CURRICULUM VITAE

Professor A.O. Kuku

I. Personal Details

Date of Birth: March 20, 1941
Marital Status: Married with four children
Nationality: Nigerian
Sex: Male
U.S.A. Permanent Resident (Green card) since March 2002

II CURRENT POSITION: Professor of Mathematics, Grambling State University, Grambling, LA, USA. Since August 2008

III. Position held in the last five years

(a) Member, Institute for Advanced Study Princeton, NJ, USA. Sept. 2003-Aug. 2004
(b) Visiting Research Professor, MSRI Berkeley, CA, USA. Aug-Dec 2004
(c) Visiting Professor, OSU (Ohio State Univ.) Columbus, OH, USA 2005
(d) Distinguished Visiting Professor, Miami University, Oxford, OH, USA 2005 – 2006
(e) Visiting Professor, Universitat Bielefeld, Germany ,USA. 2006
(f) Visiting Professor, IHES, Paris, France 2006
(g) Visiting Professor, Max Planck Inst. Fur Mathematik, Bonn, Germany 2007
(h) Visiting Professor, National Mathematical Centre, Abuja, Nigeria. 2007
(i) Visiting professor, The University of Iowa, Iowa-City, USA 2007-2008
(j) Visiting Professor, National Mathema-Tical Centre, Abuja, Nigeria. 2008

IV. Educational Institutions Attended (University Education)

1.Makerere University College, Kampala, Uganda
(then under special relationship with the University of London) 1962-1965

2.University of Ibadan, Nigeria 1966-1971

3Columbia University, New York City, USA (To write my Ph.D thesis)
(Thesis written under Professor Hyman Bass) 1970-1971

V. Academic Qualification (with dates and granting bodies)

1.B. Sc (Special- Honours) Mathematics, University of London 1965

2.M. Sc. (Mathematics), University of Ibadan, Nigeria. 1968

3.Ph. D. (Mathematics), University of Ibadan, Nigeria 1971

(Thesis written under Professor Hyman Bass of Columbia Univerisity, New York).

VI. Scholarships, Grants, and Prizes

Won many subjects and proficiency prizes while in school

African Scholarship programme of American Universities (ASPAU)- I declined this offer 1962

United States Agency for International Development (USAID Scholarship tenable at Makerere University College, Kampala, Uganda – (then under special relationship with University of London. 1962-1965

Shell-BP Proficiency Prize (Makerere) 1963

Mathematical Departmental Prize (Makerere) 1964

Travel fellowship awarded by US department of State 1968

AFGRAD Fellowship 1970-1971

Travel Award by "Deutsche Stiftung fur International Entwichlung" 1980,'84 & '86

Study Visit Award to Germany by the German Academic Exchange Services (DAAD) 1981

Canadian Research Council Grant 1982,1993

Third World Academic of Sciences (TWAS) Travel Grant 1993

Swedish Institute Research / Travel Grant 1993

Switzerland National Foundation Research Grant 1996

Clay Mathematics Institute Fellowship 2004 - 2005

VII. Honours, Distinctions and Memberships in Learned Societies

Honorary President, African Mathematical Union (AMU) 1995-

President, African mathematical Union 1986-1995

Fellow, Third World Academy of Science 1989-

Fellow, African Academy of Science 1986-

Member, European Academy of Arts, Science & Humanities 1986-

Fellow, Nigerian Academy of Science 1989-

Fellow, Mathematical Association of Nigeria 1987-

Distinguished Service and Achievement Award USA National

Association of mathematician (NAM)	1993
Special Merit Award, Ogun State of Nigeria	1987
Member, International Mathematical Union Commission on Development and Exchange	1986-1994
Member, Mathematics Advisory Committee International Centre for Theoretical Physics (ICTP), Trieste, Italy.	1986-92
Vice-Chairman, First Congress of African Scientists, Brazzaville, Congo	1987
Vice-Chairman, Scientific Committee, Organisation of African Unity (OAU)	1987
Member, Steering Committee, Pan-African Union for Science and Technology	1987-90
Member, Board of Trustees, Mathematical Association of Nigeria	1988-
Dean, Postgraduate School, University of Ibadan	1986-1990
Chairman, Committee of Deans of Postgraduate Schools in Nigerian Universities	1987-1988
Chairman, UNESCO Committee of African Consultants Scientists, Dakar, Senegal	1987
Chairman, Science and Technology Committee, Pan-African Institute of International relation Geneva, Switzerland	1988-
Vice-Chairman, Governing Council, International Centre for Mathematics and Physical Sciences, Porto-Novo, Benin Republic	1989
Member, UNESCO Advisory Committee of Expert Mathematicians	1987
Vice-President, Science Association of Nigeria	1983-1994
Member, Board of Directors, PRELUDE – programme Recherches et Liaison Universite et Development Namur, Belgium	1990-1993
Member, Governing Council, Institute de Recherches Mathematiques (IRMA), Abidjan, Cote D'Ivoire	1993-
Member, International Advisory Committee, International Village for Science and Technology Dar es Salaam, Tanzania	1990
Head, Department of mathematics, University of Ibadan	1983-1986
Acad. Secretary, Physical Science, Nigeria Academy of Science	1990-1993
Associate Editor (Algebra) Journal of the Nigerian Mathematical Society	1984-
Member, Editorial Board, Journal of the Nigeria Mathematical Society	1984-1990
Guest Editor, K-theory Journal	1989,2003
Member, Editorial Board "Abacus" – Journal of the Mathematical Association of Nigeria	1985-
Member, Editorial Board, Journal of the Mathematical and Computer Science	1993-
Member, Editorial Advisory Board, Africa Matematika	1986-1995
Member, Editorial Board, Nigerian Journal of Science	1977-1981
Honorary Citizenship, City of Huntsville, Alabama, USA	1968

Business Manager, Science Association of Nigeria	1978-1981
Member, American Mathematical Society	1971-
Member, London Mathematical Society	1994-
Member, Mathematical Association of America	1994-
Member, Nigerian Mathematical Society	1979-
Member, International Committee, American Mathematical Society	1993-
Chairman, Mathematics Section, Science Association of Nigeria	1978-1981
Member of Council, Nigerian Mathematical Society	1985-1990
Member of Council, Mathematical Association of Nigeria	1987-1991
Reviewer, Mathematical Reviews	1991-
1997 Distinguished Visitor, South African Mathematics Society	1997
Traditional Royal Title---Otunba Ofiran of Ijebu-land (Nigeria)	1993
African Mathematical Union (AMU) medal	2000
Foreign Fellow, Mongolian Academy of Sciences	2005
Virginia Chatelain (Endowed) Lecture, Kansas State University, Manhattan, KS, USA	2007.
Nigeria National Honours—OON (Officer of the Order of the Niger)	2008

VIII. Further Honours and Distinctions

A) Invitation by Universities/Research Institutes to give Colloquia and Seminar Lectures

I have been invited to give colloquium and seminar lectures by Universities/Research Centres in **Europe**, **USA**, **Canada**, **Asia**, **West Indies** and **Africa. USA**: University of California, Berkeley, 1992; Columbia University, New York, 1971, 1993; Cornell University, Ithaca, 1982, 1993; University of Chicago, Chicago, 1975, 82, 92, 2004; Dartmouth College, Hanover, New Hampshire, 1993, 2001, 2004; University of Illinois, Urbana-Champaign, 1975, 82; University of Iowa, Iowa City (2002, 2007); Institute for Advanced Study (IAS), Princeton, 2004; University of Michigan, Ann-Arbor, 1992; Michigan State University, East Lansing, 1992; Howard University, Washington DC, 1982, 94, 2003; University of Oklahoma, Norman, (Karcher Lecturer) 1982, Northwestern University, Evanston, 1975, 1982; North Dakota State University. Fargo, 1994; Kansas State University, Manhattan,(Virginia Chatelain Endowed Lecture0 2007: Ohio State University, Columbus, 2003, 2005; Penn State University, University Park 1993, 2004; Rutgers University, New Brunswick, NJ, 2004; State University of New York, Binghamton 1993; University of Iowa, Iowa-City, 2007, University of Wisconsin, Madison, 1992; New Mexico State University. Las Cruses.1996;University of Texas at San-Antonio, Miami University, Oxford, OH, 2005; Atlanta University Centre, 1993, Yale University, New Haven, 1993. **Germany:** Universities of Bielefeld, 1978, 80, 81, 84, 90, 94, 97; Munster, 1981, Perdabour, 1980; Max-Planck Institute fur Mathematik, Bonn, 1994, **France:** Universite Louis Pasteur, Strasbourg, 1998; Universite Paris VII, Paris 1998; **Poland:** University of Poznan, Banach Centre, Warsaw, 2002; **Sweden:** Universities of Goteborg, Uppsala, Lund; Mitag-Leffler Inst. Stockholm – all in 1993. **United Kingdom:** Universities of Warwick, 1982, London, 1981; Sussex, 1995; Edinburgh, 1995; **Holland:** University of Nijmegen, 1994, **Russia:** Moscow State University, 2005; **Switzerland:** University of Lausanne, 1996; **Canada:** Queen's University Kingston Ontario, 1982, 1993, University of Western Ontario, London,

Ontario, 2001; **Hong Kong:** University of Hong Kong, 1993; **Italy:** University di Genova 1996; University di Trieste, 1998, SISSA, Trieste, 1998, **Singapore:** University of Singapore, 1985, **China:** Institute of Maths/Systems Science, Chinese Academy of Science, Beijing, 1993; East China Normal University Shanghai, 1993; Northwestern Polytechnical University of Xian, 2002; Nanjing University, 2002; Tongji University, Shanghai, 2002; **India:** Indian Statistical Institute, Delhi, 2002; **Mexico**, Instituto de Matematicas, Unidad Morella, (2005); **Iran:** Sheriff University of Technology, Tehran, 2000; **West Indies:** University of West Indies at Kingston, Jamaica, 1993 **West/Central/East Africa:** Universities of Abidjan, Cote d'Ivoire, 1986, 1987, 90, 95; Dakar, Senegal, 1987, 89; Ouagadougou, Burkina Faso, 1997; Yaoundé, Cameroon, 1990, 92; Brazzaville, Congo, 1987, 89; Nairobi, Kenya, 1986, 91; and Several Universities in Nigeria. **South Africa:** Universities of Cape Town, Port Elizabeth, Stellenbosch, Pretoria; University of Natal, Pietermaritsburg; University of Witswatersrand , Johannesburg; University of Western Cape, Beliville, University of the North, Pietersburg; University of the Free State, Bloemfontein; Rand Afrikaans University, Johannesburg, Rhodes University, Grahamstown. – all in 1997.

B) **Special Invited Addresses by mathematical Societies**

1. Joint American Mathematical Society (AMS); Canadian Mathematical Society, (GMS); Mathematical Society of America (MAA), and USA National Association of Mathematicians (NAM); - invited Address, Vancouver, 1993
2. Hong Kong Mathematics Society Annual Lecture, 1993
3. Invited Address at the 125th Anniversary Celebrations of the Finish Mathematics Society, Helsinki, Finland, December, 1993.

