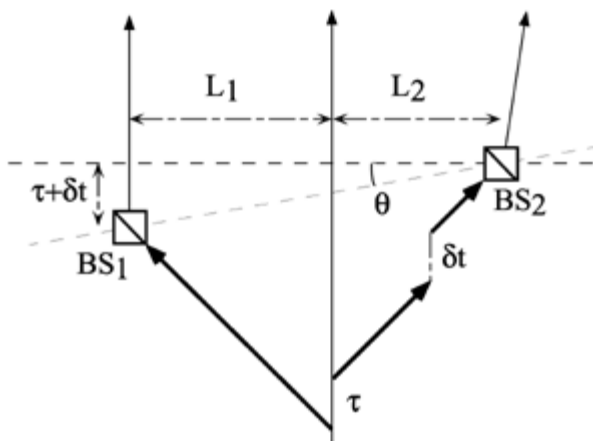


The Science of NONLOCALITY

and EASTERN APPROACHES to Exploring
ULTIMATE REALITY

*If God is infinite,
what can be
separate?*

SIR JOHN TEMPLETON



Time diagram of a two-part experiment involving moving apparatuses and demonstrating that quantum correlations are independent of distance as well as of time ordering between the two measurements. The experiment was proposed by Antoine Suarez and Valerio Scarani in 1997 and carried out by Nicolas Gisin and his Applied Physics Group at the University of Geneva in 2001.

- **PURPOSE**
- **CHAIR**
 - [BRUNO GUIDERDONI](#)
- **PARTICIPANTS**
 - [ANINDITA NIYOGI BALSLEV](#)
 - [RAYMOND Y. CHIAO](#)
 - [WILLIAM C. CHITTICK](#)
 - [RAMANATH COWSIK](#)
 - [NICOLAS GISIN](#)
 - [MENAS KAFATOS](#)
 - [AZIM A. NANJI](#)
 - [PRIYAMVADA NATARAJAN](#)
 - [RAVI RAVINDRA](#)
 - [ANTOINE SUAREZ](#)
 - [MUHAMMAD SUHEYLU UMAR](#)
 - [ANTON ZEILINGER](#)

Purpose

The assumption of classical physics that physical reality is local — that a point in space cannot influence another point beyond a relatively short distance — was challenged by Nicolas Gisin's 1997 experiments involving twin photons in which light particles were shown to communicate with one another instantly. Linked to research in atom optics conducted by Alain Aspect in the early 1980s, the revelation led some scientists to argue that physical reality on the most basic level is an undivided wholeness. Does it also imply that the stark division between mind and world is an illusion? The mystical traditions of all major religions have conceived of spiritual reality as, in some measure, a unified essence. Sufism, an Eastern approach to the divine rooted in Islamic faith and practice, has stressed the centrality of *tawhid*, the assertion of God's fundamental unity, to our understanding of the world and ourselves. God's love for creation gave existence to the universe, according to Sufi teaching,

and human love for God closes the gap between the Creator and His creatures. The philosophic expression of Hinduism known as the Vedanta emphasizes the substantial and essential identity of the individual soul with the unqualifiable Absolute (*Atman* is *Brahman*). Can the scientific concept of nonlocality aid us in exploring the ultimate reality beyond time and space and causation? Can Eastern approaches to divinity help us, in turn, to find meaning in the fantastic and ongoing revelations of modern science beyond the thrill of the chase and of discovery itself? To consider the broad implications of correlations between properties of quanta is the purpose of thirteen scientists, theologians, and philosophers meeting on the northern shore of Lake Geneva. They come together to explore the implications of quantum nonlocality for the character of physical reality, as well as the uses of the concept of complementarity—Niels Bohr’s logical framework for acquiring and comprehending scientific knowledge—in understanding the relationship between parts and wholes, the fundamental unity of creation from Eastern perspectives, and the search for meaning in modern science and mystical traditions.

