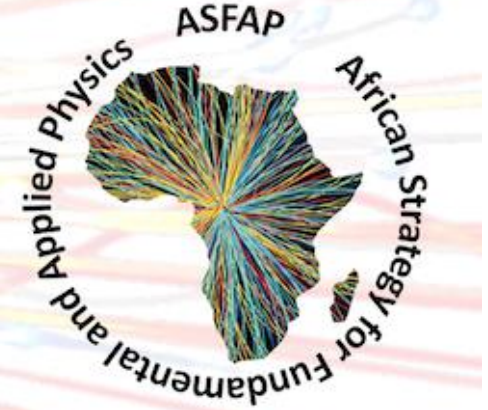




## African Strategy for Fundamental and Applied Physics



# Condensed Matter and Materials Physics Working Group

## “How to contribute?”



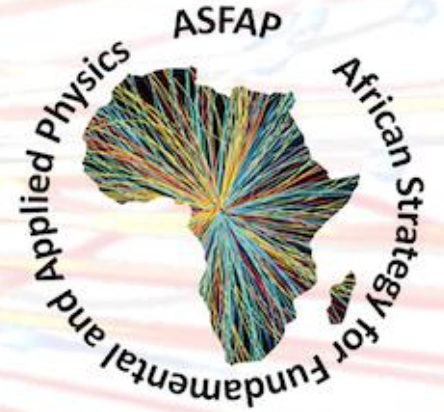
**International Union of  
Materials Research Societies**

Member of the International Science Council





## **African Strategy for Fundamental and Applied Physics**



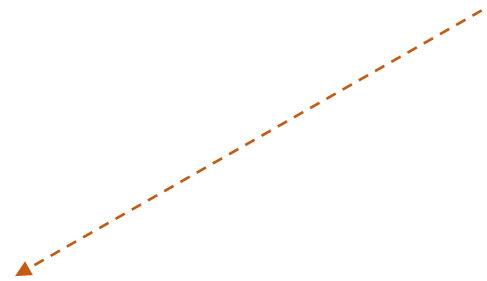
The initiative aims at producing a strategy for reforming and transforming the Fundamental and Applied Physics research, and Education in Africa for African Development.

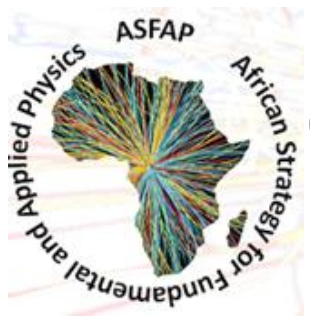


# Physics Working Groups







1. Accelerators
2. Astrophysics & Cosmology
3. Atomic & Molecular Physics
4. Biophysics
5. Computing & 4IR
6. Earth Science
7. Energy
8. Fluid and Plasma
9. Instrumentation & Detectors
10. Light Sources
- 11. Condensed Matter & Materials Physics**
12. Medical Physics
13. Nuclear Physics
14. Particle Physics
15. Optics and Photonics
16. Complex Systems





