



PanAfrican Planetary and Space Science Network – PAPSSN

Intra-Africa Academic Mobility Scheme

**GUIDELINES FOR APPLICANTS 2021**



****

**TABLE OF CONTENTS**

[1. INTRODUCTION 4](#_Toc71620924)

[2. SCHOLARSHIPS INFORMATION 6](#_Toc71620925)

[2.1. TARGET GROUPS 6](#_Toc71620926)

[2.2. TYPES OF MOBILITY 7](#_Toc71620927)

[2.3. SCHOLARSHIPS DISTRIBUTION 7](#_Toc71620928)

[3. STUDENT MOBILITY 9](#_Toc71620929)

[3.1. STUDY OPPORTUNITIES 9](#_Toc71620930)

[3.2. RESEARCH OPPORTUNITIES 26](#_Toc71620931)

[3.2.1. Research opportunities for Master’s students 26](#_Toc71620932)

[3.2.2. Research opportunities for PHD students 34](#_Toc71620933)

[4. ACADEMIC AND ADMINISTRATIVE STAFF MOBILITY 46](#_Toc71620934)

[4.1. ACTIVITIES 46](#_Toc71620935)

[4.1 ELIGIBILITY CRITERIA 46](#_Toc71620936)

[5. APPLICATION PROCESS 47](#_Toc71620937)

[5.1. PREPARATION 47](#_Toc71620938)

[5.2. ONLINE SUBMISSION 47](#_Toc71620939)

[5.2. DOCUMENTS TO BE SUBMITTED 48](#_Toc71620940)

[6. EVALUATION AND SELECTION PROCESS 50](#_Toc71620941)

[6.1. PHASE 1 - APPLICATION: 50](#_Toc71620942)

[6.2. PHASE 2 - ADMINISTRATIVE CHECK. 50](#_Toc71620943)

[6.3. PHASE 3 – APPEAL PROCEDURE 51](#_Toc71620944)

[6.4. PHASE 4 - ACADEMIC ELIGIBILITY & QUALITY. 51](#_Toc71620945)

[6.5. PHASE 5 – APPEAL PROCEDURE 52](#_Toc71620946)

[6.6. PHASE 6 - DISTRIBUTION OF SCHOLARSHIPS AVAILABLE. 52](#_Toc71620947)

[7. IMPLEMENTATION OF THE MOBILITY 53](#_Toc71620948)

[7.1. OBLIGATIONS OF THE COORDINATION OFFICE AND THE SCHOLARSHIP HOLDERS’ HOME AND HOST INSTITUTIONS 53](#_Toc71620949)

[7.1.1. Travel 53](#_Toc71620950)

[7.1.2. Insurance 53](#_Toc71620951)

[7.1.3. Scholarships 53](#_Toc71620952)

[7.1.4. Learning conditions 54](#_Toc71620953)

[7.1.5. Recognition 55](#_Toc71620954)

[7.2. OBLIGATIONS OF SCHOLARSHIP HOLDERS 55](#_Toc71620955)

[7.2.1. The Coordinating Institution has the right to suspend the payment of the scholarship if: 55](#_Toc71620956)

[7.2.2. Implications of signing the Statement of Scholarship Acceptance and the Scholarship Contract: 55](#_Toc71620957)

[7.2.3. Students must complete successfully their mobility period at the host institutions as follows: 56](#_Toc71620958)

[8. CONTACTS AND SUPPORT 56](#_Toc71620959)

# 1. INTRODUCTION

The PanAfrican Planetary and Space Science Network (PAPSSN) is an Academic Mobility project funded by the Intra-Africa Mobility Scheme of the Education Audio-visual and Culture Executive Agency of the European Commission.

The overarching objective of PAPSSN is to support the development of a skilled and innovative graduate students’ community and improve their job preparedness for the growing Planetary and Space Science labour market in Africa and foster their capacity of operating local infrastructure, generating local data and engaging with the international community of scientists and entrepreneurs.

This mobility project, capitalizing on the new commitments from the AU and the EU, wishes to develop the next generation of African scientists, leaders, and entrepreneurs by improving their access to high quality STEM education, with particular emphasis on PSS. This development in PSS and technology leads to advances in technology literacy, security, safety, and productivity across a broad front of activities. Many African countries have already identified PSS as step stone for the modernization of their economy and for practical uses such as monitoring of land-use cover change, climate change, drought, hydrology, and natural disasters. Among the unquestioned benefits of PSS in the tertiary education system of African nations is the modernisation of the tertiary education programmes and introduction of new, cutting-edge technologies designed for space and planetary exploration within Africa HEIs and industries. PSS can excite the imagination of the public and stimulates the interest of the youth in science and technology.

A crucial aspect of this mobility programme will be to promote the standardization of PSS programmes by laying down a set of procedures that will be common throughout the consortium. This will, in turn, facilitate the internationalisation of the partner HEIs. It has been demonstrated that developments in PSS help the scientific community to address trans-boundary issues related to developmental and environmental problems, such as water management, and can consolidate international relationships, promote collaborations and optimize the use of limited funds. The PAPSSN will provide a critical venue to bridge the gap between countries with same PSS agenda but different skills and infrastructure thereby delivering the most impactful HE in terms of economic, cultural and livelihood of society. This project will promote a sustainable scientific and higher education strategy for developing PSS in Africa and attract national and international funding for African research institutions through the development of new collaborations and the strengthening of existing ones.

PARTNERS:

|  |  |  |
| --- | --- | --- |
| INSTITUTION | ACRONOYM | COUNTRY |
| Botswana International University of Science and Technology (Coordinating Partnet) | BIUST | Botswana |
| Addis Ababa University | AAU | Ethiopia |
| Copperbelt University |  | Kenya |
| University of Nigeria Nsukka | UNN | Nigeria |
| University of the Witwatersrand | Wits | South Africa |

TECHNICAL PARTNER:

|  |  |  |
| --- | --- | --- |
| INSTITUTION | ACRONOYM | COUNTRY |
| University of Bologna | UNIBO | Italy |

# 2. SCHOLARSHIPS INFORMATION

PAPSSN will train up to 36 MSc students, 14 PhD candidates and 10 staff members. Mobility must be to an institution in an eligible country other than the home country / country of the home institution.

## 2.1. TARGET GROUPS

|  |  |  |  |
| --- | --- | --- | --- |
|  | Participants | Mobility Types | Duration |
| **Target group 1** | African nationals and/or residents registered or having obtained a degree in one of the Higher Education Institutions that is a member of the consortium. | Master  Credit seeking  Degree seeking | 6 months  24 months |
| Doctorate  Credit seeking  Degree seeking | 12months  36/48 months |
| Staff working in or associated with one of four African partner institutions, wishing to visit a different partner institution. | Visits for teaching and/or research, or for engagement on administration and management | 1 or 3 months |
| **Target group 2** | African nationals and residents (students) registered in Higher Education Institutions of African countries not included in the partnership, or whom have obtained a Higher Institution degree or equivalent from an institution of these countries. | Master  Credit seeking  Degree seeking | 6 months  36 months |
| Doctorate  Credit seeking  Degree seeking | 12 months  36 months |

|  |  |
| --- | --- |
| **Region of Africa** | **Country** |
| Central | Burundi, Cameroon, Central African Republic, Chad, Congo, Congo DRC, Equatorial Guinea, Gabon and Sao Tome and Principle |
| Eastern | Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Sudan, South Sudan, Uganda and Tanzania |
| Northern | Algeria, Egypt, Libya, Tunisia and Morocco |
| Southern | Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe |
| Western | Benin, Burkina Faso, Ivory Coast, Cape Verde, Gambia, Ghana, Guinea, Guinea Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal , Sierra Leone and Togo |

## 2.2. TYPES OF MOBILITY

There are three (3) types of mobility within PAPSSN:

**Credit seeking mobility – for students already enrolled in Master’s and PhD degrees:**

Credit-seeking mobility of 6 and 12 months at a partner institution, leading to academic recognition of the study period towards a Master’s and PhD degree programme respectively at the home institution.

**Degree-seeking mobility – for students that want to complete a full Master’s and PhD:** Degree seeking mobility entails a full scholarship for a period of 24 to 48 months (depending on the programme) at a partner institution.

**Staff mobility:**

Staff mobility can be undertaken by academic, research or administrative staff from partner institutions who wish to visit other partner institutions within the consortium.

## 2.3. SCHOLARSHIPS DISTRIBUTION

An indicative distribution of mobility across target groups is given below. This may be adjusted to optimize project implementation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of mobility** | **Target Group 1** | **Target Group 2** | **TOTAL** |
| **Masters** | 22 | 14 | **36** |
| **Doctorates** | 10 | 4 | **14** |
| **Staff** | 15 |  | **15** |
| **TOTAL** | **47** | **18** | **65** |

An indicative breakdown of credit-seeking and degree-seeking student mobility for the first call for application is given below. This may be adjusted to optimize project implementation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Type of mobility** | **Credit-seeking** | **Degree-seeking** | **TOTAL** |
| **Masters** | 18 | 18 | **36** |
| **Doctorates** | 6 | 8 | **14** |
| **TOTAL** | **24** | **26** | **50** |

IMPORTANT: Types of mobility and their distribution might change to meet the project’s need. Please refer to the PAPSSN website (<https://www.papssnmobility.org)> for the most updated list of opportunities.

# 3. STUDENT MOBILITY

## 3.1. STUDY OPPORTUNITIES

The partner institutions offer opportunities in the following area of studies:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Pan-African Planetary and Space Science Network / PAPSSN**  **List of Master and Doctoral programs\*** | | | | | | | |  |
| **N.** | **HEI name** | **Country** | **Master/ Doctoral program** | **Title of the academic programme** | **Priority Thematic field of study** | **Subject description** | **Details** | **Academic Calendar** |
| 1 | BIUST | Botswana | Master | Physics | STEM and ICT | MSc by coursework and research in Physics, Astronomy Radioastronomy and related fields | 4 semesters  60 credits |  |
| 2 | BIUST | Botswana | Doctorate | Physics | STEM and ICT | PhD by research only in the fields of Physics, Astronomy, Radioastronomy and applied physics | 6 semesters  60 credits |  |
| 3 | BIUST | Botswana | Doctorate | Geology | STEM and ICT | PhD by research only in fields spanning from geophysics to planetary science | 6 semesters  60 credits |  |
| 4 | BIUST | Botswana | Doctorate | Environmental Sciences | STEM and ICT | PhD by research only. Research topics spanning from atmospheric science to remote sensing | 6 semesters  60 credits |  |
| 5 | Copperbelt University | Zambia | Master | Physics | STEM and ICT | MSc by coursework and research in the fields of physics and astrophysics | 4 semesters  240 credits (60 each semester) | **01/09/2021 – 30/07/2022** |
| 6 | Copperbelt University | Zambia | Doctorate | Physics | STEM and ICT | PhD by research in the fields of physics and astrophysics | 6 semesters  360 credits (60 each semester) | **Open year around** |
| 7 | University of the Witwatersrand | South Africa | Master | Geology | STEM and ICT | Master of Science by Dissertation in the field of geology including research topics related to impactite and meteorites | 4 semesters  45 credits | **01/02/22 – 30/11/2022** |
| 8 | University of the Witwatersrand | South Africa | Master | Geophysics | STEM and ICT | Master of science by Dissertation in the field of geophysics | 4 semesters  45 credits | **01/02/22 – 30/11/2022** |
| 9 | University of the Witwatersrand | South Africa | Master | Physics | STEM and ICT | Master of Science by Dissertation in the field of physics and astrophysics | 4 semesters  45 credits | **01/02/22 – 30/11/2022** |
| 10 | University of the Witwatersrand | South Africa | Doctorate | Geosciences | STEM and ICT | PhD programme by research only in the fields of geology and geophysics | 6 semesters  60 credits | **01/02/22 – 30/11/2022** |
| 11 | University of the Witwatersrand | South Africa | Doctorate | Physics | STEM and ICT | PhD programme is by research only and involves an original research topic within the broad disciplines of Physics and Astronomy | 6 semesters  60 credits | **01/02/22 – 30/11/2022** |
| 12 | University of Nigeria | Nigeria | Master | Space Physics | STEM and ICT | MSc by coursework in the fields of space technology, astrophysics and atmospheric sciences | 4 semesters  30 credits |  |
| 13 | University of Nigeria | Nigeria | Doctorate | Space Physics | STEM and ICT | PhD by coursework and research in physics and astrophysics | 6 semesters  30 credits |  |
| 14 | Addis Ababa University | Ethiopia | Master | Physics | STEM and ICT | MSc by coursework and research in physics and space physics | 4 semesters  33 credits [6 thesis] OR 97 ECTS credits (30 thesis) | **01/10/2021 – 01/06/2022** |
| 15 | Addis Ababa University | Ethiopia | Doctorate | Physics | STEM and ICT | PhD by coursework and research in the field of physics and applied physics | 8 semesters  84 credits [72 thesis] OR 120 ECTS | **01/10/2021 – 01/06/2022** |
| 16 | Addis Ababa University | Ethiopia | Master | Space Science | STEM and ICT | MSc by coursework and research in Space Science and technology | 4 semesters  33 credits [6 thesis] OR 97 ECTS credits (30 thesis) | **01/10/2021 – 01/06/2022** |
| 17 | Addis Ababa University | Ethiopia | Doctorate | Astronomy and Astrophysics | STEM and ICT | PhD by coursework and research in the field of astrophysics and Astronomy | 8 semesters  84 credits [72 thesis] OR 120 ECTS | **01/10/2021 – 01/06/2022** |

