

# *Outcomes of the South African Summit Meeting in Bloemfontein, Oct 2014*



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***<http://www.ecanews.org/>***



Dept of Chemistry  
UNIVERSITY OF THE FREE STATE  
UNIVERSITEIT VAN DIE VRYSTAAT  
YUNIVESITHI YA FREISTATA  
Bloemfontein 9300, South Africa

2014

international year  
of crystallography

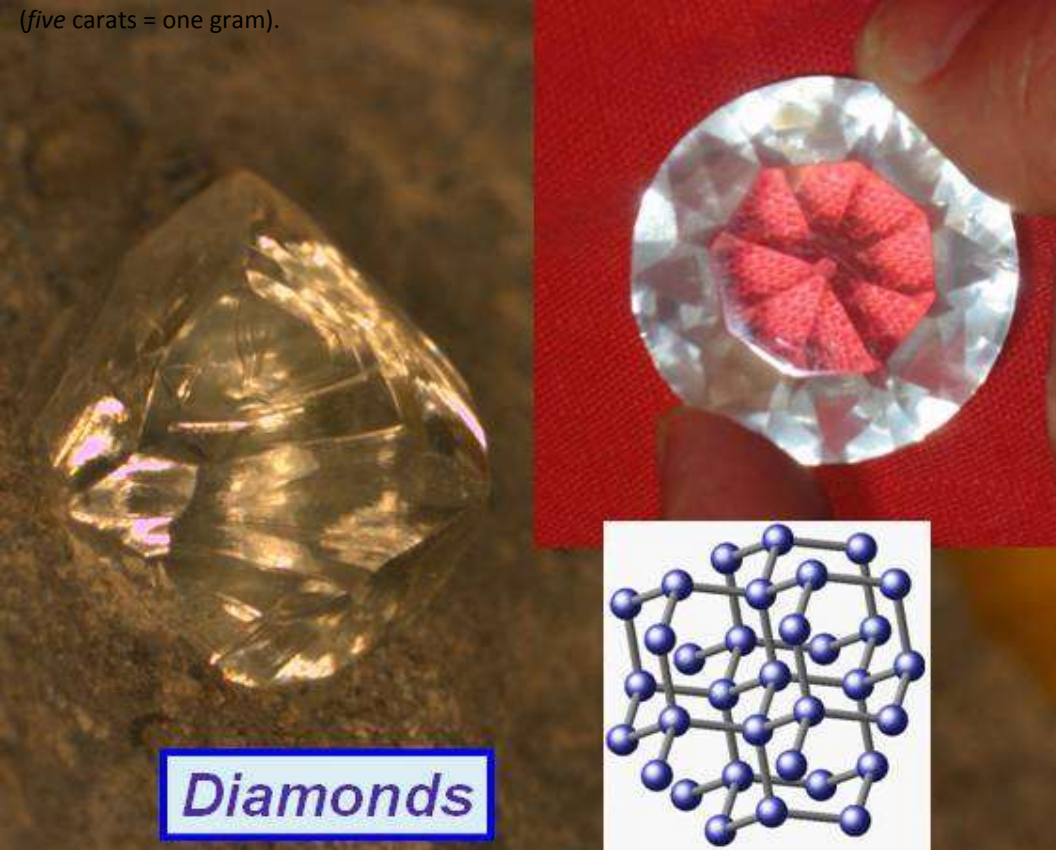


IYCr2014



# **Crystals from South Africa...**

(five carats = one gram).



Diamonds

> weighed more than *half* a kilogram (to be precise, **0.5678 kg!**); a massive 3026 carats, (five carats = one gram).

**Cullinan Diamond:**  
discovered on 25  
January 1905 at  
***Cullinan Premier*** mine,  
just east of Pretoria in  
South Africa.



Cullinan Diamond replica

## Meteorites



Appropriately named **ISCORITE**, has never been reported on earth.

>>studying the moon rocks brought back from Apollo moon program a few years later

**ISCORITE** identified in space (on the moon), but not on earth!

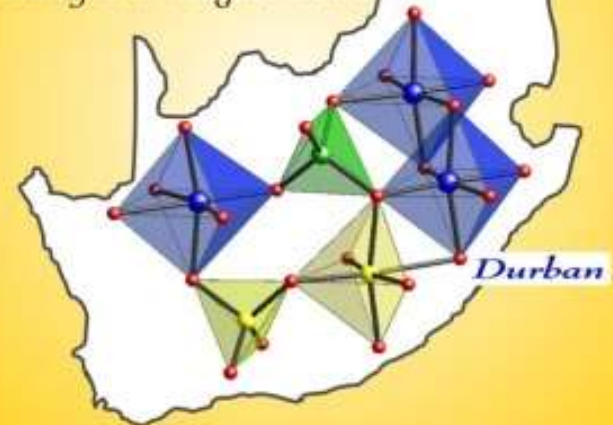
## Late 1960's:

strange crystals discovered in a high temperature iron smelting blast furnace of **ISCOR**, South Africa's principal iron producer, at Vanderbijl Park.

a complex iron oxo silicate

# ECM-21

South Africa - August 2003





# EUROPE

# ASIA

# AFRICA

- Morocco
- Tunisia
- Egypt

- Swaziland

Greenland (Denmark)

Iceland

Norway

Finland

Russia

United Kingdom

Denmark

Ireland

Holland

Belgium

Germany

France

Portugal

Spain

Western Sahara

Mauritania

Senegal

Guinea-Bissau

Guinea

Sierra Leone

Liberia

French Guiana

Brazil

Paraguay

Uruguay

Sweden

Estonia

Latvia

Lithuania

Belarus

Poland

Austria

Switzerland

Slovenia

Croatia

Italy

Albania

Greece

Tunisia

Algeria

Libya

Mali

Niger

Chad

Sudan

Eritrea

Yemen

Oman

Qatar

UAE

Saudi Arabia

Iran

Afghanistan

Pakistan

India

Nepal

Bhutan

Bangladesh

Myanmar

Thailand

Laos

Sri Lanka

China

Kazakhstan

Mongolia

Uzbekistan

Kyrgyzstan

Tajikistan

Turkmenistan

Turkey

Georgia

Armenia

Azerbaijan

Cyprus

Syria

Lebanon

Israel

Jordan

Iraq

Kuwait

Saudi Arabia

UAE

Qatar

Oman

Yemen

Eritrea

Sudan

South Sudan

Ethiopia

Somalia

Uganda

Kenya

Rwanda

Burundi

Tanzania

Angola

Zambia

Malawi

Mozambique

Zimbabwe

Namibia

Botswana

Swaziland

South Africa

Lesotho

Madagascar

# ***ECA Member Countries & Observers***

1. Algeria ●
2. Austria
3. Belgium
4. Bulgaria
5. Croatia
6. Czech & Slovak Rep
7. Denmark
8. Egypt ●
9. Finland
10. France
11. Germany
12. Greece
13. Hungary
14. Irish Cryst. Assoc.
15. Israel
16. Italy
17. Latvia
18. Macedonia
19. Morocco ●
20. Netherlands
21. Norway
22. Poland
23. Portugal
24. Russia
25. Serbia
26. Slovenia
27. South Africa ●
28. Spain
29. Sweden
30. Switzerland
31. Tunisia ●
32. Turkey
33. UK
34. Ukraine