IX. Details of Position Held At University Level

a) Position held in Nigeria

1. Assistant Lecturer in Mathematics, University of Ife,	1965-1967
2. Lecturer in Mathematics, University of Ife	1967-1968
3. Lecturer in Mathematics, University of Ibadan	1968-1976
4. Senior Lecturer in Mathematics, University of Ibadan	1976-1980
5. Sub-Dean (Postgraduate) Faculty of Science University of Ibadan	1978-1980
6. Reader in Mathematics, University of Ibadan	1980-1982
7. Professor of Mathematics, University of Ibadan	1982-2002
8. Head, Dept. of Mathematics, University of Ibadan	1983-1986
9. Dean, Postgraduate School University of Ibadan	1986-1990
10. Chairman, Committee of Deans of Postgraduate School in Nigerian Universities	1987-1988

b) Permanent Position held outside Nigeria

11. Professor of Mathematics, International Centre for Theoretical Physics (ICTP) Trieste , Italy (A United Nations Research Centre in Mathematics and Physics under UNESCO). 1995-2003

(Note: I had to retire in 2003 at the UNESCO mandatory age of 62)

c) Visiting Positions Outside Nigeria

12.Visiting Scholar, Columbia University, New York, USA	1970-1971
13.Visiting Assistant Professor, Columbia university New York, USA	1971
14.Post-Doctoral Visitor, University of Chicago, Chicago, USA	1974-1975
15.Visiting Professor, Univ. Bielefeld, Germany, Summer1980; Fall 1981; Summer 1985; Fall 1990; Summer1994, Fall 2006.	
16.Visiting Professor, University of Illinois at Urbana – Champaign, USA, Second Semester	1982
17.Visiting Professor, Queen's University, Kingston Ontario, Canada Summer 1993 Summer	1982
18.Visiting Professor, Mathematical Sciences Research Institute (MSRI), Berkeley, California, USA. Fall	1992, 2004
19.Visiting Professor, Cornell University, Ithaca, New York, USA Spring Semester	1993
20.Visiting Professor, University of Hong Kong (Summer)	1993
21.Visiting Professor, Institute of Mathematics/Systems Science, Chinese Academy of Sciences, Beijing, China (Summer)	1993
22.Visiting Professor, Chalmers University of Technology and the University of Goteborg, Goteborg, Sweden (Fall)	1993
23.Visiting Professor, Mittag-Leffler Institute, Stockholm, Sweden	1993
24.Visiting Professor, Howard University, Washington DC, USA, Spring Semester	1994
25.Visiting Professor, Max-Planck Institute fur Mathematik, Bonn, Germany	1994, 2007
26.Member, Institute for Advanced Study, Princeton, NJ USA	2003-2004
27.Visiting Professor, Ohio-State Univ. Columbus, OH 43210	2005
28.Visiting Professor, African Institute for Math Sciences, (AIMS) Capetown, South Africa.	2005
29.Distinguished Visiting Professor, Miami University,Oxford, OH, USA	2005-2006
30 Visiting Professor, IHES (Institut Des Hautes Etudes Scientifique, Paris, France,	2006
31 Visiting Professor, University of Iowa, Iowa City, USA	2007-2008

X. Some Highlights of Administrative and organizational Experience

As Head of the department of Mathematics, University of Ibadan, 1983-1986, I caused our undergraduate and post graduate programmes to be overhauled and initiated postgraduate programmes in industrial mathematics. etc.

As Dean of Postgraduate School, University of Ibadan 1986-1990, I was responsible for the organisation, coordination and improvement of postgraduate training and research in all the ten faculties of the University. In this capacity. I initiated various new programmes, succeeded in generating more funds for the school, created a "Forum for interdisciplinary Discourse" streamlined the regulations of the school, improved the formal of presentation of

results, etc.

As Chairman of the Committee of Deans of Postgraduate Schools in Nigerian Universities for two years (1987-1988), I spearheaded the harmonization of standards and quality of programmes, as well as overall improvement of postgraduate training and research in Nigerian Universities.

As President of the African Mathematical Union (AMU) for nine years, (1986-1995), I was responsible for organizing and coordinating various mathematical activities all over the continent of Africa. During my tenure, I created four Commissions- AMU Commission on Mathematics Education, AMU Commission on Pan-African Mathematics Olympiad, AMU Commission on History of Mathematics in Africa, and AMU Commission on Women in Mathematical in Africa. I also created a Pan-African Mathematical Sciences Network involving sixteen selected Universities/Research Centres in Africa with the aim of enhancing graduate training and research as well as co-operation North – South and -South.

I was a Vice-Chairman of the First Congress of African Scientists, which, in 1987, created the Pan-African Union for Science and Technology and I have since made several contributions to the development of Science and Technology all over Africa.

As a member of the International Mathematical Union Commission on Development and Exchange for eight years (1986-1994), I made contributions on the South development and exchanges in mathematical research in the developing countries, and other parts of the world.

At the International Congress on Mathematics Education in Quebec, Canada in 1992, I was the organizer of the sessions on "Undergraduate Mathematics Education for Specialists, Future Researchers and Mathematics teachers" Also, at the International Congress of Mathematics Education at Seville, Spain, in July 1996; I was co-organiser of a working Group on "International Cooperation in Mathematics Education.

I have organized or co-organised several International Conferences/School Symposia/Congresses, e.g. I have been:

1. Chairman, Organising Committee, International Workshop on group Representation and its Applications, Ibadan, Nigeria 1981
2. Chairman, Organising Committee, International Symposium on Mathematical Modelling, Ibadan, Nigeria, 1984
3. Chairman, Organising Committee, Second Pan-African congress of Mathematicians, Jos, Nigeria, 1986
4. Chairman, Organising Committee, International School/Symposium on Algebraic K-theory and its Applications, Ibadan, Nigeria, 1987
5. Vice-Chairman, Organising Committee, First Congress of African Scientists, Brazzaville, Congo, 1987
6. Chairman, Organising Committee, Foundation Postgraduate courses in Algebra, (organised for National Mathematical Centre, Abuja) Ibadan, Nigeria, 1987
7. Chairman, Organising Committee, International Symposium on Current Research Trends in Mathematics, Computer Science and Mathematics, Physics, Arusha, Tanzania, September, 1989
8. Chairman, Organising Committee, Second Foundation Postgraduate Courses in Algebra, National Mathematical Centre, Abuja Nigeria, June, 1992.
9. Chairman, Organising Committee, Third Pan-African Congress of Mathematicians, Nairobi, Kenya, August, 1991.
10. Organiser, Sessions on Undergraduate Mathematics Education for Specialists, Future

Researchers, and Mathematics Teachers, at the International Congress on Maths Education Quebec, Canada, August, 1992.

11. Chairman, Organising Committee, International Symposium on "Mathematics Education in African for the twenty first century: Cairo, Egypt, September, 1992
12. Chairman, Organising Committee, International Symposium on "Current Research Trends in Mathematics, Computer Science and Mathematics Physics", Port-Novo, Republic of Benin, January, 1993, Ibadan, Nigeria, January 1994
13. Chairman, Organising Committee, Fourth Pan-African Congress of Mathematics, Ifrane, Morocco, September, 1995
14. Co-organiser, Working Group on "International Cooperation on Mathematics Education" at the Eight International Congress on Mathematics Education, Seville, Spain, July, 1996.
15. Local Organiser, ICTP School on "Numerical Simulation of Partial Differential Equations, September, 1996
16. Director, ICTP Workshop/Symposium on "Algebraic K-theory and Applications" held in September, 1997.
17. Member, Scientific Committee, International Conference on "Quantum Field Theory, Non-Commutative Geometry and Quantum Probability", Trieste, March 2001.
18. Member, Scientific Committee, Workshop on Algebraic Geometry and Strings - K-theory, Derived Categories and Strings, Geneva, Italy, June 18-21, 2002.
19. Director, ICTP School and Conference on "Algebraic K-theory and its Applications", August 2002.
20. Organiser: International conference on "Algebraic K-theory and its Applications", Safi, Morocco, July 25-30, 2004.
21. Co-organiser, International Workshop on "Representation theory in Geometry and Physics" IMSP, PortoNovo, Benin Republic, August 1-17, 2005.
22. Director, School and Conference on 'Algebraic K-theory and its Applications' ICTP, Trieste, Italy, May 14 to June 1, 2007.

XI. Some Other Miscellaneous Information including Teaching Experience

i) I have served as External Examiners to various Universities including: University of Benin, Obafemi Awolowo University, Ahmadu Bello University, Ogun State University - all in Nigeria; University of Yaoundé, Cameroon; University of Abidjan, Cote D'Ivoire; Fourth Bay College and Njala University College, Sierra Leone, University of West Indies, Kingston, Jamaica.

ii) By now, I have taught the major areas of pure Mathematics – Algebra, Analysis, Geometry and Topology at both undergraduate and beginning graduate levels. I have written a book "Abstract Algebra" suitable for honours undergraduate and beginning graduate students. I have also taught advanced graduate courses on various topics including: Algebraic K-theory, Commutative Algebra, Algebraic Topology, Algebraic Number Theory, Homological Algebra, Category Theory, Algebraic Geometry/Differential Geometry and Representation Theory. By now, I have over 35 years of University teaching and research experience.

iii) In the USA, I have taught undergraduate and graduate courses at Columbia University, New York (Summer School) (1971); University of Illinois, Urbana Champaign (Jan.-May, 1982); Cornell University, Ithaca (Jan.-May, 1993); Howard University, Washington DC (Jan.-May, 1994).,Miami University, Oxford, Ohio, (2005-2006), and currently at the

University of Iowa, Iowa City, (2007-2008).

iv)I have supervised eleven M.Sc/MPhil research projects, two Ph.D's and seven ICTP Diploma projects.

v)I have served on interview panels to appoint Mathematics Staff to various Universities and Polytechnics in Nigeria.

vi)I have rendered numerous services on Boards and Committees at the University of Ibadan, including Appointments and promotions Committee, development Committee, Committee of deans, Publications Committee etc. I have served almost continuously as a member of University of Ibadan Senate since 1976.

XII. Major International Conferences Attended (With Papers Read)

1.USA National Science Foundation Conference on Class Groups of Orders and Group-rings held at Northfield, USA, July 1975. **Invited Paper Read:** Whitehead groups of orders in p-adic algebras

2.Summer meeting of the American Mathematical Society held at Kalamazoo, Michigan USA, August 1975.

3.International Conference on Algebraic K-theory held at Mathematisches Forschungsinstitut, Oberwolfach, Germany, July 1976. **Invited Paper Read:** Some finiteness results in the K-theory of orders in p-adic algebras.

4.International Conference on Algebraic K-theory held at Northwestern University, Evanston, Illinois, USA, January 1976. **Invited Paper Read**: G_n of finite rings and SK_n of Orders.

5.International Conference on "Orders and their Applications" held at Mathematisches Forschungsinstitut, Oberwolfach, Germany, August 1980. **Invited Paper Read:** SG_n of Orders and Group-Rings.

6.International Conference on Algebraic K-theory held at Mathematisches Forschungsinstitut, Oberwolfach, Germany, July 1980. **Invited Paper Read:** A convenient setting for Equivariant Higher Algebraic K-theory.

7.The 93rd meeting of the American Mathematical Society together with Emmy Noether Symposium held at Bryn Mawr College, Pennsylvania, USA. March 16-19, 1982, **Invited Paper Read:** The Cartan map for equivariant higher Algebraic K-groups.

8.Annual Conference of the Canadian Mathematical Society held at Carleton University, Ottawa, Canada, June 1992.

9.International Conference on "Algebraic K-theory, Geometry and Number Theory", at Universitat Bielefeld, Germany, July 26-31, 1982. **Invited Paper Read:** "Equivariant K-theory and the Co homology of profinite groups".

10.American Mathematical society Summer Research Conference on "Applications of Algebraic K-theory to Algebraic Geometry", at University of Colorado at Boulder, Colorado, USA: June 1983. **Invited Paper Read:** K-theory of Group-rings of finite groups over maximal orders in division algebras.

11.Conference of Directors (Heads) of Mathematics Institutes in African Universities held at Yaoundé, Cameroon, September 26-30, 1983.

