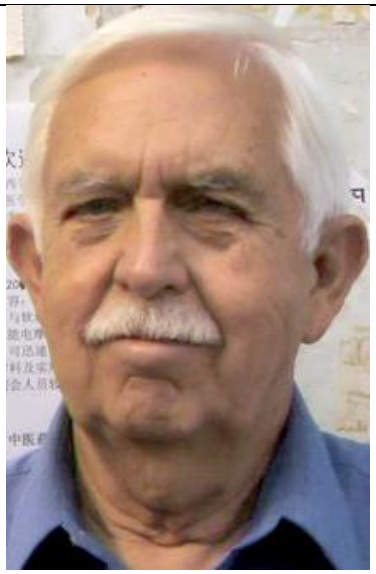
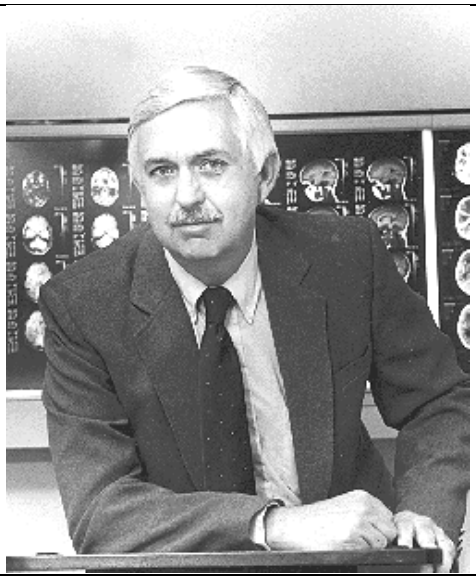
THE DOYENS OF MEDICAL PHYSICS:
PROFESSOR PERRY SPRAWLS – ONE OF THE TOP EDUCATORS SHARING VISUALS FOR TEACHING FROM A SMALL EMORY UNIVERSITY CLASSROOM TO CLASSROOMS AROUND THE WORLD

By Prof. Slavik Tabakov, Emeritus President IUPESM, President IOMP (2015-2018)





Prof. Perry Sprawls - a relatively recent photo and a photo from 1990s as Professor at Emory University

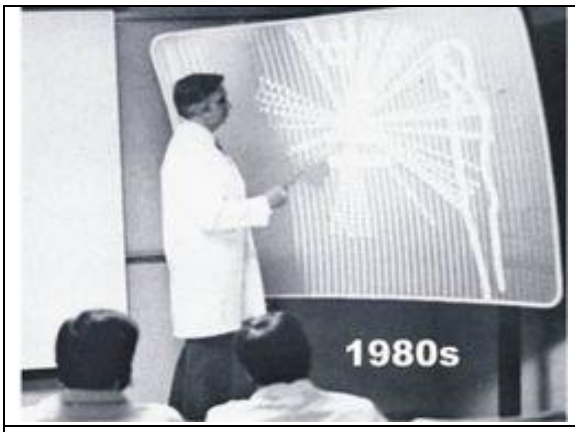
Thousands of medical physicists around the world use the excellent web site WWW.SPRAWLS.ORG - the site where Prof. Perry Sprawls has included his pioneering books on Physical Principles of Medical Imaging (especially X-ray Diagnostic Radiology) and Physical Principles of MRI. These books, written in late 20th century are still relevant with their excellent explanations of the methods and principles, but more importantly their superb explanatory diagrams have found place in many lectures and presentations. The extensive collection of visuals created throughout his career are now available for all to use on the website: Sprawls Shared Visuals for Teaching All these have been specially made by Prof. Sprawls to facilitate medical physics lecturing and are now classics in the profession. He introduced Computer Aided Teaching in radiology in 1980s and later introduced Teleteaching in the profession.

In 1994 Prof. Sprawls was invited to join the faculty of the ICTP College on Medical Physics in Trieste, Italy and from the following term he became one of its Co-Directors. He enriched the teaching there with his excellent visuals, which he continues to give to all students for free usage in their future teaching activities. In 2002 he, together with Slavik Tabakov, transformed the College into a "Train-the-Trainer" activity and hundreds of colleagues from Low and Middle Income (LMI) countries continue to use all College materials to start new teaching activities in their own countries. Alongside this Prof. Sprawls travelled to many countries to provide and help in the development of medical physics education programs in support of global healthcare. In 2003 he was awarded the inaugural IOMP Harold Johns Medal for Excellence in Teaching and International Education Leadership. He further pioneered teleteaching in the profession, making use of Internet tools for further disseminating medical physics education. In 2010 he received the AAPM Annual Award for Innovations in Education for his project: Collaborative Teaching; A model for Enriching the Medical Physic Learning Environment and in 2011 the Award for his development of A Model for Clinically Focused Physics Education.

In 2006 Prof. Sprawls joined the huge team of EMITEL project, developing the first e-Encyclopaedia of Medical Physics. He continues to take active part in the project and became one of the Editors of the Encyclopaedia. He continues with this role also in the recently published (2022) 2nd updated edition of the Encyclopaedia.

In 2012 Prof. Perry Sprawls and Prof. Slavik Tabakov were elected as Co-Editors-in-Chief of the IOMP Journal Medical Physics International (MPI) – a new Journal dedicated to educational and professional topics in the profession. This open access e-Journal quickly became one of the most read journals in the profession with

thousands of readers per month. In 2022 Perry Sprawls, together with Slavik Tabakov and Geoff Ibbott became the inaugural Co-Editors-in-Chief of the new journal Medical Physics International – History Edition, dedicated to the history of our profession.