**Plus:**

- 3x Individual Member Reps

**Plus:**

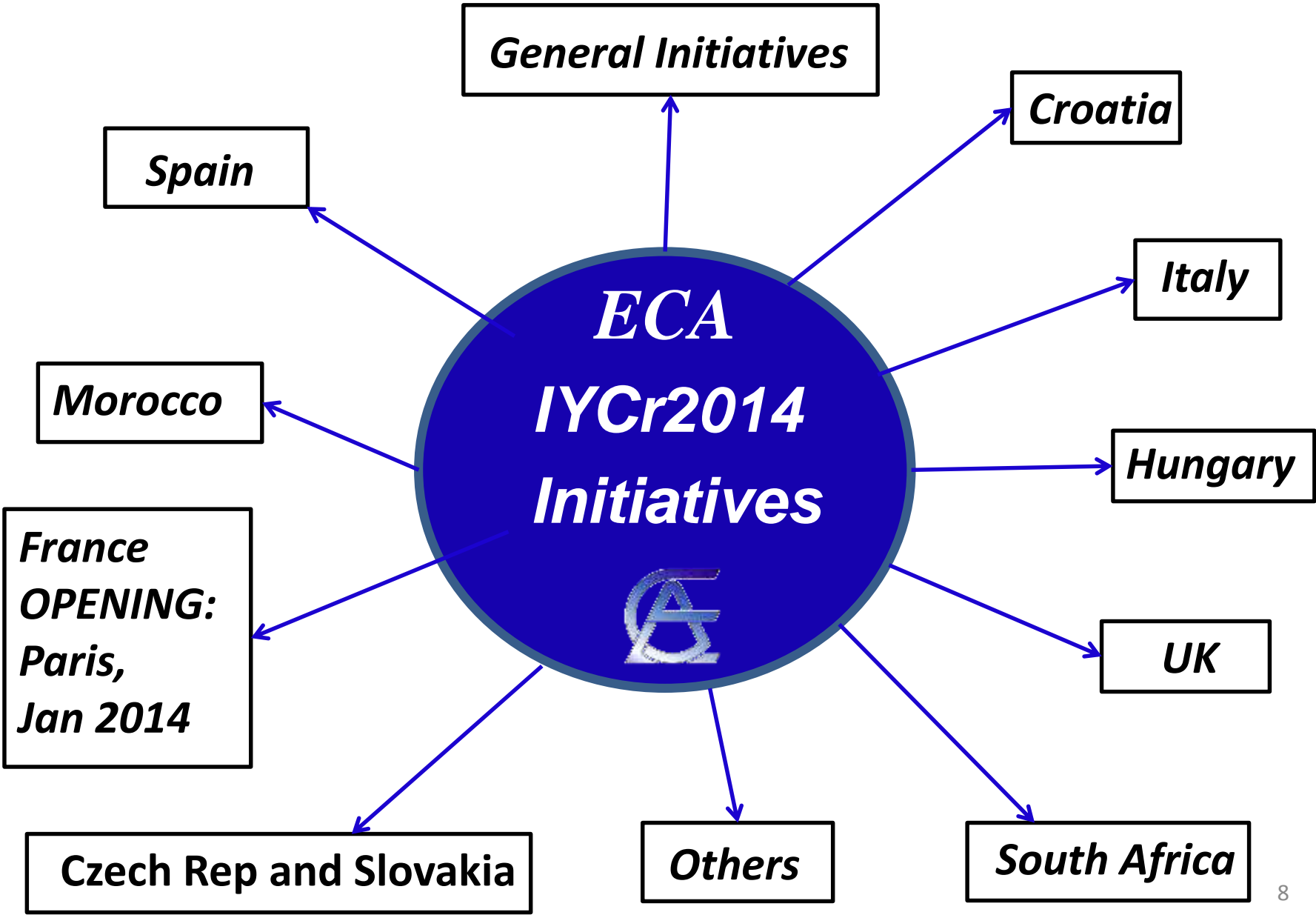
- 1x CAM
- IUCr

**3x Observers:**

- Armenia
- Belarus
- Estonia

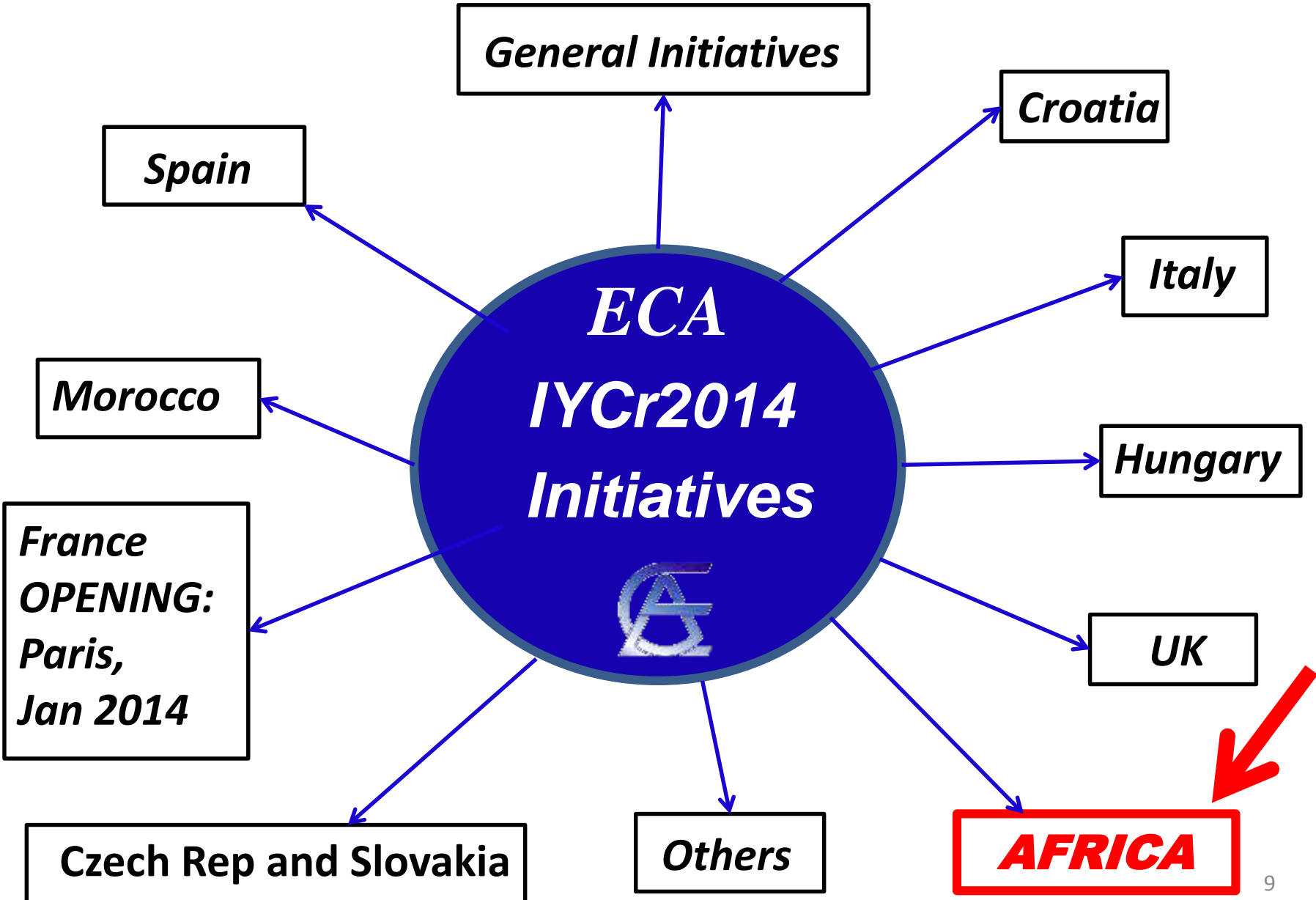


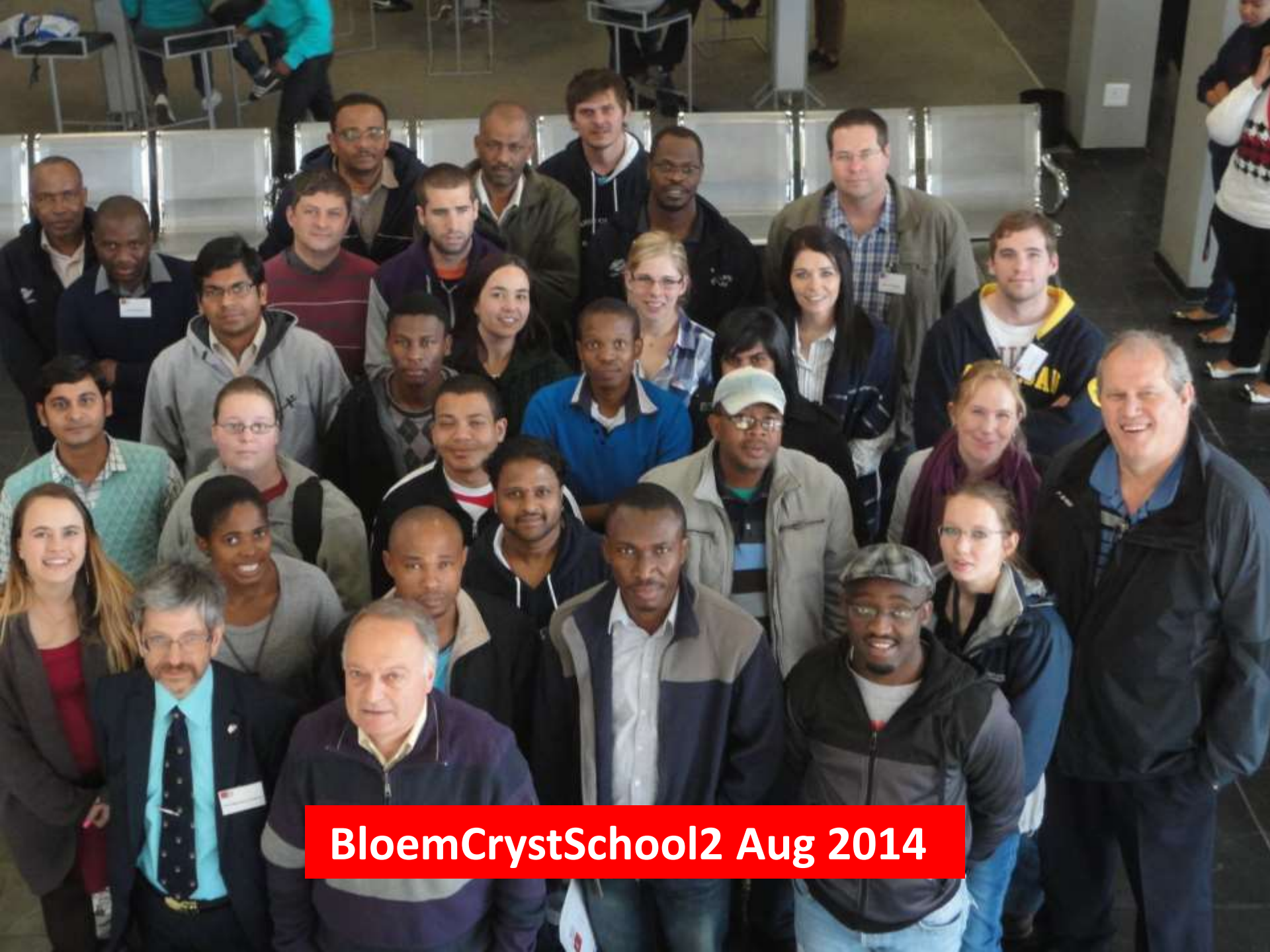
**Programme for 2014; with IUCr**





**Programme for 2014; with IUCr**





**BloemCrystSchool2 Aug 2014**



0 300 KM

WORLD  
E SITES  
NCES

NAMIBIA

BOTSWANA

ZAMBIE  
QUE

SWAZILAND

LESOTHO

INDIAN OCEAN

ANTIC  
EAN

ROBBEN ISLAND

CAPE FLORAL  
REGION

WESTERN CAPE

EASTERN CAPE

CAPE POINT  
HERMANUS

DE HOOP  
GARDEN ROUTE

# UFS Chem building: Northern façade:

CHEMISTRY

H

$$[A]_t = [A]_0 e^{-kt}$$

E

$$PV = nRT$$

M


$$P_2 = P_1 / c$$

I

$$A = \epsilon l c$$

E

$$\Delta G = \Delta H - T\Delta S$$

$\mu = \gamma h / 2$   
 $\alpha + \eta \rightarrow \odot$

# *Promote Science in Africa...*



# Funding

- **UFS Chemistry**
- **SA Dept Science & Technology [T Auf der Heyde]**
- **IUCr**
- **SAASTA**
- **SA NRF**
- **Panalytical**