Chair

BRUNO GUIDERDONI is a director of research at the Paris Institute of Astrophysics (IAP) and an expert on Islam. A graduate of the University of Paris where he earned a Ph.D. in astronomy in 1986, he held a post-doctoral fellowship at the French Academy of Sciences for two years before receiving an appointment to the research staff of the IAP, which is supported by the French National Center for Scientific Research. He was promoted to his present position in 1992. Dr. Guiderdoni’s research has focused on the birth and evolution of galaxies. He has produced a number of key papers that have contributed significantly to the elaboration of the paradigm of “hierarchical” galaxy formation, the theory that galaxies are the result of mergers and collisions between smaller star swarms, and participated in the discovery of the uniform glow of the cosmos at far-infrared wavelengths invisible to the human eye. He is currently working on simulations of galaxy formation that are used to interpret observations made of the universe’s most distant large-scale structures. Dr. Guiderdoni is an associated scientist on the European Space Agency’s two scientific satellites, Herschel and Planck, that will be launched in 2007 to survey the full far-infrared and submillimeter waveband and measure the fluctuations in the temperature of cosmological background radiation with unprecedented resolution and sensitivity. He has published more than 100 scientific papers and organized eight international conferences in his field. Before undertaking his graduate work, Dr. Guiderdoni fulfilled his national service obligation as a physics teacher in the French high school in Casablanca. Introduced to Islam in Morocco, he embraced the faith in 1987, and from 1993 to 1999, he was in charge of a television program, “Knowing Islam,” that is broadcast by the state TV channel in France. Under the aegis of the Islamic Institute for Advanced Study, he has lectured widely on spirituality and on his views about the connections between science and religion. He has played an active role in promoting inter-religious dialogue, particularly among the Abrahamic traditions. Since the tragic events of last September 11th, he has spoken out often on the values of humility and tolerance in any search for truth.

Participants

ANINDITA NIYOGI BALSLEV, an expert on classical Indian as well as Western thought traditions, is an associate research professor of philosophy at the University of Copenhagen. Born in Calcutta, she received her bachelor’s degree with honors from Calcutta University, took a master’s degree in philosophy there, and went on to earn a Ph.D. in philosophy from the University of Paris in 1968. She has been a fellow at the Indian Institute of Advanced Study and a research lecturer at the Center for Cultural Research at Denmark’s Aarhus University, as well as a senior lecturer at Aalborg University in Denmark and a visiting professor at the University of Kentucky, Rutgers University, and Aarhus’s Institute for the History of Ideas. Dr. Balslev was a senior advisor to the Danish National Institute for Education Research in 1996, and in 1998, she held the Asutosh Mukherji Chair at the National Institute of Advanced Study in Bangalore, India. Dr. Balslev has organized a number of international conferences around cross-cultural and interdisciplinary issues and delivered invited talks in Asia, Europe, and North America on the interface between science and

religion. Her articles in academic journals explore, among other issues, the problem of time, notions of self, and the meaning of consciousness in the context of Indian thought. In addition to editing two volumes, she is the author of *A Study of Time in Indian Philosophy* (1983 and 1999) and *Cultural Otherness: Correspondence with Richard Rorty* (1991 and 1999). Dr. Balslev is currently writing a new book entitled "I-Consciousness: A Cross-Cultural Inquiry."

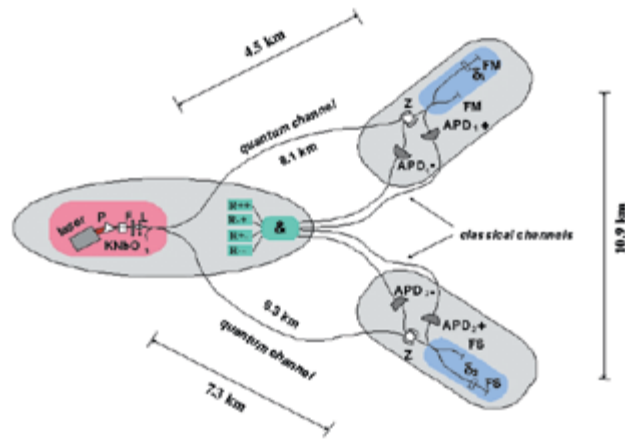
Physicist **RAYMOND Y. CHIAO** is widely known for pioneering experiments in the twilight zone of quantum mechanics where objects can pass through solid walls. His recent work involves investigations of faster-than-light phenomena. He has measured how long photons take to "tunnel" through a barrier that ought to be impenetrable and found that they appear to outpace the speed of light when they are successful in reaching the other side. Born in Hong Kong and educated in the United States, he earned a bachelor's degree from Princeton University, where he was elected to Phi Beta Kappa in his junior year, and a Ph.D. in physics from the Massachusetts Institute of Technology in 1965. After teaching at MIT for two years, he joined the physics faculty of the University of California, Berkeley and was named a full professor in 1977. Dr. Chiao has held a Woodrow Wilson Fellowship and an Alfred P. Sloan Fellowship. A member of Sigma Xi, he won the second prize of the Gravity Research Foundation in 1981 and the Scientific Innovation Award for Outstanding Work in Modern Optics from the Center for Advanced Study at the University of New Mexico in 1986. He is a fellow of both the American Physical Society and the Optical Society of America. Dr. Chiao has published some 125 papers in major scientific journals. He edited *Amazing Light* (1996), a volume dedicated to the Nobel laureate Charles H. Townes on the occasion of his eightieth birthday.