Prof. Perry Sprawls as developer of Computer aided education in Radiology in the 1980s and pioneering teleteaching in the 2000s

Prof. Perry Sprawls (sitting in the middle) with faculty and students of the College on Medical Physics 2002

Perry Sprawls. was born on a farm in South Carolina, USA in 1934. After attending the local public schools, he enrolled in Clemson University obtaining three degrees – B.S. in physics, M.S. in nuclear science, and Ph.D. in bioengineering. After completing his military service and working for two years on the staff of a major research laboratory, he joined the faculty of Emory University in Atlanta, USA, for 45 years in the Radiology and Physics Departments.

After retiring from Emory University in 2005 and becoming a Distinguished Emeritus Professor, his family created the Sprawls Educational Foundations, www.sprawls.org , to support and provide free and open resources for medical physics education around the world.

The beginning of his career as a clinical medical physicist in the 1960s coincided with the introduction of most of the advanced imaging modalities: Mammography, CT, MRI, and Digital Radiography. Prior to that time, radiography and fluoroscopy, the two X-ray imaging modalities were relatively simple to operate with just a few technique factors to adjust. The newer modalities were all more complex with different physical principles and more adjustable factors affecting image quality and other factors including radiation exposure to patients. His work as a clinical physicist in a large hospital and affiliated clinics was collaborating with and helping the medical staff understand and optimize the procedures with these more complex imaging modalities. It was a learning opportunity in two ways. First, direct “hands-on” experience with the new modalities and their clinical applications, and second, an understanding of what physics topics radiologists and other medical professionals needed to know to effectively and safely use the imaging modalities.

Since these topics were not included in previous educational programs for radiologists, technologists, and medical physicists, there was a need for Continuing Education (CE) Courses on these topics. This became a major activity of Prof. Sprawls, especially in MRI. At Emory he was Director and principal faculty of the Magnetic Resonance Education Canter that provided CE courses attended by radiologists from throughout the USA and many other countries. He also provided courses in other countries in Europe, Central and South America, China and India.

Prof. Sprawls began his academic career at Emory University teaching general and nuclear physics in a traditional classroom as had been used for many years. The only "technology" was a writing board and a few pieces of dusty chalk. His concept of the traditional classroom was it as a "box" in which we enclosed students separating them from the physical universe they should be learning about. He realised there that classrooms needed "windows" through which the students could view elements of the physical universe as discussed by the teachers. This was to be the subject of much of his research and development projects throughout his career. The first activity, in collaboration with other faculty members, was to install image projectors in the classroom and the development of physics demonstrations that could be projected onto a large screen.

As Prof. Sprawls explains his work: Building on the concept that a knowledge of physics, especially medical physics, is a mental representation of the actual physical universe and is a complex network of images, concepts, verbal descriptions, and quantitative/mathematical relationships. A distinction is made between sensory concepts, especially visual concepts, and symbolic representations, words and mathematical symbols. The value of physics knowledge to support specific activities depends on the knowledge structure and is very different for different activities. For Radiologists and Radiology Residents the difference between getting good scores and passing examinations compared to conducting and optimizing imaging procedures. A knowledge of sensory concepts, especially visual, supports several functions The significance is how these knowledge structures are formed or learned. The symbolic representations can be learned in a traditional classroom with lectures and writing on a board or projected on a screen with an overhead projector. The formation of sensory concepts requires observation and viewing the elements and interaction of the physical universe, either directly or through appropriate visuals. It is the visuals that provide classroom "windows" through which the physical universe can be observed.

Prof. Sprawls further expands his activities into Collaborative Teaching, using the concept that learning is a natural human process that occurs when a learner/student observes and interacts with the immediate environment and is an ongoing and continuing process. Teaching is the process of helping someone learn and is in several forms. One way is the traditional classroom teacher, who interacts directly with the learners/students with lectures and discussions. The other way is a teacher who helps students learn by providing education resources, including textbooks, but of special interest here, visuals that can be used by the classroom teacher to provide more effective classroom presentations. This forms the concept of Collaborative Teaching.

His concepts for teaching medical physics are now used in almost all teaching in the profession where his specially made visuals have taken part in the education of thousands of students in medical physics. He continues to be active in the profession and apart from his work with a large international team in the updating of the Encyclopaedia of Medical Physics, he took part in the authorship of the book "Introduction to Medical Physics". He also continues to be Co-Editor-in Chief of the Journal MPI-History Edition.

Perry Sprawls the Historian: Especially in the more recent years, he has recognized the value of documenting and preserving the history of medical physics and related clinical applications. This was encouraged as most of the developments, that are now history, occurred during his career and he had memories of many and personal experience in some, including mammography, CT, MRI, the evolution of film-intensifying screen radiography and digital radiography. He is using his experiences, memories, and archive of documents from the past to publish articles on this history. Links can be found on the website, www.sprawls.org ,

Prof. Sprawls with his late wife Charlotte and their son Charles (a professional vocalist in New York) have always had special interest and supporters of classical music, with Perry serving as President of the local Opera.

Throughout much of his life, he has been especially active in the Baptist Church, in various leadership positions and educational activities. In his free time Perry cares for his excellent garden – developed on an initially barren place.


Prof. Perry Sprawls receives the ICTP Gratitude Plaque (in his 80s) and currently at his garden in Black Mountain, NC (in his 90s).

After retiring from the practice of clinical medical physics in the hospital and clinics, Dr. Sprawls continues using that valuable experience to support his activities an educator