panspermia, which seemed doomed before the possibility of transport of organic material within comets offered a shield against sterilizing interstellar radiation.

There are some rich alternatives open in the mystery of the origin of life. SETI is a program taking action on this matter of deep interest to human beings.

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High-Pressure Physics

Frontiers of High-Pressure Research. HANS D. HOCHHEIMER and RICHARD D. ETTERS, Eds. Plenum, New York, 1992. xii, 497 pp., illus. $125. NATO Advanced Science Institutes Series B, vol. 286. From a workshop, Fort Collins, CO, July 1991.

Pressure is an important thermodynamic parameter that can be used to squeeze information from biological, chemical, geological, or physical systems. As such, it is similar in importance to temperature or electric and magnetic fields. The main advantage of high pressure is that it provides a way of changing density and interatomic distances over a wide range. This is of great use for studying the behavior of organisms of the deep sea, investigating chemical reaction rates in liquids and solids, understanding the interior of the earth, or testing theories of condensed matter, to name just a few applications.

The potential of pressure for such purposes is becoming more widely recognized. This is not surprising, since, for example, the handling of a diamond anvil cell, the workhorse of the modern high-pressure laboratory, is so simple that an undergraduate can easily use it. Also, high-pressure experiments can be combined with a wide range of techniques to cover the other parameters mentioned above and make the phenomena of interest accessible to a wide range of probes. Furthermore, high pressure provides ways of synthesizing materials that are unattainable with other techniques. Though there are some instances when high-pressure experiments seem to be done just for the sake of the pressure itself, most high-pressure papers are published in journals of general scope, which is a favorable situation, since it indicates that high-pressure scientists are involved in problems of broad interest and draws the attention of others to the use of high pressure. At the same time journals and meetings devoted especially to high-pressure studies offer the opportunity to exchange technical tricks or hear about subjects one might otherwise ignore.

The publication of *Frontiers of High-Pressure Research* should provide a stimulus for further interaction among fields. As the editors write in the introduction, the workshop of which it is the proceedings was motivated by the role of high-pressure experiments in the discovery of high-T_c superconductors, in the tailoring of materials for optoelectronic devices, in advances toward producing metallic hydrogen, and in polymer research. This is an interesting mix of fundamental and applied subjects of physics, although it may disappoint biologists, chemists, and geophysicists who might be attracted by the broad title. Unfortunately, the meeting was a little too early to capture the excitement over fullerenes.

The workshop was also intended as a forum for young scientists, and this goal was achieved, judging from the editors' report and the authorship of the papers. It is a good sign that in addition to familiar names in high-pressure physics, many other researchers were present. However, the number of theoretical papers is unfortunately low, especially compared to the contents of a meeting held in 1981 to which the editors compare this more recent one. Nevertheless, the experimental papers in the volume illustrate to an outsider the wide range of techniques applicable under different thermodynamic conditions at high pressure, among them NMR, resistivity measurements, AC susceptibility, and Mössbauer, Brillouin, Raman, photoluminescence, and nonlinear optical spectroscopy at high magnetic field and at low or high temperatures.

The contents have been subdivided according to four subjects: polymers and low-dimensional systems, molecular systems, quantum wells and semiconductors, and high-T_c superconductors. At the end of each section, the highlights of roundtable discussions are presented. Two papers in the volume are particularly outstanding.

A description of the behavior of organic metals is given by I. Marsden *et al.* They start out with an overview of the organometallic molecules and proceed by giving a simple explanation of Peierls distortions and charge- and spin-density waves. Subsequently, they describe the high-pressure behavior of $Cs[Pd(dmit)_2]_2$. This substance shows a metal-insulator transition at low temperature, but with increasing pressure the conductivity of the low-temperature phase increases, maybe owing to a transition to a semimetallic phase. Even though the insulating phase does not seem to be a simple Peierls distortion of the metallic phase, the experimental results provide a clear illustration of the theoretical points discussed in the introduction of this paper.

N. W. Ashcroft discusses the influence of ordering on the stability of the phases of hydrogen in the megabar pressure regime, where metallization and dissociation are expected. It is explained in a didactic way that orientation of the protons is important, since neither a Mott model with fixed protons on a Bravais lattice nor a uniform proton distribution gives very realistic metallization pressures. But this is a formidable complication, since it is quite possible that the molecules could have fixed but random orientations. Ashcroft discusses the highly interesting possibility that in the state where band overlap occurs (and this is predicted to happen for spherically averaged configurations), the randomness could preclude the diffusion of electrons, or, in other words, Anderson localization. This in turn would prevent the observation of a Drude absorption or reflectivity edge, which is one of the most important experimental probes.

The roundtable discussions should certainly be of interest to a broad audience, since the panel members give brief overviews of their work and discuss future directions. The discussions of molecular solids and superconductors are especially enjoyable, since the chairmen have managed to clearly abstract the lively discussions. The discussion sections are probably useful reading before one makes a selection of papers to read.

I would recommend *Frontiers of High-Pressure Research* for the overview it gives of an exciting field of condensed matter science. The description of interesting and new techniques is important for specialists, and most of the papers are clear enough, apart from some jargon, that graduate students should be able to understand them.

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Other Books of Interest

Muscular Contraction. ROBERT M. SIMMONS, Ed. Cambridge University Press, New York, 1992. xii, 299 pp., illus. $69.95. Based on a meeting, Cambridge, U.K., June 1989.

By the time Andrew Huxley was awarded the Nobel Prize for his work on nerve conduction his research interests had turned to muscle contraction, and when his associates undertook to honor him at a conference in 1989, that was the subject he