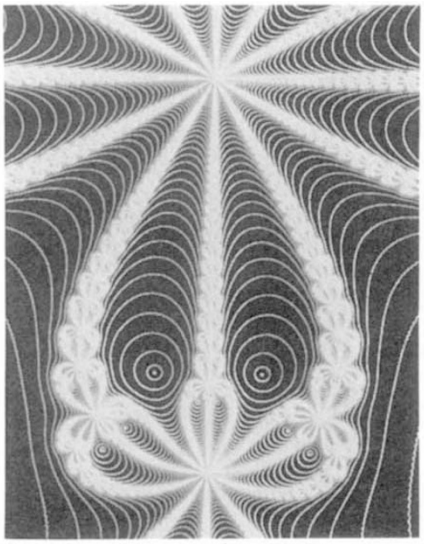
by hedging its bets about the attractiveness of its favourite subjects, category theory in particular. The choice of emphasis is therefore an act of faith that the mathematical flavour, if a little astringent for computer scientists in 1991, will be routine within a few years. Theoreticians may wish to reward this high-risk approach with a subscription now; others can probably afford to wait.



Gregory Sams/Science Photo Library

Fractals — patterns of popularity.

Computational Mathematics and Modeling is a journal founded to publish translations of Soviet papers, mostly from the *Transactions of the Faculty of Computational Mathematics and Cybernetics* of Moscow State University. Section headings include numerical methods, methods for solving inverse problems, and mathematical modelling. The style is classical: for example, "modelling" has the meaning accepted in applied mathematics for many years, and there is no trace of more recent Western preoccupations such as ecology, dynamical systems, or even computer configurations and networks. But given the quality of Soviet computational mathematics and the increasing communication with contemporary computer science outside the Soviet Union, this is almost guaranteed to change, although the results may not be evident in the journal for some time.

Journal of Visual Languages and Computing is the only journal in the set that tries to establish a standard for a new field. Apart from what the name suggests, the contents cover pictorial information systems and databases, use of icons in programming, biologically inspired vision systems, visualization of data, and associated issues of user modelling and the human–computer interface. As many papers on these subjects are now turning up in conference proceedings and a variety of journals, there is a good case for having a single recognizable focus for all of this effort. The papers in the first volume are consistently enlightening about what can or ought to be included in visual computing, and do full justice to its rather heterogeneous mixture of components. In addition, the editors have allowed into their pages a quotation from the software engineering guru F. Brooks that expresses scepticism about their subject. This combination of openness and adventurousness in the journal deserves a positive response. Unlike the other journals under review, this publication takes on something new and has no real rival. □

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Seeing the light

W. J. Firth

Quantum Optics. Editor E. R. Pike. *IOP 6/yr. UK £139, elsewhere $278.*

QUANTUM theory famously sprang from the inability of classical radiation theory to predict the black-body spectrum of thermal radiation, by way of Planck's 1900 hypothesis that elementary radiation sources can exchange energy only in discrete multiples of their oscillation frequency. One might therefore expect the 'photon' or quantum of optical energy to be the keystone of twentieth-century optics.

Why, then, should it have taken almost a century for it to have a journal of its own? Basically, Planck's quantum of light was upstaged almost from square one by Bohr's extension of the quantum hypothesis to atoms, which led on to all of atomic, nuclear and solid-state physics, much of modern chemistry and much else besides. Not only was the photon neglected, it was even reviled as unnecessary: almost all radiation phenomena, including thermal radiation, can be explained satisfactorily by coupling quantized matter to classical radiation — the so-called semiclassical model.

Only in the past few decades has it become possible to devise and perform experiments in which the quantized nature of light is essential, and in which there is a measurable difference between quantum and classical theories. In every case decided so far, the quantum nature of light has been vindicated, and these experiments, together with the development of the associated ideas and their consequences, constitute the new science of quantum optics — the study of phenomena that require nonclassical theories of light for their understanding.

Most of the earlier phenomena were rooted in the statistics of detectors, for example photon antibunching. Today's hottest topic is squeezing, that is, getting around the inherent graininess of quantum light and apparently beating Heisenberg's uncertainty principle by taking advantage of the fact that it is the product of quantities that has a minimum uncertainty: one factor can have a very small error provided that the other becomes very uncertain. Schemes for ultra-high-precision measurements, and possibilities for low-noise communications, give squeezing both a fundamental and an applied dimension — a powerful combination in these times.

This journal aims to be by and for the 'strictly quantum' optics community. This is a fairly small and widely scattered community, and the journal has been slim (a total of 30 contributions in 1990), if geographically broad in its author catchment. It can hardly be said to have superseded existing journals for which quantum optics is a subtopic. For example, *Physical Review A* continues to publish many more articles on quantum optics than *Quantum Optics*.

The plot thickens, however. Early this year the European Optical Society was formed, with one of its aims being to emulate and rival the Optical Society of America, whose journals dominate the wider domain of optics, with strong competition, especially on the European front, from *Optics Communications* and *Journal of Modern Optics*. Among its activities, the society will publish a two-part journal, one part being devoted to "pure and applied optics", with *Quantum Optics* as the second part.

Cultivating a quiet if fertile corner of optics is one thing: taking on the entire field is quite another. The future of this infant journal looks interesting but somewhat uncertain. □

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Treading over old ground

C. J. S. Clarke

Reviews in Mathematical Physics. Editor-in-chief Huzihiro Araki. *World Scientific. 4/yr. US $265 (institutional); $106 (personal).*

THE title of this new journal is perhaps unfortunate, raising expectations that are impossible to fulfil in publishing terms. The ideal review would be a pedagogic work, carefully aimed at an audience of workers in different fields who either are entering the field reviewed or require background informa-