International Commission on Radiation Units and Measurements, Inc.

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Dr. Charles Mistretta Received 18th Gray Medal

Dr. Charles Mistretta received the Gray Medal on July 31, 2017 at the 59th Annual Meeting and Exhibition of the American Association of Physicists in Medicine (AAPM) in Denver, Colorado. Dr. Mistretta's talk was entitled "Historical Recollections of Developments in Angiography 1971-2017. The Gray Medal was presented to Dr. Mistretta by ICRU Vice Chairman Dr. Paul DeLuca.

Dr. Mistretta received his degree in High Energy Physics from Harvard University in 1968. He has been doing research in medical imaging since 1971. His group was responsible for the development of digital subtraction angiography (DSA) which was commercially introduced in 1980.

His research has focused on time resolved angiography and has resulted in the introduction of accelerated imaging techniques. Emphasis has been placed on the development of accelerated magnetic resonance imaging (MRI) methods using sparse sampling which significantly violates the traditional Nyquist sampling theorem, the use of non-Cartesian acquisition trajectories and the application of constrained reconstruction techniques like HYPR and its derivatives.

Acceleration factors as large as 1,000 have been achieved in selected MRA applications. These techniques have recently been extended to many areas of medical imaging such as positron emission tomography (PET), photoacoustic tomography and x-ray computed tomography (CT) where dose reductions of ten have been reported by several groups for perfusion studies.

Dr. Mistretta and Dr. Charles Strother introduced 4D DSA, an x-ray technique which adds an additional dimension to traditional DSA by producing a time series of 3D image volumes at high frame rates.

Dr. Mistretta is a Fellow of the AAPM, American Institute for Medical and Biomedical Engineering (AIMBE), and International Society for Magnetic Resonance in Medicine (ISMRM). He has received the Laufman Greatbatch Prize for the development of DSA, and the J Allyn Taylor International Prize in Medicine. He is the recipient of the 2010 Technology Achievement Award by the MIT Club of Wisconsin.