ANEŽKA KLUSTOVÁ

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CURRENT POSITION

Imperial College London (ICL), United Kingdom 10/2020 - Present
High Energy Physics Research (PhD), President's Scholar

Supervised by Prof Morgan Wascko and Dr Abbey Waldron.

Measurement of the nuclear dependence in inclusive antineutrino scattering with MINERvA in 1D and 2D. Lead geometry, simulation, and reconstruction developer for the near detector gaseous argon prototype TOAD in the test beam at Fermilab. Commissioning, assembly, testing, and operation of TOAD. Attended HEP postgraduate lectures (including journal club), and professional skills development courses. Expected year of graduation: 2024.

EDUCATION

University College London (UCL), United Kingdom 2016 - 2020
MSci Natural Sciences, Physics and Inorganic & Materials Chemistry

1st Class Honours (87.5%), Dean's List Commendee

MSci Thesis: Exotic Contributions to Neutrinoless Double Beta Decay, supervised by Prof Frank Deppisch. Theoretical investigation of Beyond the Standard Model processes mediating neutrinoless double beta decay, specifically scalar and vector Majoron assisted decays, and demonstrating that two neutrino double beta decay can be used as a probe to investigate New Physics.

Relevant modules: Particle Physics (94%), Quantum Field Theory (88%), Advanced Quantum Theory (99%), Mathematical Methods I, II, and III (85%, 83%, 91%), Scientific Communication and Computing (86%), Research Software Engineering with Python (87%), Inorganic Chemistry (86%), Chemistry of Materials (82%)

National University of Singapore (NUS), Singapore 2018 - 2019
Awarded study abroad placement.

Gymnázium J. K. Tyla, Hradec Králové, Czech Republic 2012 - 2016
Maturita: Mathematics (1), Physics (1), Chemistry (1), English (1), Czech (1).

RESEARCH EXPERIENCE

Fermilab, Illinois, USA 09/2022 - Present
Visiting Researcher

- Commissioning, assembly, and operations of the near detector gaseous argon prototype for DUNE (Teststand of an Overpressure Argon Detector, TOAD).
- Geometry, simulation, and reconstruction development for the test detector.

CERN, the European Organization for Nuclear Research, Switzerland 06/2019 - 08/2019
Summer Research Student, Neutrino Platform

- Supervised by Dr Davide Sgalaberna and Dr Umut Kose.
- R&D of an innovative SiPM calibration system for the T2K scintillator tracker detector and possibly DUNE; gained theoretical background in neutrino oscillation physics.
- Set up experiments and designed components in CAD, measured MPPC characteristics and the efficiency of light distribution through scintillating fibres, analysed data in ROOT.
- Attended a series of lectures covering wide range of topics in the fields of theoretical and experimental particle physics and computing.

UCL Physics Department, United Kingdom 06/2018 - 08/2018
Summer Research Student, High Energy Physics Group

· Supervised by Dr Cheryl Patrick and Prof David Waters.
· Participated in the development of the SuperNEMO validation strategy software using C++ ROOT library, analysed multiple simulated data from neutrinoless double-beta decay events and background processes, and compared them to reference distributions.
· Gained theoretical background in physics of neutrinoless double-beta decay process.

Sotio a.s., Czech Republic 06/2017 - 08/2017
Process Development Intern

· Carried out cytometric and cell culture statistical data analysis, and cell culture modelling
· Participated in the preparation of active cellular immunotherapy treatment, worked in clean premises (GLP training)

Czech Technical University in Prague, Czech Republic 2015 - 2016
Research Intern, Faculty of Nuclear Sciences and Physical Engineering

· Studied the dynamic behaviour of nuclear reactors working on school reactor VR-1
· Analysed theoretically predicted and experimentally collected data using Python

Academy of Sciences of the Czech Republic, Czech Republic 2014 - 2015
Open Science Research Intern, Institute of Physics

· Studied and experimentally determined the solar cells efficiency based on the depth of dopant material using open circuit method, analysed theoretically predicted and experimentally collected data
· Presented results at the Open Science Expo 2015 in Prague and received Honourable Recognition for work with public

AWARDS, HONOURS AND FUNDING

NuInt 2022 Accommodation Grant 10/2022
Full accommodation stipend to give a talk at NuInt 2022, Seoul National University, Seoul, South Korea.

ICL President's PhD Scholarship 2020 - Present
Full tuition fees and generous stipend for PhD place at ICL for high achieving undergraduates showing excellent academic performance and promising research potential with challenging programme that complements research opportunities with professional development and networking within an elite cohort.

UCL Mathematical & Physical Sciences Dean's List Commendee 2020
Commends outstanding academic performance by graduating students, equivalent to the top 5 % of student achievement in the faculty.

Kellner Family Foundation Scholar 2016 - 2020
Highly competitive scholarship for talented Czechs studying at the world's best universities.

Honourable Recognition for work with public at the Open Science Expo 2015

Member of The Union of Czech Mathematicians and Physicists 2012 - Present
Awarded membership for excellency in subject competitions.

TEACHING EXPERIENCE

ICL Department of Physics, United Kingdom 10/2021 - Present
Graduate Teaching Assistant
Currently teaching 3rd year Nuclear and Particle Physics seminars (second term 2022/23).
Demonstrated 3rd year undergraduate labs of Computational Physics (first term 2021/2022).

TALKS, POSTERS AND OUTREACH

NuInt 2022, Seoul, South Korea 10/2022
Invited talk about flux simulation and prediction at MINERvA. Poster presentation about studying nuclear dependence in inclusive antineutrino scattering with MINERvA. Received full accommodation stipend.

