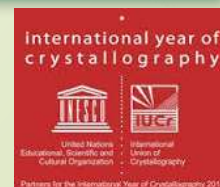


The African Initiative of IUCr in the University of Dschang and Cameroon: actions, facts and perspectives

by

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Outline

2

Introduction

- 1) Brief presentation of the University of Dschang,
- 2) The programme **Crystallography in Africa** of the IUCr in cameroonian universities: Main achievements (2013–2014),
- 3) Research in Crystallography in Cameroon: facts and ambitions,

Conclusion and outlook

Introduction

3

- ❖ As pluridisciplinary science, crystallography finds applications in all modern scientific areas,
- ❖ To commemorate the centennial of the birth of X-ray crystallography, our institution was invited and interested to join the programme [Crystallography in Africa](#) launched by the IUCr,
- ❖ To actively participate to events scheduled for the IYCr2014, the following objectives were fixed by the University of Dschang:
 - ✓ [Foster teaching and research in Crystallography at national level,](#)

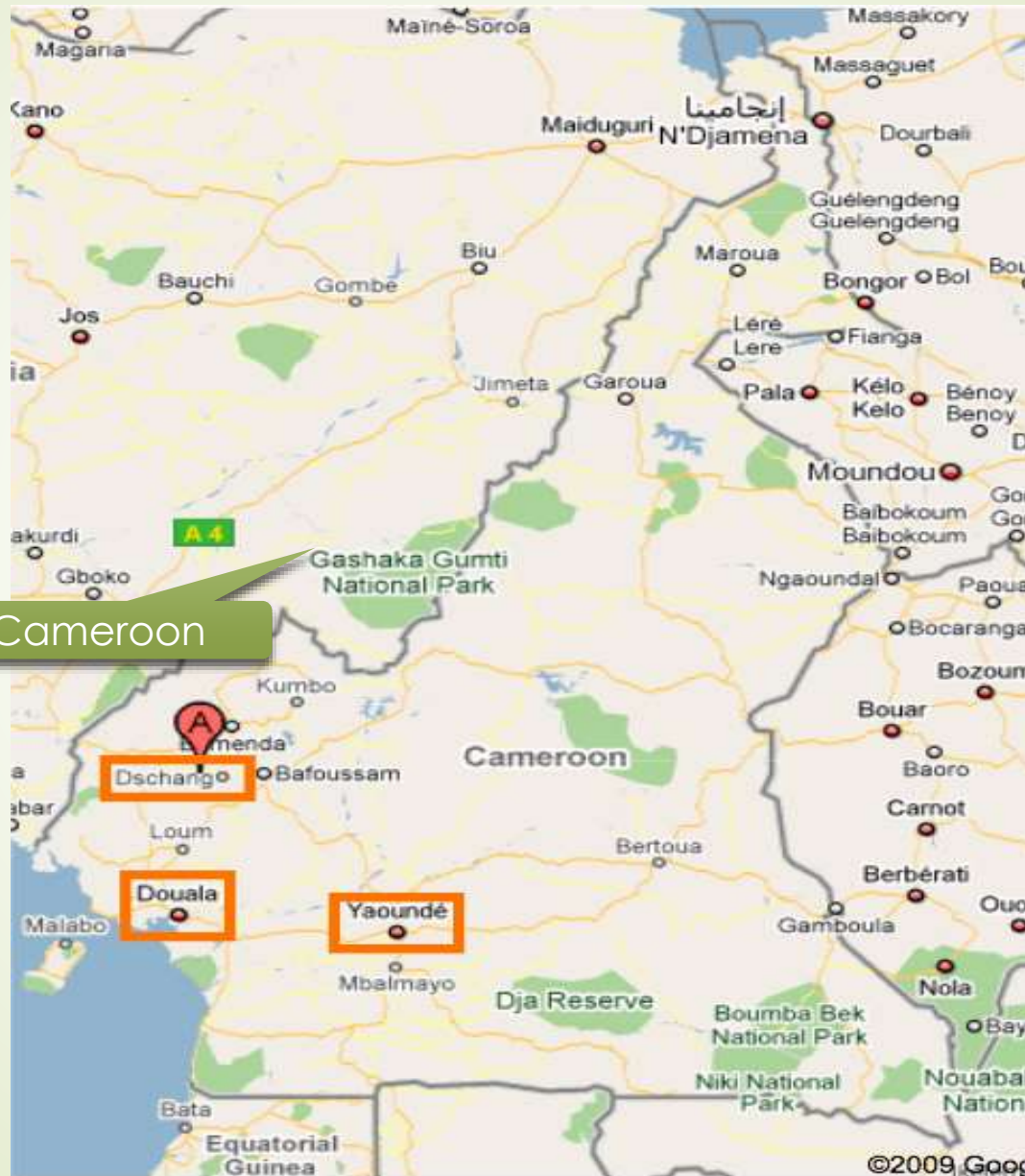
Introduction

4

- ✓ Positioning itself as regional leader university in Crystallography (mainly in research),
- ✓ Disseminate to a large extend basic knowledge on the applications of crystallography,
- ✓ Facilitate the creation of a national association of crystallography in Cameroon and beyond, its adhesion to the IUCr.

1) Brief presentation of the University of Dschang

5



1) Brief presentation of the University of Dschang

6

In 1993

Creation

- ❑ 1600 Students
- ❑ 5 Faculties
- ❑ 92 Lecturers



In 2015

- ❑ ~ 31 500 Students
- ❑ 5 Faculties
- ❑ 460 Lecturers
- ❑ 2 Institutes
- ❑ 5 Antennas



1) Brief presentation of the University of Dschang

7

.....Classicaly,



Faculty of Science (8 500 Students)



Faculty of Law and Political Science (4 600 Students)



Faculty of Letters and Social Sciences (7 000 Students)



Faculty of Economics and Management (4 200 Students)

1) Brief presentation of the University of Dschang

.....Specifically,



Faculty of Agronomy and Agricultural Science (1 900 Students)



FOTSO VICTOR Institute of Technology (4 200 Students)



Institute of Fine Arts (800 Students)



5 Antennas (Bambui, Belabo, Ebolowa, Maroua, Nkolbisson)

Some selected pictures of the main campus of the University of Dschang

9







2) The AI-IUCr and Cameroonian universities: Main achievements (2013 – 2014)