***IYCr2014: Pan African Conference  
and Summit: Bloemfontein 12-17  
Oct 2014***



***CRYSTALLOGRAPHY AS VEHICLE  
TO PROMOTE SCIENCE IN  
AFRICA AND BEYOND***







# 12-15 October 2014: IYCr2014Africa Conference

## Programme:

### 1. Conference 12-15 Oct

### 2. Summit: 15-17 Oct

Sunday	12 October		Title		
	12:00	17:30	Registration	Bains Game Lodge	
<b>Session 1</b>			<b>Opening</b>	<b>Bains Game Lodge</b>	
	18:00	18:15		Opening	
	18:15	20:15		Mixer and Dinner	
Monday	13 October		Title		
<b>Breakfast</b>	07:00	07:45	Breakfast		
<b>Session 2</b>		<b>Chair:</b>	<b>A Roodt</b>	<b>UFS</b>	
	08:15	08:50	KN1	L Barbour (US)	Establishing crystallography at the Univ. of Stellenbosch
	08:50	09:10	Y1	D Haynes (US)	Towards functional materials from multi-component Xtals
	09:10	09:40	KN2	D Billing (Wits)	Powder XRD in South Africa
	09:40	10:00	Y2	M Fernandez (Wits)	Opportunities for young Crystallographer at Wits & in SA
	10:00	10:30	KN3	A Thalal (UCA)	Crystallography In Morocco
<b>Tea</b>	10:30	11:00	Tea		
<b>Session 3</b>		<b>Chair:</b>	<b>D Billing</b>	<b>WITS</b>	
	11:00	11:30	KN4	S Bourne (UCT)	Adventures in Chemical Crystallography
	11:30	11:50	Y3	A Brink (UFS)	Crystallography in South Africa: thoughts from the young
	11:50	12:20	KN5	J v Rooyen (UCT)	From humble beginnings (Electron Microscopy)
	12:20	12:40	FPY1	4x Flash Posters	Young Scientists (4+1min each)
<b>Lunch</b>	12:45	14:00	Lunch		
<b>Session 4</b>		<b>Chair:</b>	<b>A Thalal</b>	<b>UCA, Morocco</b>	
	14:00	14:30	KN6	J Ngoune (Cameroon)	Crystallography in Cameroon
	14:30	15:00	KN7	M Tredoux (UFS)	Mineralogy: Nanoparticles in Geology
	15:00	15:30	KN8	H Boughzala (TEMU)	Crystallography in Tunisia: history and future
<b>Tea</b>	15:30	16:00	Tea		
<b>Session 5</b>		<b>Chair:</b>	<b>J Conradie</b>	<b>UFS</b>	
	16:00	16:30	KN9	Z Yav (UKin, DRC)	Crystallography in the D. R. Congo
	16:30	16:45	Y4	B Kennedy (UFS)	Identifying Minerals in Nanoparticles
	16:45	17:05	Y5	S Kimani (UCT)	Biological Crystallography in Chemistry and More
	17:05	17:25	Y6	C Oliver (UCT)	Challenges for a young crystallographer at UCT
	17:30	17:40	FPY2	2x Flash Posters	Young Scientists (4+1min each)
	17:40	18:30	<b>POSTER SESSION 1</b>		<b>Odd Numbers</b>
<b>Dinner</b>	19:00		Dinner		

Tuesday		14 October			
<b>Breakfast</b>	07:00	07:45	Breakfast		
<b>Session 6</b>		<b>Chair:</b>	<b>WD Schubert</b>	<b>UP</b>	
	08:15	09:00	KN10	C Esterhuysen (US)	Building Crystallography at US as female scientist
	09:00	09:30	KN11	O Munro (UKZN)	History and Current Status of XRD Science in UKZN
	09:30	09:50	Y7	B Omondi (UKZN)	Challenges for a young Crystallographer at UJ/ UKZN
	09:50	10:20	KN12	HG Visser (UFS)	History of Crystallography at UFS: Past, Present, Future
	10:20	10:30	FPY3	2x Flash Posters	Young Scientists (4+1min each)
<b>Tea</b>	10:30	11:00	Tea		
<b>Session 7</b>		<b>Chair:</b>	<b>D Visser</b>	<b>UFS</b>	
	11:00	11:20	Y8	P Mangwala (UKin)	Structure Elucidation of Physalins Isolated from Physalis
	11:20	11:50	KN13	E du Plessis (Sasol)	XRD in Industry: applications at SASOL
	11:50	12:10	Y9	R Forbes (Sasol)	Young Scientist's perspective of XRD at Sasol
	12:10	12:40	KN14	M Lee (NMMU)	Electron microscopy: at the Atomic level
	12:40	13:00	I1	D Levendis (Wits)	High Pressure Crystallography (WITS)
<b>Lunch</b>	13:00	14:15	Lunch		
<b>Session 8</b>		<b>Chair:</b>	<b>J Dillen</b>	<b>US</b>	
	14:15	14:45	KN15	A Venter (NECSA)	Neutron Diffraction in South Africa
	14:45	15:30	KN16	P Comba (Heidelberg)	Structure and Function: From Crystallography to ...
	15:30	15:45	FPY4	3x Flash Posters	Young Scientists (4+1min each)
<b>Tea</b>	15:45	17:00	<b>Tea and POSTER SESSION 2</b>		<b>Even Numbers</b>
	17:00	18:00	<b>AGM (Chair: C Esterhuysen)</b>		<b>Meeting of the SA Crystallographic Society</b>
<b>Dinner</b>	19:00		Dinner		
Wednesday		15 October		Title	
<b>Breakfast</b>	07:00	07:45	Breakfast		
<b>Session 10</b>		<b>Chair</b>	<b>H Boughzala</b>	<b>TEMU, Tunisia</b>	
	08:15	08:45	KN17	T Kroon (UFS)	Crystallography and Physics in the South African context
	08:45	09:15	KN18	WD Schubert (UP)	Biological XRD at UP (SA)
	09:15	09:45	I2	M Ntwaeaborwa (UFS)	SAASTa NRF: Nanomaterials programme
	09:45	10:00	FPY5	3x Flash Posters	Young Scientists (4+1min each)
<b>Tea</b>	10:00	10:30	Tea		
<b>Session 11</b>		<b>Chair:</b>	<b>DLevendis</b>	<b>Wits</b>	
	10:30	11:00	S1	JCA Boeyens (UP)	Establishing Crystallography at the CSIR and WITS
	11:00	11:30	S2	LR Nassimbeni (UCT)	Crystallography at the University of Cape Town
	11:30	12:00	A Roodt	Closing	
<b>Lunch</b>	12:00	13:30	Lunch		

# Honouring South African 'Crystallographic Icons' Jan Boeyens and Luigi Nassimbeni



THE CRYSTALLOGRAPHIC  
COMMUNITY

at the  
PAS AFRICAN MEETING OF THE  
INTERNATIONAL YEAR OF CRYSTALLOGRAPHY  
(IYCR2014AFRICA)

Honoring  
**JAN C.A. BOEYENS**

for his  
Exceptional Contributions to Crystallography in South  
Africa and Inspired Visits of New Theorists for Chemistry

Mantoloking, 21 October 2014

THE CRYSTALLOGRAPHIC  
COMMUNITY

at the  
PAS AFRICAN MEETING OF THE  
INTERNATIONAL YEAR OF CRYSTALLOGRAPHY  
(IYCR2014AMERICA)

Honoring  
**LUIGI R. NASSIMBENI**

for  
Outstanding Science and Inspiring Teaching, Contributing  
to Crystallography in South Africa for Over 40 Years

