About the Authors

S.J. (Jan) Abas trained as an Applied Mathematician and obtained a Ph.D. from London University in 1967. He lectured in mathematics, computer science, and computer graphics at University College of Wales Bangor for 27 years and did research in computational physics. He took early retirement in 1993 to concentrate on writing, traveling, and developing Islamic Art and a brain-centred model of the human personality called Neurobics. He is currently a part time lecturer and a Research Fellow in the School of Informatics at Bangor. Address: School of Informatics, University of Wales, Bangor, United Kingdom, LL57 1UT.

Victor Acevedo is a digital artist originally from Los Angeles, California. He studied traditional fine art at Art Center College of Design in Pasadena, and to date, he has shown his work in over 80 exhibitions worldwide. In 1999 his computer graphic piece *The Lacemaker* was included in the ACM/Siggraph documentary film called *The Story of Computer Graphics*. He is currently living in New York City where he lectures on digital art at the School of Visual Arts. His interest in geometrical structure, polyhedra and periodic space division is an integral part of his ongoing graphic work. Address: Box 220129 Greenpoint Station, Brooklyn, NY 11222-0129, USA.

Jill Britton is deeply interested in the teaching of mathematics. She regards mathematics as the "study of patterns" and uses the art of M.C. Escher to promote an interest in geometry. Her professional experiences include authoring recreational mathematics books, conducting "hands-on" workshops, and preparing future elementary school teachers. She is currently a mathematics instructor at Camosun College in Victoria, British Columbia, Canada. Address: 6572 Bella Vista Drive, Victoria, BC V8Z 6X1, Canada.

H.S.M. Coxeter, who likes to be called Donald, was born in London (England) in 1907 and was educated at Trinity College, Cambridge, 1926–36. He is now an Honorary Fellow of that College, which means that he could reside there for the rest of his life; but he prefers to remain in Toronto (where he taught at the University for sixty years) with his daughter and her husband, their old dog and young dog and cat. The Royal Society of London bestowed on him the 1977 Sylvester Medal (awarded to one mathematician every three years). He is the author of about a dozen books on geometry, algebra, crystallography, and the

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Jos de Mey was born in St. Denijs-Westrem Fl. Or. Belgium in 1929 and studied at the Royal Academy of Fine Arts in Ghent 1942–1949. He taught Interior Architecture and Color Harmony at the Royal Academy of Fine Arts in Ghent 1950–1968 and was a Docent at the Architecture school in Ghent 1969–1980. Since 1950 he has had a practice in interior architecture, color advising, and furniture design. An admirer of Van Eyck, Brueghel, Magritte, and Escher, he began painting in 1968, evolving from abstract constructivism towards extreme "realism" with impossible figures. Address: Daalmstraat 7, 9930 Zomergem, Belgium.

Sandro Del Prete, born in 1937, went to school in Freiburg, Switzerland, where he obtained a diploma in commercial subjects. Drawing and painting had been his favourite hobbies since childhood, and so he spent six months in Florence where he attended the Academy of Art. He went into business and has enjoyed the support of his wife and two sons in his inspiration. Both the pleasant atmosphere in his office and the many people with whom he has contact have provided him with numerous ideas for his drawings. Address: Gallerie Illusoria, Wylerstrasse 81, CH-3014 Bern, Switzerland.

Victor Donnay, Associate Professor and Chair of the Department of Mathematics at Bryn Mawr College, studies chaotic dynamical systems, specifically those that arise in billiard systems and geodesic flows on surfaces. He is interested in issues of mathematics pedagogy, particularly the uses of cooperative learning and computer visualization and exploration as means to bring the excitement of mathematics to a wider audience. Address: Department of Mathematics, Bryn Mawr College, Bryn Mawr, Pa. 19010 USA.

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Jane Eisenstein develops software for a living and weaves fiber art for her soul. She is fascinated by the boundary between order and disorder and enjoys Escher's explorations there. Through her weaving, she also seeks the "delight [that] lies somewhere between boredom and confusion." Address: 233 West Durand Street, Philadelphia, PA 19119, USA.

