

Unesco Kalinga Prize Winner – 2000

Ernst W. Hamburger



A German Born Brazilian Physicist & Popularizer of Science.

[Born : 6th August, 1933, Berlin, Germany

Emigrated to Brazil with his Parents when he was still three years old...]

Science is the means to better the living condition of people & the goal can be achieved only when it is popularized amongst the masses.

.... E.W. Hamburger

Science is certainly not the final answer to poverty. But it is surely a definite means to empower people by which they can be made self confident to move in the path of progress.

... E.W. Hamburger

In Brazil, we are making Science Popular like football.

... E.W. Hamburger

Prof. Ernst W. Hamburger- A Brief Profile

Ernst Wolfgang Hamburger is a German – born Brazilian Physicist and Popularizer of Science.

Born in Germany in 1933, Prof. Hamburger emigrated with his parents to Brazil when he was still three years old. He studied physics at the University of São Paulo and joined its faculty (Institute of Physics) soon after his graduation, in 1960. He is now a retired full professor of physics.

Prof. Hamburger is internationally known for his activities regarding public understanding of science. He is the director of Estação Ciência, an interactive science museum in São Paulo. He won the UNESCO Kalinga Prize for the Popularization of Science and the José Reis Award for the Divulgarion of Science, the medal of the Brazilian Order of Scientific Merit, a member of the Brazilian Academy of Sciences.

Dr. Hamburger is married to Dr. Amélia I. Hamburger, also a physicist and colleague at the university. They have five children. One of them, Cao Hamburger, is a renowned film and TV director and scriptwriter.

Prof. Ernst Wolfgang Hamburger born in 1933 in Berlin, Immigrated to Brazil when he was only 3 years old. He became a naturalized Brazilian citizen in 1956.

Prof. Ernst Wolfgang Hamburger studied physics at the University of Sao Paolo in 1951 and began working in the Electrostatic Accelerator Laboratory as an undergraduate assistant in Nuclear Physics experiments. He devoted himself to this field of research for the next 20 years, measuring nuclear reaction mechanism and the structure of atomic nuclei. He studied light, intermediate and heavy nuclei, from Helium to Bismuth, and published over 20 papers on nuclear physics in main international journals. Many of his results were significant and kindled interest internationally. In this period, Prof. Hamburger also presented three theses, one at the University of Pittsburgh, USA and two the Sao Paolo University.

From 1968 on, he started to take a keen interest in, and develop, physics education. A curriculum Development Project for Secondary school physics was established, a group was set up for the

production of films for physics teaching and an interdisciplinary graduate programme in Science Education was launched which has granted over 130 master's degrees. The dissertations deal with education and the diffusion of physical Sciences in schools, universities, the media and society.

In 1994 Prof. Hamburger received the Jose Reis Prize for Science Popularization bestowed by the National Research Council of Brazil. In 1994 he was invited to Estocao Ciencia, a Science Centre of the Sao Paolo University. Since then he has devoted himself to the activities of the Centre which has given 3500 square metres of its 5000 square metres to exhibitions and receives about 2 lakh visitors year (70% School Children). Prof. Hamburger has won several awards for his work at the Centre, for his efforts to popularize science, his TV programmers, educational software and video series.

Several books (on racial discrimination, race and diversity etc) were brought out in connection with the exhibition on the population of African origin in Brazil. More recently, a book on "Science Centres and Museums-Visions and Experience" containing

Glossary on Kalinga Prize Laureates

articles by 40 researchers and popularisers on the Brazilian experience in this field was published.

Prof. Ernst Wolfgang Hamburger organized the production of Physics films for use in university and middle school.

A printed newsletter is sent from the Centre every 2 or 3 months to all schools in the state of Sao Paulo because good communication with the school system is essential for the effectiveness of the Centre.

Since, 1996, the Centre has an internet site with an electronic version of the Newsletter and science popularization materials, particularly a series of attractive animation which is being developed to explain topics such as the Solar System, how to make a simple electric motor, how does laser work?

Prof Hamburger has devised a special programme for out-of-school and street children. They are socialized and educated, using the Centre's equipment, especially personal computers on which they learn to write and use educational software. This Project, called **Projeto Clicar** receives over 600 children a year, and has successfully established a relationship of trust with them as a first step to their 'inclusion'. The programme has attracted interest both in Brazil; and other countries- including the University of California- and has been rewarded as the best social project sponsored by business houses (in this case by the national petroleum company – Petrobras).

Prof. Hamburger has received the Kalinga Prize on 26.2.2001 for the year 2000 at New Delhi.



Prof. Ernst Wolfgang Hamburger : Science Popularizer Extraordinaire

Prof Hamburger, winner of the 2000 Kalinga award for the popularization of science, has been teaching physics at the University of Sao Paolo since 1955. As head of basic physics courses, he was instrumental in introducing many innovations that made his teaching more up to date, effective and interesting.

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In 1994 Prof. Hamburger received the Jose Reis Prize for Science Popularisation bestowed by the National Research Council of Brazil.

Prof. Hamburger studied physics at the University of Sao Paolo in 1951 and began working in the Electrostatic Accelerator Laboratory as an undergraduate assistant in Nuclear Physics experiments. He devoted himself to this field of research for the next 20 years, measuring nuclear reaction cross sections in the million electron volt energy region in an attempt to get a better understanding of nuclear reaction mechanism and the structure of atomic nuclei. He studied light, intermediate and heavy nuclei, from Helium to Bismuth, and published over 20 papers on nuclear physics in main international journals. Many of his results were significant and kindled interest internationally. In this period, Prof. Hamburger also presented three theses, one at the University of Pittsburgh, USA and two the Sao Paolo University.

From 1968 on, he started to take a keen interest in, and develop, physics education. A Curriculum Development Project for secondary school physics was established, a group was set up for the production of films for physics teaching and an interdisciplinary graduate programme in Science Education was launched which has granted over 130 master's degrees. The dissertations deal with education and the diffusion of physical sciences in schools, universities, the media and society.

Prof Hamburger was part of a team of authors for writing physics text books, stories for films and TV programmes on physics and physics teaching, organized training courses for school teachers, introduced new teaching methods, modern physics content and science popularization activities such as talks, courses, exhibitions of experiments. He also visited tens of thousands of schools.

In 1992 he started a new experiment of Cosmic Ray Detection.

Prof. hamburger is married to Amelia Imperio Hamburger and has five children.

Estacao Ciencia

In 1994 he was invited to head Estacao Ciencia, a Science Centre of the Sao Paolo University. Since then he has devoted himself to the activities of the Centre which has given 3500 square metres of its 5000 square metres to exhibitions and receives about 2 lakh visitors a year (70% school children). Its activities include:

Exhibitions

- Nuclear physics and cosmic rays
- Waves, particles and fields
- Thermodynamics and energy
- Marine biology, history and anthropology of peoples of African origin in Brazil
- History and physics of photography and cinema
- Astrophysics and cosmology
- Medieval castles and feudalism
- Urban development of Sao Paolo and other cities
- Lightning and thunderstorms
- History of highway transportation

Publications and Books

Several books (on racial discrimination, race and diversity etc) were brought out in connection with the exhibition on the population of African origin in Brazil. More recently, a book on “Science Centres and Museums- Visions and Experience” containing articles by 40 researchers and popularisers on the Brazilian experience in this field was published

Television and Video

At the initiative of Prof. Hamburger, the Centre has co produced video programmes for science popularization on television. The most successful one is a series of ten one-minute clips on basic concepts such as: Black Hole, theory of Relativity, What are we made of? Elementary Particles, produced with the educational TV station **TV Cultura**. The series has been presented at festivals in Brazil and abroad and won many prizes.

Another co-production with TV Culture is “Visions of Liberty”, a 30-minute video inspired by the exhibition on slavery.

“Cosmic Radiation” was produced with the Physics Institute and the Cinema Department of the University.

Recently, a new series called Telecurso 2000 was produced and broadcast by TV Globo, which has the largest audience in the country. The physics course consists of 50 TV programmes of 15 minutes each, together with 2 printed volumes and a chapter for each programme. Prof. Hamburger supervised the team of physics teachers who prepared the text for both books and TV programmes.

Films

Prof. Hamburger organized the production of physics films for use in university and middle school.

Newsletter

A printed Newsletter is sent from the Centre every 2 or 3 months to all schools in the state of Sao Paolo because good communication with the school system is essential for the effectiveness of the Centre.

Internet

Since 1996, the Centre has an internet site with an electronic version of the Newsletter and science popularization materials, particularly a series of attractive animation which is being developed to explain topics such as the Solar System, how to make a simple electric motor, how does laser work?

Educational Software

Educational software developed for physics and mathematics received a prize from the Ministry of Education.

Annual Events

- International Scientific Video Festival
- Fair of Materials for Science Teaching and Popularisation (nearly 100 firms, universities and schools show teachers, students and administrators the latest developments in equipment and software.

Art Exhibits

The Centre has held art exhibitions, plastic art contests, folk dances etc.

Theatre

A theatre group performs a specially written play on the history of scientific ideas since ancient times.

Curriculum Development Project

In 1969 Prof Hamburger got together school and university teachers, graphic designers and journalists in a physics-teaching project for a secondary school course. Four volumes for students (Mechanics 1 & 11, including heat, electricity and electromagnetism) and a teachers' guide were published by the Ministry of Education, which financed the work. Each volume was accompanied by a kit for making simple experiments in the classroom. The volumes ran into several editions and influenced books published subsequently by other authors. This was probably the first team curriculum development project in Brazil.

Education Policy

Between 1975-83, the military government reduced requirements for teacher certification. This gave rise to an intense debate; scientific societies opposed the reduction, and it was finally cancelled by the government. The debate influenced thinking on education in the years that followed.

Teacher Training Courses

In-service course for nearly 100 physics teachers were organized. Teachers were trained to use the new curriculum materials.

Newspaper articles

Prof. Hamburger periodically publishes articles on physics, education and science popularization in the main newspapers of Sao Paolo.

S&T and Development

In 1968, debates on the role of science in social and economic development led to the organization of an interdisciplinary course taught by eminent sociologists, engineers and economists to physicists and other scientists, and later published as a book.

Special Programme for out of school children

Prof Hamburger has devised a special programme for out-of-school and street children. They are socialized and educated, using the Center's equipment, especially personal computers on which they learn to write and use educational software. This Project, called Projeto Clicar receives over 600 children a year, and has successfully established a relationship of trust with them as a first step to their "inclusion". The programme has attracted interest both in Brazil; and other countries – including the University of California – and has been rewarded as the best social project sponsored by business houses (in this case by the national petroleum company-Petrobras).

Degrees, Awards

Prof. Hamburger has won several awards for his work at the Centre, for his efforts to popularize science, his TV programmes, educational software and video series.

He has taught in Brazil and at the University of Pittsburgh and was a member of the International Commission on Physics Education.



Prof. Ernst Wolfgang Hamburger of Brazil

Selected for Kalinga Prize - 2000

PRESS NOTE

NEW DELHI, Feb 24,2001: prof. Ernst W. Hamburger of the University of Sao Paulo has been selected for the prestigious Kalinga Prize 2000 for popularizing science in Brazil.

The award will be given by Union Minister for Water Resources Arjun Charan Sethi at a function here on February 26, according to an official release.

Prof. Hamburger has contributed to the development of the Estacao Ciencia by organizing exhibitions and setting up innovative programmes such as projeto Clicar. The project aims at socializing and educating young out-of-school children through the use of personal computers at the center, and with the help of specialized educators.

The Kalinga Prize, established in 1951 by UNESCO, is given as an international recognition for science popularization. It has been awarded to 56 brilliant promoters of science and technology since its inception. (UNI)



KALINGA PRIZE 2000
award ceremony

INVITATION

National Museum Auditorium
Janpath, New Delhi - 110 001.
Monday, 26th February 2001, 3.30 p.m.



