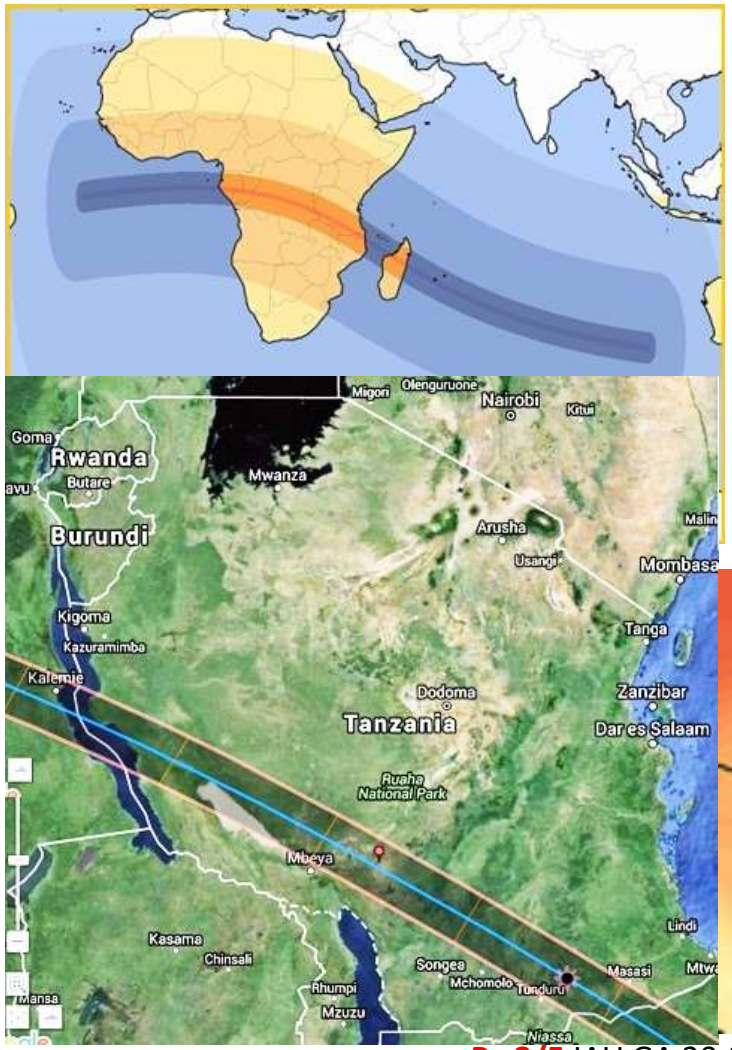
OBSERVATIONS OF 01 SEPTEMBER 2016 ANNULAR SOLAR ECLIPSE FROM TANZANIA

DR NOORALI T. JIWAJI, OPEN UNIVERSITY OF TANZANIA ntjiwaji@yahoo.com
DR CHRISTIAN B. UISO, UNIVERSITY OF DAR ES SALAAM cbuiso@yahoo.com

ABSTRACT: The major astronomical event of an Annular Solar Eclipse that crossed through the heart of Africa on September 01, 2016 was used as an outreach, educational, and scientific opportunity in Tanzania. We present the challenges of organising, funding and reaching the population and educating the public as well as students in schools across the country. We also present findings of global solar radiation and temperature changes monitored during the eclipse. Results show a practically night sky situation during full annularity and a nearly 4oC drop in air temperature at full eclipse.