Michele Emmer is a professor of mathematics whose main field of interest is minimal surfaces and calculus of variations. He has a long-held interest in art and mathematics: he has produced 25 films and videos in the series "Art and Mathematics," is editor of Springer's video series, and author of the video "The Fantastic World of M.C. Escher." He is organizer of exhibitions on "Art and Math" and on "Math and Cinema"; of the annual conference in Venice "Mathematics and culture" (Springer Italia). He is a scientific journalist for sev-

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Bruno Ernst is one of the pseudonyms of Hans de Rijk (1926). His motto is NESCIUS OMNIUM CURIOSUS SUM : I don't know anything but I am curious in everything. He was a professor in mathematics and physics,with a special interest in visual perception. A friend of Escher since 1956, he wrote many articles and some books about Escher's life and work (e.g. *The Magic Mirror of M.C. Escher*). In 1984 he began his work with Oscar Reutersvärd and in 1985 he organized an international exhibition in Utrecht (Holland) "Imposssible Figures." Address: Stationstraat 114, 3511 EJ Utrecht, The Netherlands.

George Escher is the eldest son of M. C. Escher. He worked as a mechanical engineer in Canada since 1958. He is now retired in Mahone Bay, Nova Scotia. Address: R.R.1, Mahone Bay, N.S. Canada B0J 2E0.

Tamás F. Farkas (b. 1951) has since 1972 dealt with a kind of experimental art that aims to research organization of multidimensional forms. He developed a high-level analysis of structures provided by the geometry of higher dimensions. His work explores plane and space-filling with small geometric organizational elements, continuous formations, and quasi-architectural interlinking of crystal-type units in impossible structures. Address: Rózsa u. 46, Budapest VI, H-1064, Hungary.

Robert Fathauer is a part-time researcher at the Jet Propulsion Laboratory and an Adjunct Professor in the Electrical Engineering Department at Arizona State University. His field of specialty is electronic and micromechanical materials and devices. He also owns *Tessellations*, a business that produces puzzles and other products that combine art and math; his on line store is mathartfun.com. He also produces art prints based on fractal and/or Escheresque tilings. Address: 3913 E. Bronco Trail, Phoenix, AZ 85044, USA.

Helaman Ferguson moved recently to a larger studio where he is realizing his life-long dream of carving mathematical theorems in the hardest granite blocks he can get. Current projects include a 57-ton, 16-foot -high fountain for the middle of a small lake and carving a negative gaussian curvature form out of a single 24 ton, 8-foot-high block of black granite. Ferguson carves stone by subtraction – perhaps it is no accident that his mathematical work also involves subtraction. A subtractive integer matrix, GL(n,Z), algorithm for finding integer relations first published in 1979 by Ferguson and Rodney Forcade was named one of the top ten algorithms of the century. Address: 10512 Pilla Terra Court, Laurel, Maryland, USA.

István Hargittai is Professor of Chemistry of the Budapest University of Technology. A member of the Hungarian Academy of Sciences, Norwegian Academy of Sciences, and the Academia Europaea, he has done research in molecular structures and lectured in 30 countries. His books include the *Candid Science* series of conversations with famous scientists, Imperial College Press, London, *The Road to Stockholm: Nobel Prizes, Science, and Scientists,*

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Douglas Hofstadter is College of Arts and Sciences Professor of Cognitive Science at Indiana University in Bloomington. He explores the fundamental mechanisms of human thought by devising and building computer models and then systematically observing their successes and failures. He is also involved in literary translation, particularly of verse, and in the study of scientific and mathematical creativity. Author of several books, his first, *Gödel, Escher, Bach: an Eternal Golden Braid* won the 1980 Pulitzer Prize for nonfiction (although it incorrectly told its readers that the birth year of M.C. Escher is 1902). Address: Center for Research on Concepts and Cognition, Indiana University, 510 North Fess Street, Bloomington, Indiana 47408, USA.

J. Taylor Hollist is associate professor of mathematics at State University of New York at Oneonta. He has taught geometry at Oneonta State for 35 years. He has given talks at many mathematics conferences on historical aspects of M.C. Escher and his most recent publication is titled "M. C. Escher's Association with Scientists." Address: Department of Mathematical Sciences, State University of New York, Oneonta, NY 13820-4015, USA.

Kelly Houle began studying anamorphic art while attending the University of Arizona. She graduated with a degree in atmospheric science and taught math and science for several years before opening her own private tutoring company in Phoenix. She is actively involved in many aspects of the arts, including music, dance, writing, painting and drawing, and continues to incorporate ideas from mathematics, astronomy, meteorology, and geology into her work. Through artist residencies and workshops, Kelly encourages children to be curious, and to explore the connections between math, science, and art. Address: 6350 N. 78th St., #282, Scottsdale, AZ 85250, USA.

