

Alaa Mohammed Idris Bakhit

Personal Website

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EDUCATION

Mar. 2021 - Sep. 2025

PhD in Physics

Materials Physics Center (MPC), the University of the Basque Country, Spain.
doctoral thesis title "Growth and Electronic Properties of Rare-Earth-Transition Metal Surface Compounds Grown on Curved Single Crystals and their Protection by 2D Materials" with Dr. Frederik Schiller.

Oct. 2018 - Dec. 2020

M.Sc. in Condensed Matter Physics

The ICTP-East African Institute for Fundamental Research (EAI FR), University of Rwanda (UR), Rwanda.

Master thesis title "Diamond under extreme strains" with Prof. Sandro Scandolo, Abdus Salam International Centre for Theoretical Physics, Italy.

Sep. 2017 - Jun. 2018

M.Sc. in Mathematical Sciences

The African Institute for Mathematical Sciences (AIMS-Cameroon), Cameroon

Master thesis title "Radio Interferometry: From the Measurements to the Image" with Dr. Marcel Atemkeng, Centre for Radio Astronomy Techniques and Technologies, Rhodes University, South Africa.

Oct. 2010 - Nov. 2014

B.Sc. (Hons) in Physics, First Class

Sudan University of Science and Technology, Sudan.

RESEARCH INTERESTS

Studying the growth of 2D materials on flat and curved transition metal substrates.

WORK EXPERIENCE

Sep. 2025 - present

Postdoctoral researcher

Donostia International Physics Center (DIPC), San Sebastián, Spain.

Sep. 2024 - Nov. 2024

Visiting Researcher

University of Trieste, Trieste, Italy.

Performed DFT simulations of hBN adsorption on vicinal surfaces of curved Pt(331) utilizing Quantum Espresso package to Model surface structure and electronic properties in collaboration with the group of Prof Maria Peressi.

Apr. 2023 - Jun. 2023

Visiting Researcher

Russian-German Laboratory at BESSY II, Berlin, Germany.

Conducted UHV-based experiments, studying the growth (CVD) of hBN and Graphene on flat and curved transition metal substrates.

Jul. 2018 - Oct. 2018

Teaching Assistant (part-time)

University of Bahri, College of Applied Science, Sudan.

I taught the second-year students in the Physics laboratory, 50 students in the lab (20 hours/week).

Dec. 2014 - Aug. 2016

Teaching Assistant (part-time)

Sudan University of Science and Technology, Department of Physics, Sudan.

I gave tutorials to first, second and third-year students, 50 students in a class (26 hours/week).

Mar. 2015 - Jun. 2016

Teaching Assistant (part-time)

University of Bahri, College of Applied Science, Sudan.

Teaching second-year students in Physics Laboratory, 30 students in the lab (20 hours/week).

AWARDS & HONORS

2025

ICTP PWF funding awarded by

Joint ICTP Physics Without Frontiers, Trieste, Italy.

2023

Student award for best talk awarded by

Joint EPS-SIF International School on Energy 2023, Varenna, Italy.

2023	A three months internship grant awarded by The COST Action CA20116 OPERA, Brussels, Belgium.
2022-2025	A fellowship for the recruitment of young women doctoral students awarded by Fomento San Sebastián, Spain.
2022-2025	Fully-funded scholarship for a PhD degree in Physics awarded by Materials Physics Center (MPC), Spain.
2021-2022	One year scholarship awarded by The University of the Basque Country, Spain.
2018-2020	Fully-funded scholarship for a master degree in Condensed Matter Physics awarded by The Organization for Women in Science for the Developing World (OWSD), Italy.
2017-2018	MasterCard Foundation Scholar, AIMS Cameroon, Cameroon
2017-2018	Fully-funded scholarship for a master degree in Mathematical Science awarded by AIMS Cameroon, Cameroon.
2014	Award of Outstanding Graduates in Science awarded by The Minister of Higher Education and Scientific Research, Sudan.
2011, 2012, 2013, 2014	Award of Sudan University of Science and Technology for outstanding students awarded by Sudan University of Science and Technology, Sudan.

CONFERENCES

Jun. 2025	Graphene2025 International Conference, San Sebastián, Spain Poster: The formation and protective behavior of a hexagonal boron nitride layer on platinum-type surfaces
Jun. 2024	Graphene2024 International Conference, Madrid, Spain Talk: Formation of Europium-transition metal surface compounds and protection of Eu below hexagonal boron nitride (hBN)
Mar. 2024	The DPG Spring Meeting of the Condensed Matter Section (SKM), Berlin, Germany Talk: Formation of Europium-transition metal surface compounds and protection of Eu below hexagonal boron nitride (hBN)
Aug. 2023	36th European Conference on Surface Science, Lodz, Poland Talk: Formation of Europium-transition metal surface compounds and protection of Eu below hexagonal boron nitride (hBN)
Jun. 2023	The 5th BESSY @ HZB user meeting, Berlin, Germany Poster: Epitaxial growth of hexagonal boron–nitrogen–carbon (h-BNC) monolayer on different substrate materials.
Mar. 2023	The DPG Spring Meeting of the Condensed Matter Section (SKM), Dresden, Germany Talk: Formation of Europium-transition metal surface compounds and protection of Eu below hexagonal boron nitride (hBN)
Jul. 2022	Graphene2022 International Conference, Aachen, Germany Poster: Electronic structure of stable facets in the 2D material hBN/Pt system
Apr. 2022	The 5th International Conference on Applied Surface Science (ICASS), Palma, Spain Talk: Electronic structure of stable facets in the 2D material hBN/Pt system Poster: Raman frequencies of diamond under non-hydrostatic Pressure
Oct. 2021	Quantum2021, Bilbao, Spain
Aug. 2021	International Conference of Physics Students (ICPS 2021), Copenhagen, Denmark. Contribution with an online talk on Diamond under extreme strains
Aug. 2019	International Conference of Physics Students (ICPS 2019), Cologne, Germany Contribution with a talk on Radio Interferometry: From the Measurements to the Image
Jul. 2019	Future of Science Conference, AIMS-Rwanda, Kigali, Rwanda

