

Nuclear Physics WG

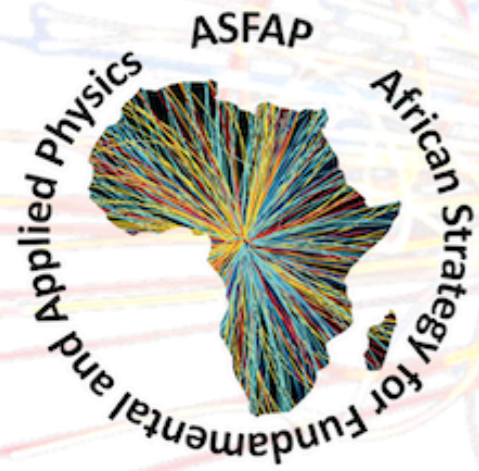
ASFAP Community Town Hall (virtual meeting)

12 – 15 of July 2021

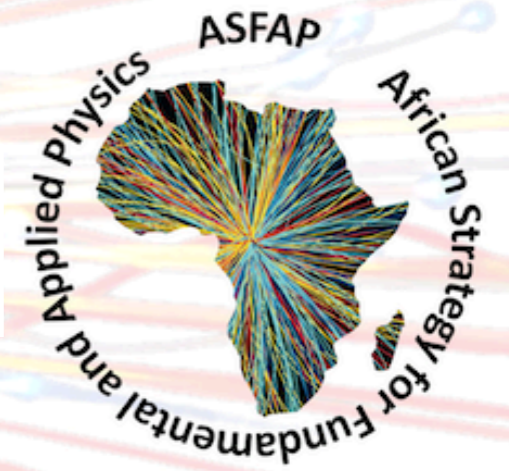
Dr. Sevdalina Dimitrova

Dr. Hassan Ibrahim

Dr. Mark Dalton



Working Group Structure



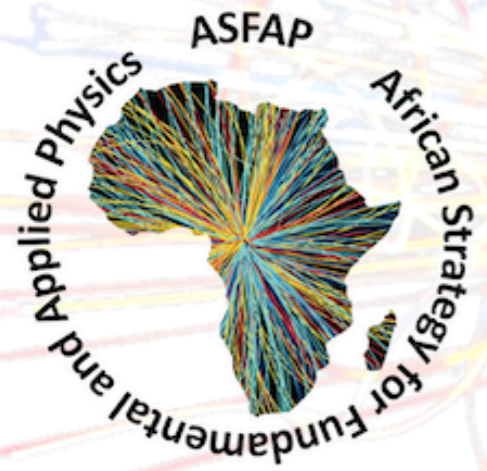
- Dr. Sevdalina Dimitrova (Institute for Nuclear Research and Nuclear Energy (INRNE), Bulgaria)



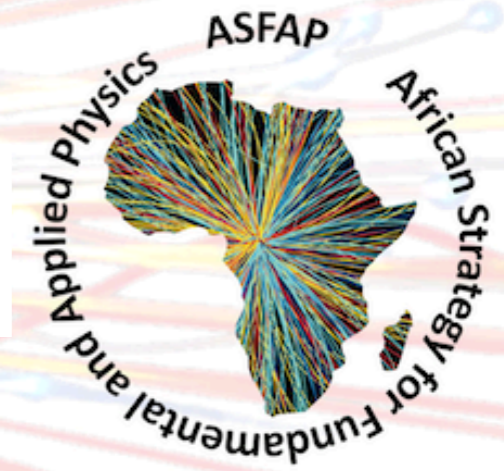
- Dr. Hassan Ibrahim (Cairo University, Egypt)



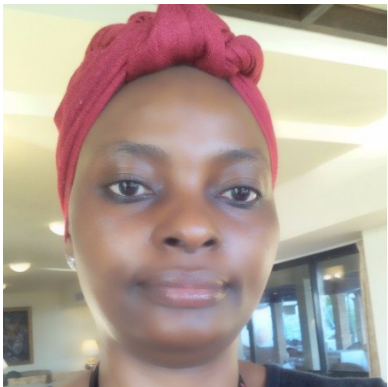
- Dr. Mark Dalton (Jefferson Lab, USA)



