



# Project Evaluations/Testimonials

*TF1: Universities & Research*

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2013

## **Astronomy Workshop Ghana**

### **THE FOLLOWING FEEDBACK WAS WRITTEN BY A PARTICIPANT**

*(Gagakuma Bertelsen, University of Ghana, Legon)*

I am glad to have been part of this five day workshop. A lot of knowledge about the universe, and particularly our existence has been shared; knowledge I have not gained in all my education as a science student. I have learned that all the other elements come from the fusion reactions of hydrogen in the stars. Also I now understand more clearly some of the technologies scientists employ in carrying out research on the known universe. More practical is the fact that almost all technological innovations which the everyday consumer enjoys – in treatment, medicine, communication, computers and many more – are spin-offs of astronomy and space research. It would therefore be prudent for any nation (Ghana) to encourage and invest heavily in space research if it hopes to realise meaningful development. Our West African neighbour Nigeria realized this not too long ago and have taken the necessary steps to set up a space program. I am truly impressed with their progress, and it is my hope that Ghana can learn from their example.

It is also gratifying to know that GAEC has a space research center with support from the South African government. Their focus right now is on Radio Astronomy and with the SKA (Square Kilometre Array) project to begin operations in 2017, jobs will be created and those communities affected will see great development in economy and infrastructure. This workshop has exceeded my expectations; my mind has been opened to many possibilities. I am a better problem---solver. The task now is to spark an interest in space science in the hearts of the rising generation. Workshops such as this will do just that.

The only regret I have is that participation was low. I recommend that steps should be taken to significantly increase participation the next time this happens. Of course we will do our part by spreading the good news. To Dr Ashong and his team of professionals I am particularly impressed with your dedication to this cause. Let me say that your efforts will definitely yield positive results in the near future. This is the beginning of a great work in Ghana. Thank you for taking time out of your busy schedules to do this.

Participants were asked to evaluate the workshop. Most responses were overwhelmingly positive that the workshop had met their expectations.

**Participants' Responses to: "HAS THE WORKSHOP MET YOUR EXPECTATIONS?"**

1	Yes it has. The workshop has really educated me a lot, both about the progress of science and Astronomy worldwide.
2	Yes.
3	No answer
4	Yes, over and above.
5	Yes it has.
6	Yes, because I was expecting to relate astronomy to my field of study.
7	Yes.
8	Yes, and even exceeded them.
9	YES, GREAT START!
10	Yes, I expected it to be fun and educating and it was even more than that.
11	YES.
12 *	Not actually.
13	The workshop has exceeded my expectations. I have gained a wealth of knowledge that I have not had from all my science education.
14	Yes, it has.
15	Yes, because I have understood some things.
16	This workshop has exceeded my expectations, my mind has been opened to many possibilities.
17	The workshop met my expectations and has added more to my little knowledge of what I know before and has now pointed the way out for me to follow to improve on my knowledge in learning more about the Universe.
18	Yes.
19 *	Yes, but the beginning was anticlimaxed. We could have started with a video in the planetarium to drive passion and curiosity.
20	Yes.
21	Yes, it has.
22	Yes, it has. I attended to learn more about Astronomy and I know a lot of new things.
23	Yes.
24	Yes.
25	Yes
26	No answer

Comments on two less positive responses:

12\* This person may not have had any expectations, as their answer to "What did you learn?" was "I learnt what astronomy is".

19 \* This is a valid point. Our original plan was to start with a video in the planetarium, but due to the launch at the Ministry we departed from the original programme.

### **Responses of participants**

**d) "WHAT SHOULD WE DO DIFFERENTLY NEXT TIME?" and suggestions about**

**e)**

**"HOW CAN WE TAKE THINGS FORWARD?"**

1	e) A workshop should be organised from time to time targeting Senior High School and Junior High School. Also effort must be made to add Basic Astronomy to the integrated sciences curricula in SHS and JHS and introductory Astronomy for the Universities in Ghana. I can help create awareness with families, friends and course mates through the wonderful website that Mrs Sarah showed us teaching us how to use the internet to see the world.
2	d) n.a. e) Create more awareness for astronomical issues and its importance to the country. Organise workshops for 2 <sup>nd</sup> cycle institutions.
3	d) Organise it at larger area. e) By creating awareness.
4	d) Time it so that SHS students can participate. e) Form Astronomy Clubs in all schools. Talk about it at social clubs.
5	d) Create groups to research topics to present and communicate. e) Organise workshops for Senior High School (SHS) and JHS. * Adding basic astronomy to JHS curricula among others
6	d) I think next time it should be made known publicly, that is the "workshop". e) By bringing on board new ideas and new people to the workshop.
7	d) Invite more young people to attend the conference. e) More publicity of the Planetarium and Ghana Astronomical Society.
8	d) We could factor in the Senior High School Students too, such that it could be organised during their vacations. e) Beginning on a very small scale, university students can form clubs or small associations. Also we, the beneficiaries of this workshop can meet often to display and demonstrate any science spinoffs.
9	d) and e) Add a few more experts, and shorter sessions (1hr max).
10	d) Maybe it should last longer for about a month (if possible) for there to be effective training. e) Increasing the number of skilled teachers to teach to our level of understanding.
11	d) We should do good publicity. e) By taking initiatives in enhancing the