SHORT COURSES

Feb. 2019	Short Course on Machine Learning. ICTP East African Institute for Fundamental Research (EAIFR), University of Rwanda, Rwanda.
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WORKSHOPS

Aug. 2024	CAMD Summer School 2024 - Electronic Structure Theory and Materials Design, Denmark. Poster: Formation of Europium-transition metal surface compounds and protection of Eu below hexagonal boron nitride (hBN)
Jan. 2024	School on Synchrotron Light Sources and Their Applications, Italy.
Jul. 2023	Joint EPS-SIF International School on Energy 2023, Italy. Talk: Formation of Europium-transition metal surface compounds and protection of Eu below hexagonal boron nitride (hBN)
Jun. 2023	OPERA International Hybrid Training School - Characterization Techniques for Epitaxial Materials, Portugal.
May 2022	The Capri Spring School on Transport in Nanostructures, Italy. Talk: Electronic structure of stable facets in the 2D material hBN/Pt system
May 2021	MaX School on Advanced Materials and Molecular Modelling with Quantum ESPRESSO ICTP, Italy.
Jan. 2020	Workshop on Catalysis. ICTP East African Institute for Fundamental Research (EAIFR), University of Rwanda, Rwanda.
Nov. 2019	Workshop on Defect in Crystals. ICTP East African Institute for Fundamental Research (EAIFR), University of Rwanda, Rwanda.
Nov. 2019	Mini-African School of Electronic Structure Methods and Applications (MASESMA). ICTP East African Institute for Fundamental Research (EAIFR), University of Rwanda, Rwanda.
Oct. 2018	CODATA-RDA-ICTP School of Research Data Science. ICTP East African Institute for Fundamental Research (EAIFR), University of Rwanda, Rwanda.
Dec. 2017	Statistics with R Workshop AIMS-Cameroon, Cameroon.
Oct. 2017	Introduction to Computer Algebra and Applications AIMS-Volkswagen Stiftung Workshop, Cameroon.
Nov. 2015	Training Workshop Sudanese Standards and Meteorology Organization (SSMO), Sudan.
Mar. 2015	The Art of Successful Teacher Skills and Methodology of Teaching Melody Press International Foundation, Sudan.
Mar. 2015	NDT (Nondestructive testing.), level 2 High Level Capacity Building and Human Development Center (HLCHDC), Sudan.
Dec. 2014	Training Workshop Entrepreneurship Center For Training and Small Project Development, Sudan.

PUBLICATIONS

Voloshina, Elena, et al., Nanoscale (2025).
Bakhit, Alaa Mohammed Idris, et al., arXiv preprint arXiv:2508.10746 (2025).
Schiller, Frederik, et al., ACS catalysis (2024).
Bakhit, Alaa Mohammed Idris, et al., Nanoscale 15.27, 11517-11528 (2023).
Bakhit, Alaa Mohammed Idris, et al., Science Talks 4, 100071 (2022).
Bakhit, Alaa Mohammed Idris, et al., Appl. Phys. Lett. 119, 211902 (2021).

VOLUNTEER EXPERIENCE

Jun. 2025 - Jul. 2025	Expanding Physics Horizons in Sudan: Leveraging Online Seminars for Growth Organizer and participant selection committee Member.
Mar. 2022 - present	Outreach activities organised by Materials Physics Center (MPC) Participated in women in science activities, science week and school visits, Spain.
Sep. 2017 - Jun. 2018	AIMS-Cameroon Give Back Activity Recording videos on math courses for first-year students at University of Yaoundé I Cameroon.

2017-2018

Student's Representative at AIMS-Cameroon.

Served as the elected representative for the student body.

COMPUTER SKILLS

- Python, Quantum Espresso
- LaTeX, Linux (including shell scripting)

LANGUAGE SKILLS

Arabic (native), English (IELTS score: 6, 2018), Spanish (A2, 2024)

REFERENCES

Dr. Frederik Schiller

Tenured Scientist at the Centro de Física de Materiales (CSIC-UPV/EHU), San Sebastián, Spain.

✉ frederikmichael.schiller@ehu.es

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Prof. Sandro Scandolo

Senior Research Scientist, International Centre for Theoretical Physics (ICTP), Trieste, Italy.

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