# Condensed Matter and Materials Physics

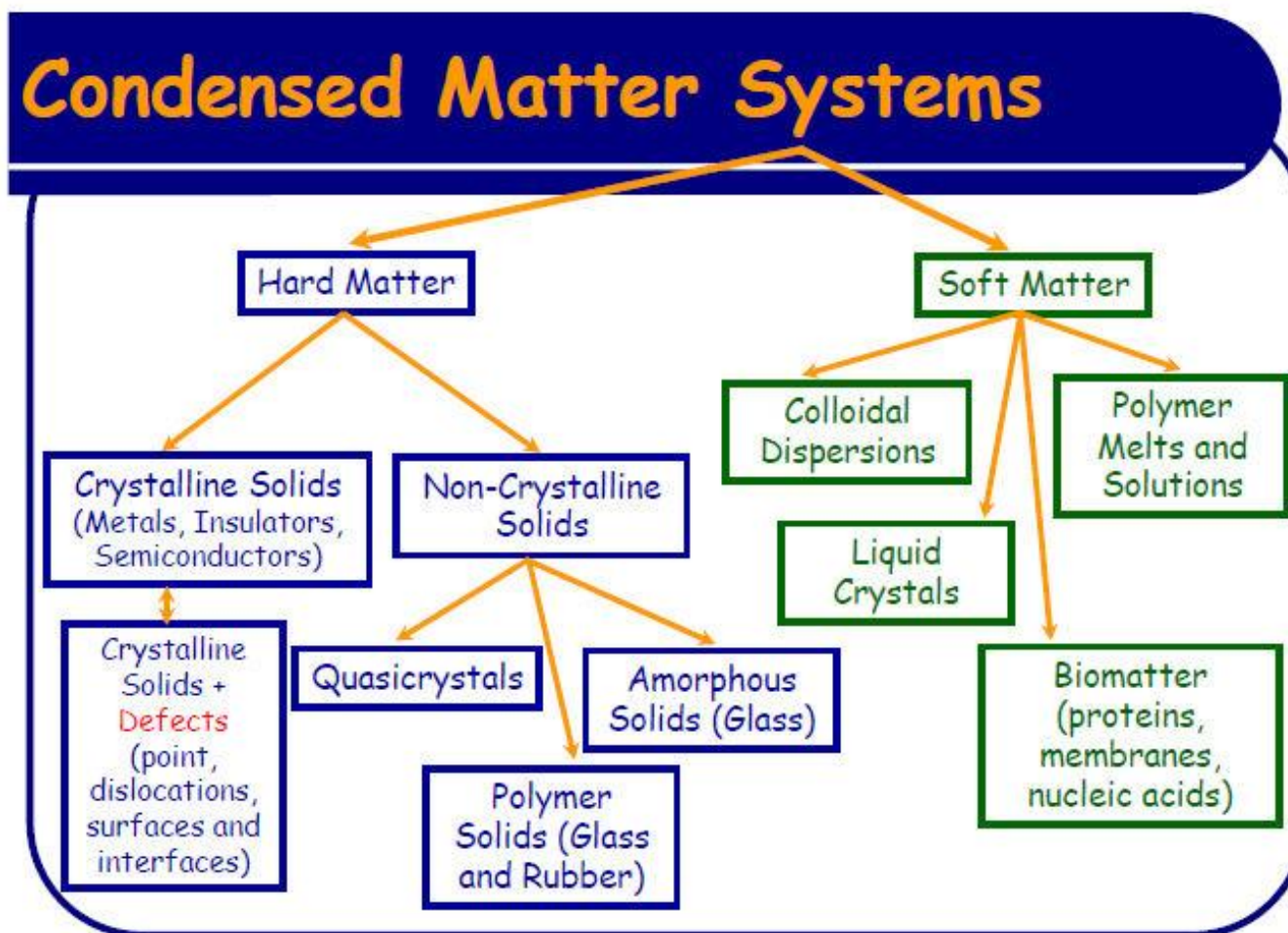
## Working Group: Co-Conveners

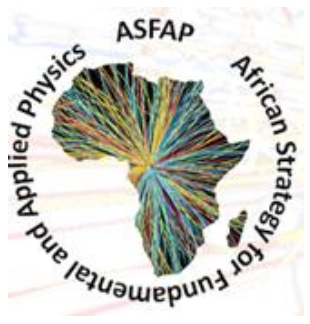
| Name                   | Affiliation   | Country           |   |
|------------------------|---|-------------------|---|
| Prof Balla Diop Ngom   | Cheikh Anta Diop University, Dakar<br><b>Head, Quantum Photonics, Energy and Nanofabrication Laboratory</b> | Senegal           |    |
| Prof David Dodoo-Arhin | University of Ghana<br><b>Head, Hybrid and Energy Materials Laboratory</b>                                  | Ghana             |    |
| Dr Samuel Chigome      | Botswana Institute for Technology Research and Innovation<br><b>Senior Researcher, Nanomaterials</b>        | Botswana/Zimbabwe |   |
| Prof Sonia Haddad      | University of Tunis El Manar<br><b>Head, Condensed Matter Physics Laboratory</b>                            | Tunisia/Algeria   |  |



# Condensed Matter Physics

**Condensed matter physics:** seeks to understand how matter arises from a large number of interacting atoms and electrons, and what physical properties it has as a result of these interactions.

