

“Science Education in Northern Uganda”

GuluNap-Science

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Università di Napoli “Federico II”

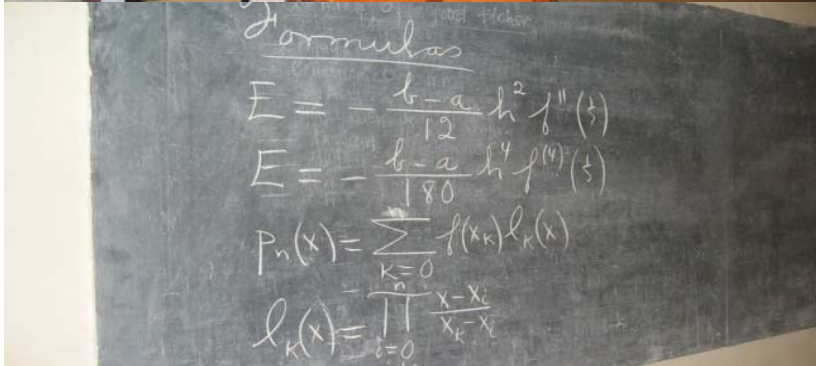
Collaboration in Science Education

Teacher-to-be = BSE (Biol, Chem, Phys, Math)

- **Re-design of Curricula and Lab-work**
 - **Preparation of Gulu Young Staff**
- **Proposals/Materials (Science Education Research)**

In-service Teachers (Physics, Secondary Schools)

- **Re-construction of Knowledge**
 - **Team Work**
- **Low-cost Experiments (easy-to-disseminate)**
 - **Notes (lack/scarcity of Textbooks)**
 - **Personalised Suggestions**



Gulu: Bachelor in Science Education

Scarce Power, NO Public Transport

NO (or Old) Textbooks, Very Scarce ITC

Few Teachers (often from outside)

Inadequate or No Labs, Very Guided Approach

Few (or None) Questions by Students

Often Mnemonic Learning (from Notes)

Very Few Women

Costly Univ. Fees

National Exam for Government Support

Great Formality (ex Britannic Empire)

GULUNAP-SCIENCE 2006 → NOW

PHYSICS

BSE (I, II, III year) NEW COURSES

**Basic Physics Education, General
Astronomy, Introductory General Physics**

- **Sinergic Mix: Lecture/Lab/Question-Time**
 - **Co-presence of 2 professors**
 - **Conceptual Nodes**
 - **Lab-work: low-cost, local materials**
 - **Proposals from Physics Educ. Research**
 - **Activities' Notes**
 - **Esperiments' Worksheets**
 - **Problems, Port-folios**

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BIOLOGY 2006 →
Animal Histology and Physiology
Ecology

CHEMISTRY 2008 →
Organic Chemistry I

MATHEMATICS 2009 →
Differential Equations II

In-service Physics Teachers NUTS1 (11-16 Dic. 2006)



Science Education Faculty
Gulu University
Uganda

Facoltà di Scienze MFN
Università di Napoli Federico II
Italy

**Every Day
Physics Practicals
with
Every Day Materials**

11th - 16th December 2006
Main Campus, Gulu University

The workshop is reserved to 45 Physics Teachers in service in Northern Uganda secondary schools. Transport and Full board accommodation will be provided by the workshop organisers.

Organising Committee :
E. Sassi - L.A. Smaldone
D. Katongole - V.S. Mambo - B.J. Zziwa

1st N.U.T.S. Workshop

© physics: L.A. Smaldone

Secondary Schools: often No Resources
Teachers: often Not Prepared

First Workshop in Northern Uganda

- **32 Teachers (17 Schools)**

Previous Teaching: 6800 IDP Studs

- **Team- Work, Experiential**

- **Knowledge Re-Construction**

- **Lab: Local, No-cost Resources**

- **Apparatuses: Easily Reproducible**

- **Portfolio**

- **Notes as Textbooks**

FAO 25/11/11

NUTS 1

Example LAB-WORK: Telemeters



In-service Physics Teachers NUTS2 (17-22 Gen. 2010) “*LIGHT IN NORTHERN UGANDA*”

Northern Uganda Teachers of Science
2nd N.U.T.S. Workshop

Faculty of Science
Gulu University
Uganda

Facoltà di Scienze MFN
Università di Napoli Federico II
Italy

Naples OSA Student Chapter

Light in Northern Uganda

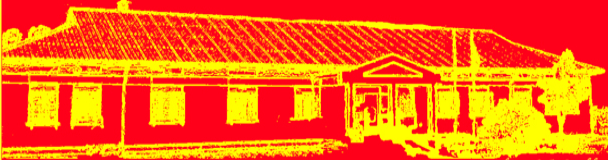
2nd N.U.T.S. : 17th - 22nd January 20100
Main Campus, Gulu University

Each workshop is reserved for 40 in-service Teachers of Physics from Northern Uganda Secondary Schools.

The subjects will span from low-cost no-cost experiments on shadows, water lenses, colors perception, light dispersion to laser and optical fibers.

Two teachers will be accepted from each school. Transport and full board accommodation will be provided by the workshop organisers.

