesis topic: Diffuse supernova neutrino background
Supervisor: Associate Professor Irene Tamborra

28 Jan 2016: **Engineering degree (BSc) in Technical Physics**
The AGH University of Science and Technology in Kraków, Poland
Thesis topic: Analysis of the impact imposed by neutron spectrum on production and burn-up of actinides in nuclear reactors
Supervisor: Associate Professor Mariusz Kopeć

Research interests

Astroparticle physics, neutrino physics, sterile neutrinos, non-standard neutrino interactions, neutrino and dark matter, physics beyond the Standard Model

Awards

08/2018: **Lørup Scholar Stipend**, award of 50,000 DKK for excellent MSc thesis work, Niels Bohr Institute, Denmark

07/2015: **Internship DESY, Hamburg, Germany**, grant of 2500 € to work with Peter Göettlicher the leader of Analogue Electronics and Microcontroller Applications group in DESY
• Installing and upgrading software on the high sensitivity electronic devices, e.g., pattern generator, logic analyzer, multichannel high voltage supplier.
• Testing the response quality of a new generation of chips and scintillator tiles for the Calice calorimeter (the International Linear Collider (ILC)).

Scientific presentations/seminars

Invited talks:

11/2020: **Astrophysical constraints on the new mediators with non-standard coherent neutrino-nucleus scattering**
Virtual Seminar, Center for Cosmology and Astroparticle Physics, Columbus, Ohio
Hosts: Anna Porredon and Yi-Kuan Chiang

07/2020: **The impact of keV sterile neutrinos on core-collapse supernovae**
Brookhaven Neutrino Theory Virtual Seminar, Brookhaven National Laboratory, Upton, New York, Host: Peter B. Denton

07/2020: **The impact of keV sterile neutrinos on core-collapse supernovae**
Virtual Journal Club, Virginia Tech, Blacksburg, Virginia, Host: Natalia Tapia Arellano

06/2020: **Non-standard physics scenarios in the supernovae**
Plenary talk, QUARKS 2020, Pereslavl Zalessky, Russia, Host: Sergey Troitsky, Postponed to 2021

08/2019: **Tau lepton asymmetry by sterile neutrino emission – Moving beyond one-zone supernova model**
Neutrino Quantum Kinetics in Dense Environments, Copenhagen, Denmark, Host: Shashank Shalgar

03/2019: **Determining supernova unknowns with the diffuse supernova neutrino background**
Seminar, Max Planck Institute for Physics, Munich, Germany, Host: Francesco Capozzi

Contributed talks:

04/2020: **The impact of keV sterile neutrinos on core-collapse supernovae**
Transient Tuesday, DARK, Neils Bohr Institute, Denmark

05/2019: **Determining supernova unknowns with the diffuse supernova neutrino background**
Supernova Neutrinos at the Crossroads: astrophysics, oscillation, and detection, Trento, Italy

01/2019: **Neutrinos - Introverts among elementary particles**
Introduction to University Pedagogy, Copenhagen, Denmark

01/2019: **Determining supernova unknowns with the diffuse supernova neutrino background**
Nordic Winter School on Particle Physics and Cosmology, Skeikampen, Norway

06/2018: **Determining supernova unknowns with the diffuse supernova neutrino background**
NBIA and Dark Summer School: Multi-Messengers from Compact Sources, Copenhagen, Denmark

Posters:

08/2020: **Lifting the core-collapse supernova bounds on keV-mass sterile neutrinos**
SLAC Summer Institute, Menlo Park, California, online

06/2020: **Lifting the core-collapse supernova bounds on keV-mass sterile neutrinos**
Neutrino 2020, Chicago, Illinois, online

Additional courses, Phd schools

07/2019: **Advancing Theoretical Astrophysics**
Summer school, University of Amsterdam, The Netherlands

04/2019: **Responsible Conduct of Research**
PhD course, University of Copenhagen, Denmark

01/2019: **Introduction to University Pedagogy**
PhD course, University of Copenhagen, Denmark

11/2018: **Elementary Particle Physics**
PhD course, University of Copenhagen, Denmark

Teaching experience

fall 2020: Teaching Assistant, Applied Statistics, University of Copenhagen

spring 2020, fall 2019: Teaching Assistant, Computer science for physicists, University of Copenhagen

Computer skills

Advanced: PYTHON, C++, C, LaTeX, bash, git, MATLAB, Mathematica, OpenMP

Extracurricular activities

2019 - present: **Transient Tuesdays**
Co-organizer of bi-weekly discussions about astrophysical transient objects' physics at DARK, Neils Bohr Institute, Denmark

Students advised/mentored

08/2020 - present: Co-advisor, Daniel Abdulla Bobruk, University of Copenhagen, master's project: Constraining the eV-mass sterile neutrinos with the supernova neutrino signal

06/2020 - present: Mentor, Nanna Marie Baars Støvelbæk, University of Copenhagen, master's project: Dust formation in type IIn supernovae

01/2020 - 04/2020: Mentor, Kristine Simone Nielsen, University of Copenhagen, master's project: Expanding the Physics of Dark Matter - Exploring a new way to explain the acceleration of the Universe

Referees

The following senior scientists are familiar with my studies and research activity:
1.: **Associate Professor Irene Tamborra**
E-mail: tamborra@nbi.ku.dk, Tel: +45 35 33 32 27,
Affiliation: Niels Bohr Institute, University of Copenhagen, Denmark

2.: **Assistant Research Fellow Meng-Ru Wu**
E-mail: mwu@gate.sinica.edu.tw, Tel: +886-2-2789-6779,
Affiliation: Institute of Physics, Academia Sinica, Taiwan

3.: **Distinguished Professor of Physics George Fuller**
E-mail: gfuller@ucsd.edu, Tel: +1-858-534-9085,
Affiliation: University of California, San Diego, United States

Peer-reviewed publications

3.: **Lifting the core-collapse supernova bounds on keV-mass sterile neutrinos**
Anna M. Suliga, Irene Tamborra, and Meng-Ru Wu, JCAP **08** (2020) 018

2.: **Tau lepton asymmetry by sterile neutrino emission - Moving beyond one-zone supernova models**
Anna M. Suliga, Irene Tamborra, and Meng-Ru Wu, JCAP **12** (2019) 019

1.: **Measuring the supernova unknowns at the next-generation neutrino telescopes through the diffuse neutrino background** (co-first author)
Klaes Møller, Anna M. Suliga, Irene Tamborra, and Peter B. Denton, JCAP **05** (2018) 066

Ongoing projects

Astrophysical constraints on the new mediators with non-standard coherent neutrino-nucleus scattering
Anna M. Suliga and Irene Tamborra, to appear soon

A closer look at the *pp*-chain reaction in the Sun: Constraining new light mediators
Anna M. Suliga, Shashank Shalgar and George Fuller, to appear soon

Towards the detection of the non-electron flavor diffuse supernova neutrino background
Anna M. Suliga, Irene Tamborra and John F. Beacom, to appear soon

Diffuse supernova neutrino background and the stellar mass function
Thomas D. P. Edwards, Anna M. Suliga, Irene Tamborra, Shunsaku Horiuchi and Shin'ichiro Ando, in preparation

Constraining the eV-mass sterile neutrinos with the core-collapse supernovae
Daniel Abdulla Bobruk, Anna M. Suliga, Irene Tamborra, and George Raffelt, in preparation