About the Prize

The Kalinga Prize was established in 1951 by UNESCO as the premier honour of its Scientific Awards Committee of the Kalinga Foundation Trust. The award is given to the holder of a prize from the Trust in recognition of a KALINGA Prize winner in science who has made outstanding contributions to the understanding of science and technology to the public. The Committee of UNESCO selects the prize winners of science based from Kalinga Trust, with a recommendation of a five-member international jury.

The Kalinga Prize is awarded to scientists who promote the popularization of science, applications, in the form awarded a \$50,000 US prize of travel and technology award in Kalinga.

About the Laureate

Prof. Dr. B. R. Rameshwar, with his Ph.D. in Physics at the University of Madras in 1974, and has been a Professor of Physics at the Madras University since 1974. He is the Director of the Kalinga Centre, a research centre of the Kalinga Foundation, in the Kalinga Centre of Science in Madras.

Prof. Rameshwar has contributed to the development of the Kalinga Centre by providing a platform for the development of science, technology and innovation. The centre is a leading and leading institution of science through the use of personal experience in science, and with the help of personal experience.

The Kalinga Prize is awarded to the holder of a prize from the Trust in recognition of a KALINGA Prize winner in science who has made outstanding contributions to the understanding of science and technology to the public.

Mr. Arjun Chandra Sankar

He is the holder of the Kalinga Prize in Science, awarded to the holder of a prize from the Trust in recognition of a KALINGA Prize winner in science who has made outstanding contributions to the understanding of science and technology to the public.

or

Prof. Dr. B. R. Rameshwar
Professor of Physics, University of Madras, Madras

Mr. Mahesh Chandra Sankar

He is the holder of the Kalinga Prize in Science, awarded to the holder of a prize from the Trust in recognition of a KALINGA Prize winner in science who has made outstanding contributions to the understanding of science and technology to the public.

Prof. Dr. B. R. Rameshwar
Professor of Physics, University of Madras, Madras

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Prof. Dr. B. R. Rameshwar
Professor of Physics, University of Madras, Madras



UNESCO PRESS

KALINGA PRIZE FOR THE POPULARIZATION OF SCIENCE TO BE AWARDED IN NEW DELHI TO PROF. ERNST W. HAMBURGER OF BRAZIL

New Delhi – The Kalinga Prize for the Popularization of Science – one of the UNESCO's science prizes- will be awarded to Ernst Wolfgang Hamburger, director of the *Estacao Ciencia*, a center of the University of Sao Paulo (Brazil) dedicated to the popularization of science and technology, in a ceremony in New Delhi, February 26, 2001.

Mr. Hamburger, who was born in Germany in 1933 and emigrated to Brazil with his parents three years later, has been Professor of physics in Sao Paulo since 1960. He has contributed to the popularization of science through numerous articles and his book – *O Que e Fisica?* – as well as programmes broadcast on TV Cultura. In 1994, Mr. Hamburger received the Jose Reis Science Popularization Prize and became director of the *Estacao Ciencia*, part of the UNESCO-supported RedPop science popularization network in Latin America and the Caribbean.

Mr. Hamburger has contributed to the development of the *Estacao Ciencia*, through the organization of many exhibitions and the mobilizations of sponsors for innovative activities such as the *Projeto Clicar*, created in 1996 with the support of the national petroleum company, Petrobras. *Estacao Ciencia* receives 25,000 visitors a month, mostly children and adolescents. *Projeto Clicar* was established to provide a special space with computer equipment to young people who wish to explore independently the various facets of human knowledge. In 1999, close to 600 children from troubled social or family backgrounds took part in the project. Educators and students assist the children in their exploration.

The Kalinga Prize, whose recipient gets 1000 Pounds and the Albert Einstein Silver Medal, was created by UNESCO in 1952 following a donation from the Indian Kalinga Foundation. It is awarded in recognition of a contribution to the popularization of science, technology and research. Previous laureates includes six Nobel Prize winners. In 1999, the Prize was given to Professors Marian Ewurama Addy (Ghana) and Emil Gabrielian (Armenia).

For more information on the Projeto clicar see: www.eciencia.usp.br/

For more information about UNESCO science prizes see:

http://www.unesco.org/science/unesco_intern_sc_prizes.htm



The Union Minister for Water Resources Shri Arjun Charan Sethi presenting the Kalinga Prize 2000 to Prof. Ernst W. Hamburger, University of Sao Paulo (Brazil), in New Delhi in February 26, 2001.

**BRAZILIAN PROF. HAMBURGER RECEIVES
KALINGA PRIZE 2000 FOR POPULAZING SCIENCE**

Union Minister Water Resources, Shri Arjun Charan Sethi presented the **Kalinga Prize 2000 Award** to the Brazilian Prof. Ernst W. Hamburger at a function held here today. A Professor of the University of Sao Paulo (Brazil), Mr. Hamburger bagged the **award** for his dedicated works in the field of popularising Science in Brazil.

Awarding the prize, Shri Sethi said that a scientist should demystify the mystery of nature and simplify scientific knowledge for the grasp of common men. This would enable a nation to develop a scientific spirit, a rational faculty and a proving mind. Prof. Hamburger has carried the scientific ideas to the grassroots level through his innovative methods and lucid language.

Prof. Moegiadi, Director, UNESCO gave the welcome address and Shri M.K. Kaw, Secretary, Department of Education, Govt. of India delivered the felicitation address.

The **Kalinga Prize** was established in 1951 by UNESCO at the generous initiative of Late Shri Biju Patnaik, Founder Chairman of the **Kalinga Foundation Trust**. First awarded in 1952 with the help of a grant from the Trust, it is presented annually by UNESCO to a person or persons who have made outstanding contributions to the interpretation of science and technology to the general public. The Director General of UNESCO selects the prize winner out of nominations received from Member States, on the recommendation of a four-member international jury. It has been awarded to 56 (fifty-six) brilliant promoters of science and technology till today since its inception.

**Address of Shri Arjun Charan Sethi,
Hon'ble Minister of Water Resources, Government of India
At the Prize Giving Ceremony for Conferring of
Kalinga Prize on Prof. Ernst W. Hamburger of Brazil
On 26th February, 2001 at 3.30 P.M.
At National Museum Auditorium, New Delhi.**

Prof. Ernst W. Hamburger
Prof. Moegiadi, Director of UNESCO, New Delhi
Mr. M. R. Kaw, Secretary Department of Education
Distinguished Invitees,
Member from the Media
Ladies and Gentlemen

At the outset, I welcome you all to this august gathering in honour of Prof. Ernst W. Hamburger, who has been conferred the prestigious Kalinga Prize for the year 2000. It is indeed a great honour for me to be present amongst you and a privilege all the more, to confer this coveted prize on Prof. Ernst W. Hamburger. Prof. Hamburger has been a distinguished Physicist and a renowned Professor, who has carved out a niche for himself in his chosen area of specialization. However, what is remarkable about him is his seminal contribution in popularizing the concepts and idioms of science to the people at large, which is the motto and basic objective of Kalinga Prize. It has always been a challenging task to make scientific concepts and ideas intelligible, comprehensible and communicable to the common man. In order that scientific concepts and ideas are appreciated, it is all the more essential that they are understood in the first instance. Only when concepts are understood better then only we can interpret, appreciate and apply them in practical aspects. At a time, when human ingenuity have opened new frontiers in the domain of scientific research, it is incumbent on part of scientific community to collect, collate and disseminate such ideas to general public. The scientists job should be to demystify the mystery of nature and to simplify scientific knowledge for the benefit of common man. This will help a great deal to develop a scientific spirit, a rationale faculty and a probing mind.

This has been the hallmark of Kalinga Prize, instituted by my mentor late Shri Biju Pattnaik. He was not only a great leader, a nation builder and visionary, but also a great rationalist. All through his life not only he fought against social injustice and oppression and strove for all round development of the country, but also fought against superstition and dogma that stood against the progress of the society. Today on this solemn occasion, it is propitious to recall his contributions for the development of scientific temper and creation of rational and participatory society.

Prof. Hamburger has carried forward the scientific ideas to the common man through innovative methods in a very lucid language and idiom. His initiative and efforts in popularising science among the people in general are commendable. I congratulate him for all his efforts. It is indeed a great honour and privilege for me to give away this prize of Prof. Hamburger.

With these few words, I thank the organizers for their kind invitation to give away this prize.

Thank you.



Prof. Hamburger Visits The Kalinga Foundation in Bhubaneswar and Given a Civic Reception by Chief Minister of Orissa Shri Naveen Patnaik

The Kalinga Award for Science Populrisation was established at the initiative of Mr. Biju Patnaik, the Founder Chairman of the Kalinga Foundation Trust and presented for the first time in 1952. It is given annually by UNESCO to a person or persons with a distinguished career of service in the interpretation of science and research to the public. Many of the prize winners have been well known scientists in their own right, while others have been trained in journalism or have been educators or writers.

Prof. Ernst Wolfgang Hamburger, winner of the 2000 Kalinga Award, has time and again stressed the need to make science simpler and more popular in all segments of society. For him, this would be a significant social achievement. For instance, educating street children might not solve all their problems, but would certainly go a long way in bringing them a sense of happiness. "To socialize science, to make it as populr as football, we have to make it much more interesting, and ensure that the 'excluded group' is not left out."

The 68 year-old Brazilian scientist was awarded the Prize by the Union Minister of Water Resources Mr Arjun Charan Sethi at a ceremony in New Delhi on 26 February, 2001. Mr. M.K. Kaw, Secretary General, Indian National Commission for UNESCO gave the felicitation address.

Born in 1933 in Berlin, Prof. Hamburger immigrated to Brazil when he was 3 years old. He was naturalized in 1956. He studied at the University of Sao Paolo, did research in nuclear physics for 20 years, and published over 20 papers in international journals and presented three theses – one at the University of Pittsburgh, USA and two at the Sao Paolo University.

In 1994 he received the Jose Reis Prize for Science Popularisation bestowed by the National Research Council of Brazil.

From 1968 he began taking a keen interest in physics education. He modernized physics text books, scripted stories for films and TV programmes, organized training programmes for school teachers, introduced new teaching methods, gave talks and courses, and set up exhibitions of experiments. He also visited tens of thousands of schools.

In 1994 he was made head of the Estacao Ciencia, a Science Centre in Sao Paolo University. The Centre holds science exhibitions on a very wide range of subjects from nuclear physics and marine biology to

Glossary on Kalinga Prize Laureates

medieval castles and feudalism and the urban development of Sao Paolo. It receives about 200,000 visitors a year, publishes newsletters, books, and educational software, holds annual festivals. It has co-produced several prize-winning video programmes on science popularisation.

Of particular interest is Prof Hamburger's special programme for out-of-school and street children who are welcomed at the Centre, socialized and educated, using the Centre's personal computers on which they learn to write. Entitled *Projeto Clicar* this Project is sponsored by the national petroleum company, Petrobras, and receives over 600 children a year with whom a successful relationship of trust has been established as a first step to their "inclusion".

While in India Prof Hamburger visited the Kalinga Foundation in Bhubaneswar where he was given a civic reception by Chief Minister Mr Naveen Patnaik. He addressed a well attended press conference, even as the Foundation Trustees and office bearers – Mr B.C. Pattnayak- President, Mr K. K. Patnaik – Managing Trustee, Mr Bimal Das – Secretary , and Mr Prafulla Samal- Joint Managing Trustee – organized a programme of visits to several leading educational and scientific institutions in the state capital.



Speech Delivered by Prof. Ernst W. Hamburger During Civic Reception at Bhubaneswar

UNESCO Press Release

“Mr Hamburger has contributed to the development of the Estação Ciência, through the organization of many exhibitions and the mobilization of sponsors for innovative activities such as the Projeto Clicar, created in 1996 with the support of the national petroleum company, Petrobras. Estação Ciência receives 25,000 visitors a month, mostly children and adolescents. Projeto Clicar was established to provide a special space with computer equipment to young people who wish to explore independently the various facets of human knowledge. In 1999, close to 600 children from troubled social or family backgrounds took part in the project. Educators and students assist the children in their exploration. “

Prof. Hamburger, who was honoured at a civic function here on Thursday, said that the days when fruits of scientific research remained a close preserve of a few had been over with the advent of electronic media. The new system of communication has now created a tremendous scope for taking science to the doorstep of people, he pointed out.