|  |
| --- |
| **BOTSWANA INTERNATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY** |
| 1. **MSc Physics**   **Duration (in semesters):** 4  **Study credits (per semester):** 60  **Objectives (max. 150 words**): The objectives of this programme is to: train students in academic work and scientific methodology; provide students the skills to extract information from literature and combine with own research, in order to correctly interpret and evaluate scientific results and distinguish academic results from results that would be of interest to industry in the form of innovation or patents; produce graduates with specialised training in Physics in preparation for scientific careers in academic, industrial, and research institutions; produce physicists with highly employable and valued, transferable, scarce skills to drive industrialisation and sustainable socio-economic diversification in Botswana and Africa; empower graduates with a solid foundation and working knowledge of Physics for solving problems of local importance and global relevance in diverse scientific and non-scientific professions;develop research capacity in Botswana and Africa in physics with specialisation in Astronomy and Astrophysics (to develop human capital for the SKA and AVN projects in Botswana an Africa), Materials Science, Applied Nuclear Physics and Technology, Non-linear Dynamics and Complex Systems, and Computational Physics (including Big Data Analytics).  **Structure and content (max. 400 words**): MSc students in Physics undertake research in an advanced topic in any of the following areas of specialisation: Astronomy and Astrophysics, Materials Science, Applied Nuclear Physics and Technology, Non-linear Dynamics and Complex Systems, and Computational Physics (including Big Data Analytics). After a minimum period of two semesters (one year) and a maximum period of six semesters (three years), a full-time MSc student is required to submit a dissertation which will be examined by two examiners, either one internal and one external examiner to the university or by two external examiners. The total credit value of an MSc qualification is 240 credits.  **Learning outcomes (max 200 words**): Produce trained personnel in Physics will be able to i) understand and apply physics principles to solve forefront scientific problems in specialisation areas of Astronomy and Astrophysics, Materials Science, Applied Nuclear Physics and Technology, Non-linear Dynamics and Complex Systems, and Computational Physics (including Big Data Analytics); ii) acquire, analyse and interpret data; iii) conduct independent research; iv) produce graduates with a wide range of theoretical, computational, and technical skills for enhanced employment opportunities in both the industry and academia.   1. **PhD Physics**   **Duration (in semesters):** 6  **Study credits (per semester):** 60  **Objectives (max. 150 words**): The objective of this programme is to: produce graduates who are able generate new scientific knowledge through performing independent and original academic research leading to publications in any of the following areas of specialisation: Astronomy and Astrophysics, Materials Science, Applied Nuclear Physics and Technology, Non-linear Dynamics and Complex Systems, and Computational Physics (including Big Data Analytics); to produce graduates who will create new industries in Botswana and Africa; produce graduates with specialised training in Physics in preparation for scientific careers in academic, industrial, and research institutions; produce physicists with highly employable and valued, transferable, scarce skills to drive industrialisation and sustainable socio-economic diversification in Botswana and Africa; develop research capacity in Botswana and Africa in physics in the above specialization areas.  **Structure and content (max. 400 words**): PhD students in Physics undertake original research in an advanced topic in any of the following areas of specialisation: Astronomy and Astrophysics, Materials Science, Applied Nuclear Physics and Technology, Non-linear Dynamics and Complex Systems, and Computational Physics (including Big Data Analytics). After a minimum period is six semesters (three years) and the maximum period is eight semesters (four years), a full-time PhD student is required to submit a thesis which will be examined by three examiners, of which at least two examiners must be external to BIUST and one internal or all three examiners shall be external. For a PhD, a successful Viva Voce is mandatory for conferment of the degree. The PhD work must result in at least one publication in reputable peer reviewed international journal. The total credit value of a PhD qualification is 360 credits.  **Learning outcomes (max 200 words**):  Produce trained personnel in Physics will be able to i) understand and apply physics principles to solve forefront scientific problems in specialisation areas of Astronomy and Astrophysics, Materials Science, Applied Nuclear Physics and Technology, Non-linear Dynamics and Complex Systems, and Computational Physics (including Big Data Analytics); ii) to acquire the competence to undertake original and independent research in experimental, theoretical, computational, and applied physics and to make significant and original academic contributions at the frontiers of the discipline of specialization.   1. **PhD Geology**   **Duration (in semesters):** 6  **Study credits (per semester):** 60  **Objectives (max. 150 words**): A PhD in Geology aims to create a new generation of scientists working in all the Earth science disciplines from economic geology, to geophysics to planetary science. Multidisciplinary projects with application of geological methods/concepts into broader fields are encouraged: e.g., remote sensing for solving development problems, biogeochemistry applied to early life and exobiology, geophysics of planet earth and exoplanets, etc. At the end of the programme the candidate will have to: i) demonstrate their competence to carry out independent and original academic research in Earth sciences; ii) present the results of her/his research into a peer-reviewed academic publication in order to increase the productive of the university; iii) have acquired skills in oral presentation and sufficient confidence in their knowledge, ideas and abilities to be able to present and defend their academic work in front of their peers.  **Structure and content (max. 400 words**): A PhD study by research focuses on understanding of the dynamic processes affecting our planet, using the standard tool of geosciences (e.g., geophysics, geochemistry, etc.) and those common to other disciplines (e.g., biology, natural science). Students are encouraged to take up topics relevant to the society and at the frontier of knowledge. The research topics are defended and accepted through a series of evaluations and feedbacks. Students are encouraged to take up topics relevant to society and at the frontier of knowledge. After a minimum period is six semesters (three years) and the maximum period is eight semesters (four years), a full-time PhD student is required to submit a thesis which will be examined by three examiners, of which at least two examiners must be external to BIUST and one internal or all three examiners shall be external. For a PhD, a successful Viva Voce is mandatory for conferment of the degree. The PhD work must result in at least one publication in reputable peer reviewed international journal. The total credit value of a PhD qualification is 360 credits.  **Learning outcomes (max 200 words**): Upon completion of the degree the candidate will be able to pursue an approved programme of research on a subject falling within the area of earth and planetary sciences. This PhD programme shall make a distinct contribution to the knowledge or understanding of the subject and afford evidence of originality shown either by the discovery of new facts and by the exercise of independent critical power.   1. **PhD Environmental Science**   **Duration (in semesters):** 6  **Study credits (per semester):** 60  **Objectives (max. 150 words**): The objective of this programme is to produce graduates able to perform independent and original academic research in environment and climate studies. The graduates must be able to present the results of their research to a standard equivalent to that of peer-reviewed academic publication to increase the productive of these university. At the end of the programme the students will have acquired skills in oral presentation and sufficient confidence in their knowledge, ideas, and abilities to be able to present and defend their academic work in front of their peers.  **Structure and content (max. 400 words**): The programme consists of a PhD by research which focuses on understanding of climate and land management change impacts on the natural and socio-economic environment well as evaluating and monitoring the extent of land degradation and deforestation using process-based ecosystem modelling, GIS and Remote sensing. Students are encouraged to take up topics relevant to the society and at the frontier of knowledge such as planetary atmospheric science. The research topics are defended and accepted through a series of evaluation and feedbacks. Student performance is assessed through progress made in her/his PhD research supervisor(s) based on progress report and presentation. Two external examiners and one internal examiner need to evaluate the PhD dissertation. The PhD work must result in at least one publication in reputable peer reviewed international journal before submission for PhD defence.  **Learning outcomes (max 200 words**): At the end of the programme the student must be able to pursue an approved programme of research on a subject falling within the scope of studies at the University. Such a programme shall make a distinct contribution to the knowledge or understanding of the subject and afford evidence of originality shown either by the discovery of new facts and by the exercise of independent critical thinking. |

|  |
| --- |
| **COPPERBELT UNIVERSITY (ZAMBIA)** |
| 1. **MSc Physics**   **Duration (in semesters):** 4  **Study credits (per semester): 60**  **Objectives (max. 150 words**): The programme offers MSc in Physics with major in several fields of physics and astrophysics. General objectives of the programme are: i) to provide an education framework in the University, the Country and the Region leading to professional competence in space related physics; ii) to lay appropriate underpinning scientific knowledge leading to high levels of competence and interest in space related physics; iii) to provide students with insights into space related physics research topics that prepares the students to use the available regional and international space related research facilities.  **Structure and content (max. 400 words**): The MSc programme in Physics (including all specializations) is on a Full-time basis. The minimum duration is two years, while the maximum duration is four years. Except where explicitly specified, all MSc programmes consist of two phases. Phase I constitutes the taught component comprising lectures, laboratory exercises, field trips, seminars and literature review sessions. Depending on the programme of study, Phase I has a duration of 12 – 18 months and culminates in a written examination. Phase II (6 - 12 months) of the programme covers the second and final year when students are required to conduct a supervised research project in the relevant discipline to culminate in the writing of a dissertation. In phase II of all MSc programmes, the dissertation or thesis shall carry 100 points, with a weighting of 15 points for oral presentation (public defence or viva) and 85 points for the written document. The award of the degree is subject to the acceptance by the CBU of a dissertation/thesis that will satisfy the Examiners, that in their assessment, the outcome of the research shall reflect originality of the subject matter which contributes new and/or additional findings to the body of scientific knowledge in Africa and the world. A pass mark for the dissertation/thesis shall be a mark of 50% or better. The grade for the dissertation/thesis shall be Pass or Fail.  **Learning outcomes (max 200 words**): The programmes are designed to ensure that the academic and professional mandates of the School of Mathematics and Natural Sciences meet the following objectives: i) To provide advanced theoretical, practical and research-based knowledge and skills in specialised basic and applied disciplines in Physics; ii) To upgrade the qualifications of teachers, lecturers, educators and training providers through provision of advanced skills and knowledge needed to effectively deliver courses and related services at tertiary levels of academic and professional education; iii) To provide graduate students with opportunities to develop specialised academic and research skills that should enhance their career prospects, while stimulating intellectual and professional growth.  **2. PhD Physics**  **Duration (in semesters):** 6  **Study credits (per semester):** 60  **Objectives (max. 150 words**): General objectives of the PhD in Physics are: i) to provide an education framework in the University, the Country and the Region leading to professional competence in space physics and related fields; ii) to lay appropriate underpinning scientific knowledge leading to high levels of competence and interest in space physics and related fields; iii) to train students in space physics research mindedness and awareness that prepares the students to use the available regional and international PSS research facilities.  **Structure and content (max. 400 words**): The PhD programme is by research only and the research topics should be original and must exhibit some measure of academic and socio-economic relevance to the needs of Zambia and the world. For the PhD, the research and thesis shall be completed at least three years and within six years after the initial registration. The dissertation will be assessed in part by an oral examination (*viva voce*) and the dissertation report. The candidate will be required to publish at least one paper or show proof acceptance for publication. The award of the degree is subject to the acceptance by the CBU of a dissertation that will satisfy the Examiners. The outcome of the research shall reflect originality of the subject matter which contributes new and/or additional findings to the body of scientific knowledge in Africa and the world.  **Learning outcomes (max 200 words**): The programmes are designed to ensure that the academic and professional mandates of the School of Mathematics and Natural Sciences meet the following objectives: i) To provide advanced theoretical, practical and research-based knowledge and skills in specialised basic and applied disciplines in Physics. ii) To upgrade the qualifications of teachers, lecturers, educators and training providers through provision of advanced skills and knowledge needed to effectively deliver courses and related services at tertiary levels of academic and professional education. iii) To provide graduate students with opportunities to develop specialised academic and research skills that should enhance their career prospects, while stimulating intellectual and professional growth. |