Mantoloking, 21 October 2014

# 15-17 October 2014: IYCr2014Africa Summit

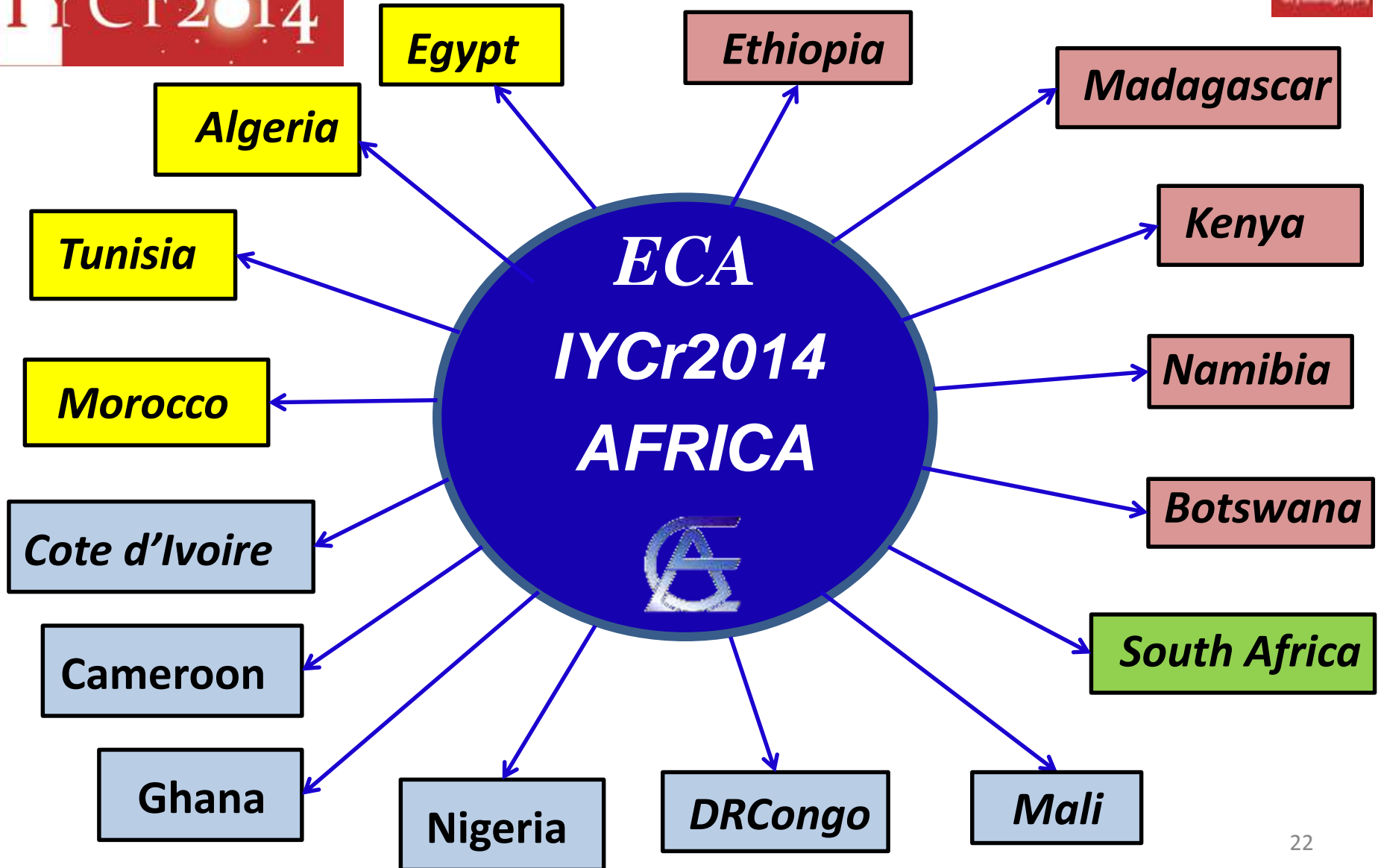
Wednesday	15 October		Affiliation		Details
	12:00	14:00	Arrival & Registration: CR Swart		UFS Campus, Bloemfontein
<b>Session S1</b>	<b>Chair:</b>	<b>A Roodt</b>	<b>UFS</b>	<b>Opening of Summit</b>	
	14:00	15:30	Rectorate (UFS); T Auf der Heyde (SA DST); S Garcia-Granda (IUCr Exec Comm); G Pillay (SA NRF); JP Ngome Abiaga (UNESCO); M Zema (IYCr2014 of IUCr); A Roodt (ECA)		
<b>Tea</b>	15:30	16:15	Tea		
<b>Session S2</b>	<b>Chair:</b>	<b>M Zema</b>	<b>Pavia/ IUCr</b>		
	16:15	16:45	SK1	S Garcia-Granda (Spain)	History of Crystallography
	16:45	17:00	FPY6	3x Flash Posters	Young Scientists (4+1min each)
	17:00	18:00	<b>POSTER SESSION 3</b>		
<b>Dinner</b>	19:00		Dinner		
Thursday	16 October		Affiliation		Details
<b>Breakfast</b>	07:00	07:45	Breakfast		
<b>Session S3</b>	<b>Chair:</b>	<b>S Garcia-Granda</b>	<b>Oviedo/ IUCr</b>		
	08:15	09:00	SK2	P Kanyankogote (DRC)	Crystallography/ Science in DRC & Central Africa
	09:00	09:30	SK3	A Thalal (Morocco) & H Bougzala (Tunisia)	Overview: Crystallography/ Science in Arabic Africa
	09:30	10:00	SK4	P Steynberg (Sasol)	Crystallography/ Science in Industry
<b>Tea</b>	10:00	10:30	Tea		
<b>Session S4</b>	<b>Chair:</b>	<b>C Esterhuysen &amp; A Roodt</b>	<b>IYCr2014:</b>		
	10:30	11:00	SK5	M Zema (IUCr; Italy)	Activities of IYCr2014
	11:00	11:20	SK6	Ngome-Abiaga (Unesco)	UNESCO initiatives in Africa
	11:25	12:45	<b>PANEL DISCUSSION 1</b>		
<b>PANEL DISCUSSION 1: 'Current state of Crystallography / Science in Africa': (UFS SENATE HALL)</b>					
<b>Some questions for PANEL:</b>			<b>Panel:</b>		<b>Young Scientists:</b>
<ol style="list-style-type: none"> <li>1. What is the current state?</li> <li>2. What has Morocco &amp; Tunisia done differently?</li> <li>3. How was current activity in Francophone countries started?</li> <li>4. Is it important for Industry?</li> <li>5. Is it important for Suppliers of Equipment?</li> <li>6. What has South Africa done differently?</li> </ol>			Auf der Heyde (SA DST); Kanyankogote (DRC); Zema(IUCr); Pillay (SA NRF); Zamxaka (SAAStA/NRF); Steynberg (Sasol); Venter (NECSA); Ngome-Abiaga (UNESCO); Taylor (UFS); Antalis (Bruker); Thalal (Morocco); Garcia-Granda (Spain)		Haynes (US; SA); Gitari (Kenia); Mangwala (DRC); Muller (Namibia); Simon (Nigeria); Traore (Mali); Dina (Madagascar); Brink (UFS)