12.International Conference on Algebraic K-theory held at Mathematisches Forschungsinstitut, Oberwolfach, Germany May 17 – June 2, 1984. **Invited Paper Read:** K_n and SK_n of integral group-rings and orders.

13. International Conference on Orders and their applications held at Mathematisches Forschungsinstitut, Oberwolfach, Germany, June 3-9, 1984
14. Singapore Topology Conference, National University of Singapore, June 10-15, 1985. **Invited papers read**: Higher K-theory of groups-rings and orders in Algebra over number fields.
15. Second Pan African Congress of the African Mathematical Union University of Jos, Nigeria, March 23-29, 1986. Invited paper read: Mathematical Research in Africa: Problems and Prospects.
16. International Congress of Mathematicians, University of California, Berkeley, August, 3-19, 1986.
17. International Symposium on Group Theory and its Applications, University of Abidjan, Cote D'Ivoire, July 1986. **I gave four invited lectures** on "Axiomatic Representation of Finite groups.
18. Southern Africa Mathematical Science Association (SAMSA) Symposium on Mathematics and Mathematics Education, University of Lesotho, Lesotho, December 1986. **Invited Paper Read:** Some recent developments in Algebraic K-theory.
19. International Symposium on Algebra and Algebraic Geometry, University of Abidjan, Cote D'Ivoire, December 29-January 10, 1987. **I gave four invited lectures** on Algebraic K-theory.
20. USA-Japan Seminar on Applications of Algebraic K-theory to Algebraic Number theory and topology, East –West Centres, Honolulu, Hawaii, USA, January 12-16, 1987.
21. ICMI Symposium on Mathematics as a Service Subject, International Centres for Mechanical Science, Udine, Italy, April 4-10, 1987. **Invited Paper Read:** Mathematics and Computer Science Education in African. Yamousoukro, Cote D'Ivoire. **Invited Paper Read**: Mathematics as a service subject - The African Experience.
22. International Symposium on re-structuring Mathematics and Computer Science Education in African. Yamousoukro, Cote D'Ivoire. **Invited Paper Read**: The status and preparation of mathematics researchers and teachers in Africa.
23. First Congress of African Scientists, Brazzaville, Congo, June 25-30, 1987. **Invited paper read**: Mobilisation and Production of Basic Scientists for the Development of Africa.
24. Societe Mathematique de France Colloquium on "Mathematics a Venier" Paris, December 9-11, 1987, **Invited Paper Read:** Co-operation in Mathematics Between France and African countries.
25. African Academy of Sciences (AAS) Conference on the Networking of the African Scientific Organizations.
26. International Conference on 'Orders and their Applications', May 29-June 4 , 1988 , **Invited Paper Read:** Some finiteness results in the higher K-theory of group-rings and orders in algebras over number fields.
27. International conference on 'Algebraic K-theory' Mathematisches Forschungsinstitut, Oberwolfach, Germany, June 5-11, 1988. **Invited Paper Read:** Higher K-theory of integral Group-rings and orders.
28. Sixth Congress of the International Commission on Mathematics Education (ICME-6), Budapest, Hungary, July 27–August 3,1988. I was part of special panel constituted to discuss the future of ICMI.
29. Centenary celebrations of the America Mathematics Society, Providence, Rhode Island, USA, August 8-12, 1988
30. Second Pan–African congress of Professors World Peace Academy (PWPA), Yaoundé,

Cameroon, November 30 – December 4, 1988 **Paper Read as Invited Plenary Lecturer:** Mathematical Sciences and African Development.

31. Commonwealth Science Council Workshop on Commercialization and Evaluation on Research and Development.
32. IDRC conference on human resources development and strengthening of research capacities for West and Central Africa: Dakar, Senegal, April 5-8, 1989.
33. Europe-Africa Encounter – Conference on North-south Interdependence and solidarity; Porto Nove, Republic of Benin August 1989.
34. International Symposium on Current Research Trends in Mathematics, Computer Science and Mathematics Education Arusha, Tanzania, September 11-16, 1987. **Invited Plenary Paper Read:** on Equivariant Higher Algebraic K- theory.
35. African academy of Sciences Conference on Networking of African Scientific Organization (NASO), Nairobi, Kenya, October 2-5, 1989. **Invited Paper Read:** The role of Mathematical Sciences in the Industrial Development of Africa.
36. European Academy Conference on Science, Culture and the Health of the World: Geneva, Switzerland, October 10-14, 89.
37. Twenty-fifth anniversary Conference of International Centre for Theoretical Physics (ICTP), Trieste, Italy, October 31 – November 3, 1989.
38. 2nd congress of African scientists, Accra, Ghana, January 19 – February 2, 1990. I was one of the organizers of this congress.
39. International Congress of Mathematicians, Kyoto, Japan, August 20-28, 1990. **Paper Read:** Some finiteness results in the Higher K- theory of orders and group- rings.
40. Third world Academy of Science general Conference, Caracas, Venezuela, October 27-30, 1990.
41. 'Prelude' – Programme Recherché et liaison Universite et Development – Congress on 'Scientific Networks' Namur, Belgium, November, 1990. **Invited Paper Read:** Networks' in the context of New European Relationships and North – South Co- Development.
42. Third Pan- African Congress of Mathematicians, Nairobi, Kenya, August 20-28, 1991. I was Chairman of the International Committee, which organized the Congress. **Invited Paper Read:** Algebraic K- theory and other Mathematical Sciences.
43. Preparatory Conference for the First PAN- African Congress of peoples and states, Dakar, Senegal, March 25-30, 1992. **Invited Paper Read:** Science and Technology Integration of Africa: a matter of survival.
44. International Conference on Commutative Algebra, Fes, Morocco, April 20-25, 1992. 1992. K-theory of polynomial rings orders and group-rings. (**Invited Paper**)
45. UNESCO Workshop on the Writing of structured texts for African Universities, Nairobi, Kenya, June 8-11, 1992.
46. First European Congress of Mathematics, Paris, France, July 3-10, 1992. I participated in a Round-Table on Co-operation of European Mathematical Society with Developing Countries.
47. Seventh international Congress of Mathematics Education, Quebec, Canada, August 16-23, 1992. **I Organised a session on** 'Undergraduate Mathematics Education for Specialists, Future Researchers and Mathematics Teachers'.
48. Advanced Workshop on Arithmetic Algebraic Geometry, ICTP, Trieste, Italy, August 31 to September 4, 1992. **I chaired a round-Table on the Status** of Mathematics in the Third World.

49. African Mathematical Union Symposium on Mathematics Education in Africa for 21st Century, Cairo, Egypt; September 5-10 1992. **I was Chairman of the Organizing Committee for this Symposium**.
50. Third World Academy of Science (TWAS) General Conference, Kuwait, November 24-28, 1992.
51. International Symposium on 'Current Research Trends in Mathematics, Computer Science and Mathematical Physics' Port Novo, Benin Republic, January 1993. **Invited Paper Read:** Some Recent Developments in the K-theory of group-rings and orders in algebras.
52. Annual Meeting of the American Association for the Advancement of Science (AAAS), Boston, USA, February 1993**. I gave an Invited talk on** 'Capacity Building and Human Resources for accelerated Development of Science and Technology in Africa.
53. 'Math Fest. 93'. Atlanta University Centre, Atlanta, Georgia, USA; March 18-20, 1993. **I gave an invited address Entitled** 'Mathematics as a Universal Language.'
54. International Conference on Algebraic K-theory, Mathematisches Forschungsinstitut, Oberwolfach, Germany; June 27 – July 3, 1993. **I gave an invited Lecture titled;** Higher K-theory of Modules over finite EI categories.
55. UNESCO Conference on Science and Technology for the year 2000 and Beyond, Paris, France, July 5-10, 1993.
56. Joint American Mathematical Society (AMS). Canadian Mathematical Society (CMS), Mathematical Association of America (MAA)., Meeting, university of British Columbia, CMS, MAA, USA national Association of Mathematicians (NAM). **Invited address titled:** Mathematical Research and Education in Africa –Problems and Prospects.
57. Tenth Anniversary meeting of the Third World Academy of Science, ICTP Trieste, Italy; October 31 – November 5, 1993.
58. One hundred and twenty fifth (125th) Anniversary Celebration of the Finnish Mathematical Society, University of Helsinki, Finland; December 1-2 `1993. **I gave an invited Address on** Mathematics as a Universal Language'.
59. International Symposium on Current Research Trends in Mathematics, Computer Science and Mathematical Physics, University of Ibadan, Nigeria; January 17-21, 1994. **I gave an invited Lecture on** K-theory of Modules over 'EI categories.
60. International Conference on 'Algebraic K-theory and Arithmetic' Fields Institute, Waterloo, Canada, February 28- march 3, 1994.
61. International Conference on Algebraic K-theory and connections with Algebraic Groups – Universitat Bielefeld July 20-24, 1994. **Invited Paper Read:** Higher K- theory of orders Grouprings and Modules over EI-categories.
62. International Workshop on Cyclic Homology – Trento, Italy, July 18-22, 1994.
63. International Congress of Mathematicians, Zurich, Switzerland, August 1- 10 1994.
64. International Workshop on the future of Mathematics communication, MSRI, Berkeley, California, USA, **Invited Paper Read:** Electronic Communications in Africa: situation Report. November 30 – December 3, 1994
65. ICMI Conference on International Collaboration on Education Monash University Melbourne, Australia, April 19-24, 1995. **Paper Read:** Mathematics Education in Africa in relation to other continents.
66. International Conference on Commutative Algebra, University of Fes. Morocco. June 5-10, 1995 **Invited Paper Read:** K-theory of Polynomial extensions.

67. 50th Anniversary Celebrations of UNESCO, ICMS, Edinburgh, UK, Nov. 95.

68. Fourth AMU Pan-African congress of Mathematicians, Ifrane, Morocco. **Invited Paper Read:** Higher Class Groups of orders and groupings

69. 10th Anniversary celebrations of the African Academy of science, Nairobi, Kenya, Dec., 1995.

70. Great Lakes K-theory conferences, Fields Institute, Toronto Canada, March 1-3, 1996. **Invited Paper Read:** Higher Class Groups of orders and groupings

71. International Conference on K-theory, Maths Inst., Oberwolfach, Germany, June 10- 15, 1996. **Invited Paper Read:** Equivariant K-theory for compact Lie Group actions.

72. 8th International Congress on Mathematics Education on Mathematics Education, Seville Spain, July 13-21, 1996. I co-organised a Working Group on International cooperation on Mathematics Education.

73. Second European Congress of Mathematics, July 21-28, 1996.

74. African Mathematical Union Workshop in Algebra, University of Ouagadougou, Burkina Faso, April 21-25, 1997. **Invited Lecture:** Equivariant Higher K-theory for Compact Lie Groups actions.

75. Joint AMS-SAMS-LMS meeting, University of Pretoria, South Africa, June 25-28, 1997. **Invited Lecture:** Higher Class Groups of Orders and Integral Groupings.

76. AMS summer Research Conference, University of Seattle, Washington USA. July 12-25, 1997. **Invited Lecture:** Higher Class Groups and Continuous K-theory of p-adic orders.

77. ICTP Workshop/ Symposium on Algebraic K-theory and its application, Trieste, Italy, Sep. 1-19, 1997. **I was a Director** as well as Local organizer of the Workshop/Symposium.

78. Workshop on Algebraic K-Theory, Université Paris, VII, France. **Invited Lecture:** Non-Commutative Chern characters of compact Lie group C-algebra.

