

first involved in a number of war-related projects, directed largely by Linus Pauling. When he was a senior research fellow, he and B. Gunnar Bergman worked out the structure of the sigma-phase of the Fe-Cr system, a study that marked the beginning of his main research career, the structures of transition-metal phases. At MIT and later at Oregon State, he and his wife Clara, together with their associates, worked out the structures of a very long list of transition-metal complexes. Many of the binary and tertiary alloy phases (often containing silicon or aluminum) have large unit cells and are very complex, but a common feature is that their interstices are distorted tetrahedra, whence the name "tetrahedrally close packed" ("tcp"). Some representatives of this group of compounds later became important as possible storage materials for hydrogen. Following the discovery of quasicrystals in 1984, the building principles of tcp phases were used in the derivation of models of their structures. David was able to make important contributions to this field, and his insight and critical sense were much appreciated.

Early in his MIT career, David also began a notably productive research effort on the structure of zeolites, which included derivation of the structures of the commercially most important zeolites, A and X/Y-Faujasite. He also found time to write (with Carl W. Garland, Jeffrey I. Steinfeld and later Joseph W. Nibler) a widely used laboratory text *Experiments in Physical Chemistry*, (first published in 1962 by McGraw-Hill and now in its sixth edition). Among David's professional services were 15 years on the US National Committee for Crystallography, including 3 years as secretary-treasurer and 3 as chairman (1967-69); organizing chairman of the Eighth International Congress and General Assembly of the International Union (1969); chairman of the American Crystallographic Association (1970); member of the executive committee of the International Union of Crystallography (1972-78); and regional coeditor of *Acta Crystallographica*.

After his retirement, David continued to be active in science despite his failing health. At the regular luncheon meetings of the physical chemists at Oregon State, he contributed his customary insights to the discussions until the last week of his life.

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Gianni Ascarelli

Gianni Ascarelli, a member of the Purdue University physics department for over 30 years, passed away in West Lafayette, Indiana, on 24 September 1995, after a four-year struggle with cancer.

Ascarelli was born in Rome, Italy, on 25 October 1931. In 1938, the family resettled in São Paulo, Brazil, but returned to Italy in 1948. Ascarelli, who had received a BS degree in physics from the University of São Paulo, enrolled at the University of Rome and obtained a physics degree ("Laurea") in 1954.

Ascarelli worked for a short period at the Italian equivalent of the National Institutes of Health. In 1955, he sailed to the US and enrolled as a physics graduate student at MIT. After obtaining his PhD in 1959, he spent two years as a postdoc at the University of Illinois.

In 1961, Ascarelli returned to Italy to assume the positions of group leader with the Italian National Research Council and lecturer at the University of Rome. In 1964, he joined the faculty of Purdue University as an associate professor and was promoted to professor in 1970. Subsequently, he spent several years as a visiting scientist in various places in Europe.

Ascarelli's research interests were initially focused on solid-state physics, with emphasis on the properties of semiconductors and ionic crystals. In the early 1960s, he made several pioneering contributions to solid-state spectroscopy through the innovative use of the modulation techniques he invented. He studied recombination, and low field breakdown processes, as well as nuclear magnetic resonance phenomena in doped semiconductors. By employing optical absorption techniques, Ascarelli established at Purdue a strong effort to explore the physics of excitons and the electron-phonon coupling in semiconductors.

Along with his work on semiconductors, Ascarelli developed a keen interest in the optical properties of biologically relevant materials. He used far-infrared techniques to establish the vibrational spectrum of a number of biological systems. To this end, he began to utilize submillimeter cyclotron resonance with suitable lasers. He also explored the effects of the application of relatively high magnetic fields on biological systems. Having dealt extensively with aqueous solutions, Ascarelli became interested in the intriguing, fundamental problems associated with the mobility and the transport properties of electrons in liquids.

During Ascarelli's last fifteen years or so, his main field of research was the exploration of electron energy levels

and electron transport in some non-polar dielectric liquids, mainly those of the rare gases. He also succeeded in measuring indirectly the exciton effective mass in liquid xenon, in cooperation with a group from the universities of Jerusalem and Hamburg. While measuring electron mobility, he also found an apparent discontinuity in the density of liquid argon along isobars slightly above the critical temperature, and the possibility of a surface phase transition caught his attention. Later on, he was able to resolve this mystery by estimating the effects of capillary condensation.

His last effort was the direct measurement of the effective electron mass in liquid rare gases, using cyclotron resonance.

Ascarelli's research was characterized by an attempt to identify an issue on which there might be a conceptual or an experimental difficulty, and then design an experiment to resolve the question.

He also made important theoretical contributions, such as his model of the electron mobility in rare-gas liquids. From a comparison of the model calculations and experiment, he was able to evaluate the density dependence of the effective mass of electrons in liquid argon and xenon. He continued his experimental work even when his last illness made it very difficult.

He was an outstanding experimentalist. Always full of ideas and plans, he was meticulous in the execution of his projects, being involved in every detail. His very fruitful and imaginative experimental work was based on a deep and thorough understanding of the relevant theories. He was always open to new ideas and developments, and by giving advice and engaging in discussion he contributed to the research of many people who consulted with him.

Fluent in French, English, Italian and Portuguese, Ascarelli was able to give physics lectures in all these languages. He was a rigorous person, demanding much from his students and colleagues alike. This trait, along with his urge to firmly uphold his moral principles and opinions, caused at times disagreements and misunderstandings. He was a loyal, pleasant and helpful colleague and friend. He will be missed by many.

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