WILLIAM C. CHITTICK, a professor of comparative studies at the State University of New York, Stony Brook, has written extensively on Islamic philosophy with special emphasis on the Sufi tradition. A graduate of the College of Wooster in Ohio, he received a Ph.D. in Persian language and literature from Tehran University in 1974 and later studied at the Imperial Iranian Academy of Philosophy in Tehran, where he also served as an assistant professor in 1978-79. Dr. Chittick had begun his teaching career at the Center for the Humanities at Aryamehr Technical University in Tehran. He returned to the United States just before the Iranian Revolution and in 1981 accepted an appointment as an assistant editor of Columbia University's *Encyclopedia Iranica* (1982-85). In 1983, he was named an assistant professor of religious studies at SUNY Stony Brook. He was promoted to his present position in 1996. Dr. Chittick has been a visiting professor of Arabic literature at Harvard University. A former member of the board of editors of the SUNY Press, he has held a Fulbright Fellowship and two fellowships awarded by the National Endowment for the Humanities. In 2000, he was awarded the Mevlâna Özel Ödülü by the Kombassan Foundation in Turkey. In addition to numerous articles in scholarly journals and contributions to encyclopedias, histories, and collected works, he has translated a dozen major Persian and Arabic texts into English and is the author or co-author of eleven books. His most recent studies are *Sufism: A Short Introduction* (Oneworld, 2000) and *The Heart of Islamic Philosophy: The Quest for Self-Knowledge in the Teachings of Afdal al-Din Kâshânî* (Oxford University Press, 2001).

The director of the Indian Institute of Astrophysics in Bangalore for the past decade, **RAMANATH COWSIK** has made wide ranging contributions to theoretical physics, experimental physics, and science management. He formerly headed the Gravitation Group at the Tata Institute of Fundamental Research in Bombay with which he was associated for forty years. His papers pointing out the astrophysical and cosmological consequences of finite neutrino masses contributed to the basic paradigm for studying galaxy formation and dark matter. Dr. Cowsik also has advanced knowledge of the behavior of cosmic rays at low and high energies, and his discussion of non-thermal particle populations inside supernova remnants have led to a physical understanding of their spectra. In the course of his experimental searches for new feeble forces and tests of Einstein's principle of equivalence of inertial and gravitational masses, he designed a new kind of torsion balance with which he performed the 1/2nd laboratory experiment searching for the so-called "fifth force"—a hypothesized addition to the four fundamental interactions between objects in nature. Investigating the dust of presolar diamonds, rubies, and carborandum embedded and preserved in meteorites, Dr. Cowsik has been able to infer the formation of these materials in stellar winds and to estimate by a completely new method the age of the Milky Way. Recently

he explored the Himalayas to establish a unique site for optical infrared astronomy in Ladakh on the border of Tibet. Dr. Cowsik was born in Nagpur in central India and took his baccalaureate degree at the University of Mysore. He earned a master's degree in physics at Karnatak University and, after further graduate work at the Atomic Energy Training School in Mumbai, he received his Ph.D. in physics from the University of Bombay in 1969. He had joined the Tata Institute as a research associate in 1961, and he subsequently became a research fellow, a fellow, a reader, an associate professor, a professor, and a senior professor there. Named a Distinguished Professor in 1996, he retired from his faculty position earlier this year. Dr. Cowsik has held a research fellowship at the University of Chicago and been a visiting lecturer and assistant professor at the University of California, Berkeley, a senior visiting fellow at the Max Planck Institute for Physics and Astrophysics in Munich, and a distinguished visiting professor at Washington University in St. Louis. Currently serving on the governing council of the Commission on Cosmic Rays of the International Union of Pure and Applied Physics, he is a fellow of the Indian National Science Academy, the Indian Academy of Sciences, the National Academy of Sciences, India, the Indian Geophysical Union, and the Third World Academy of Sciences. In addition to invited lectureships, he is the recipient of many other honors, including the Vikram Sarabhai Award for Space Sciences, the Shanti Swarup Bhatnagar Award in Physical Sciences, a NASA Public Service Group Achievement Award, the Third World Academy of Sciences Award in Basic Sciences, the Vainu Bappu Memorial Award of the Indian National Science Academy, the S.N. Bose Birth Centenary Award of the Indian Science Congress Association, and the Padma Shri Award from the President of India. Dr. Cowsik has published some 180 papers in scientific journals and is the editor of *Cosmic Pathways* (1985) and two other books.

