

CURRICULUM VITAE

NAME: Prof. J.Otieno Malo, M.Sc. (Moscow), Ph.D. (Brandeis), M. Inst. P., FKNAS

DATE OF BIRTH: 14th April, 1941

MARITAL STATUS: Married, two children

PLACE OF BIRTH: Maseno, Kisumu District, Kenya

PERMANENT ADDRESS: Department of Physics, University of Nairobi,
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EDUCATION SCHOOLS: 1. Maseno Primary School (1950 – 1951)
2. Kisumu Union (1952 – 1955)
3. Ambira Intermediate (1957)
4. Friends Secondary School Kamusinga (1958 –1962)

EXAMINATION PASSED: 1. Competitive Examination (1953)
2. Kenya African Preliminary Examination (1957)
3. Cambridge Overseas School Certificate (1961)

DEGREES: 1. M.Sc. 1968, Friendship University, Moscow, USSR.
2. Ph.D. 1972, Brandeis University, Waltham, Mass, U.S.A.

1. EXTERNAL EXAMINER

1. 1982/83 to 1984/85 University of Dar es Salaam, Tanzania
2. 1984/85 to 1987/88 University of Malawi, Chancellor College Zomba, Malawi
3. 1987/88 to 1989/90 The National University of Lesotho, Roma, Lesotho.
4. 1987/88 to 1989/90 Moi University, Eldoret, Kenya.
5. 1988/99 University of Zimbabwe, Harare, Zimbabwe
6. 1988/89 to 1990/91 University of Botswana, Gaborone, Botswana.

7. 1995 to 1997 The National University of Lesotho, Roma, Lesotho
8. 1995 to 1997 Makerere University, Uganda.
9. 2000/2001 Egerton University

2. **PROFESSIONAL POSITION**

1. 1969 – 1972 - Special Assistant Lecturer, University of Nairobi (UoN)
2. 1972 – 1974 - Lecturer in Physics, (UoN)
3. 1979 – 1980 - Senior Lecturer in Physics (UoN)
4. 1980- Todate - Professor of Physics (UoN)
5. 1978 (9 months) - Research Professor, Uppsala University, Sweden (Sabbatical Leave)
6. 1984/85 - Research Professor, Boston College; U.S.A. (Sabbatical Leave)
7. 1996 - Visiting Professor, Uppsala University (Sweden), 3 months
8. 1975 (6 months) - Visiting Senior Lecturer, Makerere University, Uganda
9. 1981 (1 month) - Visiting Scientist, Tata Institute of Fundamental Research Bombay, India (1 month)
10. 1979 – 1988 - Chairman, Department of Physics
11. 1995 – Todate - Member, San Marco Executive Committee

3. **PROFESSIONAL MEMBERSHIP**

1. Kenya Physical Society - Chairman, (1983 – 1999)
2. Kenya National Academy of Sciences
 - Chairman
 - Hon. Treasurer
 - Hon. Assistant Secretary
 - Assistant Editor – Academy Journal of Science
3. National Council for Science and Technology (from 1994) to date
 - Member of Steering Committee
 - Member of Research Committee
 - Chairman Physical Sciences Specialist Committee
4. Chairman Natural Sciences Committee of the Kenya National Commission for UNESCO (1988)
5. Member of University of Nairobi Council from 1996 to date
6. Member of University of Nairobi Senate

7. Member of Academic Board of College of Biological and Physical Sciences, University of Nairobi
8. Member of Faculty of Board of Science, University of Nairobi
9. General Editor, African Journal of Science

4 (a) CONSULTANCY

From April 1982 to October 1983: Working at UNESCO Regional Office for Science and Technology for Africa, Nairobi, Kenya as a Consultant in Basic Sciences. My duties included among others; Promotion of Studies on the Contribution of Science and Technological Education to the enhancement of human values and enrichment of indigenous culture; Commissioning research studies at the regional level; Organize regional meeting/seminars for scientists, Promotion of Public Understanding of modern Science and Technology and their Social implication; Cooperation with non-governmental organizations and professional bodies in the translation of Scientific materials into simple literature for the general public.

Organized the following meetings on behalf of UNESCO.