	knowledge of astronomy at all educational levels, especially the basic levels.
12	d) We should emphasize the positive effects of astronomy on mankind. e) i) To create the awareness in the public; ii) To publish article; iii) Build a radio station and create awareness of the local people.
13	d) I would like to see more participants. e) We need to introduce astronomy to children. This will spark the interest in astronomy and space sciences in the hearts of the rising generation. Workshops such as this will do just that.
14	d) 3 days. When teachers are free. e) Involve university people in the project. Find scholarships for active persons to attend sandwich programme.
15	d) I think there should be a uniform (T---shirts). e) We need to involve the secondary schools and forming of clubs.
16	d) I recommend that steps should be taken to significantly increase participation the next time this happens. Of course we will do our part by spreading the good news.
17	d) Increase publicity. e) Train more people who can hold workshops at different locations in Ghana.
18	d) Announce via the media, start with a climax, include practical field works, less theory. e) Announce via the media, use the coming eclipse as an opportunity to sell astronomy, engage with high school students.
19	d) The time span for a day's workshop. e) Involving the participation of more educational institutions in the astronomical workshops.
20	d) It should be done when teachers and students are less busy. e) Advertising a summary of what could be learnt and done at the planetarium.
21	d) n.a. e) Target youths who are interested in Astronomy and hold similar workshop.
22	d) Make it an international workshop. e) By reading wide and sharing knowledge.
23	d) Invite more of the Junior and Senior High School students. e) By publicizing Astronomy.
24	d) There should be a handout on each presentation for further reading. e) Seeking funds from government, companies, factories, etc. to organise conference at least twice a year.
25	d) More practicals should be involved, e.g. the telescope viewing should be done more often. e) I think we should place emphasis on creating more awareness especially at the grassroots and rural areas.

Note on Comment 5 e): It is on the Junior High School curriculum already.

## Guatemalan School of Astrophysics

From our perspective, we believe that GUASA2013 was one of the best events of Science/Astrophysics that happened in Guatemala and in Central America during 2013 and probably also in the last few years. For us, it was inspiring, encouraging and exciting event. We believe in our previous statements because we got comments from the students and the lecturers we invited. Many of the students said that they had one of the most exciting, scientific encouraging, happiest and memorable weeks in the last years. After all the above is said, we only can conclude that GUASA2013 was a great success, and that we managed to meet all the objectives we listed in the original proposal. Below, we quote excerpts of the written comments we got from one student and one lecturer:

*I found the GUASA School excellently organized, planned to the last detail, in location and in the topic and lecturers chosen. It was thought in a visionary way. The organizers were excellent hosts, Sara, David, Mitchell, Martin and Silvia are unforgettable human beings. I take this opportunity to send an email to you (the organizers) in order to thank you for taking me into account for the school GUASA2013.*

*-Lucia Aguilar, Student*

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*I would like to extend my gratitude for your invitation and hospitality at the First School of Guatemalan Astrophysics. I continue to be thoroughly impressed by the level of professionalism displayed by the organization team and the smooth running of the school. The enthusiasm and application of the students attending the school and the public participation in the evening activities clearly shows that there is a group of highly-driven, educated and talented young individuals within Central America whose scientific skills and industry will be of high-value to the region in future years if encouraged and nurtured. Although six weeks have passed, I continue to discuss this school with my colleagues and peers and continue to be asked about my experiences. For instance, the school was highlighted several times at the international science meeting hosted in Washington DC in January of this year. My intensely positive impressions of Guatemala as a beautiful, welcoming country, its students as individuals of high promise and work-ethic, and the success of the school in firing their imaginations and aspirations is currently being propagated across the world amongst scientists and engineers.*

*-Dr. Martin Still, Lecturer*

2014

### **Education telescope Mongolia**

Overall, our project was well received and we are confident that we have initiated a significant change to astronomy education in Mongolia. Students and teachers were very enthusiastic and the schools that received the telescopes have promised to fully teach the astronomy sections of their physics curriculum.

### **Latin American School of Observational Astronomy**

ESAOBELA-14 unfortunately ended on January 31<sup>st</sup>. Nevertheless, these observations highly motivated the students to carry out their observational practices, to process the data they obtained in order to visualize their observations, and to carry home in their hearts the excitement that comes from observing a rare astronomical phenomenon.