NICOLAS GISIN is the group leader for the Optics Division of the Group of Applied Physics at the University of Geneva. He is also a professor of physics at the Swiss university. His research is at the crossroads between modern optics and quantum physics, and he works both on conceptual issues and on their application. Dr. Gisin's experiments in long distance quantum entanglement are at the heart of quantum information processing and have made him an international leader in the emerging field of quantum cryptography—a technique using single photons of light to send secret messages with the assurance that no one has eavesdropped on them. A graduate of the University of Geneva, he took his undergraduate degree and earned master's degrees in mathematics and in physics there as well as a Ph.D. in physics in 1981. His dissertation was awarded a prize by the Louis de Broglie Foundation. Dr Gisin did post-graduate work in optics at the University of Rochester and upon his return to Switzerland in 1984, he joined a start-up company, Alphatonix, dedicated to the development of fiber instrumentation for the telecommunications industry. Four years later, he joined a Swiss software company. In 1988, he accepted an invitation to return to his alma mater as head of the optics section of the Group of Applied Physics. His work won worldwide attention in 1997 when he reported the results of an experiment in which he split a light beam in two, at a facility near the Geneva train station, and sent the resulting pair of photons in opposite directions over fiber-optic cables to detectors located more than six miles apart. Dr. Gisin confirmed that a stimulus applied to just one of the twin beams instantly determined the state of the sibling photon as predicted by quantum theory. What Albert Einstein called “spooky action at a distance” has been the focus of much of Dr. Gisin's subsequent research. It is increasing our understanding of the information content of quantum states and holds promise not only for encryption but also computation among other applications. Dr. Gisin has published some 200 papers in scientific journals. Once a nationally ranked field hockey player, he also finds time to work with Swiss youngsters interested in the sport.



In a now classic experiment, physicist Nicolas Gisin split a light beam in two at a facility in Geneva and sent the resulting pair of photons in the opposite directions over fiber-optic cables to detectors located in the suburban towns of Bellevue and Bernex. He demonstrated that the twin particles communicated with one another instantly as predicted by quantum theory.

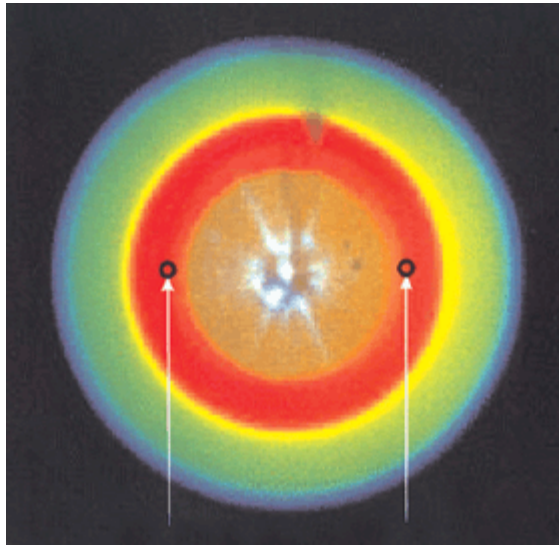
University Professor of Interdisciplinary Science and a professor of physics at George Mason University, Greek-born **MENAS KAFATOS** has explored the implications for physics and for philosophy of particle “entanglement” over long distances in two books. Written with his George Mason colleague Robert Nadeau, *The Non-Local Universe* (Oxford University Press, 1999) and *The Conscious Universe* (Springer-Verlag, 1990 and 2000) consider the potential of nonlocality to transform our understanding of the nature of reality. Dr. Kafatos, who is a native of Crete, received his bachelor’s degree from Cornell University and a Ph.D. in physics from the Massachusetts Institute of Technology in 1972. After three years of post-doctoral research in astrophysics at the University of Colorado and the NASA/Goddard Space Flight Center, he joined the George Mason physics faculty and was promoted to full professor in 1984. Dr. Kafatos won international attention for his early work in theoretical astrophysics, particularly his work on black holes, those “ghosts” of massive dead stars whose gravitational imprint, frozen in space, challenges physicists to broaden their cosmological perspective. His current research interests include Earth observing and Earth systems science, foundations of quantum theory, the nature of consciousness, and cosmology. In 1991, he founded George Mason’s Institute of Computational Sciences and Informatics, which evolved into its School of Computational Sciences. Four years later, he founded the Center for Earth Observing and Space Research (CESOR). He still serves as director of CESOR and as principal investigator of several federally funded George Mason programs for the effective use of data anticipated from the next generation of space platforms among other activities. Dr. Kafatos is an honorary member of the Romanian Academy of Sciences and currently serves as vice president for education of the American Astronautical Society. He has published some 165 scientific papers and is the co-editor of six books and the co-author of four others.