1. Microprocessor and Data Processing Seminar, 29th November – 3rd December, 1983, Dakar, Senegal
2. Regional Seminar on Research and Application of Informatics in Africa, 3rd – 10th December, 1983, Nairobi.
3. Meeting for the Establishment of the Basic Sciences Network within ANSTI, 12 – 14 September, 1984, Nairobi.
4. UNESCO/KNAP Workshop on Physics and Instrumentation for Environmental Monitoring, Solar Energy and Geophysics 16th – 12th December, 1984, Nairobi, Kenya.
5. Inaugural Meeting of the Physics Sub-Network within ANSTI 2nd – 4th April, 1985, Nairobi, Kenya.
6. As UNESCO Consultant in Basic Sciences – African Network of Scientific and Technological Institutions (ANSTI) Physics Subnetwork Coordinator, I made a general research survey and study in 1988 of Secondary School Systems in Anglophone and Francophone Countries, and taking Kenya and Cote D'Ivoire as examples, I made a detailed study and my findings and recommendations are contained in a Booklet I submitted to UNESCO/Rosta entitled “Comparative Study of Secondary School Physics Syllabuses in Anglophone and Francophone Systems including Equipment Fabrication”.

4 (b) CONSULTANCY

From 1984 – 1992: ANSTI Consultant Project Coordinator

(ANSTI) The African Network of Scientific and Technological Institutions is a project set up by UNESCO in January, 1980. The major objective of ANSTI is the development and improvement of facilities which will enhance the opportunities within African region for the training of high-level manpower in the disciplines of science and technology. ANSTI is made up of subnetworks each of which deals with one discipline in selected engineering or basic sciences fields. The organization sets out to achieve its objectives by supporting post-graduate courses, professor and student exchanges, book and journal publications, research grants and organization of seminars within the disciplinary subnetworks. To date, the following disciplinary Subnetworks have been established and operational.

a) Engineering Fields

- i) Agriculture engineering and food processing technology
- ii) Chemical engineering
- iii) Civil engineering
- iv) Electrical and electronic engineering
- v) Energy (solar and unconventional power sources)
- vi) Mechanical engineering
- vii) Metallurgical engineering
- viii) Mining and geological engineering
- ix) Water resources and environmental engineering

b) Basic Science Fields

- i) Chemistry
- ii) Earth sciences
- iii) Physics

4 (c) ANSTI Consultant Project Coordinator at UNESCO/Rosta Nairobi, Kenya 1993 to April 1994.

- (a) Reviewed and Monitored ALL ongoing activities in each of its four main programs

i) Postgraduate Training and Institutional Capacity Building

This involve postgraduate fellowships for studies in ANSTI Member Institutions numbering over 100 in the African Region, visiting Staff Fellowships, Short Term International Fellowships – Staff Development, Travel Fellowship. Provision of Equipment for research laboratories, Books, Journal, Desktop publishing equipment. To date over 200 postgraduate fellowships have been awarded for Training to Masters and Doctorate levels in ALL the Disciplinary Networks including Physics and over 60 Staff Fellowships.

(ii) Seminar, Workshops/Scientific Conference and Meetings

Over 80 Subnetwork Scientific Seminars and Training Workshops on Equipment maintenance have been organized. Proceedings of the meetings have also been produced and distributed.

iii) Publications

The African Journal of Science and Technology (AJST) has been published in THREE series annually. To date over Twenty books have been published by the Subnetworks including FOUR in Physics and Subnetwork Newsletters.

iv) Research Promotions

Receiving and evaluating research proposals and awarding research grants.

- (a) Prepared a Conceptual Paper for presentation to the ANSTI Governing Council describing future programs and possible sources of funding.
- (b) Prepared project proposal for funding of ANSTI individual programs by extrabudgetary support.
- (c) Planned and supervised the activities of ANSTI staff.