Organising Committee:
E. Sassi - L.A. Smaldone - Naples OSA Student Chapter
J. Okello-Onen - J.Z. Byansi



Graphics: L.A. Smaldone

- **35 Teachers (19 Schools) (75%)**
Previous Teaching: 3500 IDP Studs
- **Team-Work, Full Immersion**
- **Re-building of Optics Knowledge + some XX century Physics**
- **Lab-work (also low-cost)**



SECONDARY SCHOOL EDUCATION

(13 years, including Primary)

Secondary School "A" Level (7)

Diploma in Secondary Education (14)

UNIVERSITY DEGREE

Bachelor in Science Education (3 years) (13)

BSE + Postgraduate Diploma in Secondary Education (1)

19 Schools from 5 Northern Uganda Districts

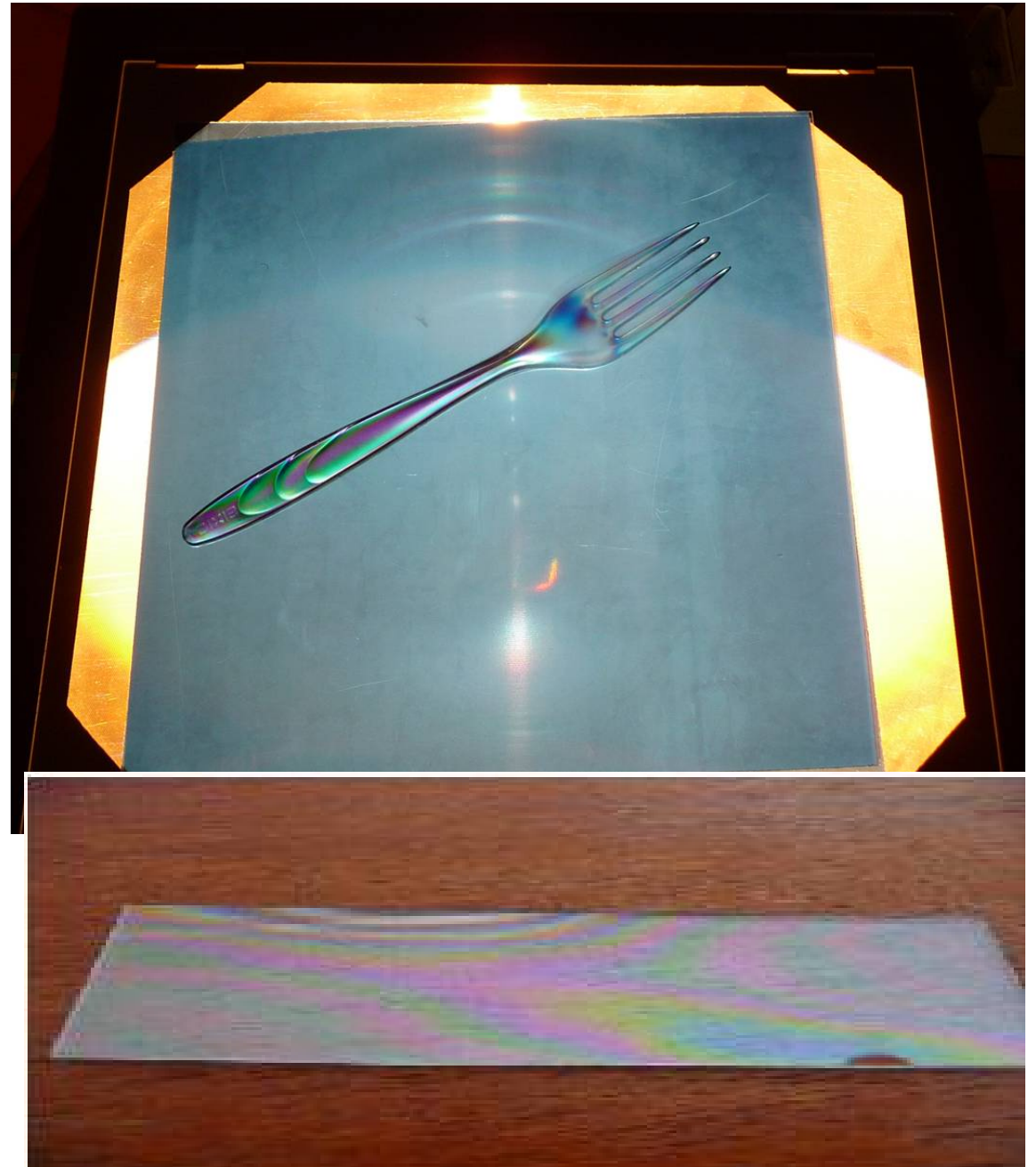
ADJUMANI (4) GULU (4)

KITGUM (4) LIRA (4) PADER (3)

OPTICS Experiments: Interference, Polarization



**Most Expensive Material:
a Cheap Laser Pointer**



OPTICS Experiments: CD Spectrometer, Total Internal Reflection



NEXT FUTURE (2012 →)

**More NUTS for in-service Teachers
(PHYSICS, MATH, BIO, CHEM)**

Basic Science for Agriculture

Post-harvest Technology of Fruits

A photograph of a rainbow in a cloudy sky. The rainbow is a faint, multi-colored arc spanning across the middle of the frame. The sky is a mix of grey and white clouds. In the bottom left corner, there are some dark green tree branches.

**THANKS
FOR YOUR ATTENTION**

FAO 25/11/11