AZIM A. NANJI is director of the Institute for Ismaili Studies in London. Born in Kenya, he took a first-class degree with honors in literature and religious studies at Makerere University in Uganda and received a Ph.D. in Islamic studies from McGill University in 1972. After spending a year as a post-graduate research and teaching fellow at McGill’s Institute of Islamic Studies, he joined the religious studies faculty of Oklahoma State University, where he became a full professor in 1983. In 1988, he was named professor and chair of religion at the University of Florida, a position he held for the next ten years. Dr. Nanji also has been a Visiting Killam Fellow at Dalhousie University in Halifax, Nova Scotia and a Margaret Gest Visiting Professor of Religion at Haverford College. He has received a Rockefeller Fellowship, an American Institute of Indian Studies Senior Research Fellowship, a Canada Council Award, and a research grant from the National Endowment for the Humanities. An elected member of the American Society for the Study of Islam, he delivered the plenary lecture at the National Conference on Religion, Philanthropy, and Civil Society in Washington in 1994. He is a member of the steering committee for the Aga Kahn Award for Architecture and was previously co-chair of the Islam Section of the American Academy of Religion as well as a

member of the editorial advisory board of the *Journal of the American Academy of Religion*. Dr. Nanji has published some forty scholarly articles and book chapters and is the editor of three books and the author or co-author of two others. His 1978 study, *The Nizari Ismaili Tradition*, won the Council of Canada Publication Award.

An investigator probing images of galaxy clusters produced by the Hubble Space Telescope for clues to the distribution of “dark” matter, the dominant but unseen gravitational influence on the cosmos, **PRIYAMVADA NATARAJAN** is an assistant professor of astrophysics at Yale University with an abiding interest in the philosophy of science. Born in the south of India, she received bachelor’s degrees in science and in mathematics from the Massachusetts Institute of Technology then pursued graduate work in MIT’s program in science, technology, and society before taking a Ph.D. in astrophysics at Cambridge University in 1998. Awarded a research fellowship at Trinity College, Cambridge, she continued her work in England for the next several years before accepting an appointment to the Yale faculty in 2000. Dr. Natarajan’s research focuses on a range of topics in astrophysical cosmology. Among other questions, she is investigating the role of gamma-ray bursts in star formation, how groups of galaxies may form and change over time, and the evolution and scale of the massive whirlpools, known as black holes, in their centers. She serves on the advisory committee of the American Association for the Advancement of Science’s Program of Dialogue on Science, Ethics, and Religion and on the board of advisors of the John Templeton Foundation. In addition to some thirty papers in scientific journals, Dr. Natarajan has published a collection of poems.