President's Scholars Symposium, ICL 07/2022
Poster about introduction to neutrino physics, neutrino interactions, MINERvA experiment and analysis motivation.

Postgraduate Symposium, Department of Physics, ICL 07/2022
Poster overview of an inclusive antineutrino scattering analysis.

New Perspectives 2022, Fermilab, USA 06/2022
'MINERvA in 10 Minutes' invited talk on behalf of the MINERvA collaboration.

Neutrino 2022, Virtual Seoul 05/2022
Poster on current progress of studying nuclear dependence in inclusive antineutrino scattering with MINERvA.

APS April Meeting 2022, New York City, USA 04/2022
Parallel talk on current progress of studying nuclear dependence in inclusive antineutrino scattering with MINERvA.

OWAN21 Workshop, Institute of Physics, UK 10/2021
Quick-fire talk on inclusive antineutrino scattering with MINERvA.

Outreach and community engagement:
- 1 social mobility + diversity outreach talk to school pupils aged 15+ (2017)
- 1 science communication talk to school pupils aged 15+ (2020)

SUPERVISION

Mr Alan LI, Ms Hongting NIU, Mr Mingze YAN, Ms Qirui ZHAO, ICL 05/2022 - 06/2022
- Supervised Year 1 students working on 'Building and optimising a multi-stage coil accelerator'

Ms Alina IMYSHENEKOVA, St Paul's Girls' School 06/2021 - 08/2021
- Summer research experience in particle physics

TRAINING AND EXTRACURRICULAR ACTIVITIES

AEPSHEP 2022, Pyeongchang, South Korea 10/2022
Asia Europe Pacific School of High Energy Physics with 33 lectures and every-day discussion sessions, supporting international collaboration between PhD students from all around the world. Included poster session.

SLAC Summer Institute, Stanford University – Virtual 08/2022
Two-weeks long summer programme with virtual lectures and discussion on 'Golden Opportunities: Puzzles and Surprises - Past Future'.

STFC HEP Summer School, University of Oxford, UK 09/2021
Two-weeks long school aimed at UK-based experimental particle physics PhD at the end of their first year of

training, consisting of lectures, tutorials and related problem sheets covering Quantum Field Theory, Quantum Electrodynamics and Quantum Chromodynamics, the Standard Model and various phenomenological topics. Included poster sessions.

Neutrino Interaction School, DUNE 06/2021 - 07/2021
Series of classes, talks and hands-on activities introducing neutrino-interaction physics, including interaction cross-section measurement, evaluating systematic uncertainties and interaction modelling within DUNE.

MINERvA 101 Week 06/2021
Series of talks and hands-on activities introducing neutrino-interaction physics, including interaction cross-section measurement, evaluating systematic uncertainties and interaction modelling within MINERvA.

DUNE Computing Training 05/2021
Introduction to data volumes at FNAL, basic overview of art and LArSoft, development of configuration files to control batch jobs, grid submission and monitoring.

Introduction to Machine Learning, Yandex School of Data Analysis 01/2021 - 02/2021
Intensive 2-week course of machine learning and deep learning methods, via a series of lectures (formal definitions and derivations), seminars (hands-on data analysis) and 2 Kaggle competitions. Included classification, regression, feature selection, dimensionality reduction, feature scaling, clustering and special deep learning topics such as convolutional neural networks and generative adversarial learning. Achieved 94% (top 1 score).

Technology Internship Experience UK, Bright Network 07/2020
Three-day virtual internship programme including seminars on communication and collaboration, creative problem solving and design, agile software development and networking with Accenture, Google, Goldman Sachs, Bloomberg, Amazon and Vodafone representatives. Enterpreneurial team project on delivering Facial Verification in Customer Banking App Sign-In Process.

The Physics of Life Online Summer School, Princeton University 06/2020 - 08/2020
Weekly lectures and discussions of the provided reading material geared towards creating a bridge between undergraduate physics and applications in living systems. Included topics ranging from bacterial and cellular motility to computational neuroscience introduction.

UCL Academic Representative for Natural Sciences 2016 - 2018
Member of Physics and Chemistry Staff-Student Consultative Committees
Leading role within the department to make the student voice heard, enabling communication and helping to promote constructive change, development and enhancement of the programme, making impact on course content, its management and delivery.

UCL Transition Mentor for Natural Sciences 2017 - 2018
Physics Society Parenting Scheme
Positive role model and peer support, facilitating academic sessions, sharing experience.

UCL Interdisciplinary Journal Club 2017 - 2018
Collaborative club for Natural Sciences to meet excellent researchers, learn new analytical techniques, practise presentation skills, and discuss the newest research activities.

Beginners HTML/CSS Web Development Course, Code First Girls 10/2017 - 12/2017
An introduction to web development consisting of fundamental skills of front-end web dev (HTML, CSS, JavaScript), collaborative development with Git and Github, and a team project of creating a website.

UCL Global Citizenship Programme: Justice & Equality 06/2017
Team project based on examining climate change from the perspective of justice (uneven effect distribution) through innovation and entrepreneurship.

DATA ANALYSIS SKILLS

Programming Languages	Python, C++, ROOT, Geant4, MATLAB, Mathematica
Software & Tools	Jupyter, Github, Git, LaTeX, Excel, Unix.

LANGUAGES

Czech	Native Speaker
English	Fluent (C1 IELTS Certificate)
German	Limited working proficiency (B1 Goethe Institute Certificate)
Russian	Elementary proficiency

31/12/2022 in London Anežka Klustová