Subgroups



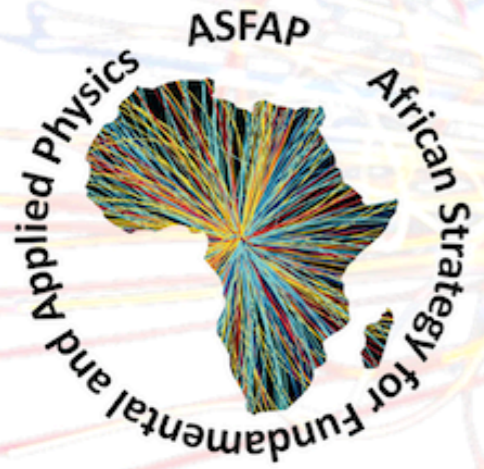
- Nuclear Theory - Dr Walaa Seif (Cairo University, Egypt)



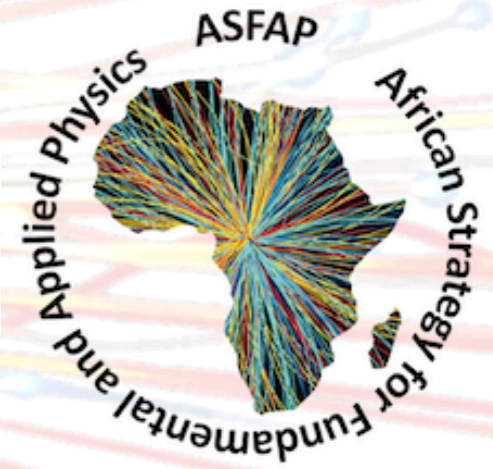
- Nuclear Reactions - Dr Iyabo Usman (University of the Witwatersrand, South Africa)
 - nuclear astrophysics, nuclear structure and nuclear reactions



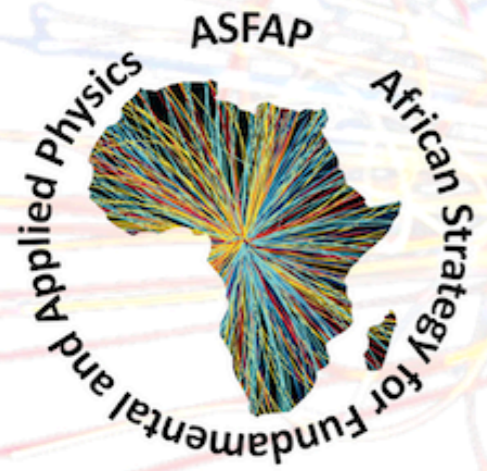
- Applications - Dr Mojisola Usikalu (Covenant University, Nigeria)
 - nuclear medicine, reactor physics, isotope production, environment