Coordinated and Edited Writing and Production of FOUR Physics Books for Undergraduate Studies sponsored under UNESCO, Major Project on Development of Learning/Teaching Materials:

- 1. Mechanics
- 2. Electricity and Magnetism
- 3. Structure and Properties of Matter
- 4. Geometrical Optics

4 (f) CONSULTANCY

The State of Science and Technology in Africa as of December, 1996 (UNESCO)

The total number of qualified human resources, namely the stock and number of economically active persons who possess the necessary qualifications to become Scientists, Engineers and Technicians including the national expenditure for research and experimental development (R & D), is essential information for the planning and formulation of Science Policy. In order to provide UNESCO member states and interested partners in the African Region with updated Statistics in selected Science and Technology indicators in a number of African Countries, the UNESCO office in Nairobi decided to compile the necessary information to be published in the form of a handbook towards the end of the year. To this end an appropriate questionnaire was designed and

produced to be sent to knowledgeable scientists and engineers in the selected countries for them to complete and return to the consultant for compilation and analysis.

5. REGIONAL CONFERENCES

1. From 17 – 21st March 1986, co-chaired the First Regional Physics Seminar on “PHYSICS FOR DEVELOPMENT” under the sponsorship of ANSTI in Abidjan, Ivory Coast.
2. Organized and directed an International Workshop on Curriculum Development in Physics, Mathematics and Computer Science from 1st – 13th September, 1986, Nairobi, Kenya. Sponsored by ICTP.
3. 6th – 10th January 1987 attended organizing committee meeting for the forthcoming “Workshop for Planning of Network Projects in Material Science and Solar Energy. Sponsored by ICTP and UNESCO under the auspices of Interdivisional Group on Physics for Development (IGPD) of European Physical Society (EPS). Paris, France.
4. 10th – 12th March 1987 Chaired Annual Meeting ANSTI Physics Subnetwork Committee Meeting in Bunjumbura, Burundi.
5. 24th – 30th January 1988 Chaired a Meeting on Comparative Study of the Secondary School Physics Syllabuses in Anglophone and Francophone Systems including Equipment Fabrication in Abidjan, Cote d’Ivoire. Sponsored by UNESCO.
6. 7th – 14th February 1988. Attended Experts Meeting on Priorities and Perspectives of Science and Technology for Development in West Berlin, Federal Republic of Germany.
7. 21st – 27th February 1988 Chaired the Annual Meeting of ANSTI Physics Subnetwork on the theme “Physics Research and African Development” in Addis Ababa, Ethiopia.
8. 5th – 7th August 1991. Chaired the ANSTI Physics Subnetwork Committee and the 3rd Regional Seminar in “Physics in the Service of Africa”. Presented a plenary paper entitled “Physics and Industrial Development in Africa”. Gaborone, Botswana.
9. 4th – 5th May 1992 attended a Workshop on the Physical Sciences in Eastern and Southern Africa. Its Status and Future in Arusha, Tanzania. Presented a paper on the Interaction between Physical Sciences and other Sciences.
10. 17th – 19th January 1994 attended an International Conference on Physics and Industrial Development – Bridging the Gap in New Delhi, India. Presented a paper on “Capacity Building in Science and Technology. The African Perspective”.

11. 27 to 30 October 2016 Presentation KNEB at the IAEA TWG NPI
Vienna Austria

11. KNAP/KPS (Kenya Physical Society) Sixth AGC 21st – 25th September 1992 on the Theme “Physics and Technology Development in Africa”. Nairobi, Kenya.
12. KPS/ANSTI Regional Conference on “Capacity Building in Physics for Development” – Bridging the Gap 19th – 23rd September, 1994. Nairobi, Kenya
13. International Conference on Research and Communication in Physics September 18th – 22nd 1995; Tokyo Japan.
14. 7th International Workshop on the use of Microcomputers in Science and Mathematics Education 2nd – 9th July 1995, Nairobi, Kenya sponsored by ICTP.
15. International Conference on the use of Microcomputers in Physics Education 10th – 14th July 1995, Nairobi, Kenya sponsored by IUPAP.
16. Organizing KPS Regional Conference on “Material Science and Physics Education” 23rd – 27th September 1996. Nairobi, Kenya.