<b>Lunch</b>	13:00	14:00	Lunch		
<b>Session S5</b>		<b>Chair:</b>	<b>J Venter</b>	<b>UFS</b>	Expanding Crystallography in Africa
	14:00	14:20	SI1	V Smith (US; SA)	Young Scientist: Univ of Stellenbosch
	14:20	14:40	SI2	P Gitari (Kenia)	Establishing Crystallography & Nanotechnology in Kenya
	14:40	15:00	SI3	T Muller (Namibia)	XRD & kinetics: nitrosyl, cyanide & acetonitrile complexes
<b>Tea</b>	15:00	15:30	Tea		
<b>Session S6</b>		<b>Chair:</b>	<b>M Ntwaea-borwa</b>	<b>UFS</b>	
	15:30	16:00	SI4	M Zamxaka (SAASTA)	SAASTA's role in advancement of Science in SA
	16:00	16:15	SI5	R Dina (Madagascar)	Piezoelectric materials from Madagascar by XRD
	16:15	16:45	S16	P Mensah (UFS)	Some perspectives from Science: Ghana
	16:45	17:00	FPY7	6x5min Posters	Young Scientists (4+1min each)
	17:10	18:15	<b>POSTER SESSION 4</b>		
<b>Dinner</b>	19:00			Dinner	
<b>Friday</b>	<b>17 October</b>			<b>Affiliation</b>	<b>Details</b>
<b>Breakfast</b>	07:00	07:45	Breakfast		
<b>Session S7</b>		<b>Chair:</b>	<b>TBA</b>	<b>UFS</b>	
	08:15	08:50	SK7	J Bradley (WITS)	Crystallography for All
	08:50	09:15	SK8	P Antalis (Bruker)	From Supplier to Open Labs in Africa
	09:15	09:35	SI1	D Billing (WITS)	Publishing in IUCr Journals
	09:35	10:00	SI2	D Nyanganyura	ICSU Africa: Action Plan and Science Activities
<b>Tea</b>	10:00	10:30	Tea		
<b>Session S8</b>		<b>Chair:</b>	<b>A Roodt &amp; JP Ngome-Abiaga</b>		<b>PANEL DISCUSSION 2</b>
	10:30	11:30			
<b>PANEL DISCUSSION 2: Way forward for crystallography/ Science in Africa: (UFS SENATE HALL)</b>					
<b>Core questions for PANEL/Actions</b>			<b>Panel:</b>		<b>Young Scientists:</b>
<ol style="list-style-type: none"> <li>1. Modalities for setting up schemes for Regional Cooperation</li> <li>2. Setting up of a regional fund for increasing human mobility</li> <li>3. Regional training centre(s) of crystallography</li> <li>4. Role of synchrotron /neutron in crystallography</li> <li>5. Can UNESCO and IUCr help</li> <li>6. Formation of <b>AfCA</b></li> </ol>			Ngome-Abiaga (UNESCO); Bougzala (Tunisia); Taylor (UFS); Schubert (UP; SA); Kanyankogote (DRC); Zema (IUCr); Ngoune (Cameroon); Zamxaka (SAASTA/NRF); Mensah (UFS)		Brink (UFS); Aziz (Sudan); Pretorius (UFS); Nibret (Ethiopia); Laza (Madagascar); Gitari (Kenia); Bungu (UFS & Cameroon); Muswema (DRC); Venter (UFS)
<b>Session S9</b>		<b>Chair:</b>	<b>TBA</b>	<b>TBA</b>	
	11:30	12:15	TBA	TBA	Conclusion / Declaration/ Formation <b>AfCA</b>
<b>Lunch</b>	12:20	14:00	Lunch		Depart

