

## Call for Proposals 2014 - TF2

### Contact person

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## Project details

### Task Force

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### 1. Project title:

School of Astronomy & Space Science in (West) Central Africa

### Project title abbreviation

SASSCA

### 2. Project summary (maximum 2000 characters):

Looking beyond Nov. 3 2013, this proposal is to support the second Astronomy & Space Science workshop to be held in Libreville (Gabon) in October 2015, following a successful Pan-African 2013 total solar eclipse and scientific workshop in the same city. As a reminder, on November 3rd 2013, Gabon and other countries in Africa experienced a total solar eclipse. This unique opportunity was used to set a significant momentum towards the establishment of a language/regional node for French-speaking Africa and more, as well as to organise a successful seven (07) days astronomy and space science workshop in Libreville. Plans are well ahead for a second (and better) workshop designed to become The Biennial School for Astronomy and Space Science for (west) Central Africa (SASSCA). SASSCA's aim will be to help develop a regional astronomy & space science research, teaching and outreach hub in (west) central Africa with an initial focal point in Gabon. The intended workshop in 2015 will consist of compact lecture series and activities covering basics of astronomy & space science, to help participants develop and teach high school and/or undergraduate astronomy & space science courses; to start/continue with further astrophysics/space science studies themselves and/or to use these subjects in their professional duties. Modern observational techniques, data reduction and analysis skills, and other key tools in these fields will be introduced. The hands on activities, during the school are aimed at setting the foundations right for future and more advanced regional endeavours in astronomy & space science. The workshop and later on the school (SASSCA) will also aim at dramatically improving the local/regional outreach capacity. A decisive yardstick to measure our success. Finally, the time will also be used for further networking and strategising, considering that 2015 will also be the International Year of Light, coordinated by the ICTP, one of our key partners in 2013.

### 3. Keywords or tags

School of Astronomy and Space Science in Central Africa

### 4. Project start date:

05/10/2015

### 5. Project duration (how long will the project take to complete?):

Seven (07) days for the school from October 5th, 2015.

Depending on finances, duration might expand.

### 6. Project Location (where will the project take place?)

Libreville in GABON. In the same city and on the same site as the one where the key events associated with the PAN AFRICAN Nov. 3, 2013 total solar eclipse were held.

### 7. Objectives (what do you hope to achieve with this project?)

This school/workshop should develop and mature into a format that can be easily reused, while retaining a crucial balance between past experiences, new and world leading inroads. In brief, what we envisage beyond this workshop and its correlated activities is to:

- \* upscale it into a biennial School for Astronomy & Space Science in Central Africa (SASSCA) with lecturers from Africa, Europe, the USA and students mainly from the (west) central African region and possibly beyond;
- \* foster and promote academic/professional exchange programs for research/training visits/stays inside central Africa, between central Africa and other regions of Africa and beyond, with an emphasis on convincing participating neighbouring countries to move towards the establishment of a committee or a regional node for astronomy & space science.
- \* facilitate the integration of research/professional teams based in central Africa within growing continental science & engineering initiatives such as the African VLBI, MeerKAT, the SKA AFRICA, and other large science/engineering projects.

### **8. How does your project satisfy the call's criteria?**

There is very little astronomy & space science taught in Gabon, in Central Africa and more generally in sub-Saharan Africa (outside South Africa). However, there is clearly a growing interest in developing astronomy & space science in the region. The continental capacity to use observational facilities in Africa such as SALT, MeerKAT, HESS and the forthcoming SKA will require a focused and collaborative effort. The school/workshop will provide an additional platform to address the future development of astronomy & space science curriculum as well as key capacity in outreach for Gabon and the region. The intended 2015 workshop will consist of compact lecture series and activities covering basics of astronomy & space science, to help participants develop and teach high school and/or undergraduate astronomy & space science courses; to start/continue with further astrophysics/space science studies themselves and/or to use these subjects in their professional duties. Modern observational techniques, data reduction and analysis skills, and other key tools in these fields will be introduced. The hands on activities, during the school are aimed at setting the foundations right for future and more advanced regional endeavours in astronomy & space science. Since participants will be dominantly drawn from the two overlapping audiences of (a) physical/mathematical science students; (b) lecturers and educators in these fields, we are aiming for a maximal impact towards astronomy for children and schools. The 2015 workshop to become a biennial school feeds well into a regional plan for the development of astronomy in Central Africa in tune with the prescriptions in the IAU's ten year strategic plan. It also expands well the 2013 IAU/OAD workshop - in Libreville - where advanced discussions were held about the how to set up a global node of astronomy resources for the French speaking world. Gabon, as was noted back then in 2013, showed sound abilities in hosting such node.

