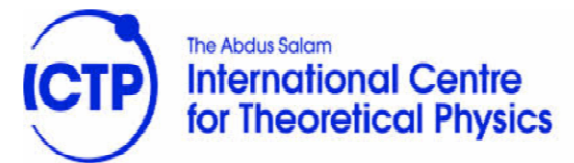




AFRICA (GIRGEA)

February 14, 2019 – ISWI meeting

Christine Amory-Mazaudier
christine.amory@lpp.polytechnique.fr



BURKINA FASO



Frédéric OUATTARA is the winner of the Space Science Excellence Award for Africa for the year 2018. He received the award at the AGU Fall Meeting in Washington DC on December 12th.

CLASSIFICATION OF DATA BASED ON SEASON, SOLAR ACTIVITY AND GEOMAGNETIC ACTIVITY: 64 CLASSES

Table 1. Different classes of variability.

Factors of variability		Number of classes
Seasonal variation	Ecliptic plane/solar magnetic equator – Sun-Earth relative position Spring Summer Autumn Winter	4 classes
Sunspot variation (radiation UV, EUV)	Toroidal component of the solar magnetic field $Rz < 20 \rightarrow$ minimum $20 \leq Rz \leq 100 \rightarrow$ increasing $Rz > 100 \rightarrow$ maximum $100 \geq Rz \geq 20 \rightarrow$ decreasing	4 classes
Shock event Shock activity	Aa indices and SSC Classification by Legrand & Simon (1989) Richardson et al. (2000) Shock related to CME 1 class	4 classes
Quiet magnetic activity	Poloidal component of the solar magnetic field Slow solar wind speed 1 class	
Geomagnetic activity Recurrent activity	High solar wind streams from coronal holes 1 class	
Geomagnetic activity Fluctuating activity	Fluctuating solar wind all other cases 1 class	

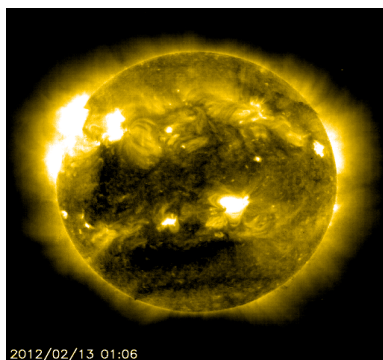
KINA FASO

Using Aa magnetic indice and SSC=> Empirical relation between Solar events, solar wind and geomagnetic indices

[Classification Legrand and Simon (Annales geophysicae 1989), J-L. ZERBO et al. (Annales Geophysicae 2001)]

Aa > 20 nT

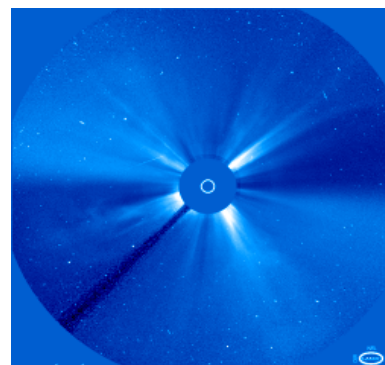
Recurrent activity
High speed solar wind streams
from coronal holes