He said science is certainly not the final answer to poverty. But it is surely a definite means to empower people by which they can be made self-confident to move in the path of progress. To drive home the point, he cited the public response to the science museum in his country, Brazil, where 25 percent people are “extremely poor” and football is worshipped more than anything else.

He said the establishment of the museum had proved the deep-seated longing in people to use science for their development. It attracts more than 2 lakh visitors every year, most of whom are school children belonging to the disadvantaged section of the society. “When they sit before the computer and operate it you must see them to believe the kind of self-confidence generated in their minds”, he pointed out. He said in Brazil nearly 95 percent children go to school, a situation that was not seen decades back. Popularisation of science played a key role in bringing this change, thanks to the electronic media. Almost every family in Brazil has either a radio or a television which regularly run programmes on science prepared in common man’s language, taking people’s access to information to a new height. “We are making science popular like football”, he remarked .

The Kalinga prize for popularizing science is given every year by UNESCO on behalf of Kalinga foundation trust set up in 1950 by statesman and freedom fighter late Biju Patnaik. The prize money carries 1000 pounds and the Albert Einstein silver medal. According to managing trustee of Kalinga foundation trust, Kamini Patnaik, the prize money is small it had nevertheless attracted several illustrious scientist, including 6 Nobel prize winners. The prize money is being doubled from 2001 and efforts are on to increase the amount to 10,000 pounds soon, he added.

The latest winner Prof. Hamburger, who was born in Germany in 1933, emigrated to Brazil at the age of 3 with his parents, where he has been teaching physics in Sao Paulo since 1960. He has contributed to the popularization of science through numerous articles and his book- O Que e Fisica? – as well as programmes in television. In 1964 he was also given Jose Reis science popularisation prize and became director of the Estacao Ciencia, part of the UNESCO- supported science popularization network in Latin America and the Caribbean.” -

“The Times of India”, March 2nd, 2001.



Kalinga Prize / Prix Kalinga

The 2000 Kalinga Prize for the Popularization of Science will be awarded to :

Ernst Wolfgang Hamburger of Brazil

**In a ceremony organized by UNESCO and the Kalinga Foundation Trust
In New Delhi, India, in February 2001**

Born in Germany in 1933, Professor Hamburger emigrated with his parents to Brazil three years later. He joined the faculty of the University of São Paulo in 1960 as full professor of physics.

An Unflagging Commitment to Science Popularization :

Today, Professor Hamburger is Director of Estação Ciência (ehamburger@eciencia.usp.br), a Brazilian science center which is part of a UNESCO- supported network for science populrization entitled RedPop- Rede de Popularização das Ciências de América Latina e Caribe. This network has its own Science Popularization Prize (see www.ciencias.unal.edu.co/serpop/premio.htm), which Estação Ciência won in 1997.

Professor Hamburger is acting chairman of the new Brazilian Association of Science Centres and Museums (ABCMC-Associação Brasileira de Centros e Museus de Ciências).

Professor Hamburger's interest in physics education and science popularization dates back to the 1960s when he launched a curriculum development project and set up a laboratory offering demonstration experiments to schools that would later serve as the model for exhibitions organized for the general public by the Physics Institute.

In this brief overview of his distinguished career, we shall concentrate only on his extensive activities to Popularize science in Brazil.

Media Activities :

Since the 1970s, Professor Hamburger has published articles sporadically on physics and science popularization in the principal newspapers of São Paulo. In 1992 and 1993, journalists themselves became the focus of his activities when he turned his hand to teaching an extracurricular course on science popularization for journalists at the School of Communications and Arts of the University of São Paulo.

Professor Hamburger was a member of the coordinating committee for a series on the secondary school curriculum in 1976 produced by the educational television station of the state of São Paulo, TV Cultura; he was responsible for the programmes on physics.

In 1984, he published *O Que é Física?*, a Popularization book describing the beginning of physics from observation of celestial bodies, the Copernican revolution, theories of heat, electricity and light, quantum physics, electrons in solids, relativity theory, atomic nuclei and elementary particles, astrophysics and

physics research in Brazil. Over the years, the book had stimulated many a vocation in physics among young readers

Science Exhibitions :

In 1986, during the nearest approach of Halley's Comet, Professor Hamburger and faculty at the University of São Paulo organized an exhibition on the physics and astronomy involved which attracted some 70,000 people over a period of months. Encouraged by the exhibition's success and that of another larger exhibition on the theme of energy mounted at the São Paulo Museum of Technology in 1987 and financed by the state electricity company (CESP), Professor Hamburger maintained a permanent exhibition at the University of São Paulo between 1988 and 1994 of interactive physics experiments on superconductivity, mechanics, thermodynamics, nuclear physics, supernovae, astronomy and cosmology; the exhibition was visited mostly by school pupils.

Estação Ciência :

1994 proved to be a turning point in Professor Hamburger's career as a science popularizer. It was the year the National Research Council of Brazil bestowed on him the Premio José Reis de Divulgação Científica rewarding the best science popularizer in the country.

It was also the year he took up the post of Director of Estação Ciência, a science center founded in 1987 by the National Research Centre which has been part of the University of São Paulo since 1990. Over the past six years, Professor Hamburger has succeeded in increasing the budget of Estação Ciência and obtaining grants from agencies and businesses which have enabled him to extend both the activities of the center and their audience.

Science Exhibitions :

Most Estação Ciência exhibitions are inspired by research done in the University of São Paulo. After being shown at Estação Ciência, the exhibitions often travel to other science centres, universities and schools around the country. Interestingly, Estação Ciência uses an interdisciplinary approach, calling on collaborators from the humanities, biological and exact sciences for the different exhibitions.

Examples of Exhibitions are :

- The Zumbi dos Palmares exhibition, named after a hero of the resistance to slavery among the population of African origin in Brazil who was killed in 1695 (Anthropology Department, USP);
- The Xavantes of Mato Grosso. A group from this native tribe built a typical hut at Estação Ciência and talked to visitors about their daily life (Anthropology Museum);
- Medieval Castles (History Department, USP);
- Architecture and City Planning in São Paulo and other Cities (18th and 19th centuries) (Architecture and Urbanism School);
- History of Highway Transport (Architecture and Urbanism School);
- Marine Biology. Live fishes and invertebrates in aquaria and preserved specimens in oil (Zoology Department, USP);
- Urban Birds (Zoology Department, USP);

- Cosmic Ray Electronic Telescope (Physics Department, USP);
- Atmospheric Electric Discharges (National Space Research Institute);
- Magic Lantern – Origins of Cinema (Cinema Department, USP);
- History of Physics (multiple exhibitions).

Science for Street Children :

In 1996, Estação Ciência launched a project for street children known as *Projeto Clicar*, sponsored by the national petroleum company, Petrobras. Educators teach street children to read and write, and prepare them to go to school or return to school. All of the centre's exhibits are used for the purpose but the core of the work involves computers, which the children learn to operate. The children are free to come and go as they please. Their numbers had grown to 600 by 1999. The project has attracted considerable media interest.

Science Videos :

Among the science videos co-produced by Estação Ciência, one might mention a series of ten attractive and amusing one-minute clips entitled *Minuto Científico* exploring such themes as black holes, what are we made of? And relativity theory. Co-produced with TV Cultura, *Minuto Científico* has been awarded prizes at several national and international festivals. Other videos include *Visões de Liberdade*, a 30-minute video inspired by the Estação Ciência exhibition on the origins of Brazil's African population and produced by TV Cultura; and *Cosmic Radiation*, a 25-minute video for classroom use co-produced by the Physics Institute and Communications School of the University of São Paulo.

Since 1996, Estação Ciência has also hosted a yearly international scientific video show sponsored by Petrobras and the Banco do Brasil.





ewhambur@if.usp.br
12/31/2008 06:45 PM

To: crmishra@nalcoindia.co.in
cc:
Subject: Enc: Re: Fw: Request for Detailed Bio-data of Prof. Ernst.
Wolfgang Hamburger, Kalinga Prize Winner for the Year -2000

Dear Dr. Mishra
I take it that the CV to be sent is updated to 2008.
sincerely e w hamburger

----- Mensagem encaminhada de ewhambur@if.usp.br -----
Data: Wed, 31 Dec 2008 10:28:20 -0200
De: ewhambur@if.usp.br
Reponder para: ewhambur@if.usp.br
Assunto: Re: Fw: Request for Detailed Bio-data of Prof. Ernst. Wolfgang
Hamburger, Kalinga Prize Winner for the Year -2000
Para: crmishra@nalcoindia.co.in

Dear Dr. Mishra
thank you for your message.
I will collect the data during the next two weeks and send them to you.
My science popularization work, including articles and exhibitions, is all
in
the portuguese language; does that interest you?
sincerely
ernst w hamburger



"Ernst W. Hamburger"
<ehamburger@terra.co
m.br>

To: <crmishra@nalcoindia.co.in>
cc: "ewhil" <ewhambur@if.usp.br>
Subject: Fw: CV E W Hamburger as requested

02/08/2009 01:37 AM

dear Dr Mishra
I sent this CV on january 30. Please acknowledge receipt.
sincerely e w hamburger

----- Original Message -----

From: [Ernst W. Hamburger](#)

To: crmishra@nalcoindia.co.in

Cc: [ernst.w.hamburger](#)

Sent: Friday, January 30, 2009 4:58 PM

Subject: CV E W Hamburger as requested

dear Dr Mishra

Enclosed please find CV as requested.

I included personal data but private address should not be published.

Please acknowledge receipt.

I am sorry it was not possible to conclude earlier, due to other urgent obligations.

Next week hope to send other requested materials.

sincerely e w hamburger

The mail is scanned by Scan Mail for Domino - Nalco Corp
#####



CV EWHversao em ingles 25012008.doc

Ernst Wolfgang Hamburger

Curriculum Vitae

April - 2008

- Born 6/8/1933 Berlin, Germany
- Immigrant in Brazil October 1936
- Naturalized Brazilian Citizen 7/27/1956
- Married to physicist and collaborator Amélia Império Hamburger, with whom has five children:
Esther, Sonia, Carlos, Vera and Fernando.
- Has six grandchildren
- **Home Address** : P. Monteiro Lobato 163
São Paulo, SP 05506-030
Phone 55 11 3031 8408,
email ehamburger@if.usp.br; ehamburger@terra.com.br
Brazil

I) RÉSUMÉ OF CV AND DESCRIPTION OF CONTRIBUTION TO SCIENCE EDUCATION

- 1) Entered Physics course at University São Paulo in 1951 and started working in Electrostatic Accelerator Laboratory as undergraduate assistant in Nuclear Physics experiments. Devoted himself to this field of research for next twenty years. Measured nuclear reaction cross sections in the million electron volt energy region, in order to better understand nuclear reaction mechanisms and obtain information on structure of atomic nuclei. Studied light, intermediate and heavy nuclei, from Helium to Bismuth. Published over twenty papers on Nuclear Physics in main international journals; several results were significant and much quoted. Presented three thesis in this period: Ph.D. at University of Pittsburgh, USA, 1959; *Livre Docente*, 1962 and *Cadeira* (chair), 1968, at *Universidade de São Paulo (USP)*.
- 2) **Teaches physics** at University since 1955. Was **Head of Department of Experimental Physics** for many years starting 1970.
- 3) Taught **Nuclear Physics** 4th year undergraduate and graduate course.
- 4) Since 1965 was in charge of 2 year **basic physics courses**, introduced many innovations to make course more interesting, up to date and effective. Wrote lecture notes, revised in successive years, printed by *Instituto de Física USP* for student use.
- 5) Emphasized **laboratory experiments** performed by students, introduced new experiments and course planning to make sure experiment and theory advanced together during school year, thus improving student understanding and success rates in courses (formerly lab and theory courses were poorly coordinated).