|  |
| --- |
| **UNIVERSITY OF THE WITWATERSRAND (SOUTH AFRICA)** |
| 1. **MSc Geology**   **Duration (in semesters):** 4  **Study credits/hours (per semester):** 45  **Objectives (max. 150 words**): The Master of Science by Dissertation (MSc) programme in the School of Geosciences aims to develop high-level research skills by exposing candidates to appropriate research methodologies and/or instrumentation within specialist fields. The specialist field of relevance to the current application is the MSc Geology.  **Structure and content (max. 400 words**): Candidates undertake research under supervision of members of staff of the respective schools on a mutually-agreed topic for which appropriate supervisor resources and facilities are available. Progress is monitored via the supervisor(s), and School and Faculty-level Graduate Studies Committees (GSC) through assessment of the Research Proposal and Annual Progress Reports; final assessment of the written dissertation is made by two independent examiners, at least one of whom must be external to the University, whose reports are approved by the Faculty GSC.  Current MSc projects within the School linked to supervisor specialisations cover multiple aspects of the geology and geophysics of terrestrial impact structures, economic ore deposits hosted within impact structures, and meteorites.    **Learning outcomes (max 200 words**): By the end of the programme the candidate should be able to: i) generate, explore and consider options and possibilities for scope, content and methodology of research leading to a dissertation; ii) identify the most appropriate scope, content and methodology of research commensurate with one or several of the following: interest, research imperatives, resources and supervision available; iii) explain why a particular scope, content and methodology of research has been chosen and what has been taken into account in doing so; iv) undertake the research and produce the dissertation, while continuously monitoring and adapting own performance as required or recommended by supervision and/or peers; v) evaluate own learning during the research and identify strengths, weaknesses and areas for improvement; vi) reflect on the ethics of the research and what (s)he has learnt about him/herself as a learner and as a researcher; vii) demonstrate an advanced understanding of the boundaries, inter-connections, value and knowledge creation systems of the chosen discipline/s within the sciences and an ability to critically evaluate these; and viii) demonstrate an advanced understanding and ability to analyze specified bodies of content and their inter-connectedness in chosen discipline/s in Planetary Science.   1. **MSc Geophysics**   **Duration (in semesters):** 4  **Study credits/hours (per semester):** 45  **Objectives (max. 150 words**): The Master of Science by Dissertation (MSc) programme in the School of Geosciences aims to develop high-level research skills by exposing candidates to appropriate research methodologies and/or instrumentation within specialist fields. The specialist field of relevance to the current application is the MSc Geophysics.  **Structure and content (max. 400 words**): Candidates undertake research under supervision of members of staff of the respective schools on a mutually-agreed topic for which appropriate supervisor resources and facilities are available. Progress is monitored via the supervisor(s), and School and Faculty-level Graduate Studies Committees (GSC) through assessment of the Research Proposal and Annual Progress Reports; final assessment of the written dissertation is made by two independent examiners, at least one of whom must be external to the University, whose reports are approved by the Faculty GSC.  Current MSc projects within the respective schools linked to supervisor specialisations cover petrophysics of a variety of rock materials, remote sensing of geophysical datasets and geophysics of terrestrial impact structures.    **Learning outcomes (max 200 words**): By the end of the programme the candidate should be able to: i) generate, explore and consider options and possibilities for scope, content and methodology of research leading to a dissertation; ii) identify the most appropriate scope, content and methodology of research commensurate with one or several of the following: interest, research imperatives, resources and supervision available; iii) explain why a particular scope, content and methodology of research has been chosen and what has been taken into account in doing so; iv) undertake the research and produce the dissertation, while continuously monitoring and adapting own performance as required or recommended by supervision and/or peers; v) evaluate own learning during the research and identify strengths, weaknesses and areas for improvement; vi) reflect on the ethics of the research and what (s)he has learnt about him/herself as a learner and as a researcher; vii) demonstrate an advanced understanding of the boundaries, inter-connections, value and knowledge creation systems of the chosen discipline/s within the sciences and an ability to critically evaluate these; and viii) demonstrate an advanced understanding and ability to analyse specified bodies of content and their inter-connectedness in chosen discipline/s in Geophysics and Planetary Science.   1. **MSc Physics**   **Duration (in semesters):** 4  **Study credits/hours (per semester):** 45  **Objectives (max. 150 words**): The Master of Science by Dissertation (MSc) programme in the School of Physics aims to develop high-level research skills by exposing candidates to appropriate research methodologies and/or instrumentation within specialist fields. The MSc in Physics by dissertation is offered in the fields of Physics, Astronomy & Astrophysics, Computational Physics, Condensed Matter Physics, Crystallography, High Energy Physics, Nuclear Physics, Particle Physics, Theoretical Physics. The specialist fields of relevance to the current application are Astronomy & Astrophysics.  **Structure and content (max. 400 words**): Candidates undertake research under supervision of members of staff of the respective schools on a mutually-agreed topic for which appropriate supervisor resources and facilities are available. Progress is monitored via the supervisor(s), and School and Faculty-level Graduate Studies Committees (GSC) through assessment of the Research Proposal and Annual Progress Reports; final assessment of the written dissertation is made by two independent examiners, at least one of whom must be external to the University, whose reports are approved by the Faculty GSC.  Current MSc projects within the School of Physics linked to supervisor specializations cover multiple aspects of radio, multifrequency, and multimessenger astrophysics, specializing in extragalactic sources and searches for dark matter and using data from instruments such as MEERKAT, H.E.S.S., Fermi, and KM3NeT.  **Learning outcomes (max 200 words**): By the end of the programme the candidate should be able to: i) generate, explore and consider options and possibilities for scope, content and methodology of research leading to a dissertation; ii) identify the most appropriate scope, content and methodology of research commensurate with one or several of the following: interest, research imperatives, resources and supervision available; iii) explain why a particular scope, content and methodology of research has been chosen and what has been taken into account in doing so; iv) undertake the research and produce the dissertation, while continuously monitoring and adapting own performance as required or recommended by supervision and/or peers; v) evaluate own learning during the research and identify strengths, weaknesses and areas for improvement; vi) reflect on the ethics of the research and what (s)he has learnt about him/herself as a learner and as a researcher; vii) demonstrate an advanced understanding of the boundaries, inter-connections, value and knowledge creation systems of the chosen discipline/s within the sciences and an ability to critically evaluate these; and viii) demonstrate an advanced understanding and ability to analyze specified bodies of content and their inter-connectedness in chosen discipline/s in Astronomy, Space Physics and Planetary Science   1. **PhD Geosciences**   **Duration (in semesters):** 6  **Study credits/hours (per semester):** 60  **Objectives (max. 150 words**): The PhD programme aims to develop new knowledge and high-level research skills and capacity via novel projects. The specialist fields of relevance to the current application from the School of Geosciences is the PhD Geosciences. The School of Geosciences has a strong record of research on African impact structures and a growing research capacity in meteorite provenance studies. Whilst impact cratering and meteorite research is not exclusively dedicated to African themes, research exploits Wits’ geographic advantage in examining African geoheritage.  **Structure and content (max. 400 words**): The Doctor of Philosophy (PhD) programme is by research only and involves an original research topic within the broad disciplines of geology, geophysics or palaeontology and may be completed by publication or monograph + 1 publication. The thesis may be completed by publication or by monograph + 1 publication. Candidates undertake research under supervision of members of staff of the respective schools on a mutually-agreed topic for which appropriate supervisor resources and facilities are available. Progress is monitored via the supervisor(s), and School and Faculty-level Graduate Studies Committees (GSC) through assessment of the Research Proposal and Annual Progress Reports; final assessment of the written thesis is made by three independent examiners, at least two of whom must be external to the University and one of whom must be based internationally, whose reports are approved by the Faculty GSC. Current PhD projects within the respective schools linked to supervisor specialisations cover multiple aspects of geology and geophysics of terrestrial impact structures.  **Learning outcomes (max 200 words**): The qualifying candidate must demonstrate through a body of work that he/she: i) is capable of independent and original research; ii) possesses highly specialized, authoritative knowledge and is competent to apply that knowledge to the solution of problems; and iii) is self-directed and self-critical.   1. **PhD Physics**   **Duration (in semesters):** 6  **Study credits/hours (per semester):** 60  **Objectives (max. 150 words**): The PhD programme in Physics aims to develop new knowledge and high-level research skills and capacity via novel projects. The PhD in Physics is offered in the specializations of Physics, Astronomy & Astrophysics, Computational Physics, Condensed Matter Physics, Crystallography, High Energy Physics, Nuclear Physics, Particle Physics, Theoretical Physics. The specialist fields of relevance to the current application from the School of Physics are Astronomy & Astrophysics.  **Structure and content (max. 400 words**): The Doctor of Philosophy (PhD) programme is by research only and involves an original research topic within the broad disciplines of physics and must be completed by dissertation. Candidates undertake research under supervision of members of staff of the respective schools on a mutually-agreed topic for which appropriate supervisor resources and facilities are available. Progress is monitored via the supervisor(s), and School and Faculty-level Graduate Studies Committees (GSC) through assessment of the Research Proposal and Annual Progress Reports; final assessment of the written thesis is made by three independent examiners, at least two of whom must be external to the University and one of whom must be based internationally, whose reports are approved by the Faculty GSC. Current PhD projects within the School of Physics linked to supervisor specializations cover multiple aspects of radio, multifrequency, and multimessenger astrophysics, specializing in extragalactic sources and searches for dark matter and using data from instruments such as MEERKAT, H.E.S.S., Fermi, and KM3NeT.  **Learning outcomes (max 200 words**): The qualifying candidate must demonstrate through a body of work that he/she: i) is capable of independent and original research; ii) possesses highly specialized, authoritative knowledge and is competent to apply that knowledge to the solution of problems; and iii) is self-directed and self-critical. |

|  |
| --- |
| **UNIVERSITY OF NIGERIA, NSUKKA** |
| 1. **MSc Space Physics**   **Duration (in semesters):** 4  **Study credits/hours (per semester):** 12  **Objectives (max. 150 words**): The MSc program in Space Physics is designed to impart both theoretical and practical knowledge on Astrophysics, physics, physics of the atmosphere and thereby inculcating in the students, the skills and intellectual training needed for taking up careers in Space Physics collaborating with universities, research centres and industries.  **Structure and content (max. 400 words**): The students are required to take core courses designed to give foundation knowledge in physics and technology and at advanced levels in the various areas of Space Physics. The students are also required to take courses in the specialised areas of their choice following the advice of their supervisor. The MSc examination consist of written papers on the courses taken and research work presented in the form of a project report or dissertation as the case may be. The core courses of the programme are: Classical Mechanics, Classical Electrodynamics, Quantum Mechanics, Statistical Physics, Quantum Field Theory, Methods of Theoretical Physics, Electronic Instrumentation and Measurement. Courses offered in the field of Astrophysics are: High Energy Astrophysics, General Relativity, Cosmology, Plasma Physics, Galactic and Extragalactic Radio Astronomy, Random Signals and Noise Processing, Radio Astronomy and Space Science Information. Courses offered in the field of Atmospheric Sciences are: Meteorology, Physics of Geomagnetic Phenomena, Aeronomy, Physics of Remote Sensing, Communication and Satellite Technology, Radio Wave Propagation.  **Learning outcomes (max 200 words**): The training increases not only the student’s skills, intellectual and professional competence for making career as a physicist, but also prepares the students for careers as lecturers and researchers in the universities and other tertiary educational institutions; industrial research institutes and government departments (including space agencies and observatories). The students are expected to be knowledgeable enough in the various areas of atmospheric science and astrophysics course taken in order to understand, initiate and conduct researches in space science independently with minimal supervision.   1. **PhD Space Physics**   **Duration (in semesters):** 6  **Study credits/hours (per semester):** 12  **Objectives (max. 150 words**):  The aim of the PhD programme in the Department of Physics is to impart scientific knowledge in key areas of research such as astronomy and astrophysics and ultimately lead to the production of high level man power with strong background in physics. The graduates from this programme are expected to develop a high degree of competence in thinking independently about research problems and seeking to provide insight into solutions using the techniques’ learned as physicists.  **Structure and content (max. 400 words**):  To be awarded a degree candidate must pass a minimum of 30 units courses made up as follow: i) core courses of 27 credits, including the general courses (see MSc course list), thesis research project and seminars; ii) elective courses of minimum of 3 credits; iii) at least two oral presentations/seminar reporting the research progresses (6 units); iv) the PhD candidate shall carry out research in a relevant area of specialization and submit an monographic thesis (12 credits) which must be defended (*viva voce*) before a panel of external and internal examiners.  **Learning outcomes (max 200 words**):   1. Successful graduates of the above degree programmes are well equipped for postgraduate studies and teaching in the relevant subject. Their training also prepares them for careers in Government Departments, e. g. Meteorology, Geological Survey, National Standard organization; in Industrial research Establishment e.g. Astronomical Observations, oil, steel and other industries; and commercial and technical firms needs the services of a physicist. |