2012/02/13 01:06

Aa > 20 nT

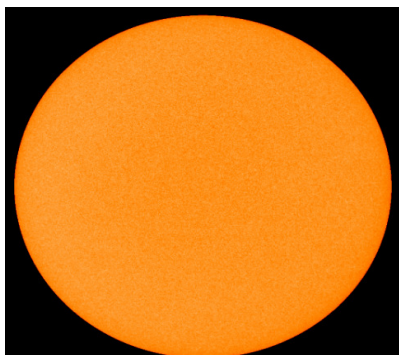
Shock activity/SSC and
CME



2001/08/09 01:15

Aa < 20 nT

Quiet magnetic activity



All the other cases
classified in the
fluctuating activity
20%

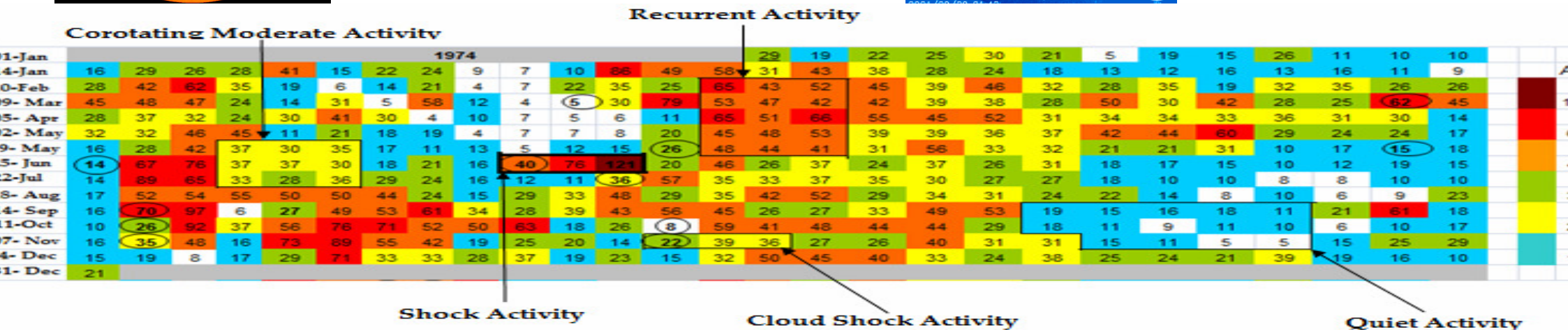


Diagram of the daily Aa for the year 1974 , one line corresponds to a solar rotation

