Laudation
on the occasion of the 60th birthday of
Professor Ferenc Weisz

by Sándor Fridli (Budapest, Hungary)

Ferenc Weisz was born in 1964 in a small village in the southern part of Hungary. He completed his secondary school education and graduated from the nearby gymnasium in Mohács. His interest in mathematics was already evident at that time. It was therefore a logical decision for him to continue his studies in mathematics at the Eötvös Loránd University (ELTE). Even as a student he demonstrated his talent for mathematics. He was awarded the Pro Sciencia Gold Medal by the Hungarian Academy of Sciences for his results as a student researcher in 1989. After graduating with honours he started his professional carrier as a PhD student at the Department of Numerical Analysis of ELTE Faculty of Informatics. Ever since he has been a loyal member of the department in various positions, as a professor since 2003. From 2023 he has been serving as Head of Department.

The success of his scientific work is marked by the degrees and honours he has achieved. He received his Candidate's degree in 1991 and the Doctor of Science degree from the Hungarian Academy of Sciences of HAS in 2001. As young researcher he was awarded the György Alexits Prize of HAS in 1997. For his work in Gabor and wavelet analysis he was honored the Gábor Dénes Prize in 2017. He received the prestigious Academy Prize (HAS) in recognition of his significant and internationally acclaimed achievements in the fields of classical Fourier, diadic and nowadays highly important wavelet analysis in 2019.

Ferenc Weisz is one of the leading members of the internationally renowned Hungarian Fourier series and real function theory school, the history of which goes back more than a century. Thanks to his decisive results in various chapters of harmonic analysis he is an internationally recognized, outstanding researcher in this field. His research interests in harmonic include in particular one- and multidimensional Fourier analysis, wavelet analysis, theory of Hardy spaces, and lately the theory of variable index spaces. He has published his results in leading international journals and at numerous international conferences. In addition, he has published several papers and a book in probability

theory, more specifically in theories of martingale theory, and stochastic processes. It is important noting that he has not only solved difficult problems, but has also made significant contributions to the further development of these fields, for example by generalizations, and by developing new methods, concepts.

His scientific work is embodied in about 250 publications. Many of them appeared in leading and high impact factor journals, and have have generated a lively international response. His results are cited in an impressive number, more than 4500 according to Google Scholar, of national and international papers on his research topics. There are several internationally renowned mathematicians among those who cited his works. He has presented his results at numerous international conferences, many times as invited speaker. He serves as member of the editorial board of eight journals, including Journal of Fourier Analysis and Applications, the prestigious journal in Fourier analysis.

Ferenc Weisz is an active member of the international mathematics community in his research areas. His highly regarded scientific activity is reflected in the many invitations he has received as visiting researcher at leading scientific centres in his field. For example, in 1992 and 1993 he spent two years at Ludwig-Maximilians University in Munich on a DAAD scholarship, in 1998 and 1999 two years at Humboldt University in Berlin on a Humboldt scholarship, in 2004 and 2005 two years at the University of Vienna on a Lise Meitner scholarship, and in 2016, 2017 and 2019 he spent one month each as an invited lecturer at several major Chinese universities (Beijing, Wuhan, Changsha, Hong Kong, Macau). In 2019, and in 2024 he spent a month as an invited researcher at the University of Cambridge.

His research milestones are best illustrated by his 6 monographs. All of them were published with esteemed publishers, two with Springer and Kluwer in 1994, 2004, and the other four with Birkhäuser (Springer) in 2012, 2017, 2021, 2022. In his first book (Martingale Hardy Spaces and Their Applications in Fourier Analysis, Lecture Notes in Math. vol. 1568, Berlin, Heidelberg, New York: Springer Verlag, 1994, 217 pages), he successfully combined martingale theory and Fourier analysis, applying martingale theory methods to the study of Fourier series. It was the first book in the literature to discuss the topic of multi-index martingale Hardy spaces. These results have inspired the research of many mathematicians, who have drawn heavily on his theorems and the methods he developed in their work. The main topics of his second, third and sixth monographs (Summability of Multi-Dimensional Fourier Series and Hardy Spaces. Kluwer Academic Publishers, Dordrecht, Boston, London, 2002, 350 pages; Summability of Multi-Dimensional Trigonometric Fourier Series. Surveys in Approximation Theory, 7, 2012, 179 pages; Martingale Hardy Spaces and Summability of One-Dimensional Vilenkin-Fourier Series. Birkhäuser (Springer), Basel, 2022, 633 pages), among others, are summations

of one- and multidimensional Fourier series and their relation to Hardy spaces. With his method, multidimensional problems of orders of magnitude more difficult than one dimensional ones can be handled well. As a result, he has solved many long-standing problems, answering questions raised decades ago by several authors who are now classics. In his fourth and fifth monographs (Convergence and Summability of Fourier Transforms and Hardy Spaces. Birkhäuser (Springer), Basel, 2017, 450 pages; Lebesgue Points and Summability of Higher Dimensional Fourier Series. Birkhäuser (Springer), Basel, 2021, 303 pages), he extended the theory of Lebesgue points, which is central to mathematical analysis, to multidimensional functions and a very broad class of strong summation procedures. As a consequence of the summation methods he developed, both classical and deep strong summation theorems can be obtained. Since 2004 he has been intensively involved in research in Gabor and wavelet analysis. Ferenc Weisz is now one of the internationally recognised leading researchers in this field. His results have contributed significantly to the elucidation of fundamental problems in wavelet analysis. Particularly noteworthy are those of his achievements that contribute to the theoretical background of image processing and image reconstruction. His international recognition is also reflected in the fact that he was invited to write a chapter of a monograph on the results of wavelet analysis, published by Springer in 2016.

Besides his scientific research he has been engaged in high-quality academic teaching on every level of university education for more than 36 years. In his teaching work, he has always taken great care to support talented students and promote their professional development. Some of his former students are now members of the Department of Numerical Analysis at the ELTE Faculty of Informatics. He is the developer of the topics of several courses and author of university notes. Within the Doctoral School of the Faculty of Informatics he is the leader of the doctoral program "Scientific Computations and Models, Numerical and Symbolic Methods".

In this greeting, we have of course only been able to give a brief overview of Ferenc Weisz's research activities. Nevertheless, we can also be sure that his life's work will be enriched by many fine scientific results in the years to come, and we wish him every success in this endeavour.