|  |
| --- |
| **ADDIS ABABA UNIVERSITY, DEPARTMENT OF PHYSICS** |
| 1. **MSc Physics**   **Duration (in semesters):** 4  **Study credits (per semester):** 23 ECTS  **Objectives (max. 150 words**): The Department of Physics of AAU offers a MSc degree programme by coursework and research in physics. Postgraduate degree programmes normally form an integral part of a University, to serve the general purpose of developing research capabilities through dedicated and persistent scholarship as well as providing relevant trained manpower needed for teaching at institutions of higher learning and/or carrying out research in Academic, public and private institutions. The MSc programme in physics covers the following areas of specialization: Astronomy/Astrophysics, Atmospheric Physics Condensed Matter Physics (Solid State Physics) Laser Spectroscopy, Modelling and Simulation of Novel Materials, Nuclear physics, Polymer Physics, Quantum Field Theory, Quantum Optics, Space Physics, Statistical physics, Imaging Physics.  **Structure and content (max. 400 words**): A graduate student is required to take seven courses (each with 7 ECTS) from the compulsory module (Mathematical Methods of Physics, Electromagnetic Theory, Statistical Mechanics, Quantum Mechanics, Classical Mechanics, Computational Physics, Experimental Physics); and additional two courses (each with 7 ECTS) from the specialization module from one's area of specialization (which a student is expected to select among the following: Astronomy/Astrophysics, Atmospheric Physics, Condensed Matter Physics, Laser Spectroscopy, Modelling and Simulation of Novel Materials, Nuclear physics, Polymer Physics, Quantum Field Theory, Quantum Optics, Space Physics, Statistical Physics and Imaging Physics). The courses are assessed through tests, assignments, presentations, and a final examination to determine the final (letter) grade. Upon successful completion of the course works, a graduate student must undertake a graduate thesis (up to 30 ECTS) on an approved topic under the supervision of an advisor. The graduate thesis must represent individual effort to carry out an investigation of a selected problem in theoretical or experimental physics. Finally, the graduate student is required to successfully defend the graduate thesis work before an examination committee. The student must also submit at least one research article by the end of the programme.  **Learning outcomes (max 200 words**): The Master of Science in Physics program provides the candidate with knowledge, general competence, and analytical skills on an advanced level, needed in industry, consultancy, education, research, or higher educational/research institutions. The individual research project gives special expertise within one of the research areas represented at The Department of Physics: Astronomy/Astrophysics, Atmospheric Physics, Condensed Matter Physics, Laser Spectroscopy, Modelling and Simulation of Novel Materials, Nuclear physics, Polymer Physics, Quantum Field Theory, Quantum Optics, Space Physics, Statistical Physics and Imaging Physics.   1. **PhD Physics**   **Duration (in semesters):** 8  **Study credits/hours (per semester):** 17 ECTS  **Objectives (max. 150 words**): The Department of Physics of AAU offers a research PhD degree program in physics by course work and full dissertation. PhD programmes form an integral part of a University, to serve the general purpose of developing research capabilities through dedicated and persistent scholarship as well as providing relevant trained manpower needed for teaching at institutions of higher learning institutions and/or carrying out research in academic, public and private institutions. This postgraduate program is designed primarily to prepare Physicists for careers in University teaching and research institutions. This objective is met by having program containing courses in all main specialization areas. The PhD research project is intended to emphasize practical aspects of the course work and to enable students to initiate, promote, and foster research in various areas of physics  **Structure and content (max. 400 words**): A PhD student is required to take 3 courses (each with 8 ECTS) relevant to his specialization area, 2 seminar works (each with 5 ECTS) on current topics that are relevant to his/her area of specialization including: Astronomy, Astrophysics, Atmospheric Physics, Condensed Matter Physics, Laser Spectroscopy, Nuclear physics, Quantum Field Theory, Quantum Optics, Polymer Physics and Space Physics. The courses are assessed through tests, assignments, presentations, and a final examination to determine the final (letter) grade. The courses and seminars are offered during the first year (2 semesters). Upon successful completion of the course and seminar works, a graduate student must undertake a dissertation on an approved topic under the supervision of an advisor. The PhD dissertation must constitute individual effort in carrying out an investigation of a selected problem in theoretical or experimental physics as well as advance the frontiers of the discipline. The student is required to successfully defend the findings of the dissertation work before an examination committee. The student must publish at least one scientific articles before the end of the PhD.  **Learning outcomes (max 200 words**): At the end of course PhD candidates would be able to: i) understand the whole process of scientific research in the broad field of physics; ii) formulate, present and defend a PhD Research Proposal; iii) understand and describe the research methodologies, methods and techniques relevant for PhD thesis; iv) understand the rationale behind sampling procedures, and becoming familiar with the various methods of data collection; v) Developing the ability to formulate testable hypotheses in deductive research, and understand the logic behind hypothesis testing by applying various statistical methods; vi) Investigating the connection between statistical analysis and research methodology, and understanding that the most advanced statistical techniques and findings are useless without a solid research methodological base; vii) publish a scientific paper.   1. **MSc Space Science**   **Duration (in semesters):** 4  **Study credits (per semester):** 23 ECTS  **Objectives (max. 150 words**): To train Junior research in space science which are able to conduct quantitative and qualitative research and statistical analysis of data in support to space technology development and space exploration. To create graduates that can participate in cutting edge scientific projects in support of universities, Research institutions and industries.  **Structure and content (max. 400 words**): The programme consists of taught modules plus a final year dissertation at year II. Most of the modules are 7 ECTS credits each and include: Advanced Research Methods, Computational Physics, Methods of mathematical Physics, Space Science, Instrumentation in Space Science and Introduction to Space Technology. At the end of the taught modules the candidate will have to prepare a thesis presenting original scientific data choosing among the available fields in PSS. The dissertation will be evaluated by an internal panel as well as by external examiners.  **Learning outcomes (max 200 words**): The MSc in space science programme aims to support the expansion and capacity building of space science, physical science, mathematics and related science and technology that sustains quality and sustainable national space science networks amongst universities, research institutions, national and international organizations, Integrated science and technology applications, telecommunication agencies, Ministry of Science and Technology, Ministry of Education, Ministry of defence, Ministry of agriculture, different industries, universities and research centres.   1. **PhD Astronomy and Astrophysics**   **Duration (in semesters):** 8  **Study credits/hours (per semester):** 17 ECTS  **Objectives (max. 150 words**): The main objective of Astronomy and Astrophysics PhD programme is to improve the overall skills in Space Sciences at the national level and to create skills and knowledge that can be transferred to Universities, industries and research Institutes is line with SDGs and 10 years of government program in human capital training.  **Structure and content (max. 400 words**): The programme consists in taught module, seminars and research with a final dissertation. The taught modules include: Modern observational techniques in astronomy, Advanced Relativistic Astrophysics, Stellar structure and evolution and Radiative process in Astrophysics, Galactic and Extragalactic Astronomy. The programme includes also a module in Advanced Scientific Writing at the end of which graduates will be equipped with the knowledge to guide them through preparation and submission of scientific papers for international peer reviewed journals. The courses and seminars are offered during the first year (2 semesters). Upon successful completion of the course and seminar works, a graduate student must undertake a research on an approved topic under the supervision of an advisor. The PhD dissertation must constitute individual effort in carrying out an investigation of a selected problem. The student is required to successfully defend the findings of the dissertation work before an examination committee. The student must publish at least one scientific articles before the end of the PhD.  **Learning outcomes (max 200 words**): At the end of course PhD candidates would be able to: i) understand the whole process of scientific research including conceptualization, theorization, operationalization, measurement, validity and reliability; ii)formulate, present and defend PhD Research Proposal; iii) Understand and describe the research methodologies, methods and techniques relevant for PhD thesis writing domain; iv) Identify and Select appropriate research method and related techniques and carry out advanced and coherent research for the partial fulfilment of their doctorate degree; v) Understanding the rationale behind sampling procedures, and becoming familiar with the various methods of data collection used in both qualitative and quantitative planetary systems; vi) Developing the ability to formulate testable hypotheses in deductive research, and understand the logic behind hypothesis testing by applying various statistical methods; vii) Investigating the connection between statistical analysis and research methodology, and understanding that the most advanced statistical techniques and findings are useless without a solid research methodological base; viii) Becoming a knowledgeable consumer of space and earth observation related sciences research; ix) Clearly understand the rules of thumb for writing research articles; x) prepare a manuscript and submit it to get publishing. |

