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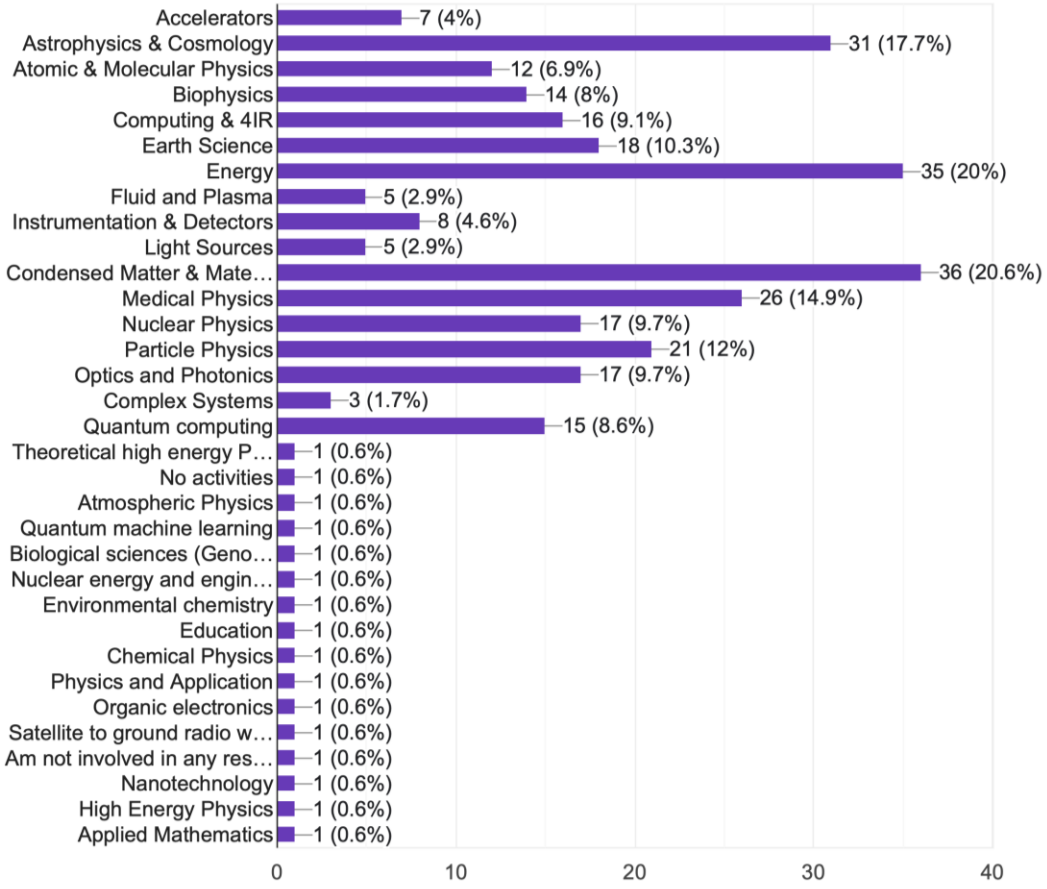
AFSAP – Towards the final report

The Computing Working Group

It is one of the working groups of the African Strategy for Fundamental and Applied Physics, ASFAP.

Group "transverse" to the other groups:

- **driven by the needs of the research community in order to boost their output**



Chapter 7: Computing Working Group

Main sections:

1. Introduction and Motivation
2. Computing Challenges for Scientific Activities in Africa
3. Synergies with neighboring fields
   - Artificial Intelligence
   - Quantum Computing
4. High priority Future Needs from Scientific Community
5. Recommendations and perspectives
6. Conclusions

7.1: Introduction and motivations

For the large sample of collected data in research or industry, computing is an essential component to data mining. This section:

- Highlights the need of computing for scientific research
- Defines what is a computing service
- Introduces Quantum Computing and AI
- Source of information for this report: survey launched in 2022.
  - Here more should be added because other contributions added up.

7.2: Computing Challenges for Scientific Activities in Africa

In this section

- Show the broad spectrum of scientific fields that are in need of computing
- Give extensive example of the Higgs Boson search @ LHC:
  - data mining,
  - simulation of detectors and theoretical models
  - Necessity of a grid of distributed resources to handle the avalanche of data.
- Introduce GPU and High Performance Computing for specific requirements and repetitive tasks
- Concentrate on Africa and point out the little investment and the lack of commitment.