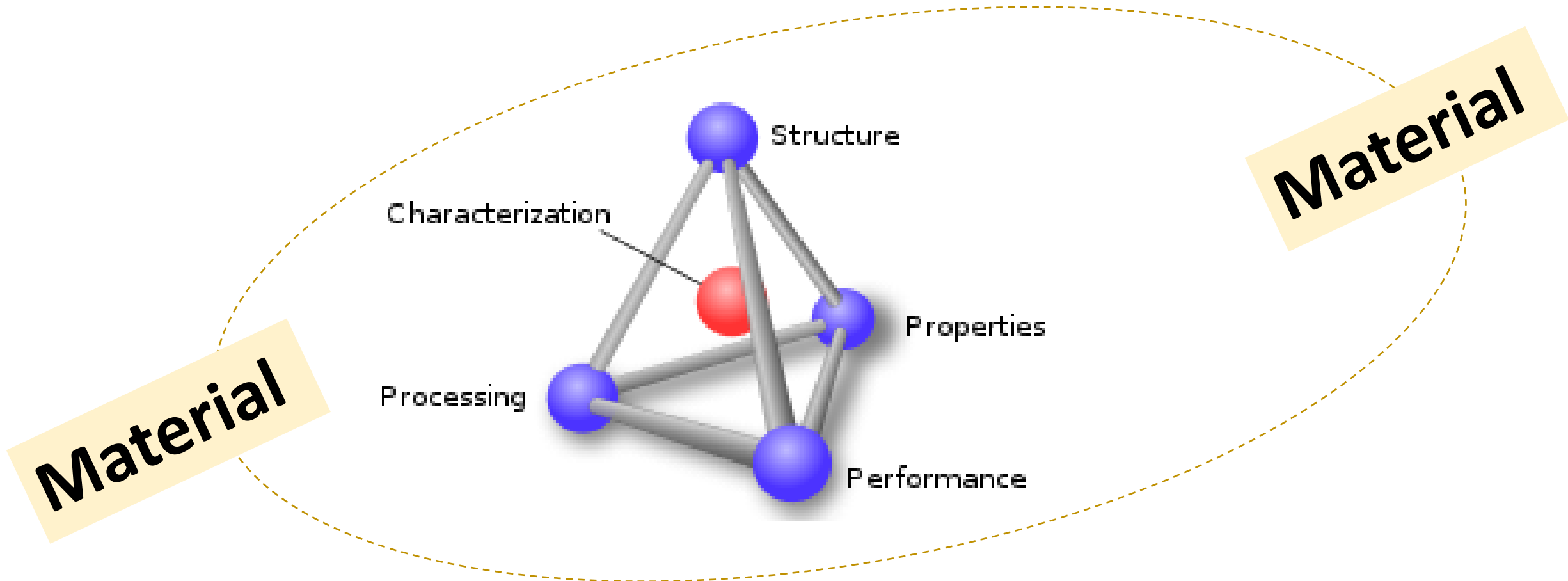




# Materials Physics



**Materials physics:** considered a subset of condensed matter physics because it applies fundamental condensed matter concepts to describe the physical properties of materials.

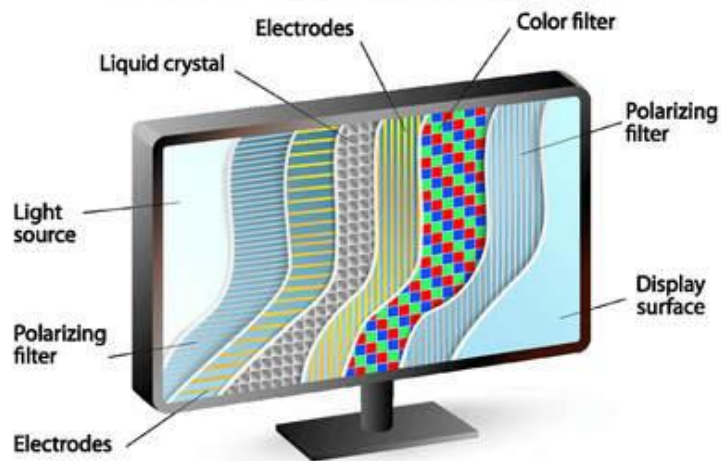


# Condensed Matter and Materials Physics

Overlap with Materials  
Science and Engineering

Largest subfield of physics because of its direct link to material development.