### **9. Target Audience (who will benefit from this project?)**

The school is aimed at two (partially overlapping) audiences:

- 1) physical/mathematical science students;
- 2) lecturers and educators in these fields.

### **10. Overall project implementation plan (how will you carry out the project?)**

NOMMO ASTRONOMIA, the society for astronomy & space science in Gabon will partner with the Gabonese Space Agency (AGEOS) and relevant local (academic/educationa) institutions to set up a Local Organisation Committee (LOC) which will have an overall supervision of the project implementation. Exactly as was successfully done in 2013 by thje time of the 2013 Pan African total solar eclipse. The LOC will act a local coordinator. A Scientific Organisation Committee (SOC) will be drawn in partnership between the LOC and international partners for the event. This will be an improved version of the organising committee set up to organise the 2013 total solar eclipse in Gabon as well as the associated workshops. Government involvement will be secured through the participation, in the LOC of the AGEOS, a state organ. We aim for 40 participants, domiantly from "French-speaking" Africa. We aim to provide all participants with full travel bursaries and in case of limited funds will give priority to students residing in Central Africa and/or Gabon. Details of school are as follows:

Venue : Lycee International Berthe & Jean (LPIBJ) at ESSASSA in Libreville. Same as in 2013.

Date : October 5th - 11th 2015

Number of delegates: About 40 + 5 facilitators

Type of participants: Educators/Lecturers/Students

Language: French with potential French-english translations whenever needed.

A backbone of the LOC strategy will be to maximise the local and regional momentum set and gained with the successful hosting of relevant Pan African events by the time of the Nov. 3 2013 total solar eclipse, in collaboration with the International Astronomical Union as laid down at this website

(<http://eclipse2013.weebly.com/>) and this one (<http://www.astro4dev.org/activities/gabon-eclipse/>). By the end of this workshop, we expect a stronger collaborative team in place internationally and in Gabon with the right local ties in the private sector but also and most importantly at the local decision making process.

### **11. Project timeline (please provide specific dates and activities throughout the project)**

October 5-10, 2015: World Space Week;

October 5th -11th 2015: Astronomy & Space Science Workshop in Libreville - GABON

Preliminary Programme in French since the School will be ran in French:

DAY1:

9h00 - 10h30: Acteurs, croyances, idées et méthodes d'observations en astronomie

10h30- 11h00: Pause café

11h00-12h30: Introduction a la Sphère Céleste, Coordonnées sur la sphère céleste

12h30-14h00: Pause déjeuner

14h00-16h00: Identification des constellations, utiliser une carte de la sphère céleste

16h00-16h30: Pause cafe

16h30-17h30: Session pratique 1: Stellarium and/or CLEA

Session pratique 2: Comment monter un galileoscope, le spectre electromagnétique

19:00 Diner;

22h00 - .... Observations du ciel de nuit (si le temps le permet)

DAY 2: De légers exercices d'appropriation du type Starfinder sont a inclure

9h00 - 10h30: L'Echelle cosmique

10h30 - 11h00: Pause café

11h00 - 12h30: Le système Terre-Lune; Les planètes du système solaire.

12h30 -14h00: Pause déjeuner [Observation possible du Soleil. En groupe]

14h00 -16h00: Eléments de base sur Les étoiles. Caractérisation des étoiles. Eléments de spectroscopie/photométrie

16h00-16h30: Pause café

16h30-17h30: Distances & Luminosités stellaires. Les chandelles cosmiques

19:00: Diner;

22h00 - .... Observations du ciel de nuit (si le temps le permet)

DAY 3: Explorons la Voie Lactée pour initier les élèves à une démarche scientifique.

La formation est construite sur l'étude de notre Galaxie la Voie Lactée et est basée sur des outils développés au cours du projet européen EUHOUW (Comenius). La compréhension physique de ces données sera aussi proposée avec une activité kinesthésique permettant une modélisation de la Voie Lactée avec des acteurs humains. Le contexte des recherches sur la Voie Lactée et la nouvelle génération d'instruments dédiés à la radioastronomie seront présentés.