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Scott Kim is an independent game designer specializing in visual mathematical puzzles for magazines like *Discover*, and on the web. He is the author of the book *Inversions*, a collection of his symmetrical lettering designs (see his web site www.scottkim.com for samples). He has contributed puzzles to many computer games, including *The Next Tetris*, *Heaven & Earth*, *Obsidian*, and *Escher Interactive*. He received a Ph.D. in Computers and Graphic Design from Stanford University. Address: PO Box 2499, El Granada CA 94018, USA.

Eva Knoll was born and raised in Montréal, Québec, graduated from the McGill University School of Architecture, and pursued further research in the geometry of art at the Department of Design and Planning of Université de Montréal, where she earned her Master's degree. The study of geometry in art,

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Matjuska Teja Krasek holds a B.A. degree in painting from Arthouse-College for Visual Arts, Ljubljana, and is a freelance artist who lives and works in Ljubljana (Slovenija). Through her art she wishes to convey her experiences and feelings connected with the research results of different disciplines to all who are, regardless of their basic profession, interested in exploring the way our world and nature operate. Her theoretical as well as practical work is especially focused on symmetry as a linking concept between art and science. Address: Ob zici 7, SI-1000 Ljubljana, Slovenija.

Claude Lamontagne is a professor at the School of Psychology, University of Ottawa (Canada), where he has been researching and teaching the Psychology of Perception from a Cognitive Science perspective since 1977. After graduate training (Ph.D. 1976) in artificial intelligence at the University of Edinburgh (Scotland) he entered an academic career essentially focused on developing computational models of cognition in general and of visual perception in particular, against the conceptual background of an insistent epistemological questioning. Address: School of Psychology, University of Ottawa, 145 Jean-Jacques-Lussier, P.O. Box 450, Stn. A, Ottawa, ON, Canada, K1N 6N5.

Kevin Lee currently teaches computer science at Normandale Community college in Minneapolis, Minnesota. As a former high school math teacher he is interested in how technology can be effectively used to teach mathematics. He became fascinated in the tessellations of M.C. Escher in 1993 and as a result has created several commercial computer programs about symmetry and tessellations. Address: Department of Mathematics and Computer Science, Normandale Community College, Bloomington, MN 55431, USA.

Jean-François Léger holds a BA in Psychology and an MA in Sociology of the Arts from the University of Ottawa and is currently an Art Educator at the National Gallery of Canada in Ottawa. He was responsible for the public programming for the exhibition "M.C. Escher: Landscapes to Mindscapes" (December 1995 - March 1996) and is author of M.C. Escher: *An Introduction for Teachers*. He has developed a wide variety of public programmes to accompany exhibitions at the National Gallery, and has produced didactic materials on video and for the Web. Address: Education and Public Programs, National Gallery of Canada, 380 Sussex Drive, P.O. Box 427, Station A, Ottawa, Ontario, K1N 9N4, Canada.

Arthur L. Loeb earned the BS degree in Chemistry from the University of Pennsylvania and a Ph.D. in Chemical Physics from Harvard University, where he has taught since 1973. He is Senior Lecturer and Honorary Associate in Visual and Environmental Studies and is on the faculty of the Graduate School of Education. His principal interests are Design Science (storage, retrieval and communication of spatial concepts and patterns), Visual Mathematics (mathematics as an experimental, inductive science), and its use in teaching. He directs the *Collegium Iosquinum* ensemble for medieval and renaissance music, and is a choir member and instrumentalist at University Lutheran Church, Cambridge, MA. Address: Department of Visual and Environmental Studies, Carpenter Center for the Visual Arts, Harvard University, Cambridge, MA 02138, USA.

Makoto Nakamura (b. 1947) graduated from Tama Arts university in 1970. He is a free-lance artist in Tokyo, working mainly in design and illustration. His favorite artists, who have been most influential in his work, are M.C. Escher and Isson Tanaka (1908–1977) and the writer Kengi Miyazawa (1896–1923). Address: 3-11-4 Kamata Otaku, Tokyo, Japan.