- 6) Introduced modern physics (e.g. **Relativity, Quantum and Particle Physics topics and experiments**) in first years.
- 7) Set up special **collection of demonstration experiments**, *Laboratorio de Demonstrações*, to be shown by teachers during lectures and recitation sessions. The demonstrations were also important inspiration for physics students who later became school teachers.
- 8) Since 1968 started to take physics education as an **object of investigation and development**. Gradually shifted from Nuclear Physics to Physics Education, to Science Education.
- 9) Led a **Curriculum Development Project** for secondary school physics, *Projeto de Ensino de Física*, published in 5 volumes, including a Teacher's Guide, by a Foundation connected to Ministry of Education of Brazil, FENAME/MEC, 1970-75. Author team included experienced secondary school teachers and university professors. Project was influenced by international developments such as PSSC and (Harvard) Project Physics in USA and Nuffield Physics Course in UK, but was appropriate to Brazilian conditions, where teachers in general have little content knowledge and less familiarity with physics experiments. Simple experiments were designed and included as a necessary part of the course; experimental kits on Mechanics, Electricity and Electromagnetism, were developed by the team and sold by the publisher. Two examples: the study of motion used a low friction inclined plane track made of steel strip on aluminum support and steel bearing ball; chronometers were mechanical and expensive at that time, so an inexpensive "sand chronometer" was developed, using the sandglass principle in a way that gave time measurements of precision 0.1 sec. For study of electromagnetism, a small easy to build motor was developed; the most difficult part to make, the commutator, was replaced by interrupting the current during half of each cycle, simply by scraping off the enamel insulation of the copper wire only from half the circumference; this design, first published in the volume on electromagnetism of this project, was later used in many books. These devices were developed by students and school teachers, coauthors of the project. The Project was successful in schools, was reprinted several times, but required more work from teachers, and was not widely used in schools. However it influenced texts published in the following years and was used in teacher training courses; also about one thousand teachers attended one-week in service courses based on the texts and experiments of these books, and teacher licensing courses in universities practiced with them.
- 10) Established a group for **production of films for physics teaching** in collaboration with the Cinema Department of the School for Communication and Arts of the University. Seventeen short "single concept" films, each 4 minutes long, were produced in the following years, aimed at general physics courses in universities. A visit by US physics teacher and film maker Al Baez in 1971 was helpful in establishing the program.
- 11) In 1970 presented a paper at the annual meeting of the Brazilian Society for the Progress of Science (*Sociedade Brasileira Para O Progresso da Ciência*) on **The University Entrance Exam and Distortions of the Educational System**, which was immediately published in the daily press and caused much discussion among educators. At that time the university entrance exams were widely considered, when well formulated, as selecting the "best" students. The paper pointed out that independently of how cleverly the exam was designed, it was in the first place a social and economic selection. Only students who went to a good school and had time and money to prepare well for the exam had a real

chance (except for a few very talented and hard working poor students). Most of the successful candidates followed expensive cramming courses after regular school. These courses followed the exams year after year and were able to predict the kinds of questions that were asked. The only way to select talents from all social and economic groups was, and is, to greatly improve public education, which is free and available to all. All this seems obvious today and is widely accepted by educators, but was not in 1970. Today, 38 years later, almost all children go to school for at least 8 years, but the quality of public schools is, in general, insufficient for them to enter public (free) universities; private (paid) universities have less competition at entrance, but are expensive and the quality of education is usually lower. The improvement of the quality of primary and secondary public education is still the greatest educational challenge in the country.

- 12) Proposed and directed, during initial years, an **Interdisciplinary Graduate Program in Science Education (Physics)**, initiated 1969, formalized 1973, in collaboration with the School of Education, which has granted over 230 masters degrees as of 2008. This was the first interdisciplinary graduate program in University of Sao Paulo. The dissertations are about education and diffusion of physical sciences in schools, universities, the media and society. Here the various development projects in physics education were subject of research and dissertations. This program attracted teachers interested in graduate studies aimed at improving teaching and learning of physics; many of the graduates later set up similar R & D programs in other universities.
- 13) Studied the working of the **university physics curriculum**, trying to understand and correct the **high flunking and dropout rates of students**, principally during the first year of university. Difficulties of abstract thinking and of mathematical abilities were not sufficiently taken into account in introductory Calculus and Physics courses. Laboratory experiments could be exploited to ease some of these difficulties, by furnishing concrete examples of abstract operations. For example the study of Rotation of Rigid Bodies and the concept of Angular Momentum as a (axial) vector quantity is much easier if the student holds the axle of a spinning bicycle wheel in his hands and changes its direction, and examines the fall of a weight tied to a string wound around a solid cylinder with fixed axle.
- 14) Was **advisor of seventeen graduate students** in the program on science education, who presented research dissertations on topics such as Teacher In-Service Training Program, Science Exhibition for Elementary School Teacher Pre-Service Training, A Course on Gravitation for Elementary School Teachers, Science Education based on Community Problems, A Course on Physics of Environment at University of Rio Grande do Norte, The Undergraduate Physics Course at University of São Paulo, Undergraduate General Physics Laboratory, Analysis of the *Projeto de Ensino de Física*, Production, Use and Evaluation of Teaching Films, An Electricity Course for Knowledge Transfer, Limitations in Understanding of Basic Concepts in Physics, *Projeto de Ensino de Física* in Programmed Individual Instruction. Also advised three master degree students in Nuclear Physics.
- 15) Was advisor of seven doctoral thesis, of which one in Nuclear Physics and seven in Physics Education; these were on topics similar to the above.
- 16) Organized, on behalf of the Brazilian Physical Society, *Sociedade Brasileira Física*, the first **National Symposium on Physics Teaching**, *Simpósio Nacional de Ensino de Física*, in 1970, and again in 1976 the third Symposium. These symposia, held initially every three, and later every two, years, are

Glossary on Kalinga Prize Laureates

to this day important meetings to discuss the state of the art of physics teaching, and to bring together physics and science school teachers, university professors and researchers. During the military dictatorship in Brazil, 1964-1985, when communication media were severely censored, scientific and professional meetings were also important to discuss general subjects.

- 17) As member of the Governing Board, **Directoria, of Sociedade Brasileira de Fisica**, 1969-71 and 1976-78, and later of the society's general council, Conselho, has striven to keep both research and teaching questions as concerns of the same Physical Society. Believes that if research and teaching and learning are thought of concomitantly, all do better, for research is but a way of learning, from nature as teacher.
- 18) Has organized and participated as author in teams to write texts for physics books, story boards for physics films, for Television programs for physics teaching, and for science exhibitions.
- 19) Was **adviser for Physics TV programs** of the Educational **TV Station TV Cultura-Canal 2** in Sao Paulo in the series *Colegio 2*, aimed at secondary schools, 1975.
- 20) Later was **supervisor of the physics content** for national **TV programs and accompanying textbooks** produced for Brazil's largest TV network, **Rede Globo, Telecurso 2000**, with support of the São Paulo Industry Federation, *Federação das Industrias do Estado de S. Paulo, FIESP*, aimed at secondary school level, but to be used also by adult students working in industries. These courses were very successful and were shown for many years on open TV and as video cassettes in institutions.
- 21) In the Physics Institute of the University, and later in *Estação Ciência*, **organized (taught many of them) over a hundred in service training courses for school teachers**, introducing modern teaching methods and modern science content.
- 22) In the **Physics Institute** organized **science popularization activities: talks, courses, exhibitions** of experiments and posters, visited by tens of thousands school students and other interested people. The first exhibitions, very successful with large public, were on Halley's Comet during the approximation in 1986, and on Energy, in 1987, sponsored by an electricity company, CESP. Both required more space than the Physics Institute had, and were shown in other buildings on or near campus. The success showed that there was much interested public for science exhibitions.
- 23) The Physics Institute has a history in research significant in Brazilian science education, and this should be known to students and younger faculty. For this purpose, EWH led organization of symposia, publications and exhibitions on important research work done by faculty of the Institute in the past:
 - i) 1984-chair of commission for homage to 70th birthday of prof. Mario Schenberg, including a) International Symposium on Theoretical Physics; b) Publication of Proceedings of this Symposium (org. A.L.R. Barros); c) Special issue of *Revista Brasileira de Fisica* ("Festschrift" org. N. Fernandes); d) publication of two books by Schenberg: ***Pensando a Fisica*** (org. A.I. Hamburger) and ***Mário Schenberg: Entrevistas*** (org. J.L. Goldfarb and G. Guinsburg);
 - ii) 1988- "**40 years of the discovery of the pi-meson**", homage to prof. Cesar Lattes, symposium and exhibition;
 - iii) 1990- "**50 years since discovery of Penetrating Showers in Cosmic Rays**", research led by institute founder Prof. G. Wataghin;

- iv) 1992- “**A History of Nuclear Physics**”, for the 70th birthday of Prof. Oscar Sala.
- 24) Published small **book** on ***O que é Física? (What is Physics?)*** in 1984, directed to general public, specially school students; eighth edition published 2007.
- 25) In 1992 started, with E. Silva, a new **physics experiment on Cosmic Ray Detection**, in collaboration with colleagues of his and other institute, including INFN in Italy. An electronic telescope for high energy muons of cosmic origin, to look for possible anisotropies or “point” sources in the sky was built and tested. **A smaller instrument, for teaching and demonstration** purposes, was also developed and used in Physics Institute and at *Estação Ciência*.
- 26) In 1994 was invited to **direct Estação Ciência**, a Science Center in the city of S. Paulo, established 1987 and belonging to University of S. Paulo since 1990, housed in building of an old factory. Devoted himself to increasing and improving the activities of the center. Below are mentioned some of his initiatives, most of which depended on the collaboration of university colleagues and staff.
- 27) Obtained collaboration of faculty and funds from government and private agencies to set up or borrow **many new exhibitions**: Nuclear Physics and Cosmic Rays, Thermodynamics and Energy, Marine Biology, History and Anthropology of Population of African Origin in Brazil, Way of life of Xavantes (American Indian tribe) in state of Mato Grosso, Plume Art of American Indians in Brazil, History and Physics of Photography and Cinema, Astrophysics and Cosmology, Medieval Castles and Feudalism, Urban Development of S. Paulo and other Cities, Lightning and Thunderstorms, History of Highway Transportation, among others. The permanent exhibition was substantially enlarged with new experiments and exhibits, by incorporating part of the building which had not yet been refurbished.
- 28) **Estação Ciência** now has an area of 5 000 square meters, being about 3 500 for exhibitions. It receives over 300 000 visitors per years, of which ca. 70% are school children who come in buses. There is a team of **university students who act as explainers** in the exhibitions. The selection, training and supervision of these explainers is an important part of the working of the center. Often these students later become teachers.
- 29) Since 1995 there is a special program, set up with the help of specialized educators, **for children who spend most of their time in the streets** and often do not go to school. The children are socialized and educated using the centers' equipment, specially personal computers, where they learn to write and use educational software. This **Projeto Clicar** receives hundreds of children per year, and has been very successful in establishing a relationship of trust, first step to an inclusion of this social sector, and return to school. The program has attracted much interest from projects with similar aims in Brazil and in other countries (e.g. University of California), from the media and has received a prize Top Social 2000 as the best social project sponsored by companies in the country, bestowed by ADVB – *Associação de Dirigentes de Venda e Marketing do Brasil*. It is sponsored by the national petroleum company Petrobras.
- 30) *Estação Ciência* has co-produced several **video programs for science popularization on TV channels**, upon initiative and coordination of EWH. University scientists help prepare the script or story board and TV professionals direct and produce. The most successful is a 1996 series of ten one minute clips on basic scientific topics, **Minuto Científico**, directed by Cao Hamburger : Black Hole, Theory of Relativity, What are we made of ? Elementary Particles, and others, produced with the

Glossary on Kalinga Prize Laureates

educational TV station *TV Cultura*, which is still occasionally broadcast, as in 2008. The series was presented at festivals in Brazil and abroad and received much applause and several prizes: see below. Another co-production with *TV Cultura* is “Visions of Liberty”, a 30 min video inspired by the exhibition on Slavery and the African origin population in Brazil. With the Physics Institute and the Cinema Department of the University was produced “Cosmic Radiation”, directed by M. Tassara, based on talk by EWH. Many TV channels have run programs filmed in *Estação Ciência*, e.g. the physics part of the series *Telecurso 2000*.