*IYCr2014: Pan African Conference and Summit: Bloemfontein 12-17 Oct 2014*



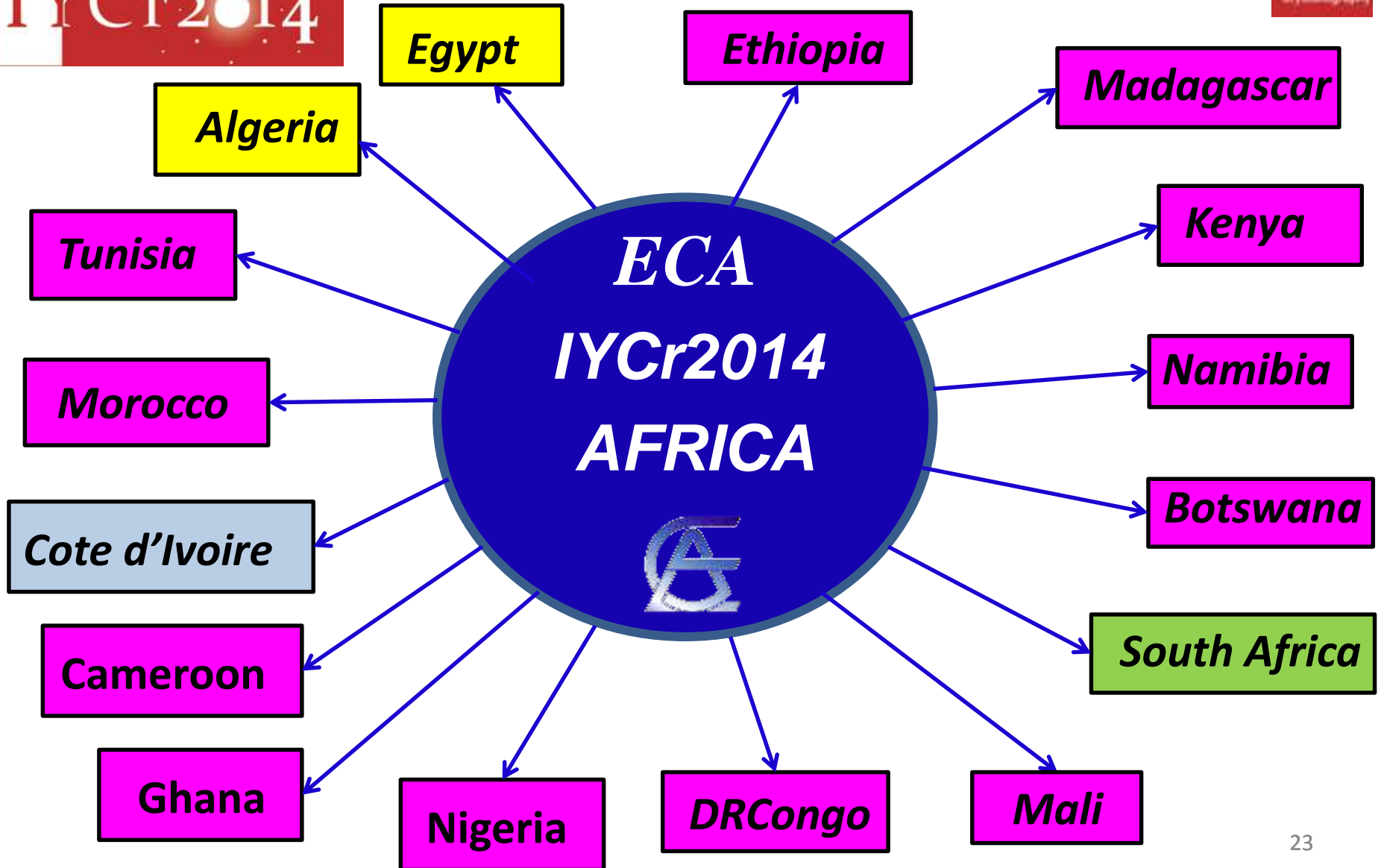
**IYCr2014**



*IYCr2014: Pan African Conference and Summit: Bloemfontein 12-17 Oct 2014*



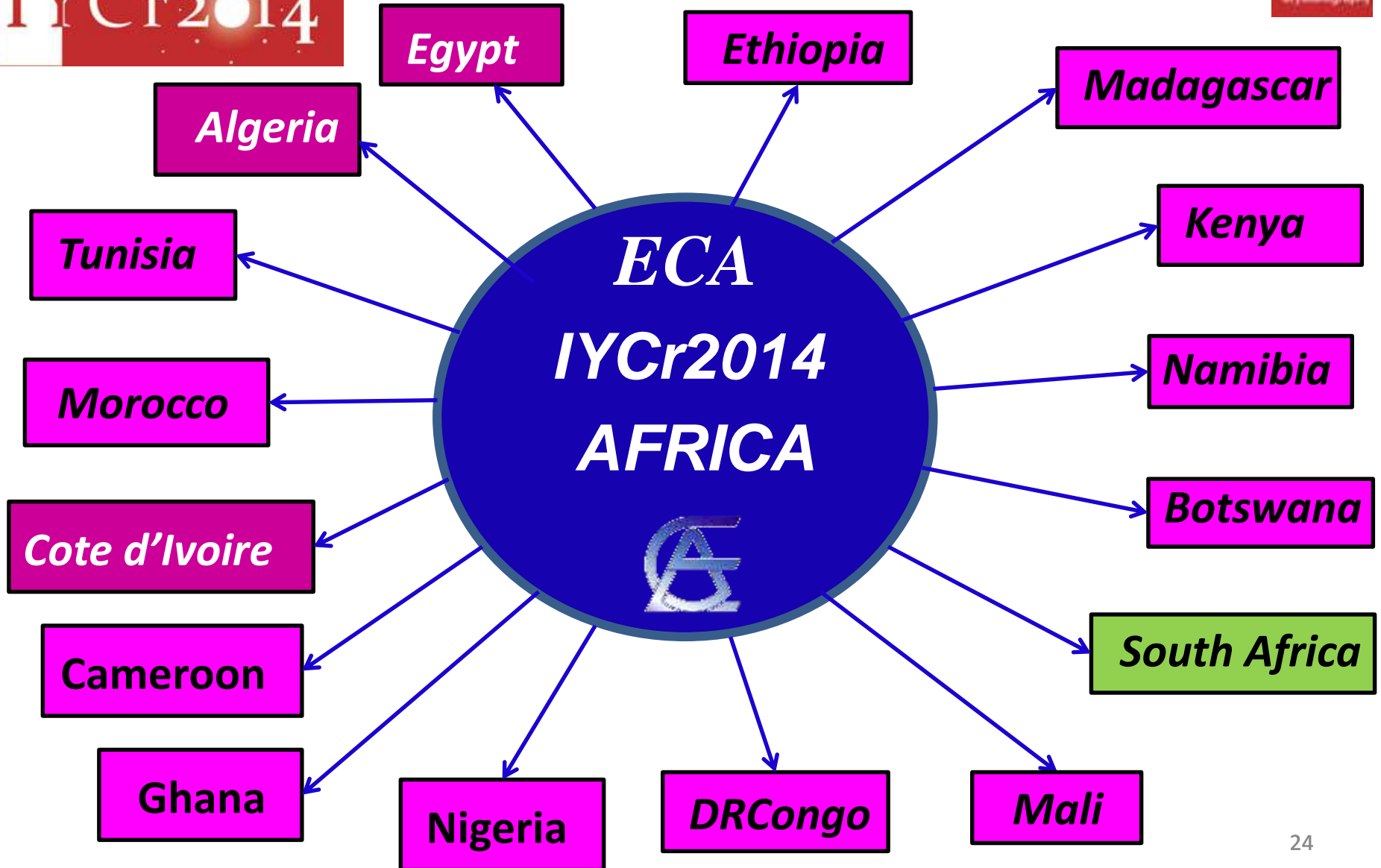
**IYCr2014**



*IYCr2014: Pan African Conference and Summit: Bloemfontein 12-17 Oct 2014*



**IYCr2014**



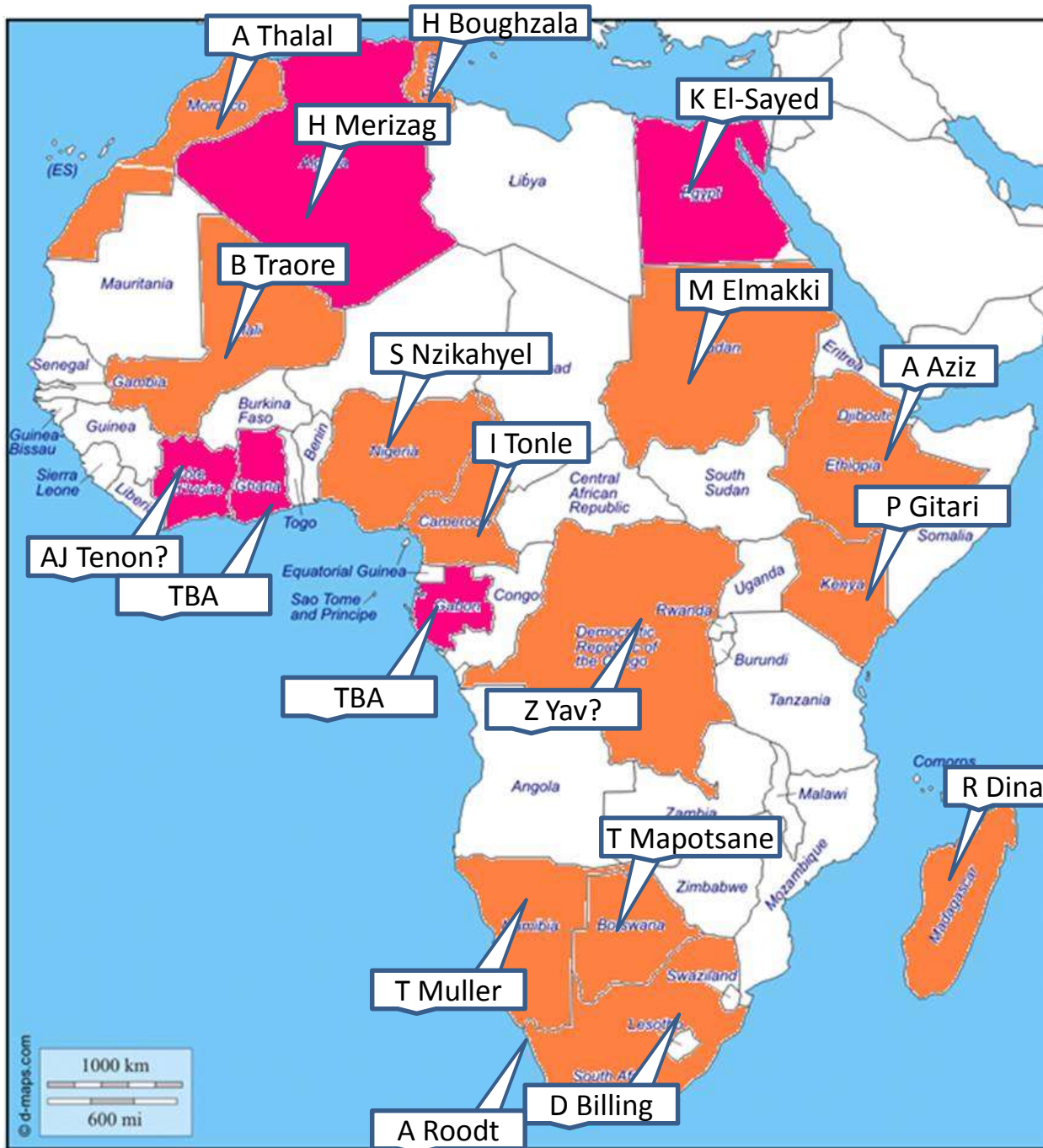


**Form a Steering Committee to  
work towards an African  
Crystallographic Association**











**Pan African  
Conference  
& Summit**

2014

celebrate • disseminate • innovate

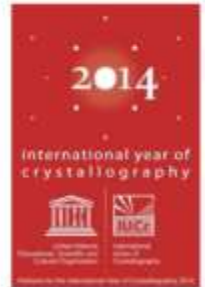
2014





# Pan African and South African Summit of the International Year of Crystallography: IYCr2014Africa

Bloemfontein, South Africa, 15-17 October 2014



## •DECLARATION TO:

- The President: International Union of Crystallography
- The Director of the Science Policy and Capacity Building Division: UNESCO
- The President: European Crystallographic Association
- The Commissioner of Human Resources, Science and Technology: Africa Union
- All African Government Ministries of Science & Technology, Higher Education, Scientific research and Education



## **Urge ALL associated to:**

- **pro-actively continue with programmes to ensure that the legacy of the International Year of Crystallography and particularly the promotion of science is preserved;**
- **over time provide basic diffraction equipment for crystallographers in all countries in the region to allow research activity in Crystallography and balanced partnership collaboration across Africa and beyond;**
- **facilitate the establishment of National Committees of Crystallography in African Countries and support the activities of the existing ones;**

•introduce a scientific visa to ensure mobility of researchers between African nations. Such a visa would allow for the exchange and collaboration between African countries and the sharing of scientific resources and expertise, to address common developmental targets, for the benefit of all. This scientific visa should be free of charge, be valid for at least a year, and should be issued quickly once certified by appropriate higher education and research bodies;