## LIQUID CRYSTAL DISPLAY



Breakthrough of Condensed matter physics

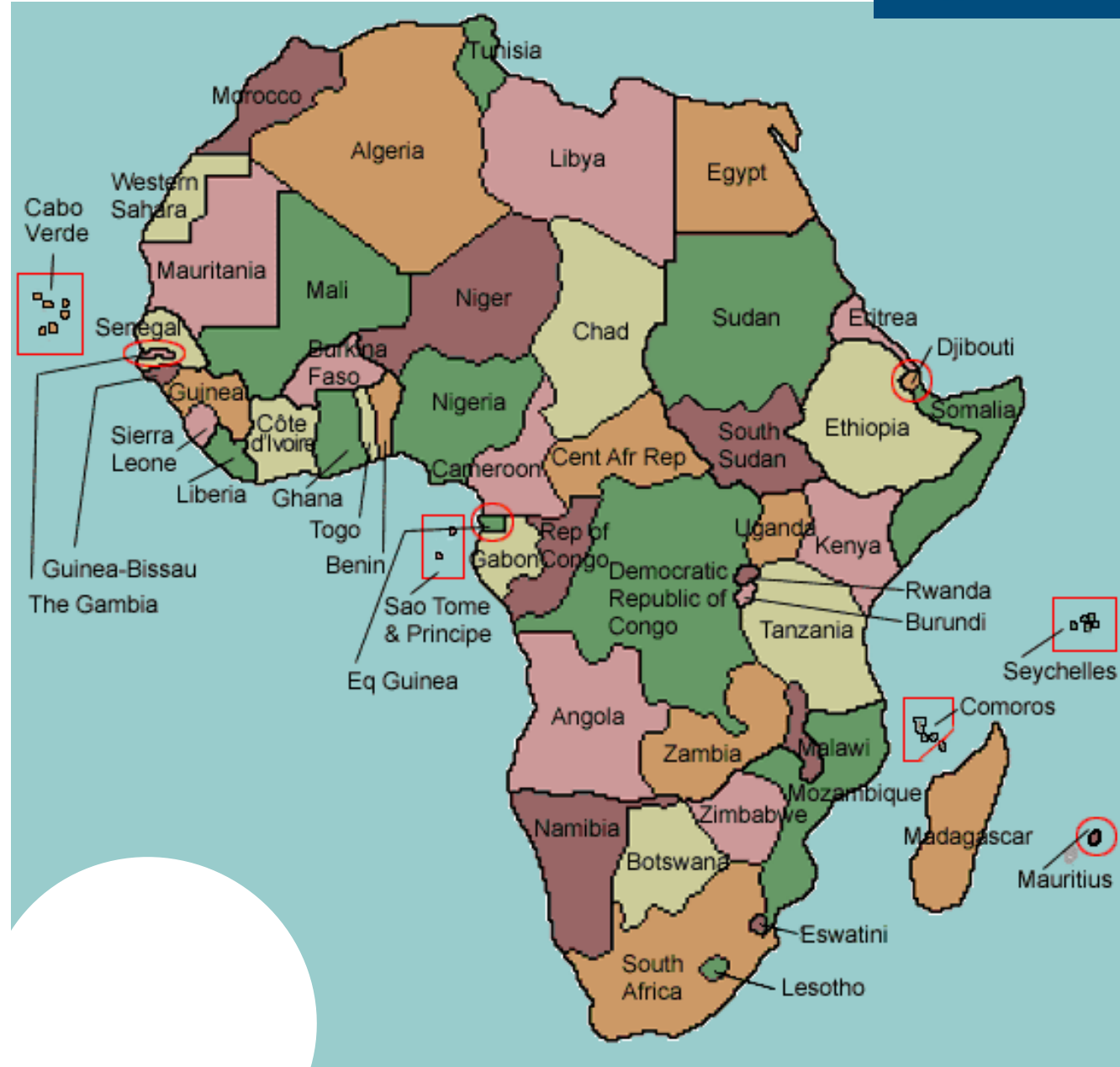


# Africa



## Facts

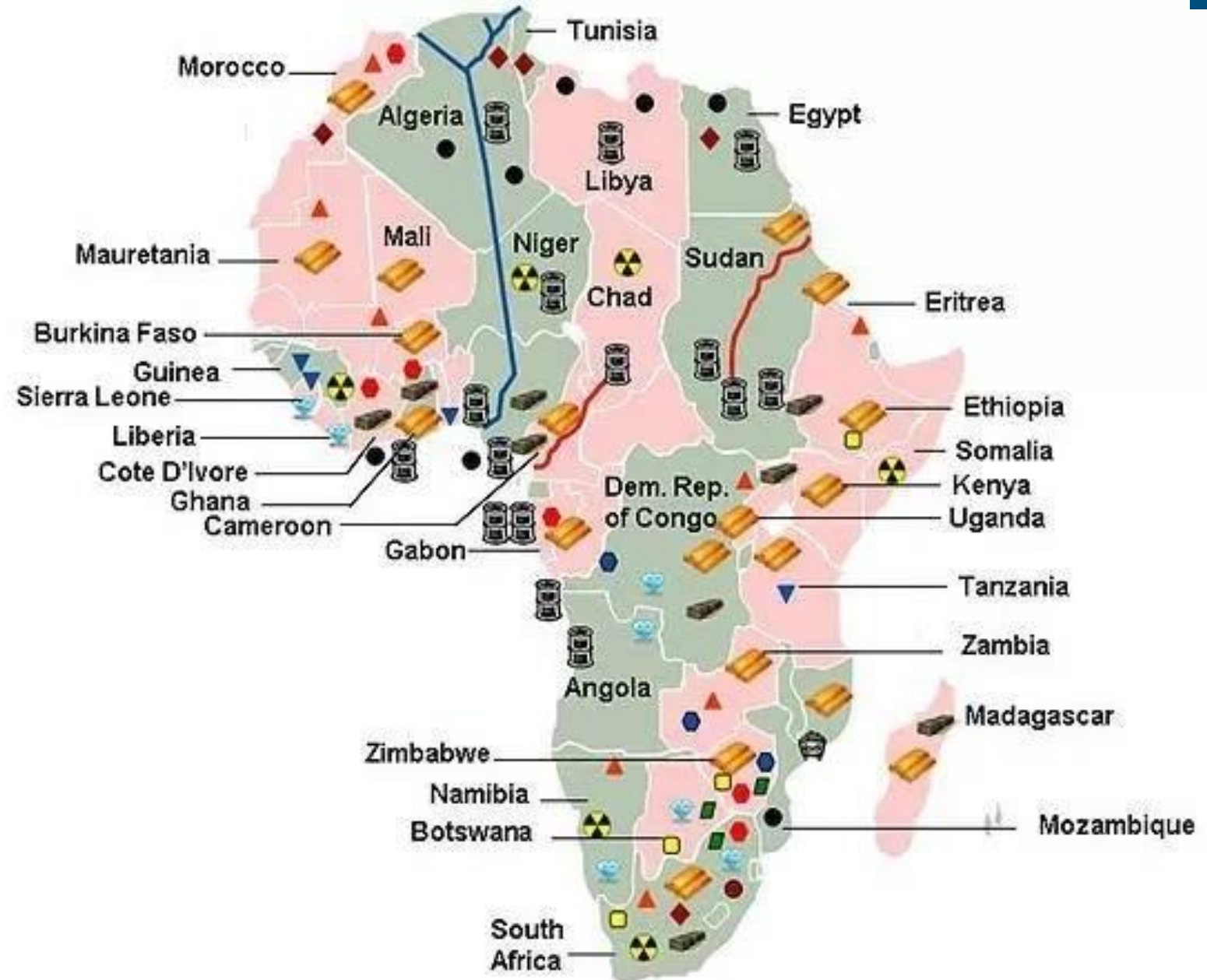
- World's second largest continent = 30.37 million km<sup>2</sup>
- Second most populous = 1,386,337,673
- Literacy rate rate = 22 – 96%
- 30% of the earth's mineral resources are in Africa