BURKINA FASO

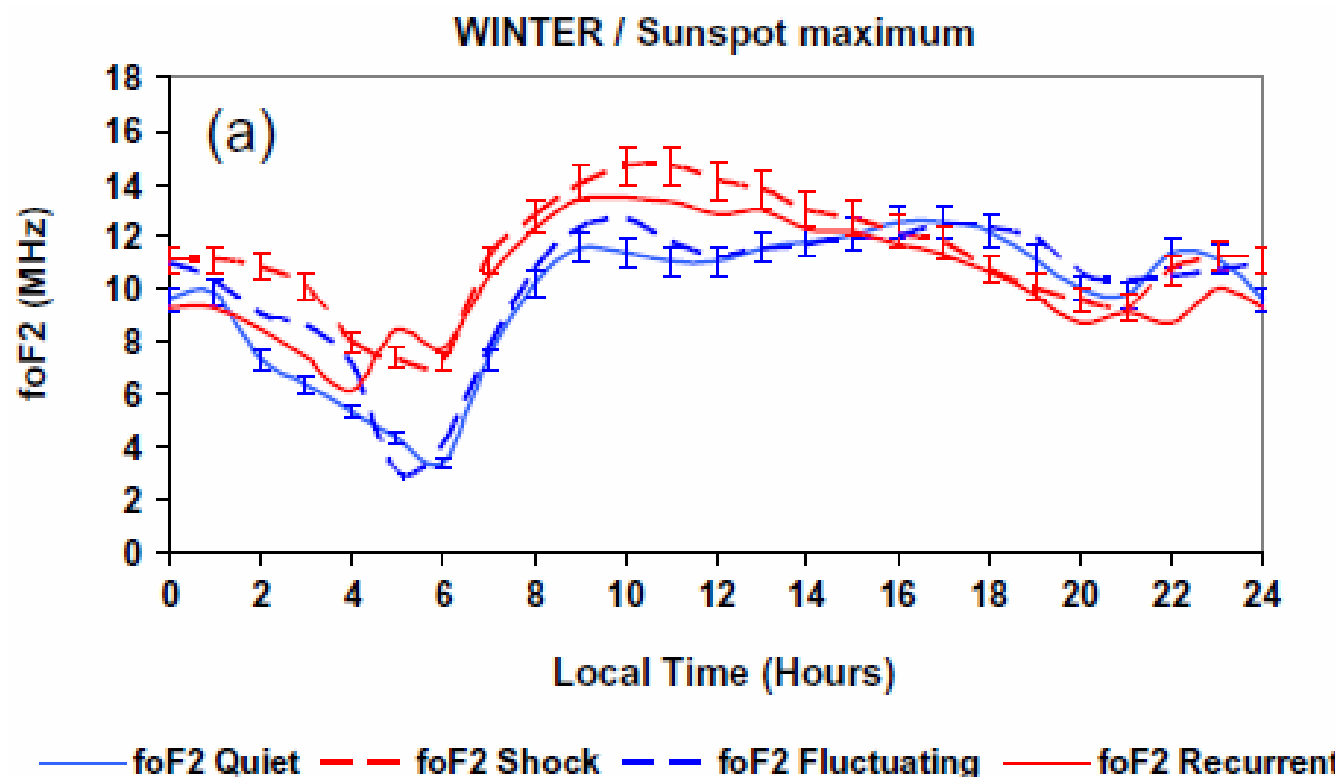


Frédéric Ouattara ISWI
Coordinator of Burkina Faso

Data from ionosonde : 1966-1998
11229 days => 64 classes

Ouattara and Amory-Mazaudier, SWSC, 2012

Statistical model of critical frequency of the F2 ionosphere layer including the impact of CME and High speed solar wind



CÔTE D'IVOIRE

Dr Franck GRODGI defended his thesis on June 30 at Houphouët Boigny University in Abidjan, Côte d'Ivoire.

Director : Vafi DOUMBIA / ISWI coordinator of Côte d'Ivoire



Title : "Study of the Equatorial Electrojet from the electrodynamic parameters of the equatorial ionosphere".

Use of the IONOSONDE (IEEY)

=> from left to right

Vafi DOUMBIA, Arsène KOBÉA, Franck, his wife, Frédéric OUATTARA, Olivier OBROU

Photographer : Christine AMORY-MAZAUDIER

an ACKAH defended his thesis on January 25, 2019 at Houphouët Boigny University in Abidjan, Côte d'Ivoire.

Director: Olivier OBROU



Title : “Study of the Total Electron Content and Ionospheric Scintillation over Abidjan during the solar minimum and solar flares periods”

Use of SCINDA GPS (IHY-ISWI)

=> from left to right

er OBROU, Vafi DOUMBIA, Jean and his family, Arsène KOBÉA, Frédéric OUATTARA, Pierre ADOHI

CÔTE D'IVOIRE

Ibrahima COULIBALY defended his thesis on February 6 , 2019 at Houphouët-Boigny University in Abidjan, Côte d'Ivoire.

Director: Jean-Pierre ADOHI



Title: Study of disturbances of the equatorial F-layer ionosphere at night during a magnetic storm

Use of the IONOSONDE (IEEY)

to => from left to right

Vivier OBROU, Jean Pierre ADOHI, Soro Ibrahima, Arsène KOBÉA, Vafi DOUMBIA

Assisting :Christine AMORY-MAZAUDIER

C-France

by KHALE-SAYI defended his thesis on July 9, 2018 at the University of Strasbo



Director : Cécile JOLLET

Title of his thesis: 'Study of the correlated background noise induced by cosmic muons in the Double Chooz experiment.'

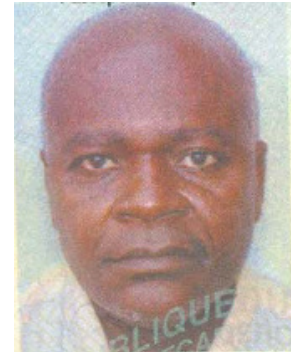
=> from left to right

by KALE SAYI, Jérôme BAUDOT, Alessandra TONAZZO, Cécile JOLLET and Claudio
NTI.

CAMEROON

Pré MESSANGA ETOUNDI defended his thesis on March 2, 2018 at the University of Yaoundé in Cameroon.

Director : César MBANE / ISWI Coordinator of Cameroon



Title of the thesis: "Measurements and interpretation of the regular variation of the components (XYZ) of the Earth's magnetic field in Yaounde-Cameroon".

Use of the AMBER magnetometer (IHY-ISW)

ean KIGOTSI defended his thesis publicly on May 11, 2018 at the University of Kinshasa, UNIKIN, A private defense of this thesis took place on December 1, 2017



Title: 'Analysis of the flash activity of storm systems in the Congo Basin'

Directors :

Serge SOULA , *University of TOULOUSE*

Albert KAZADI, *University of KINSHASA*



Bruno KAHINDO

DRC ISWI Coordinator

Financial support of the French embassy of Kinshasa

Bienvenu DINGA, RC ISWI coordinator, defended his thesis on November 01, 2017 at the Marien Ngouabi University in the Republic of Congo



Title : 'Study of material dynamics in the Congo Basin: case of solid and dissolved suspensions.'

