

# Fundamental Physics in Egypt

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# Introduction

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I apologize that my overview won't be comprehensive, as Egypt is too big, with 27 public universities, 27 private universities, and 20 semi-private universities. Each of these institutions has physics department and physicists engaged in different aspects of physics teaching and research, but I don't have the data for all of them.

Moreover, I just prepared these slides today after I learned that I have to do so.

Fundamental physics in Egypt includes both theoretical and experimental research, with contributions in areas such as particle physics, condensed matter physics, and astrophysics.

# Key Research Institutions

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**Cairo University:** One of Egypt's oldest and biggest universities, it has a strong physics department involved in various research activities.

**American University in Cairo (AUC):** Offers robust programs in physics with research in areas like Nano Physics, quantum information, etc.

**Zewail City of Science and Technology:** Named after Nobel laureate Ahmed Zewail, this institution focuses on advanced scientific research and education. We have undergraduate physics programs with majors: HEP, ASTRO, CMP. In addition to center for fundamental physics (CFP), involves in Particle Physics, Cosmology and Astroparticle research.

**British University in Egypt (BUE):** has a center for Theoretical Physics (CTP) engages in Astrophysics, Gravity research.

**National Research Institute of Astronomy and Geophysics (NRIAG):** Engages in research related to astronomy, geophysics, and space science.

**National Research Center (NRC):** Engages in Material Science and Applied physics

# Areas of Research

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- **Experimental Particle Physics:** Egyptian physicists participate in CMS collaboration, through the ENHEP, them also Fayoum and Mansoura Universities. In addition, Egypt is a member of SESSAM, light source experiments, and other international collaborations.
- **Theoretical High Energy Physics:** BSM, Supersymmetry, supergravity, String theory, namely at the CFP at Zewail City and CTP at the BUE.
- **Condensed Matter Physics:** Research in materials science and nanotechnology at Cairo, Ain Shams and other Universities.
- **Astrophysics and Cosmology:** Studies related to the structure and evolution of the universe.
- **Applied Physics** (Laser, Biophysics, etc.) in the national instituties and several physics department.

# Physics Graduate Program at Zewail City

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- **Program Overview: M.Sc. & Ph.D**
  - Advanced curriculum covering various aspects of physics
  - Emphasis on research and innovation
- **Open to All:**
  - Available to both Egyptian and non-Egyptian students
  - Encourages a diverse and international student body
- **Opportunities:**
  - Access to state-of-the-art research facilities
  - Collaboration with leading scientists and researchers
  - Preparation for careers in academia, industry, and research

We also welcome postdoctoral fellows based on the availability of internal and external grants

# Physics Funding in Egypt

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## ➤ Overview of Funding Sources:

- Government funding through the Ministry of Higher Education and Scientific Research
- Grants from STDF. Science, Technology & Innovation Funding Authority.
- International funding from collaborations and partnerships

## ➤ Challenges:

- Limited budget allocations compared to global standards
- Dependence on external grants and collaborations

## ➤ Impact on Research:

- Resource constraints affecting the scope and scale of research projects
- Efforts to secure more funding and investment in scientific research

# Conclusions

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- **Egypt's contributions to global physics research.**
- **Growing community of physicists despite challenges.**
- **Future potential and opportunities for growth.**