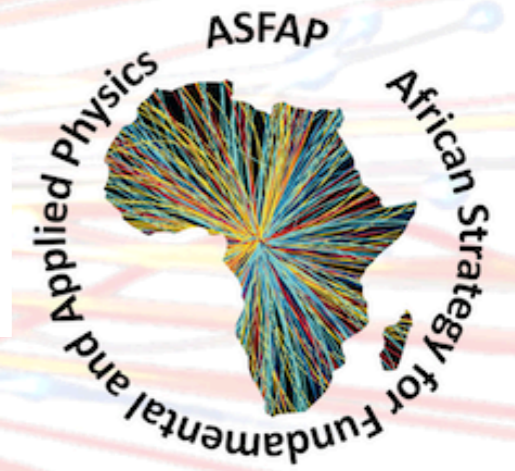
Possible Nuclear Physics subgroups



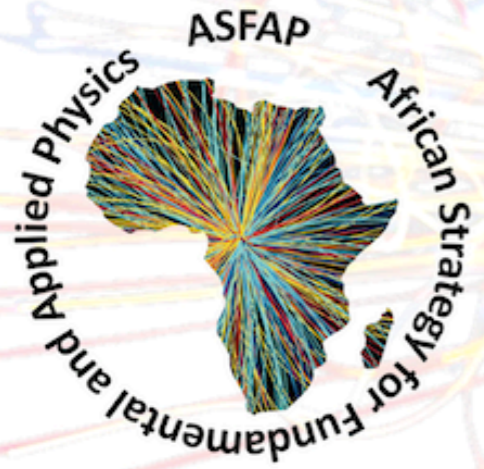
- Hadronic physics
 - Form factors, structure functions, parton distributions, spectroscopy, spin structure
- Heavy ions, heavy flavor and jets
 - QCD phase diagram, correlations, flow, viscosity, multiplicities etc.
- Fundamental symmetries and neutrinos
 - beta decay, Neutrinoless Double Beta Decay, EDM, CP violation, Time reversal, sterile neutrinos, mass, Majorana, cosmogenic neutrinos



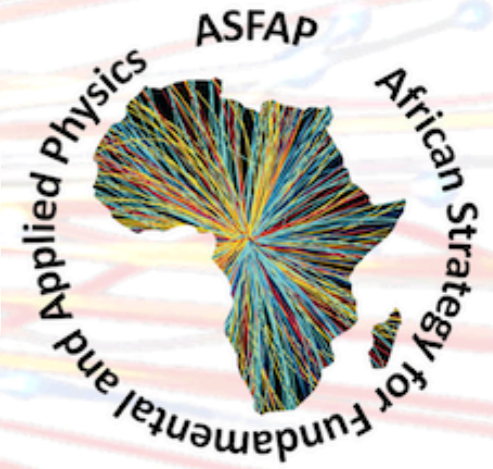
Liaising Groups



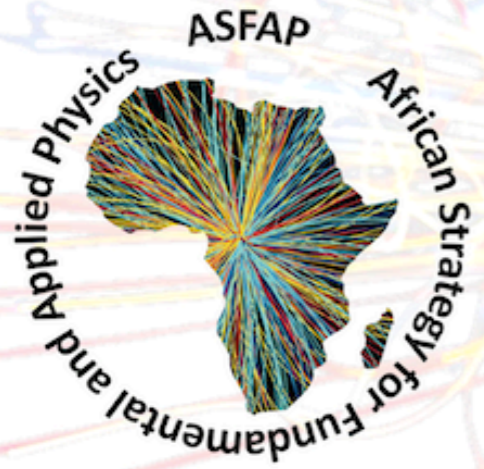
- Accelerators (required infrastructure)
- Instrumentation & Detectors (required infrastructure)
- Computing (required infrastructure)
- Particle Physics (very large overlap)
- Medical Physics (overlaps with applications in nuclear medicine)



