

Bridges

Mathematical Connections in Art, Music, and Science



1998

BRIDGES

**Mathematical Connections
in Art, Music, and Science**

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Reza Sarhangi, Editor

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Preface

*There is an original inside me.
What's here is a mirror for that, for you.*

- Rumi

A major reason for developing the Bridges Conference and this collection of papers is our desire to come together from a diverse set of apparently separated disciplines, to share and recognize abstract similarities, common patterns, and underlying characteristics.

The most fundamental patterns in the universe – from the double helix structures of DNA molecules and the spiral arms of galaxies, to the hexagonal packing structures of honeycombs and graphite carbon atoms – appear in the chain of evolution, in the shapes of cultures and civilizations, and in the extreme complexities encountered at high magnifications in high-speed computers.

These patterns are the subject of a staggering variety of fields that we study to shape and enrich our expressions. Each field is growing more diverse. Rather than keeping together, they tend to spread, interact and join with other areas. This branching threatens to make one lose the big picture for details that don't carry the desired essence of the whole. But, the process of growing together may be a natural, inevitable one, which is being accelerated by the works of such people as those included in this collection.

We hope the annual Bridges Conference and these proceedings have the potential to connect many more areas of intellectual pursuit, within a variety of disciplines in science, art, and humanities.

While emphasizing and encouraging the interconnection of materials in the search for a common ground, we did not ignore those readers who are eager to be challenged with deeper mathematics and led into a higher mastery of the concepts.

We are grateful that this publication has occurred on the centennial of the birth of M. C. Escher, whose contributions have impacted a great number of mathematicians, artists, and scientists.

We owe gratitude to our friends here and around the world who encouraged us to call for the Conference and enthusiastically participated by submitting stimulating papers.

The work of many hands, our humble offering is like one green leaf from a poor dervish. But perhaps our dervish is a prophet in the wilderness. We give what we have, when it blooms.

Reza Sarhangi