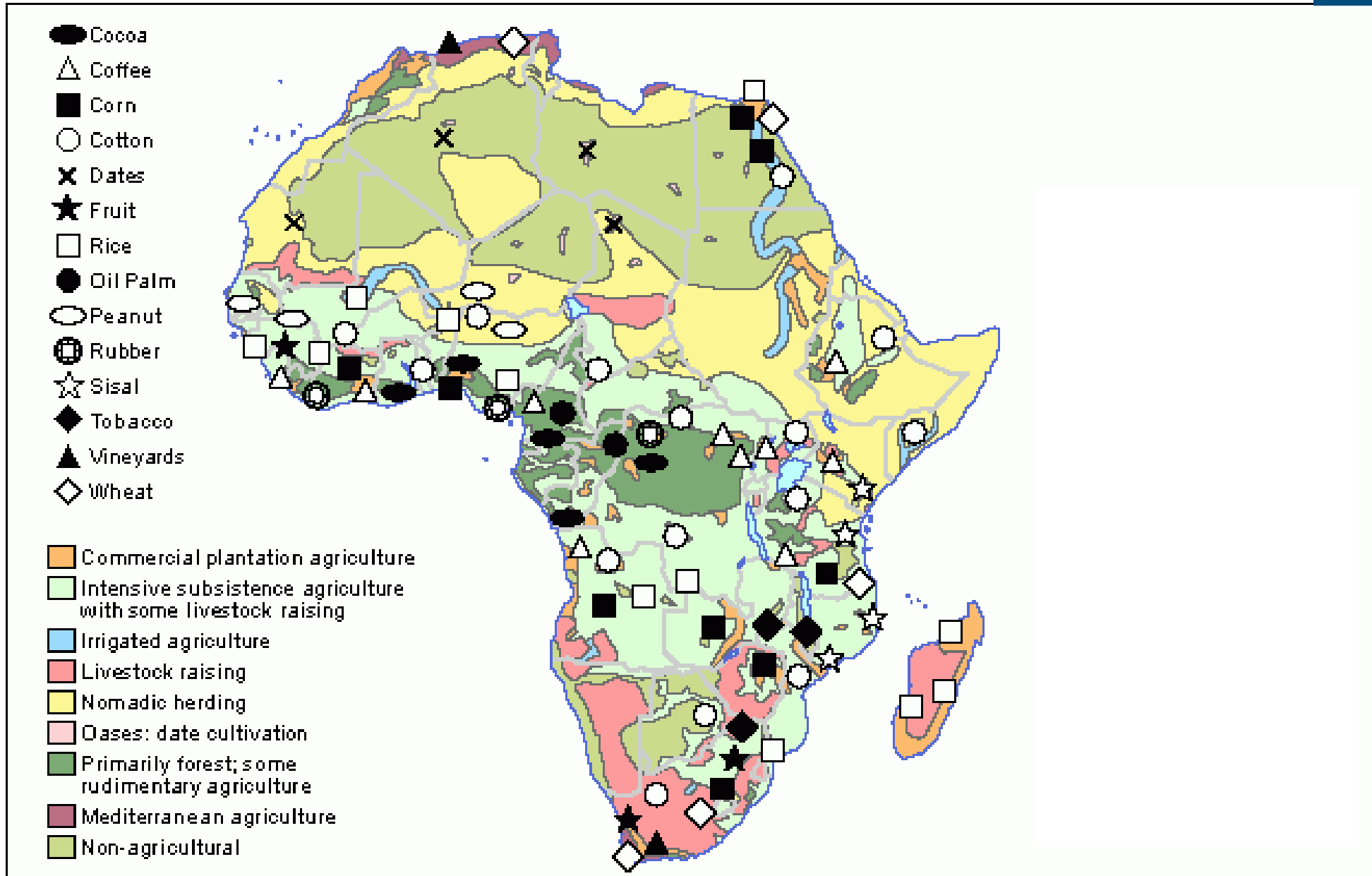


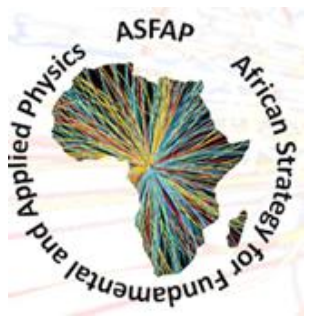
# Africa's Mineral Resources

- Oil
- Gas
- Coal
- Copper
- Bauxite
- Gold
- Diamond
- Timber
- Uranium
- Chromium
- Cobalt
- Manganese
- Phosphate
- Platinum
- Palladium



# Africa's Agricultural Resources

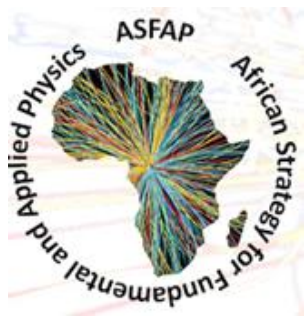




# Condensed Matter and Materials Physics

## “subgroups”

1. Theoretical and computational Condensed Matter Physics
2. Nanomaterials
3. Superconducting materials
4. Quantum Matter and topological Materials
5. Advanced 2D materials
6. Materials for optics
7. Magnetic Materials
8. Soft matter
9. Materials for energy
10. Materials for water purification
11. Materials for biology
12. Materials for quantum computing
13. Construction and manufacturing Materials