Bienvenu DINGA initiated Space Weather in **SCINDA GPS**

Chairperson: Bernard MPASSI-MABIALA, University Marien Ngouabi University (Congo)
Reporter: Jean BIEMI, University F. Houphouët Boigny (Côte d'Ivoire)
Reporter: Paul Sand MOUSSOUNDA, University Marien Ngouabi University (Congo)

CRASTE-LF



A regional workshop on Global Navigation Systems was organized in Dakar from 13 to 15 November 2018 by CRASTE-LF. Idrissa GAYE from THIES University, who is organizing the new GIRGEA school, took part and made contacts to put in the program of our next school a presentation of the EGNOS system.



ATELIER REGIONAL
systèmes Mondiaux de Navigation

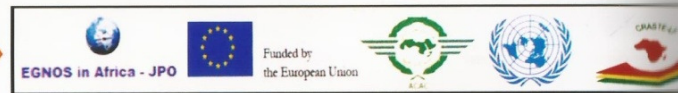


Photo from left to right
Idrissa GAYE, Mourad BOUZIANI, Emran A

SENEGAL



Idissa GAYE
organize the school

Ministry of Higher Education, Scientific Research and Innovation

4th EDITION OF THE ISWI-MAGHREB-WEST AFRICA (IMAO 2019)

SCHOOL OF SPACE WEATHER

Thiès / SENEGAL [15 to 25 October 2019]

Organized by

The UFR - SET / University of Thiès

LapTPAD Laboratory

In collaboration with: CRASTE-LF and Le GIRGEA

With the support of

International Space Weather Initiative (ISWI)

Under the High Patronage of the Minister of Higher Education,
Scientific Research and Innovation

EGAL-school

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MOROCCO

Aziza BOUNHIR

ISWI Ccoordinator of Morocco



Conference : Female Astronomy
on February 11, 2019
Day of Women and Girls in Science

CLUB HIGH ENERGY PHYSICS AND ASTRONOMY
&
LABORATOIRE DE PHYSIQUE DES HAUTES
ENERGIES ET ASTROPHYSIQUE

ORGANISÉ PAR

Femmes et Astronomie

15h00 : Ouverture de la journée (Maquettes, Portraits des femmes scientifiques).
16h30 : Conférence intitulée « Astronomie au féminin » présentée par le professeur Aziza Bounhir.
17h30 : Présentation des travaux des doctorantes du Laboratoire PHEA.
17h50 : Débat sur l'état de la femme en science.
18h30 : Pause café
18h40 : Compétition avec un prix au gagnant.
19h30 : Clôture de la journée avec la chanteuse Meryem Guennoun.