79. Great Lakes Algebraic K-Theory meeting and Annual AMS meeting, University of Illinois, Urbana-Champaign. March, 1998.

80. International Congress of Mathematicians, Berlin, Germany. August 18-27, 1998.

81. 10th General meeting of TWAS, Trieste, Italy. December 9-10, 1998.

82. International Workshop on Stable Homotopy and Algebraic K-theory. Universitaat Bielefeld, Germany. February 10-15, 1999.

83. International Conference on Non-Commutative Algebras, CIRM, Université Luming, May 21-25, 1999.

84. International Conference on 'Algebraic K-Theory', Mathematisches Forschungsinstitut Oberwolfach, Germany, September 26 - October 2, 1999. **Invited Lecture:** Non-Commutative Chern characters of compact Lie group C*-algebras and compact quantum groups.

85. EXCITE (European Science Centres) Annual Conference, Prague, Czech Republic, November 18-20, 2000. **Invited Lecture:** North-South cooperation for global literacy and numeracy.

86. TWAS General Conference and AFRISTEC Meeting, Dakar, Senegal. November 21-26, 1999.

87. 5th AMU Pan-African Congress of Mathematicians, University of Western Cape, Cape Town, South Africa. **Invited Plenary Lecture:** Chern characters in non-commutative geometry.

88. International Workshop on Arakelov Geometry, Université Montpellier II, France. May 26-27, 2000.

89. TWAS General Meeting, Teheran, Iran. October 21-26, 2000.

90. First Pan-African Symposium of Mathematics Olympiads, Tunis, Tunisia. November 1-6, 2000. **Invited Plenary Lecture:** Mathematical sciences and other sciences.

91. Science Institute group (SIG)/African Academy of Sciences (AAS) meeting on "Millennium Science Initiatives in Africa", Nairobi, Kenya. November 14-16, 2000. **Invited Lecture:** Mathematical Sciences vis-à-vis basic sciences in Africa.

92. International Conference on "Recent Advances in the Mathematical Sciences" --- To celebrate the 50th Anniversary of the Indian Institute of technology, (ITT), Kharagpur, India. December 20-22, 2000. Invited **Keynote Address:** Continuous Cohomology and Higher K-Theory of exact categories.

93. International Conference on "Geometric Analysis and Index Theory", Trieste, Italy, March 18-24, 2001. **Invited lecture**: Equivariant Hopf-algebra KK and Index theories.

94. International Conference on "Quantum Field Theory, Non-Commutative Geometry and Quantum Probability", March 26-29, 2001. I was a member of the Scientific Committee for this meeting.

95. Great Lakes K-theory Conference, Evanston, Illinois, USA, April 20-22, 2001

96. High-Dimensional Manifold Topology, Workshop Conference, Trieste, Italy, May 21 - June 8, 2001.

97. International Conference on "Topology and its Applications". Norfdjordeid, Norway, August 6-10, 2001. **Invited lecture**: Profinite and continuous higher K-theory of exact categories, schemes, orders and group rings.

98. International Workshop on "Mathematics for Development of Africa". Arusha, Tanzania, Nov. 19-21, 2001. **Invited paper read:** Mathematics and the development of Africa - The way forward.

99. Expert group meeting on Millennium Science Initiative (MSI) Institutes in Africa, Kampala, Uganda, Jan.

100. The Conference on Algebraic Topology, Northwestern University, Evanston, Illinois. USA. March 24-28, 2002.

101. Workshop on K-theory, Derived Categories and Strings, Geneva, Italy, June 18-21, 2002. (I was a member of the Scientific Committee).

102. Workshop on Stratifications of Moduli Spaces, Warsaw, Poland, May 14-19, 2002. **Invited lecture:** profinite and continuous higher K-theory of exact categories, schemes, orders and group rings.

103. School and Conference on Algebraic K-theory and its Applications (in honour of H. Bass), in Trieste, Italy, July 8-16, 2002. **I gave <u>six</u> invited lectures** on "K-theory and Representation Theory".

104. Conference on Algebraic K-theory and its Applications, July 22-26, 2002. **I gave an invited lecture** on "Profinite and continuous higher K-theory of exact categories, schemes and orders".

105. International Conference on "Algebraic K-theory". Mathematisches Forschungsinstitut Oberwolfach, Germany, August 4-10, 2002.

106. International Congress of Mathematicians, Beijing, China. August 18-26, 2002.

107. Workshop on “Enriched Structures and Stable Homotopy”, Cambridge, United Kingdom. September 8-19, 2002.

108. Conference on "K-theory and Arithmetics", Cambridge, United Kingdom. September 30 - October 4, 2002.

109. TWAS 8th General Conference and 13th General Meeting, New Delhi, India. October 19-24, 2002.

110. G-77 High Level Conference on Science and Technology, Dubai, UAE. October 25-26, 2002.

111. TWAS 9th General Conference and 14th General Meeting, Beijing, China, October 16-20, 2003

112. International Workshop on "Geometric Methods in Representation Theory", University Warwick, Coventry, United Kingdom, March 28-April4, 2004. **Invited lecture**: "K-theory and Periodic Cyclic Homology of Some Quantum Algebras."

113. International Workshop on "Hopf Algebras", University of Wales at Swansea June 24-26, 2004. Invited lecture: A complete formulation of Baum-Connes Conjecture for the action of discrete quantum groups.

114. International Conference on "Algebraic K-Theory and its applications, Safi, Morocco, July 25-30, 2004. I co-organized this conference and also gave an invited lecture on "A complete formulation of Baum-Connes conjecture for the action of discrete quantum groups".

115. International Conference on "Topology, Analyses and Application to Physics" at Moscow State University, Russia, Feb. 13-20, 2005. **Invited paper read:** "A complete formulation of the Baum-Connes conjecture for the action of discrete quantum groups".

116. International Workshop on Algebraic K and L-theory of infinite groups, Edinburgh, UK, June 27-July 1, 2005. I gave an invited lecture titled: "Higher K-theory of virtually infinite cyclic groups".

117. International Workshop on "Representation Theory in Geometry and Physics", IMSP, Porto-Novo, Benin Republic, August 1-17, 2005. I was a co-organiser of the Workshop.

118 International conference on "Algebraic K-theory". Mathematisches Forschunginstitut, Oberwolfach, Germany. July, 2006.

119 International Workshop on Non-Commutative Geometry and Cyclic Cohomology July 31 to August 4, 2006.

120 ICSU Regional Office for Africa consultative Forum.Sept 25-27, 2006

121 African Union Congress of African Scientists and Policy Makers , Alexandria, Egypt, October 26-29, 2006. I gave an invited Key-note Address on "African Solutions to African challenges through Science and Technology"...

122 Blackwell-Tapia Conference, IMA, Minnesota, USA, Nov3-4, 2006

123 International Workshop on "Representations, Cohomology and Support Spaces" Bielefeld, April 29-May 1, 2007.

124 ICTP School and Conference on "Algebraic K-theory and its Applications" May 14-June 1, 2007. I was a Director of the School/Conference and I also gave an invited lecture on "Farrell-Jones conjecture and Higher K-theory of twisted polynomials and power series rings".

XIII. Research Interest and Contributions

- My research area is Algebra in a broad sense. My research over the years have focussed on Commutative and Non-commutative Algebra /Arithmetic/Geometry through methods of K-theory, Cyclic homology, encompassing Algebra, Number theory, Representation theory, Algebraic topology, operator algebras and some Algebraic Geometry and Differential

Geometry. Such usually non-commutative structures; include e.g. (1) Orders in algebras over number fields and p-adic fields; (2) Group-rings and representations of finite, discrete, profinite, algebraic and compact Lie groups); (3) C*-algebras, and Lie groups C*-algebras; (4) Hopf algebras and Quantum groups. Note that cyclic homology and K-theory of the latter two structures belongs to non-commutative geometry.

- My initial work contributed to the understanding of the LF and NF functors with applications to the computation of Picard group of Algebraic Geometry, see [3]. Moreover, I also contributed to the understanding of Whitehead groups of group-rings of finite group over the ring of integers in algebraic number fields and p-adic fields as well as Whitehead groups or orders in algebras over such fields. I proved several finiteness results in this direction (see [4],[5]).
- Later, with the definition of Higher Algebraic K-theory by Quillen and others, it became important for various applications to understand the structure of Higher K-theory of orders and group-rings, (that is, to study K_n (all n) of the category of finitely generated projective modules over grouprings and orders; K_n of the category of G-representations in the category of finitely generated modules over such rings as the ring of integers in number field, their localisations and completions, where G is a finite, profinite or compact group). More precisely, let R be the ring of integers in a number field F, A any R-order in a semi-simple F-algebra Σ, $\underline{p}$ a prime ideal of R, I have proved many striking results on the Higher K-groups $K_n(A)$, $G_n(A)$, as well as on Higher dimensional class groups $C\ell_n(A)$. For example, I proved that for all $n \geq 1$, $K_n(A)$, $G_n(A)$ are finitely generated Abelian groups, and that rank $K_n(A)$ = rank $G_n(A)$ = rank $K_n(\Sigma)$ for all $n \geq 2$; that $SK_n(A)$, $SG_n(A)$, $SK_n(A_{\underline{p}})$, $SG_n(\underline{p})$ and $C\ell_n(A)$ are finite groups for all $n \geq 1$. See [10],[12],[14],[17],[21]. All the results above hold for A=RG, (G finite group) and I also proved that if G is a finite p-group, then $SK_n(RG)$, $C\ell_n(RG)$ are finite p-groups for all $n \geq 1$. I also proved a striking characterisation of p-adic semisimple algebras Σ in terms of K-theory of maximal orders Γ in Σ, i.e. Σ is unramified over its centre if and only if $SK_{2n-1}(\Gamma)=0$ for all $n \geq 1$. (See [7]).
- In [12], I obtained several important results on the Higher K-theory of the category of representations of a finite group G in the category of $\underline{P}(\Gamma)$ where Γ is a maximal order in a central division algebras over number fields and p-adic fields. These results translate into computations of $G_n(\Gamma G)$ as well as lead to showing via topological and representation theoretic techniques that a non-commutative analogue of a fundamental result of R.G. Swan at the zero-dimensional level does not hold.
- Moreover, in collaboration with A. Dress, I was able to formulate an equivariant Higher Algebraic K-theory via the theory of Mackey functors and this equivariant theory has proved very useful in proving result on Higher K-theory of group-rings. More precisely, if G is any finite group, *C* an exact category, and T a G-set, we constructed higher algebraic K-functors (-,*C*,T), (-,*C*,T) as "Mackey functors" from the category of G-sets to the category of Abelian groups, (i.e. functors satisfying certain functorial properties, in particular, the categorical version of Mackey subgroup theorem in representation theory), in such a way as to identify (G/H, $\underline{M}(R)$, G/e) with $K_n(\underline{M}(RH)$ = $G_n(RH)$; (G/H, $\underline{P}(R)$, G/e) with $K_n(\underline{P}_R(RH))=G_n(R,H)$, and (G/H, $\underline{P}(R)$, G/e) with $K_n(RH)$ for any subgroup H of G where for any ring R with identity, $\underline{P}(R)$ is the category of finitely generated projective R-modules and $\underline{M}(R)$ is the category of finitely generated R-modules, (R Noetherian), and $\underline{P}_R(RH)$ the category of RH-lattices, see [8],[9]. I have since generalised these constructions to the cases where G is a profinite group (see [11]) and G a compact Lie group (see [24]). These

constructions have also been useful in studying cohomology of groups. My book on 'Axiomatic theory of induced Representation of Finite Groups', is an exposition of the theory of Mackey functors in the context of representation of finite groups (see [48]). Through the above techniques I was able to prove the striking result that if k is a field of characteristic p, G a finite or profinite group, then the inclusion functor $\underline{P}(kG) \to \underline{M}(kG)$ induces an isomorphism ~ (see [8],[11]). This result leads to some interesting computation of e.g. that for a finite group G, is a finite p-group (see [14]).