## 3.2. RESEARCH OPPORTUNITIES

### 3.2.1. Research opportunities for Master’s students

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| N. | Host institution | Research specialisation | Title | Abstract | Contact person |
| 1 | **Addis Ababa University** | **Space Physics** | *Investigation of GICs over the African low-latitude region during varying geomagnetic storms* | Geomagnetically induced currents (GICs) represent a significant space weather issue for power grid and pipeline infrastructure, particularly during severe geomagnetic storms. The impacts of GICs on critical infrastructure are severe in high-latitude regions due to the fact that the Earth’s magnetic field configuration is open at the poles. Thus, multiple studies have been conducted and despite understandable limitations in providing accurate warnings, research centres are in a position to offer near real-time forecasts of impacts of GICs on vulnerable infrastructures. However, not much studies have been conducted on the low-latitude regions that can be turned into early warning operational purposes to the said infrastructure, particularly in the African low-latitude regions. Ground-based magnetometer station data will be primarily used in order to investigate the severity of GICs during varying geomagnetic storms in the African low-latitude regions. Moreover, multiple solar and geomagnetic indices will also be used to supplement the investigation. Therefore, the student will employ different techniques using multiple data sources to analyse the cascading mechanisms during geomagnetic storms of varying magnitudes leading to the disturbance in magnitudes of the equatorial electro-jets (EEJ) which in turn results to GICs over African low-latitude region. It is also mandatory that the candidates have background in using Python or R programming languages. | Dr Nigussie Mezgebe, Assistant Professor of Space Science  Department of Space Science and Applications Research & Development  Entoto Observatory Research Center (EORC)  Ethiopian Space Science  and Technology Institute (ESSTI)  Tele: (+251) 118961050  Mobile: [(+251) 944242039](tel:091%20201%200792)  Addis Ababa, Ethiopia  P.O. Box 33679 |
|  |  | **Cosmology** | *Evolution and day-to-day variability of night-time equatorial ionospheric plasma density irregularities* | Post-sunset ionospheric plasma density irregularities in low latitudinal and equatorial regions are generally known as equatorial spread F (ESF). It is a post-sunset phenomena in which the F-region of the ionosphere becomes unstable as a result of Rayleigh-Taylor instability. As a result of this instability, large scale plasma bubbles develop at the bottom of F-region and arise to more than 1000 km altitudes. Although it has been studied more than eight decades since the discovery of ionospheric plasma irregularities by Booker and Wells (1938), the basic physical mechanism of how these irregularities form and their day-to-day variability remain a challenging issue. Understanding its short time characteristics and forecasting its occurrence is very important because of its impact on radio communications that degrade ground and satellite-based communications and navigation systems. In this study we will utilize data from multiple ground - based instruments including GPS and magnetometers and also satellite based measurements to study magnetically quiet and disturbed time characteristics of plasma irregularities. The study also includes developing empirical representation of ESF over the African longitudinal sector. | Dr Ephrem Beshir, Associate Researcher of Space Science at the Department of Space Science and Applications Research & Development, Ethiopian Space Science and Technology Institute (ESSTI), Ethiopia |
| 2 | **Botswana International University of Science and Technology** | **Cosmology** | *A Comparative Analysis of Galaxy Number Count and Cosmic Magnification as Cosmological Probes* | As we enter the era of precision cosmology, where surveys will have unprecedented measurement ability, observational data will hold unmatched power for testing theoretical ideas. This presents a strong opportunity for innovative work. For example, it will be possible to develop a novel framework to answer the crucial question: Which is a better cosmological probe: galaxy number count or cosmic magnification? It is important to answer this question since, in order to realise the full potential of the forthcoming precise observational data, we need to employ only the right, most effective and/or efficient analytical tools (the cosmological observables). The galaxy number count has been widely used in cosmology to hunt down the signatures of dark energy and modified gravity in the large-scale structure. However, most of the theoretical models appear degenerate by this approach. A recent work suggest that the cosmic magnification holds the potential to distinguish, specifically, models of interacting dark energy. This needs to be investigated further. In this work we will build on this effort and extend it to standard, non-interacting dark energy theories and alternative theories of gravity.  We will compare the results with a corresponding rigorous analysis using the galaxy number counts. We will provide a comprehensive investigation of the effectiveness of both the galaxy number count and the cosmic magnification as cosmological probes of models of the late-time cosmic accelerated expansion.  Method: This project will involve mainly analytical calculations and computer programming in python. Given the allowed duration for this project (6 months), the potential student is expected to have good background in cosmology or astrophysics, and a substantial experience with python. The candidate needs to be hardworking.  Potential output: A minimum of one research publication in an international journal is expected from this project. | Contact person:  Dr. Adams Duniya,  Department of physics and Astronomy  BIUST  duniyaa@biust.ac.bw |
| 3 | **Copperbelt University** | **Observational astrophysics and instrumentation – site selection** | *Survey and characterisation of potential observatory sites in Zambia* | Zambia is centrally located and has great potential to complement sky surveys that, at present, are mostly done in the southern and northern parts of the continent. This is largely because there are no telescopes installed in Zambia in particular and Central Africa in general and that potential sites to host any such telescopes have not been sited save for the SKA site in Kasempa and the AVN site in Mwembeshi. This project aims to survey potential sites for hosting future telescope projects and carry out preliminary site characterisation for areas that will show potential for both optical and radio telescope observatories. The project will involve travelling to different places across Zambia, including mostly the remote places. | Prospery Simpemba  Copperbelt University  Department of Physics  School of Mathematics and Natural Sciences  P.O Box 21692  Kitwe, Zambia  Phone: +260 21 2290945  Email: [pcs200800@gmail.com](mailto:pcs200800@gmail.com)  Mobile: +260977704168 (WhatsApp)  Skype ID: simpemba |
|  |  | **Theoretical Astrophysics** | *Investigation into the Origins of the Titius-Bode Law Using Exoplanetary Data* | The Titius-Bode Law (TBL) is an empirical relation giving the placement of a planet from its host-star. In the advent of exoplanets, this relation has been tested by a number of authors and found to work. The shortcoming however is that there are two free parameters which are specific to the system under consideration and in-order to know what these parameters are, one has to first measure them. What this means is that the TBL is not only grossly limited but handicapped insofar as its predictive power is concerned. The reason for this is that the origins of the TBL are not known hence the free-parameters. In our recent works which are not yet published, it has been shown that these gap in the free-parameters can be closed. What is needed is to carry out field-wide study of explanets from the currently available data whereby a rigorous statistical analysis is carried out in-order to strengthen the preliminary results that we have. | Dr. Golden Gadzirai Nyambuya  Copperbelt University  Department of Physics  School of Mathematics and Natural Sciences  P.O Box 21692  Kitwe, Zambia  Phone: +260 21 2290945  Email: [gadzirai@gmail.com](mailto:gadzirai@gmail.com)  Mobile: +260 969269213 (WhatsApp) |
| 4 | **University Of Nigeria Nsukka** | **Astrophysics, Pulsars** | *Pulsar glitch activity parameter and its effect on magnitude of neutron star inner crust* | Spinning neutron stars, known as pulsars, provide specimens where matter exists in extraordinary conditions not found here on earth. Understanding the dynamics of their interior is of utmost importance to scientists as it presents a picture of how matter in degenerate state interacts. The interior of neutron star is mostly enriched with degenerate neutrons in form of superfluid. Based on current understanding of neutron star structure, this superfluid is located in the inner crust and the core of the neutron star. An impulsive dynamic anomaly in the spin evolution of neutron stars known as pulsar glitch is considered as the most striking manifestation of the existence of a neutron superfluid in the inner crust that rotates independently. However, due to a trigger mechanism that is yet to be well understood, this independently rotating superfluid can suddenly transfer angular momentum to the rest of the neutron star components resulting in the sudden spin-up of the crust – the glitch. Glitch behaviors in pulsar are mainly studied through the glitch sizes and the inter-glitch time intervals. The behavior can be very different from pulsar to pulsar and from event to event. Pulsar researchers rely on the glitch behavior to extract some information about the structure of neutron star. One of such behaviors of interest is the pulsar glitch phenomenon. Pulsar glitch activity parameter, which is the mean fractional change in pulsar spin frequency per year due to glitch, is being used to constrain the magnitude of the neutron star inner crust. The usual way to calculate the glitch activity parameter is a linear regression of the cumulative glitch sizes with respect to the cumulative inter-glitch time intervals. This approach certainly underestimates the errors on the activity parameter. This is largely because this approach assumes a linear dependence of glitch sizes on the inter-glitch time intervals, as well as equal variance in the fit residuals. In reality, both assumptions are not in line with glitch data. When the glitch activity parameter obtained in this approach is used to constrain the magnitude of the inner crust, results which are in conflict with theoretical predictions are usually obtained.  In this project, the usual ways of calculating the glitch activity parameter is to be reviewed, a model for proper quantification of the errors involved shall be developed. In addition, Equations-of-State governing the neutron star structure is to be constrained by the improved glitch activity results. | Augustine Chukwude (Ph.D)  augustine.chukwude@unn.edu.ng  Department of Physics and Astronomy  University of Nigeria Nsukka  Enugu State  Nigeria |
|  |  | **Astrophysics, Observational, Instrumentation** | *A Portable Pulsar Detection Radio Telescope operating at 608 - 611 MHz: Design, Construction and Performance* | Pulsar signals are relatively weak and detected with a very sensitive receiver, at least when compared to that used to detect other radio sources. The first pulsar PSR J1919+21 was discovered by Jocelyn Bell in 1967 with a 16,000 m 2 array of 2000 dipoles tuned to 81.5 M Hz. With the recent introduction of the Software Defined Receivers (SDR) and availability of high performance PCs, this same observation can be carried out today with a relatively small antenna of no more than 2m2 and consisting of no more than 35 dipole elements, However, the detection of pulsar will NOT be in real time as done in professional radio telescopes but the approach is to record the signal and use modern specialised techniques of digital signal processing to increase the Signal-to-Noise Ratio (SNR) and be able to detect the pulses. This project will basically involve the design and construction of a small portable radio telescope (along with its frontends and backends) with processing software capable of collecting sufficient data over a 4 to 6 hour time-frame to detect the brightest pulsars in the northern and southern hemispheres, PSR B0329+54 and PSR B0833-45, in the frequency band 608-611 M Hz.  Briefly, the front-end system will comprise a 2.5 m long 17-element Yagi which will be designed (using the YagiCAD software) and constructed by the student, a 5-element interdigital mechanical filter that will be also designed and constructed, ultra-low noise amplifiers, power dividers and bias tees that will be acquired from reputable radio astronomy equipments manufacturers. For the back-end components, a number of SDRs with at least a bandwidth of 2 MHz and precise internal clocks will be used as the receiver, a PC running Linux will be used for data acquisition and analysis.  Data acquisition softwares will be based on the GNU Radio Consortium while data analysis and validation will be done using PRESTO (PulsaR Exploration and Search TOolkit), a C and python based analysis software primarily designed to efficiently search for binary millisecond pulsars from long observations. This project will serve as a basis for subsequent ones which will be aim at detecting less brighter pulsars by improving the overall system temperature. | Dr. Iyke A. Obi  tonykassidy\_z@yahoo.com  NASRDA-Centre for Basic Space Sciences  Nsukka  Enugu State |
|  |  | **Astrophysics, Star formation** | *Star formation and AGN activities in nearby star-forming HII galaxies* | Galaxy formation and evolution involves complex physical processes and understanding how galaxies evolve through cosmic time remains a fundamental question in astrophysical research. Star-formation (SF), one of the most important processes is fundamental to the formation and evolution of galaxies. A measure of the rate of star formation, along with other properties of a galaxy such as the stellar mass, are obtained through fitting SED (spectral energy distribution) models to multi-wavelength spectrophotometric observational data of the galaxy. This allows for SFR calibrations of luminosities at various wavelengths.  The Hα emission line stands out as the best tracer of SF coming from HII regions ionised by massive stars. However such line can also arise from these same massive stars heated by Active Galactic Nuclei (AGN), hence SFR calibrations based on Hα line can be overestimated by the presence of an AGN if the AGN’s contribution is not taken into account.  In this project, our goal is to study the effect of AGN on the SFR of its host galaxy. We will use the python-based code, CIGALE (Code Investigating GALaxy Emission), a state-of-the-art galaxy SED-fitting model relying on energy balance, to compute the contribution of an AGN in a self-consistent manner in estimating the SFR of a statistical significant sample of nearby star forming galaxies. This will be followed by a comparative analysis of the AGN contributions obtained from other independent methods such as line ratio diagnostic diagrams as well as that obtained with other SED-fitting models. Correlations between the AGN Xray luminosity and SFR will be searched for. The analytical component of the project will also involve some level of computing/modelling. | Dr. Iyke A. Obi  tonykassidy\_z@yahoo.com  NASRDA-Centre for Basic Space Sciences  Nsukka  Enugu State |