LE 11 FEVRIER 2019
Amphi 10
MARRAKECH



ALGERIA

Naima ZAOURAR
ISWI coordinator for ALGERIA

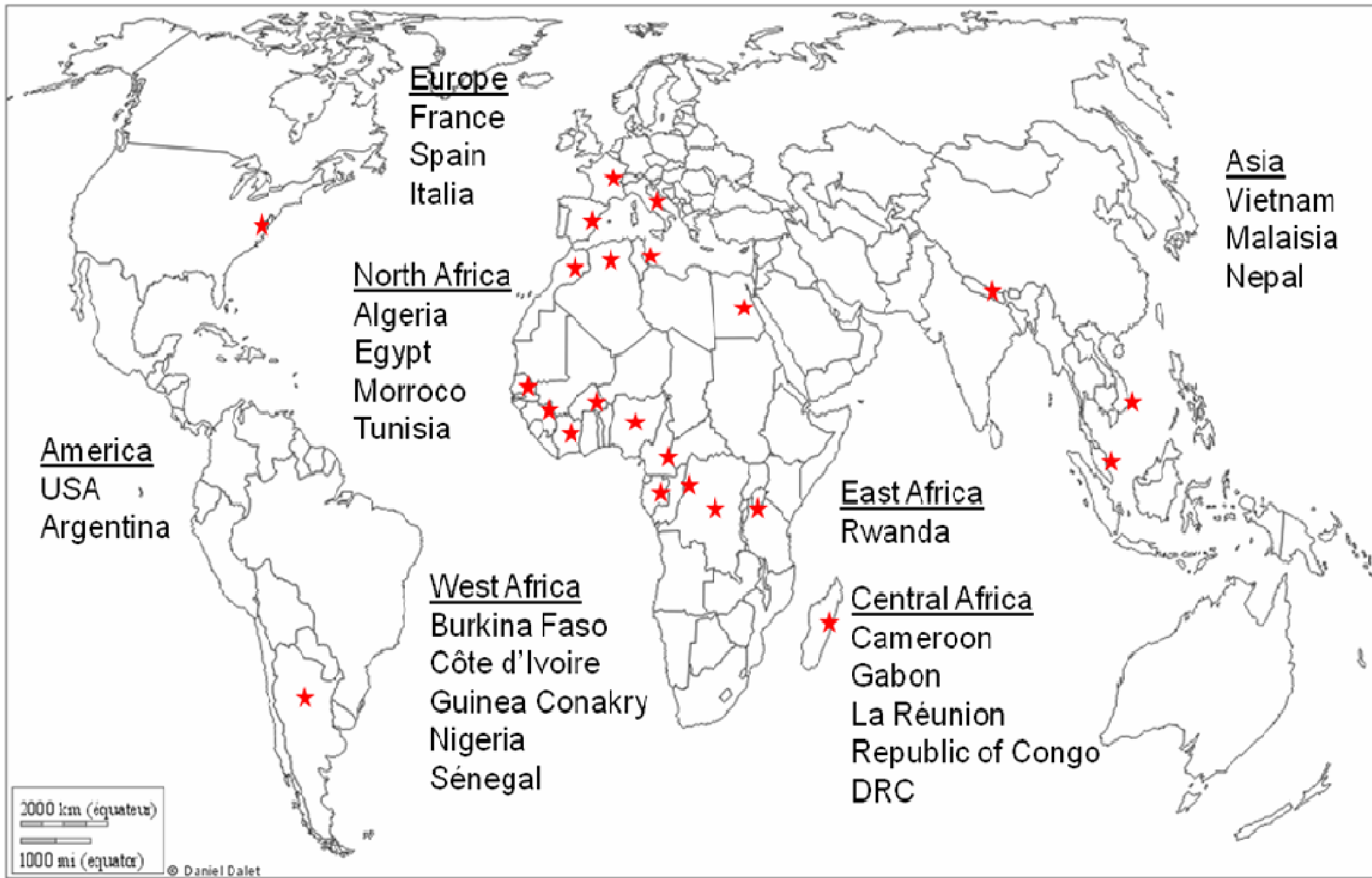


Creation of the Algerian Association of Women and Girls in Science, on February 11 2019 , under the patronage of UNESCO
This ceremony will take place in USTHB, Mrs. Yasmina Yahiat and Naima ZAOURAR were invited as founding members.

Yasmina YAHIAT

ate
2/2019

Countries/first year	PhD [1992-2018] [with GNSS]	PhD in Progress [with GNSS]
Algeria- 2010	3	3 [2]
Benin-1990	1	
Burkina Faso-2006	6 [2] 2009,2014	7
Cameroon-2015	1	
Cote d'Ivoire-1990	13 [1] 2019	3 [2]
Egypt-2010	3 [1] 2015	
Spain-1990	1	
France-1990	3	
Guinea Conakry-2016		1
India-2007	1	
Nigeria-1990	cooperation	1
Malaysia-2018	1	
Morocco-2013	1 [1] 2016	3 [3]
Nepal-2018		2 [2]
RC-2009	1	1 [1]
DRC-2011	4	5 [1]
Senegal-1990	2	
Tunisia-2017	1	
Vietnam-2006	6 [1] 2014	2 [1]
total	48 [6] 12,5%	30 [12] 42,85%



Conclusion

Importance of GNSS for studies in Africa to develop research in different fields

- geodesy, seismology

- study of ionosphere, space weather

- meteorology and climate study

- etc...

- + Many applications

Importance of networking and developing cooperation between the countries of the sub-regions