22h00 - .... Observations du ciel de nuit (si le temps le permet)

DAY 4: A la recherche de planètes extrasolaires pour initier les élèves à une démarche scientifique.

Le stage est centré sur la recherche de planètes extrasolaires et se base sur des ressources pédagogiques développées au sein du projet européen « EU-HOU. Hands-On Universe, Europe » dans plus de 15 pays européens. Outre les enjeux et derniers résultats de ce domaine de recherche en pleine expansion, nous présenterons les principes de la détection de ces planètes

orbitant autour d'autres étoiles que le Soleil. Suite à une introduction pratique aux techniques d'analyse d'images avec un logiciel (Salsaj) permettant l'analyse de données dans les classes sur le thème des puissances de 10, deux exercices sur la détection des planètes extrasolaires adaptés au programme de seconde seront proposés. Une activité kinesthésique sera également proposée pour expliquer le principe de l'effet Doppler observé au sein de systèmes planétaires.

22h00 - .... Observations du ciel de nuit (si le temps le permet)

DAY 5: A la recherche de planètes extrasolaires pour initier les élèves à une démarche scientifique - SUITE & FIN

22h00 - .... Observations du ciel de nuit (si le temps le permet)

DAY 6: Activités orientées science de l'espace, utilisant des images satellitaires pour l'extraction d'information sur le temps, les aérosols, etc.

9:30-10:30: Télémétrie/Téledétection et défis actuels en Afrique ; Présentation de l'Agence Gabonaise pour l'Etudes et l'Observation Spatiale (AGEOS) & opportunités

10:30-11:00: Pause café

11:00pm-12:30: Utilisation des images satellitaires (Landsat ETM+) pour la détermination des températures de surface

12:30-14:00: Pause déjeuner [Observation possible du Soleil. En groupe]

14:00-15:00: Utilisation des images satellitaires (MSG): produits météorologiques en couleur RGB (nuages, pluie);

15:00-16:00:Utilisation des images satellitaires (MSG): produits météorologiques en couleur RGB (poussieres,aerosols);

DAY 7: Brainstorming sur projets collaboratifs + Feuille de route Groupe de travail.

## **12. Project deliverables (at the end of the project what will you be able to measure to see whether the project has been successful?):**

Consolidation of a Working Group for Astronomy and Space Science in Central Africa (WGASSCA) including most of the regional stakeholders with a clear mandate to work towards a Central African Society for Astronomy & Space Science (CASASS). WGASSCA coordinating unit will be located in Libreville and initially hosted by the AGEOS (Gabonese Space Agency). Each participating neighbouring country commit to set up a local branch and relevant seeds for astronomy & space science. The WGASSCA should be initiated by the time of the 2015 workshop in Gabon.

A formal/written commitment between all the stakeholders towards a biennial School for Astronomy & Space Science in (west) Central African (SASSCA School) with lecturers from Africa, Europe, the USA and mainly African students from the Central African region.

A consolidated Gabonese branch of the WGASSCA including all the national stakeholders with a clear mandate and timeline to work towards the development of a national astronomy & space science research, teaching and outreach strategy

A commitment by Gabonese authorities to fine tune the astronomy module currently offered at the only teacher training institute into a potential test bed for its implementation at University level both locally and regionally.

A consolidated network of at least twenty (20) experienced Gabonese Trainers.

40 regional delegates/participants = 40 "champions" for astronomy & space science in (central) Africa for a better Life for us here.

## **13. Contact details of project leader:**

**Full name of project leader**

**Title First name Last name**

Dr. Patrice M. OKOUMA

**Nationality**

Gaboness

**Mobile phone number**

+27734173614

**Email address**

[okouma@gmail.com](mailto:okouma@gmail.com)

**Organization**

NOMMO ASTRONOMIA

Society for Astronomy &amp; Space Science in Gabon

**Position in organization**

Head/President.

**Physical address of organization**

B.P. 3360

Estuaire Libreville

Gabon

**Organization website**<http://ama09gabon.weebly.com/>**Postal address of organization**

B.P. 3360

**Organization telephone number**

+27734173614

**Organization fax number**

+241 72 10 51

**Any other preferred means of communication (e.g. Skype)**

skype: okouma

**14. Background details of project leader:****Summary of academic qualifications**

BSc Mathematics;

MSc Astrophysics &amp; Space Science;

PhD Applied Mathematics (major in cosmology).