### 3.2.2. Research opportunities for PHD students

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| N. | Host institution | Research specialisation | Title | Abstract | Contact person |
| 1 | **Addis Ababa University** | **Earth Observation, Atmospheric sciences** | *Studying the equatorial ionospheric irregularities* | Ionized particles that inhabit the Earth’s upper atmosphere vary in space and time. The spatio-temporal variations of ionospheric ion density are a threat for trans-ionospheric propagation radio wave dependent applications like navigation, positioning, and so on. The effect of equatorial ionospheric ion density irregularities after sunset is found to be the most intense and most frequent compared to high and middle latitude regions ionospheric irregularities. As observed recently using Low Earth Orbiting (LEO) Satellite in-situ data, the African equatorial ionosphere exhibited the highest and frequency occurrence of equatorial ion density irregularities which is called equatorial plasma bubble (EPB). However, the triggering mechanisms for the day-to-day and longitudinal variations of EPB are not yet fully understood. To tackle this research problem multiple ground and space-based data will be used; for example COSMIC II is a constellation of six LEO satellites launched on June 25, 2019 into low degree inclination. It is equipped with different atmospheric and ionospheric sensors. From those sensors ionospheric and atmospheric parameters such as GNSS TEC, RO electron density profiles, amplitude and phase scintillation, in-situ ion density, plasma drift velocity, neutral temperature and wind speed are being obtained; and these measurements are available for public use. In addition, GNSS observations available for public use all over the globe are useful to drive conditions of the equatorial ionosphere. These and similar observations can be used to quantify equatorial ionospheric irregularity and associated driving parameters like vertical drift velocity. Moreover, it is suggested that atmospheric gravity waves seed the occurrence of equatorial ionospheric irregularity even though its role on the day-to-day and longitudinal variations EPB is not yet well understood. Therefore, the role of atmospheric gravity waves on the occurrence EPB will be investigated using atmospheric parameters such as neutral temperature profile and wind speed observed by SABER/TIMED and COSMIC II satellites. In addition to space observations different empirical and physical model data can be used to investigate this problem. Therefore, a student in this study will investigate comprehensively the playing factors in the occurrence of low-latitude postsunset ionospheric irregularities and their evolution, under varying space weather conditions, using multiple data sources and the underlying fundamental physics. | Contact person:  Nigussie Mezgebe Giday, PhD  Department of Space Science and Applications Research & Development  Entoto Observatory Research Center (EORC)  Ethiopian Space Science  and Technology Institute (ESSTI)  Tele: (+251) 118961050  Mobile: [(+251) 944242039](tel:091%20201%200792)  Addis Ababa, Ethiopia  P.O. Box 33679 |
|  |  | **Earth Observation, Atmospheric sciences** | *Equatorial plasma drift velocity modeling* | The equatorial ionosphere exhibits very complex variability that adversely affects trans-ionospheric propagation radio wave dependent applications. The equatorial ionospheric electrodynamics is believed to be the main role player for the occurrence of equatorial ionospheric irregularities. Especially, the post-sunset equatorial ionospheric irregularity which is commonly called equatorial spread F (ESF) is mainly controlled by the Pre-reversal Enhancement (PRE) vertical plasma drift velocity. Theoretical investigations have shown that the post-sunset F region zonal neutral wind speed, through ionospheric dynamo, produces PRE zonal electric field that is directly related to PRE vertical plasma drift. Other variables like the geomagnetic field strength and ionospheric conductivity affect the vertical plasma drift. To enrich our understanding about the role of the electrodynamics on the occurrence of ionospheric irregularity, plasma drift models have been developed by different studies. However, the empirical models that have been developed so far did not consider main drivers like zonal neutral wind speed as the model driver and as a result those empirical models are not able to mimic the diurnal and longitudinal variations vertical drift velocity. Therefore, the aim of this project is to develop a model that can describe the longitudinal and diurnal variations of the equatorial ionosphere plasma drift velocity using multi-data sources. Different ionospheric and thermospheric parameters such as neutral wind speed, vertical plasma drift, ionospheric conductivity, geomagnetic field strength, and deviations between solar terminator and geomagnetic field line will be used in this model development. Therefore, a candidate must have an excellent background in modeling physical processes and processing Low Earth orbiting satellite and ground based ionospheric and thermospheric data using Python or R programming language. | Contact person:  Nigussie Mezgebe Giday, PhD  Department of Space Science and Applications Research & Development  Entoto Observatory Research Center (EORC)  Ethiopian Space Science  and Technology Institute (ESSTI)  Tele: (+251) 118961050  Mobile: [(+251) 944242039](tel:091%20201%200792)  Addis Ababa, Ethiopia  P.O. Box 33679 |
| 2 | **Botswana International University of Science and Technology** | **Planetary Science and astrobiology** | *The astrobiological potential of the Makgadikgadi pans (Botswana)* | The Makgadikgadi, Botswana, is the largest inland evaporitic basin in the world covering 16,000 km2. The basin comprises myriads of small evaporitic lakes and three larger pans, Ntwetwe, Sua and Nxai. Water and brines within the pans provide broad spectra of compositions have varying compositions: from Ca, Na and K dominated brines. The surface of the pan is dry for 8 months, from April to November, and is characterized by precipitation of layers of authigenic clays and evaporites such as gypsum, halite and potash. The halophilic environment harbours thriving microbial communities of extremophiles and fungi and includes unique niches ideal for testing new hypothesis on the resilience of life that can lead to breakthroughs in exobiological studies. Understanding functional metagenomics of the saltpans will potentially provide valuable information on the molecular adaptation and resistance to extreme environmental conditions.  The huge surface area provides environments that vary from playa lakes with ephemeral springs to the fossil dunes fields with direct analogies to Mars morphologies. The Makgadikgadi is fed by surface runoff and by groundwater upwelling that give rise to flood channels, ephemeral springs and layered morphologies. These peculiar layered morphologies are easily identified from remote sensing and are comparable to those observed in the equatorial region of Mars. The cyclical seasonal rise of water table leads to the formation of evaporite deposits comparable with the playa deposits found in Meridiani Planum and other regions on Mars with chloride and sulphate deposits. The Makgadikgadi pans represent an unparalleled example of the overlap of groundwater and wind activity paving the way for experiment aimed at testing existing hypothesis of Martian hydrogeology of Mars.  The main goals of this project would be to: i) perform a microstratigraphic study of the pan sediments to provide a geological and sedimentological framework to further studies; ii) perform radiocarbon dating measures to further constraint the age of the pan deposits; iii) study the presence of organominerals and the extent of the interactions between the extremophiles living in the pan and the authigenic minerals formed at the pan surface and in the subsurface. This project will include a strong field work component and analytical phase including Raman spectroscopy, SEM-EDX and cathodoluminescence. | Contact person:  Dr. Fulvio Franchi  franchif@biust.ac.bw  Department of Earth and Environmental Sciences  Botswana International University of Science and Technology (BIUST)  Private Mail Bag 16, Palapye  BOTSWANA |
|  |  | **Remote sensing and earth observation** | *Dynamics of Surface Water Quality Derived from Satellite Remote Sensing: Insights from water quality contrasts of Lake Tana in Ethiopia and Okavango Delta in Botswana* | Water quality refers to the chemical, physical, biological, and radiological characteristics of water. Surface Water quality indexes include physical, chemical, and biological properties These indexes are conventionally ascertained by in-situ measurements. For large area of water body, in-situ measurements are a labour intensive and time-consuming process. Moreover, the accuracy and precision of in-situ data can be questionable due to both asynoptic field sampling and laboratory errors. As a result, it is not viable to provide a simultaneous surface water quality fluctuation database on a regional scale that represent point estimations of the surface water conditions in time and space. Obtaining spatial and temporal variations of quality indices in large water body sampling is almost impossible under these conditions. Therefore, these difficulties of successive and integrated sampling become a significant obstacle to the monitoring and management of the dynamics of surface water quality.  However, with advent of space borne remote sensing techniques, it has become possible to monitor and identify large scale regions and water bodies that suffer from water quality problems in a more effective and efficient manner. Using remote sensing, water bodies can be monitored using the interaction of its optically active constituents with light and the change in reflected energy spectrum. Other properties of water which is optically inactive include acidity, and pathogens, which have no directly detectable signals, but may be interpretable and inferable from those detectable water quality parameters with which strong correlations can be found. Many researchers frequently use the visible and near infrared bands of the solar spectrum (mostly from blue to near infrared region) in their investigations to obtain robust correlations between water column reflection and physical and biogeochemical constituents, such as transparency, chlorophyll concentration (phytoplankton), organic matters and mineral suspended sediments in different water bodies.  Lake Tana is located outside the Rift Valley on the north-western plateau of Ethiopia and it is the largest water bodies in Ethiopia. In the Lake Tana watershed, four major rivers contribute about 93% of the stream flow into the lake. Among the largest tributary river, Gilgel Abay contributes 50% of the streamflow followed by Gumara 32%, Ribb 12%, and Megech 6%. The local and regional ground water in flows contribute only 3% and 7%, respectively. The lake is geologically dammed by quaternary and tertiary basalts in the south and western part where the out flowing Blue Nile River drains out. The damming has cut off any oozing out flow which simplifies modeling of the lake stage. Lake Tana has rich natural resources and great potential for the development of irrigation, hydroelectric power, high value crops, aquatic products, livestock products, and ecological tourism. But currently the lake is endangered by heavy sediment loads, eutrophication, invasive weed (e.g., water hyacinth) and heavy metals thereby degrading its surface water. Moreover, the water quality and quantity have been deteriorating due to rapid population growth, soil erosion, sedimentation and eutrophication by organic and inorganic fertilizers from agriculture. The quick loss of vegetative cover and land use change due to recent agricultural intensification could have also attributed to recent increases in sedimentation and biodiversity degradation in the lake.  In contrast, the Okavango Delta is believed to be pristine until recent past. The delta is known for its shallow valleys, meandering channels, oxbow lakes and grassy floodplains that sustain a fragile and complex ecosystem. The annual water inflow in the basin is in the range from 3120 Mm3, during the dry season, to 10,900 Mm3, during wet season. Approximately 95% of the water inflow into the basin is from the Angolan (upper) catchment. In the Delta, about 98% of all water is lost by evapotranspiration. The effects of climate changes and human activities on the water quantity and quality of the Okavango Delta are still poorly understood and there is, to date, no comprehensive report on the resilience of the system to hydroclimatic extremes.  This study aims to provide comprehensive and robust relationship between environmental factors and some of the major water quality indicators such as chlorophyll-a (chl-a), colored dissolved organic matters (CDOM), Secchi disk depth (SDD), turbidity, total suspended sediments (TSS), and total phosphorus (TP) for the two contrasting water bodies based on analysis of satellite imageries that cover longer period in order to determine (i) change in the land cover/land use around the two water bodies; (ii) water quality dynamics over a period of 18 years (2002-2019); and (iii) obtain insights from similarities and contrasts in the dynamics of water quality that might be useful for intervention measures and policies. |  |
| 3 | **Copperbelt University** | **Cosmology** | *Investigation into the Mass of the Photon Using Gamma-Ray Burst Time Delays* | Gamma-Ray Burst (GRB) events are one of the most energetic events in the Universe. In these events, it has been observed that photons of different frequencies emanating from these events arrive at the Earth based telescope at different times. This has given rise to the phenomenon known as "*Time Delays in the Arrival Times of GRB Photons of Different Frequency*". The mundane assumption in prevalent and contemporary physics is that these time delays are a result of the Photon being endowed with a non-zero mass. In this project, while the Photon is assumed to be massive, the time delay is not attributed to the mass-effect but to the cosmic medium being a rarefield plasma and this plasma has a dispersive effect on the propagating Photon. This view we have arrived at from preliminary results on 9 GRBs which have given an excellent picture that this may very well be the case that the . In this project, the student is expected to make a wide survey of the GRB database and search for this signature of a rarefied cosmic plasma. | Dr. Golden Gadzirai Nyambuya  Copperbelt University  Department of Physics  School of Mathematics and Natural Sciences  P.O Box 21692  Kitwe, Zambia  Phone: +260 21 2290945  Email: [gadzirai@gmail.com](mailto:gadzirai@gmail.com)  Mobile: +260 969269213 (WhatsApp) |
| 4 | **University Of Nigeria Nsukka** | **High Energy Astrophysics** | *A Study of the Mechanism for the X-rays Emission from Symbiotic Stars* | Symbiotic stars (SySts) are particularly interesting as they are a possible progenitors of Type Ia supernovae, which are themselves used as ‘standard candles’ for cosmological studies. Despite this use, the class themselves cover a broad range of systems, typically identified in the optical, where they are often bright. The X-ray emission is often quite soft (i.e. low energy), and many systems may be undetected due to absorption of the X-rays by the Galactic interstellar medium. In the case of a white dwarfs as a primary, the secondary can be either a red giant or an asymptotic giant branch (AGB) star, and they are categorized as white dwarf (WD) symbiotic, whereas in the case of a neutron star as a primary, the secondary can be either a giant, AGB star, or a supergiant, and they are categorized as symbiotic X-ray binaries.  Efforts are currently ongoing to unravel the uncertainty associated with the origin of the X-ray emission from Symbiotic Stars (SySts), a broad class composed of interacting, binary systems formed from a red giant or a supergiant, which transfers matter to a much hotter companion, either a white dwarf (WD) or neutron star. A century ago Merril 1919, identified the first such system in the odd variable star, R Aqr, which appeared to have an optical spectrum typical of an M dwarf but with bright [O III] lines, a higher ionization state expected from a cool star. Decades later SySts were detected in X-rays, but this has not simplified the situation. Researchers have divergent views on the origin of the X-rays emission, resulting in classifications of X-ray emitting SySts as follows: (a) the supersoft X-ray sources with energies ≤0.4 KeV, likely emitted directly from the white dwarf , (b) soft X-ray objects that exhibit a peak at 0.8 keV and maximum energies up to 2.4 KeV, likely originating from a hot, shocked gas where the stellar winds collide (c) objects with a non-thermal emission and energies higher than 2.4 KeV  due to the accretion of mass onto a neutron star, and (d) those with very hard X-ray emission (>10 KeV) the , assumed to be emitted from the boundary layer of the accretion disk and the accreting hot companion. In many cases, however, the precise mechanism and physics responsible for the production of X-ray emission remains uncertain, in part because their distances are poorly estimated or not available. We propose to use newly-available data on the distances of X-ray emitting SySts from ESA’s Gaia mission combined with archival X-ray data from the Chandra, XMM-Newton, and Swift satellites to determine the true X-ray luminosities and spectra of SySts. We will then correlate this data with the different proposed types to search for a better understanding of the physics and origin of these unusual systems.  The main objective of this project is re-analyze all of the existing Chandra, XMM-Newton, and Swift X-ray observations of SySts with known Gaia distances to search for correlations between the different types SySts, with intention of getting a clearer understanding of the mechanism for the X-rays emission from these perculiar sources**.** Specifically, the research will focus on answering such questions like: (i) how does the hot component accrete matter from the secondary star? (ii) what is the physical nature of the accretion flow in SySts? and (iii) how are the X-rays (soft and hard) produced? A major component of this project is the re-analysis of all of the existing Chandra, XMM-Newton, and Swift X-ray observations of SySts with known Gaia distances using the latest Chandra CIAO and software from the other missions. | Prof. Romanus Eze  [romanus.eze@unn.edu.ng](mailto:romanus.eze@unn.edu.ng)  Department of Physics and Astronomy  University of Nigeria Nsukka  Enugu State  Nigeria |
|  |  | **Astrophysics, Active Galactic Nuclei** | *Multi-wavelength Study of Active Galactic Nuclei across Cosmic Time* | Galaxies are the fundamental building blocks of the universe and massive galaxies are known to be active due to intense accretion of matter onto a supermassive blackhole at the centre of the galaxy. It is widely believed that the energetic output of radio-loud active galactic nuclei (AGN), which launch powerful relativistic jets of material, plays a significant role in controlling star formation in their surrounding galaxies. This PhD project is designed to address some of the existing gaps in our knowledge of the physical processes that drive radio-loud AGN activity and how these physical processes evolve across cosmic time. This research will be possible through the vast samples of radio-loud AGN being generated in various surveys at radio, optical, X-ray and γ-ray frequencies. The research will focus on developing some theoretical framework for modelling and statistical interpretation of the observed data for both high- and low-redshift AGN.    Specifically, the project will employ multi-wavelength data that are readily available in public archives to investigate the accretion/emission properties of AGN over a wide range of redshift. Special attention will be paid to similarities and/or systematic differences in the data, which could be interpreted in the context of the evolutionary scenario. | Dr Finbarr C Odo  finbarr.odo@unn.edu.ng  Department of Physics and Astronomy  University of Nigeria Nsukka  Enugu State  Nigeria |

CREDIT RECOGNITION SYSTEM

Information on the courses and associated credits offered by partner institutions may be found on the Partner programme websites (links may be found from the PAPSSN website). The guideline in the table below should be used for credit equivalence.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Institution Name** | **Tot credit per semester**  **[e.g. 60 credits]** | **Weeks within a single semester [e.g. 15 weeks]** | **Weight for ONE lecture hour [e.g., 1h = 0.1 credits]** | **Weight for ONE tutorial hour**  **[e.g., 1h = 0.1 credits]** | **Weight for ONE Laboratory hour**  **[e.g., 1h = 0.2 credits]** | **Other factors [e.g. hours of independent study]** |
| BIUST | 60 | 14 | 0.1 | 0.1 | 0.1 | 0.1 |
| WITS\* | 60 | 13 | 0.1 | 0.1 | 0.1 | 0.1 |
| CBU | 60 | 15 | 0.1 | 0.1 | 0.1 | 0.1 |
| UNN | 15 | 15 | 0.03 | 0.03 | 0.03 | 0.03 |
| AAU | - | - | - | - | - | - |

The applicant must discuss the proposed study plan with the head of department and/or programme leader at the home institution and receive a written endorsement and statement indicating which home credit exemptions will be granted for the mobility. This statement must accompany confirmation of degree enrolment and be uploaded to the application website. Credit – seeking mobility will only be considered and awarded if such an endorsement has been obtained. Credit – seeking students will receive a transcript from the host institution stating the completed courses, and the home institution will grant recognition from courses taken during the mobility and exemption from home courses as per the statement from the home head of department and/or programme leader.

