The title of this journal makes its core topic self-evident. The question of relationships between the material world and its apparently non-material counterpart or complement is one of the oldest, most puzzling and most controversial issues in the philosophy and history of science. There exists a vast literature addressing its many different aspects from a wide variety of viewpoints. Monistic, dualistic, and even pluralistic approaches have been proposed in both epistemological and ontological interpretations, and elaborated in quite a number of variants.

Although the issue of consciousness and the brain is presumably the most discussed mind-matter issue in contemporary research (the notion of the “hard problem” has been coined and several journals have been created to address it), its boundaries have become somewhat fuzzy and permeable. Today we are witnessing an increasing interest in mind-body questions, be it due to a revival of psychosomotics or due to the emergence of relatively new fields such as psycho-neuro-endocrinology. These areas have even started to involve relations to and the impact of social and cultural environments. But the role of the material environment of agents has been emphasized as well, for instance in recent studies of embodiment.

Yet any basic understanding of the relationship between the categorically different concepts of mind and matter has remained lacking for centuries. It must be admitted that progress in individual sciences has most often not only disregarded problems of this kind, but even depended on disregarding them. The traditional methodologies of physics, chemistry, biology and the neurosciences illustrate this insofar as they restrict their interest exclusively to the material domain of their respective level of reality. However, this must not be taken as a proof of the validity or even necessity of such a procedure. With the present journal, we want to explore basic mind-matter questions in a way which is unbiased by the presuppositions of individual disciplines, yet builds on their achievements. It would be outright impossible to investigate general or specific mind-matter issues without explicitly considering the important results of the individual disciplines involved.

With this background, Mind and Matter is conceived as an interdisciplinary journal, aimed at an educated readership interested in all aspects of mind-matter research from the perspectives of the sciences and humanities. It is devoted to the publication of empirical, theoretical, and conceptual research and the discussion of its results. The main subject areas of the journal are:
neuroscience, cognitive science, behavioral science
physical approaches, mathematical modeling, data analysis
philosophy of science, philosophy of mind, applied metaphysics
cultural and social studies, history of ideas

Topics combining approaches from different disciplines in an interdisciplinary way are particularly encouraged. Appropriate review articles, commentaries, interviews, book reviews, and conference reports will be published occasionally.

Being interdisciplinary means more than assembling various multidisciplinary viewpoints. In genuinely interdisciplinary work, aspects of different disciplines are merged in such a way that the result could not be obtained by a simple combination of results from individual disciplines. Using a mathematical metaphor, results of interdisciplinary work cannot be decomposed into factors like a tensor product; interference terms are essential. This is one of the reasons why interdisciplinary work is so much more difficult and ambitious than disciplinary or multidisciplinary approaches.

This also implies that interdisciplinary work is often, maybe generically, not included in the mainstreams of the traditional sciences. In this sense, *Mind and Matter* will be specifically devoted to the publication of promising “non-standard” approaches which are at the frontier of research. This may even include controversial discussions of standard methodological principles of the sciences. However, it will exclude material ranging from unfounded speculation to pure science fiction as it is circulated in dedicated discussion groups and public media.

The success of a journal depends essentially on the quality of the articles which it contains, but it depends also on the accessibility of those articles to its readership. These two requirements easily lead to opposing tendencies. On the one hand, high standard articles have to involve the (sometimes technical) terminology of the contributing disciplines. This bears the risk of becoming undigestable for readers without that specific background. Thus, a proper compromise between the careful presentation of sound work and its accessibility for generally educated readers must be found. This will require considerable effort on all sides, authors, readers, and editors, if the level of the journal is to be kept a safe distance from intellectual fast food.

An editorial board of international standing, representing the subject areas of *Mind and Matter*, supports the journal and helps to accentuate its contours. Manuscript submissions to the journal will be professionally reviewed by academic peers. *Mind and Matter* emphasizes the important role of a functioning review system by providing the option that referees may disclose their identity with respect to an accepted article in print. Beyond this, referees (as well as readers in general) are encouraged to
submit commentaries on articles if they want to make specific suggestions or disagree on interpretive accounts.

The first issues of *Mind and Matter* will be based on presentations at a workshop on aspects of mind-matter research, held in Wildbad Kreuth, Bavaria, Germany, in June 2003. (The workshop program is still available online at http://www.igpp.de/english/tda/mindmatter/mm.htm). The main body of the present issue collects original research contributions by Tito Arecchi, Dick Bierman, Eliano Pessa and Giuseppe Vitiello, and Hans Primas, addressing aspects of the mind–matter problem in ways which elaborate particular approaches inspired by standard quantum theory, but clearly exceed the range of its usual applications in physics – “quantum queries”. Although there is no doubt that Roger Penrose’s ideas and their application to consciousness research has become extremely popular over the last decade, the contributions in this issue will demonstrate promising alternatives.