### **Regional School on Astrophysical Data Reduction Nepal**

The Regional School on Astrophysical Data Reduction (RSADR2014) is successfully organized at the Central Department of Physics, Tribhuvan University during 9-13 June 2014. The importance of freely available database is strongly realized by the participants.

### **Starlight in the University – Astrolab Phase 2**

The project was meant to stimulate the interest of the students in Astronomy, these was achieved as two out of the eleven 300 level students have indicated interest in majoring in astronomy. For the present 12 400 level students, nobody is offering astronomy.

2015

### **Andean Cosmology School**

The Andean Cosmology School at Uniandes in Bogota was a complete success.

### **Guatemalan School of Astrophysics**

From our perspective, we believe that GUASA2015 was one of the best events of Science/Astrophysics that happened in Guatemala and in Central America during 2015 and probably also in the last few years. For us, it was inspiring, encouraging and exciting event. We believe in our previous statements because we got comments from the students and the lecturers we invited. Many of the students said that they had one of the most exciting, scientific encouraging, happiest and memorable weeks in the last years. After all the above is said, we only can conclude that GUASA2015 was a great success, and that we managed to meet all the objectives we listed in the original proposal.

### **Introducing Data Analysis in the University System**

The workshop was well attended and the students were enthusiastic; however, a single visit of one month is not sufficient to ensure sustainability.

Given my expertise in astronomical data analysis – albeit in the ultraviolet – I had proposed to help build a group in Copperbelt University to begin analysis. In order to build a long-term partnership, I had planned to make several trips over the period of the year so that progress could be made on each trip. However, I was only awarded about 40% of my original request and I modified my trip to make a single visit of one month. In retrospect, the original plan of several visits was not realistic and would not have led to significantly more progress.

### **Latin American School of Observational Astronomy**

The funding from the IAU covered most of the expenses and let us give travel scholarships to four students who had paid their own airfare.

The school was evaluated by the students who considered it satisfactory. The text of the speech given by a student during the closing ceremony is attached (Appendix 4):

#### **Santa Maria Tonantzintla, 3 January, 2015 Closing Speech of Thanks**

First, in the names of all the students of this school, I would like to thank the Instituto de Astronomía of the UNAM (IA-UNAM) and the Instituto Nacional de Astronomía, Óptica y Electrónica (INAOE) through Prof. Jose Pena and Raul Mujica gave us the opportunity to attend this event. We would also like to thank the staff for their help



and for sharing their knowledge; from the depth of our hearts we thank them, since both physics and astronomy are sadly out-of-date in our countries and it is truly frustrating when a student shows interest and passion for astronomy and has no help to convert this interest into a profession. We promise to share the knowledge we have acquired, to widen it and to show you in the near future that the seeds you have sown during these three weeks will give fruit. We also want to extend our thanks to the professors who took time to share their valued knowledge with us. You have motivate us to study astronomy more deeply and the always move ahead. Finally, we are thankful for the links of friendship and brotherhood we have created which will build the foundations of a community of astrophysicists in our homelands. This is not the end, but rather the beginning. Thank you.

### **Time Variability in Modern Astrophysics**

The students took a multiple choice knowledge test at the start of the workshop, and again the same was repeated in the afternoon of the last day of the workshop. The 17 questions had 4 possible choices each, and covered all sessions of the workshop, except F (no contribution from the lecturer). At the start, the average number of correct answers by participant was 5.6 (lowest 0, highest 12), slightly better than a random distribution. By the end, the average number of correct answers was 12.1 (lowest 7, highest 17), showing a marked increase in the knowledge level of the participants. The test (including the correct answers) is attached, along with an excel summarizing the results.

Social life: We witnessed many interactions among the participants and with the lecturers as well, new friendships, and in general a happy mood. See B9 & B10 below. From 17 participants, 10 different nationalities were present, and this made for an enthusiastic melting pot of cultures and languages. One participant was mildly sick with stomach problems at the Observatory, but quickly recovered thanks to medicines provided by the LOC.

In the post- questionnaire, a set of questions were asked to evaluate how the participants perceived the organization and the benefits of the workshop. We list them here, with the average score from 16 participants (question B8 was answered by 14 participants only):

( 0 Strongly disagree; 1 Disagree; 2 Neither agree nor disagree; 3 Agree; 4 Strongly agree)

B1 My background knowledge was adequate to understand all of the material: **2.9**

B2 The workshop increased my interest in Astronomy: **3.8**

B3 I intend to pursue a career in Astronomy: **3.9**

B4 The workshop covered too much material in too little time: **2.8**

B5 Lectures were clear and well-organised: **3.1**

B6 The observation sessions were well-organized: **3.6**

B7 The data reduction sessions were well-organized: **3.0**

B8 The workshop was worth my time and effort: **3.6**

B9 Other workshop participants helped me learn the material: **3.7**

B10 I intend to stay in touch with one or more of the other workshop participants:  
**3.8**