At UNN 90 hours of lectures/tutorial per semester (15 weeks) lead to 3-credit unit course: i.e. 3 hours of lecture per week and 3 hours of tutorial per week per semester: (3h+3h) x 15weeks = 90h per semester, 90/30 = 3 credits.

BIUST would recognize for the same module 9 credits as the system considers 1 credit for every 10 hours spent in class, laboratories, tutorials, and independent study: 90/10=9 credits.

At WITS a full academic year is equivalent to 120 credits, corresponding to 1200 notional study hours according to the National Qualifications Framework. The MSc Dissertation and PhD are regarded as full-year programmes lasting 1.5 years and 3 years, respectively, so the respective credits are 180 for MSc and 360 for PhD, even though students are funded for 2 years for an MSc. For this reason it is necessary to recalculate the credits for the MSc from 3 semesters to 4 semesters and, thus, that 1 semester for the MSc programme under PAPSSN will equal 45 credits. Thus, a student attending Wits for non-degree studies will complete the equivalent of 60 credits (600 hours) for a 6-month visit and 120 credits (1200 hours) for a 10-month visit for a PhD, but 45 credits (450 hours) for a 6-month visit and 90 credits (900 hours) for a 10-month visit for an MSc.

CBU: The Zambia Qualification Authority (ZAQA), a statutory body established under the Zambia Qualification Authority Act No. 13 of 2011 has developed the Zambia Qualifications Framework (ZQF) in line with the provisions of the Act. According to the Guidelines for Registration and Accreditation of Qualifications in the ZQF, ZAQA has recommended a system for representing credits allocated to each component of the qualification (i.e. courses) whereby one course credit represents 10 notional hours of learning. This learning includes classroom, supervised and self-directed hours, assessment time, workplace training, assignment writing, online learning and fieldwork. A normal year of fulltime studies is considered to be 1200 hours giving 120 credits.

ELIGIBILITY CRITERIA

To be eligible for a scholarship, masters and doctoral students must comply with the following criteria:

1. Be a national of and resident in any of the eligible countries covered by the Programme (see Section 2.1)
2. At the time of the application for a scholarship, be registered at or have obtained their most recent degree (or equivalent) from: One of the higher education institutions included in the partnership (Target Group 1); or A higher education institution not included in the partnership but established in an eligible country (Target Group 2)

Students applying form Masters or PhD degree – seeking mobility are expected to have obtained at least their Bachelor’s or Master’s degree in an eligible African country and from an institution other than the prospective host institution.

1. Have sufficient knowledge of the language of instruction in the host institution.
2. Meet the specific requirements of the host institution.
3. The student should have proof of admission from the host institution.

Students can only benefit from one scholarship under the Intra – Africa Academic Mobility Scheme.

Students having benefited from scholarship(s) under the previous Intra – ACP Academic Mobility Scheme cannot receive scholarship under the Intra – Africa Academic Mobility Scheme.

# 4. ACADEMIC AND ADMINISTRATIVE STAFF MOBILITY

## 4.1. ACTIVITIES

Staff may undertake mobility visit for 1 month at any of the African partner institutions. Staff mobility should contribute to strengthening the academic, management and co – operation capacity of the partner institutions, through participation in research projects, teaching, production of new teaching material, development of teaching methods, harmonization of curricula, development of joint curricula, development of administrative tools and sharing of management approaches. The mobility is also expected to be an integral part of the institutional staff development plan and recognized as such upon return of the staff member.

## 4.1 ELIGIBILITY CRITERIA

In order to be eligible for a scholarship, staff must comply with the following criteria:

Work as an administrative, academic or research staff in any of the PAPSSN partner institution.

# 5. APPLICATION PROCESS

## 5.1. PREPARATION

The applicant should:

1. Verify the eligibility criteria (if a candidate does not fulfil all of the eligibility criteria, he/she should not submit an application, as the application will be considered ineligible and not be evaluated).
2. Identify the Target Group to which (s) he belongs and the available scholarships.
3. Select at least one host institution. It is highly recommended that applicants select up to 3 different host institutions from the available options but always with consideration to the language and background requirements defined by the host institution and programme.
4. Visit the PAPSSN website and read attentively the “Before you apply”, “FAQs” and the “online Application Form”
5. Collect all necessary information and documents to complete the Application Form: Several documents are mandatory and the online system will not allow the application to be summited without them. In case of unreadable documents, the application will be considered ineligible and will not be evaluated.
6. Select the host institution(s) with consideration to the following:
7. The language requirements of the host institution.
8. The identified areas of excellence and available projects in each partner institution.
9. The required academic background for the field of study, research project or activity.
10. The cost of living at prospective host institutions, personal needs for subsistence, and the monthly stipend for the scholarship.
11. The need to adapt to different cultural realities at the host institution and also to different climate conditions, in case of selection.
12. Prepare a mobility project proposal describing the aims, activities and foreseen study/work plan and taking into consideration the objectives and goals of the host programme and of the PAPSSN project. The proposal must be clear in its methodology, impact and benefit, as well as its feasibility within the timeframe established by the duration of the scholarship. Staff should liaise with the home and prospective host universities on the programme of activities, e.g. lectures or administrative work to be delivered; research activities to be carried out; type of training to be followed; etc. This text will be included in the online application.
13. Prepare a motivation letter to be submitted to each prospective institution with regard to the benefits and expected outcomes of the mobility. This text will be included in the online application. You can apply up to a maximum of three host Universities. Applicants must upload one motivation letter for each host prospective University. The three letters must be different.

## 5.2. ONLINE SUBMISSION

The Application Form is completed through the following steps:

1. Applicants should have a valid e-mail address and an internet connection. Communication of results will be done exclusively by e-mail to the address provided.
2. In order to access the form, the applicants should create a new login in the “Apply now” section of the PAPSSN website, selecting the type of scholarship for which they wish to apply.
3. Applicants should then complete the online Application Form. The system will save a draft of the application every time the “Save” button is pressed, allowing it to be revised, edited and completed. The applicants should carefully prepare and revise the application before pressing the “Submit” button.
4. After pressing “Submit” button, it is not possible to make any additional changes to the application.
5. The Application Form must be completed in English.
6. The deadline for the submission of online application is provided on the PAPSSN website. The Coordinating Office will do everything possible to avoid system failures, but cannot assume any responsibility should applicants encounter technical difficulties preventing submission just before the deadline. Applicants must therefore avoid last minute applications. **Applications sent by any other means, e.g. mail, fax or e-mail, will NOT be accepted.**
7. Once the “Submit” button has been pressed, the application is closed and sent to the Coordinating Office, which gives it a code. A digital notice of submission is sent to the applicant by email as well as a full copy of the application. This notice does not constitute a confirmation of eligibility nor of selection; it only confirms submission of the application.
8. All applicants for student mobility are advised to prepare a work plan and research proposal in consultation with their own institution supervisor and supervisor from the prospective host institution.

## 5.2. DOCUMENTS TO BE SUBMITTED

Digital copies of several documents are required and must be uploaded to the website. If the candidate fails to submit all required documents the application will be excluded without any possibility of appeal.

1. Passport or National ID
2. Bachelor and Master Certificates together with their Transcript of Records.
3. At most 4-page Curriculum Vitae
4. Motivation letters: 1 per Host University. You can apply up to a maximum of 3 Host Universities. If you apply for 3 Host Universities you must upload 1 motivation per each Host University. The 3 letters must be different.
5. 2 Reference letters: One of the references letters must be from your last project supervisor.
6. PAPSSN Research project proposal. In case you apply for 3 Host Universities you must upload 3 PAPSSN Research project proposals (1 per Host University). You must use the template found in the “Download” section, at the top right of the webpage.
7. Previous Intra-Africa/ACP Award Declaration. This is a declaration whose template is provided by PAPSSN consortium. You can find the template to be used in the “Download” section, at the top right of this webpage.

**FOR ALL APPLICANTS:**

1. Copy of passport or National ID
2. Degree certificate(s) together with their Transcript of Records – Must have been issued by a higher education institution and dated, signed and stamped, otherwise it will not be considered valid and the application will be excluded. In the case of the applicant having achieved more than one academic degree, one uploaded file must contain all documents. All copies of original documents must be certified.
3. At most 4-page curriculum vitae

**FOR STUDENT MOBILITY:**

1. Transcript of academic records for degrees completed, stating in detail all courses taken and grades obtained in the course. Documents must be dated, signed and stamped by the institution, otherwise they will not be considered valid and the application will be immediately excluded. All copies of original documents must be certified.
2. Motivation letters: 1 per Host University. You can apply up to a maximum of 3 Host Universities. If you apply for 3 Host Universities you must upload 1 motivation per each Host University. The 3 letters must be different.
3. 3 Academic reference letters: One of the references letters must be from your previous research project supervisor.
4. PAPSSN Research project proposal. In case you apply for 3 Host Universities you must upload 3 PAPSSN research project proposals (1 per Host University). You must use the template found in the “Download” section, at the top right of the webpage. The research proposal should include (i) Goal and objectives of the research project (ii) State of the art and originality of the proposal (iii) Methodology (iv) Work plan and equipment needed (v) Bibliography.
5. Previous Intra-Africa/ACP Award Declaration. This is a declaration whose template is provided by PAPSSN consortium. You can find the template to be used in the “Download” section, at the top right of this webpage.
6. For credit-seeking mobility: Statement issue by the home institution confirming the applicant’s enrolment in a master’s or PhD degree programme. The home institution supervisor should endorse the applicant’s mobility study plan. The study plan should include a description of the degree programme, the degree duration, the number of credits for the degree and the number of credits per course.
7. Certificates of language skills, if applicable, in accordance with the requirements of the hots institution.

**FOR STUDENT MOBILITY:**

1. Statement by a senior staff member at the home institution with a brief description of the applicant’s main activities and an endorsement of the mobility proposal. This document must be dated, signed and stamped by the institution, otherwise it will not be considered valid and the application will be excluded. The declaration should be written in English, by the person to whom the applicant reports (e.g. Head of Department, Director or Dean) at the home institution.
2. Statements by the hosting staff member at the host institution confirming the mobility plan and duration.

Additional documents, if applicable:

1. Document conforming physical disability (e.g. declaration from a doctor; recent medical exam; etc.)
2. Document confirming vulnerable socio-economic situation. This document must be dated, signed and stamped by a suitable organization or authority.
3. Document confirming vulnerable refugee or asylum status. This document must be issued by a recognized authority and must be dated, signed and stamped.
4. Other documents relevant to the application.

All documents must be attached to the online Application Form. Applicants that are incomplete or have blank or unreadable documents will be considered ineligible.

If an applicant wishes to attach more than one document in the same field (e.g. support letters from the home institution), one file should be attached that includes all documents, up to a maximum of 2MB.