6. NATIONAL CONFERENCES

As the Chairman of The Kenya Physical Society, I organized and directed the following

- 1). KNAP/KPS 1st Annual General Conference (AGC) in September 1987, in Nairobi on the them “8-4-4 Post Primary and University Physics Education”. The Conference was attended by over 70 participants from Secondary School Teachers, Researchers and University Physics Professors. A number of pragmatic recommendations were made in order to enhance the teaching of physics under the 8-4-4 system and thus improve the quality of teaching, teachers and students. The recommendations were presented to the Minister of Education.
- 2). KNAP/KPS 2nd AGC in September 1988 in Nairobi on the theme: “The Role of Physics in National Development”. The areas covered by the Conference included Energy, Education, Agriculture, Health, Water, Habitat, Environment and Industry. The meeting was attended by well over 100 participants from all over the Republic.
- 3). KNAP/KPS 3rd AGC in September, 1989 on the theme: “The Contribution of Physics in Energy, Water, Agriculture and Health Care Resources” Presented a paper on “Quantum Genetics”.
- 4). KNAP/KPS 4th AGC in September, 1990 on the Theme “Physics in Innovation for Development”.
- 5). KNAP/KPS 5th AGC in September, 1991 on the theme: “Physics for Better Future in Africa”. Delivered a keynote address entitled “Some Reflections, Thoughts and Experiences on the Role of Physics in Nation Building”.

- 6). 9th KPS/AGC on the Theme “Physics Education under the 8-4-4 System in Kenya. 20th – 22nd September 1995 Nairobi, Kenya.
- 7). 4th Regional Conference and 10th KPS/AGC on the Theme; “Microcomputers in Physics Research and Education” 21st – 25th September, 1998, Nairobi, Kenya.
- 8). Image Analysis and Remote Sensing Techniques Workshop 1st – 13th November 1998, Nairobi, Kenya.

7. INTERNATIONAL/REGIONAL CONFERENCES

- 1). UN/US International Conference on Spin-off Benefits of Space Technology: Challenges and Opportunities For The Developing World, Tampa, Florida, USA 30th March to 3rd April 1998.
- 2). Regional Preparatory Conference on UNISPACE III Rabat, Morocco 26th –30th October 1998. Presented a paper entitled “Spin-Off Benefits and Space Commercialization.
- 3). Trends and Perspectives in Remote Sensing at the San Marco Satellite Station, Malindi, Kenya. Middle East and African Remote Sensing International Symposium, Rabat, Morocco. 26th – 27th October 2000.
- 4). National Workshop on Science and Technology Park for sustainable Growth June 2004, Nairobi, Kenya.
- 5). Science and Technology Capacity Building in the Framework of MDG December 2005, Nairobi, Kenya ASADI I.
- 6). Science Technology and Innovation and Society, The African Perspective and Experience 2006 Nairobi, Kenya.
- 7). June 2007
- 8). Low Frequency Array Workshop (LOFAR) Emmen, Netherlands and Vaxjo, Sweden May 2007.
- 9). UN-Spider Workshop, Bonn-Germany, Vaxjo, Sweden Oct/Nov. 2007
- 10) Regional Workshop on the Role of Parliamentary Office Science and Technology and Pairing Scheme between Parliamentarians and Scientists 2007, Nairobi, Kenya.

8. PAPERS AT NATIONAL WORKSHOP

1. ASADI III Dakar Senegal, Nov. 2007 on Water and Health
2. The Role of National Academy in Research and Innovation 2004 Workshop on Celebration of Scientific Revival Day of Africa.
3. Building Human Capital through Enhanced Science Education 2005 Workshop on Celebration of Scientific Revival Day of Africa.
4. Interaction between Basic and Applied Sciences in Development 2006 Workshop on Celebration of Scientific Revival Day of Africa.

9. GENERAL EDITOR

The African Journal of Science and Technology

UNESCO/ANSTI sponsored

Series A – Technology

Series B – Basic Sciences

Series C – General Science and Technology

10. SABBATICAL LEAVE

1. Spent 9 months from January to September 1978 at the Department of Quantum Chemistry, University of Uppsala, Sweden. I gave and also attended numerous seminars not only at the Department of Quantum Chemistry but also at the Institutes of Physics, Theoretical Physics, Mathematics and Chemistry. In March, I visited U.S.A. and gave seminars at Boston college, MIT and at Brandeis University.
2. Spent 5 months from August, 1984 to January, 1985 at the Department of Physics, Boston College, Mass, U.S.A. I taught an Advanced Graduate Course in Group Theory. Together with Prof. Kalman of Boston College and Prof. H. Gould of Clark University in Worcester, Mass, U.S.A. – we did research in Theoretical Plasma Physics and our problem was concerned with the Effects of an External Magnetic Field on the Dynamical Properties of Strongly Coupled One Component Plasma in Three Dimension. I also gave a series of seminars on the Spectral Line Shapes and Widths in Plasmas.

