

Biography of A.A.Makarov



Alexander Makarov was born in 1966 in a Siberian town of Irkutsk. Interest in technology brought him to study in Moscow Engineering Physics institute where he started to work in the group of Prof. A.Sysoev on design of analytical instrumentation, mainly exotic time-of-flight mass spectrometers (TOFMS). During those years Alexander also got married and started his family.

After defending PhD thesis in 1992, he went on a self-organized trip to visit several UK universities and subsequently became a post-doc in Warwick University where he got involved in tandem mass spectrometry. In 1996 he joined a small high-tech company HD Technologies in Manchester, UK formed by S.Davis and A.Hofmann. Though the company specialized on contract development of TOFMS, this is where he started to deviate from the beaten path and made first steps towards the concept of the Orbitrap mass analyzer. Proof-of-principle results were presented at ASMS Conference in 1999. Following acquisition of HD Technologies by Thermo Corporation in 2000, Alexander concentrated research on the interfacing of the analyzer to an electrospray ion source.

Expansion of the research team and transfer of the project to the Thermo Bremen factory resulted in the commercial release of a new LTQ Orbitrap tandem mass spectrometer in 2005 and its enthusiastic acceptance by mass spectrometry community, especially for proteomic and metabolism research. Alexander continued to provide scientific guidance on further extensions of this instrument family as well as of Orbitrap-based Exactive/Q Exactive family of instruments for routine analysis. Pursuing the strategic goal of bringing Orbitrap-based mass spectrometry into new analytical applications, Alexander continues to drive improvements of technology as illustrated by introduction in 2011 of a new generation of Orbitrap analyzers and enhanced Fourier transform algorithm. In 2013 these innovations formed the basis of a new family of Orbitrap-based mass spectrometers – so-called tribrid (Orbitrap Fusion). This instrument and its newest Lumos variant open new frontiers in proteomic analysis by offering unprecedented performance and usability.

Another important direction of his work became expansion of Orbitrap mass spectrometry towards top-down analysis of proteins and further of native protein complexes and even viruses, implemented in the recent Exactive Plus EMR instrument (2013). He also works on interfacing the technology to gas chromatography (with Q Exactive GC instrument launched in 2015), ion mobility and different ion sources.

For his role in these developments Alexander has received Heinrich-Emmanuel Merck award (2007), Award for Distinguished Contribution in Mass Spectrometry of American Society for Mass Spectrometry (2008), Gold Award of Russian Society for Mass Spectrometry (2007), Curt Brunnee award (2009), Science and Technology Award of Human Proteome Organization (2011), Thomson medal of International Mass Spectrometry Foundation (2012) and others.

Since 2006 Alexander has been living in Bremen with his family and he currently holds a position of Director of Research in Life Sciences Mass Spectrometry of Thermo Fisher Scientific and chair of Professor of high resolution mass spectrometry at Utrecht University. He is among authors of more than 70 papers and more than 70 families of patents and patent applications.