# 6. EVALUATION AND SELECTION PROCESS

## 6.1. PHASE 1 - APPLICATION:

A Call for application will be launched and applications will be collected through the PAPPSN website. **The call will be open for 45-60 days.**

The application package (application and supporting documents) will consist of:

a) Personal data and proof of nationality (including passport/national ID);

b) Selected host universities and programmes (up to 2 options from two different partner universities);

c) Motivation statement;

d) Preliminary study/research plan (students), teaching/training plan (staff);

e) Languages skills;

f) Diplomas (or declaration of final year student from the Registry Office) and academic records/transcripts or proof of employment for staff mobility;

g) CVs and list of publications (if any);

h) Reference letters;

i) Proof of disadvantaged group;

j) Any other additional documents the candidate wishes to submit

k) Declaration on scholarships previously received by EACEA

**Note: students that have previously benefited from Intra-APC or Intra-Africa Academic Mobility Scheme are not eligible.**

## 6.2. PHASE 2 - ADMINISTRATIVE CHECK.

Actor in charge: the PAPSSN general secretariat at the Central Management Unit with the support of the Gender and Disadvantaged groups Committee

Task: Candidatures will pass through a preliminary screening whose goal will be to check the formal eligibility of the candidatures:

* **Completeness**: all the mandatory documents have been uploaded by the candidate in her/his official AMIDILA application form.
* **Eligibility requirements:** all the eligibility requirements have been met by the candidate:
  + nationality;
  + former Intra-Africa scholarship;
  + other general requirement that the partnership would like to set.
* **Target Group**: the candidate did apply for the correct Target group. In the case the candidate did not, she/he will be moved to the correct Target Group.
* **Disadvantaged Group**: in the case the candidate has declared to belong to a disadvantaged group supporting documents shall have been provided and will be checked by the Gender and Disadvantaged groups Committee.

The administrative check will be assessed upon the following application documents:

* Information provided in the application form
* Documents uploaded in the application

In addition to the documents needed to assess the academic eligibility and quality of the candidate, the following documents are also required:

* Passport
* Declarations regarding former Intra-Africa scholarship
* Disadvantaged group supporting documents

## 6.3. PHASE 3 – APPEAL PROCEDURE

Actors in charge:

* The PAPSSN general secretariat at the Central Management Unit will send out a “rejection notification” to those candidates who did not pass the eligibility check with 1-week time to appeal against the decision under well justified reason for appealing.
* The Selection Committee will support PAPSSN general secretariat through the appeal procedure.

## 6.4. PHASE 4 - ACADEMIC ELIGIBILITY & QUALITY.

Actor in charge: Admission office and Academic supervisors at the Host universities coordinated by the PAPSSN Local Management Unit

Task:

* ELIGIBILITY: Checking whether the candidate meets the admission requirements (including language requirements) of the programme s/he applied for – Actor: Admission office (?)
* QUALITY: Performing the academic assessment of candidates and ranking applications against the following criteria – Actor: Academic supervisors

CRITERIA 1 - Academic background and candidate profile:

* Coherence of the academic background and profile of the candidate with the programme selected
* Academic performance during previous/current studies at the Home university

CRITERIA 2 – PAPSSN project proposal and motivation:

* The mobility project submitted by the candidate (learning agreement; research agreement; work plan) is appropriate with the mobility opportunity the candidate applied for
* The motivation of the candidate is strong and relevant with PAPSSN objectives and with the mobility opportunity the candidate applied for

When performing the academic assessment, the academic supervisors may decide to schedule interviews with the candidates.

The academic eligibility and quality will be assessed upon the following application documents:

* Diplomas of previous university studies
* Transcript of Records of previous university studies
* CV including list of publications, conferences attended, etc.
* Reference letters
* Language certificate, if required by the Host university
* Motivation letter
* Mobility project
  + Master credit seeking – courses 🡪 learning agreement
  + Master credit seeking – research 🡪 research proposal
  + Master degree seeking – courses 🡪 research proposal
  + Master degree seeking – research 🡪 research proposal
  + Doctorate credit seeking 🡪 research proposal
  + Doctorate degree seeking 🡪 research proposal
  + Staff 🡪 Work plan

## 6.5. PHASE 5 – APPEAL PROCEDURE

Actors in charge:

* The PAPSSN general secretariat at the Central Management Unit will send out a “rejection notification” to those candidates who did not pass the Academic eligibility and quality with 1-week time to appeal against the decision under well justified reason for appealing.
* The Selection Committee will support PAPSSN general secretariat through the appeal procedure.

## 6.6. PHASE 6 - DISTRIBUTION OF SCHOLARSHIPS AVAILABLE.

Actor in charge: Selection committee

Task: to distribute the scholarship available to the candidates applying the following criteria

CRITERIA 1 – Academic quality results and ranking provided by the Host universities

CRITERIA 2 – The distribution shall adhere as long as possible with the PAPSSN project as approved by the EACEA

CRITERIA 3 – Crosscutting issues such as favoring the participation of disadvantaged groups; fair balance among countries of origin (especially for target group 2); others.

During this PHASE 4 the Selection committee is also in charge to assess candidatures in cases of doubts among candidates.

# 7. IMPLEMENTATION OF THE MOBILITY

## 7.1. OBLIGATIONS OF THE COORDINATION OFFICE AND THE SCHOLARSHIP HOLDERS’ HOME AND HOST INSTITUTIONS

### 7.1.1. Travel

The PAPSSN Coordinating office will be responsible for booking and paying the grantees’ two-way travel ticket between the cities of the home and host institutions, with reference to the maximum amounts foreseen by the PAPSSN for such travel. If the home or host institutions are not located in a city with an international airport, the scholarship holders must keep the invoices of the local transportation, for example, bus or train used to undertake the travel, so as to be able to submit a reimbursement request to the Coordinating Office. He request should be made as soon as possible, in a proper form that will be available online in the Scholarship Holder’s Section and should be accompanied by scanned original payment reciepts. The original documents must be sent to the Coordinating Office, which will assess the request. In case of stays of more than 12 months it will not be possible to buy the return ticket immediately. Therefore, all reimbursement requests should be deferred until the return ticket has been purchased and the overall flight expenditure is known. Taxi expenses will not be reimbursed if less expensive modes of transportatio are available. All the reimbursements will be made using the exchange rate (relative to the Ruro) of the day on which the expenses were incurred.

### 7.1.2. Insurance

The Coordinating Officer will provide directly to each scholarship holder a comprehensive health, travel and personal accidents insurance valid in the host country, in line with the demands of EACEA. This insurance will be valid from the time and place of departure until the grantee’s return at the end of the mobility period.

### 7.1.3. Scholarships

The scholarship will cover:

* Roundtrip flight ticket and visa costs;
* Participation costs such as tuition fees, registration fees and service fees where applicable;
* Insurance (health, accident, travel);
* A settling-in allowance;
* **Allowances for female scholarship holders (*per academic year only for mobility equal or longer than 2 academic years)*;**
* A monthly subsistence allowance;
* A contribution towards the research costs associated with student mobility of 10 months or longer.

Allowances to be paid to the scholarship holder are as follows

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Type of mobility** | **Subsistence allowance** | **Settling-in allowance** | **Allowances for female scholarship holders** | **Participation costs** | **Research costs** | **Insurance costs** | **Travel and visa costs** |
| (per month) | *Single payment* | *(per academic year only for mobility equal or longer than 2 academic years)* | *(per academic year only for mobility equal or longer than 10 months)* | (per academic year only for mobility equal or longer than 10 months) | (per month) |
| Master | **600** | **600** | **600** | **3500** | **600** | **75** | According to travel bands |
| Doctorates | **900** | **900** | **900** | **4000** | **2000** | **75** |
| Staff | **1200** | **-** | **-** | **-** | **-** | **75** |
|  | *Must be paid in full to the scholarship holder* | | | *To be managed by the partnership* | | | |

Participation costs are transferred directly to the host institution. Insurance is arranged by the coordinating institution on the behalf of students.

A scholarship contract that defines all the conditions, benefits and responsibilities related to the project implementation as well as the schedule of payments covered will be signed by each institution, the scholarship holder and the Coordinating Office. Only after this document is signed it will be possible to transfer the scholarship documents. This will be done directly by the host institution: the first payment will comprise the first monthly subsistence allowance as well as a settling-in allowance, after which the monthly allowance will be paid to the grantees bank account. The monthly subsistence allowance can only be paid from the month of arrival and covers each full month of mobility, subject to academic progress. If a portion of a month is more than 15 days a full month allowance is to be paid (for example: for academic reasons the mobility duration is 9 months and 15 days only 9 month’s allowance should be paid; if the duration is 9 months and 16 days then 10 months’ allowance should be paid).

### 7.1.4. Learning conditions

The host institution will ensure that the scholarship holder (all types of mobility) ha the same learning conditions and the same health and security protection levels as local students and members of the academic community. The host institution will provide support to the scholarship holder, including support towards resolution of any administrative procedures required by the host country’s authorities. The scholarship holder should inform the Coordinating Office immediately by e-mail if there is lack of necessary support by the host institution.

### 7.1.5. Recognition

In cases of credit-seeking mobility, home institutions will be expected to consider the study period undertaken abroad as an integral part of the study/research programme developed in the home institution, as outlined in Section 2.2.

## 7.2. OBLIGATIONS OF SCHOLARSHIP HOLDERS

### 7.2.1. The Coordinating Institution has the right to suspend the payment of the scholarship if:

1. The scholarship holder withdraws from the project in case of force majeure.
2. The scholarship holder does not comply with the internal regulations of the host institution.
3. The scholarship holder does not comply with the internal regulations set by the PAPSSN partnership.
4. The scholarship holder fails to fulfil the requirements of his/her study/work programme.

A reimbursement of costs paid to scholarship holder may be requested in cases such as:

1. The scholarship holder did not provide the necessary information related to his or her ineligibility at the application stage, and the partnership detects this at a later stage (i.e. he/she has already received funds from Intra-Africa or Intra-ACP, does not hold the necessary diploma, is not national and resident in an eligible country, etc.).
2. Subsistence allowances and insurance costs can be recovered for a given month if they have been paid to the scholarship holder at the beginning of a month and he/she has not implemented more than n months + 15 days of mobility (see the 16-day rule)

### 7.2.2. Implications of signing the Statement of Scholarship Acceptance and the Scholarship Contract:

1. In case of any reimbursement obligation, the scholarship holder has 30 days upon return to home country to carry out such reimbursement to the Coordinating Institution, Botswana International University of Science and Technology, following the instructions that will be provided. If the scholarship holder fails to do so, additional banking fees and interests may be charged or legal steps may be taken.
2. The scholarship holder may not accept, during the period of current grant, any other mobility grant awarded by the European Union.
3. The scholarship holder has the obligation to inform the Coordinating Office about any change in the study/research/work period and programme.
4. The mobility period must be fully respected; it is not possible to divide the duration of stay foreseen by the project. If the scholarship holder intends to leave the host institution during the mobility, even if fir a limited time, he/she must ask for permission from the host institution and the Coordinating Office. Permission must first be obtained in writing from the research supervisor or programme director as well as the PAPSSN representative at the host institution, with a clear justification for the absence/leave, following which all information must be sent to the Coordinating Office for final approval.
5. Scholarship holders must comply with the rules and regulations of the host institution.
6. Any absence from host programme activities must be duly justified to the PAPSSN contact person at the host institution (e.g. a statement from a medical professional), with a copy to the Coordination Office.
7. Scholarship holders are compelled to report (by e-mail) to the host institution and Coordinating Office any difficulties experienced during the mobility flow, such as: language barriers; integration with classmates; communicating with professors; difficulty in accessing study materials; health insurance; accommodation; etc.

### 7.2.3. Students must complete successfully their mobility period at the host institutions as follows:

1. Degree-seeking mobility: all courses and research requirements must be met according to the regulations of the host institution.
2. Credit-seeking mobility: the proposed courses and research activities must be completed and confirmed by the host institution.
3. In case of academic failure, the Coordinating Office reserves the right to apply the measures identified in the scholarship holder’s contract.
4. The scholarship holder I obliged to submit, within 30 days of the end of the mobility period, an evaluation form provided online by the Coordinating Office.

# 8. CONTACTS AND SUPPORT

Project website:  ([https://www.papssnmobility.org](https://www.papssnmobility.org/))

Coordinating Office: Botswana International University of Science and Technology

Project Coordinator: Dr. Fulvio Franchi

Project Manager: Ms Gadibotsile Chakandinakira

Email address for all enquiries: info@papssnmobility.org

Further contact information I available on the project website.

The Call for Applications for scholarships on the project website will announce the deadline for applications.

The applicant’s e-mail address as indicated in the application form will be the only means of communication between the applicant and the Coordinating Office.