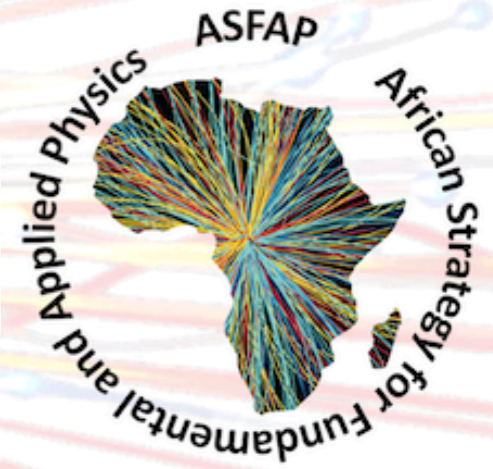
Interaction with Particle Physics Group



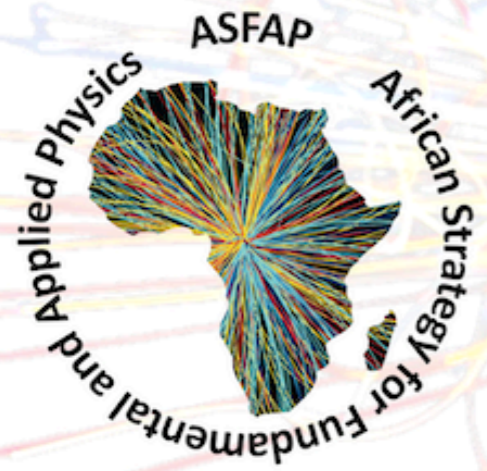
- It seems that many of the fields that are considered Nuclear Physics in the US might be included in Particle Physics in the African context.
 - ATLAS facility at Argonne National Laboratory (ANL),
 - Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratory,
 - Continuous Electron Beam Accelerator (CEBAF) at Thomas Jefferson National Accelerator Facility (TJNAF),
 - Facility for Rare Isotope Beams
 - Ton-Scale Neutrinoless Double Beta Decay
 - Electron Ion Collider (EIC), Brookhaven National Laboratory
- As it is right now some of the conveners would not be considered Nuclear Physicists.
- We need to meet with the Particle Physics Group to discuss where the boundary should lie.



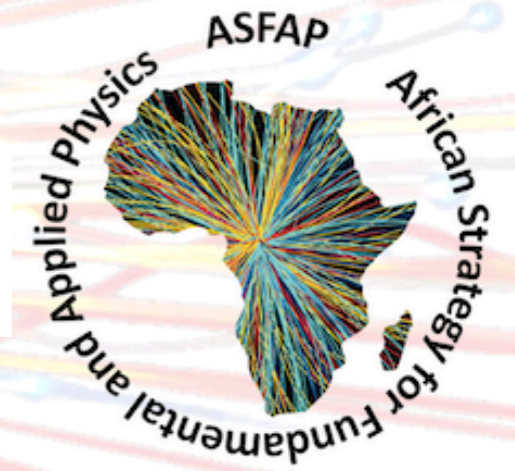
DOE office of Nuclear Physics



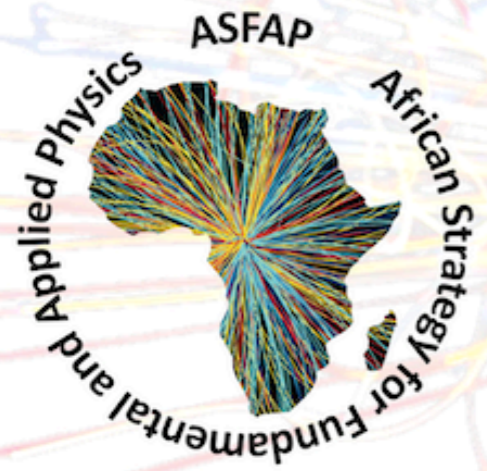
- Heavy Ion Physics Research
- Medium Energy Nuclear Physics Research
- Nuclear Structure and Astrophysics
- Fundamental Symmetries
- Theoretical Nuclear Physics Research
- Accelerator Physics Research



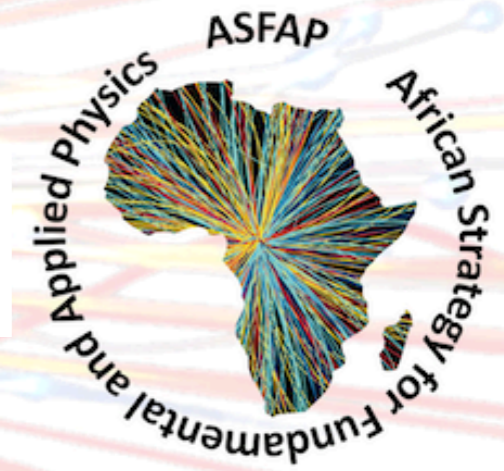
Membership



- We have not yet identified a good way to find the Nuclear Physicists in Africa, how to store the information etc.
- How is membership management for ASFAP handled? Should we not have something centralized for this?
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Summary



- We have recruited 3 subgroup conveners for subgroups that are important in Africa.
- Might want to add another 1 or 2 subgroups.
- Should meet with Particle Physics Group.
- Not yet begun recruiting members of the group that could contribute to the white paper.
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