The issue begins, however, with a memorial account of the Chemistry Nobelist Ilya Prigogine, who passed away in May this year. The author, Karl Gustafson, is a mathematician at the University of Colorado at Boulder and worked with Prigogine and his group for two and a half decades. Gustafson’s words of remembrance provide insights into Prigogine’s broad scope of interests and his deep intuitions in and beyond science, which are presented as sensibly as his personality as a whole. Readers of this issue will be particularly interested in how Prigogine assessed the problem of mind and matter in the last years of his life.

The paper by Tito Arecchi combines perspectives of cognitive science, neuroscience, the physics of dynamical systems, and quantum theory. His approach is embedded in the theory of chaotic systems, whose relevance for cognitive neuroscience was proposed by Walter Freeman and, from a conceptual viewpoint, John Nicolis about thirty years ago and has received an increasing amount of confirmation since then. Arecchi suggests considering homoclinic chaos, a particular type of complex dynamical behavior around critical points called saddle points, as crucial for neural synchronization and feature binding. Representing mind/brain states in terms of specific distribution functions, so-called Wigner functions well known in quantum theory, he predicts an uncertainty relation between the duration of a particular perception process and the uniqueness of a perceived percept – a challenge for both experimentalists and theoreticians working in the fields of perception and cognition.

Dick Bierman reports a recent experimental study devoted to an old question, first brought up by John von Neumann in his 1932 monograph “Mathematical Foundations of Quantum Mechanics”: does the quantum mechanical measurement process depend on the consciousness of an observer? Two major protagonists in the discussion of this issue in physics are Eugene Wigner and, currently, Henry Stapp. In a corresponding ex-
periment carried out by Abner Shimony and coworkers in the 1970s, no indications were found for an influence of the consciousness of human observers on the state of an observed quantum system. Bierman presents results from an improved experimental setup, in which he used event-related brain potentials of his observers rather than their verbal reports to check such indications. Surprisingly, his results are not as negative as those by Shimony’s group and call for further work.

Eliano Pessa and Giuseppe Vitiello explore the idea, originally proposed by Hiroomi Umezawa about 40 years ago, of using quantum field theoretical models for describing cognitive processes. Their central target in this regard is the phenomenon of memory and related topics. Their article first reviews the approach as a whole, including its extension to a dissipative quantum model of mind/brain states, which accounts for interactions with an environment and generates a direction of time. Noise and chaos are reported as natural and important ingredients in the dissipative quantum model of the brain, indicating interesting connections with the approach presented by Arecchi.

A fundamental theoretical approach concerning the relation between mind and matter is the focus of Hans Primas’ article. His conceptual framework, combining a psychophysically neutral level of reality with another level at which mind and matter are distinguished, has been discussed by philosophers since Spinoza. Interestingly, this framework has become increasingly attractive in contemporary discussions; different variants of it can be recognized in publications by, e.g., David Chalmers, Galen Strawson, Max Velmans and others. Primas’s main sources of inspiration are Leibniz and the correspondence between Wolfgang Pauli and Carl Gustav Jung.

His speculative – as he emphasizes himself – outline proposes a basically quantum theoretical, i.e. non-Boolean, formulation leading to the possibility of quantum correlations between mind and matter even without direct interactions. Primas suggests the distinction between tensed time, including “nowness” as a term foreign to any physical description, and a tenseless parameter time, standardly used in physics, as the key to the distinction between mental and material domains.

The article is largely backed up in mathematics, referring to topics such as observable algebras, non-commuting time operators, stochastic processes, and probability theory. It contains quite a number of starting points for far-reaching future work. For instance, Ioannis Antoniou, Baidyanath Misra and coworkers at the Solvay Institutes in Brussels have studied non-commuting time operators and associated properties as basic characteristics of chaotic processes. A careful implementation of this idea (and others) in cognitive neuroscience is particularly interesting in view of many empirical results indicating that chaotic brain behavior might be the rule rather than the exception.
This issue concludes with a report about a conference on “process thinking” by Michel Weber and Anderson Weekes. The focus of the conference was on sense perception, but the impact of process philosophy in general exceeds that scope by far. Its intended upshot is to offer an alternative to traditional substance philosophy, to consider “becoming” as the primitive concept rather than “being”. It is most likely that original papers on this approach will appear in future issues of this journal.

Together with invited guest editors, we plan to publish special issues on particular topics which are of relevance for mind-matter research. For instance, issues devoted to various biofeedback approaches and to the foundations and applications of the concept of pragmatic information are interesting candidates. Another type of special issue will be dedicated to personalities whose work has been of outstanding significance for mind-matter research.

After all, it is our hope that Mind and Matter will provoke serious, inspired research on problems related to its subject areas. At the editorial office, we will do what we can to encourage the development and expansion of the field by stimulating, generating, maintaining and maybe even increasing the active interest of our readers in the age-old problem of the relationship between mind and matter.