- 31) A **printed Newsletter** was sent, up to 2002, from *Estação Ciência* every two or three months to all schools of the state of S. Paulo. Good communication with the school system is essential for the effectiveness of the Science Center. Since 1996 the center also has a **site on the Internet**, with an electronic version of the Newsletter and the science popularization materials, particularly a series of **interactive animation** which is being developed by M. Matsukuma to explain certain concepts: the Solar System, Making a simple electric motor, how does a laser work? And others.
- 32) **Educational Software** for physics and mathematics was developed, e.g. *Oficina de Funções* (Mathematical Function Workshop) received a prize from the Ministry of Education (1997). *Urban Birds* is a multimedia program inspired by an exhibit in the *Estação Ciência*.
- 33) We cite some of several **books** organized by *Estação Ciência* and several publishers, with EWH as co-author and / or co-organizer. **Centros e Museus de Ciências – Visões e Experiências** (1998) about Science Centers and Museums in Brazil, organized by then staff member S. Crestana, contains papers by forty science researchers and popularizers.
- 34) A **course** directed to science center personnel of Brazil and Latin America, organized at *Estação Ciência* in 2000, taught by experienced specialists from this region, was published in book form **Educação para Ciência** (2001), org. S Crestana, EWH et al. It includes descriptions of most interactive science centers in Brazil.
- 35) From 1995 to 2002 *Estação Ciência* organized a yearly fair of materials for teaching and popularization of science, **Mostra de Material de Divulgação e Ensino de Ciências**, including talks by teachers and scientists. About one hundred exhibitors, universities and schools, showed the teachers, students and administrators who visit the fair, about ten thousand, the latest developments in equipment, books, software, etc. The proceedings of four fairs were later published as books: **The Challenge of Teaching Sciences in Century XXI** (2000); **Science and Social Inclusion** (2002); **Science and Art – Discovery and Imaginary** (2003), and **Scientific Knowledge and Everyday Knowledge** (2004), all org. by staff member C. Matos with Introduction of EWH. After EWH's retirement, in 2003, the fairs were discontinued.
- 36) On the other hand, three books, organized by anthropologists, were co-published with the University of S. Paulo Press about themes from the exhibition on Slavery and African Origin Population.
- 37) *Estação Ciência* since 1995 hosts, invited by EWH, every year, an International Scientific Video Festival, **VerCiência**, organized by video firm Mediatech in Rio de Janeiro, São Paulo and, more recently, other cities, showing a selection of the world's best scientific videos.

Glossary on Kalinga Prize Laureates

- 38) In 2003-2004 the University Coordination of Social Communication and *Estação Ciência* organized seminars on “Science and Society-Journalistic Mediation” and published a book *Ciência e Sociedade – Mediações Jornalísticas*, org. Cremilda Medina, EWH author of chapter.
- 39) Organized traveling Exhibition **Scientific Aspects of Space Travel**, (2004) for general public (20 posters, 8 experiments & multimedia), for Brazilian Space Agency (AEB), *Estação Ciência da USP*.
- 40) Organized Traveling Exhibition on **Physical Sciences in Brazil**, for general public (40 posters, 4 experiments and 4 multimedia presentations), 2005, sponsored by Brazilian Physical Society (SBF), Ministry of Science Technology (MCT), Science Foundation of State of S. Paulo (FAPESP), *Estação Ciência da USP*, for International Physics Year.
- 41) Since 2001, until 2008, EWH has been **coordinator** of a Program of the *Academia Brasileira de Ciência* (Brazilian National Academy of Sciences, of which he is a member) for furthering **Inquiry Based Science Education (IBSE)** in Brazil; he also coordinated this **Programa ABC na Educação Científica- Mão na Massa** locally in São Paulo, in *Estação Ciência*, until 2009. In recent years this program has been his principal educational task.
- 42) The Programme is aimed at the initial school years, for ages 6 to 13, and organizes in service training for teachers, not only of science content, but also of how to conduct experiments and observations in class, with active participation of pupils in all stages of the process, from the discussion to define the question to be answered, to the planning, performance and analysis of results. Since elementary school teachers and administrators usually have little background in science, especially in inquiry and experimentation, it takes some time for teachers to feel sure of themselves to adopt this methodology. At present the program is being tried in twelve cities in Brazil, with good results. The largest group is in S. Paulo, with about one hundred municipal schools. Several educational research papers on this work have been presented at professional meetings.
- 43) In each city a university or science research institution collaborates with the municipal or state school system in the preparation of teaching materials and development sessions with teachers and educational personnel.
- 44) The Program quoted above is similar to Programs which exist in the USA, France and about thirty other countries. They have the support of the respective National Academies of Science and of the international, organization **Inter-Academy Panel (IAP)**. The IAP organized a working group to study the evaluation of Inquiry Based Science Education (IBSE) Programs, of which EWH was a member and is co-author of the **Report of the Working Group on International Collaboration in the Evaluation of Inquiry-Based Science Education (IBSE) programs**, published by the Academy of Sciences of Chile in 2006.
- 45) In S. Paulo EWH has supervised the **preparation of teacher training** for the program and **development of texts and experiments** for teachers to help plan and perform activities with the children in class. The largest program is a collaboration with the municipal school system of the city of S. Paulo, introducing Inquiry Based Science Education in about one hundred schools situated in different regions of the municipality. In 2007 the first formal **class room evaluation** of the program was carried out, which showed positive results. The same was true of the second evaluation, carried out in 2008. Both evaluations were planned together by the teams of the Municipal Education Authority

and *Estação Ciência*, and required students to carry out a simple science experimental observations (physics in 2007, botany in 2008), working in small groups, and to answer a short test.

II) DEGREES, TITLES AND DISTINCTIONS

- **Bachelor** in Physics, Universidade de São Paulo, USP, 1954
- **Specialist** in Physics, USP, 1955
- **Ph.D** in Physics, University of Pittsburgh, USA, 1959
- **Livre Docente** in Nuclear Physics, USP, 1962
- **Member Brazilian Academy of Sciences, 1967**
- **Full Professor** Chair of General and Experimental Physics, USP, 1968
- **Homage** by graduating physics class of 1968 and 1994, USP
- **Faculty spokesman** of graduating physics class, 1993, USP
- **Premio Jose Reis de Divulgação Científica**, Jose Reis Prize for Science Popularization, bestowed by National Research Council (CNPq) to best science popularizer in Brazil, 1994.
- **Palme Académiques**, bestowed by Government of France, S. Paulo, 2001
- **Kalinga Prize for Popularization of Science**, bestowed by **UNESCO and Kalinga Foundation**, 2000
- **Medalha Ciência Hoje de Divulgação Científica**, by journal *Ciência Hoje*
- **Latin American Prize for Popularization of Science and Technology**, bestowed to EWH by **UNESCO/ORCYT** and **RedPop**-Latin American Network for Science and Technology Popularization, 2003, as best individual popularizer for 2002-2003.
- **National Order for Scientific Merit**, bestowed by the **President** of the Republic and the **Minister for Science and Technology**, Federal Government of **Brazil**, 2005.

{Prizes received by *Estação Ciência* programs during EWH directorship:

- **Latin American Prize for Popularization of Science and Technology 1996/97**, bestowed to *Estação Ciência* by **UNESCO/ORCYT** and **RedPop**-Latin American Network for Science and Technology Popularization, 1997, as best Latin American institution of the year.
- **Top Social 2000** Best Social Project sponsored by Brazilian company bestowed to **Projeto Clicar**, sponsored by **Petrobras**, by ADVB, *Associação de Dirigentes de Venda e Marketing do Brasil*
- **Best Educational Software** to *Oficina de Funções*, Brazilian Ministry of Education, 1998.
- **Recommended Site on Internet** The site of *Estação Ciência* has been selected for quality and interest by several magazines and sites who evaluate the Internet in Brazil: Revista da Web magazine, April 2000; www.EscolaNet, february 1999 and march 2000; Webguide magazine, September and November 1999; www.BOL, Brasil on Line, February 2000; Links & Sites March, September and October 1999.

Prizes to *Minuto Científico* video series:

- **Prix Leonardo**, Parma. Italy, 1997
- **Best Science Popularization for Youth**, Telescience Progr, Canada, 1998
- **Best Juvenile Program**, 1st Latin American TV Meeting, Gramado, Rio Grande do Sul, Brazil, 1998}

III) PROFESSIONAL SOCIETIES :

- **SBPC, Brazilian Society for the Progress of Science**, *Sociedade Brasileira para o Progresso de Ciência*, member since 1956. Has been member of Council, 1976-80, of Board of Directors, 1981-83, of Organizing Committee of many Annual Meetings and of special commissions, e.g. Working Group for proposal of reform of teacher training and certification courses in universities, 1976-82; results published in journal of SBPC, *Ciência e Cultura*, in 1981 and 1989.
- **SBF, Brazilian Physical Society**, *Sociedade Brasileira de Física*, since foundation in 1966. Was member of Board of Directors or of Council for several periods from 1969 to 1989, as General Secretary and later as Secretary for Physics Teaching Questions.
- Member Organizing Committee for many Annual Meetings. Convenor of first National Symposium on Physics Teaching in 1970, now a regular biannual meeting. Co-founder of *Revista Brasileira de Física*, Brazilian Journal of Physics, and of the *Boletim* of SBF.
- **American Physical Society**, APS, New York, since 1956. Participation in several scientific meetings while in the US and publication in journals.
- **Academia Brasileira de Ciências**, Rio de Janeiro, elected associate 1967 and full member 1969. From 2001 until 2008 coordinator of the Academy's Program for Inquiry Based Science Education "**ABC na Educação Científica – Mão na Massa**".
- **Associação dos Docentes da USP, ADUSP**, Faculty Association of USP, since 1976. Was President 1983-85, when sponsored academic and cultural meetings and publications about role of University and its organization, course on danger of nuclear war, etc.
- **Associação Brasileira de Centros e Museus de Ciências**, ABCMC, Brazilian Association of Science Centers and Museums, founding member and first president for two terms, 1998-2002, now honorary member.