RAVI RAVINDRA is a professor emeritus at Dalhousie University in Halifax, Nova Scotia where, until his recent retirement, he had been professor and chair of comparative religion, professor of international development studies, and adjunct professor of physics. Born in Patiala in the Punjab area of northwest India, he earned his bachelor’s and master’s degrees at the Indian Institute of Technology in Kharagpur and a Ph.D. in physics at the University of Toronto in 1965. Subsequent to a post-doctoral fellowship in physics at Toronto, he held a post-doctoral fellowship in philosophy at Princeton University and a post-doctoral fellowship in religion at Columbia University. He began his teaching career as an assistant professor of physics at Dalhousie in 1966. Formerly a visiting member of the Institute for Advanced Study in Princeton and a visiting member of the Indian Institute of Advanced Study in Simla, he has been the visiting Kern Professor of Science and Spirituality at the California Institute of Integral Studies and the Korett Visiting Professor of Philosophy and Medicine at the Pacific Medical Center in San Francisco. The founding director of the Threshold Award for Integrative Knowledge given by the Swiss Threshold Foundation, he formerly served as chair of its selection committee. Dr. Ravindra is the recipient of numerous research grants and a John Templeton Foundation Science and Religion Course Program grant as well as fellowships from the Canada Council, the Social Sciences and Humanities Research Council of Canada, and the Shastri Indo-Canadian Institute. He formerly served as a director of the International Theosophical Society’s School of the Wisdom in Madras, India, a member of the board of advisors of the John Templeton Foundation, a member of the board of judges for the Templeton Prize, and a member of the advisory committee for the Program of Dialogue Between Science and Religion of the American Association for the Advancement of Science. Dr. Ravindra has had a long and deep interest in the metaphysics and practical spiritual disciplines of Hinduism, Buddhism, and Christianity. Among contemporary spiritual teachers, he has been influenced by Jiddu Krishnamurti and Jeanne de Salzmann, who was a pupil of George Ivanovitch Gurdjieff. In addition to publishing more than 120 articles in scientific and scholarly journals, Dr. Ravindra is the author or co-author of ten books. Among them are the highly influential *Whispers from the Other Shore: Spiritual Search East and West* (1984 and 2000) and *The Yoga of Christ in the Gospel According to St. John* (1990 and 1992). His most recent study, *Science and the Sacred*, was published by the Theosophical Publishing House in 2000. A new book, *Krishnamurti in the Long Line of Rishis in India*, will be published next year by Munshilal Manoharilal Publishers in its Builders of Indian Philosophy Series.



Twin photons produced in the nonlinear optical process called "spontaneous parametric down-conversion" pass through pinholes 1 and 2. They are entangled with each other in such a way that it is possible to observe correlations-at-a-distance in their behaviors. The experiment was carried out at the University of California at Berkeley by Raymond Y. Chiao and Paul G. Kwiat.

The founding director of the Center for Quantum Philosophy, a division of the Zurich-based Institute for Interdisciplinary Studies (IIS), **ANTOINE SUAREZ** conducts and promotes research on the foundations of quantum theory and seeks to stimulate discussion of its metaphysical implications. He is a native of Spain and graduated from the University of Zaragoza before pursuing graduate work in experimental physics at the University of Fribourg in Switzerland. Dr. Suarez took his Ph.D. in natural science at the Swiss Federal Institute of Technology (Eidgenössische Technische Hochschule Zürich or ETH) in 1975. While at ETH, he not only became interested in the philosophical significance of quantum mechanics, but also in genetic epistemology. For more than a decade, he was engaged in research on cognitive growth that led to the development of improved methods for teaching mathematics and science to children. Dr. Suarez directed the Swiss think tank, IIS, from 1985 to 1993, and with major support from the Lemman Foundation, he undertook studies that brought the insights of philosophers, theologians, and ethicists to bear on advances in science. Since assuming his current position in 1989, he has conducted and facilitated, with support from the Odier Foundation, experimental research on correlations of nonlocal quantum, that is, faster-than-light influences on phenomena. With Valerio Scarani, he was the first scientist to propose experiments using moving measuring devices to investigate the tension between quantum mechanics and relativity, especially whether there is a real time ordering behind nonlocal influences. Dr. Suarez actively collaborated with Nicola Gisin's Group at the University of Geneva in carrying out the work. Recent results suggesting that relativity's tools for dealing with the flow of time are irrelevant in the realm of quantum processes have strengthened his interest in exploring possible links among levels of reality. In addition to articles in scientific journals, chapters in volumes of collected works, and an early study on the relation of thought to action in adolescents, he is the editor (with Alfred Driessen) of *Mathematical Undecidability, Quantum Nonlocality and the Question of the Existence of God* (Kluwer, 1997).