11. PUBLICATIONS

1. Collision Broadening of Rotational Spectrum J. Chem. Phys. 57, 2229 (1972).
2. Quantum theory of pressure broadening of rotational spectrum by three-dimensional rigid rotator, Ph.D. thesis. – University Microfilms – 72 – 109 (1972), Michigan, U.S.A.
3. Quantum Statistical Response Function, - Nuovo Cimento 21B, 178 (1974).
4. On a Certain Transformation of Boltzmann Equation – Nuovo Cimento. 21B, 178 (1974).
5. The Quantum Theory of Three Dimensional Rigid Rotator – Nuovo Cimento 21B, 162, (1974).
6. Two relaxation Time Model for Orientational Motion of Molecules in a Gas Reservoir – J. Chem. Phy. 64, 2212 (1976).

7. Saturation Effects of Collision Broadened Rotational Lines J. Chem. Phy. 65, 945, (1976).
8. On the Solution of Fokker – Planck Diffusion Equation by Path Integral Method – Nuovo Cimento 35B, 1, (1976)
9. The Study of the Influence of Stochastic Sources in Boltzmann Kinetic Equation – Nuovo Cimento 35B, 1, (1979).
10. An attempt to separate Long and Short Range forces by Gaussian Method. J. Math. Phys. 20, 878 (1979).
11. Statistical Thermodynamics of a Two-Electron System. African Journal of Science and Technology (AJST) Series B Vol. 7, P65 No.2 (1995).
12. On the Coordinate, Energy and Angular Momentum Preparation of the Density Matrix. African Journal of Science and Technology (AJST) Series B Vol. 7 No. 1 P73 (1995).
13. On the Effect of an External Magnetic Field on Dynamical Properties of the OCP. To appear in KJS
14. Traditional Quantum Mechanics vs. Local Hidden vs, Local Hidden Variables – To appear AJST.
15. A Review of Spectral Line Shapes and Widths in Plasmas. Kenya Journal of Sciences. To appear KJS
16. Statistical thermodynamics for a System of Two-Dimensional Rigid Rotator. AJST Vol. 6 No. 2 2005
17. A composite Space-Time Curvature Model. J. B. Awuor, J.O. Malo, Modern Physics Letters Vol. 13 (1998) 677-683.
18. Construction of the Quantum Lagrangian Density in the Nonsymmetric Gravity Theory and Evaluation of Conserved Currents. P. Baki and J. O. Malo. Accepted Journal Mathematical Physics, (1999).
19. Screening Function k_z in the strongly coupled one-component plasma (OCP) in a uniform magnetic field. KJS Series A, Vol. 12 No. 1, 2007
20. Quantum Theory of Non Relativistic Adiabatic Charged Particle Motion in Inhomogeneous Electric and Magnetic Fields KJS Series A Vol. 13 No. 1 2008.
21. On the Effects of Random Forces in Non Uniformly Distributed Systems KJS Series A Vol, 14 No 1 2010

12. PAPERS READ AT INTERNATIONAL MEETINGS

1. Transport Phenomenon in Strong Magnetic and Electric Field. Pres. The winter College on the Theory of Imperfect Crystalline Solids, 1970.
2. Order – Disorder Transitions in Ferromagnetic Materials. Pres. International Conference in Theoretical Physics, (1973).
3. On the Classical Partition Function by Gaussian Method. Pres. International Conference in Theoretical Physics, 1973
4. Statistical Thermodynamics of a Two Spin System. Pres. International Symposium on Atomic, Molecular and Solid State Theory, 1976.
5. The Quantum Theory Non-Relativistic Adiabatic Charged Particle Motion. Pres. NATO Advanced Study Institute on Strongly Couple Plasma 1977.
6. On the Coordinate, Energy and Angular Momentum Preparation of the time Dependent Density Matrix. Press. Swedish National Physics Conference, 1978.
7. Application of Many Body Scattering Theory to Molecular Structure Calculations. 1. Proc. International Symposium on Atomic, Molecular and Solid State Theory, 1978.
8. On the Conventional Approaches to the BBGKY hierarchy. Proc. Colloquia on Mathematical Physics, 1977.
9. Statistical Thermodynamics of a Two Electron System. Proc. 14th International Conference on Thermodynamics and Statistical Physics, 1980.
10. Molecular Structure Calculations Based on Many Body Scattering Theory II. Proc. International Colloquium on Group Theoretical Methods in Physics. 1985.
11. National Workshop on Science and Technology Park for Sustainable Growth June 2004, Nairobi, Kenya.
12. Concept and Design of The Kenya International Radio Observatory (KIRO) 2007.

