IMAGING THE HUMAN BRAIN: PROGRESS AND PROSPECTS

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Among many advances in brain science over the past few decades, the ability to create images of brain structure and activity from non-invasive measurements outside the head is among the most remarkable. This lecture for the non-scientist will survey the progress over the past few decades in structural brain imaging techniques such as X-Ray Computed Tomography (CT) and Magnetic Resonance Imaging (MRI), and functional brain imaging techniques such as Positron Emission Tomography (PET), Functional Magnetic Resonance Imaging (fMRI), electroencephalography (EEG), magnetoencephalography (MEG), and a variety of Optical Imaging approaches. The development and effective application of such techniques have depended upon close collaborations of physicists, engineers, mathematicians, and neuroscientists, thus providing an instructive background and introduction for a conference/course celebrating the 150th anniversary of Croatian-born physicist Nikola Tesla. The lecture concludes with a consideration of the prospects for future advances in structural and functional brain imaging.