7.3: Synergies with neighbouring fields

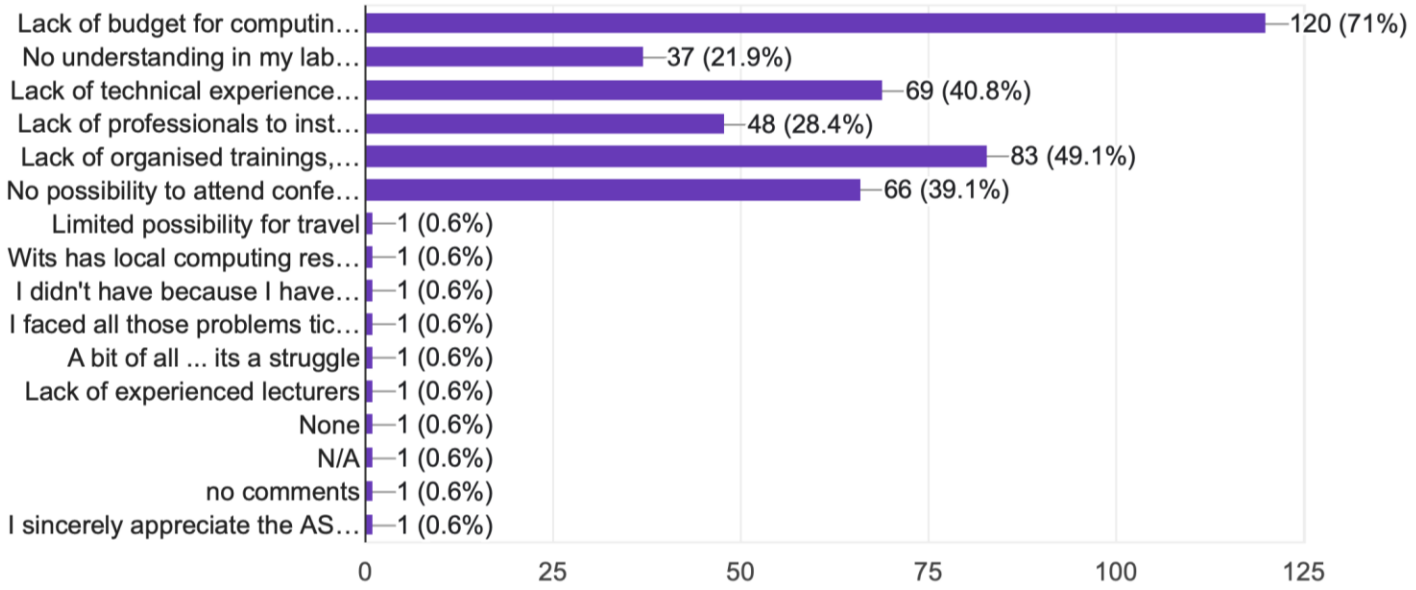
Concentrate here on the 2 more obvious neighbouting fields:

- **Artificial Intelligence**
- **Quantum Computing**

7.4: High priority Future Needs from Scientific Community Consultations

Here we have taken essentially into account the output as recorded from the survey launched in 2021

- **This has to be completed with the new contributions that have shown up recently and that broaden the focus beyond the survey only.**



7.5: Recommendations and perspectives

Considering the answers provided by the survey cited above and to improve the situation and boost the scientific research in Africa, we draw the following guidelines

- **Develop computing infrastructure and build a knowledgebase**
- **Build Knowledge and include computing in Education**
- **Harnessing Cloud Computing for Africa's Scientific Research Infrastructure**
- **Prioritizing Sustainable Investments in HPC Centers for Africa's Development**

7.6: Conclusion

- The top priority is raising the awareness of governing bodies and stakeholders at each level about crucial role of computing
- Global and long scale planning is necessary
- Budget should be expressly dedicated to computing
- Close collaboration between countries within Africa and all over the world.

ROADMAP for the next few months

- Most of the information and subjects is available
- New valuable contributions came in the last months that changed a bit the general layout of the report.

- Restructure the sections
  - Some information needs to move between sections
- Put more references
- Improve the language and the english
- Discuss the conclusions and recommendations to have them consistent with those of other chapters of the report.

More general throughout the report

- Agree on what is chapter, section, langage and reference.
- Agree also on how much effort and how long

THANK YOU