Purposes of activities:

- ✓ Promote teaching in crystallography, in Cameroon and Central Africa,
- ✓ Promote basic training in crystallography in Cameroon and beyond,
- ✓ Strengthen research activities in crystallography in Central Africa,
- ✓ Raise internationally the profile in research of crystallographers from Cameroon and Central Africa

Focus on 3 aspects

Teaching

Training

Research

Achievements in teaching and training activities

13

- ✓ In all universities in Cameroon, crystallography course is compulsory at undergraduate level and optional for MSc students,
- ✓ For the IYCr, an advanced intensive course and an international workshop were jointly organised by the IUCr and the University of Dschang in Cameroon:
 - **Intensive course (26. 02. 2012 – 03. 03. 2012)**
 - Lecturer: Prof Claude LECOMTE (Univ. Lorraine, France),
 - 30 hours of teaching and 2 oral presentations,
 - 50 participants:
 - 20 lecturers from Cameroonian universities,
 - 30 Master and PhD students.

Advanced crystallography course organized in the University of Dschang (26.02 – 03.03 2012)

14



Prof C. LECOMTE during a training session for master and PhD students

Some pictures of the Intensive course
(26. 02. – 03. 03. 2012)



□ International Workshop on Crystallography (8 – 12 April 2013)

16

Trainer	Home institut
Claude LECOMTE (Pr)	Jean Barriol Institute, University of Lorraine (Vandoeuvre-les-Nancy France)
Juan RODRIGUEZ-CARVAJAL (Pr)	Institute of Chemistry of Condenser mater, Bordeaux (France)
Yvon BIBILA (Pr)	Laue-Langevin Institute Grenoble Cedex 9 (France)
Emmanuel WENGER (Dr)	Jean Barriol Institute, University of Lorraine Vandoeuvre-les-Nancy (France)
Stanislas PECHEV (Dr)	University of Cocody Abidjan (Ivory-Cost)

Given lectures covered a broad range of topics including:

- X-ray physics,
- Data collection and interpretation,
- Introduction to basic crystallographic programs: **FullProf Suite: DICVOL, TREOR, WinPLOTR**



P. Pamela
(MSc Student)

J.C. Rodriguez

Y. Bibila

C. Lecomte

E. Wenger

S. Pechev

The workshop in numbers:

- 5 Lecturers (trainers),
- 58 attendees,
- 6 Countries (Cameroon, Gabon, Chad, France, Ivory-Coast, Congo)
- 30 hours of lectures,
- 20 hours of practical on power diffraction, structure determination and refinement,
- 40 men and 18 women,
- 1 poster presentation session,
- 1 guided visit in a local museum.

