FOREWORD

Foreword to the Special Issue Dedicated to Misha Lyubich

Anna Miriam Benini[1] · **Tanya Firsova**[2] · **Scott Sutherland**[3] ·
Michael Yampolsky[4]

This and 1–2 of subsequent issues of the ArMJ are dedicated to Misha Lyubich's 60th Birthday and follow the anniversary conference "Analytic Low-Dimensional Dynamics" at Fields Institute, May 27–June 7, 2019.

Misha Lyubich is an outstanding figure in the field of Dynamical Systems. He is one of the founders of modern-day real and complex one-dimensional dynamics, having in many ways shaped the development of this exciting field.

Misha was born in 1959 in Kharkov, Ukraine, which was then a part of the Soviet Union. In 1975–1980 he was a student at the Mathematics and Mechanics Department of Kharkov State University (which, incidentally, was the scientific home of one of the great dynamicists of the late 1800-early 1900s, Alexandr Lyapunov). Lyubich's senior thesis in 1980 on entropy of rational maps established that the topological entropy is always equal to the log of the degree (a result which was independently obtained by Gromov). Soviet political realities, and in particular, tacit anti-Semitic policies, influenced all of Lyubich's early mathematical career. He would only be admitted to graduate school in Tashkent, the capital of Uzbekistan in Central Asia. In his Ph.D. thesis, which he defended in 1984, he obtained fundamental results on ergodic theory and structural stability of rational maps. In particular, he proved the existence and studied the properties of the measure of maximal entropy of a rational map, now known as Lyubich measure. At that time the interest in Holomorphic dynamics exploded in the West, and his work on structural stability had a substantial overlap with a parallel work by Mañé, Sad, and Sullivan.

In 1989, during the "perestroika" time, the borders of the Soviet Union started to open, and Lyubich was able to leave, together with his family. On his way, he received an invitation from John Milnor to join the Institute for Math Sciences at Stony Brook, which was founded at that time, and whose Director he is now. So in the beginning of

✉ Anna Miriam Benini

1 Universita' degli studi di Parma, Parma, Italy

2 Kansas State University, Manhattan, USA

3 Stony Brook University, Stony Brook, USA

4 University of Toronto, Toronto, Canada

the 1990s, he found himself in the very center of events in Holomorphic Dynamics. Since then, his work has made a deep and lasting impact on the field and related areas.

His fundamental contributions to the field include his proof of the Feigenbaum—Coullet–Tresser conjectures on hyperbolicity of renormalization of unimodal maps, his beautiful early work with A. Eremenko on transcendental dynamics, his foundational contributions to the field of the dynamics in several variables, the proof of the Regular or Stochastic conjecture in the dynamics of quadratic maps, and many, many others. Misha's many mathematical interests have connected the realm of dynamics to the fields of complex-analytic geometry, statistical physics, group theory and others.

Misha Lyubich's mathematical contribution goes well beyond the beauty of his theorems. By his generous sharing of ideas, and his enthusiastic support for new lines of research, he has inspired and mentored generations of young researchers. His deep understanding of the underlying connections between the different areas of mathematics gives him a unique panoramic vision and a striking sense of direction in the entangled mathematical world.

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