13. PAPERS IN PREPARATION

1. **Plasma Physics**
 - (i) On the Influence of External Noise in One-Component Strongly Coupled Plasma.
 - (ii) The Quantum Theory of Relativistic Adiabatic Charged Particle Motion.

- (iii) Single Particle Motion in the Strongly Coupled One-Component Plasma in a Uniform Magnetic Field.

2. **Statistical Mechanics**

- 1. Order – Disorder transitions in Nickel based alloys
- 2. Statistical Thermodynamics in n Electron system.
- 3. Quantum Chaos.

3. **Quantum Chemistry**

- (i) Molecular Structure Calculations Based on Many Body Scattering Theory.
- (ii) Quantum Theory of the DNA Molecule

14. **QUANTUM BIOLOGY**

Summer School and Seminar Lecturers in U.S.A, Sweden, Norway, Italy, Kenya. From 1980s.

- i. Quantum Genetics
 - 1. Historical development of the theory of the Hereditary
 - 2. Stereostructure of DNA and Connection with its Biological Functioning.
 - 3. Properties of Hydrogen Bond
 - 4. Quantum Theory of the DNA Molecule.
 - 5. Stem Cell Research

BOOKS: Working on a book for both graduate students and researchers in Plasma Physics.

TITLE: Nonequilibrium Statistical Mechanics – Kinetic Theory

PUBLIC APPOINTMENTS

Appointed Council Member from January 1994 of the Kenya National Council For Science and Technology. Made Chairman of the Physical Sciences Specialist Committee. We produced the following important documents.

- (a) The Kenya Space Sciences Policy that will lead to the creation of the Kenya Space Agency.
- (b) Framework for establishment of The Kenya Physical Sciences Research Institute.
- (c) The Kenya Nuclear Sciences Policy that will lead to the creation of the Kenya Atomic Energy Agency.

(d) The Kenya Meteorological Research Institute (KEMETRI)

15. PRESIDENTIAL APPOINTMENT

1. Chairman, Lake Basin Development Authority (LBDA) (February – June 1987).

FROM JULY, 1987 TO MAY 1993

2. Chairman, Tana and Athi Rivers Development Authority (TARDA)>
3. Chairman, Kenya Power Company (KPC) now KENGEN.
4. Chairman, Tana River Development Company (TRDC).

16. MINISTERIAL APPOINTMENTS

Chairman, Kenya Energy Laboratories (KEL) (From August, 1987 to 1995)

17. SOME RELEVANT ACTIVITIES

1. As Chairman of Kenya Energy Laboratories (KEL) supervised the compilation of a working Document on priority areas for immediate establishment of the Laboratory. The document was presented to the Minister for Energy for seeking funds in March, 1988.
2. In February, 1988 as a member and Chairman Designate for the Natural Science Committee of the Kenya National Commission for UNESCO, was invited by the Germany Foundation for Commission for UNESCO to participate at a meeting of African Experts on “Priorities and Perspectives of Science and Technology for Development” in West Berlin. I presented a paper entitled “Priorities and perspectives and Related Technology for National Development in the Field of Applied Geophysics, Solar Energy, Micro and Mini-Computers, Biofuel, Biotechnology, Material Science, Science and Technology. A number of far reaching recommendations were made which I have sent to the Minister of Education through the Kenya National Commission for UNESCO.
3. A member of the San Marco Project Executive Committee that is responsible for running the project on behalf of the Government of Kenya. This project was established by an Agreement between the Governments of the Republics of Kenya and Italy concerning the Satellite Tracking, and Launching, including Telemetry and Command Services at the Station in Malindi, Kenya. I have also been instrumental in establishing an Agreement with the European Space Agency ESA culminating in establishing a Remote Sensing Station in Malindi. The Agreements with Italian and ESA envisage both training of Scientists and Engineers to Masters and Doctorate degrees levels and Technicians for Operation and Maintenance of the station.
4. I have been deeply involved in spearheading not only the development but also the promotion of Space Science and Technology in Kenya for socio-economic

development of the country in the fields of Scientific Research and Teaching, Environmental and Resource Management, Communication and indeed Meteorology and Technology Transfer for industrialization. To this end I have developed very vital international collaborations and strong links with the following:

- (a) Spectrum Astro-Inc. is one of the leading American Space Companies. A document has been produced that describes the KenyaSat Initiative with a Program Plan that provides for execution as well as Long Term Strategy for accomplishment of the business objective of the Initiative. A “Non-Disclosure Agreement” in other words “Mutual Confidentiality Agreement” was signed back in May 1998 between University of Nairobi and Spectrum Astro Inc. U.S.A.
- (b) The Surrey Space Centre (SSC) University of Surrey in the U.K. A project Proposal “For a Collaborative Program of Microsatellite Technology Transfer and Training between SSC and Kenya has been produced. The document focuses on a program and involves an in-depth know-how transfer and training to Kenyans to be achieved through design, construction, test, launch and orbital operation of microsatellite KenyaSat 1. The proposal envisages establishment of a Team of skilled Space Scientists and Engineers for Kenya national space capability that will ultimately achieve Kenya’s first Satellite in a low earth orbit (LEO) carrying advanced Earth Observation and Communication payloads. To this end a Memorandum of Understanding for collaboration in Space Technology and Research has been drawn for signature.
- (c) Have also been instrumental in establishing a relationship between the Department of Physics of Nairobi and Pocheestroom University in the Republic of South Africa. The project involves collaboration with Scientists from NASA, Russia and Canada towards the establishment of a Neutron Monitoring Station in Kenya for recording of Solar Flare events at high altitude Equatorial site. The objective is to build and operate a Neutron Monitor at Timboroa in Kenya at an elevation of 10,000 ft (3000 m) to measure emission of neutrons during solar flare events. For optimal detection of these neutrons, one needs a monitor with the most direct viewing direction towards the sun (Equatorial) with least atmosphere above it. (Elevation).
- (d) Currently, with some Scientists at the Institute of Space Physics, Uppsala University, Sweden and in collaboration with Russian Scientists at the Radiophysical Research Institute Nizhniy, Novgorad, a process is underway in compiling a Project Proposal for the establishment of a Kenya International Radio Observatory that are useful in the study of terrestrial magnetosphere, ionosphere, near earth space plasma, environmental effects due to physical and chemical processes.

- (e) Back in the early 1980's, was involved as a UNESCO Consultant Specialist in the Basic Sciences In not only writing up a Project Proposal, but also in sensitization visits to a number of key African countries regarding design and construction of a very long Baseline Inteferometry with very large collecting area for a Collaborative Scientific Program with Radiotelescope. The implementation involved the construction of a Giant Equatorial Radiotelescope (GERT), (Size 25 km x 50 cm), on or close to the equator and setting up of an International Institute of Space Science and Electronics (INISSE) as a collaborative project or joint venture of developing countries. Kenya was chosen to host the project was to undertake fundamental research in the field of Radio Astronomy that deals with investigations of celestial bodies by means of radio-waves emitted by the bodies. The concept, design, fabrication, construction and resources were to be undertaken by Scientists and Engineers from the developing countries.
- (f) Lead Consultant, Data Management for the Northern Corridor Transportation Improvement Project; A World Bank Project being implemented by UNES/UoN from 2006 upto 2011.
- (g) Member of ICSU Dues Review Committee 2009
- (h) Member IAP Evaluation Committee of ICSU Programme and Activities 2009
- (i) Member Ad Hoc Group on Weighted Voting System ICSU 2010
- (j) Board Member of the Kenya Nuclear Electricity Board AND Chair Technical Committee 20 10 to 2015
- (k) Member of the Knowledge Management Africa KAM Kenya Chapter Steering Committee 2006 todate
- (l) Chairman Department of Physics UoN 1978/1988

JOSEPH O. MALO