Achievements in research

19

- ✓ Research activities have been promoted and raised:
 - More PhD students have been registered in Crystallography,
 - The International scientific cooperation in crystallography has been strengthened,
 - Two PhD theses were defended,
 - A powder diffractometer (Siemens D5000) was acquired, as a joint action of [Bruker](#), [IUCr](#) and [UDs](#),
 - Cameroonian crystallographers were introduced to the international scientific community in crystallography.





**A group of students during practicals on the Siemens D5000 powder diffractometer
(International Workshop on Crystallography, 8 – 12 April 2013, Dschang, Cameroon)**

Participation to international meetings

- ✓ 8 cameroonian crystallographers attended 5 international conferences in Crystallography,
- ✓ About 15 communications were presented,
- Pan African Summit Meeting on Crystallography
(Bloemfontein, South Africa, 15 – 17 October 2014)
- IUCr 23rd General Assembly
(Montreal, Canada, 5–12 August 2014)
- Indaba 7 Workshop on structural chemistry
(Skukuza, Kruger national park, South Africa, 2 – 7 sept. 2012)

Participation to international meetings

- ✓ 8 cameroonian crystallographers attended 6 international conferences in Crystallography,
- ✓ About 15 communications were presented,
- Workshop on "Structural analysis through X rays diffraction and applications to crystal engineering")
(Pont à Mousson, France, 2 – 5 July 2012)
- Southern African Powder Diffraction Conference and Workshop,
(Johannesburg, South-Africa, 27 – 31 January 2014)

3) Research in Crystallography in Cameroon: facts and ambitions (2012 – 2015)

Topics under investigation

- ❑ Porous and Magnetic coordination compounds,
- ❑ Intermetallic compounds for renewable energies
- ❑ Synthesis and characterization of aluminosilicate-based nanohybrid materials,
- ❑ Identification and characterization of clays and clay minerals.

3) Research in Crystallography in Cameroon: facts and ambitions (2012 – 2015)

Involved researchers (Lecturers only)

- ❑ Physics of condenser matter: 5
- ❑ Chemistry of Materials: 4
- ❑ Mineralogy: 4
- ❑ Soil sciences: 3
- ❑ Coordination chemistry: 6

3) Research in Crystallography in Cameroon: facts and ambitions (2012 – 2015)

Publications authored or co-authored by Cameroonian crystallographers

- ❑ Acta Crystallographyca (6)
- ❑ Journal of Solid State Chemistry (1)
- ❑ Polyhedron (3)
- ❑ Applied Clay Science (2)

In collaboration with researchers from France, Canada,
South-Africa, Russia, Italy, Argentina, Belgium

3) Research in Crystallography in Cameroon: Ambitions (2015 – 2018)

Institutional vision for coming years

1) **Densification of scientific equipment**

- Single crystal diffractometer,
- Infrared spectrometer,
- X-ray fluorescence;

Creation of a Center for physical
measurements (regional vocation)

3) Research in Crystallography in Cameroon: Ambitions (2015 – 2018)

Institutional vision for coming years

2) Development of capacities and human resources in crystallography

- Training of PhD students and technicians for equipment,
- Recruitment of new lecturers in Crystallography,

Establishment of a policy for the utilization, maintenance and the management of acquired equipment.

3) Research in Crystallography in Cameroon: Ambitions (2015 – 2018)

Institutional vision for coming years

3) Vulgarization of crystallography for a sustainable development

- Promote a full exploitation of the Center of Physical measurements by pointing target or potential users (Mining sector, Soil sciences, Geology, Chemistry,...)
- Exploitation of the "Groupement d'Interêt Economique (GIE) " as active tool for the valorization and follow-up of equipment in Cameroon.

Conclusion and outlook

- The activities organized during the IYCr 2014 as well as the programme Crystallography in Africa were very beneficial for Cameroon and neighboring countries,
- They have contributed to improve this science, in teaching and research,
- The University of Dschang will continue to help as fully as possible the Cameroonian Crystallography Association in their actions.

Acknowledgements

30



International Union of Crystallography



Bruker AXS SAS, France

IYCr2014

Organising committee



University of Dschang

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- **Yvon BIBILA (Pr)**
- **Stanislas PECHEV (Dr)**
- **Emmanuel WENGER (Dr)**

Thank you for your kind
attention.