- Furthermore, I have studied and obtained several finiteness results on Higher K-theory of modules over 'EI' categories, i.e. categories in which every endomorphism is an isomorphism. The theory of modules over 'EI' categories is a generalisation of modules over group-rings and has topological applications in the study of transformation groups since certain topological invariants reside in the K-theory groups (see [20]).
- Let C be an exact category, ℓ a rational prime. I have developed an extraordinary cohomology theory in form of a profinite Higher K-theory (C,ℓ) yielding remarkable ℓ-completeness theorems for various exact categories C and in particular for the profinite higher K and G-theories (A,ℓ):= $(\underline{P}(A),\ell)$; (A,ℓ):= $(\underline{M}(A)_\ell)$ where A is any R-order in a semisimple F-algebra over number fields and p-adic fields. This study was inspired by continuous cohomology theories rooted in algebraic topology and Arithmetic Algebraic Geometry. With the techniques above, I also proved that if R is the ring of integers in a p-adic field F, ℓ a rational prime the , are finite groups and that under suitable hypothesis (e.g. A=RG, G finite group) then is also finite. I have also defined and studied continuous K-theory of p-adic orders A, and obtained several results on this construction including the fact that is a pro-p-group (see [27]).
- In a joint work with G. Tang, I have obtained interesting results on higher K-theory of virtually infinite cyclic groups V for the two types of V. When V is the semi-direct product where is an automorphism and the action of the infinite cyclic group is given by , we proved among other results that if R is the ring of integers in a number field F, then for all , is a finitely generated Abelian group and for all , is |G|-torsion. For the second type where the are finite and we prove that the Nil groups of V are |H|-torsion (see [32]).
- In a joint work with G. Tang, I obtained explicit computation of the "bar" homology groups of a non-initial ring - a problem arising in higher K-theory and algebraic topology, see [30].
- I have in a joint work with M. Mahdavi-Hezavehi investigated and obtained interesting results on the algebraic structure of subgroups of the group of units of a non-commutative local ring (see [33]).
- I have also been working on Non-commutative geometry especially entire/periodic cyclic homology and K-theory of involutive Banach algebras, C*-algebras, group C*-algebras, Hopf algebras and quantum groups and studying connections (Chern characters) between K-theory and cyclic homology of these structures. More precisely, I have, in a joint work with D.N Diep and N.Q. Tho, constructed and studied non-commutative Chern characters from K-theory of compact Lie group C*-algebras and compact quantum groups to their entire/periodic cyclic homology, and proved interesting results - that the Chern characters are isomorphisms modulo torsion in the case of compact Lie group C*-algebras and compact quantum groups, (see [22],[25]).
- I have also, in a joint work with D.N. Diep, obtained some interesting results on non-commutative Chern characters of some non-compact quantum algebras see [31]. More precisely, we proved that the periodic cyclic homology groups of the quantised algebra of functions on coadjoint orbits of connected and simply connected Lie groups are isomorphic

to the periodic cyclic homology of the quantised algebra of functions on coadjoint orbits of compact maximal subgroups, without localisation. We also compute the K-groups, periodic cyclic homology and Chern characters of such algebras for quantum half planes and quantum punctured complex plane.

- I have also been working on quantum group theoretic formulation of the Baum-Connes conjecture - a celebrated problem in non-commutative geometry. More precisely let A be a discrete quantum group acting on a C*-algebra B and satisfying some regularity assumptions (resembling the proper G-compact action for a classical discrete group G on some space). I have in a joint work with D. Goswami (see [34]) constructed an analytic assembly map) from the A-equivariant K-homology groups to the K-theory groups.. In [36], we have provided a complete formulation of Baum-Connesoconjecture for the action of discrete quantum groups as well as verified our formulation for general finite dimensional discrete quantum groups and proved surjectivity of our assembly map for the dual of $SU_q(2)$.
- In a joint work with X. Guo, I have defined and studied wild kernels for higher K-theory of division algebras D over number fields. We proved among other results that it is finite. We also obtained interesting connections between the wild kernels and the subgroup of divisible elements of .of K-tgroups of the division algebras. (see [37])
- In a joint work with Guo and Qin (see [38], I have proved that if *F* is a number field and D a finite dimensional central division F-algebra with square free index, then K_2D is generated by Steinberg symbols *{a,b}* with *aF**, *bD**, whereas if *F* is a global field, then for any integer n>3, there is an extension field *E* over *F* of degree *n* such that K_2E is not generated by the Steinberg symbols *{a,b}, a in F*, b in E**.
- In a joint work with X. Guo, I proved that if *A* is a quarternion algebra and B an Eichler order in A, then the only p-torsion possible in even dimensional higher class groups of B are for those rational prime p which lie under prime ideals of O_F at which is not maximal. A similar result is obtained for hereditary orders in semi-simple algebras. (See [40])
- In [42], I have constructed absolute and relative equivariant higher Algebraic K-Theory for Waldhausen categories as a generalization of the constructions in [8] for exact categories. Applications to Thomason's complicial Waldhausen categories are given as well as some finiteness results for some Waldhausen K-groups.
- In [43], I proved that if R is the ring of integers in a number field F and A is any R order in a semi-simple F algebra, then K_{2a} A, G_{2n} A are finite groups and that when G is a finite p-group, SK_{2n-1} (Z G), SK_{2n-1} (Z_pG), are finite p-groups
- [42] is a comprehensive exposition of Higher algebraic K-theory including constructions, fundamental results, and connections to Galois, Etale , Motivic Cohomology theories, Representation theory as well as well as computations of K-theory of intefers in global and local fields.
- .Let G be an algebraic group over a field F.. In [45] , I studied and computed equivariant higher K-groups as well as profinite equivariant higher K-groups for some G-schemes over number fields and p-adic fields. I also obtained among others, some finiteness and l-completeness results for twisted flag varieties etc.
- In [46], I proved that the rational Higher K-theory and G-theory for twisted power Series rings over arbitrary orders are isomorphic as well as isomorphic to rational K-theory of twisted power series rings over semi-simple algebras over number fields.. I also proved some finiteness results for negative K-theory of such rings as well as some l-completeness and other results for profinite K-theory of such rings.

- In [47], I construct a cohomology theory in the category of generalized co-efficient systems in a purely categorical setting in order to generalize classical Bredon cohomology theory and show that this theory constructed in general categorical terms indeed yields Bredon cohomolgy for finite, discrete, profinite and compact Lie groups. We also study Higher K-theory for the category of finitely generated (resp. finitely generated projective) objects in the category of generalized Bredon co-efficient systems and obtain some finiteness results.
- In [48], I study higher K-theory of p-adic orders, and twisted polynomial and power series rings over p-adic orders. For higher K-theory of p-adic orders, I obtain a partial solution to an open question, and in the three cases, obtain some p-torsion results. I also prove that higher K- and G-theories of twisted Laurent series rings over p-adic orders are rationally isomorphic.

- I have published a book titled 'Abstract Algebra' suitable for the use of honors undergraduates and beginning graduate students in mathematics (see [49]). Moreover, I have published in the lecture notes series of the National Mathematical Centre, Abuja, Nigeria, my notes on 'Topics in Algebraic K-theory', and 'Commutative Algebra' - all arising from the invited lectures I gave at the centre on the topics (see [52],[53]). I have edited several Proceedings of International K-theory meetings –including Journal publications-- see [50], [51], [55], [56], [58] My new book "Representation Theory and Higher Algebraic K-theory"

  published by Chapman and Hall/Taylor and Francis is suitable for an advanced graduate course .or for use by Researchers in the field and related fields. It has xxvii +442 pages. (See [57]).

  Finally, I have published quite a number of papers on topical issues in Mathematical Research and Education, as well as Topical issues in Science and Technology (see [59] to [78]).

XIV. Research In Progress

1. I am currently studying various operations, e.g., λ-operations, Adams operations on the Equivariant higher K-theory, which I have defined for profinite and compact Lie groups. I am also studying the connection between the equivariant K-theory and other Equivariant homology and cohomology theories, e.g. Bredon cohomology. I am also working on G-spectrum formulation of the equivariant higher K-theory for G profinite and compact groups.
2. I had earlier proved some finiteness results for the higher K- theory of finite 'EI' categories. I am currently studying Higher K-theory of modules over arbitrary 'EI' categories with applications to orbit categories, component categories and fundamental group categories of G-spaces, where G is a compact Lie group.
3. I am currently working on further explicit computations of Higher K-groups of R- orders where R is the ring of integers in number fields and p-adic fields as well as when the orders are group rings RG where G is a p-group or metacyclic group (e.g. dihedral, quarternion groups) and nilpotent groups.

4.I am working on specific computations of higher-class groups of orders and group-rings by exploiting connections with Galois and Etale cohomology theories. I am also working on some questions concerning torsion in even-dimensional higher class groups.

5.I am currently working on Chern characters between K-theory and cyclic homology – entire/periodic cyclic homology including the context of Lie group C*- algebras and quantum groups. I am currently working on Chern characters of locally compact quantum groups by computing K-theory and cyclic homology of locally compact quantum groups.

6.I am also trying to compute cyclic homology of orders and integral group rings of finite, profinite and compact groups and in the process obtain computations for K- theory of group rings of such groups.

7.I am currently working on the Baum-Connes conjecture especially a quantum group formulation of the conjecture. As a follow-up to [34] and [36], I am trying to define assembly maps for locally compact quantum groups.

8.I am currrently working on equivariant Higher algebraic K-theory for the action of algebraic groups , emphasizing the connections between the equivarinat K-theories defined in my book and the recent work of Merkurjev.

9.I am working on the extensions of my recent results on profinite higher K-theory of exact categories to Waldhausen categories.

10.I am trying to construct a non-commutative Algebraic Geometry via an attempt to formulate non-commutative version of Gröthendieck topology.. I am also working on constructing non-commutative etale cohomology which will be an extension of Soule's constructuons to Division algebras and (non-commutative) maximal orders.

XV. Publications

A) Thesis/Dissertation

1.A.O. Kuku: A survey of Algebraic K-theory, M.Sc. Ibadan, 1968

2.A.O. Kuku: On the Whitehead group of p-adic integral group-rings of finite p-groups. Ph.D. Ibadan, 1971 (Thesis written at Columbia University, New York, USA, under Professor Hyman Bass)

B) RESEARCH ARTICLES

3.A.O. Kuku (1973): Some Algebraic K-theoretic applications of the LF and NF functors. **Proceedings of the American Mathematical Society**, 37 (2) 363-365.

4.A.O. Kuku (1973): Whitehead group of orders in p-adic Semi-simple algebras. **Journal of Algebra** 25 (3) 415-418

5 A.O. Kuku (1976): Some finiteness theorems in the K-theory of orders in p-adic algebras. **Journal of London Mathematical Society**, (13) 122-128.

6 A.O. Kuku (1977): SK_n of orders and G_n of finite signs, Algebraic K-theory – **Lecture notes in Mathematics, 551. Springer-Verlag, Berlin Heidelberg-New York. 60-68.**

7 A.O. Kuku (1979): SG_n of orders and group-rings. **Mathematisches Zeitschfifts,**, 291-295.

8 A. Dress and A.O. Kuku (1981): The Cartan map for equivariant higher algebraic K-groups. **Communications in Algebra**, 9(1) 727-746.