International Astronomical Union (IAU) General Assembly
Division E : SUN AND HELIOSPHERE
August 24 and 27, 2018

GEOGRAPHICAL LOCATION AND PATH OF ECLIPSE



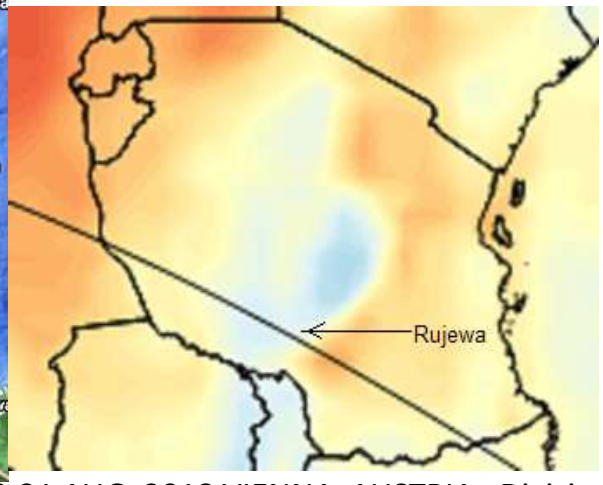
RUJEWA SITE:

8.7000 ^{O}S

34.3830 ^{O}E

- Selected as most accessible with least cloudiness

- Flat expanse with no obstructions

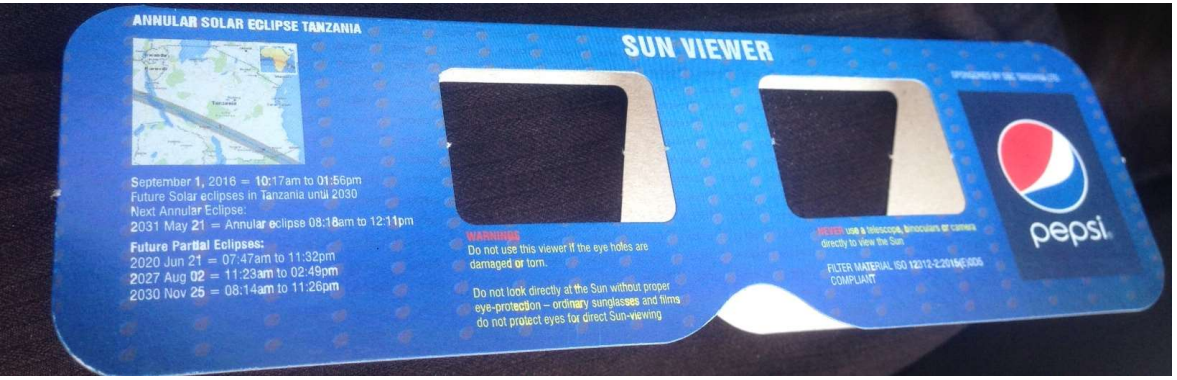


ECLIPSE CICUMSTANCES AT RUJEWA SITE:

8° 41' 32.78" S <–> -8.69244° 3m 05.0s (annular solar eclipse)
34° 21' 29.51" E <–> 34.35820° 2m 50.5s (lunar limb corrected)
Help
Antumbral depth : 94.17%
2.9km (1.8mi)
Path width : 101.0km (62.7mi)
Obscuration : 94.787%
Magnitude at maximum : 0.98602
Moon/Sun size ratio : 0.97359
Antumb. vel. : 0.543km/s (1216 mph)

Event (ΔT=68.4s)	Date	Time (UT)	Alt	Azi	P	V	LC
Start of partial eclipse (C1) :	2016/09/01	07:03:22.3	+47.0°	068.1°	296°	10.3	
Start of annular eclipse (C2) :	2016/09/01	08:51:10.0	+68.9°	037.7°	296°	09.3	+6.2s
Maximum eclipse (MAX) :	2016/09/01	08:52:42.5	+69.2°	036.8°	209°	12.3	
End of annular eclipse (C3) :	2016/09/01	08:54:15.0	+69.4°	035.9°	123°	03.0	-8.3s
End of partial eclipse (C4) :	2016/09/01	10:47:27.0	+66.7°	315.5°	121°	12.5	

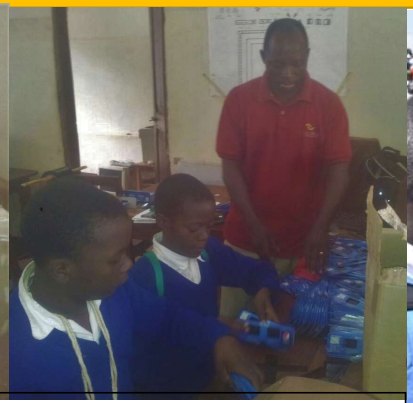
LOCALLY DESIGNED AND MANUFACTURED SUN VIEWERS



THOUSAND OAKS FILTER MATERIAL SUPPLIED BY COLLEAGUE FROM SOUTH AFRICA

Cost of local manufacture:
300 Tsh = $0.12 = 12 cents EACH

Compared to imported glasses cost:
18,000 Tsh = $10 EACH !!!