István Orosz (b. 1951) was trained as a graphic designer at the University of Arts and Design in Budapest. In his fine art works he likes to use visual paradox and illusionistic approaches while following traditional printing techniques such as woodcutting and etching. He also tries to renew the technique of anamorphosis. He is animated film director at the Pannonia Film Studio, guest teacher at the University of Arts and Design in Budapest and a member of the Hungarian Art Academy. He often uses $OYIT\Sigma$ (No one) as an artist's pseudonym. Address: H-2092 Budakeszi, Reviczky u. 20. , Hungary.

Peter Raedschelders is an amateur artist and amateur mathematician who makes Escher-like tessellations and other unusual prints all based in mathematics. His prints include not only classical tessellations, but also tessellations with limits, and fractal tessellations. Other prints have strange perspectives or are based on mathematical models such as the Klein Bottle. His prints are in private collections all over the world and are published in several books and magazines. Address: O-L-VR-PL-15-1, 9150 Kruibeke, Belgium.

Marjorie Rice (b. 1924) is a homemaker and caregiver for her husband, Gilbert, who recently had a stroke. She has long been interested in the works of M.C. Escher and this led to her making tessellations based some of the pentagon tilings she later found. She hopes to continue exploring these as time allows. Address: 4005 Olympic Street, San Diego, California 92115, USA.

John Rigby spent forty one years at Cardiff University, and recently retired from his position there as Reader in Mathematics. During that time he also held temporary posts in Toronto, Ankara and Singapore. He is still an active researcher in elementary geometry and is currently interested in Traditional Japanese Geometry. Address: School of Mathematics, Cardiff University, Senghennydd Road, Cardiff CF24 4YH ,Wales, UK.

Rinus Roelofs (b. 1954) studied Applied Mathematics at the Technical University of Enschede, then took a degree from the Enschede Art Academy with

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Doris Schattschneider grew up in Staten Island, New York, and received her BA from the University of Rochester and MA and Ph.D. in mathematics from Yale University. She is a professor of mathematics at Moravian College, where she has taught for over 30 years. She has a deep interest in Escher's work, and is the author of *Visions of Symmetry: Notebooks, Periodic Drawings, and Related Work of M.C. Escher*. She was co-organizer, with Michele Emmer, of the Escher Centennial Congress in Rome and Ravello in 1998. Address: Mathematics Department, Moravian College, 1200 Main St., Bethlehem, PA 18018-6650, USA.

Claudio Seccaroni (b. 1959) studied Chemical Engineering at the University of Rome, "La Sapienza." He is a researcher at ENEA (Italian National Agency for New technologies, Energy and Environment) in the Safeguard of Cultural Heritage Unit, where he attends to the characterization of ancient pigments and their technology. Address: INN-ART sp 50, ENEA, C.R. Casaccia, s.p. Anguillarese 301, Santa Maria di Galeria, 00060 - Roma, Italy.

Marjorie Senechal grew up in Kentucky and received her BS from the University of Chicago, and MS and PhD degrees from the Illinois Institute of Technology. She has taught at Smith College since 1966, where she is Louise Wolff Kahn Professor in Mathematics and History of Science and Technology. Her areas of research include discrete geometry, tiling theory, and mathematical crystallography. She is the author or editor of seven books and numerous articles, and is the director of Smith's Program in the History of Science and Technology, and the Northampton Silk Project. Address: Dept. of Mathematics, Smith College, Northampton, MA 01063, USA.

Marco Spesso (b. 1956) studied Architecture at the University of Rome, "La Sapienza" and received the Ph.D. in Conservation of Monuments. Currently at the University of Genoa, he is a researcher in the History of Architecture. Address: via Portuense 104, 00153 Roma, Italy.

Dick Termes is an artist who lives in the Black Hills of South Dakota. For the past 32 years he has painted total environments onto the surface of the sphere, and calls these works Termespheres. The spheres hang and rotate from ceiling motors using a six-point perspective to show the north, east, south, west, up, and down direction all in one painting. His subjects range from geometric to surrealistic to realistic and range in size from 1 foot to 8 feet in diameter. Address: 1920 Christensen Dr., Spearfish, SD 57783, USA.

Mark Veldhuysen is director of Cordon Art B.V., exclusive worldwide representatives of the M.C. Escher copyrights When time permits, he enjoys tracking down some of the spots that Escher once visited and recorded in sketches and prints. Address: Cordon Art B.V., Nieuwstraat 6, 3743 BL Baarn, The Netherlands.

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