9A.O Kuku and A. Dress (1982): A convenient setting for equivariant higher algebraic K-theory. **Lecture Notes in Mathematics. 966, Springer-Verlag; Berlin,** Heidelberg, New York, 59-68.

10 A.O. Kuku (1982): Higher algebraic K-theory of group-rings and orders in algebras over number fields. **Communications in Algebra.** 10(8) 905-916.

11 A.O. Kuku (1984): Equivariant K-theory and the cohomology of profinite groups. **Lecture Lecture notes in Mathematics 1046, Springer-Verlag: Berlin Heidelberg, Heidelberg New-York.** 235-244.

12 A.O. Kuku (1984): K-theory of group-rings of finite groups over maximal orders in division algebras. **Journal of Algebra**, 91(1) 19-31.

13 .O. Kuku (1984): Some applications of Algebraic K-theory to representation theory, number theory, homological algebra, topology, and analysis. **Abacus**, 17(1), 1-18.

14 A.O. Kuku (1986): K_n, SK_n of integral group-rings and orders. **Contemporary Mathematics**, 55, 333-338.

15A.O. Kuku (1986): Induction Theory for finite group representations via Mackey functors. **Proceedings of Abidjan Symposium on Methods Group Theory**, 1986.

16 A.O. Kuku (1987): Some recent development in Algebraic K-theory, **Proceedings of the SAMSA Conference, Lesotho, 1987,** 52-63.

17 A.O. Kuku (1987): Some finiteness results in the higher algebraic K-theory of orders and group-rings, **Topology and its Applications 25,** 185-191.

18A.O. Kuku (1993): Some recent developments in the K-theory of group-rings and orders in algebras. **Afrika Matematika** (3) 2, 1993, 67-77.

19A.O. Kuku (1995): Algebraic K-theory and some other areas of Mathematics **Proceedings of the Third Pan-African Congress of Mathematics**, pp. 1-20, 1995.

20 A.O. Kuku (1996): Higher K-theory of modules over 'EI' Categories. **Afrika Matematika** (3) 6, 1996, pp 15-28.

21 A.O. Kuku (1999): Ranks of K_n and G_n of orders and group-rings of finite

groups over integers in number fields **Journal of pure and Applied Algebra** 138 (1999), 39-44.

22 D.N. Diep, A.O . Kuku and N.Q. Tho (1999): Non-Commutative Chern character of compact Lie group C*-algebra. **K-Theory Journal** (1999) 17(2) 195-208.

23 D.N. Diep, P.H. Hai and A.O. Kuku (1999): Compact quantum group C*-algebra as Hopf Algebras with approximate units (Preprint).

24 A.O. Kuku (2000): Equivariant Higher K-theory for compact Lie group actions. **Beitrage Zur Algebra und Geometrie (Contributions to Algebra and Geometry** (41) (2000) No 1, 141-150.

25 D.N. Diep, A O. Kuku and N.Q. Tho (2000): Non-Commutative Chern Characters of compact quantum groups. **Journal of Algebra** 226, 311-331 (2000).

26 A.O Kuku (2000): Higher Dimensional class groups of grouprings and orders in algebras over number fields (Preprint).

27 A.O. Kuku (2001): Profinite and continuous higher K-theory of exact categories, orders and group – rings. **K-Theory Journal** 22, 367-392 (2001)

28 A.O. Kuku (2003): Classical Algebraic K-theory (i.e. the functors K_0,K_1,K_2) **Handbook of ALGEBRA**, vol. 3, 157-196: Elsevier (2003).

29 A.O. Kuku (2001): Continuous cohomology and Higher K-theory of exact categories. **In "Applicable Mathematics - its Perspectives and Challenges". (J.C. Misra (ed)) pp. 42-53**. Narosa Publishing House, New Delhi, India.

30 A. O. Kuku and W. Tang (2003): An explicit computation of the "Bar" homology groups of non-unital ring. "**Beitrage zur Algebra and Geometrie**", vol. 4, no 375-382 (2003)

31. D.N. Diep and A.O. Kuku (2001): Non-commutative Chern-Connes characters for some Non-compact quantum algebras (preprint)

32 A.O. Kuku and G. Tang (2003): Higher K-theory of group rings of virtually infinite cyclic groups. **Mathematisches Annalen,** 325, 711-726 (2003).

33 A.O. Kuku and M. Mahdavi-Hezavehi (2004): Subgroups of $GL_1(R)$ for local rings R **Communications in Algebra**", vol 32, no. 5, 1895-1902 (2004).

34 D. Goswami and A.O. Kuku (2002): Towards the Baum-Connes analytical assembly map for the actions of discrete quantum groups (Preprint).

35 A.O. Kuku (2003): K-theory and representation theory. "Contemporary Developments in Algebraic K-theory" **Proceedings of the ICTP (2002) K-theory School (**dedicated to H. Bass on his 70th birthday) . ICTP Lecture Notes Series (15), 259-356 (2003).

36 D. Goswami and A.O. Kuku (2003): A complete formulation of Baum-Connes con jecture for the action of discrete quantum groups. '**K-theory' Journal 30**, 344 – 363 (2003)

37 X. Guo and A.O. Kuku (2006): Wild kernels for higher K-theory of division and semisimple algebras. "**Beitrage zur Algebra and Geometrie**" and "**Contributions to Algebra and Geometry**". 47, (1) 1 - 14

38 X. Guo, A.O. Kuku and H. Qin (2003): On K_2 of division algebras. **Communications in Algebra**, 33 (2005) No. 4, 1073-1081

39. D.N. Diep and A.O. Kuku (2003): K-theory and periodic cyclic homology of some non-compact quantum algebras (Preprint).

40 X. Guo and A.O. Kuku (2005): Higher class groups of generalized Eichler orders. **Communications in Algebra**, 33 (2005) No. 3, 709-718

41. A.O. Kuku (2006): Higher Algebraic K-theory **Handbook of Algebra**. Vol. 4. Elsevier , 3 - 74 (2006)

42 A.O. Kuku (2006): Equivariant Higher algebraic K-Theory for Waldhausen Categories. "**Beitrage zur Algebra und Geometrie"**" Vol 47, No.2., 583-601 (2006) .

43 A. O. Kuku (2005): Finiteness of Higher K-groups of orders and grouprings. "**K-theory**" Journal., 36, 51 -58

44 X. Guo and A.O. Kuku (2009): Higher class groups of locally triangular orders over m number fields . "ALGEBRA COLLOQUIM" 16 : 1, (2009) 79-84

45 A. O. Kuku (2007) Profinite Equivariant Higher Algebraic K-theory for the Action of Algebraic Groups (Preprint)

46 A. O. Kuku (2007) Higher Algebraic K-theory for twisted Laurent series rings rings over orders and semi-simple algebras. "ALGEBRAS AND REPRE-SENTATION THEORY" (2008) 11: 355-368

47 A. O. Kuku (2008) Cohomology and Higher K-theory for generalized Bredon co-efficient systems. (Preprint)

48 A. O. Kuku (2008) Higher Algebraic K-theory of p-adic orders and twisted Polynomial and Laurent series rings over p-adic orders. (preprint)

(C) <u>Books and Monographs</u>

49 A.O. Kuku (1980): Abstract Algebra, **Ibadan University Press** Reprinted 1992) <u>xvii + 419</u> pages

50 A.O Kuku , E. Thoma, J. H. Rawnsley: (1985) Group Representations and its

applications. Proceedings of an International Summer School, Ibadan, Nigeria 1981 **Les Cours du CIMPA, Nice, France (1985)**

51A.O Kuku and C.A. Weibel (ed) (1989): **Proceedings of the Symposium on Algebraic K-theory,** Ibadan, 1989. **K-Theory Journal**

52 A.O. Kuku (1997): Basic commutative Algebra, **Lecture Notes Series, National Mathematical Centre, Abuja, Nigeria.**

53 A.O. Kuku (1997): Topics in Algebraic K-theory. **Lecture Note Series, National Mathematical Centre , Abuja Nigeria**.

54 H. Bass, A.O. Kuku and C. Pedrini (ed) (1999): Algebraic K-Theory and its Applications. **Proceedings of the Workshop and Symposium, Trieste, Italy. World Scientific, 1999. xii + 607 pages.**

55 M. Karoubi, A.O. Kuku and C. Pedrini (ed) (2003): "Contemporary Developments in Algebraic K-theory" **(Proceedings of the ICTP (2002) K-theory School** dedicated to H. Bass on his 70th birthday). ICTP Lecture Notes Series (15), viii + 536 pages.

56 M. Karoubi, A.O. Kuku and C. Pedrini (ed) (2003): **Four special issues of K-theory Journal (Proceedings of (2002) ICTP K-theory Conference** dedicated to H. Bass on the occasion of his 70th birthday).

57 A. O. Kuku (Book) (2007) RepresentationTheory and Higher Algebraic K-theory, C Chapman and Hall/Taylor and Francis xxviii + 442 pages.

58 E. Friedlander, A. O. Kuku, and C. Pedrini(2008).(Ed) Recent Developments in Algebraic K-Theory. Proceedings of ICTP School on "Algebraic K-K-Theory and its Applications, May 14-26, 2007. ICTP Lecture Series . vii + 347 pages.

(D) **<u>Articles On Topical Issues In Mathematical Research And Education, Science And Technology</u>**

59 A.O. Kuku (1988): Mathematics as a service subject –The African Experience. Selected papers on the teaching of mathematics as a service subject; R.R.Clemens et al (ed) **Springer-Verlag, New York. 53-67**.

60 A.O. Kuku (1988): Mobilisation and production of basic scientists for the development of Africa. **Proceedings of the First Congress of African Scientists, Brazzaville, Congo 223-234**.

61. A.O. Kuku (1988): Towards a more comprehensive Franco-African co-operation in mathematics, **Proceedings of Mathematiques a vneir' Societe Mathematique du France. Paris**.

62. A.O. Kuku (1988): Mathematical Sciences and African Development – in '**Relevant Education for Africa'**. B. Dkana and L.C. Rayapen (ed) **PWPA 159-176**.

63. A.O. Kuku (1990): Networks in the context of new European relationships and North-South CO-development. **Proceedings of Prelude Congress Namur, Belgium**.

64 A.O. Kuku (1991): Mathematical Sciences and the development of Nigeria **Discourses of The Nigeria Academy of Science**.

65. A.O. Kuku (1993): Capacity Building and Human Resources for accelerated development of Science and technology in Africa in Science in Africa: **'Career strategies for graduate students' AAAS, 1993,19-22**.

66. A.O. Kuku (1993): Mathematical Research and Education in Africa. Problems and Prospects. Joint AMS-MAA-CMS-NAM invited Address, Vancouver, 1993.

67. A.O. Kuku (1994): Mathematics as a universal language **Bulletin of the Mathematical Society** of Finland 1994.

68.. A.O. Kuku (1994): Some perspectives on World Mathematics Year-WMY 2,000. **International Mathematical Union (IMU) Newsletter, 1994**) No. pp. 1-2

69 A.O. Kuku (1994): African mathematical Union (AMU) and the challenges of developing mathematical sciences in Africa. **London Mathematical Society Newsletter 1994**, pp. 1-3

70. A.O. Kuku (1995): Mathematical Education in Africa in relation to other continents. **(Proceedings of the International Commission on Mathematics Instruction)** Conference, Monash University, Melbourne, Australia, 1995, pp. 403-424.