PUPILS ASSEMBLE SUN VIEWERS

SHARING SUN VIEWERS

- 50,000 pcs PLEDGED FROM MAINLY PEPSI SPONSORS and SMALL CROWD FUND
- 40,000 pcs AFTER TAX
- 20,000 pcs FILTER AVAIL.
- FINANLLY - 10,000 pcs MADE AND DISTRIBUTED

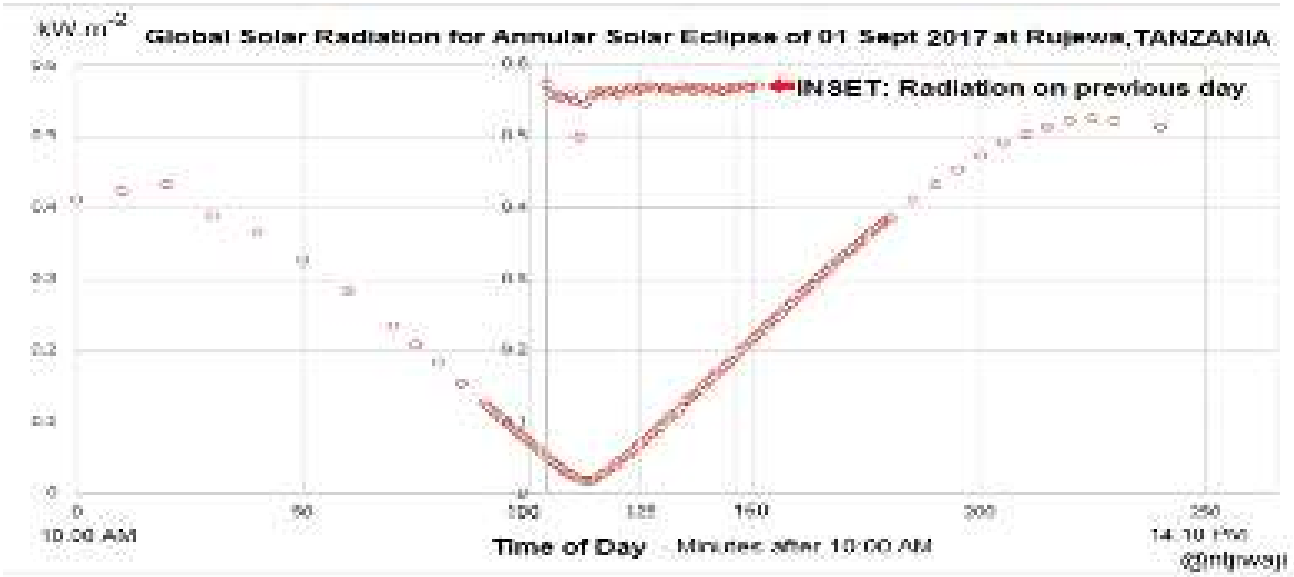
PUBLIC RESPONSE HUGE CROWDS AT RUJEWA

ATTENDANCE AT RUJEWA SITE:
PLANNED 500 BUT TURN UP 5,000

STUDENTS WERE MOST ATTRACTED

Educational opportunity continually expressed and stressed

Solar Radiation and Air Temperature Measurements



FINDINGS:

1. SOLAR RADIATION:

- 600W reduction
- 17.9W at max eclipse
- Effective sunset value
- Minimum at predicted time 11:52/53 PM

==========

2. TEMPERATURE:

- 4 ^{O}C DROP
- Lagged by 10 min