IV) POSITIONS HELD :

- **Professor of Theoretical Physics**, Mackenzie University, S. Paulo, 1955
- **Assistant Professor**, *Faculdade de Filosofia, Ciências e Letras da Universidade de S. Paulo, FFCLUSP*, 1956 and 1960-61
- **Research Assistant**, University of Pittsburgh, U S A, 1957-59
- **Associate Professor**, *Livre Docente, FFCLUSP*, 1962-68

Glossary on Kalinga Prize Laureates

- **Visiting Associate Professor**, University of Pittsburgh, U S A, 1965-67
- **Professor**, *Professor Catedrático Física Geral e Experimental*, FFCL USP, 1968-70
- **Professor Experimental Physics**, *Instituto de Física de USP*, 1970-2003
- **Chairman Physics Department**, FFCLUSP, 1967-68
- **Chairman Department Experimental Physics**, *Instituto de Física USP*, several periods since 1970
- **Aide to S. Paulo State Secretary for Science, Technology and Economic Development**, 1991-92. In charge of relations with Universities and Research Institutes
- **Director of Estação Ciência, Science Center of Universidade de São Paulo**, 1994-2003
- **Retired from University, 2003** (Obligatory retirement at age 70, but continues work as collaborator)

V) MEMBERSHIP IN COMMISSIONS :

- **Faculty Senate** (*Congregação*) of *Faculdade de Filosofia FFCL* and later Physics Institute of USP, 1967 to retirement 2003
- **Physics Department Council** since 1967 to 2003
- **Undergraduate Physics Teaching Committee** 1969-70
- **Graduate Physics Teaching Committee** 1970-76
- **University Senate** (*Conselho Universitário*) 1978-80
- **University Central Council for Culture and Extension** (*Conselho Central de Cultura e Extensão Universitária*) 1989-90 and 1993-2003, as representative of Physics Institute. This council is responsible for all extracurricular and outreach work of the university. President of Chamber for University Extension in this Council, 1997-99.
- **Consultant to National Research Council** (*CNPq*) in Science Education 1982-83
- **Scientific-Technical Council of Museum of Astronomy** (*Museu de Astronomia e Ciências Afins, MAST, do CNPq*) in Rio de Janeiro, 1989-95
- **Jury for Young Scientist Prize** given by CNPq, 1992
- **Working Group for Science Education Program**, (*GT/SPEC/PADCT*) Ministry of Science and Technology, Brasília, 1995-97
- **Jury for José Reis Prize for Science Popularization**, CNPq, 1998
- **International Commission on Physics Education**, ICPE, of International Union of Pure and Applied Physics, IUPAP, 1999-2002
- **Commission on Physics Course** of Ministry of Education, for guidelines for National Exam for Physics Courses, 2000-2001.

VI) ADVISER OF GRADUATE DISSERTATIONS

Seventeen master dissertations approved

Eight doctoral thesis approved

(Presently (2008) two doctoral students)

(Mestrado = Master, Doutorado = Doctorate)

- Ivo Leite Filho, *“Projeto Circuito Ciência: Implantação de atividades científicas e orientação para pesquisa, em escolas municipais de São Paulo”*, **Doutorado**, Faculdade de Educação de Universidade S. Paulo (FEUSP), 2003
- Beatriz Aparecida Capiroglio de Castro, *“O projeto de Educação Continuada da Estação Ciência : Um Estudo de Caso”*, **Mestrado**, FE/IFUSP, 1999
- Edson Minoru Kubo, *“Projeto Microsul: Um Telescópio de Raios Cósmicos. Descrição e Caracterização do Equipamento”*, **Mestrado**, Instituto de Física da Universidade de São Paulo (IFUSP), 1998
- Denise d’Assumpção Cardoso, *“Mostra Científica como Método de Aprendizagem para Curso de Formação de Professores de 1ª. a 4ª. series do 1º, grau”*, **Mestrado**, IF-FE USP, 1998.
- Ozimar da Silva Pereira, *“Ensino de Física Moderna e Raios Cósmicos no Segundo grau”*, **Mestrado**, IF/EUSP, 1997.
- Sergio Anéfalos Pereira *“Construção e Caracterização de um Telescópio de Muons Cósmicos”* **Mestrado**, IFUSP, 1996
- Maria Cristina Martins *“A Física Nuclear e seu papel no ensino de física e na divulgação científica”*, **Doutorado**, FEUSP, 1995
- Polônia A. Fusinato *“Panorama do Curso da Física de USP no Perfil de seus Alunos- Estudo de Desempenho Acadêmico no período de 1989-1995”*, **Doutorado**, FEUSP, 1995.
- Alberto Gaspar: *“Museus e Centros de Ciências – Conceituação e Proposta de um Referencial Teórico”*, **Doutorado**, FE-USP, 1993.
- Dacio Guimarães de Moura: *“O elemento lúdico no ensino de Física”*, **Doutorado**, FE-USP, 1993.
- Fernando D. Prado: *“Acesso e evasão de estudantes na graduação. A situação do curso de Física na USP”*, **Doutorado**, FE-USP, 1990.
- Silvânia S.do Nascimento: *“Um curso de gravitação para professores de primeiro grau”*, **Mestrado**, IF e FE-USP, 1990.
- Dacio Guimarães de Moura: *“Reflexão sobre o currículo de física na escola secundária do Brasil; subsídios para planejamento de currículos”*, **Mestrado**, IF e FE-USP, 1985.
- Marta Maria Castanho Pernambuco: *“Ensino de ciências a partir dos problemas da comunidade”*, **Mestrado**, IF e FE-USP, 1981.
- Maria Cristina Dal Pian Nobre: *“A proposição de objectivos para um curso de física do meio ambiente no Rio Grande do Norte RN; uma questão de análise sistemática”*, **Mestrado**, IF e FE-USP, 1981.
- Fernando Dagnoni Prado: *“A graduação em física da USP”*, **Mestrado**, IF e FE-USP, 1980.

Glossary on Kalinga Prize Laureates

- Vera Lúcia L. Soares: “*Laboratório didático de física no ciclo básico da Universidade*”, **Mestrado**, IF e FE-USP, 1977.
- Diomar da Rocha S. Bittencourt: “*Uma análise do Projeto de Ensino de Física*”, **Mestrado**, IF e FE-USP, 1977.
- Mikiya Muramatsu: “*Produção, Utilização e Avaliação de Filmes Didáticos*”, **Mestrado**, IF e FE-USP, 1977.
- Plínio U. M. dos Santos: “*A transferência de aprendizagem como objectivo explícito de currículos – um curso de eletricidade visando à transferência de aprendizagem*”, **Mestrado**, IF e FE-USP, 1977.
- Paulo Alves Lima “*Limitações no entendimento de conceitos básicos de Física*”, **Mestrado**, IFUSP e FEUSP, 1977.
- Antonio Geraldo Violin: “*O Projeto de Ensino de Física (PEF) Mecânica I em um curso programado individualizado*”, **Mestrado**, IF e FE-USP, 1977.
- Luiz Carlos Gomes: “*A Reação $^{91}\text{Zr}(\text{d,t})^{90}\text{Zr}$* ”. (**Co-orientação** com Olácio Dietzsch), **Mestrado**, IFUSP, 1975
- Claudio Zaki Dib: “*Tecnologia da educação e aprendizagem em Física*”, **Doutoramento**, IFUSP, 1973.
- Tereza Borellow-Lewin: “*Estudo de estrutura dos núcleos Sn^{113} e Sn^{123}* ”, **Doutoramento**, IFUSP, 1971.

Undergraduate Students

Supervisor for large number of undergraduate students, for initiation to science research and as explainers for science exhibitions, at Physics Institute and at *Estação Ciência*, where there are about a hundred explainers from different academic areas every two years. Beyond being great help to visitors, this is an important experience for the student-explainers, increases the significance of the university course and diminishes drop-out rate.

VII) RESEARCH & DEVELOPMENT IN PROGRESS

- **Development of Demonstrations and Exhibitions for Science Centers, specially for space research institute (2006-2008).**
- **Science Education Based on Inquiry (IBSE) in the first years of school (Kindergarten to grade 8, ages 5 to 14). How to introduce IBSE in a school system in S. Paulo. Planning, performing and evaluation of teacher training for IBSE.**

VIII) ACADEMIC PUBLICATIONS

First Part : Education Subjects

In this part we cite also relevant papers from the series of internal publications of the Physics Institute, numbered IFUSP/P-xx, which were later included in graduate theses (e.g. of Polonia A. Fusinato and Fernando D. Prado), but not published in journals.

See also section X publications in books.

Glossary on Kalinga Prize Laureates

- E W Hamburger **Apontamentos sobre o ensino de Ciências nas séries escolares iniciais**, Estudos Avançados **21** (60), 93-104, 2007 (“Notes on science teaching in the initial school grades”)
- Wynne Harlen et al **Report of the Working Group on International Collaboration in the Evaluation of Inquiry-Based Science Education (IBSE) programs**, published by the Academy of Sciences of Chile in 2006, coauthor.
- B.C. Athayde, R. Samagaia, A.I. Hamburger, E.W. Hamburger, - **Análise de Ensino de Ciências com Experimentos em escolas Públicas de São Paulo**, Public. Interna IFUSP/P-1582, apresentado ENPEC outubro 2003. (“Analysis of Science Teaching with Experiments in public schools in S. Paulo”, presented at ENPEC – meeting for Science Teaching Research, 2003)
- Fusinato, P.A.; Hamburger, E.W. e Castro, B.A.C. de – **“Estudo do Desempenho dos Alunos nas Disciplinas do Primeiro Semestre do Curso de Física da USP em 1991”** – IFUSP/P-1082, 1993. (“Student performance in the first semester of USP physics course in 1991”)
- Rodrigues, I.G. e Hamburger, E.W. – **“O Group de Ensino do IFUSP: Histórico e Atividades”**, edição revista e ampliada IFUSP/P-1035, 1993. (History of the Physics Institute Research in Teaching Group)
- Hamburger, E.W.; Fusinato, P.A.; Castro, B.A.C. de – **“Acompanhamento dos Alunos Ingressantes no IFUSP em 1989”** – IFUSP/P-, IFUSP, 1992. (“Follow-up of students Who entered IFUSP in 1989”)
- Hamburger, E.W. – **“O Ensino de Graduação: Como Está?”** – contribuição à Mesa Redonda durante o IX Simpósio Nacional de Ensino de Física – São Carlos, SP- publicação IFUSP/P-894, 1991 (“How is undergraduate teaching?”)
- Hamburger, E.W. **“Problemas da Educação no Brasil”** – Síntese e Conclusões do Curso de mesmo nome organizado pelo GT da SBPC sobre Licenciatura em disciplinas científicas. Ciência e Cultura **41** (1989) 786-791. O curso todo está publicado à pág. 732-785 da mesma revista. (“Problems of Education in Brazil”)
- Castro, B.A.C. de; Hamburger, E.W. e Rabinovitch, S.V. – **“Estudo sobre o Desempenho dos alunos do curso de Física da USP: a influência da exigência de pré-requisitos”** - Publicações IFUSP/P-787, 1989. (“Influence of requiring pré-requisites on student performance in USP physics course”)
- Hamburger, E.W.; Castro, B.A.C. de e Rabinovitch, S.V. - **“Desempenho dos alunos do curso de Física da USP”** - Publicações IFUSP/P-760, 1988. (“Performance of students of USP physics course”)
- Hambruger, E.W. – **“40 anos de Meson Pi”** – Palestra realizada em Reunião Annual da SBPC, em São Paulo, 1988 Publicação IFUSP/P-729, julho 1988. (“Forty years of the pi meson”)
- Hamburger, E.W. – **“Networks, Physics Education and Development”** – Paper Presented at the Congresso Inter-Americano de Enseñanza de Física, Oaxtepec, Mexico Publicação IFUSP/P-719, 1988.
- Hamburger, E.W. – **“Exame Vestibular”** – Anais do Seminário Vestibular Hoje (1986), Publ. Univ. Fed. Minas Gerais, SESU/MEC, 1987. (University entrance exam)