71. A.O. Kuku (1996): Mathematics in AFRICA - an Appraisal. **TWAS Newsletter**.

72. A.O. Kuku (1997): Science and Technology Literacy (SLT) and Numeracy: Meanings and Rationales, **UNESCO book on 'Innovations in Science and Technology Education**. W. Jenkins (Ed.) pp.141-164

73.. A.O. Kuku **(**2002**):** Mathematical Sciences and other Sciences. **Proceedings of the African Symposium of Mathematical Olympiads, Tunis 9-**24

74.. A.O. Kuku (2001): Mathematics and the Development of Africa - The way forward. **Proceedings of Arusha Conference on Mathematical Sciences and African Development**. 114-120

75.. A.O. Kuku (2004): The Role of Mathematical Sciences in the Scientific,

Technological, Social and Economic Development of Nigeria, **Nigeria Academy of Science**(2004).

76. A.O. Kuku (2005): Mathematical Sciences and the development of Africa. Polimetrica, Italy, 75-81 (2005).

77. A. O. Kuku (2006) African Solutions to African Problems through Science and Technology. Invited Key-note Address at the congress of African Scientists and Policy Makers, Alexandria, Egypt Oct 26-29, 2006.

78 A. O. Kuku (2008) The role of Mathematics in the Scientific, Technological Development and Innovation of Africa. ICSU-ROA Book (To appear).

XVI. Biographical Listings

1.Who's who in the World
2.Dictionary of international biography
3.International Who's who of Intellectuals
4.Men of Achievement
5.Men and Women of Distinction
6.Who's who in Africa
7.Who's who in Nigeria.

XVI Hobbies And Extra-Curricular Activities

Ballroom Dancing, Chess, Table Tennis, Lionism-President Bodija Lions Club, Ibadan, Nigeria (1991-92 Lionistic year)

Melvin Jones Fellow, International Association of Lions Clubs, 1991-

Appendix

Summary of My Activities at ICTP during my Appointment 1995-2003

by

Professor Aderemi Oluyomi Kuku

1)From May to September 1995, as President of the African Mathematical Union, I organised from ICTP the Fourth Pan-African Congress of Mathematicians which took place at the AI-Ahakhawayn University, Ifrane, Maroc, September, 18-26, 1995. Apart from my numerous other contributions to the success of the Congress, I gave a plenary mathematics lecture on: "Higher class groups of orders and group-rings". It is note-worth that the General Assembly of the African Mathematical Union (AMU) unanimously decided to make me Honorary President of the AMU in appreciation of my nine years of meritorious service to the Union.

2)I have been in charge of weekly mathematics seminars at ICTP since July 1995, and I have been making mathematical contributions in several areas of mathematics during discussions at the seminars.

3)I initiated in March 1997, a series of specialised Algebra/Topology /K-theory seminars meant to explore deep connections between K-theory and other areas of mathematics – notable Algebra. Topology and geometry (Algebraic/Differential geometry/Non- Commutative geometry) as well as applications of K-theory to Mathematical Physics, Dynamical Systems, Econometrics and Control Theory.

4)I have been assessing and approving manuscripts of visiting mathematicians and Post-Docs for ICTP preprints/internal reports – since July, 1995

5)I completed the supervision of my Ph.D student, Michael Alawode, who visited ICTP January to July, 1996.

6)I gave invited Colloquium/Seminar lecturer at:

i)University of Edinburgh, U. K. (November, 1995)

ii)University of Sussex, U. K. (November, 1995)

iii)New Mexico State University, Las Cruses, USA, (March, 1996)

iv)Fields Institute, Toronto, Canada, (March, 1996)

v)Mathematiches Inst. Oberwolfach, Germany, (June 1996), September 1999

vi)Universita di Genova, Italy, (June, 1996)

vii)University of Lausanne, Switzerland, (November, 1996)

viii)Universitat Bieldfeld, Germany. (February, 1997), March 1999

ix)University of Ouagadougua, Burkina Faso, (May, 1997)

x)University of Witwatersrand, Johannesburg, South Africa (June, 1997)

xi)Rand Afrikaans University Johannesburg, South Africa, (June, 1997)

xii)University of Cape Town, Cape Town, South Africa (June, 1997)
xiii)Rhodes University, Grahamstown, South Africa (June, 1997)
xiv)University of Stellenbosch, Stellenbosch, South Africa (June, 1997)
xv)University of Natal, Pietemaritzburg, South African (June 1997)
xvi)University of the Western Cape Bellvile, South Africa, (June 1997)
xvii)University of Port Elizabeth, Port Elizabeth, South Africa (June, 1997)
xviii)University of the Free State, Bloemfontein, South Africa (June, 1997)
xix)University of Pretoria, Pretoria, South Africa, (June, 1997)
xx)University of Seattle, Washington, USA, (AMS Research meeting) July 1997.
xxi)Universite Lois Pasteur, Strasbourg, France, February, 1998.
xxii)Universite Paris VII, Paris, France, February, 1998.
xxiii)University of Trieste, Italy (October 1998)
xxiv)SISSA, Trieste, Italy (August, 1998)
xxv)University of Ljubljana, Slovenia (September, 1999)
xxvi)Sheriff University of Technology, Teheran, Iran (October, 2000)
xxvii)Dartmouth College, Hanover, New Hampshire USA (April, 2001)
xxviii)Univ. of Western Ontario, London, Ontario, Canada (April, 2001)
xxix)Univ. of Iowa, Iowa City (March, 2002)
xxx)Univ. of Poznan, Poland (May, 2002)
xxxi)Banach Centre, Warsaw (May, 2002)
xxxii)Northwestern Polytechnical University, Xian, China (September, 2002)
xxxiii)Nanjing University, Nanjing China (September, 2002)
xxxiv)Tongji Univ., Shanghai, China (2002)
xxxv)Indian Statistical Institute, Delhi, India (October, 2002)

I have generally assisted the Head of Mathematics in diverse ways: e.g. I assisted him in the preparation of the proposal document for the 1997 Schools on Nonlinear Functional Analysis, Elliptic Curves, and Algebraic K-theory submitted to EEC. I have participated in the selection of Post-Docs, Visiting Mathematicians and Associates since 1995.

I was a local organiser for the 1996 school on 'Computer Simulation of Partial Differential Equations', September 9-27, 1997.

I was a Director as well as the Local organiser for the 1997 School on "Algebraic K-theory and its applications" and I was in charge of all correspondence connected with the school. I worked in co-operation with the two other Directors towards the publication of the Proceedings of he Workshop at the School. The two other Directors of the School are Professors H. Bass, (Columbia University, NY, USA) and C. Pedrini, (University of Genova, Italy). The Proceedings was published by "World Scientific" (in 1999).

I was invited to be the 1997 Distinguished Visitor of the South African Mathematics Society – an honour awarded to only one mathematician in any year funds are available for such award. In this capacity, I gave invited colloquium/seminar lectures at eleven South African Universities. (See (6) x to xix above).

In June 1997, there was a joint American Mathematical Society, South African Mathematics Society, and the London Mathematical Society conference in Pretoria, South Africa. I was invited together

with Eric Friedlander of North – Western University, Evanston, Illinois, USA to organise a special session on Algebraic K-theory at the Pretoria meeting. I also gave an invited lecture at the meeting.

I was Director as well as local organizer for the 2002 School/Conference on Algebraic K-theory and its Applications dedicated in honour of H. Bass on his 70th birthday. There will be a special issue of K-theory Journal for the Proceedings of the conference as well as a book titled "Contemporary Developments in Algebraic K-theory" for the Proceedings of the School. The other two co-editors of the two publications are M. Karoubi (Paris 7) and C. Pedrini (Genova).

International Conferences attended (with Papers read)

1. International Conference on Commutative Algebra, University of Fes. Morocco. June 5-10, 1995 **Invited Paper Read:** K-theory of Polynomial extensions.
2. 50th Anniversary Celebrations of UNESCO, ICMS, Edinburgh, UK, Nov. 95.
3. Fourth AMU Pan-African congress of Mathematicians Ifrane Morocco. **Invited Paper Read:** Higher Class Groups of orders and groupings
4. 10th Anniversary celebrations of the African Academy of science, Nairobi, Kenya, Dec., 1995.
5. Great Lakes K-theory conferences, Fields Institute, Toronto Canada, March 1-3, 1996. **Invited Paper Read:** Higher Class Groups of orders and groupings
6. International Conference on K-theory, Maths Inst., Oberwolfach, Germany, June 10- 15, 1996. **Invited Paper Read:** Equivariant K-theory for compact Lie Group actions.
7. 8th International Congress on Mathematics Education on Mathematics Education, Seville Spain, July 13-21, 1996. I co-organised a Working Group on International cooperation on Mathematics Education.
8. Second European Congress of Mathematics, July 21-28, 1996.
9. African Mathematical Union Workshop in Algebra, University of Ouagadougou, Burkina Faso, April 21-25, 1997. **Invited Lecture:** Equivariant Higher K-theory for Compact Lie Groups actions.
10. Joint AMS-SAMS-LMS meting, University of Pretoria, South Africa, June 25-28, 1997. **Invited Lecture:** Higher Class Groups of Orders and Integral Groupings.
11. AMS summer Research Conference, University of Seattle, Washington USA. July 12-25, 1997. **Invited Lecture:** Higher Class Groups and Continuous K-theory of p-adic orders.
12. ICTP Workshop/ Symposium on Algebraic K-theory and its application, 'Trieste, Italy, Sep. 1-19, 1997. **I was a Director** as well as Local organizer of the Workshop/Symposium.
13. Workshop on Algebraic K-Theory, Université Paris, VII, France. **Invited Lecture:** Non-Commutative Chern characters of compact Lie group C*-algebra.
14. Great Lakes Algebraic K-Theory meeting and Annual AMS meeting, University of Illinois, Urbana-Champaign. March, 1998.
15. International Congress of Mathematicians, Berlin, Germany. August 18-27, 1998.
16. 10th General meeting of TWAS, Trieste, Italy. December 9-10, 1998.
17. International Workshop on Stable Homotopy and Algebraic K-theory. Univesitaat Bielefeld, Germany. February 10-15, 1999.
18. International Conference on Non-Commutative Algebras, CIRM, Université Luming, May 21-25, 1999.
19. International Conference on 'Algebraic K-Theory', Mathematisches Forschungsinstitut

Oberwolfach, Germany. September 26 - October 2, 1999. **Invited Lecture:** Non-Commutative Chern characters of compact Lie group C*-algebras and compact quantum groups.