**Summary of relevant experience**

- \* Participant to the OAD stakeholder workshop in Cape Town on December 12-14, 2011;
- \* Single Point of Contact for IYA09 in Gabon;
- \* Member of the Working Group on Space Sciences in Africa;
- \* Associate Editor for African Skies/Cieux Africains;
- \* Lead-Organiser for the successful FIRST Astronomy & Space Science Workshop in Gabon by the time of the 2013 total solar eclipse. In partnership with IAU/OAD and ICTP;
- \* Co-Organiser of the successful 2013 IAU/OAD Francophone Workshop in Libreville - Gabon.

**Brief career history**

- \* Mathematics Teacher at J.B. Obiang Etoughe Public High School in Libreville (Gabon) from 1999 to 2004;
- \* Head of the Maths. Dpt. at the same school in 2003 and 2004
- \* 2005- 2012 : Back to University for updates (MSc + PhD)
- \* 2012-2013: Postdoctoral research fellow at the University of Cape Town (South Africa)
- \* 2013-present: Postdoctoral research fellow at the University of the Western Cape (South Africa)

**Alternative contact person if project leader is unable to complete obligations**

Mr. Fernand LEPOKO,

Secretary General, NOMMO ASTRONOMIA

+241 06 03 98 83 / +241 07 599 441

**Email of alternative contact**[alif\\_lep@yahoo.fr](mailto:alif_lep@yahoo.fr)**Proposed team members (name, position, email, organization) and their responsibilities**

Mr. Fernand LEPOKO

Member of the LOC, will oversee the implementation of the static exhibition as well as logistical aspects of the workshop;

Dr. Medard MOUELE

Member of the LOC, will oversee the implementation of the star gazing and "road shows", as well as logistical aspects of the workshop.

Dr. Patrice OKOUMA

Member of the LOC, will coordinate the actions of all the stakeholders.

## 15. Project Budget

### Professional costs (e.g. number of people, rates, etc.)

0.0 Euros

### Travel and subsistence (e.g. distance, rate per km, etc.)

Travel Costs:

Travel - Non-Gabonese delegates (15 × € 1000 on average) ..... 15000 Euros

Travel - Facilitators & Organiser(s) (5 × € 1000 on average) ..... 5000 Euros

Local Transportation ..... 2000 Euros

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Subtotal: 22000 Euros

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Cost of Bursaries:

Delegates bursaries (40 students × 7 days × € 30): 8400 Euros

Facilitator bursaries (5 lecturers × 7 days × € 35): 1400 Euros

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Subtotal: 9800 Euros

### Consumable items (e.g. meals, materials, etc.)

Paper materials & stationery, postage, resource CDs ..... 200 Euros

Bags and name badges (50 × € 5) ..... 500 Euros

10 × Text books to remain in Gabon (10 × € 50 ) ..... 500 Euros

### Event Costs (e.g. venue hire, sound system hire, etc.)

Opening Function (50 × € 5) ..... 500 Euros

school banquet (50 × € 10) ..... 500 Euros

Social events (3 × € 250 - transport, visits, refreshments) ..... 750 Euros

### Production and printing (e.g. pamphlets, posters, etc.)

Communication (Poster, Web development): 500 Euros

### Distribution of materials (e.g. postage, etc)

0.0 Euros

### Administration and support costs (e.g. phone, fax, etc)

Preparation Costs

Meetings of the Committees (airtime, phone calls): 100 Euros

### Other costs

Insurance for non-Gabonese delegates ..... 500 Euros

Contingencies ..... 3000 Euros

### Total cost

38850 Euros

**Other funding (amount/source/purpose)**

28850 Euros.

Gabonese state/private entities as well as multilateral bodies are to be approached to cover the shortfall in some of sections of the budget above. Fund raising started as early as August 2014.

**Amount requested from the IAU**

15000 Euros

**16. Additional Comments****Please enter any (brief) additional comments, if any, which may be relevant to this proposal**

NOMMO ASTRONOMIA in partnership with the IAU/OAD and the ICTP organised two successful workshops in 2013, in Gabon which set a unique momentum for astronomy and space science in Gabon, central Africa and in the global Francophone world. The present proposal aims at maintaining this decisive momentum for achieving a central goal of the IAU's ten year strategic plan as far as Francophone Africa is concerned.