Glossary on Kalinga Prize Laureates

- Hamburger, E.W. – **“Palestra sobre Evasão – VII Simpósio Nacional de Ensino de Física SNEF”** – Publicações IFUSP/P-637, São Paulo, 1987. (“Talk on drop-out rate” in VII National Physics Teaching Symposium, 1987)
- Castro, B.A.C. de; Hamburger, E.W. e Rabinovitch, S.V. – **“Levantamento Preliminar de Evasão na USP”** – Parte II – Publicações IFUSP/P-653, São Paulo, 1987 (“Preliminary survey of drop out rates in *Universidade de São Paulo* USP” part II)
- Hamburger, E.W. – **“Visita a Museus da Ciência na Europa”** – Publicação IFUSP/P-652, 1987. Trabalho apresentado no 2º Simpósio Latino Americano de História da Ciência, SBPC, São Paulo, 1987. (“Visit to Science Museums in Europe”)
- Castro, B.A.C. de; Prado, F.D.; Hamburger, E.W. e Rabinovitch, S.V. – **“Evasão e Desempenho dos Alunos no IFUSP em 1981”** – Publicações IFUSP/P-590, São Paulo, 1986. (“Drop-out rate and performance of students of IFUSP in 1981”)
- Hamburger, E.W. – **“Levantamento Preliminar da Evasão na Universidade de São Paulo”** – Publicações IFUSP/P-600, São Paulo, 1986. (“Preliminary survey of drop out rates in *Universidade de São Paulo* USP” part I)
- Prado, F.D.; Hamburger, E.W. e Rabinovitch – **“A População Estudantil Matriculada no IFUSP em 1984”** – Publicações IFUSP/P-556, São Paulo, 1985.
- Prado, F.D.; Hamburger, E.W. e Rabinovitch, S.V. – **“Estudo Comparado dos Matriculados no IFUSP nos anos de 1983 e 1984”** – Publicações IFUSP/P-557, São Paulo, 1985. (“Comparison of students registered in physics institute USP in 1983 and 1984”)
- Hamburger, E.W. – **“Mário Schenberg”**, Revista de Ensino de Física 6 (abril de 1984) 67-77 (Saudação ao professor Schenberg na outorga do título de Professor Emérito do IFUSP, 28/6/1984). (Address to professor Schenberg when declared Emeritus)
- Hamburger, E.W. – **“A Reforma da Universidade”**, Jornal da ADUSP, nº 9, novembro de 1984. (“University Reform”)
- Castro, B.A.C. de; Hamburger, E.W.; César, R.O.; Rabinovitch, S.V. e Prado, F.D. – **“Análise de informações e opiniões de formados em física”** (publicação interna do IFUSP) 1983. (“Analysis of data and opinions of physics graduates”)
- Rabinovitch, S.V. e Hamburger, E.W. – **“Análise de Questionários”** – Vestibular de 1982 – IFUSP (publicação interna do IFUSP) 1982.
- Rabinovitch, S.V. e Hamburger, E.W. – **“A Evasão de alunos no Curso de Física da USP”** – **Atas do V Simpósio Nacional de Ensino de Física**, Organizado pela SBF, Belo Horizonte, MG, 1982. (“Drop-out rates in the physics course at USP”)
- Hamburger, E.W. – **“A Política de Pós-Graduação em Educação”** – **Anais da I Conferência Brasileira de Educação**. Ed: Cortez, SP, Setembro/ 1981, pp. 221-224. (“Policy for Graduate courses in Education”)
- Hamburger, E.W. – **“Post Graduate Training and the Needs of Society”** - **Proceedings of the International Conference on Post Graduate Education in Physics**, Prague, August, 1980, Edit.

Glossary on Kalinga Prize Laureates

P.J. Kennedy, publicação da International Commission on Physics Education ICPE/IUPAP, Edinburgh, 1981.

- Hamburger, E.W. et alia – **“Sugestões para Formação de Professores nas Disciplinas Científicas”** (Coordenador do GT da SBPC), **Ciência e Cultura** 33 (março/1981), 369-377. (“Suggestions for pre service teacher training in the sciences”)
- Hamburger, E. W. e Rabinovitch, S.V. – **“A matrícula dos vestibulandos de 1981 no IFUSP”** (publicação interna) 1981.
- Hamburger, E.W. e Rabinovitch, S.V. – **“A situação dos vestibulandos de 1981, com relação às disciplinas Física 1 e 2 do IFUSP”** (publicação interna) 1981. (“Situation of 1981 freshmen in Physics 1 and 2 courses”)
- Prado, F.D. e Hamburger, E.W. – **“Respostas de formados acerca do Currículo de Física da USP”** – **Ciência e Cultura** 33 (7) Resumos, P. 305 1981. (“Answer by graduates about the physics curriculum at USP”)
- Hamburger, E.W. – **“Para que pós-graduação?”-Revista “Encontros com a Civilização Brasileira”** nº 19, 1980. (“Graduate education, what for?”)
- D’ Ambrósio, U.; Cunha, L.A.R.; Hamburger, E.W. (coordenador) e Giannotti, J.a. – **“Ensino de Ciências de Forma Integrada”** – Simpósio realizado em Brasília, 1976, durante Reunião Annual da SBPC. **Textos publicados em Ciência e Cultura** 29 410-428 1977. (Round table on “Science teaching in an integrated fashion”)
- Hamburger, E.W. – **“New Science and Old Cultures”** – Physics Education, London, January, 1976, p.24. Work presented at **“International Conference on Physics Education”**, Edinburgh, Scotland, 1975.
- Hamburger, E.W. e Amaral, L.Q. – **“Levantamento da situação dos alunos que se matriculam e não comparecem no Curso de Física da USP”- Revista Brasileira de Física**, vol. Esp., nº 3, p. 892, 1976.
- Rabinovitch, S.V. e Hamburger, E.W. – **“Levantamento da situação dos alunos que se matriculam e não comparecem à Disciplina Física 1 da USP”** – publicação interna, 1976. (“Situation of students who register but do not show up at Physics 1 course in USP”)
- **“Physics and Recent Trends in Education”** based on article by E.W. Hamburger, Chap. 16 of book **New Trends in Physics Teaching III**, ed. J.L. Lewis, UNESCO, Paris, 1976 pgs, 212 to 223. Book from proceedings of the International Conference on Physics Education, Edinburgh, july 1975.
- Hamburger, E.W. (coordenador) – **“Proposta de Guia Curricular de Física para 2º grau”** ed. Secretaria da Educação do Estado de São Paulo, S. Paulo, 1975. (“Proposal for a curriculum guide for physics in secondary school”)
- Hamburger, E.W.; Moscati, G. e Silva, A.J. da – **“Estatísticas de aprovação no curso de Física da USP”** – IFUSP – Resumo em Atas do II Simpósio Nacional de Ensino de Física, SBF, Belo Horizonte – p. 195, 1974.

Glossary on Kalinga Prize Laureates

- Hamburger, E.W.; Tassara, E.; Moraes, J.A.B. de; Zanetic, J.; Muramatsu, M.; Gebara, N.; Soares, V.L. Lemos – **“Avaliação de filmes didáticos de física”** – **Revista Bras. de Física**, vol. 3 (1973) 603. (“Evaluation of physics teaching films”)
- Hamburger, E.W. – **“Organização de um curso básico de Física para 1500 alunos”** – **Rev. Bras. De Física**, vol. 2, (1972) 141. (Organization of a university basic physics course for 1500 students”)
- Hamburger, E.W.; Almeida, J.F. de – **“Curso sobre condução elétrica em sólidos para o ensino médio”** – **Rev. Bras. de Física** 1, vol. 1, (1971) 191. (“A course on electric conduction in solids”)
- Santos, P.U.M.; Nakano, H.; Violin, A.G.; Bittencourt, D.R.S.; Lima, P.A. e Hamburger, E.W. – **“Um cronômetro barato”** – **Rev. Bras. de Física** 1, (1971) 187. (An inexpensive chronometer) (based on sandglass principle, 0.1 sec precision)
- Hamburger, E.W. – **“Algumas statistics do curso de Física da F.F.C.L. da USP”** – Simpósio Nacional sobre o Ensino da Física, Boletim nº 4, SBF-p. 240, 1970. (“Some statistics of the physics course at University of S. Paulo”)
- Hamburger, E.W. – **“O exame vestibular e os desajustes do sistema de ensino”** – **Ciência e Cultura**, 22(2) p. 223-228, 1970 (“The University entrance exam and the maladjustment of the school system”). See also the newspaper Folha de S. Paulo, july 1970, and: **“New trends in physics teaching”**, edited by John L. Lewis, UNESCO, vol. 3, p.61, 1976.

Second Part : Nuclear Physics :

Silva, E.; Hamburger, E.W.; Pacheco, E.J.; Pacheco, J.A.F.; Galhardo, L., Dietzsch, O.E Cernichiaro, G.R.C. – **“Monitor de Muons Cósmicos no Hemisfério Sul: Experimento Microsul”**, Anais do Simpósio: Técnicas Experimentais em Física, Dedicado ao Prof. Marcello Damy de Souza Santos, Publicação ACIESP 86, p. 46-53, 1993.

- Hamburger, E.W. – **“A Física Nuclear em um Quarto de Século: da Conferência de Pittsburgh (1957) à de Florença (1983)”** – Publicado nas Atas da VIII Reunião de Trabalho sobre Física Nuclear, p.169 a 218, organizada pela SBF, Ed. P.R.S. Gomes et al, 1985.
- Borello-Lewin, T.; Dietzsch, O. Hamburger, E.W.; Orsini, C.M.Q.-**“High- Resolution Study of the $^{118}\text{Sn}(\text{d},\text{p})^{119}\text{Sn}$ Reaction at 17 MeV”** – Nucl. Phys. A 249 (1975) 284.
- Hamburger, E.W.; Lima, W. de – **“Um fluxômetro para líquidos utilizando radioisótopos”** – Revista Brasileira de Tecnologia, vol. 4 (1973) 85.
- Hamburger, E.W.; Borello-Lewin, T.; Pessoa, E.F.; Orsini, C.Q. e Dietzsch, O. – **“Energy Levels of ^{111}Sn , ^{113}Sn and ^{123}Sn ”** – Rev. Bras. De Física 2 (1972) 157.
- Hamburger, E.; Borello- Lewin, T.Dietzsch, O.; Frota Pessoa, E. e Orsini, C.Q. – **“Energy Levels of Sn^{113} and Sn^{123} ”** – “International Conference on Properties of Nuclear States, Montreal, 1969, Contribution, 8.2., p. 250.
- Hamburger, E.W.; Schneid, E.J.; Cohen, B.L. – **“Study of Inelastic Scattering of protons from Sn^{116} , Sn^{122} and Sn^{124} at Isobaric Analogue Resonances”** – Phys. Rev. 161 (1967) 1208.

- Hamburger, E.W. – **“Direct Compound Interference at an Isobaric Analogue Resonance in Deuteron Stripping”**, Phys. Rev. Lett. 19 (1967) 36.
- Hamburger, E. W.; Cohen, B.L.; Kremenek, J. E Moorehead, J.B. – **“Isobaric Analogue Resonances in the Scattering of Protons by Cd ¹¹⁴”**, Phys. Rev. 162 (1967) 1158.
- Hamburger, E.W.; Acquadro, J.C.; Cesar, R.O. e Goldemberg, J. – **“Photodeuteron Yields II: Zinc”**. Anais da Academia Brasileira de Ciências, 1966.
- Hamburger, E.W.; Brown, R.I.; Matsushigue, L.B.H.; Szily, A. e Bonomi, P. – **“Espalhamento de Nêutrons pelo Ferro”**, Relatório interno do Laboratório do Acelerador Eletrostático da USP, 1965.
- Hamburger, E.W. e Hamburger, A.I. – **“Energy Levels Y⁹⁰ from the Y⁸⁹ (d,p)Y⁹⁰ Reaction”**, Nucl. Phys. 68 (1965) 209.
- Hamburger, E.W. – **“The Nb⁹³(d,t)Nb⁹² Reaction”**, Anais da Academia Brasileira de Ciências 36(1964) 399.
- Hamburger, E.W. – **“Inelastic Deuteron Scattering – A Compilation and Discussion of Available Data”**, Nuclear Physics 50 (1964) 66.
- Hamburger, E.W.; Sheline R.K. e Watson, C. – **“The Ground state configuration of Nb⁹²”** Phys. Lett. 8 (1964) 121.
- Hamburger, E. W. e Hamburger, A.I. – **“Neutron Proton Residual Interactions in the Y⁸⁹ (d,p) Y⁹⁰ Reaction”**, Phys.Lett. 4 (1963) 223.
- Hamburger, E.W.; Goldemberg, J. e Szily, A. – **“The Photodeuteron Yield from Cu⁶³”**, Anais da Academia Brasileira de Ciências 35 (1963) 169.
- Hamburger, E.W.; Landim, E. e Dietzsch, O. – **“Efficiency of a Long Counter as a function of the direction and locus of incidence of neutron”**, Nuclear Instruments and Methods 15 (1962) 300.
- Hamburger, E.W. e Reber, L.H. – **“Study of the K³⁹(d,d') Reaction”**, Physical Review 128 (1962) 333.
- Hamburger, E.W. – **“Inelastic Scattering of Deuterons from Strontium and Yttrium”**, Nuclear Physics 39 (1962) 139.
- Hamburger, E.W. e A.G. Blair – **“Inelastic Scattering of Deuterons from the Magnesium Isotopes”**, Physical Review 122 (1961) 566.
- Hamburger, E.W. – **“Study of the Differential Cross Sections of Deuteron Stripping Reactions as a function of the Incident Energy”**, Physical Review 123 (1961) 619.
- Hamburger, E.W.; Dietzsch, O.; Hama, Y. e Zawislak, F.C. – **“Study of the O¹⁶ (d,n)F¹⁷ Reaction”**, Nuclear Physics 27 (1961) 103.
- Hamburger, E.W.; Cohen, B.L. e Price, R.E. – **“Low-Energy Protons produced in the Deuteron Bombardment of Nuclei”**, Physical Review 121 (1961) 1143.
- Hamburger, E.W. e Cameron, J.R. – **“Reaction of 14.8 MeV Deuterons with the Lithium Isotopes”**, Physical Review 117 (1960) 781.

