Edgar Müller

Edgar Müller graduated in physics from the University of Stuttgart, Germany in 1983. Straight after, he joined Siemens in Erlangen to participate in the development of first-generation MRI systems. In the early years, up to 1991, he developed the first Siemens local coil (breast coil) and the first sequences for flow quantification. Later Edgar headed a neuro-functional MR team that developed fMRI and DTI sequences and post-processing software. This period also saw the strengthening of a huge cooperational network. Between 2005 and 2016 Edgar headed global cardiovascular MRI Applications development. Highlights of this period included the initiation of workflow prototypes, leading to the development of Dot engines.

Since November 2016 Edgar has been Head of the Siemens MR Technology and Innovation Management Team that encompasses MR innovation and IP management, the MR technology incubator and the key expert network. Besides being responsible for the MR innovation process across all clinical imaging and technology fields, Edgar and his team establish and manage large-scale strategic collaborations that focus on the development and validation of hardware innovations or groundbreaking new applications such as Compressed Sensing or MR Fingerprinting.

Erlangen, Germany

How did you first come in contact with MRI?
While completing my master thesis in physics, I heard about a fascinating new possibility to obtain images from the human body with a new method based on magnetic resonance. At that time Siemens had launched a huge program to develop MRI and I successfully applied for a job in Erlangen at the age of 26 years. I have had the privilege of being involved from the very first Siemens product operating at 0.35 Tesla in 1983 through many generations of MRI scanners to the present system portfolio.

What is most motivating about your job?
If you compare MRI to other imaging modalities, there is a fundamental difference: while other modalities rely on more or less one physics observable (e.g. attenuation of X-rays) MRI images are influenced by many independent physics observables: human tissue differs in relaxation times T1, T2, diffusion properties, chemical shift, magnetization transfer, velocity behavior, magnetic susceptibility, to name just a few important ones. This allows us to design pulse sequences, which can create virtually every desired imaging contrast between different tissues. There is a brilliant physics and technology behind MRI which is hugely fascinating not only for me, but for many colleagues I have had the privilege to work alongside.

But what has most motivated at a personal level is the outstanding friendships I have forged with people working with the same spirit of innovation over decades: within Siemens as well as at many institutions worldwide, where we were able to brainstorm and realize things that people could scarcely have contemplated just a few years earlier.

What do you think are the most important developments in MRI?
The current reality is that more than 90% of all MRI procedures are covered by innovations from the 1980's, like affordable high-field superconducting magnets including high-quality gradient and RF hardware, accompanied by inventions of fast imaging sequences like Turbo Spin Echo and FISP/FLASH.

What we experienced then was a race in magnetic field strength, followed by a decade of gradient power and then a decade of RF channel density. However, I sense that we are now at the dawn of a new age in MRI, which will be driven by the use of artificial intelligence, deep learning methods, cloud computing, etc. This will guide us to MRI scanners that are really simple to use, robust, and fast.

What would you do, if you could do for one month whatever you wanted?
There is nothing I could wish for, since I have always had the freedom to do just what I wanted to do in my professional life. For example, in October 1991 I heard about fascinating experiments going on in both the USA and in the UK with regard to fMRI. What started out as a hobby became my official profession at Siemens MR in 1992. What followed where the most wonderful ten years of my professional life. I was able to ramp up a research team under the guidance of former Siemens Healthcare CEO Hermann Requardt and we had total freedom in what we developed, with successful outcomes. When we came up with first ideas about Compressed Sensing, my former boss Christoph Zindel realized the potential immediately and again I could do for years exactly what I wanted to do.

My private life is a completely different world. At home there is a wonderful woman to whom I have been married for more than 35 years, six children – three girls and three boys aged between 16 and 35. All the interaction with them and with their partners keeps me busy and young. And there are hobbies, which I wish I could devote more time to: I like hiking and skiing in the mountains, having grown up close to the Austrian Alps; listening to pop music by bands such as Dire Straits; and still occasionally playing the piano, which had been a big hobby in my youth. And, last but not least, playing chess and reading good books such as Astrid Lindgren's "Karlsson on the Roof".