•support training workshops;

•encourage the mobility of researchers within the region;

•promote joint research projects;

•leverage national bodies, institutions and international funding agencies for financial support;

- facilitate regional conferences on the subject of Crystallography and its applications in Africa;**
- assist in the promotion of Crystallography and science in education programmes;**
- provide the very poor countries with minimal infrastructure and materials for research such as powerful computers for data analyses and servers;**
- assist in creating a database, listing African crystallographers;**
- establish a public awareness and engagement programme that will create fact-based understanding of Crystallography through awareness, dialogue and education in the region.**

**We further request that the IUCr and UNESCO facilitate the establishment of an **African IYCr Cooperation Fund**.**

The funds will support actions such as:

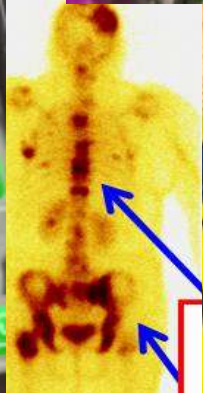
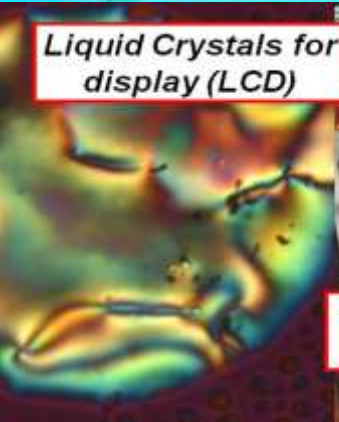
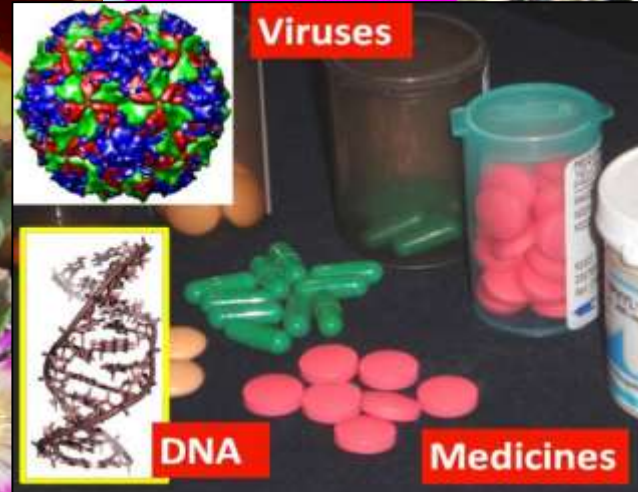
- increasing collaboration and cooperation among scientists in Africa;
- providing seed money for up to two projects per annum initially, involving a minimum of 2 countries in the region, of which at least one should be well established in Crystallography;
- funding for short term visits of up to 3 months for early career researchers;
- supporting training workshops at established centres of Crystallography or at emerging centres in the region;
- enabling the sharing of facilities within the region.

# **For 2015; Secured Funding from ICSU (and IUCr?):**

- 1. Workshop in Central African Region; details tba (C Lecomte)**
- 2. Delegates to High Level Meeting of INDABA8 (Kruger National Park, SA): 16-21 Aug 2015 (A Roodt)**
- 3. North African Meeting: Tunisia: (M Zema) Nov 2015 to further cement  
**AfCA****

**Chicken or Egg?**

# Pomote SCIENCE via Crystallography



**Thank you for your support!**