

Integrating Open-Source Digital Fabrication for Educational CubeSat Prototyping in Africa

Sunday 26 October 2025 10:00 (20 minutes)

The global CubeSat ecosystem continues to evolve through open-source collaboration and localized innovation. This presentation explores how digital fabrication, open hardware, and STEM-based community engagement are being leveraged in Ghana to design and prototype educational CubeSat systems. Drawing from our work at Ghana FabLab, we showcase how tools such as 3D printing, CNC milling, and microcontroller platforms (e.g., Arduino, ESP32) are used to introduce students and young innovators to the foundational systems of satellite engineering.

This initiative demonstrates that low-cost, open-source prototyping can be an accessible and scalable entry point into space technology, especially in underserved regions. The session covers our current development of a ground-based CubeSat model, incorporating telemetry transmission, solar power simulation, and open-source satellite communication protocols. We also explore how collaborative platforms and shared documentation accelerate knowledge transfer across local and international maker communities.

The goal is to inspire cross-border partnerships, promote inclusivity in the global CubeSat movement, and highlight Africa's emerging role in open space innovation. We invite collaborators to join us in developing community-based, education-friendly CubeSat kits that can empower the next generation of satellite engineers.

This presentation will be of interest to educators, open-source hardware developers, CubeSat engineers, and space outreach programs looking to expand their global impact through grassroots innovation.

Author: KOOMSON, Matthew (Ghana Fablab)

Presenter: KOOMSON, Matthew (Ghana Fablab)

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