- Hamburger, E.W. e A.G. Blair – “**(D,p) and (d,t) Reactions on Magnesium Isotopes**”, Physical Review 119 (1960) 777.
- Hamburger, E.W. – “**Simple Method for Calibration of Magnetic Analysers for Nuclear Accelerators**”, Review of Scientific Instruments 31 (1960) 777.

IX) BOOKS AND BOOK CHAPTERS :

Ciências Físicas no Brasil – Estudos e Pesquisas Recentes/2005

organizer and co-author, E. W. Hamburger, Ed. Livraria da Física, 2006 (“Physical Sciences in Brazil-Recent Studies and Research/2005”, based on Exhibition of same title)

- **Ciência, Tecnologia e Jornalismo**, capítulo no livro “Ciência e Sociedade-Mediações jornalísticas, org. Cremilda Medina, Ed. CCS/Estação Ciência/USP, 2005 (“Science, Technology and Journalism”, chapter in book Science and Society – Journalistic Mediation, org. C. Medina)
- **Educação para a Ciência**, org. S. Crestana, E W Hamburger, S. Mascarenhas e D. M. Silva, Ed Livraria da Física, S Paulo, 2002, 676p. (Education for Science : Training Course for Science Centers & Museums)
- **O Desafio de Ensinar Ciências no Século XXI** – org. E. W. Hamburger e Cauê Matos, EDUSP, SP, 2000, 350 pgs. (“The Challenge of Teaching Science in the 21st Century”)
- **Centro e Museus de Ciência – Visões e Experiências** – org Silvério Crestana et al Ed. Saraiva/ Estação Ciência, SP, 1998, E.W. Hamburger: apresentação e capítulo Divulgação Científica, pg. 174-181. (“Science Centers and Museums – Visions and Experience”)
- **Telecurso 2000 (2º grau)** – Curso de Física- dois volumes: Física- dois volumes: **Física 1 e Física 2** – Editora Globo, 1996-1997 – autores C.R. Matos, R. Simonetti, A. Gaspar, NC Ferreira; Supervisão E.W. Hamburger. Ao todo 50 capítulos, correspondendo a 50 programas de televisão veiculados pelas redes Globo e TV Educativa. (“Physics 1 and 2” Textbooks with 50 chapters to accompany 50 TV programs shown by commercial and educational TV channels)
- Hamburger, E.W. e Gaspar, A. – **Museus e Centros de Ciências** (capítulo 9 do livro **Pesquisas em Ensino de Física**), organização R. Nardi, Escrituras Editora, São Paulo, 1998. (“Science Centers and Museums” in book “Research in Physics Teaching”)
- Hamburger, E.W. (Organizador); Gama, H.U. (Resumos) – “**Pesquisas sobre o ensino de Física**” – Resumos das Dissertações de Mestrado em Ensino de Ciências, modalidade Física, apresentadas nos anos de 1976 a 1982 – Edição Preliminar – IFUSP, maio/1990. (“Researches on Physics Teaching”, resúmenes of masters dissertations presented in graduate program on Physics teaching, 1976-1982)
- Carlton, D.; Schaerf, C. ed., Editora Macmillan, Londres, 1989-”**Perspectives on the Arms Race**” Ed. D. Carlton e C. Schaerf, Macmillan, London, 198-Chap. 15 by E.W. Hamburger on “Brazil and Disarmament”.
- Horta, C.E.R.; Mafran, M.A.; Mota, A.V.T. e Hamburger, E.W. – “**Vestibular Hoje**”, Editora MEC/ SESU, 1987.

Glossary on Kalinga Prize Laureates

- Hamburger, E.W.(organizador e co-autor) **“A USP em Debate”** – Ed. ADUSP, 1985. (“Debate on USP- University of São Paulo”)
- Hamburger, E.W. **“O que é Física”** – Editora Brasiliense, Coleção Primeiros Passos, 1984 (1ª edição); está atualmente na 8ª edição além de edição especial para o Círculo do oLivro. (“What is Physics” for general public, 8th ed)
- Hamburger, E.W. (Organizador) – **“Causas e Consequências de uma Guerra Nuclear”**, Ed ADUSP/ CESP, 1984. (“Causes and Consequences of Nuclear War”)
- Hamburger, E.W. – **“Physics and Recent Trends in Education”** chap. In “New Trend in Physics Teaching II”, UNESCO, Paris, 1977.
- Hamburger, E.W.; Bittencourt, D.R.S. e Violin, A.g. – **“Projeto de Ensino de Física-Guia do Professor”** (1974). Ed. FENAME/MEC. (“Physics Teaching Project-Teachers Guide”)
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- Hamburger, E.W. e Hamburger, A.I. (Coordenadores). Autores: P. Singer, O. Ianni, S.A. Cunha e F. Fernandes: **“Ciência, Tecnologia e Desenvolvimento”** – Editora Brasiliense,, 1968. (esgotado). (“Science, Technology and Development”) out of print

X) PROFESSIONAL MEETINGS :

EWB took part in well over a hundred scientific meetings in Brazil and abroad, presenting papers, invited papers, as table chair or coordinator, on Nuclear Physics, Physics Teaching and Science Teaching, Science Policy, Educational Policy, Science Popularization, Science Centers and Museums, University Structure, among others. The meetings were organized by scientific societies, universities and other institutions, such as UNESCO, American Physical Society, *Sociedade Brasileira para o Progresso da Ciência*, *SBPC*, *Sociedade Brasileira de Física*, *SBF*, *Academia Brasileira de Ciências*, *ABC*, *Associação Brasileira de Centros e Museus de Ciências*, *ABCMC*, *Rede de Popularização da Ciência e Tecnologia da América Latina e Caribe*, *RedPop*, *Science Center World Congress*, *Associação Mexicana de Centros*

e Museu de Ciências, Interamerican Conference on Physics Education, Escola LatinoAmericana de Física, etc.

Abstracts or full papers were published in several journals, bulletins and proceedings.

Seminars, Colloquia, Round Tables and Events in Universities: there were over fifty along the years.

XI) ARTICLES IN NEWSPAPERS :

About thirty articles about scientific and educational subjects. The most recent one is **Ensino de Ciências – Caminhos Conhecidos** (“Science Teaching – well known paths”), with Amélia I. Hamburger, published by O Estado de S. Paulo, pg. 2, February 11, 2008, and reproduced also in electronic journals like Jornal da Ciência on same day.

XII) EXTRACURRICULAR COURSES :

In the Physics Institute and later in *Estação Ciência* organized (and taught many) about a hundred courses for science teachers (the majority) but also addressed to journalists, children, general public, educators, physics students (about research projects being pursued in the Physics Institute), science popularizers, among others. Teacher in service courses are valuable tools to improve science teaching in schools, but are not effective if the school does not provide support and encouragement for teaching innovations.



BRAZILLIAN ORDER OF SCIENTIFIC MERIT FOR PROF. E. W. HAMBURGER

The **Ordem Nacional do Merito Cientifico**

(National Order of Scientific Merit, in Portuguese language) is an honour bestowed upon Brazilian and foreign personalities recognized for their scientific and technical contributions to the cause and development of science in Brazil.



Great Cross of the National Order of Scientific Merit



Some of the Important Research Articles of Prof. E. W. Hamburger

1. **Isobaric Analog Resonances in the Scattering of Protons by Cd^{114}**
E.W. Hamburger, J. Kremenek, B.L. Cohen, J.B. Moorhead, and C. Shin
Phys. Rev. 162, 1168 (1967)
Cited 3 times
2. **Study of Inelastic Scattering of Protons from Sn^{116} , Sn^{122} , and Sn^{124} at Isobaric Analog Resonances**
E.J. Schneid, E.W. Hamburger, and B.L. Cohen
Phys. Rev. 161, 1208 (1967)
Cited 7 times
3. **Direct-Compound Interference at an Isobaric Analog Resonance in Deuteron Stripping**
E.W. Hamburger
Phys. Rev. Lett. 19, 36 (1967)
Cited 9 times
4. **Study of the $\text{K}^{39}(\text{d}, \text{d})^{95}$ Reaction**
E.W. Hamburger and L.H. Reber
Phys. Rev. 128, 333 (1962)
Cited 4 times
5. **Study of the Differential Cross Sections of Deuteron Stripping Reactions as a function of the Incident Energy**
E.W. Hamburger
Phys. Rev. 123, 619 (1961)
Cited 13 times
6. **Inelastic Scattering of Deuterons from the Magnesium Isotopes**
A.G. Blair and E.W. Hamburger
Phys. Rev. 122, 566 (1961)
Cited 10 times
7. **Low-Energy Protons Produced in the Deuteron Bombardment of Nuclei**
E.W. Hamburger, B.L. Cohen, and R.E. Price
Phys. Rev. 121, 1143 (1961)
Cited 12 times
8. **(d,p) and (d,t) Reactions on Magnesium Isotopes**
E.W. Hamburger and A.G. Blair
Phys. Rev. 119, 777 (1960)
Cited 18 times
9. **Study of Some Reactions of 14.8-Mev Deuterons with the Lithium Isotopes**
E.W. Hamburger and J.R. Cameron
Phys. Rev. 117, 781 (1960)
Cited 16 times



Cao Hamburger : A Famous Brazilian Script Writer (Son of Prof. E. W. Hamburger)

Carlos Imperio Hamburger (b. 1962, Sao Paulo), or, **Cao Hamburger**, is a Brazilian scriptwriter and director of movies and TV. He is the creator of the Castelo Rá-Tim-Bum (Castle Rá-Tim-Bum) series of programs for children in the TV Cultura of São Paulo, which gave origin also to a successful movie picture with the same title. Castelo Rá-Tim-Bum was one of the most successful children shows to ever air in Brazil. He directed in 2006 another successful film, *O Ano em Que Meus Pais Sairam de Férias* (*The Year My Parents Went on Vacation*), partly based on his childhood memories.

Cao is son of physicists and University of São Paulo professors Ernst Wolfgang Hamburger, of Jewish-German origin, and Amelia Imperio Hamburger, of Italian origin.

Filmography

1. *O Ano em Que Meus Pais Sairam de Férias* (2006), movie
2. *Filhos do Carnaval* (2006) HBO TV series
3. *Castelo Rá-Tim-Bum, O Filme* (1999), movie
4. *Castelo Rá-Tim-Bum* (1995) TV series
5. *Frankenstein Punk* (1986) - animation

External links

- Cao Hamburger's bio at IMDB (<http://www.imdb.com/name/nm0357463/>)

Source :“http://en.wikipedia.org/wiki/Cao_Hamburger”