# Condensed Matter and Materials Physics

Peanuts for high performance energy storage

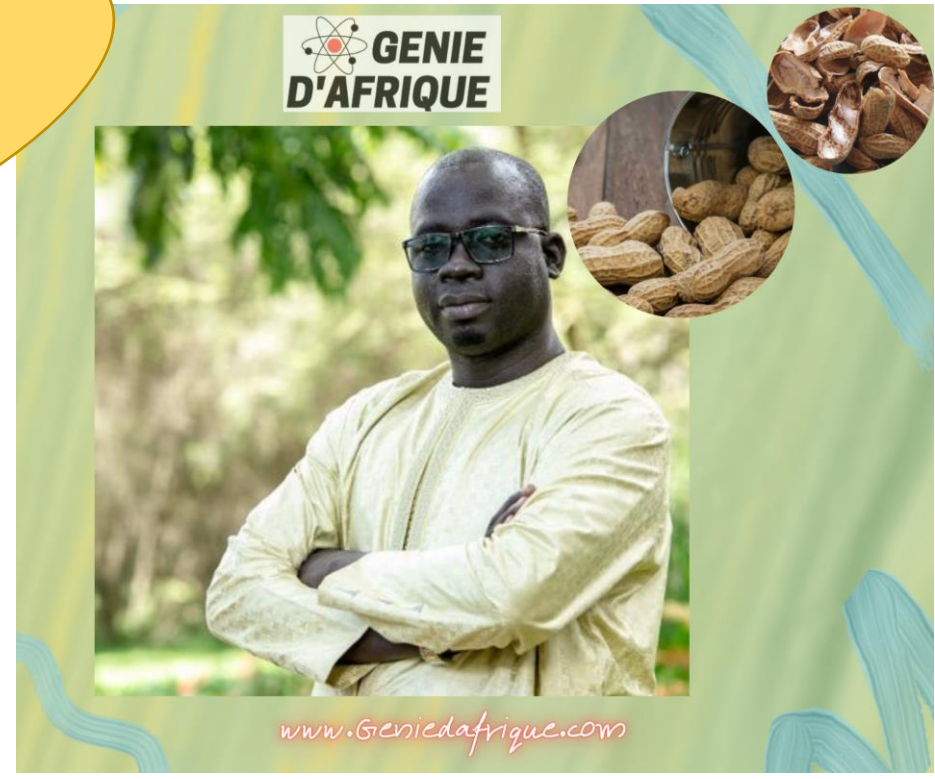


Article

## Enhanced Electrochemical Behavior of Peanut-Shell Activated Carbon/Molybdenum Oxide/Molybdenum Carbide Ternary Composites

Ndeye F. Sylla <sup>1</sup>, Samba Sarr <sup>1</sup>, Ndeye M. Ndiaye <sup>2</sup>, Bridget K. Mutuma <sup>1</sup>, Astou Seck <sup>3</sup>, Balla D. Ngom <sup>2</sup>, Mohamed Chaker <sup>3</sup> and Ncholu Manyala <sup>1\*</sup>

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- <sup>2</sup> Laboratoire de Photonique Quantique, d'Énergie et de Nano-Fabrication, Faculté des Sciences et Techniques, Université Cheikh Anta Diop de Dakar (UCAD), Dakar-Fann, Dakar B.P. 5005, Senegal; nmnyndiaye@gmail.com (N.M.N.); balla.ngom@ucad.edu.sn (B.D.N.)
- <sup>3</sup> Institut National de la Recherche Scientifique Centre—Énergie Matériaux Télécommunications 1650, Boulevard Lionel Boulet, Verreux, QC J3X 1S2, Canada; astou.seck@emt.irsna.ca (A.S.); chaker@emt.irsna.ca (M.C.)
- \* Correspondence: ncholu.manyala@up.ac.za; Tel.: +27-12-420-3549; Fax: +27-12-420-2516



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Home News Africa Senegal: biomass, a hope for storing energy

## Senegal: Biomass, A Hope For Storing Energy



# How do you contribute?



1. Identify a subgroup that you would like to join.
2. <https://twiki.cern.ch/twiki/bin/view/AfricanStrategy/AfMaterialsPhysics>
3. Letter of Interest (LOI)