MUHAMMAD SUHEYL UMAR is the director of Pakistan's Iqbal Academy in Lahore, a research institution devoted to the works and teachings of the Muslim poet and philosopher Muhammad Iqbal who became a political activist and is known as the father of modern Pakistan. Dr. Umar is also the founding editor of *Riwayat*, an intellectual journal in the Urdu language that has published articles on science, philosophy, and mysticism for the past twenty-one years, and the editor of *Iqbal Review*, an academic quarterly published alternately in Urdu and English, which has both Persian and Arabic editions. A graduate of Government College in Lahore where he took both a baccalaureate degree and master's degree in English, he earned a M.Phil. in Iqbal studies at Allama Iqbal Open University in Islamabad and, after nearly two decades in educational administration and academic publishing, a Ph.D. in philosophy from Punjab University in Lahore in 1999. Dr. Umar began his editorial career

as managing partner of Suhail Academy, a publishing company in Lahore, and in the early 1980s served as secretary general of Al-Manara Academy and as vice principal and head of the English department at Al-Manara Public School. He was named deputy director of Iqbal Academy in 1984 and assumed the directorship in 1997. Formerly chief editor of *Al-Ma'arif* and editor of *Studies in Tradition*, he served as academic director of the Institute of Islamic Culture in Lahore for two years and was named an honorary fellow in 1992. The next year he was a visiting scholar at the International Institute of Islamic Thought and Civilization in Kuala Lumpur, Malaysia. In addition to articles published in scholarly journals, he has edited a number of volumes of Iqbal's writings and collections of various literary works in Urdu. He also has published bibliographies and descriptions of extant manuscript collections in Pakistan and has several new works in preparation.

One of the world's leading researchers in the field of quantum physics, **ANTON ZEILINGER** is professor of physics and director of the Experimental Physics Institute at the University of Vienna. His work first received international attention in 1997 when he and his colleagues at the University of Innsbruck, where he was then directing the Institute of Experimental Physics, confirmed the possibility of quantum teleportation by demonstrating, through the use of pairs of entangled photons, that the properties of one particle can be instantly transferred to another over an arbitrary distance at the speed of light. More recently, Dr. Zeilinger's quantum interference experiments with "buckyball" molecules (whose shapes resemble the geodesic domes designed by R. Buckminster Fuller), so far the largest objects to have demonstrated quantum behavior, have attracted the notice of the scientific community. By proving that clusters of seventy carbon atoms obey quantum-mechanical rules, he has extended the quantum domain further than ever before. Born in Austria, Dr. Zeilinger studied at the University of Vienna and earned a Ph.D. in physics and in mathematics in 1971. After a lectureship at the Technical University of Vienna, a Fulbright fellowship at the Neutron Diffraction Laboratory of the Massachusetts Institute of Technology, and professorships at MIT, the Technical University of Vienna, and the University of Innsbruck, he accepted his present position in 1999. Dr. Zeilinger has been a visiting professor at the University of Melbourne, the Technical University of Munich, and the College of France, as well as an adjunct professor at Hampshire College in Amherst, Massachusetts, and a visiting research fellow at Merton College, Oxford. The former president of the Austrian Physical Society, he was named Austrian Scientist of the Year in 1996. His many other honors include the Senior Humboldt Fellow Prize, Germany's Order pour le Mérite, the 2000 Science Prize of the City of Vienna, and the 2001 World Future Award. Dr. Zeilinger is a fellow of the American Physical Society, a member of the European Academy of Arts and Sciences, and an honorary professor of the University of Science and Technology of China. He serves on the editorial boards of the *Foundations of Physics Letters* and *Physical Review A*. The author of more than 200 papers published in major scientific journals, he is co-editor (with Dirk Bouwmeester and Artur Ekert) of *The Physics of Quantum Information* (2000) and most recently (with Chiara Macchiavello and G. Massimo Palma) of *Quantum Computation and Quantum Information Theory*, which was published last year by World Scientific. Mindful of the practical applications of his research for the processing and transmission of information, including quantum teleportation, quantum cryptography, and quantum computing, Dr. Zeilinger is also intrigued by the epistemological implications of quantum physics. He has met with the Dalai Lama to discuss them and has challenged his scientific colleagues to consider which notions appearing distinct and even opposed today will turn out to be so for future generations.

*All things by immortal power,
Near or far,
Hiddenly
To each other are.
That thou canst not stir a flower
Without troubling of a star.*

The Mistress of Vision
- Francis Thompson

**THE HUMBLE APPROACH INITIATIVE
A PROGRAM OF THE JOHN TEMPLETON FOUNDATION**

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[Top of Page](#)