20. EXCITE (European Science centres) Annual Conference, Prague, Czech Republic, November 18-20, 2000. **Invited Lecture:** North-South cooperation for global literacy and numeracy.
21. TWAS General Conference and AFRISTEC Meeting, Dakar, Senegal. November 21-26, 1999.
22. 5th AMU Pan-African Congress of Mathematicians, University of Western Cape, Cape Town, South Africa. **Invited Plenary Lecture:** Chern characters in non-commutative geometry.
23. International Workshop on Arakelov Geometry, Université Montpellier II, France. May 26-27, 2000.
24. TWAS General Meeting, Teheran, Iran. October 21-26, 2000.
25. First Pan-African Symposium of Mathematics Olympiads, Tunis, Tunisia. November 1-6, 2000. **Invited Plenary Lecture:** Mathematical sciences and other sciences.
26. Science Institute group (SIG)/African Academy of Sciences (AAS) meeting on "Millennium Science Initiatives in Africa", Nairobi, Kenya. November 14-16, 2000. **Invited Lecture:** Mathematical Sciences vis-à-vis basic sciences in Africa.
27. International Conference on "Recent Advances in the Mathematical Sciences" --- To celebrate the 50th Anniversary of the Indian Institute of technology, (ITT), Kharagpur, India. December 20-22, 2000. Invited **Keynote Address:** Continuous cohomology and Higher K-Theory of exact categories.
28. International Conference on Geometric Analyses and Index Theory, Trieste, Italy, March 18-24, 2001. **Invited lecture**: Equivariant Hopf-algebra KK and Index theories.
29. International Conference on Quantum Field Theory, Non-Commutative Geometry and Quantum Probability, March 26-29, 2001. I was member of the Scientific Committee for this meeting.
30. Great Lakes K-theory Conference, Evanston, Illinois, April 20-22, 2001
31. High Dimensional Manifold Topology - Workshop Conference, May 21- June 8, 2001
32. International Conference on Topology and its Applications. Norfdjordeid, Norway, August 6-10, 2001. **Invited lecture**: Profinite and continuous Higher K-theory of exact categories, schemes, orders and group-rings

(To be updated)

7)Publication/Preprints since Joining ICTP

a)Research Articles / Monograph:

i)A.O. Kuku (1995): Algebraic K-theory and some other areas of mathematics. Proceedings of the Third Pan-African Congress of mathematicians. 81-100, 1995

ii)A.O. Kuku (1996): Higher K-theory of modules over E1 categories Afrika Matematika, 3(6) 15-27, 1996.

iii)A.O. Kuku (monograph) (1997): Topics in Algebraic K-theory, Lecture notes series, National Mathematical Centre, Abuja, Nigeria (1997)

iv)A.O. Kuku (1999): Ranks of K_n and G_n of orders and groupring of finite groups over integers in number field. Journal of Pure and Applied Algebra 138 (1999) 39-44

v)D.N. Diep, A.O. Kuku and N.Q. Tho, (1999): Non – Commutative Chern characters of compact lie group C*-Algebras.. K-Theory Journal, (1999) 17(2) 195-208.

vi)H. Bass, A O. Kuku and C. Pedrini (1999): (ed.) Algebraic K-theory and its

Applications, proceedings of the Workshop and Symposium, Trieste, Italy. (World Scientific. 1999)

vii)D.N. Diep, H.H. Fung and A.O. Kuku (1999): Compact quantum group C*-algebras as Hopf algebras with approximate units (preprint)

viii)A O. Kuku (2000): Equivariant Higher K-theory of Compact Lie Group Actions. Beitrage Zur Algebra and Geometric (41) (2000) No 1 141-150.

ix)D.N. Diep, A.O. Kuku and N.O. Tho (2000): Non Commutative Chern Characters of Compact quantum groups. Journal of Algebra 226, 311-331 (2000).

x)A.O. Kuku (2000): Profinite and Continuous K-theory of Exact categories, orders and group rings. K-Theory Journal 22, 367-392 (2001).

xi)A.O. Kuku (2000): Classical Algebraic K- theory i.e. the Functors K_0, K_1, K_2 (Handbook of Algebra) Elsevier. 157-196 (2003).

xii)A.O. Kuku (2000): Higher dimensional class groups of grouprings and orders in algebras over number fields (Preprint)

xiii)A.O. Kuku (2001): Continuous cohomology and Higher K-theory of exact categories: In "Applicable Mathematics - Its Perspectives and Challenges" J.C. Misra (ed) Nasora Publishing House, New Delhi, India. pp. 43-51.

xiv)A.O. Kuku and W. Tang (2001): An explicit computation of the "bar" homology groups of a non-initial ring. "Betrage zur Algebra und Geometrie - Contributions to Algebra and Geometry. 44 (2), 375-382 (2003)

xv)A.O. Kuku and G. Tang (2002): Higher K-theory of group rings of virtually infinite cyclic groups. "Mathematisches Annalen", 325, 711-726 (2002).

xvi)A.O. Kuku and M. Mahdavi-Hezabehi (2002): Subgroups of $GL_n(R)$ for local rings R "Communications in Algebra." 32 (5) 1895-1902 (2004)

xvii)D. Goswami and A.O. Kuku (2002): Towards the Baum-Connes Analytical Assembly map for the actions of Discrete quantum groups (Preprint).

xviii)D.N. Diep and A.O. Kuku: Non-commutative Chern-Connes characters of some non-compact quantum algebras. (Preprint).

xix)D. Goswami and A.O. Kuku: A complete formulation of Baum-Connes conjecture for the action of discrete quantum groups. "K-theory Journal" 30, 344-363,(2003)

xx)X. Guo and A.O. Kuku (2003): Wild kernels for higher K-theory of division and semi-simple algebras .Beitrage zur algebra und Geometrie—Contributions to Algebra and Gerometry. 47, 910. 1-14.(2006)

xxi)X. Guo, A.O. Kuku and H. Qin (2003): On K_2 of division algebras. Communications in Algebra. 33, 4, 1073-1081.

xxii)D.N. Diep and A.O. Kuku (2003): K-theory and periodic cyclic homology of some non-compact quantum algebras (Preprint).

(To be updated)

b) Other articles

(i) A.O. Kuku (1997): Science and Technology Literary and Numeracy: Meanings and Rationales. **UNESCO BOOK ON "Innovations in Science and Technology Education**" 141-164 1997.

(ii) A.O. Kuku (2000): Mathematical Sciences and other Sciences. Proceedings of the first Symposium on Pan African Mathematics Olympiads, Tunis. Already appeared.

(To be updated)

15. <u>Mathematical Interactions with and /or Guidance of Visiting Mathematician and post. Docs at ICTP Since 1995</u>

Below are Mathematicians I have interacted with and/or guided:

1.M. Mahdavi, (Iran), Algebra, June-September, 1995
2.U. M. Markafi, (Nigeria), Group Theory, may-October. 1995
3.M/ Cipu, (Romania), Commutative Algebra, July-September, 1995
4.C. Kalisa, (Rwanda) Harmonic Analysis, July – August, 1995
5.Y. Yang (China) Algebra, November 1995 to January 1996.
6.A. Susslin (Russia/USA) K-theory, July 1995
7.C. Pedrini, (Italy) K-theory, October, 1995
8.F. Torres, (Brazil/Peru) July 1995 to February 1996
9.Z. Tang. (China), Topology, may-August, 1996
10.M. Alawode (My Ph. D Student). K-theory, January-June 1996
11.R. Laubenbacher, (USA), K-theory, May, 1996
12.B. O Balogun , (Nigeria), Algebra, May-Sept. 1996
13.M. Khalkkali, (Canada, Iran), Cyclic Homology, May-August, 1996
14.Y. Alamu, (Ethiopia), Number Theory, July/August 1996
15.M. Berhani, (Morocco), Functional Analysis, August-September 1996
16.J. Ye, (China), Algebraic groups, May-Sept. 1996.
17.A. Babour, (Egypt), Algebraic Topology, July/August, 1996
18.V. Furtomy, (Ukraine) Lie Algebra, July, 1996
19.A. Bandhari, (India), Algebra, August, 1996
20.D. N. Diep, (Vietnam), K-theory/C-algebra, August/Sept. 1996, 1997, 1998, 2001
21.I. Gelfand, (USA), Miscellaneous, August, 1996
22.H. Hamaraous, (Morocco), K-theory, October, 1996
23.A. Bak, (Germany), K-theory, October, 1996
24.F. Kuene, (Netherlands), K-theory, October 1996
25.S. Kabaj. (Morocco), Commutative Algebra, August/September 1996
26.J. Browkin, (Poland), K-theory/Number theory, March, 1996
27.H. Qin, (China), K-theory/ Number theory. Jan, 1997 to July 1998
28.H. Y. Ahmed, (Jordan), Algebra, March-August, 1997
29.K. Ayegmon, (Benin) Commutative Algebra, July – November, 1997
30.J. Juyamaya, (Chile), Algebra, February 1997 to September 1997, Aug-Oct. 1998; Aug-Nov 2000

31.H. H. Phung (Vietnam), Algebra/ /Quantum Groups, Sept. 1997 to June 1998; April 1999
32.S. Yassemi, (Iran), Commutative Algebra, June-Sept., 1997
33.P. A. Tirao, (Argentina), Lie Groups/Algebras, September 1997 to Dec 1998
34.N. Bitijong, (Cameroon), Algebraic Topology, May to October, 1997
July/August 1998
35.S. Jayasree (India). Algebraic Number theory, July-September 1997
36.Q. I. Nguyen, (Vietnam), Algebraic Groups, June – September, 1997; April-July 2000
37.V. Gnedbaye (Chad) Homological Algebra, January 1998 to Feb. 1999
38.R. Dehy (Iran) Lie Algebras, January 1998 to Dec. 1998
39.A. Dzhumadidaer (Kazakhstan). Lie algebras, July/August 1998
40.A. A Darlov (Russia) Representation Theory, July/August 1998
41.A. Karabegov. (Russia) Quantization, August/September 1998
42.E. Desquith (Cote D'Ivoire) Algebra/Functional Analysis Sept-Nov., 1998
43.X. Ma (China) Topology, October – December 1998
44.G. S. Li (China) Topology, October 1998 to January 1999.
45.D. Ban (Croatia) Complex Manifolds, Jan-July, 1999
46.S. Asin-Lares (Mexico) Symplectic Geometry. January 1999 to July 1999
47.M. Chen (China) Algebraic Geometry. January-November, 1999
48.J. L Cianerce – Moiina (Mexico) Geometry/Topology. Feb-July, 1999
49.A. Wade (Senegal) Differential Geometry/Topology, January to June 1999
50.M. Elhamdadi (Morocco) Topology/K-theory. February – August, 1999
51.P. Hajac (Poland) Non-commutative Geometry June-October, 1999; May-June 2000
52.T. Farrell (USA), Topology/K – theory, October November, 1999.
53.R. Joshua (USA) K-theory / Alg Geometry, April-May, 1999
54.G. Tang (China) K-theory January 2000 to July 2001.
55.M. K. L. Thakur (India Non-Associative Algebraic Structures, June to December 2000
56.H. Rui (China), Representation Theory/Hecke Algebras. April-Sept. 2000
57.A. Tsemo (Cameroon) Geometry/Affine Manifolds, Jan. 2001 to Feb. 2002
58.A. Rahnamai Barghi (Iran), Algebra/group Theory, Jan. 2001 to July 2002
59.C. Eyrab (France), Topology/Geometry, May 2001 to August 2002
60.N. Ourimi (Tunisia), Complex Geometry, June 2001 to Feb. 2002
61.D. Goswami (India), Non-commutative Geometry, Jan to August 2002
62.X Guo (China) K-theory and Arithmetic, Jan 2003 to Dec. 2003

(To be updated)

16. <u>ICTP Diploma Courses – Teaching and Dissertation Supervision</u>

I taught an ICTP Diploma course in Differential Geometry. (30 hours February to May , 1996)

I taught an ICTP Diploma course "Abstract Algebra" (30 hours) October to December, 1996; "Abstract Algebra" course (30 hours October to December, 1997.

In 1997, I supervised the Dissertation of Two Diploma students, G. Degla, and D. Malonza. The

title are:

G. Degla: Algebraic K-theory and Cyclic Homology

D. Malonza: Structure of Mackey Functors with some applications

iv) In 1999, I supervised the Dissertation of B. K. Karna. The title is: Representation Rings of Finite groups

v) I supervised two ICTP Diploma Research Projects in 2000 as follows:

1) Charles Pooh: Grothendieck group of vector bundles over classifying spaces of compact Lie groups

2) Ganesh Bhandari: Witt rings and Galois groups.

(vi) I supervised an ICTP Diploma Research project in 2001 as follows: S. Biglari: An Introduction to Presheaves with Transfers and Motivic Cohomology

(vii) I supervised an ICTP Diploma research project in 2003 as follows.

Jorge Plazas: A Survey on the Baum-Connes conjecture.